Perspective:
The Innovation Dilemma:
How to Innovate When the Market Is Mature

Reference Paper #44
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Compliments of:
Stage-Gate International and Product Development Institute Inc.

This article appeared in J. Product Innovation Management
Volume 28, Issue S1, pp 2-27

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Most companies have ambitious growth goals. The trouble is there are only so many sources of market growth. Markets in many countries and industries are mature and increasingly commoditized; achieving growth in market share is expensive; and acquisitions often do not work. For most companies, product development means line extensions, improvements, and product modifications, and only serves to maintain market share. Markets aren’t growing, so firms increasingly compete for a piece of a shrinking pie by introducing one insignificant new product after another. The launch of a truly differentiated new product in mature markets is rare these days. As a result, development portfolios have become decidedly less innovative since the mid-1990s, and R&D productivity is down.

The answer is bold innovation—breakthrough products, services and solutions that create growth engines for the future. This means larger-scope and more systems-oriented solutions and service packages. Examples such as Apple’s iPod are often cited. (Note that Apple did not invent the MP3 player, nor was this opportunity in a blue ocean; in fact there were 43 competitors when Apple launched!) What Apple did succeed in was in identifying an attractive strategic arena (MP3s) where it could leverage its strengths to its advantage and then to develop a solution that solved users’ problems. The result—an easy-to-use, easy-to-download MP3 system, which also happened to be “cool.”

Our benchmarking studies reveal that five vectors must be in place to undertake this type of innovation to yield bolder and more imaginative development projects. First, develop a bold innovation strategy that focuses your business on the right strategic arenas that promise to be engines of real growth. Most businesses focus their efforts in the wrong areas—on flat markets, mature technologies, and tired product categories. Break out of this box towards more promising strategic arenas with extreme opportunities. Next, foster a climate and culture that promotes bolder innovation. Leadership is vital to success. If senior management does not have the appetite for these big concepts, then all your efforts and systems will fail. Senior management plays a vital role here in promoting an innovative climate in your business. Next, create “big ideas” for integrated product-service solutions. The best methods for generating breakthrough new product ideas are identified in this paper. Then drive these “big concepts” to market quickly via a systematic and disciplined idea-to-launch system designed for major innovation initiatives. Just because these projects are imaginative and bold is no reason to throw discipline out the window. In fact, quite the reverse is true. Finally build a solid business case and focus on the winners. Most innovation teams don’t get the facts, and consequently build weak business cases; the result is that many worthwhile innovations don’t get the support they need to be commercialized. It’s essential to do the front-end homework, and so build a compelling business case. Then make the right investment decisions—evaluating “big concepts” for development when little information is available. Note that financial models don’t work well when it comes to evaluating major innovations, because the data are often wrong. But other methods can be used to make these tough go/kill decisions.

Illustrations and examples are provided from many industries and companies to show how to implement these five vectors.

The Challenge

Most companies have ambitious growth goals. The challenge is that there are only so many sources of growth. Four of these—market growth, market share increases, new markets, and acquisitions—are proving difficult or expensive. Markets in many industrialized countries and industries are mature and increasingly commoditized; gains in market shares are expensive; and acquisitions often don’t work. New markets—India and China, for example—pose special problems; moreover, those firms which have entered Asia have already realized the benefits. Even traditional product development—for most companies, this means line extensions, improvements, and product...
modifications—seems depleted, and only serves to maintain market share.

The dilemma is this: shareholders and executives want a steady stream of profitable and high-profile new products, but management practices and the external environment are steering companies in a different direction: toward smaller, less risky, and less ambitious initiatives. Creating truly differentiated new products in mature markets is rare these days. Research shows that one of the foremost keys to profitability in new product development is developing and launching a unique superior product with a compelling value proposition (Cooper, 2005c). This is easier said than done, as these differentiated products are becoming harder and harder to discover and create. Markets are mature, and hence it’s increasingly difficult to create the “breakthrough” or game-changing new product. Examples are the food industry and the engineering/heavy equipment industry—huge industries, but difficult to find true innovations. Moreover, disruptive and step-change technologies are increasingly rare in most industries. Even high-tech industries struggle for the “next great innovation”: new technologies emerge as these markets mature, then user needs change quickly and competitors launch new product after new product; it’s difficult to sustain product competitive advantage in this leapfrog world. Examples are the cell phone, digital camera, software, and laptop computer industries.

One result of this innovation dilemma is a drop in productivity in R&D spending in the United States. Over a decade, cycle times in product development have reduced from 41.7 months to 24 months, according to a PDMA study (Adams and Boike, 2004). This is an astounding 42% decrease in time-to-market in 10 years! Why? Could it be that we have become that much more time-efficient in a decade? Not really, when one looks at the rest of the facts. R&D spending has remained constant (as a percent of companies’ sales), but profits derived from new products are down from 33.2% of business profits to 28.3% during the same 10-year period, a shocking 15% drop (Cooper, 2005a). So time to market is down, but so is productivity, measured by the sales-to-R&D ratio. What’s happening?

This productivity drop is a measurable performance outcome of the innovation dilemma. Simply stated, management in most companies, facing mature markets, tough competition, commoditization, and shareholder demands for short-term profits, not surprisingly have opted to focus on short-term, low risk, simple development projects—“low-hanging fruit” initiatives. Consider the portfolio breakdowns in Exhibit 1, a comparison of this century’s portfolio so far with the breakdown in the mid-1990s (Cooper, 2005a):

- New-to-the-world products are down by almost half, to 11% of the typical portfolio.
- By contrast, improvements and modifications to existing company products—the least innovative category of development—has almost doubled, and now represents almost 40% of the typical development portfolio. These data are from 2005, so the situation is likely even worse today.

Innovative initiatives are missing, so it’s little wonder that sales and productivity from new product development are down.

The Solution

The answer is bold innovation—breakthrough products, services, and solutions that create growth engines for the future. That is, in contrast to the “same old new product efforts”—extensions, modifications, upgrades, and tweaks—which swamp the majority of firms’ portfolios, we need some breakthrough, game-changing, bolder product innovation initiatives in the development pipeline. This means larger-scope and more systems-oriented solutions and service packages. Examples, such as Apple’s iPod, are often cited, but seem out of reach for most corporations. But a more careful examination of the iPod’s success reveals no magic here, but simply bolder innovation at work (Abel, 2008). Note that Apple did not invent the MP3 player, nor was this opportunity in a blue ocean; in fact there were 43 competitors selling MP3 players when Apple launched! What Apple did was first to identify an attractive strategic arena (MP3s) where it

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**BIOGRAPHICAL SKETCH**

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could leverage its strengths to advantage, and then to develop a solution that solved users’ problems: an easy-to-use, easy-to-download MP3 system, which also happens to be “cool.”

There are dozens of other similar examples of true innovation, not as well known as the iPod, where the company created “big concepts” and bold innovations, typically an integrated system or total solution package for the customer, and won.

**Green Mountain Coffee Roasters**

This company began humbly as a small café in rural Vermont in 1981, and soon was doing its own coffee roasting, selling to local hotels and restaurants. Management saw the consumer need, however: an inexpensive and convenient single-serving coffee-maker at home. Green Mountain created the K-Cup and Keurig system: they signed up well-known coffee makers (Tully’s in Seattle, Newman’s Own, Timothy’s in Canada, and others). The machine itself was simple (unlike some of the European machines imported by major food companies into the United States) and relatively inexpensive. The business model was similar to Gillette’s razor-and-blade model, namely sell the machine cheaply, and make money on the K-cups. The company has been enormously successful, achieving 2009 sales of $800 million, and has been able to win against corporate giants like Kraft and Nestlé.

