

Lessons From Product Juggernauts

Jean-Philippe Deschamps and P. Ranganath Nayak

When the shouting is over, one fact is clear: what differentiates perennially great companies from others is the products they sell. Some companies generate a never-ending stream of products that are appealing to customers and profitable to produce. Other companies achieve product innovation in fits and starts. *Yet* others launch many failed products, unprofitable products, or „me too“ products.

We recently observed firsthand the powerful impact of effective products in a series of visits to such dynamic companies as Canon, Dell, Ford, Harley-Davidson, Hewlett Packard, Honda, Intel, Microsoft, Rubbermaid, and Sun Microsystems. Here, products are what everyone talks about, thinks about, and works on. Products drive investment and generate profits. To the executives of these companies, competing means competing through products.

They share the simple but profound realization that in discrete product manufacturing, at least, there is no such thing as a „commodity“ product. *Yet* many CEOs believe there is and, worse, treat their own products as commodities. The notion of a commodity marketplace is one of the most entrenched and misleading of business myths, particularly in the United States. While it does have some validity in certain basic industries – such as minerals, chemicals, and agribusiness, where standard grades have been defined – even here products are never completely identical. Suppliers can always find ways to differentiate their products from those of their competitors.

Applying the notion of commodities to industries and products that are intensely price-competitive can be costly indeed. Trapped inside this commodity mindset, top managers may miss opportunities to shape their companies into strong, product-based competitors. Cost- and price-obsessed executives see the world in one dimension. Their attitude limits not only the capital available for investment in new products but also the creativity of product teams working to come up with new ideas.

In a noncommodity world, there are many opportunities to compete through products:

- *Competing through product proliferation* is the name of the game for Rubbermaid in plastic housewares, Casio and Hewlett Packard in pocket calculators, Honda in motorcycles, and Sony in portable audio equipment. This high-risk, high-reward strategy lets these companies offer customers the broadest choice, deliberately choking competitors out of the market through an avalanche of new products. They have learned how to blanket the market with products tailored to serve the needs of each customer group or application within it. Just as importantly, they know how to do it economically – in other words, without letting their product diversity grow out of control, beyond the capacity of their resources to support it.
- *Competing through value* typifies Toyota, particularly with its Lexus luxury division; Maytag in domestic appliances; and Ikea, the Swedish home furnishings enterprise, in furniture. These companies are outperforming their competitors by offering superior quality at affordable prices.
- *Competing through design* makes companions of Harley-Davidson in motorcycles, Sony in consumer electronics, and Braun in small domestic appliances. They have built their images and price premiums by delighting their trendy, lifestyle-conscious customers with eye-pleasing design.
- *Competing through innovation* characterizes 3M in adhesive- and film-based products and Sony and Philips in consumer electronics. They all fuel their growth by introducing one new product concept after another.
- *Competing through service* is the winning strategy for elevator companies such as Otis and Schindler. Service is actually so important for them as a source of revenues and for their customers that they have developed proprietary service management systems to protect their bases of installed elevators from the intrusion of service „pirates,“ i.e., companies trying to service other manufacturers' elevators.

Let us examine in greater detail each of these strategies for competing through products.

Competing Through Product Proliferation

General Motors pioneered the product proliferation strategy in the 1920s and 1930s as it battled Ford's Model T mono-product culture. This strategy was once considered the luxury of the rich and powerful. Today, product proliferation more closely reflects a company's development effectiveness than the depth of its resources. In fact, product proliferation is increasingly recognized as one of the more formidable competitive strategies of the 1990s for all companies. When it is intensively and effectively implemented, proliferation may be one of the quickest ways to squeeze out competitors and dominate a market.

Examples abound in a number of industries. Japanese companies are particularly adept at this strategy. They often take a scattershot approach to the marketplace, firing off as many volleys as possible without knowing how

many or which ones might hit. Toshiba, for example, has discontinued more models of laptop computers than some companies have introduced. Western companies seem to come to the market with a rifle mentality: husband your bullets, study the targets, aim at one or two, fire, then reload and fire again. The more efficient approach would marry the capability of firing many shots with the ability to aim them accurately.

