

WHITE PAPER

Developing a Product Innovation and Technology Strategy for Your Business

A framework for developing a product innovation strategy includes defining innovation goals and objectives, selecting strategic arenas, developing a strategic map, and allocating resources.

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Introduction

Many companies lack a clearly articulated and well-communicated product innovation and technology strategy. Such a strategy is essential and is strongly linked to positive performance in product innovation. A framework for developing a product innovation strategy is presented, and the various steps of strategy development are described, from best-practice ways to define innovation goals and objectives through to the selection of strategic arenas and the development of the strategic map. Defining attack plans and entry strategies are also described. Finally, methods for resource allocation and deployment using strategic buckets and strategic roadmaps are outlined.

In the late 1990s, two large firms were growing by leaps and bounds, driven by the boom in fiber-optic communications. They were Corning Glass, which manufactured fiber-optic cable, and Nortel Networks, which produced the boxes at each end of the cable to convert the light signal into an electronic signal. Then came the crash of 2000; overnight, both firms' sales plummeted, and their share prices plunged from over \$100 to about \$1.

Ten years later, Corning is thriving, whereas Nortel is in Chapter 11 and being broken up. Why? How did two great and innovative companies, facing the same crisis, end up so differently a short decade later? One reason for Nortel's demise is that the company lacked direction and an innovation strategy after the crash; instead, it limped along from one ad hoc decision to the next. By contrast, Corning's senior management took charge, developed a strong product innovation and technology strategy for the firm, and provided leadership and direction to see that strategy through (1). Corning's management took a hard look at the company's previous 100 years of successes in innovation and what drove them. They concluded that the "repeatable keys" to success — the elements in Corning's culture and history that they could draw on to face this new challenge — were a leadership commitment, a clear understanding of the company's capabilities, a strong connection to the customer and a deep understanding of major customer problems, and a willingness to take big but well-understood risks. Strongly committed to breaking out of the crisis through innovation, management assessed Corning's core competencies, determined what they could leverage, and matched those strengths to emerging and adjacent market opportunities.

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The result was a renewed innovation strategy and a three-pronged strategic attack that called for the company to grow current businesses via product-line extensions, exploit market adjacencies, and to grow current businesses via product-line extensions, exploit market adjacencies, and create totally new opportunities. The latter two thrusts required a heavy emphasis on exploratory research and new business development, and thus, in spite of financial difficulties, R&D spending was maintained at 10 percent of sales revenue. A number of new opportunities and strategic arenas were identified and assessed, and the most promising were exploited. The results were impressive: By 2008, major innovations had been realized in each of Corning's businesses, including the creation of four new business platforms and exploitation of three major market adjacencies. New product sales had rocketed to 70 percent of annual sales, and profits moved from minus \$500 million to plus \$2 billion after taxes.

An innovation strategy is an essential tool for product development and continued growth even in difficult times

The example of Corning offers some important strategic lessons for today, as we emerge from the current recession. As the Corning case illustrates, an innovation strategy is an essential tool for product development and continued growth even in difficult times.

Indeed, our research has shown that top-performing businesses have in place a product innovation and technology strategy driven by the business leadership team and a strategic vision of the business (2). As it does at Corning, this strategy guides the business's product development efforts and helps to steer resource allocation and project selection. A comprehensive product innovation strategy must include, among other elements, clearly defined objectives and defined strategic areas of focus; it must have a widely understood role in broader business goal. Further, the innovation