**P&G’s Olay Skin Care Business**

Once almost given up by P&G (Oil of Olay was cynically referred to as “Oil of Old Lady”), the business was rejuvenated based on the “one big concept” of preventing signs of aging in women’s faces (Lafley and Charan, 2008). The company searched for and found the needed technology (much of it outside of P&G) and has relaunched the business with multiple new products: Regenerist, Definity, Professional, and others (Huston and Sakkab, 2006a). Olay now does over $2 billion in sales annually. (“Open innovation” as a potential source for bold new ideas will be discussed in detail later in this article.)

**Corning Glass and LCD Displays and TVs**

In the late 1990s, Corning Glass was growing and profiting, driven by the boom in fiber optic communications. Then came the crash of 2000, and overnight, the firm’s sales plummeted, and share prices plunged from over $100 to about $1. Ten years later, Corning is thriving again. How? Corning’s senior management developed a brilliant product innovation and technology strategy for the firm, and provided the needed leadership and direction (Kirk, 2009). They concluded that the “repeatable keys” to Corning’s success 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. A number of new opportunities and strategic arenas were identified, assessed, and exploited. The biggest growth engine came from a manufacturing process developed originally in the 1960s for automotive windshields, but which Corning leveraged to create a glass substrate used for the flat LCD displays (for cell phones initially, then laptops and desk top monitors, now LCD TVs and larger displays). Major innovations were developed in each of Corning’s busi-
nesses over the decade, including four new business platforms created and three major market adjacencies exploited. New product sales have now rocketed to 70% of annual sales, and profits moved from minus $500 million to plus $2 billion after taxes.

Barnes & Noble, U.S. Bookseller

Barnes and Noble, the huge U.S. book retailer, operates hundred of bookstores across America. Facing new online competition, the company has boldly launched a reading system called Nook. One can download books from B&N’s huge inventory of books, and do so wirelessly (anywhere in the United States and Canada, on the fly, direct to the tablet, and no need for a computer).

Sanifair in Germany

The company developed a systems solution to a problem we all face when traveling on the highway—finding a clean and well-equipped restroom. The company conceived and operates a chain of public restrooms, especially at service centers along the motorways (they are in almost every service center in Germany). They are clean, open, friendly, and modern. The restrooms charge 70 cents per use, but the system is this: the user gets a voucher for the shop in the service center, thus upselling the restroom visitor to spend more and to buy goods in the service center. As one observer noted, the travelers probably use the voucher to buy coffee or beer in the service center restaurant, so they need to visit the restroom again!

There is a pattern here: this is the type of bold innovation that we need, and this is what will generate the growth desired by so many firms.

Bold Innovation Also Poses Many Challenges

Bold innovations must be strategically aligned to the business. Freelancing for long periods of time on ideas not well-aligned to company goals and strategy is a recipe for disaster. Thus the notion of setting up venture groups, departments, and even individuals, and allowing them total freedom to “wander and hunt” is ultimately doomed.

A second issue is finding that breakthrough opportunity. I’ve been involved in strategy development and ideation imperatives in numerous major corporations over the years, and coming up with new product ideas is pretty easy; there are dozens of methods. The trouble is that the great majority of ideas are mediocre at best. Envisioning that game-changing, bold idea with real potential is very rare indeed.

A third challenge is determining the locus of responsibility for the new arena or bold innovation. That is, which groups within your business or corporation should investigate “white space,” blue ocean, or new arena opportunities? And where should the concepts, products and/or services reside if they are created?

A final issue is that bold innovations often entail significant investment and market risk. Frequently, these innovations are white space, blue ocean, and emerging markets, and thus are “open territory.” But the territory may be “open” for good reason, for example, too few customers to justify creating a product for the market, or not mature enough for a product or service. The implication is that one must do the due diligence, build a solid business case, and make very difficult go/kill investment decisions.

The Five Innovation Vectors

Five vectors must be in place to undertake this different type of innovation to yield bolder and imaginative projects that create integrated, larger, and more systems-oriented solutions and product-service packages, according to our benchmarking studies of hundreds of firms (see Exhibit 2; see sidebar for research basis).

Exhibit 2. The Five Innovation Vectors That Drive Bold Innovation

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The Research Basis

Over the years, colleagues and I have undertaken numerous benchmarking studies that have probed why some businesses are so much more successful than others at product innovation (Cooper & Edgett, 2008a; Cooper & Kleinschmidt, 1995, 2007). The results of these and other studies form the basis of the five innovation vectors outlined in this article. The bar charts shown are from a study into innovation best practices undertaken with the APQC (American Productivity & Quality Center) (Cooper, 2005b; Cooper, Edgett, and Kleinschmidt, 2004a, 2004b, 2005).
Vector I: Develop a Bold Innovation Strategy that Focuses Your Business on the Right Strategic Arenas that Will Be Your Engines of Growth (Cooper and Edgett, 2009)

Most businesses focus their new-product development efforts in the wrong areas—on flat markets, mature technologies, and tired product categories. It’s necessary to break out of this box and to redirect R&D efforts on more fertile strategic arenas with extreme opportunities. Thus, to succeed in bigger, bolder innovation, your business needs a product innovation and technology strategy—a strategy that focuses your business’s R&D efforts on the most attractive arenas. Corning’s decision to focus an existing capability on an embryonic market, namely flat panel screens, is an excellent example. Sadly, the great majority of firms lack a clearly defined, robust, and well-communicated innovation strategy—there is no focus, or you’re focused on arenas that do not yield the growth engines of tomorrow. Once decided, your strategic arenas become your “hunting grounds” in the search for breakthrough ideas, big concepts, and imaginative solutions.

Vector II: Foster a Climate, Culture, and Organization that Promotes Bolder Innovation

People working in the right climate is vital to success. Having the right climate and culture for innovation, an appetite to invest in innovative and more risky projects, and the right leadership from the top is the number one factor that distinguishes top innovation companies, according to our extensive study of innovation results. Those businesses that create a positive climate for innovation, support innovation at every opportunity, reward and recognize innovators and successful development teams, and welcome ideas from all employees do much better at product innovation. Similarly, having the right senior leadership—men and women who drive and support the innovation effort with words as well as through actions—is vital to success. But most businesses lack the needed climate, culture, and leadership for innovation.

Vector III: Create “Big Ideas” for Bold, Integrated Product-Service Solutions (Cooper and Edgett, 2007)

Big ideas lead to big concepts and big solutions—the growth engines of the future. Larger-scope and more imaginative development projects—bold innovations—begin with creating game-changing and blockbuster ideas. In our benchmarking studies, we have identified over 25 proven ways to create big, bold innovation ideas. But many firms rely on few of these methods, and instead look to traditional, somewhat depleted sources for their next breakthroughs—and of course there are no breakthroughs as a result. Creating game-changing new product ideas is the necessary feedstock for an innovative and bold product development effort; but how well does your business do here?

Vector IV: Drive these “Big Concepts” to Market Quickly via a Robust Idea-to-Launch System Designed for Major Service-and-Product Innovations

Generating great ideas is half the battle. The other half is getting from the concept stage through to development and into the marketplace—through the corporate equivalent of the “valley of death.” (The “valley of death” describes the gap between conception or invention versus moving that concept or invention through to a commercialized product—the gap where so many projects die.) That’s where an effective yet rapid idea-to-launch system is needed. Without such a system, your “great ideas” and “big concepts” are like unpicked grapes on a vine—they’ll wither and die. Driving bold innovations to market means installing a robust and efficient idea-to-launch process or system that is designed to handle these major, “big concept” ideas and projects. Just because these projects are imaginative and bold is no reason to throw discipline out the window: the goal is “entrepreneurship but with discipline and due diligence,” which is quite different than “shooting from the hip.” Another issue is that most business’s stage-and-gate systems are designed for small projects, modifications, and product improvements—sustaining innovation—and fail to cope with big, innovative projects and technology platforms.

