

Managing Innovation: From Serendipity to Process

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There are many ways to increase company value. In their recent book *Competing for the Future*, Hamel and Prahalad equate the challenge to that of jacking up the value of a fraction.' The numerator of the fraction represents the company's revenues and profits. The denominator reflects its investment and cost base. To increase the value of the fraction – hence company value – management must reduce the denominator and/or grow the numerator.

Reducing the denominator has become common practice. The successive waves of restructuring, downsizing, and process reengineering have generally been aimed at lowering costs. It is now time to focus on creating long-term value by growing the numerator. Internal growth can be achieved through gaining share in existing markets and/or entering, or even pioneering, new markets. This means generating revenue by rejuvenating the company's portfolio of products and businesses through innovation.

Introducing winning products is one of the surest ways to create lasting value for all the firm's stakeholders: its owners, of course, but also its customers and employees. The continuous creation of superior new products satisfies customers, thus generating growth in market share, revenues, and profits, which in turn should please owners. And strong financial performance will ripple back to employees through more and better jobs and higher pay. The key to this „virtuous cycle“ is the core process of innovation.

Note: This article has been adapted from Product Juggernauts – How Companies Mobilize to Generate a Stream of Market Winners by Jean-Philippe Deschamps and Ranganath Nayak, Harvard Business School Press, 1995.

The Innovation Process

Innovation, or new business creation, is the process by which a company builds insights about its customers; identifies and evaluates unique market opportunities and prepares a bold game plan to seize them; and develops a stream of winning products. The process of new business creation can generally be split into two parts: an upstream process – sensing and creating opportunities – and a downstream process – converting the selected opportunities into successful products. Most companies have a formal process in place to manage the downstream part. Few that we know of have set up an equivalent process to manage the upstream part: sensing and creating opportunities. This lack of process for managing innovation reflects management's fear of stifling what is still often perceived as a soft and intangible – i.e., creative – process. Can one realistically structure and manage a „high-touch“ activity that depends so much on an entrepreneurial culture and a climate receptive to innovation? Can one seriously talk about setting up innovation management mechanisms?

At the risk of removing part of its mystique, we believe that the upstream process in innovation is not fundamentally different from other processes. It has been said that innovation consists of 10 percent inspiration and 90 percent perspiration. Well, at least that latter part can be described and mapped. It deserves to be regularly appraised and rethought (a term more suitable than *reengineered* for this kind of process) and is worth steering through various kinds of mechanisms. We find it helpful to think of the upstream innovation process as consisting of three stages (see Exhibit I):

- A fertilization stage, to envision the opportunities
- A seeding stage, to generate and manage the idea flow
- An incubation stage, to manage precursor projects

Each phase requires a different kind of attention and involvement from management, as well as different management mechanisms, which we will describe.