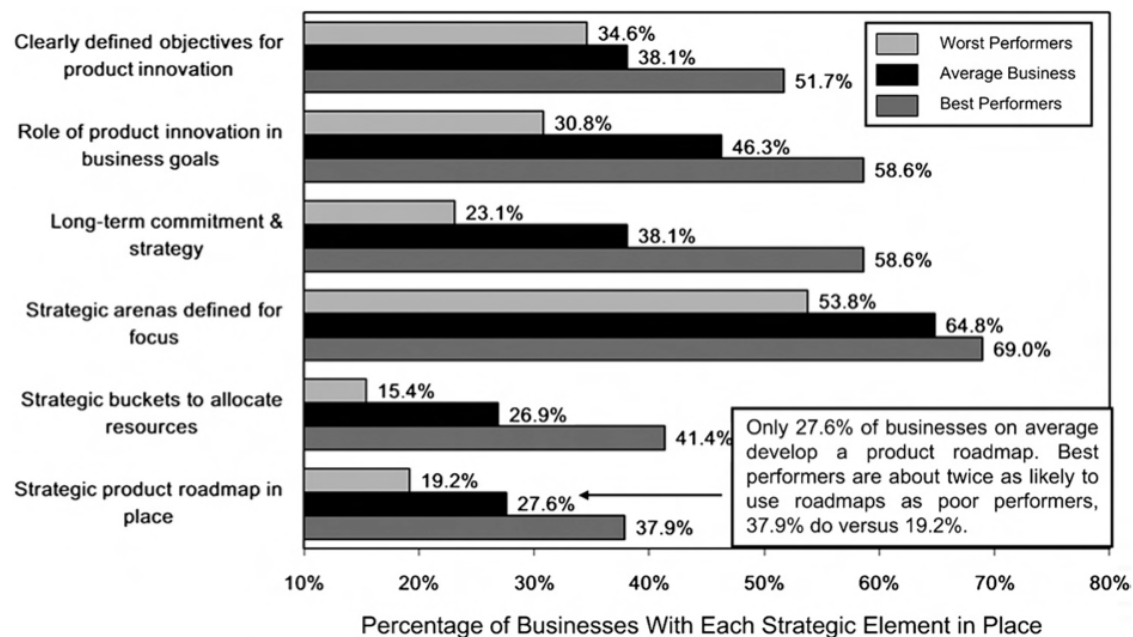


Figure 1: Best-performing businesses develop a product innovation and technology strategy, which includes elements noted here. Best performers are the top 20% of businesses, gauged on a number of performance metrics, including percent sales by new products; ROI on R&D spending; meeting sales, profit, and timing targets; and others (2).

strategy implemented in best-performing businesses is more than just a list of this year's development projects; it has a much longer- term commitment. Companies with effective product innovation programs rely on a number of tools to implement them, including strategic buckets for resource allocation and strategic product roadmaps. Across the board, top- performing businesses build these elements into their product innovation strategy; poorly performing businesses do not. For example, on average, only 27.6% of businesses develop a product roadmap, but best performers are about twice as likely to use road- maps as poor performers (Figure 1). There is an even greater discrepancy in the use of strategic buckets, a resource allocation strategy that ensures availability of resources for critical products, with 41.4% of top performers and only 15.4% of poor performers using strategic buckets.

The message for senior management is that if your business lacks a product innovation strategy that includes these key elements, this deficiency is likely hurting your business's performance. The time is ripe to develop and install such a strategy, an effort that should be led by the business's leadership team. Developing a product innovation strategy requires sustained, high-level effort; the work can be facilitated and guided by the use of a framework. The strategy development framework we developed based on observations from our study of best-performing businesses can be a helpful tool (Figure 2). This guide serves as a useful starting point to develop your own product innovation strategy.

Strategy begins with the goals for the business's product innovation effort and a clear understanding of how these product innovation goals tie into the broader business goals.