Vector V: Build a Solid Business Case and Pick the Winners

Many businesses have lots of good new product ideas. But they lack the appetite to invest in these larger-scope and more risky projects, in spite of the fact that they promise to be tomorrow’s growth engines. Part of the problem is the lack of solid business cases: these large “big concept” projects are innovative and risky, and it’s often difficult to get the right data and construct a solid, fact-based business case to convince senior management to make the investment and move forward. It’s essential to do the front-end homework, and to build a compelling business case.
Next, senior management often lacks the right tools and methods to make these riskier decisions on “big concept” innovations. For example, they rely too much on financial tools and return-on-investment methods to make the go/kill decisions, methods that work great for smaller, less innovative projects, but invariably lead to the wrong decisions when it comes to larger-scope, riskier innovation projects. And so the company retreats from these potential game-changing projects, and ends up doing the same old product improvements and modifications, with little real prospect for growth.

Let’s now revisit each innovation vector to see what this means for your company, and witness some illustrations and examples of its execution.

**Vector I: A Product Innovation Strategy to Focus on the Right Strategic Arenas**

Successful innovating businesses put a product innovation and technology strategy in place, driven by the business leadership team and a strategic vision of the business (Cooper et al., 2004b). This product innovation strategy guides the business’s product development direction and helps to steer resource allocation and project selection. Elements of this product innovation strategy are listed in Exhibit 3, along with their impacts. Note that a strong positive link exists between having these elements of a product innovation strategy in place and stellar new product performance. Simply stated, businesses that have such an innovation strategy perform much better than the rest!

**Developing a Robust Innovation Strategy**

A guide to developing an innovation strategy is mapped in Exhibit 4. First, strategy includes the goals and objectives for the business’s product innovation effort, and how these goals tie into the broader business goals. Many businesses lack these goals, or they are not articulated and communicated well (Exhibit 3).

Next, strategy delineates the arenas of strategic focus—in which product, market, and technology areas your business will focus its product development efforts. And note from Exhibit 3 that innovation strategy found in successful innovation businesses is more than just a list of this year’s development projects; it has a much longer-term commitment.

A business’s innovation strategy maps out the attack plans as well: not only where the business will focus its R&D efforts, but how it intends to win there. Finally, an innovation strategy includes defining resource allocation across areas via strategic buckets, and mapping of anticipated major initiatives over a multiyear period to yield the product roadmap.

**Focus on the Right Strategic Arenas: The Future Engines of Growth**

Focus is the key to an effective product innovation strategy. Your product innovation strategy specifies where you’ll attack—or, perhaps more important, where you won’t attack. Thus the concept of strategic arenas is at the heart of a new product strategy—the markets,
Exhibit 4. Use This Framework to Develop Your Business’s Product Innovation and Technology Strategy
industry sectors, applications, product types, or technologies on which your business will focus its new product efforts. The battlefields must be defined!

The greatest challenge in strategy development is identifying and deciding on the fertile strategic arenas or "opportunity-rich battlefields." In too many companies, strategic arenas are defined, but they are not the areas that will bring huge sales and profits; indeed, strategic arenas or areas of focus are most often the ones the firm is currently in, or arenas very close to the current areas of focus, but which are plagued by limited opportunities. The goal is to ensure that the strategic arenas you elect are fertile and offer many opportunities for blockbuster new products, like Corning and Apple did (as opposed to the "stay at home" strategy, where the opportunities may be well picked over). Here’s an example of a firm that avoided doing the obvious.

Clarke American is a specialty printer whose business is printing checkbooks for banks (Slywotzky, Wise, and Weber, 2003). But business was declining, as bank customers were using fewer checks, doing more banking online. Management looked at the firm’s core competency—specialty printing—and hence at adjacent and similar markets: business forms, company checks, and the like. All these markets were well-served, however, and also heading towards commoditization. So, wisely, Clarke’s management decided not to do the obvious, and not to do what most managements would elect (get into adjacent specialty printing markets).

Instead, through its checkbook printing business, Clarke saw an opportunity in converting the bank’s customers to a new bank. Whenever a bank acquires another bank—and there are many such takeovers these days—the acquired bank’s customers must be converted to the new bank; this entails ordering new checkbooks, integrating account databases, handling bank customer inquiries, getting checkbooks out, and so on. Clarke created a comprehensive “conversion management program” to handle all checking account conversion tasks for the acquiring bank, including communication to the end customer. To do so, they leveraged their check-printing capability, along with their expertise in integrating databases. The result was that Clarke built a new business: helping their customers—the banks—transition their clients to the new system. And Clarke earned new fees as well as establishing relationships, not with the purchasing agents of banks, but with senior executives. This bold innovation strategy shifted Clarke’s focus to helping their customers find new revenues and enhance their own customer relationships, which led to even more business opportunities for Clarke.

By necessity, your innovation strategy may mean moving into new markets and new technologies for your business, or even into emerging markets and technologies, new to the world, with much uncertainty and some risk, as Clarke American did. An added challenge is ensuring that these new and unproven arenas are fertile (as opposed to venturing into new arenas on a whim—new pastures which appear greener, but once in, are found to be barren).

**Find Big Problems, Create Big Solutions**

One key to selecting fertile arenas is to identify major problems and problem areas, and then to apply your competencies to solve the problems. The message is “find big problems, create big solutions.” The success of the iPod is an excellent illustration of this strategic approach. Note that Apple was not in the music business when it came out with the iPod; indeed Sony owned that business with its famous Walkman. In broadest terms, Apple saw the growing market need, and then identified and solved the major problems with existing MP3 players—size, storage capacity, user interface, and the shortage of legally downloadable music. In solving the problems, Apple leveraged its unique strengths perfectly: its ability to vertically integrate and deliver an “amalgam of hardware, software and content that made buying, storing and playing music virtually effortless. Apple achieved this by relying on its legendary expertise in hardware and software but without going into the music business” (Stross, 2005). Apple also positioned the iPod cleverly, targeting its loyal customer base of young, media- and tech-savvy people (Apple’s original target market) with a “cool and hip” product, almost a fashion statement. And the firm used its effective distribution channel system, maintained its high-quality image, and avoided price discounting.

Sony, which had dominated the portable music market since the introduction of the Walkman in 1979, possessed many strengths and competencies as well: size, brand name and image, distribution and market presence, technology, and manufacturing capabilities. But it elected a strategy that missed the boat. As if Sony did not learn anything from its failed Betamax strategy, instead of attacking the embryonic but growing MP3 market, it rejected the opportunity, and instead tried to defend its languishing digital mini-disc player and establish it as the next device to supplant the declining CD player, the Discman. The rest is history.

**A Two-Pronged Attack**

In defining possible strategic arenas that offer major growth possibilities, a two-pronged attack works. The
first is an *external analysis*, looking for external opportunities—markets, industries, and sectors which may prove to be fertile ground for your firm’s innovation effort. Usually the perquisite is that these new arenas are at least somewhat adjacent to the existing business, or at minimum can leverage your businesses core competencies to advantage.

The second key is to *attack from strengths*. This translates into undertaking a *solid core competency assessment*, identifying the unique capabilities of your business that could be leveraged to advantage in other markets, applications, and sectors. Note that Apple’s success with the iPod was in part due to the fact that the market was growing and attractive, but also that Apple possessed some unique capabilities, assets, and strengths: its ability to take complex systems and make them simple; its “cool” design skills; its broad distribution system; and young, loyal, and tech-savvy customers. The other 43 MP3 competitors lacked this unique set of skills and assets. But one does not have to be Apple to leverage core competencies effectively. Corning did so when it entered the LCD flat-screen glass market, and so did P&G with Olay (leveraging the company’s vast distribution, marketing, and R&D capabilities).