Fertilization: Envisioning the Opportunities

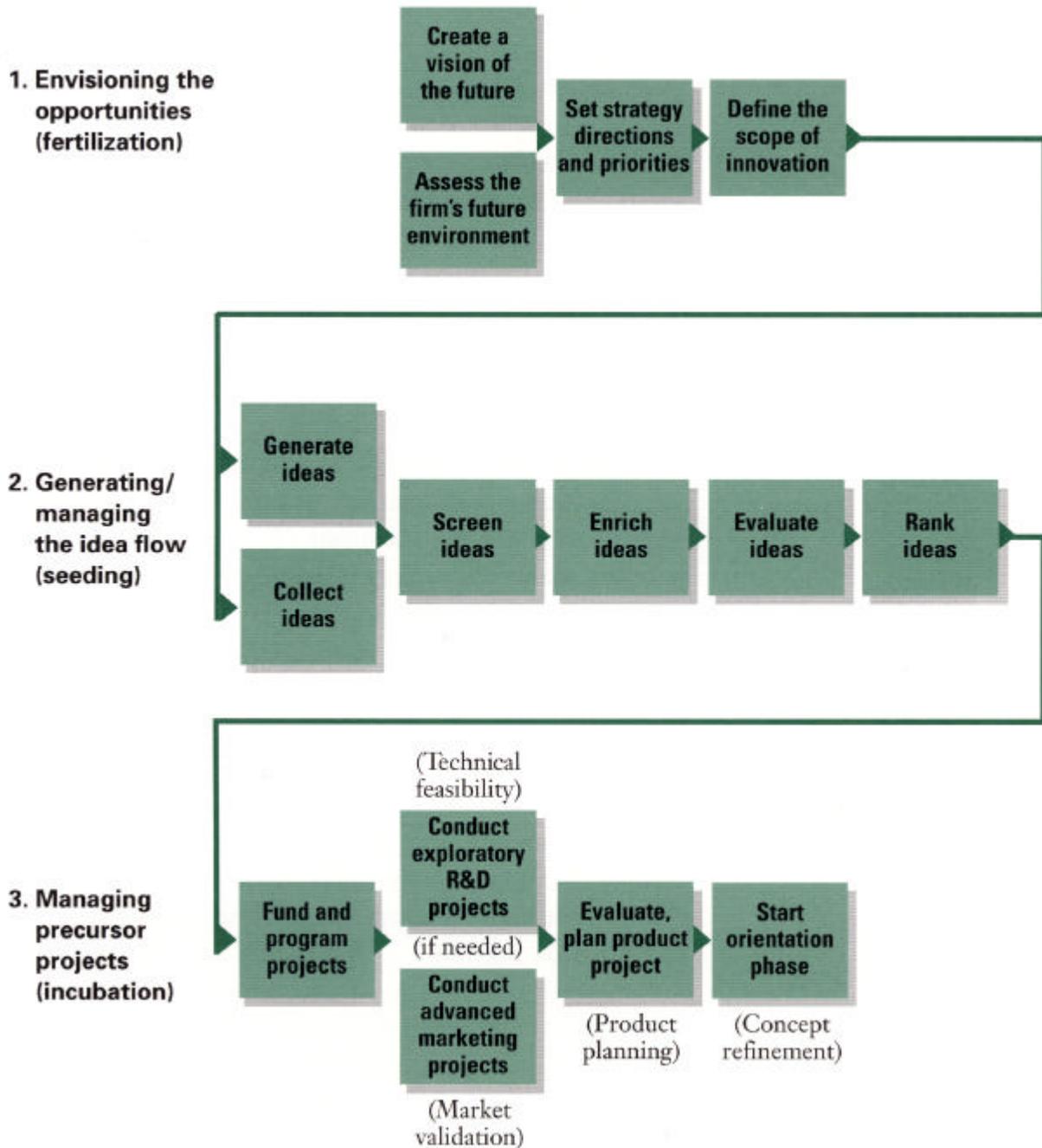
Searching for opportunities is an almost impossible task in the absence of clear guidelines for where to look and what to look for. The innovation process must therefore start with an attempt to create a vision of the company's preferred areas of growth. The vision should be as concrete as possible. It should lead to an explicit set of strategic priorities and a broad map defining the scope of the new businesses that management wants to develop and the types of innovations it seeks. There are practical ways to generate, structure, and formalize such a vision. For example, it can be very helpful to answer four simple but essential questions:

What do we want to stand for as a corporation? This question forces management to make fundamental statements about the corporate identity, values, and beliefs it wants to convey. When it goes beyond very general statements, this high-level corporate vision can help chart the company's scope, define its industry, and identify

broad business priorities and preferred ways to compete.

Exhibit 1

The Idea Management Process



Answers to the other three questions (similar to those used by Clark and Fujimoto to define a product concept²) will help refine the vision by identifying essential characteristics of the corporate path to long-term growth and renewal:

What kinds of products do we want to offer? This question raises the issue of the company's product identity. Should our products share common characteristics or attributes, and if so, which ones? For example, should Rubbermaid define the scope of its business by the nature of its products and their materials (plastic and rubber products) or by other means (e.g., function or benefits)? Should Philips stick to its traditional unwritten rule that each of its products be „electric,“ or should it look for another common thread across its many businesses?

Answering this question is neither a theoretical nor an easy exercise for management. Historical assumptions about the company's product identity create a mindset that gets passed down through several management generations. These assumptions deeply influence the scope of the innovation and product creation processes.

What kind of customers do we want to serve? This question determines the market emphasis of the company, hence the focus of its growth and renewal efforts. Do we want to serve the needs of specific industrial markets and, if so, which ones? Do we want to address the special needs of the professional market? What segments of the consumer market are we interested in serving? Or should we leave it up to our business units to decide?

It is not surprising that the innovative concept of a personal or family copier should have originated with Canon rather than with, say, Xerox. The company already had a presence in the consumer retail market with its cameras. Extending its line of office products to the small business and consumer markets was more natural for Canon than for Xerox. Kodak could have done it, of course, but its copier business unit had – explicitly or implicitly – defined its business around the needs of the „large office“ market, thus mentally excluding opportunities down market.

What do we want our products to mean to our customers? By answering this question, management complements the corporate vision with a benefit statement determining how it wants to be perceived by its customers. These benefits can be expressive, i.e., intangible and emotional, or they can be concrete and instrumental. They will influence the firm's perceived personality and identity and determine the scope of innovation.

Top management can address these four questions in several ways. In rare cases, the CEO alone will answer, considering it his or her personal responsibility to articulate a vision, at least at the general level. Only those charismatic CEOs endowed with an innate feel for the market and a dynamic sense of their business systems have a chance to come up with this kind of vision.