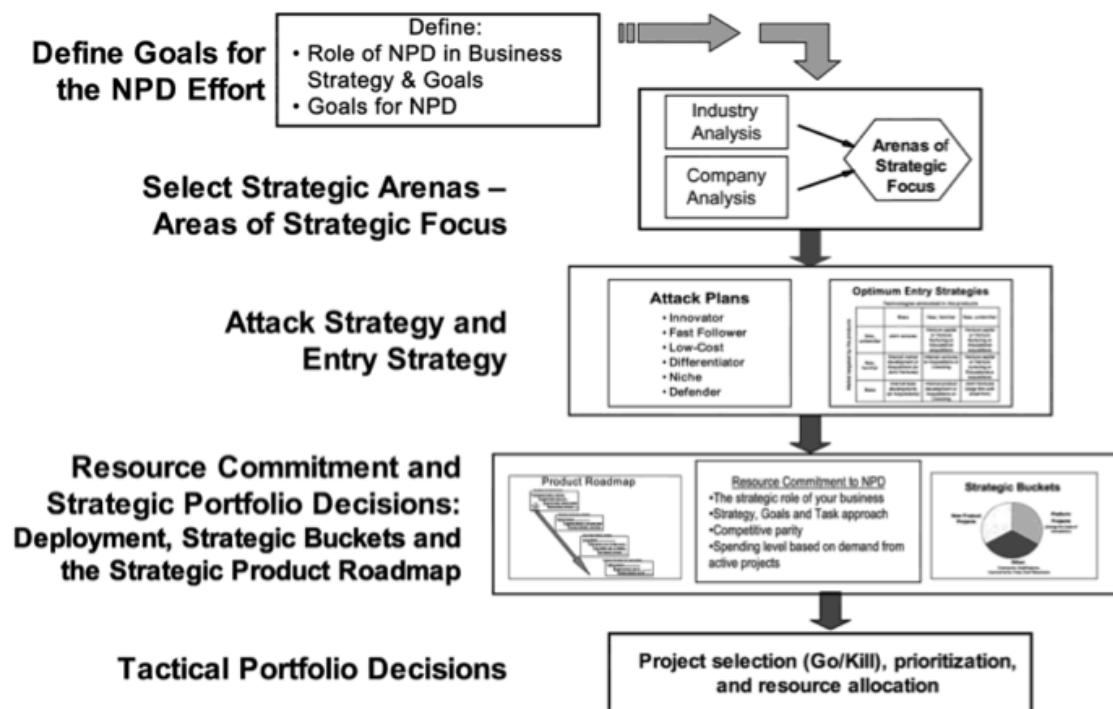


Figure 2: This framework for developing a product innovation and technology strategy begins with product innovation goals at the top and moves through to tactical project selection decisions at the bottom.

Begin With Goals and Objectives

Strategy begins with the goals for the business's product innovation effort and a clear understanding of how these product innovation goals tie into the broader business goals. Many businesses lack product innovation goals, or the goals are not articulated and communicated well. In Corning's case, the goals were ambitious: to innovate their way out of a business crisis and to double the rate of creation of new businesses per decade. These goals were supported by specific sales and profit objectives for product innovation. Note that goals are broad and give general intentions, whereas objectives are narrow, concrete, and precise.

The product-market matrix for a telecommunication firm

Markets		Voice	Data	Internet	Wireless	Long Distance
	Small - Home Office			★	★	★
	Medium Business		★		★	
	Large Business		★		★	
	Multinationals		★		★	★
	Residential	★			★	
Products						

Figure 3: The product-market matrix delineates possible strategic arenas on which to focus new-product development or R&D efforts. The axes of the diagram are "products" and "markets." Each of the arenas represented by the cells is assessed for its potential value to the company's business position. Stars designate top-priority arenas, where new product efforts will be focused.

Like Corning's, your business's product innovation strategy should specify the goals and objectives of the business's total product innovation effort and indicate the role that product innovation will play in helping the business achieve its objectives (3). Your product innovation strategy must answer the question: How do new products and product innovation fit into the business's overall plan?

The most popular objective (and metric) is percentage of the business's annual sales generated from new products. Here a "new product" is usually defined as one that has been on the market three years or less and that is visibly different to the customer from previous offerings, for example a product with new features, functionality, or performance characteristics. Some firms include only additional sales from products launched in order to discount replacement and extension products.

Another key best practice is to ensure that the role of new products in achieving the business's overall goals is clearly communicated to all. The whole point of having goals is so that everyone involved in the activity has a common purpose, something to work towards. What we observe here are typically very mediocre practices, with less than half of all businesses defining and communicating the role of product development in achieving their business goals (see Figure 1).

Define Strategic Thrust: Identify Arenas of Focus for R&D

Focus is the key to an effective product innovation strategy. Your product innovation strategy specifies where you'll attack, or perhaps more importantly, where you won't attack. Thus, the concept of strategic arenas — the markets, industry sectors, applications, product types, or technologies on which your business will focus its new product efforts — is at the heart of a new product strategy. For example, Corning's decision to focus on flat screens for LCD TVs was a bold move at the time, yet in hindsight, it was a brilliant maneuver, marrying the company's technological competencies with an emerging, albeit adjacent, market opportunity.