One of the most famous product shoot-outs took place in the early 1980s between Honda and Yamaha in the motorcycle market. Responding to Yamaha's challenge to its supremacy, Honda set out to overwhelm Yamaha with products. In 1981 and 1982, Honda introduced more than 80 new models and made 113 product alterations as well. Yamaha could counter with *only* 34 new models and 37 product alterations during the same 18-month period. By filling every market niche, Honda preempted Yamaha from increasing its penetration. The duel ended when Yamaha, badly hurt by a 50 percent drop in sales, essentially admitted Honda's product and market superiority by stepping back from the challenge.

A proliferation strategy can be one of the most effective ways to defend a leading market position, particularly when patent protection cannot be obtained or enforced. Sony, for example, knew that it could not protect its famous Walkman – which was less a technical innovation than a lifestyle revolution – from being copied. Sure enough, within three years of Walkman's 1979 introduction, imitators grabbed 80 percent of the market Sony had created.

To stop the downward slide of its share, Sony fought back – not by cutting its prices, but by multiplying its product offerings to an incredible extent. From 1981 to 1989, Sony came out with 150 new models of the original product – an order of magnitude more than its competitors. The company charted every possible variation on its core product that could be achieved without redoing the underlying Walkman technology. This intense product churning ensured that each customer would be able to find a model seemingly tailored to his or her wishes. By customizing for customers and elbowing out competitors, Sony regained its market preeminence and now holds a more than 40 percent share, a very high number in such a competitive area. And by dramatically shortening the product life cycle, the company forced an entire industry to compete on its terms.

Procter & Gamble uses a similar proliferation strategy to preempt competition in a very different market – diapers. Parents used to go to the store to buy one-kind-fits-all diapers. Now P&G, spurred by intense competition from Kao, its formidable Japanese rival, offers the widest choice: diapers just for boys and just for girls; diapers for problem wetters; diapers for infants up to six months and for those older than six months; and diapers for heavy babies and for thin babies. Diaper designers are now studying how toddlers walk, crawl, and play to further differentiate their products. The days when a company could enter the market with a generic diaper have been – so to speak – wiped out.

Competing Through Value

Winning customers by providing greater value is as old as industry and competition. In the hands of daring entrepreneurs such as Henry Ford, this strategy spurred the great consumer revolution of the 20th century.

While some people consider value creation – offering high quality at low cost – the ultimate competitive strategy, many executives dismiss this strategy in the belief that creating exceptional value requires significant product and managerial innovations that are just too hard to plan and implement.

However, an increasing number of companies are demonstrating that a value strategy of product creation *can* be pursued systematically. Two main approaches have proved effective in creating sustainable competitive advantage:

- The dogged pursuit of continuous incremental improvements, as exemplified by Toyota in cars and Maytag in domestic appliances
- The radical, innovative restructuring of the company's business system, embodied in the remarkable success of Ikea, the Swedish furniture manufacturer and retailer

Continuous Improvement. Many companies in traditional industries operate instinctively within a relatively simple quality/cost tradeoff model. In this way of thinking, there is a single, fixed, direct relationship between quality and cost. Any significant improvement in the product, whether in design, features, or even quality „feel,“ necessitates a proportional increase in costs.

Most prestigious car manufacturers, such as Mercedes-Benz and BMW, operate according to this tradeoff curve. They plan product improvements and new products on the assumption that they will automatically lead to substantial cost and, therefore, price increases. Such companies tend to assume the converse proposition as well: that by spending more they can buy higher quality.

In contrast, Toyota executives have a mental model of multiple and movable tradeoff curves. This alternative view allows for the systematic planning and introduction of process improvements that dramatically shift any given quality/cost curve. Toyota engineers are trained to produce higher quality without triggering proportional

increases in costs. By improving processes, they can break out of the confines of one quality/cost curve and move on to a newer, more advantageous one.