**Crafting the Strat-Map**

Usually this two-pronged attack—external analysis, and core competency assessment—produces a considerable list of possible strategic areas where one could focus. Next, due diligence must be done to get the facts on each promising arena; then senior management rates each arena on two key dimensions which make arenas particularly promising:

1. Can you leverage your core competencies, assets, and strengths to advantage in this arena? This becomes the horizontal axis in the Strat-Map of Exhibit 5.
2. How great are the opportunities—market size and growth, technological possibilities, and potential for profit—for each area (which becomes the horizontal axis in Exhibit 5)?

The Strat-Map in Exhibit 5 shows a pictorial display of the arenas considered and investigated, with the short list in the upper left quadrant (the “best bets”). Home base or your current arena(s) should also be shown for comparison.

Strategic arenas that both build on your business’s core competencies, and at the same time represent large and growing market and technological opportunities, are the ones that likely will be the focus of your innovation strategy. Such was the case when W. L. Gore, manufacturer of textiles for sporting applications (Gore-Tex® for ski-wear, hiking, camping, etc.) focused on a new strategic arena, namely cardiovascular applications. This new medical arena seems a long way from the textile business, but consider the rationale according to the Strat-Map:

![Exhibit 5. This Strat-Map Helps to Visualize the Strategic Areas That Could Become Key Areas of Strategic Focus for Product Innovation](image-url)
• The cardiovascular business, especially parts replacements, is a large and growing business, with many current materials facing problems and challenges. There is a strong need for new solutions here.

• W. L. Gore has developed a proprietary Teflon-based material with unique properties—liquid can flow though the material in one direction, but not the other way (this makes the material perfect for skiing and hiking; it lets sweat escape, and protects the skier or hiker from external moisture, snow, and rain). This unusual property makes the product particularly suitable for certain cardiovascular applications as well.

Next to textiles, the new cardiovascular field has emerged as one of W. L. Gore’s huge growth engines.

The specification of these strategic arenas—what’s “in bounds” and what’s “out of bounds”—is fundamental to spelling out the direction or strategic thrust of the business’s product development effort. Without arenas defined, the search for specific new product ideas or opportunities is unfocused. Over time, the portfolio of new product projects is likely to contain a lot of unrelated projects, in many different markets, technologies, or product-types, a scatter-gun effort. And the results are predictable: a not-so-profitable new product effort. specifying fertile and opportunity-rich strategic arenas is the first step to bold innovation.

**Vector II: A Climate and Culture, Organization, and Leadership that Fosters Bold Innovation**

Having the right climate and culture for innovation is difficult to measure and even more difficult to change, especially from the middle ranks of a large company. But according to our research, climate and culture prove to be the strongest drivers of businesses’ product innovation performance results and is essential to bold innovation. Here are some characteristics, which are actionable, that we observe in positive climate, high-performance businesses (see Exhibit 6).

**A Climate that Supports Innovation and Entrepreneurship**

Just over one-third of firms engaged in product development were judged to have a supportive climate (Exhibit 6). So if your company is typical, this is an area needing work. Usually this support starts at the top, and permeates throughout the organization. And it manifests itself in many ways. Here is an example.

Grundfos is a major Danish pump manufacturer, hardly an industry where one would expect to find bold innovation. But Grundfos is considered to be one of the most innovative companies in that Scandinavian country. On my first visit, I was surprised to see the company motto in English on every company vehicle in the parking lot: in large red letters, “Be Think Innovate.” On entering the front lobby of the headquarters building, I found an impressive display: no, not a museum of the history of pumps, but a showcase of their current and great innovations. Cutaway models of numerous new products along with a pictures of the project teams that developed the pumps were front and center, showing every visitor how proud Grundfos is of their innovations and innovators. How many PDMA companies pay homage to innovation by devoting their headquarters’ front lobbies to the theme? As we waited to get in to see our host, I began to read the company’s annual report. Surprisingly there were only two pages devoted to financial statements, but six pages devoted to innovation, featuring stories on recent new products and an article written by the president expounding the need for innovation. As we later toured the open-concept office where groups of people were huddled in teams, I couldn’t help but notice the energy and enthusiasm of the workforce. And the campaign of wall posters encouraging people to “be on a project team” or “submit that winning idea” was evident everywhere. Here was a climate and culture so strongly in support of innovation that anyone that did not embrace innovation would feel like a pariah.

**Rewards and Recognition for the Innovators**

*People do what they are incented to do.* Yet the majority of firms we study fail to properly incent innovators. Top performing firms make sure that people who contribute to the innovation effort are either recognized or rewarded or both. Some examples:

At Air Products & Chemicals, the CTO has made innovation his number one priority. Innovations awards are offered each year for commercialized ideas; there is also a Chairman’s Award. Rewards can be up to $100,000, a serious statement on the importance the organization accords its product innovators. Emerson Electric honors project teams and team members. Directly off their front lobby in their St. Louis headquarters building is their “wall of fame”: pictures of project leaders, innovation champions, and project teams. The company also publishes a magazine called *Innovations,* with feature stories on projects and project teams, and also a technology awards section.
Exhibit 6. The Right Climate and Culture, Organization, and Leadership Fosters Bold Innovation

Source: Cooper (2005b)
Many innovation leaders consider recognition as more beneficial than cash rewards or large prizes. A recognition-based system also poses fewer problems in its administration than does a cash-based system.

New Product Ideas Rewarded and Recognized

Many companies have established internal idea collection and handling systems. The best innovating companies also attach rewards or recognition to the submission of ideas, as shown in Exhibit 6. Some examples:

In the Meals Division at Kraft Foods, the Division General Manager awards employees token light bulbs for creating ideas; there are also awards for Innovator of the Month and Innovator of the Year. Here, recognition is typically not monetary, but peer praise, which is viewed as more effective than financial rewards.

Saint Gobain (a major French glass and materials company) has installed a worldwide ideation system. Idea submitters get points as their ideas move through each gate in the company’s stage-gate process, with more points awarded at successive gates. Points can be accumulated and later redeemed for significant prizes, such as a TV or even vacation travel.

Bausch and Lomb (eye lenses) uses limited monetary rewards to reward new product ideas. The employee can get anywhere from $5 to $5000, depending on how far the idea progresses through their stage-and-gate process.

Time Off or Scouting Time Along With Resources

The best innovators provide resources and time off to creative and passionate employees to work on their own projects. 3M is noted for this, and 3M’s “Friday projects” are still a major source of bold innovations. As one executive there said: “You need to pay people to be innovative [a reference to 3M’s reward system] and you need to give people the time to be innovative!” One cannot expect employees to switch off their day-to-day tasks at 2 PM Friday afternoon and spend the rest of the work-week “being creative.” They need dedicated time. Just in case the fear is that the business loses 10% to 20% of the workforce on self-created projects, be aware that people who pursue such projects are a distinct minority: first they must have a solid idea (often peer reviewed); and second they must have the “fire in their belly” and the entrepreneurial spirit to vigorously pursue the idea. Most employees don’t fit these criteria. But the ones that do may have your next breakthrough new product!

Skunk Works and Unofficial Projects Encouraged

Less orthodox methods of organizing for new products are also fairly common among the best innovating companies (Exhibit 6). These include:

- Skunk works: A project team, fully dedicated (100% of their time) to their development project, but working outside the official bureaucracy of the company; that is, not working within any functional area such as marketing or R&D; and the project leader reporting directly to some senior executive or executive group.
- Unofficial projects: Projects not formally approved by the traditional approval process; these can be scouting, free time, or Friday projects; or sponsored by a senior executive. Note that often these projects are early-stage projects; once they begin to require significant resources, they return to the official approval process and become “formal” projects.