Alternatively, the top management group may work on a common vision as a team. Addressing and answering the four questions above as a group is likely to give rise to a sharper vision than any one person could achieve. This may require several weekends of shared reflections and discussions, typically in a remote retreat with the assistance of an external facilitator.

Task forces constitute a third approach. Management may gather managers from all parts of the corporation to forge a vision. Task force members will typically be selected on the basis of their track record, their potential...and their age! Some Japanese companies have indeed gone as far as banning from their vision task forces any manager who would no longer be around at the time horizon considered for the vision, be it 2000, 2005, or 2010.

Senior managers can enhance their personal vision of the path to long-term corporate growth and profits by developing a firsthand understanding of where their industry is heading. An expeditionary immersion in the market – to visit customers and suppliers, investigate competitors, and generally escape from day-to-day pressures to think about the future – will yield an invaluable harvest of personal insights. The six-month expedition that Frank Carruba, Chief Technology Officer of Philips, spent in the burgeoning world of multimedia in 1994 will undoubtedly sharpen the company's vision of where the market is heading and what opportunities Philips should pursue.

Assessing the firm's future environment requires a continuous effort to identify, combine, and decipher the trends that will shape the firm's future. As illustrated in Exhibit 2, opportunities will typically emerge at the intersection of market, technological, and competitive trends. These trends need to be carefully monitored and analyzed for opportunities. Market trends highlight opportunities to provide customers with what they really want or need. Competitive trends indicate areas of opportunity, typically by uncovering the competitors' blind spots. Technology trends flag new opportunities to add value through new products and processes.

Analyzing market trends to identify areas of opportunity is not rocket science. It requires a minimum of hard data, which a company can generally get from external sources for a minimal investment. It builds on insights, which can be developed internally or obtained from outside experts. It is achieved through an analytical process that starts with a list of relevant macro-trends and from these derives more focused trends for specific market opportunities (see the illustration for kitchen appliances in Exhibit 3). Above all, it requires the discipline to find the time to conduct an exercise dealing with the long term when everyone feels the pressure of short-term issues.

Exhibit 2
Identifying Opportunities

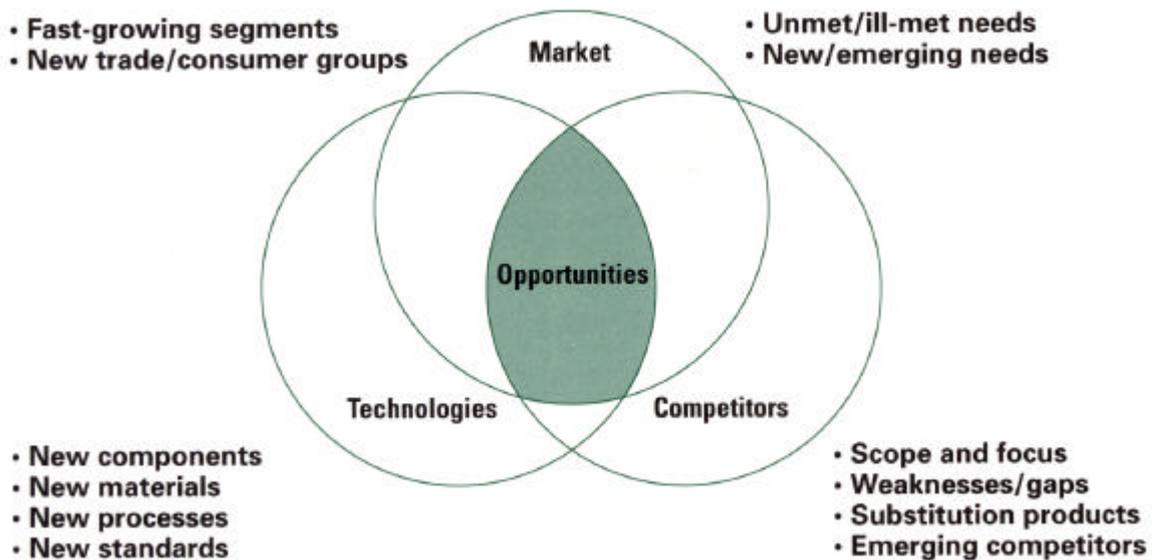
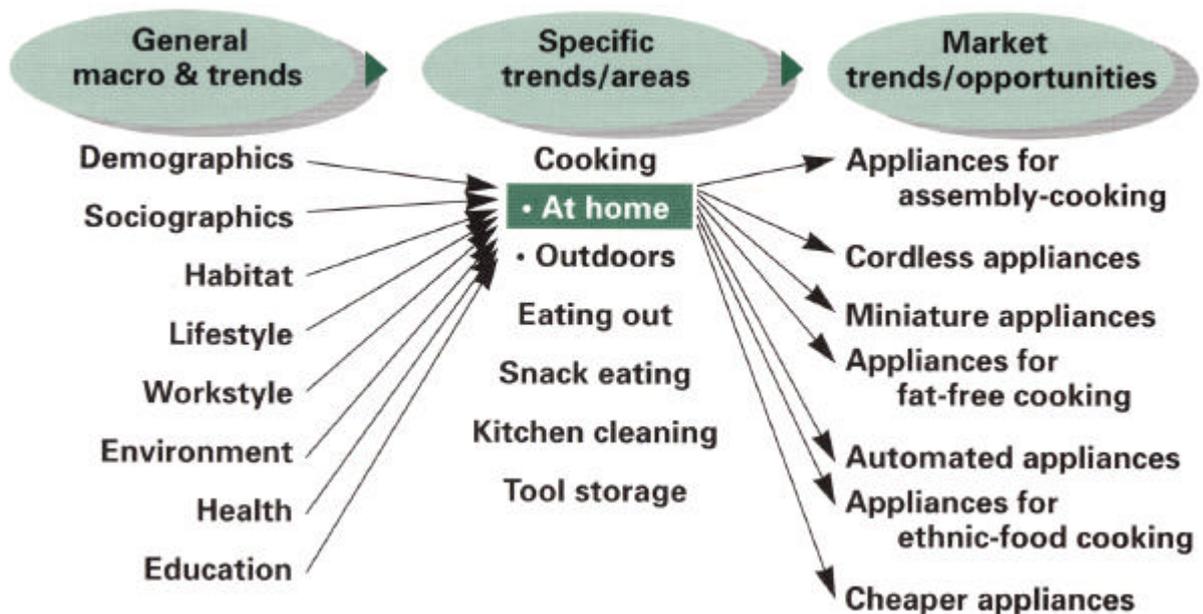