The shifts from one quality/cost tradeoff curve to another result from a number of complementary approaches:

- The introduction of more-efficient processes for the development and manufacturing of each new model, typically defined after a painstaking analysis of current deficiencies
- A gradual, systematic improvement in the design of each model, subsystem, or single part, with the goal of increasing overall product quality, reducing investment requirements, and decreasing costs
- A persistent tracking of inefficiencies and waste at all levels, such as from the late changes, excessive diversity (insufficient standardization or parts carry over), unnecessary complexity, and errors in product conception that lead to iteration and rework

This combination of approaches has enabled Toyota to manufacture the Lexus, its luxury sedan, for a fraction of the cost of its direct competitor, Mercedes-Benz's new „S“ cars.

Radical Restructuring. In its own quiet way, Ikea has revolutionized furniture design, manufacturing, and retailing. It has done so by rethinking the entire business system of its industry, from product concept to distribution. In dramatically altering the economics of its internal operations, it has been able to provide greater value to customers.

The Ikea concept seems extraordinarily simple: reduce costs to consumers by changing the way furniture is designed, stocked, sold, and delivered. At the same time, avoid the cheap discounter image by providing simple but high-quality design. Ikea furniture generally comes in kits, designed to be easily assembled at home by customers. This concept, which considerably reduces product, transport, and distribution costs, is not revolutionary. Like so many management ideas, the genius is in the implementation.

Ikea provides maximum customer value by combining:

- *Design quality:* Well-known Scandinavian designers create its furniture and house furnishings.
- *Product quality:* Attention to quality and testing exceeds that of many manufacturers of more-expensive conventional furniture.
- *Customer service:* Excellent in-store information, high availability from stock, and liberal return policy appeal to customers.
- *Design utility:* Products can be transported and stored economically in flat boxes.

This formula adds up to a tremendous perceived value in the minds of shoppers. Ikea has become one of the fastest-growing furniture groups in Europe, and it is well positioned to extend its influence in other parts of the world. At the beginning of 1992, the company operated 100 stores in 25 countries, with annual sales of about \$3.8 billion.

Ikea's success comes despite a purposeful limitation of in-store selling assistance. Customers are expected to pick out merchandise with little help from the scarce salespeople, pack their furniture into their cars, and assemble it at home. Such demands might turn away many people, but not Ikea's loyal following. „If we offered more services, our prices would go up,“ says Goran Carstedt, president of North American operations. „Our customers understand our philosophy, which calls for each of us to do a little in order to save a lot. They value our low prices.“

Competing Through Design

Companies as diverse as Braun, Harley-Davidson, IBM, Olivetti, and Sony share a passion – some would say an obsession – for the way their products look, feel, and operate. For these manufacturers, design is not a cosmetic add-on but a means of expressing their corporate identity in the marketplace and establishing their products as synonymous with quality.

Design advocates are annoyed by the narrow definition often applied to their discipline – that design means styling. They argue that they do not simply add the external touch of aesthetics to a product already developed. Rather, a good designer strives to enhance the customer's physical and functional experience with the product over its entire life. He or she achieves this enhancement by designing products that are:

- Aesthetically appealing
- Safe and pleasing to touch and use
- Immediately intelligible and easy to operate
- Easy to install, handle, store, clean, and maintain

- Easy and economical to manufacture

Designing products that are easy to manufacture is frequently the hardest part of the agenda. In some companies, designers are still viewed – and allowed to behave – primarily as artists. Because they lack real manufacturing expertise, they may lead the company into paying dearly for their ignorance.

A Swiss manufacturer of ceramic bathroom fixtures learned this lesson the hard way. To move up-market, the company enlisted a famous design consultant to develop a new bathroom line. This designer, who was well known for advanced car styling, had never worked with products such as wash basins or toilets; he was familiar neither with ceramic materials nor with the molding processes that create them.

The manufacturer knew the limitations of his industry well, of course, but did not dare constrain the artistic freedom of his expensive designer. The result? Although spectacular, the shapes designed by the consultant proved impossible to manufacture. Several costly iterations in design and molds were needed before the line could be launched.