Although such organizational approaches are adopted by a minority of firms (16%), by a seven-to-one ratio they are found in the most successful innovation companies (Exhibit 6).

Not so rare but nonetheless connected to high-performing businesses is the use of a ring-fenced innovation group focused totally on bold new products (last item in Exhibit 6). The principle here is that most R&D and marketing people wear many hats, for example, working on long-term, large projects as well as day-to-day, urgent initiatives. Sadly, when both hats are worn, the urgent projects dominate. By splitting off a dedicated group to work only on bold and major projects (no day-to-day firefighting and no short-term urgent projects), the bold projects receive the needed time and attention, and get done in a timely fashion. The downside is that such an innovation group becomes “monastic”—secluded and thus detached from the organization—and so members of this group must be rotated to avoid creating an ivory tower.

Not Risk Averse: Investments in Venturesome Projects

The old adage “put your money where your mouth is” is true when it comes to bold innovation. Our research shows that the most successful innovation firms are not afraid to invest in venturesome and higher-risk projects: there is clear evidence of such projects in their development portfolios and pipelines. For example, Corning’s willingness to take “big, but well-understood, risks” was key to their dramatic recovery in the last decade (Kirk,
Too many managements espouse the need for big innovations, yet a quick look at their R&D investment portfolio shows that the reverse is true: a significant lack of big, higher risk projects.

Executive Commitment to Product Innovation

Executives in successful innovating businesses lead the innovation effort and they are strongly committed to new product development, as shown in Exhibit 7. Providing the necessary leadership, motivation, and support is essential for bold innovation to flourish. An example is at Procter & Gamble, where the CEO, A.G. Lafley, made it clear: “Innovation is a prerequisite for sustained growth. No other path to profitable growth can be sustained over time. Without continual innovation, markets stagnate, products become commodities, and margins shrink” (Mills, 2007). “Inspiring leadership” and “motivating purpose and values” are two of Lafley’s keys to driving P&G to becoming an innovating company (Lafley and Charan, 2008). Further, having an innovation emperor (such as a Steve Jobs at Apple or Tom Watson Jr. at IBM), while desirable, is “not needed, but consistency via stage gates and scorecards is critical—exactly what they [emperors] bring to their organizations,” according to an A. C. Nielsen study (Agan, 2010).

New Product Metrics a Part of Senior Management’s Annual Objectives

A significant minority of businesses now make product innovation results part of senior management’s performance metrics, and in some cases tie their variable pay and bonuses to the business’s innovation performance. 3M pioneered this practice years ago; other firms have caught on. For example, at ITT Industries, new product results (measured by new product sales as a percentage of the business’s annual sales revenue) is now a key performance metric for business unit general managers, along with meeting profit and cost targets. Note that while still not widespread, this practice is seen in best innovating companies almost four times as often as in poor performers.

Senior Management Providing Strong Support to Project Teams

Senior management’s support is crucial to successful innovation: getting projects approved, securing the necessary financial and people resources, and gaining alignment of the functional areas to the key projects. This is especially true in the case of bold innovations, which are often too risky for mid-management to commit to.

Senior Management Engaged the Right Way in Go/Kill Decisions

This is a vital and correct role for senior management: ensuring that clear go (or kill) decisions are made, and if go, making sure the resources are committed (Cooper et al., 2004a). A robust stage-and-gate process, precisely managed, with scorecards and a (senior) governing body yield the best results (Agan, 2010). Note, however, that senior management’s job is to set the stage and to provide resources, and not so much to be an an actor front and center. Executives must avoid micromanaging projects (see Exhibit 7); indeed, one study found that “heavy involvement from senior staff in product development destroys value” (Agan, 2010).

That the right climate and culture is key to bolder innovation has been known for some time. Our APQC study identified this as the number one driver of positive innovation performance (Cooper et al., 2004a). But doing something about it is much more difficult. Culture change must be led from the top, and it takes years to effect. Some of the specific actions and tools that leaders employ are outlined in Exhibits 6 and 7.

Vector III: Create “Big Ideas” for Bold, Integrated Product-Service Solutions

Big ideas lead to big concepts and big solutions—the growth engines of the future. Ambitious, bigger, and more imaginative development projects begin with creating game-changing and blockbuster ideas. A number of management practices were studied for their impact on the business’s new product performance; the higher-impact practices include: having a solid new product process; technology and resource management; strategic planning; and market intelligence; see Exhibit 8 (Arthur D. Little, 2005). But of all management practices, effective idea management has the greatest impact on successful product innovation!

One of the common themes among bold innovators is the installation of a systematic and formal idea collection and handling system, as shown in Exhibit 9. Ideas are sought from many sources, both inside from traditional sources and outside the company from newer sources (open innovation); raw ideas are often allowed to develop and “grow legs” in an incubation area; finally all ideas are lightly screened (more of a strategic screen than a financial one), and then action is taken on the “go”
Exhibit 7. Senior Management Practices and Commitment Are Key to Driving Bold Innovation

Source: Cooper (2005b)
ideas—resources, a team, and an approved “go forward” plan. Killed ideas go into an idea vault for future consideration.

Swarovski, the Austrian crystal and jewelry company, has installed perhaps the most sophisticated and effective front end on their innovation process. Ideas are collected from many sources, and are also the result of proactive activities, such as voice-of-customer research, trend scouting (fashion and market), and technology scouting and analysis. The idea is then subjected to a very gentle strategic screen to determine if it fits with the business’s strategic direction, and if go, ends up in the Idea-Lab (essentially a front-end incubation group that fleshes out or enriches the idea). The enriched idea is then sent to a number of knowledgeable people with the company via I-Flash, Swarovski’s ideation IT support system. Evaluation and comments are sought from many, and based on this feedback the idea is now visualized, ready for screening within a business unit at Gate 1. Note the amount of front-end incubational work before the idea receives a formal Gate 1 evaluation.

Numerous methods for creating new product ideas have been developed over the years. Eighteen of these were examined in a study that determined which are the most popular and which are the most effective for creating game-changing ideas (Cooper and Edgett, 2008b). The results are in the ideation four-quadrant diagram in Exhibit 10.

The most effective ideation methods are towards the top of the diagram and include voice-of-customer

Exhibit 8. Game-Changing Idea Generation to Create “Big Ideas”—the Breakthroughs—Has a Huge Impact on the Business’s New-Product Performance
Source: Adapted from Arthur D. Little (2005)

Source: Cooper & Edgett (2007)
Exhibit 10. The Ideation Four-Quadrant Diagram Reveals the Effectiveness and Popularity of 18 Common Ideation Approaches

Source: Cooper & Edgett (2008b)
methods, denoted by diamonds. In rank order of effectiveness these VoC methods are:

- **Ethnography:** Camping out with customers or observation of customers for extended periods, watching and probing as they use or misuse the product, or go about their tasks or life. This is the most effective of all methods, but not so popular—expensive and difficult to do.
- **Customer visit teams:** Cross-functional company teams visit with customers or users; they conduct in-depth interviews to uncover problems, needs, and wants for new products. This is also a very effective method, but much more popular due to cost and ease.
- **Focus groups:** Running focus groups with customers or users specifically to identify needs, wants, and problems, points of pain, and suggestions for new products. Again popular and very effective.
- **Lead user analysis:** Working with particularly innovative customers or users, usually meeting in a group or holding a workshop, to identify problems and potential solutions (Thomke and von Hippel, 2002; von Hippel, 1982).
- **Customer designs:** Inviting customers or users to help you design your next new product, often via IT, for example, the online Lego DesignbyMe tool (von Hippel, 2005).