Exhibit 3
Systematic Trends Unbundling – Kitchen Appliances



Marketing departments frequently complain that they are neither organized nor staffed to launch and manage this type of long-term trend monitoring. Product managers are usually judged on the performance of their products and so, by necessity, focus on medium- and short-term results. Market research is supposed to support marketing; hence it also tends to limit the time horizon of its investigations. Management may expect the more senior product managers and marketers to focus on the longer term, but the latter, consumed with everyday issues and fire-fighting, often lack the time and peace of mind to do so.

Creating a dedicated Advanced Marketing group within Marketing may provide a solution to this short-termism. Advanced Marketing should be to Marketing what Advanced Development is to Development. Both departments should be solely dedicated to preparing for the future, and obviously they need to work closely together. Some companies consider this last point so critical that they locate their Advanced Marketing capabilities within **R&D**, physically and sometimes even organizationally.

We would go even further and recommend that the Advanced Marketing budget be tied more or less directly to the firm's R&D spending. The more one invests in R&D, the more sense it makes to devote a fraction of that budget to support Advanced Marketing activities. It is a sure way to provide R&D with the market guidance it so often lacks.

Advanced Marketing should focus on four types of tasks:

- Carrying on long-term marketing research: analyzing macrotrends and developing long-term market forecasts, forecasting and mapping the evolution of customer needs and behavior, monitoring trends in distribution channels or market communications, steering strategic competitor intelligence, and monitoring trends in relevant neighboring or emerging industries
- Conducting experimental marketing activities: raiding foreign markets for ideas and early trends, reviewing and evaluating inventions proposed to the firm, organizing field-venturing missions, and organizing and following up pilot or experimental product launches
- Feeding and supporting the idea evaluation process: supporting idea generation exercises (with background briefing documents), supporting and documenting idea collection, and supporting idea evaluation and screening through specific spot-check research
- Supporting ad-hoc predevelopment projects

To enhance its ability to detect early signs of new market developments, and thus to identify opportunities and threats, a company will probably need to build a structured network of market scouts or „sniffers.“ Vis à vis the market and customers, market sniffers should play the role that technology gatekeepers play in technology forecasting: they should weave a web of contacts and information sources capable of detecting early change signals, thus building insights into future market or competitive developments.

One of Europe's largest and most successful brewers, for example, is setting up such a network to monitor specific trends and attitudes affecting certain customer (and non-customer) groups. Market sniffing should ultimately be structured as an ongoing intelligence process, enlisting a large number of people from all functions.