Design conflicts often erupt within companies as philosophical battles. Whereas development engineers tend to conceive products from the inside out, industrial designers look at them from the outside in. Both perspectives are needed, but they are not easily reconciled. Often one will prevail over the other.

In automobiles, designing from the inside out often means ranking technical constraints – for example, which engine should be used and how to place it under the hood – over considerations of passenger comfort or ergonomics. Companies such as Honda, with its „Man Maximum, Machine Minimum“ philosophy, advocate just the opposite. Honda is well known for having designed a new engine for its small Civic sedan because available engines could not fit under the low hood of its new car concept.

When Ford started developing a new model in common with its Japanese partner, Mazda, it discovered that the two companies started from radically different design points of view. Ford's version of the new car, the Probe, was designed from the exterior in, reflecting the company's strong emphasis on industrial design. Mazda's version, the RX6, in contrast, was designed from the inside out, reflecting the company's strong engineering tradition. The two companies ultimately learned from each other and were able to fuse a balanced approach to development.

Providing well-designed products is becoming critical even for manufacturers traditionally thought to be in the functional or technical realm. Office automation and telecommunication products, power tools, equipment, and machinery of all types no longer sell simply on cost and performance. They compete increasingly on design – in the full ergonomic sense of the term – because design conveys quality and helps improve margins. In the cutthroat world of consumer electronics, few companies are able to consistently charge price premiums. One that can is Bang & Olufsen, the Danish manufacturer of stylish audio and visual equipment. B&O is a niche player catering to affluent, lifestyleconscious buyers.

At the opposite end of the world is Sony, perhaps the only mass-manufacturer of consumer electronics capable of charging a price premium on many of its audio and video products. An objective, comparative analysis of Sony's products against those of its direct competitors – Matsushita, Sharp, or Philips – often cannot uncover any significant technical advantage. Sony, however, commands higher prices thanks to its image of quality, which stems in part from its attention to design. At Sony, design is perceived as a corporate priority. To enhance the design department's image as well as its influence, Akio Morita made the function report to top management. Designers, he long insisted, can rule on products. That means that no Sony product concept becomes a reality until it receives the approval of the design department.

Competing Through Innovation

Few organizations can be consistently innovative over time. Even fewer can claim that they put innovation at the heart of their competitive strategy. The honor roll of those who do so includes Black & Decker, Canon, Dupont, 3M, Merck, Philips, and Sony.

For many managers, even today, innovation is a risky process. Their concern is fueled by the long list of well-known innovators who ultimately failed, such as EMI, the creator of the CT scanner, or De Havilland, the manufacturer of the first commercial jet. Business analysts and scholars have often contrasted the mixed fortunes of these failed innovators with the success of powerful fast-followers, such as Matsushita in video recorders and IBM in personal computers. However, fast-followers usually succeed only when the original innovator lacks the market position or financial strength to fully exploit its innovation. Few fast-followers succeed against a healthy, well-positioned innovator. Furthermore, the period immediately following commercialization, when the innovator controls the marketplace, is exceptionally profitable.

There are many ways to innovate, reflecting different company cultures and management philosophies. Innovation strategies vary in terms of their nature and thrust: Is management looking primarily for incremental innovations or breakthroughs? Secondly, innovation strategies can be characterized by their process. Do innovations typically occur top-down, under the inspiration and guidance of management, or bottom-up, through the creativity and efforts of people throughout the organization?

Top-Down Breakthroughs. Radical innovations typically create a new market, as Philips and Sony did with compact discs. Often technology-based, these breakthroughs flourish in companies that realize that newness sells.