Other moderately effective methods for creating breakthrough new product ideas include:

- **Peripheral visioning:** Formally assessing the external world, identifying trends and threats which normally would blindside the firm, and defining potential new products (a deliberate strategic exercise) (Day and Shoemaker, 2005).
- **Disruptive technology:** Formally analyzing technological trends, and identifying potential disruptive or radical and step-change technologies (a deliberate exercise to define potential new products) (Christensen, 2000).
- **Internal idea capture:** Formally soliciting new product ideas from your own employees (often via a webpage or IT), and screening and handling their ideas via a systematic process, much like the Swarovski illustration above.
- **Patent mining:** Mapping or mining others’ patents to see where the major technical and competitive activity is, and to identify the potential areas for new products.

Surprisingly, and in spite of all of the hype, few of the **open innovation** methods were found to be either particularly popular or effective (Chesbrough, 2006; Docherty, 2006). These are denoted by solid squares in Exhibit 10, and fall to the lower left of the ideation quadrant diagram.

On the one hand, pundits argue that open innovation is a major source of innovative ideas, as well as technology, intellectual property (IP), and even products-ready-to-commercialize. For example, at P&G, through open innovation along with improvements in other aspects of innovation related to product cost, design, and marketing, “our R&D productivity has increased by nearly 60 percent. Our innovation success rate has more than doubled, while the cost of innovation has fallen. R&D investment as a percentage of sales is down from 4.8 percent in 2000 to 3.4 percent today. And, in the last two years, we’ve launched more than 100 new products for which some aspect of execution came from outside the company” (Huston and Sakkab, 2006b). On the other hand, open innovation methods specifically as a source of innovative new ideas did not fare all that well in Exhibit 10. The fact that open innovation is relatively new and is yet to be proven over time may be one reason for its lack of popularity and effectiveness. Clearly more research is needed here. Another reason is that seeing ideas from outside the firm applies best to a handful of industries, such as consumer goods (P&G is a major proponent of open innovation; Huston and Sakkab, 2006a). But it may not apply well to higher-technology or engineering products. As GE’s CEO observes, his firm is a leader in a number of fields, such as making jet engines and locomotives, which requires “doing things that almost nobody else in the world can do” and where intellectual-property rights and a degree of secrecy still matter (Economist, 2007). The only open innovation method that is well rated is an approach that has been around for years, namely, working with suppliers as partners as a source of ideas.

Generating breakthrough new product ideas is key to creating that bold innovative new product. Note that it takes an estimated 60 ideas to generate one blockbuster new product. Numerous methods exist for generating these blockbuster ideas, and some of the more popular and effective ones are noted in the ideation quadrant diagram (Exhibit 10). But all require hard work and resources. Take a close look at these approaches and see which ones are right for your business.

**Vector IV: A Robust Idea-to-Launch System for Driving Large-Scope Projects to Market**

Coming up with great ideas for big innovations is half the battle; the other, and perhaps more difficult part, is execution—**driving these large-scope and risky projects**
through the “fuzzy” front end, into development, and finally to market. To do so, you need a robust and efficient idea-to-launch or Stage-Gate® system that is designed to handle these major, “big concept” ideas and projects. Again, companies suffer here: most firms’ idea-to-launch systems are designed for extensions and modification, and fail when it comes to larger, more ambitious innovation projects. In too many companies, the generation of great ideas takes place, but somehow they disappear into a “black corporate hole,” or, as some people phrase it, somewhere between ideation or invention and commercialization, these great ideas die in the “valley of death.” What’s missing is a mechanism, process, system, or method for selecting the winning ideas, getting them visibility and support in the corporation, securing the needed resources, and driving these bold ideas forward through development and into launch.

“The competitive value of a fast and effective innovation engine has never been greater,” was one conclusion of an extensive Booz Allen Hamilton study into successful product innovation (Jaruzeski, Dehoff, and Bordia, 2005). “Yet of all the core functions of most companies, innovation may be managed with the least rigor.” The study noted that “the key is to identify the priority areas where process improvements will have the greatest impact.” Another study revealed the precise use of stage gates with a governing body as oversight yields 130% more new product revenue; see Exhibit 11 (Agan, 2010). And Kennametal Inc., the PDMA’s outstanding corporate innovator for 2010, notes that “in 2009, 43 percent of Kennametal’s sales came from products less than five years old, up from 17 percent in the late 1990s. Key to the improvement was the establishment of a corporate innovation strategy to introduce new products at a market leading pace. Instrumental to implementing the strategy was the development of a robust and disciplined stage gate process” (author’s emphasis) (Kennametal news release, 2010).

A previous “From Experience” article describes in detail how a robust idea-to-launch system functions (Cooper, 2008). Many firms have got it wrong. Exhibit 12 shows a typical stage-gate system for larger scope projects. Note that originally Stage-Gate was developed based on observing how “entrepreneurs” in major corporations drove blockbuster new products to market (Cooper, 2011). It is a system founded on boldly innovative new products. But over time, in too many firms, their stage-and-gate system has been reduced to an operational or executional process for handling rather mundane development initiatives.

In principle, the stage-gate process is simple, indeed intuitive, consisting of a series of iterative stages and gates: do some homework and due diligence; integrate and analyze the data; and then make a decision to move onward or stop; and if onward, repeat the iteration—not unlike buying a series of options on an investment property. This options nature is particularly important in the case of bolder, higher-risk projects, as these series of due-diligence-integrate-decide iterations mitigate the risk.
in the project, much like buying a series of options mitigates the risk in purchasing an investment property.

Truly excellent companies, such as P&G or Emerson Electric, have developed proficient idea-to-launch systems and thus model the way (Ledford, 2007; Mills, 2007). Most well-crafted innovation systems are enablers, and help the project team get visibility from senior management, and hence secure commitments of the needed resources for their project. At the same time, the system is disciplined, and includes best management practices, steering the project team in the right direction and ensuring that the right actions are taken on the project. But note that an idea-to-launch system is also lean and trim, with all non-valued-added work, procedures, and reports removed (Cooper and Edgett, 2008a). There is no room for “make-work” or nonproductive activities in the process. Speed and efficiency are vital.

The typical idea-to-launch system for major innovation projects features clearly defined stages, typically five in number, as shown in Exhibit 12. Each stage has its prescribed activities and resulting deliverables. These activities are based on best practices, and include important actions such as undertaking voice-of-customer-research; engaging in constant customer iterations; getting sharp, fact-based product definition; and undertaking solid front-end homework or due diligence before development begins.

There are also clearly defined gates. These are the “bet points” or go/kill decision points, where senior management thoroughly reviews the business merits of the project and makes the needed resource investments to carry on to the next stage. Gates have defined gatekeepers (decision makers, part of a new product governance body) and go/kill criteria in the form of a scorecard. Note that these gates must have teeth—not every project passes every gate, any more than the poker player bets on every poker hand. New information often signals a kill decision—a decision to fold the hand—and such kills, although painful, must be taken. The goal is fewer but higher-value projects.

The process is very much cross-functional. This is not an R&D or marketing process, but rather a business process. Every stage is marketing, R&D, operations, purchasing, sales, etc. And the gatekeepers are a cross-functional governance body, so that essential resources can be applied from each functional area.

This paper won’t go into the details of a stage-gate system here (see Cooper, 2008), except to note that such a disciplined process is key to success, particularly in the case of bold innovation developments which tend to be larger and more complex. Discipline and a systematic approach are more vital than ever for such challenging development initiatives.