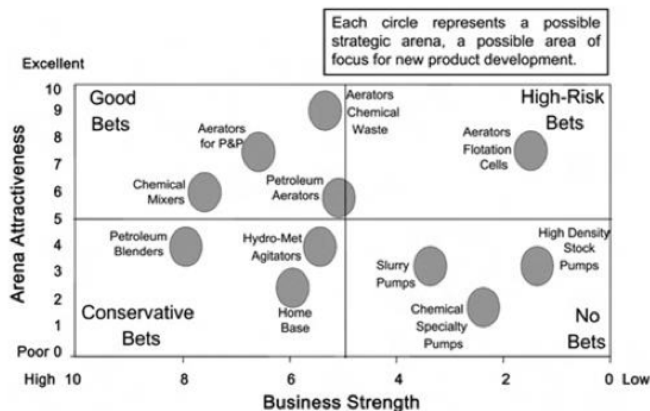


Figure 4: The strategic map plots potential arenas on two dimensions, business strength and arena attractiveness. This is a sample strategic map for a process equipment manufacturer.

The specification of strategic arenas — what's "in bounds" and "out of bounds" for product innovation — is fundamental to spelling out the direction or strategic thrust of the business's product development effort. It is the result of identifying and assessing product innovation opportunities at the strategic level. Without defined strategic arenas, the search for specific new product ideas or opportunities is unfocused. Over time, the project portfolio for new products is likely to accumulate a lot of unrelated projects, in many different markets, technologies, or product types. The result of such a scattershot effort is predictable: a not-so-profitable new product effort.

The first task, then, is identifying possible arenas, areas that offer the business some new and profitable opportunities. Many firms use the product-market matrix (Figure 3) as they try to define new but adjacent areas in which they can operate profitably. Each cell in the matrix represents a potential strategic arena that offers a number of new product opportunities.

Next comes the task of evaluating these arenas, selecting the battlefields. Usually two dimensions are used for this evaluation:

- 1. Arena attractiveness:** This is an external measure that captures characteristics such as size and growth of markets in the arena, intensity of competition and margins earned, and the potential for developing new products (for example, the technological maturity of the area, or where on the technology S- curve the arena lies).
- 2. Business strength:** This involves assessing the business's core competencies and strengths and asking whether these competencies could be leveraged if the business chose to enter the new arena.

Usually, a set of 6–8 questions is developed for each dimension, which senior management then uses to rate the various arenas under consideration (Table 1). The necessary due diligence must be undertaken on each candidate arena, gathering the necessary information for management to use in completing ratings. (Sample rating schemes are provided in [3]).

The result is the strategic map, with each arena plotted (Figure 4). Arenas in the upper left quadrant — the “good bets” — are those designated as the most promising. These are where the business should focus its product development resources. With strategic arenas selected, idea generation becomes more directed and productive, specific projects within each strategic arena can be funded, and the entire R&D effort gains focus.

Develop Attack and Entry Strategies

The issue of how to attack each strategic arena should also be part of the product innovation strategy (see Figure 2). For example, the strategy may be to be the industry innovator, the first to the market with new products, or to be a “fast follower,” rapidly copying and improving upon competitive entries. Other attack strategies might focus on being a low-cost provider versus a differentiator versus a niche player or on emphasizing certain strengths, core competencies, or product attributes or advantages. Attack strategies usually specify the globality of the innovation effort, as well, defining whether innovation will be guided by a series of domestic or regional initiatives, take a more global approach, or be “global” in nature (global product concepts and platforms, locally tailored products). An understanding of the business’s core competencies (unique strengths that can be leveraged to advantage in the marketplace) coupled with knowledge of industry success drivers (what it takes to succeed in the industry, sector, or arena) are key factors in the selection of the appropriate attack strategy.

Additionally, entry strategies should be defined for new arenas. The strategy might be to “go it alone” via internal product development or to seek alliances through licensing, partnering, joint venturing, and open innovation as a way to enhance product development capabilities in new arenas.

Criteria Used to Rate Strategic Arenas

The questions that might be used to assess potential strategic arenas address a range of issues and factors:

1) Arena Attractiveness

The market

- Size of the market in the arena
- Market growth rate in the arena
- Intensity of competition and strength of competitors in the arena
- Margins earned by others in the arena

Technological opportunities

- Rate of change of technology in the arena
- Technological elasticity: Where on the S-curve is this technology (steep versus flat)?

2) Business Strength

Technology leverage

- Ability to leverage development skills in this arena (technology, IP, R&D, or design engineering)
- Degree of fit between production processes required to succeed in this arena and company’s production processes and skills

Marketing leverage

- Ability to leverage sales force and/or distribution channel system in this arena
- Ability to leverage customer relationships in this arena
- Ability to leverage marketing communications, brand name, and image in this arena

Competitive advantage

- Would new products be unique (differentiated from) current competitors?
- Would new products meet customer needs?