Contrary to popular belief, breakthroughs are not all fortuitous. Some companies, such as Canon, DuPont, Philips, and Sony, make a conscious and systematic effort at cultivating them. Top-down breakthroughs happen only when these are all in place:

- A top management with a strong vision of where and how to innovate and the capability to communicate and mobilize people to make it happen
- A strong technological culture and world-class capability to develop innovation-enabling technologies and new proprietary product concepts
- A very clear sense of the customer (through a combination of research and intuition) and the ability to translate product concepts into attractive, salable products
- An ability to combine mutually reinforcing innovations (for example, in product and in manufacturing process)

To foster such breakthroughs, companies frequently set high goals. For example, Merck's chief of research, Edward Scolnick, prods his staff to win governmental approval of one major therapeutic drug per year. He knows that not all researchers can take such pressure, so he specifically looks for drug inventors motivated by a desire to be famous. Merck adds its own reward in the form of stock options.

Bottom-Up Incremental Innovations. In some companies, innovations may emerge at any level of the organization, independent of management support. 3M, for example, prides itself on being an archetypical bottom-up innovator. Innovation – and the spirit of entrepreneurship it has created – is so much a part of the company culture that it has somehow become away of life.

True bottom-up innovation processes are rare simply because the proper management conditions rarely exist. Executives can encourage the bubbling up of innovation in three ways:

- By establishing a climate that encourages and rewards people for taking initiatives and risks and tolerates intelligent, creative failures
- By implementing a series of management mechanisms for tapping people's creativity and collecting and screening ideas, as well as funding projects
- By creating high-level checks and balances to help manage the retained projects, along with mechanisms to integrate them with the rest of the business

Bottom-Up Breakthroughs. Real breakthroughs only rarely emerge from formal innovation processes backed by full management support. Far more often, they erupt as unplanned, spontaneous processes in the lower ranks of the company, without top management intervention and sometimes despite it. These bottom-up breakthroughs have captured the imagination of business writers and innovation researchers. 3M's now ubiquitous „Post-It“ pad is an outstanding example of a bottom-up breakthrough.

Bottom-up breakthroughs do not happen by chance or in just any type of environment. They generally occur in companies that have, as 3M has, traditions of innovation and entrepreneurship. Even seemingly accidental discoveries require enlightened managerial forbearance, if not encouragement, to become real products. Decades ago, when a duPont scientist noticed a white, waxy substance lining what he thought was an empty container, he had not discovered Teflon itself, but he had begun the process that would create this miraculous material.

Competing Through Service

Competing through products leads inexorably to competing through service as well. For customers, product and service are two faces of the same coin. Both provide numerous opportunities for achieving competitive advantage through differentiation, and both require major investments of time and money. „Yet few manufacturers give them equal consideration in their strategic priorities. Except in companies that depend on parts and after-sales maintenance for much of their profits, products continue to receive most of management's attention, while service is seen as a necessity and a source of cost rather than as an opportunity to add value to customers.

Certainly, most managers appreciate the risks involved in providing poor service. When a recent Arthur D. Little survey asked purchasing agents and purchasing decision-makers to specify the most serious problems they have

with suppliers, only 31 percent cited „product or quality mistakes,“ while 62 percent cited service-related issues such as late delivery and poor communication. What actions did these customers take when they received poor service? Not surprisingly, three out of four reported that they had reduced their business with the companies providing bad service.

Perhaps the most important observation to emerge from the survey is that even when a specific complaint is satisfied, customers still do not return to the preproblem level of business for about six months. In other words, companies cannot easily redress service problems.

On the other hand, of course, many managers also appreciate the opportunity to compete through service. But this does not mean that they know how to deliver service systematically or consistently. Product-oriented managers may find it useful to ask themselves these questions:

- Can we gain a delivery advantage
 - By better customizing our products to each customer’s needs?
 - By being more flexible, faster, more reliable?
- Can we win our customers’ preference through better support
 - Before they buy from us, in helping them define their needs and specify products?
 - After they buy from us, in ensuring a high degree of product availability at low cost?
- Can we be more generous in providing value
 - Through application know-how, information, training, etc.?
 - Through privileged upgrading, warranty, etc.?

Once management has defined a service strategy, they must build specific capabilities and processes to make it work. Some of these capabilities are well understood and amenable to specific, focused improvement actions. These include customer relations, physical distribution, and after-sales service. Other requirements – such as product customization – may be harder to satisfy, particularly when they interfere with established key processes.