Setting Strategic Priorities

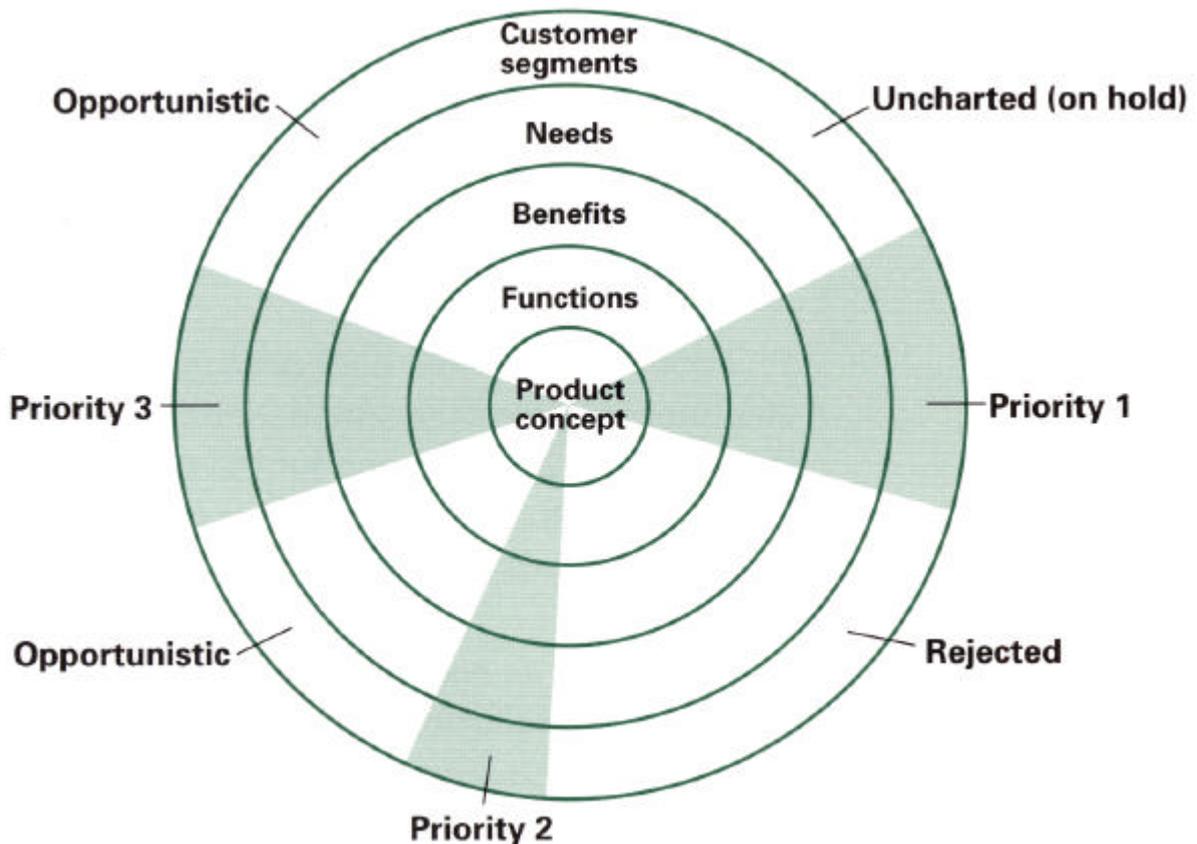
Setting strategic directions and priorities for the creation of new business should be a natural outflow of the vision exercise. At this stage, we are talking only about broad corporate development guidelines.

Strategic priorities, when they exist, are rarely made explicit to all functions and levels of management, least of all to R&D. Some managers argue that it would be dangerous to be too specific; leaks could occur. In practice, priorities are often not issued simply because they remain rather general and uncertain, even within the senior management group. When an organization allows fuzziness in the expression of its goals, particularly for the creation of new business, innovation will occur on a random basis. And random innovation is not the most effective way to chart one's future.

Management can help make its strategic priorities explicit by mapping the areas of opportunity it has selected (or rejected) along the dimensions shown in Exhibit 4. This map starts from the more general – e.g., „Which customer segments do we want to focus on?“ – and moves to the more specific, e.g., „What type of product concept do we want to offer in the future?“ In some instances, priorities will not be specified beyond a general level, e.g., „We would like to enter the market of products for the elderly.“ In other cases, management may want to specify much more precisely the profile of the areas it wants to develop and hence where innovations should occur, e.g., „We would like to enter the car fax market for those traveling professionals working out of their cars.“

The definition of strategic priorities for innovation is clearly a top management responsibility. Most executive committees, however, tend to deal with all kinds of management issues and devote insufficient time to shaping the firm's long-term future. Setting up a Strategy Board with a dedicated agenda is one way to deal with this challenge. The Strategy Board should typically include key members of the executive committee and relevant high-level functional managers, for example, the heads of Marketing and R&D (if they are not already part of the executive committee).