Make Deployment Decisions: Spending Commitments, Priorities, and Strategic Buckets

Strategy becomes real when you start spending money. Any good product innovation strategy must deal with how much to spend on product innovation, and it should indicate the relative emphasis, or strategic priorities, accorded each arena of strategic focus (see Figure 2). Thus, an important facet of a product innovation strategy is resource commitment and allocation. Earmarking resources (funds or person-days targeted at different strategic arenas, project types, or major development initiatives) helps to ensure the strategic alignment of product development with business goals (4). Top-performing businesses are much more likely than poor performers to have an effective portfolio management system that helps the leadership team allocate resources to the right areas and to the right strategic projects. Effective portfolio management means that development projects are aligned with business strategy, and there is the right balance of projects in the portfolio; strong portfolios contain high-value projects with few low-value, trivial projects. In best-performing businesses, projects are correctly prioritized, and there is the right balance between available resources and numbers of projects.

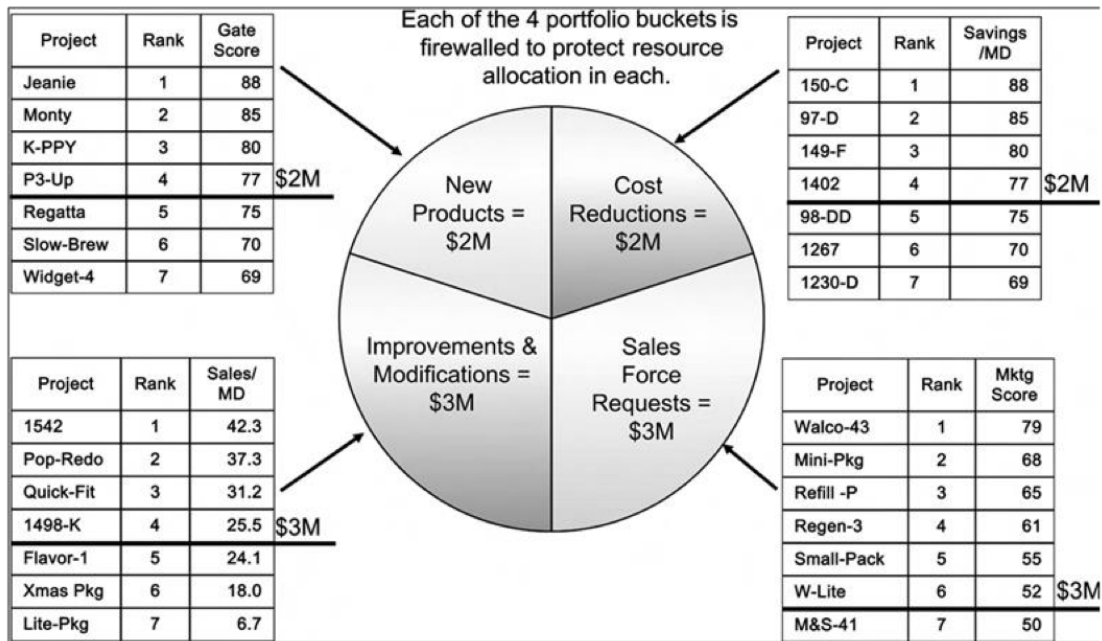


Figure 5: The strategic-buckets method splits resources into different buckets to ensure that resource allocations mirror strategic priorities. Development projects are then categorized by buckets and ranked until resources are exhausted. In this way, resources can be allocated to achieve the right balance of projects. This sample bucket map illustrates a four- bucket allocation with each bucket using different evaluation criteria to reflect the different types of risk.

Many best-performing companies use strategic buckets to help in resource deployment decisions. The strategic- bucket method is based on the concept that translating strategy from theory to reality is about making concrete decisions about where resources should be spent. Strategic buckets help management define where the development dollars should go, by project type, by market, by geography, or by product area (5). Each project type or market or geographic area is represented by a bucket. Beginning with the business's strategy, senior management makes

strategic choices about how many resources go to each bucket, for example, in a scheme allocating resources by project type, to “new products” versus “improvements and modifications” versus “sales force requests” or “cost reductions” (Figure 5).