One such process with which a service strategy will certainly interface is new product development. At a minimum, products should be designed for easy service. Ideally, service should create a proprietary competitive advantage.

The French electrical engineering group Merlin Gerin has reached the world’s top league in the manufacturing of power distribution equipment – neck-and-neck with giants ABB, General Electric, Siemens, and Westinghouse – in part thanks to its strong service orientation. For example, Merlin Gerin designed its low-voltage power switches to be particularly easy to install, adjust, and maintain. They are compact, standardized, and directly pluggable on racks. These product-service features, combined with the shortest delivery times in the industry – two weeks versus six to eight weeks for its main competitors – have made the company very popular with electrical equipment dealers and installers, which control a large part of the market. As a result of these service innovations, Merlin Gerin has doubled its market share in low-voltage distribution equipment.

Some industries depend so heavily on parts and maintenance for revenues and profits that service considerations play a critical role in the conception and design of new systems. In the elevator industry, for example, many companies besides the original equipment manufacturers have entered the service business, drawn by the stringent legal requirements under which elevators are operated and their long life cycles – up to 30 years. To protect themselves against what they call „service pirates,“ elevator OEMs such as Otis and Schindler-Westinghouse have incorporated proprietary service management systems into their products. These manufacturers are equipping shafts and elevators with sensors, intelligence, and communication capabilities that connect them on-line to the company’s service monitoring center. The objective is to optimize preventive service by recording elevator use, monitoring wear, and anticipating and communicating possible dysfunctions. This system reduces the number of routine service calls and thus cuts service costs. Since most lifts come under flat-fee service contracts, this strategy increases the manufacturers’ profitability while protecting their installed elevators from the intrusion of service pirates.

The Common Factor

Underlying all these diverse ways to compete is the realization that products are created through a *process*. Effective companies recognize that this process is large, complex, and multifunctional, involving people from Research, Engineering, Manufacturing, Marketing, Sales, Service, and Finance (Exhibit 1). They understand that such processes do not perform well when left to themselves but must be *managed*, and all levels of management need to be involved (Exhibit 2). Therefore, in these companies, the product creation process is studied,

documented, standardized, measured, controlled, and continuously improved.