Exhibit 4
Mapping Priority Innovation Areas



The main mission of the Strategy Board is to steer the process by which a coherent business strategy is formulated from its four specific components: product/market strategy, technology strategy, marketing strategy, and manufacturing strategy. In the specific field of innovation management, the Strategy Board should focus on two missions:

- *Formulating an innovation strategy:* reviewing the analysis of the environment assessment, setting strategic directions and priorities for the creation of new business, and formulating guidelines defining the scope of idea management
- *Supervising an innovation program:* reviewing and approving the selection of innovation opportunities, establishing a funding mechanism for precursor projects, appointing Venture Teams to follow up promising opportunities, approving the conversion of precursor projects into real product projects, and allocating project ownership to specific business units (new or to be created)

Defining the scope of innovation is a natural outcome of the priority setting process. For each priority area, management will select where it wants to innovate. As shown in Exhibit 5, the focus of innovation may be defined at different levels of detail, from the very broad – developing new products for a given segment – to the very specific – developing new features for a given product.

Seeding: Generating and Managing the Idea Flow

We use the term *seeding* to describe the process by which a company collects ideas or generates new ones; screens them; enriches, evaluates, and validates them; and ranks them for investment by management. This process is rarely recognized as such and therefore is seldom structured or managed, except in specific parts of R&D.

In a recent book, Wheelwright and dark advocate structuring what they call the „development funnel.“³ Our experience concurs with their conclusions: the idea funnel (Exhibit 6) needs to be structured and managed if the company wants to reinforce existing activities and create new businesses in a proactive way.

Exhibit 5
Defining the Scope of Innovation

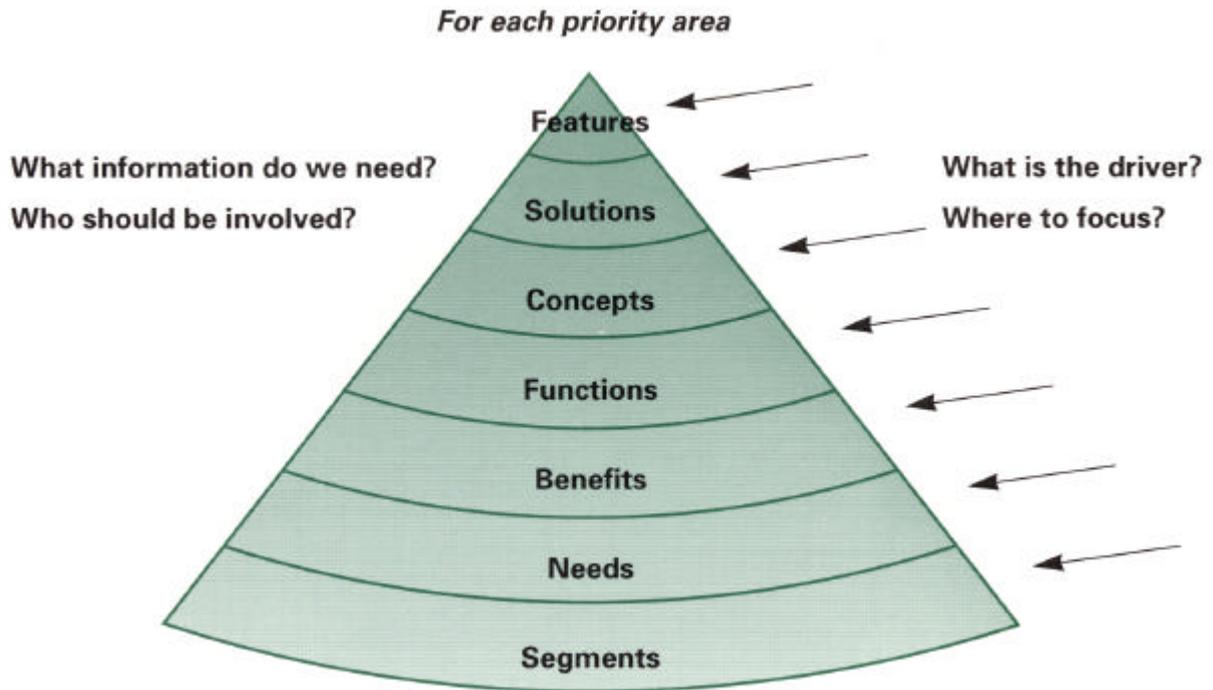
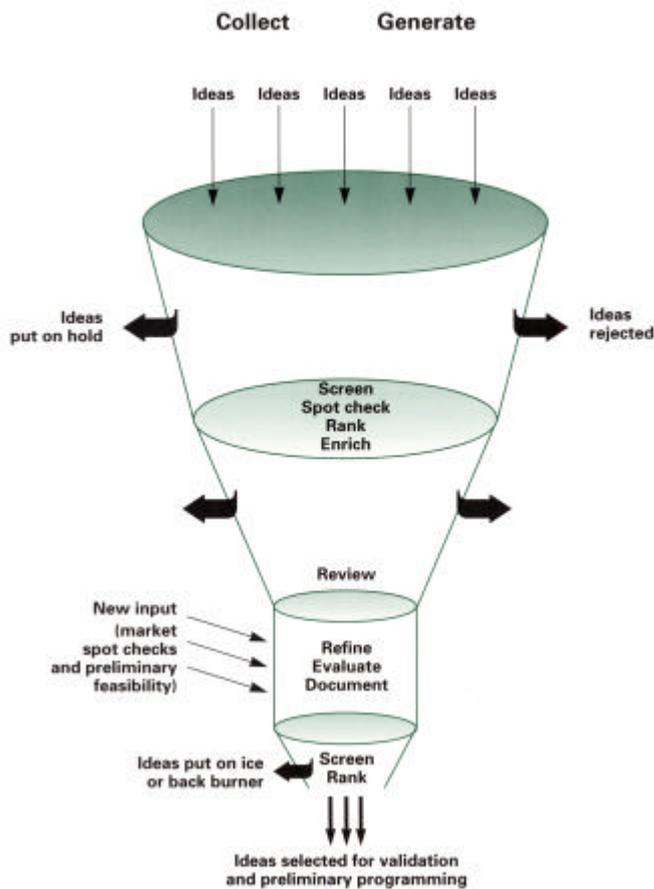