With resource allocation firmly established and driven by strategy, projects are categorized by bucket. Then projects within each bucket are ranked and funded in rank order until that bucket runs out of resources. This establishes project priorities. In this system, projects in one bucket, such as “new products,” do not compete against those in another bucket, such as “improvements and modifications.” If they did, in the short term, simple and inexpensive projects would always win out in the competition for resources, as they do in many businesses. Instead, strategic buckets build firewalls between categories; earmarking specific amounts to “new products” or to “platform developments” ensures a much more balanced portfolio.

Followed rigorously and over the longer term, the strategic-buckets method ultimately results in an optimal portfolio of projects, one that mirrors the strategic priorities of the business.

A good way to begin working toward strategic buckets is to gather data to reveal the current portfolio situation, including the current split in projects, resources, and expected sales by project type (Figure 6). From such charts, management can then begin the debate on the optimal portfolio and make strategic bucket choices

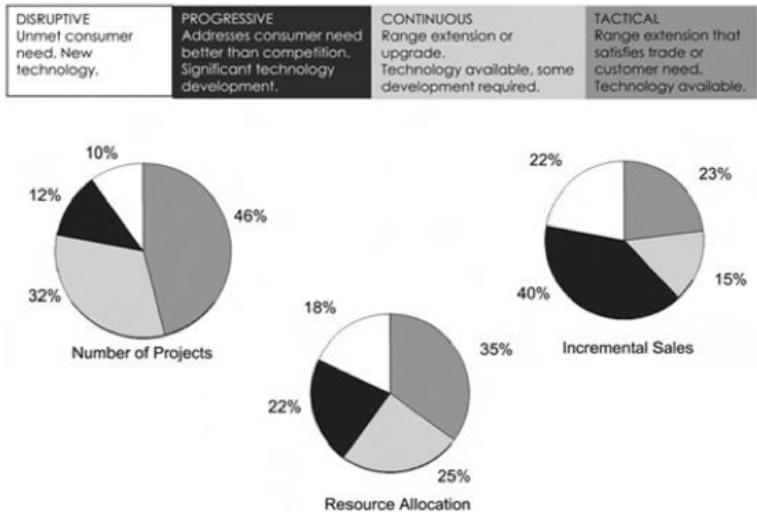


Figure 6: Three different views of a portfolio show a breakdown by project types in terms of numbers of projects (left), by resource allocation (middle), and by expected sales results (right, measured by first-year incremental or additional sales).

Define the Strategic Product Roadmap

A strategic roadmap is an effective way to plot a series of major initiatives in the attack plan. A roadmap is simply a management group’s view of how to get where they want to go or achieve a desired objective (6). Although growing in popularity, especially in high-technology businesses, the use of roadmaps is far from common, with only 27.6% of businesses in our study developing product roadmaps (see Figure 1). About twice as many best performers use product roadmaps as worst performers.