Exhibit 1

The Product Creation Process

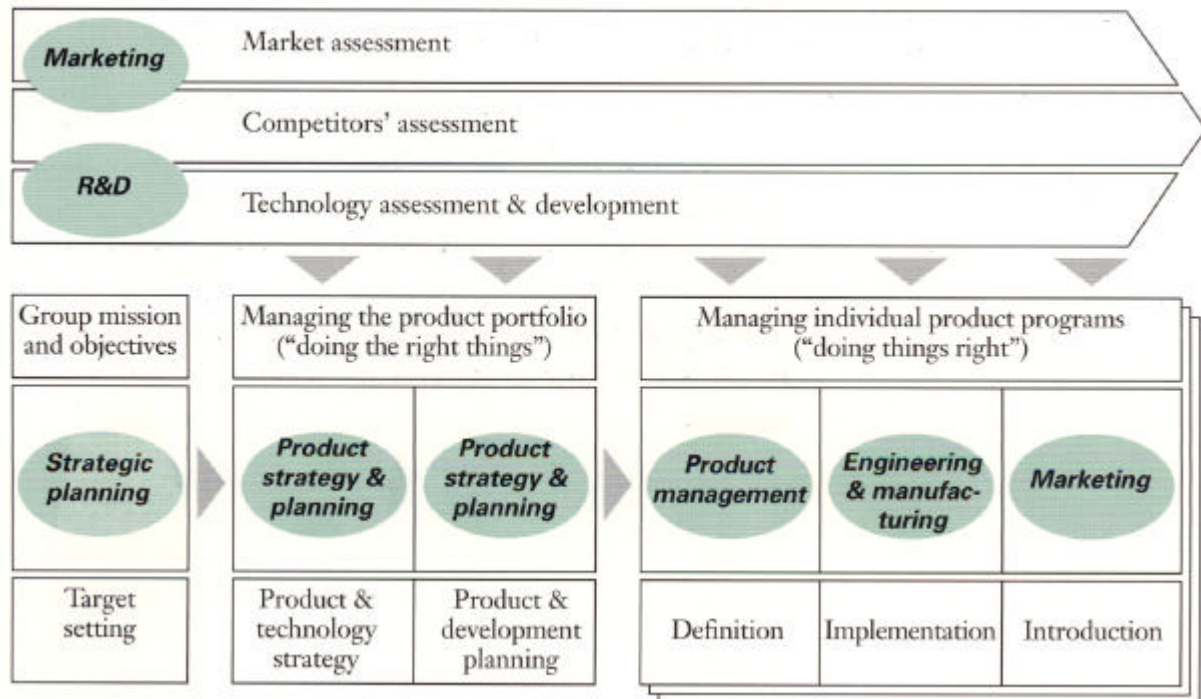
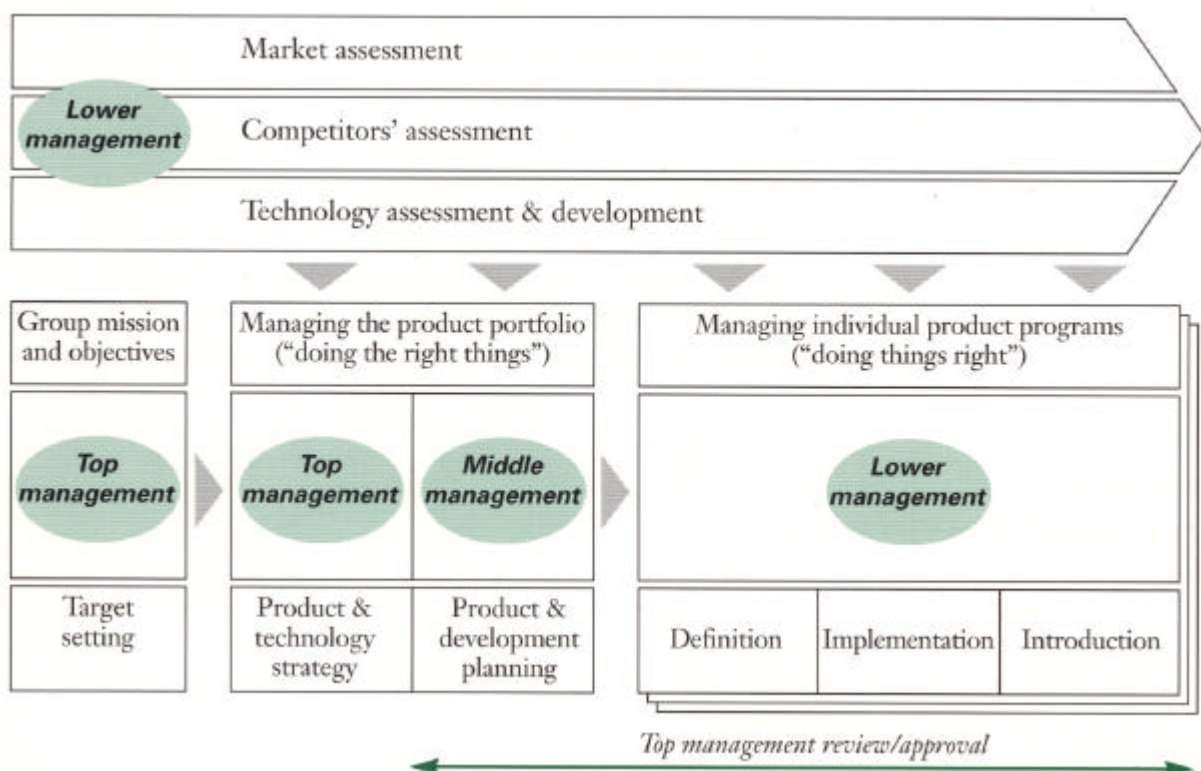


Exhibit 2

Management Involvement in Product Creation



Throughout the rest of this issue of *Prism*, we explore insights into how to manage the product creation process.