**Vector V: Building the Business Case and Picking the Winners**

There are two ways to win at new products: do projects right and do the right projects.
right points to adopting idea-to-launch processes such as stage-gate. The desire to do the right projects means having a well-crafted innovation strategy (Vector 1), building a solid business case for key projects, and employing effective portfolio management to make the right investment decisions.

**Effective Portfolio Management to Make the Right Investments**

*Strategy becomes real when you start spending money.* Thus, making key spending decisions regarding bold innovations is the essence of implementing a bold innovation strategy. Portfolio management is about investment decisions and resource allocation in the business. That is, which new product and development projects from the many opportunities the business faces shall it fund? And which ones should receive top priority and be accelerated to market? Portfolio management also deals with balance: about the optimal investment mix between risk versus return, maintenance versus growth, and short-term versus long-term new product projects. Exhibit 13 shows the portfolio breakdowns of top-performing companies versus the rest. Note how much more innovative the portfolio of projects is for the top performers, and that 16% of their portfolios are “new to the world” products.

Successful innovating businesses boast an *effective portfolio management system* that helps the leadership team effectively allocate resources to the right areas and to the right projects much more so than do poor performers (see Exhibit 14, although, as the exhibit shows, a proficient portfolio management system is still an elusive goal for the majority of firms). Development projects in successful innovators are aligned with their business strategy, while resource breakdowns in the portfolio mirror the business strategy (which points to the need for a clearly articulated innovation strategy). There is also the right balance of projects in the portfolio, for example, between long-term, bolder, and high-risk projects versus short-term projects; and between major new products and minor modifications. The best firms also do an excellent job ranking and prioritizing projects, and their portfolios generally contain high-value projects (by contrast, poor performing businesses have portfolios with far too many low-value projects). Finally, successful innovators strike the right balance between resources available and numbers of projects under way, so that priority projects receive the resources they need for execution.

**No Resources for the Bold Initiatives**

One problem with bold innovation is securing the necessary resources for these major projects to move forward. Simply stated, if resources are not deliberately set aside for major projects, these projects don’t get done. Human nature dictates that management tends to gravitate towards the low-hanging fruit. In the case of product innovation, this translates into firms doing lower-risk, shorter-term, and easier projects, which explains why portfolios have shifted over time to less innovative projects, as shown in Exhibit 1, and as shown in Exhibit 13 to poor performance. The dilemma is that the

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**Exhibit 13. Breakdown of Projects By Project Type Shows the Different Portfolios for Best Versus Worst Performers in Product Innovation**

Source: Cooper (2005a)

<table>
<thead>
<tr>
<th></th>
<th>Worst Performers</th>
<th>Average Business</th>
<th>Best Performers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotional Developments &amp; Package Changes</td>
<td>12%</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>Incremental Product Improvements &amp; Changes</td>
<td>40%</td>
<td>33%</td>
<td>28%</td>
</tr>
<tr>
<td>Major Product Revisions</td>
<td>19%</td>
<td>22%</td>
<td>25%</td>
</tr>
<tr>
<td>New To The Business Products</td>
<td>20%</td>
<td>24%</td>
<td>24%</td>
</tr>
<tr>
<td>New To The World Products</td>
<td>7%</td>
<td>10%</td>
<td>16%</td>
</tr>
</tbody>
</table>

- - -

- 45% - 55% - 65%

10 Point Steps

Best Performers focus more on innovative and game-changing projects
low-hanging fruit is not the tastiest or best fruit; taken to an extreme, the firm finds itself with 100% of its new product resources committed to modifications, tweaks, updates, and improvements, and no resources left to tackle the bolder new products.

A Hierarchical Decision Process

Portfolio management and resource allocation can be treated as a hierarchical process, with two levels of decision making (Cooper, 2003):

1. Strategic portfolio management: Strategic portfolio decisions answer the questions: Directionally, where should your business spend its development resources (people and funds)? How should you split your resources across projects types, markets, technologies, or product categories? And on what major initiatives or new platforms should you concentrate your resources? Establishing strategic buckets and defining strategic product roadmaps are the tools here.

2. Tactical portfolio decisions (individual project selection): Tactical portfolio decisions focus on individual projects, but obviously follow from the strategic decisions. They address the question: What specific development initiatives should your business do?

Use Strategic Buckets to Make Strategic Allocation of Resources to Bold Innovations

Many best-in-class companies use the concept of strategic buckets to help in the resource deployment decision. Strategic buckets simply define where management desires the development dollars to go, broken down by project type, by market, by geography, and/or by product area (Cooper and Edgett, 2006). The idea of strategic buckets is based on the notion that translating strategy from theory to reality is about making decisions on where the resources should be spent. Management begins with the business’s strategy and then makes strategic choices about resource allocation: How many resources go to each bucket—innovative new products; new items in an existing product line; updates and improvements; cost reductions; or sales force requests? Note that each of these project types competes for the same resources, and, as Exhibits 1 and 13 show, most companies have far too many of the smaller, low-hanging fruit projects and not nearly enough of bolder and genuine new product projects. Strategic buckets is designed to prevent this imbalance (Cooper, Edgett, and Kleinschmidt, 2002).

With resource allocation now firmly established and driven by strategy, projects within each bucket are then ranked against each other until out of resources, in order to establish priorities. Note that projects in one bucket (such as “bold new products”) do not compete against those in another bucket, such as “updates and improvements” or “sales force requests.” If they did, in the short term simple and inexpensive projects would always win out, as they do in many businesses. Instead, strategic buckets build firewalls between buckets. Thus, by earmarking specific amounts to “innovative new products” or to “platform developments,” the portfolio becomes much more balanced.
Employ a Strategic Product Roadmap to Establish Placemarks for Bold Innovations

A strategic roadmap is an effective way to map out a series of major initiatives in an attack plan. A roadmap is simply a management group’s view of how to get where they want to go or to achieve their desired objective (Albright and Kappel, 2003; McMillan, 2003; Myer and Lehnerd, 1997). In use, your business’s management maps out the planned assaults—the major or bold new product initiatives and their timing—that are required in order to succeed in a certain strategic arena in the form of a strategic product roadmap. (The term “product roadmap” has come to have many meanings in business. Here the meaning is a strategic roadmap, which lays out the major and strategic initiatives and platforms the business will undertake well into the future, as opposed to a tactical roadmap, which lists each and every product model, extension, version, modification, etc.) This roadmap may also specify the platform developments required for these new products. Placemarks are established for these strategic development initiatives, and resources are 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 mapped out in the form of a technology roadmap.

How to Pick the Big Winners

Project investment decisions focus on individual projects, and address the questions: Which specific new product and development projects should you do? What are their relative priorities? And what resources should be allocated to each? While there are many methods to help management select the right projects, most are inadequate, as evidenced by the high percentage of wrong choices and high new product failure rates, especially in the case of challenging and high-risk bold innovations. Traditional project selection methods may work fine for traditional projects, such as improvements, modifications, and new models, but they don’t work so well for bold innovations. Indeed, the sophistication of most financial models is far beyond the accuracy of the data input. Nothing is certain in product innovation except one fact: your numbers are always wrong! Additionally, overuse of financial tools to select development projects tends to favor “known” projects with lower uncertainties, and thus drives your business to a conservative, low risk portfolio—lots of low-hanging fruit projects, fast, cheap, and certain. But this is not what you’re trying to achieve here—bold innovation is!