Exhibit 6
Structuring the Idea Funnel



As in any process, management must understand the sequence of activities that must take place to give birth to new ideas. Then it must allocate responsibilities for managing the resulting activities and projects while continuously measuring and improving the process itself. Gauging the potential of technology to add value is an essential part of the idea-management process. Most successful innovators have set up an internal management process to cope with the two classic questions of technology deployment:

- Which technologies will enable us to satisfy a newly identified customer need (or better meet a current need), and how should we deploy them?
- How can we fully exploit the potential of our technologies as a source of new product ideas or concepts?

The technology-management process that addresses these two questions is necessarily complex because it goes far beyond R&D. Management literature often refers to this process as „internal technology transfer.“ The quality of the transfer depends on the quality of the dialogue between the technical functions (R&D, Product Engineering, Manufacturing Engineering, etc.) and the rest of the organization, particularly Marketing. This dialogue should not just be an exchange of oneway information and requests between Marketing and R&D, as is the case in many companies:

Marketing to R&D: „Here is our product idea; how do you guys propose to make it happen?“

R&D to Marketing: „We have developed this interesting technology; can you guys think of a smart application?“

The conversation must be a real exchange of information and ideas – a dialogue in which both parties stimulate and challenge each other’s thinking and engage in joint analysis, brainstorming, and decision-making. The right balance between marketing pull and technology push is best obtained by ensuring that marketers and technologists are equally represented in all innovation-management mechanisms.

We recommend two mechanisms for managing the idea flow: an Innovation Council to organize and manage the process on an ongoing basis, and Venture Teams to run idea searches in specific areas. To use process-management-speak, the Innovation Council will be the process owner of the entire idea flow, while the Venture Teams will be process owners of the application to specific opportunities.

The Innovation Council (sometimes called the Technology Council in technology-driven firms) should be set up by the Strategy Board to organize, manage, and improve the idea flow. Chaired by a member of the senior management group (typically, the highest corporate marketing or technology executive), the Innovation Council should be open and flexible in its membership and operating mode.

Members of the council should be chosen for their entrepreneurship and innovative spirit, rather than on the basis of function and status. All key functions should be represented, with a bias toward Marketing and R&D. Outsiders – for example, representatives from the distribution channels or external experts in fields of interest to the company – can be associated with the work of the council, either directly through membership in the council itself, or indirectly through participation in task force meetings or special events.

The role of the Innovation Council should be dual:

- *Setting and monitoring an innovation policy and process:* proposing, managing, and improving the idea-management process; proposing an innovation funding mechanism; monitoring the innovation climate and proposing remedies to remove obstacles; proposing a venturing process and mechanism; and monitoring progress in innovation effectiveness
- *Managing the idea flow.* defining the scope and focus of proactive idea searches; organizing and managing idea collection for new business opportunities; organizing and managing specific idea-generation exercises; managing idea screening, enrichment, evaluation, and ranking; recommending ideas for the funding of precursor projects; and evaluating the results of precursor projects and recommending real project starts.

Even though the Innovation Council should act primarily as an advisory group and a source of proposals, management can give it teeth in the form of an innovation fund. This budget will support the environmental scanning activities conducted by the Advanced Marketing group, the idea-generation and-collection process, and the funding of exploratory precursor projects.

Venture Teams are a well-known mechanism for conducting expeditionary innovation activities that fall outside the direct scope of existing business units. Venture Teams are small, multifunctional groups typically of two or three people (at least at the start), dedicated to the generation of new business opportunities in a given area and to the implementation of the resulting projects. Often, Venture Teams are asked to run the projects resulting from their innovation search and to set up the organizational and operational infrastructure to turn them into real business propositions. Venture Teams should be staffed by people with the drive and experience to generate, grow, and manage emerging new businesses for the company.