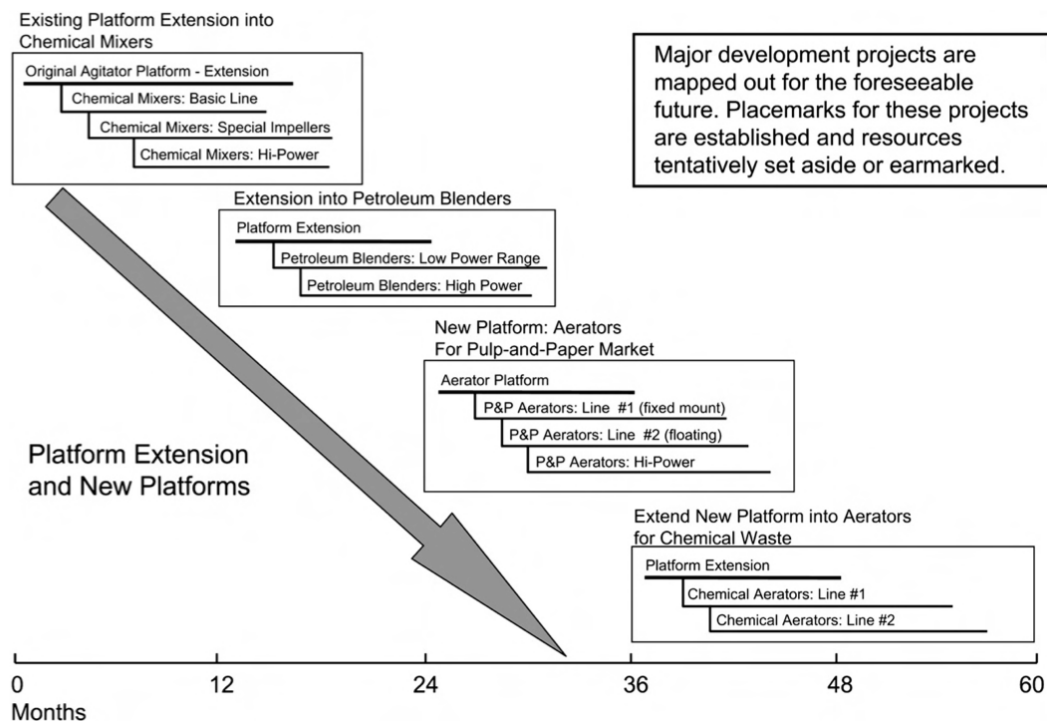


Figure 7: The strategic product roadmap lays out the firm's major development initiatives over the next 5-8 years, including new platforms. This is an evergreen plan, updated annually, so that only the first year is implemented exactly as portrayed.

When employing roadmaps, senior management maps out the major new product initiatives required in order to succeed in each strategic arena, and their timing (7). The roadmap lays out major development initiatives over time, often as far out as five to eight years (Figure 7). It may also specify the platform developments required for new products. Placemarks are established for development initiatives and resources tentatively earmarked for them. In this way, senior management is able to translate its view of the future and its strategy into resource commitments and concrete actions. Additionally, the development or acquisition of new technologies can be planned in the form of a technology roadmap (8).

Conclusion: No Pain, No Gain

Corning's story and our own research offer concrete evidence of the importance of a product innovation strategy and the strong positive impact such a strategy has on performance (see Figure 1). Through the steps laid out in this article, we've mapped a pathway for developing such a strategy for your business. The pathway begins with the business's goals and objectives and culminates with resource deployment decisions using strategic buckets and strategic roadmaps to put the strategy into practice.

If you're thinking that your business lacks such a clearly articulated innovation strategy, and that maybe now is the time to lay the groundwork for developing such a strategy, you're probably right on both counts. But a word of caution: this does take considerable time and effort. Senior management (and support staff) must be prepared to make the time available and commit to the hard work involved. But the reward is worth the effort, as evidenced by the results achieved by those businesses that have developed a product innovation strategy.

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3. Parts of the remainder of this article are taken from R. G. Cooper and S. J. Edgett, *Product Innovation and Technology Strategy* (Hamilton, ON: Product Development Institute, 2009).
4. For an outline of portfolio management methods, including strategic buckets, see R.G. Cooper, S. J. Edgett, and E. J. Kleinschmidt, *Portfolio Management for New Products*, 2 ed. (Reading, MA: Perseus Books, 2002) and R. G. Cooper, S. J. Edgett, and E. J. Kleinschmidt, Optimizing the Stage-Gate® Process: What Best Practice Companies Are Doing — Part II, *Research-Technology Management* 45(6), pp. 43–49.
5. This section is taken from R. G. Cooper, Your NPD Portfolio May Be Harmful to Your Business's Health, *PDMA Visions* 29(2), pp. 22–26; for a more in-depth discussion on strategic buckets see *Portfolio Management for New Products*, pp. 123–136.
6. For more on roadmaps, see R. E. Albright and T. A. Kappel, Roadmapping in the Corporation, *Research-Technology Management* 46(2), pp. 31–40; A. McMillan, Roadmapping — Agent of Change, *Research-Technology Management* 46(2), pp. 40–47; and M. H. Myer and A. P. Lehnerd, *The Power of Product Platforms* (New York: Free Press, 1997).
7. The term “product roadmap” has come to have many meanings. Here we mean a strategic roadmap, which lays out the major initiatives and platforms the business will undertake well into the future, as opposed to a tactical roadmap, which lists each and every product, extension, modification and version.
8. The term “technology roadmap” also has several different meanings. Here we use the term to denote a plan for the business’s expected technology developments or acquisitions; by contrast, the term “technology roadmap” is sometimes used to describe an industry technological forecast laying out what new technologies are anticipated in an industry.

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