An effective way of rating and ranking bold innovation projects is the use of multidimensional scorecards (Cooper and Edgett, 2006). Exhibit 15 provides a tried-and-proven scorecard for use by senior people at gate meetings for larger-scope and innovative projects. Note that all but one of the dimensions are nonfinancial, instead considering strategic fit and impact, competitive advantage and product superiority, market attractiveness, and the ability to leverage core competencies in the project. Scorecards are employed by the gatekeepers (the governance body) at the gate meeting to rate the attractiveness of the proposed projects and assist in the go/kill

Exhibit 15. Use This 12 Question Research-Based Scorecard to Assess Bold Innovations (Used by Gatekeeper Governance Body at the Gate Meeting)

<table>
<thead>
<tr>
<th>I. Strategic fit &amp; importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Strategic alignment – fits our strategy, centered on a key strategic arena</td>
</tr>
<tr>
<td>2. Strategic importance &amp; impact – very important to strategy, huge impact if successful</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. Market opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Size of market (existing or potential)</td>
</tr>
<tr>
<td>4. Growth rate of market (existing or potential)</td>
</tr>
<tr>
<td>5. Competitive intensity – no/few competitors, open territory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III. Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Technical – it can be done, we can develop &amp; produce (or can acquire skills &amp; capability)</td>
</tr>
<tr>
<td>7. Marketing – it can be sold, we have what it takes to market the solution (or can acquire)</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>IV. Competitive advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Solution will be unique, differentiated</td>
</tr>
<tr>
<td>9. Will offer customer or users a compelling value proposition – meets a large need at the right price</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V. Reward</th>
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</thead>
<tbody>
<tr>
<td>10. Potential for profit – we can make good profits here</td>
</tr>
<tr>
<td>11. Payback period is acceptable</td>
</tr>
<tr>
<td>12. Risk level is acceptable</td>
</tr>
</tbody>
</table>

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decisions. By walking through the set of well-crafted questions in a systematic way, debating the scores, and reaching consensus on the scores, not only do these senior people make better decisions, but there is organizational alignment and support for the selected and major innovation projects.

Missing in Action: A Solid Business Case

How many times have we heard senior executives exclaim: “I’m more than willing to invest in venturesome projects; what I don’t see is a strong business case to support the investment.” True enough. As Exhibit 16 reveals, most businesses are found lacking when it comes to undertaking the front-end due diligence work needed to put together a powerful business case. For example, only 18% of businesses on average undertake the vital market research and voice-of-customer work; proper concept testing is conducted in only 27% of firms; and in only 26% of businesses is a rigorous financial and business analysis conducted. By contrast, businesses that achieve stellar results in product innovation take the time and effort to do the front-end homework. “Front-end load the project” is one of Toyota’s seven principles of effective new product development, a requirement that a higher proportion of work be done in the early phases of a development project (Morgan, 2005): “By effectively segregating this inherently “noisy” phase of the product development process from the execution phase, Toyota is able to minimize downstream process variation that is crucial to both speed and quality.” Building a solid business case is fundamental to success in securing the necessary financial support and management commitment for a bold innovation project, and constitutes Stage 2 right before full development in the idea-to-launch model in Exhibit 12.

Building a solid business case is tough work, especially for bold innovations which usually entail quite new and often complex solutions, new markets, and sometimes new technologies. First, building a robust business case requires an effective cross-functional team, ideally dedicated full time to the project (teams multitasking across multiple projects, and doing their “day job” as well, invariably drop the ball in the business case phase). Second, an experienced team leader is key, one with a passion for the project, and the right leadership and people skills. Next, the team must have a game plan. Exhibit 16 shows what the successful innovators do. They undertake the necessary marketing homework, for example, a preliminary market assessment to probe market attractiveness; full market research including voice-of-customer work to determine the user’s unmet and unarticulated needs and to get the product definition right; concept testing to validate the product concept; and value assessment to determine the economic worth of the new solution to the customer. Technical work proceeds in parallel and includes a full technical assessment, pinpointing the technological risks and fail-points as well an intellectual property analysis; and an operations and source-of-supply assessment to determine manufacturability, costs, and investment. This cross-functional team effort culminates in a full business analysis, a recommendation to senior management, and if go, a proposed “go forward” plan. Here’s a tale of two companies working on the same bold innovation; one followed the rules and succeeded; the other failed (since this is a negative story for one firm, its name won’t be mentioned).

A major U.S. conglomerate (Company X) hosted a divisional off-site meeting to create blockbuster ideas for making money from water (the company is already in the process equipment business). At the four-day session, various teams correctly identified a major unmet need: increasingly, industrial parks are built farther outside major cities, and thus more remote from the city’s water and sewage infrastructure. The situation is especially true in developing countries. This required running miles of sewage and freshwater piping from the city system (or building a new sewage treatment plant, as well as a fresh water purification plant for the new industrial park).

The proposed solution at the ideation session was an integrated system to create a closed-loop treatment facility on site—a pre-fab water factory—not unlike what is used on the Space Station. Wastewater would be treated to remove pollutants, and finally treated to provide drinking water—no need to hook up to the city’s sewage or freshwater systems. The idea was scored, received top marks, and was one of several big ideas nominated to move forward.

A project team was assembled from multiple business units. Unfortunately, individual team members were never given the release time or resources to pursue the project vigorously. This was potentially a huge project and required much front-end homework, but the necessary due diligence work (as shown in Exhibit 16) was, for the most part, not done. Lacking the facts, the team developed a lackluster and unconvincing business case that failed to excite senior management. Moreover, the financial prospects were very hard to prove, as is typical of an innovative solution in a totally new market (this is a financially driven company, so management relies on rigid financial criteria for go, and has little appetite for major strategic projects without a strong financial case).
Note how much better the Successful Innovators execute these front-end actions!

Exhibit 16. Here Are Some of the Key Actions in the Front-End Homework Stages Essential to Building a Robust Business Case
Adapted from: Cooper (2005b)
Sadly the project was dropped in the early stages. The lost opportunity cost is substantial.

By contrast, Grundfos, the Danish pump company highlighted above, saw the same major problem in water treatment. And it moved forward and launched BioBooster, its pre-fab water factory. Wastewater is treated in a number of ways to remove pollutants, and can even be treated to provide recycled fresh water. The modular plant or water factory offers many options for custom-tailored wastewater treatment, almost in a plug-and-play mode—primary mechanical treatment, biological pre-treatment, and membrane filtering of the wastewater—all in one integrated and essentially prefabricated plant; the facility can be even expanded through UV radiation and/or reverse osmosis to a water reuse solution.

Grundfos’ BioBooster is an example of a bold innovation in a traditionally mature industry, namely process equipment. But it worked! In contrast to Company X, Grundfos has a strategy that includes bold innovation; their “Be Think Innovate” climate and culture is strongly supportive; they rely on an effective stage-and-gate process to drive these larger, more complex projects to commercialization; and management is prepared to commit to riskier investments such as the BioBooster, provided the business case is solid.

**Wrap-Up**

If your business faces mature, commoditized markets, yet wishes to grow, prosper, and be successful at new product development, then your development portfolio must contain some bold, breakthrough innovation projects. Five vectors are outlined that are proven drivers of innovation:

1. Have a product innovation strategy that focuses your development efforts on opportunity-rich strategic arenas, much like Corning, Apple, and W. L. Gore do;
2. foster the right climate and culture for innovation, driven by senior executives, as found at Grundfos and 3M;
3. set up a proactive idea generation, capture, and handling system, as at Swarovski;
4. have a robust idea-to-launch stage-gate process designed to handle large, complex, and bold development initiatives, as at P&G, Emerson Electric, and Kennametal;
5. and finally, do the necessary up-front due diligence and making the right fact-based investment decisions in these riskier projects (portfolio management), as does Corning, Green Mountain Coffee Roasters, and Grundfos.

Bold innovation is not easy, but it’s not out of reach either. The examples and illustrations provided above model the way—the next step is yours!

**References**


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