Jean-Philippe Deschamps is a vice president of Arthur D. Little, Inc., responsible for the European Technology and Innovation Management Practice. Based in the firm's Brussels office, he has extensive experience helping European companies compete through products.

Ranganath Nayak is a senior vice president of Arthur D. Little, Inc., responsible for the firm's worldwide operations management consulting practice. He has extensive experience helping companies around the world improve their operations, particularly in the areas of research, development, and manufacturing.

Creating a Product Strategy

Jean-Philippe Deschamps

Surely every business has a product strategy – right? Wrong!

A product strategy is much more than a list of specific product actions over time. It is an explicit route-map designed to guide a company in its efforts to develop and market products that build sustainable competitive advantage and meet its growth and profit objectives. A good product strategy maximizes both customer satisfaction and profits – while stating the firm's priorities so clearly that every function can refer to it at any time for practical operational guidance.

Few companies we know have clearly formulated product strategies. Ask most managers „What is your product strategy?“ and you are likely to get a blank stare, some broad generalities on product line positioning, or a detailed list of preferred product attributes. The question will also receive different responses from the various functional departments. In short, few business managers can point to a document that describes unambiguously their firm's approved product strategy. Fewer still can describe the process by which their product strategy has been formulated, modified, approved, and disseminated. Some even justify the lack of a formal strategy by arguing that it would be dangerous to write it down because of the risk of leaks. In fact, the risk of *not* having a product strategy is far higher.

Penalties and Costs

Managers often do not fully appreciate the penalties their companies pay for not having comprehensive and explicit product strategies. In our daily practice, we see at least three disadvantages.

First, by not formalizing the product strategy process, management implicitly accepts a certain level of ambiguity in long-term priorities. Many people in R&D, design, engineering, or manufacturing are left guessing as to what are the firm's chosen long-term bases of competition or the priorities among product segments and attributes. This ambiguity hampers their choice of long-term development and investment priorities. They are often forced to make choices and commitments based on whatever information they can get.

Imagine, for example, the dilemma faced by Imperial Bikes, a European manufacturer of premium bicycles. Should the company focus on reinforcing its leadership in its traditional 10-speed racing-bike segment, or should it penetrate the high-end segment of the fast-moving mountain-bike market? Should it focus on bike weight by developing new frame materials, or should it promote customized bikes by modifying its selling and manufacturing processes? How can Imperial Bikes's design, development, and manufacturing departments set their long-term priorities in terms of skills development and manufacturing investments, unless they receive clear guidelines from management on such vital product strategy options?

Secondly, according to a well-known management law, ambiguities that are born upstream – for example, in product strategy – always pop up downstream. In other words, the penalty for not having defined a clear product strategy is often a more laborious product creation process, particularly at the product definition and specification stage. Designers at Imperial Bikes experienced this difficulty firsthand during the development of their new „Feather-Grand Prix“ racing line. To satisfy marketing's demand for the lowest possible weight, they had chosen a special type of composite for their new bike's frame. This had required a special manufacturing process, which raised costs. The higher cost was acceptable as long as Marketing positioned the „Feather-Grand Prix“ line at the top end of the market, as planned.

However, after a competitor launched a new medium-priced amateur-racing bike, Marketing had immediately asked to stretch the new generation down-market to cover the lower-priced amateur-racing segment as well. The new frame materials could not meet the new cost constraints, and the development project had to be dramatically modified.

Without the framework of a detailed product strategy, each new product development project becomes a new opportunity to ask a few basic questions that ought to have been addressed up front, e.g.:

- Which market segment are we targeting specifically with that particular product?
- What is the role and mission of that specific product in our overall product line?
- What is a winning product, from the customer's viewpoint, in that segment?
- How have we chosen to beat our competitors, generally and in that segment?