Surprisingly, even though the concept has been widely promoted in the innovation literature, venture teams are not widely used. They are viewed more as an exceptional management mechanism than as a natural tool for searching for and developing new business opportunities.

Successful entrepreneurs typically choose Venture Team members from among their best and most promising managers. They remove them from all management responsibilities to ensure their full dedication to their mission. Some companies warn candidates that they will not be allowed to return to their old jobs if their project fails, thus ensuring their total commitment to success. And in most cases Venture Teams report directly to members of the senior management team, who provide them with support and protection.

This last role of management is sometimes referred to as a „shield and sword“ role. Management protects the Venture Team from the threat of red tape and short-term pressures, while simultaneously giving the team the authority and means to move quickly toward implementation, bypassing most established procedures.

Incubation: Managing the Precursor Projects

The incubation process starts with the funding and programming of priority projects selected at the end of the seeding phase. Even though they have been checked and evaluated in a first pass, most ideas will need to be further validated from technical, economic, and market perspectives. This validation process is carried out through what we call precursor projects. If the evaluation is positive, management will authorize the team to turn a precursor project into a real product development project, programming it officially in the firm's product or project plan.

Precursor projects generally face several obstacles. They sometimes stall as Marketing and R&D resources are diverted to what are perceived as more urgent product-development projects. They often lack rigorous and constructive reviews and evaluations. They may also progress in an unbalanced way, as management may not have established the multifunctional mechanism needed to manage these projects in an integrated fashion. Time pressure is also seldom exerted on precursor projects, which tend to get lost among other longer-term R&D projects. These factors explain many complaints about the slow gestation of most innovation projects.

The adoption of the two mechanisms described in the paragraphs above is a way to professionalize and speed up the incubation process. The Innovation Council provides the appropriate multifunctional mechanism to both manage precursor projects in an integrated fashion and create a sense of urgency. If it is equipped with its own innovation budget, the Council will bypass traditional conflicts over resources. Even if the resources cannot be found internally, the Innovation Council should have the authority and means to out-source part of the R&D or marketing work. Similarly, using Venture Teams ensures that precursor projects are led by a dedicated group, which in turn ensures continuity in management from inception to the successful launch of the product in the market.

Allocating Process Ownership

The mechanisms suggested to steer and manage the upstream innovation process are diverse because the process itself is diverse. It consists of a broad range of steps involving a great variety of management levels and functions. The immediate question to ask, however, is whether there should be an overall orchestrator of the whole process, someone responsible for making the various mechanisms work together.

We believe there is a need for this type of high-level sponsoring and coaching. We see four possible ways to allocate the responsibility. The first approach is to consider that the CEO (or, at the business level, the managing director) is the ultimate owner of the innovation process. His or her role is to grow and rejuvenate the company profitably and steer it toward the businesses of tomorrow. Several CEOs – for example, Bill Gates of Microsoft – undoubtedly see themselves as their companies' innovation champions.

The second approach is to consider that the top management team collectively owns the process and should work on it. The challenge, of course, is to translate a collective commitment into action, and this undoubtedly depends on how personally committed the CEO is.

The third approach consists of delegating ownership of the overall innovation process to one of the business managers on behalf of the top management team. The more senior and committed the manager, the better the chance of success. In our experience, however, this type of delegation is more frequently found in the downstream part of the innovation process than in the upstream part.

The fourth alternative is for management to allocate the responsibility to the chief technology officer (CTO), turning him or her into a broader chief innovation officer (CIO). This solution is more commonly used in Japan than in the Western world, reflecting the fact that Japanese CTOs have a long tradition of being exposed to the market and handling innovation projects from inception to market realization. In a recent colloquium organized by Arthur D. Little, 10 top-level CTOs identified their biggest challenge for the five to eight years ahead: how to implement a „seamless innovation process“ from idea and technologies to successful products in the market.

Hasn't the time come to enlarge the scope and mission of our technology champions to turn them into innovation coaches?

Conclusion

Whatever process an organization uses to nurture and manage product innovation, and whatever team it selects to take responsibility for that process, one thing is clear: there must be a commitment from senior management to set up a structure for the process. By allowing the innovation process to remain random and undirected, the organization jeopardizes its long-term growth and viability.

1 Gary Hamel and C.K. Prahalad, *Competing for the Future*, Harvard Business School Press, 1994.

2 Kirn B. dark and Takahiro Fujimoto, „*The Power of Product Integrity*,“ Harvard Business Review, November-December 1990, pp. 107-118.

3 Steven C. Wheelwright and Kim B. dark, *Revolutionizing Product Development: Quantum Leaps in Speed, Efficiency and Quality*, The Free Press, 1992, Chapter 5, p. 111.

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