

# Winning at New Products: Pathways to Profitable Innovation

## The Research Behind this Whitepaper

Most of the findings reported in this whitepaper are from a recent and major benchmarking study undertaken by the author with the APQC (American Productivity & Quality Center, Houston). This study of a large number of firms looked at the product development practices that led to superb performance (see endnote 2). This APQC study is just one of a long tradition of research investigations into what leads to successful performance in product innovation undertaken by the author and colleagues (for an overview of this ongoing research, see endnote 3). Thus the conclusions and prescriptions presented in this whitepaper are very much fact-based.

## Who Are the Best Performers?

Best performing businesses in new product development (NPD) were identified in order to uncover best practices. Best performers are defined as those that achieve the highest NPD productivity—they obtain the greatest output for a given input. NPD performance in the APQC study<sup>2</sup> was judged on multiple criteria such as: NPD profitability for money spent; NPD profitability versus competitors; percentage of projects meeting sales targets; meeting profit targets; on-time performance; and the ability to open up new windows of opportunity.

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## What Are the Keys to Success in Product Innovation?

New product success is vital to the growth and prosperity of the modern corporation. In the U.S., almost half of CEOs rate innovation as “very critical” to their future business success, according to a recent Cheskin & Fitch Worldwide study.<sup>1</sup> A 2005 ADL study reveals that “enhanced innovation abilities” is rated as the number one lever to increase profitability and growth among European companies, even higher than cost cutting and mergers-and-acquisitions.<sup>2</sup>

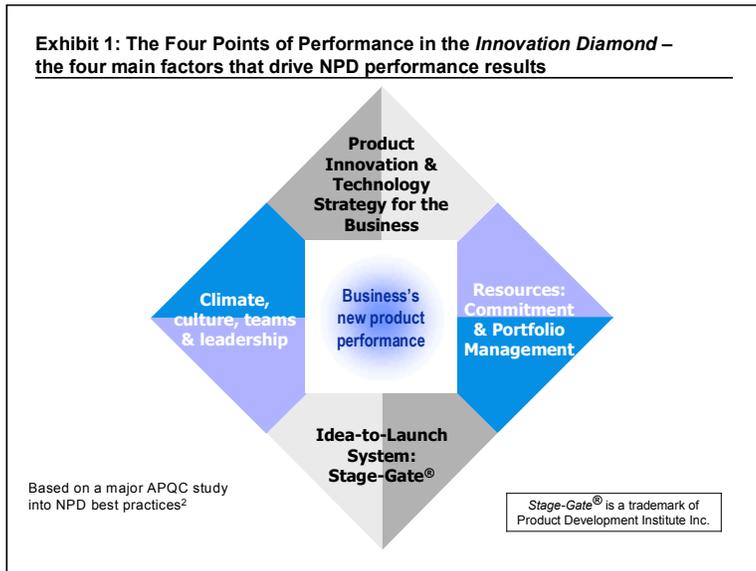
Developing and launching a steady stream of new product successes is no easy feat, however. Only one product concept out of seven becomes a new product winner; and 44% of businesses’ product development projects fail to achieve their profit targets!<sup>3</sup>

Some companies, like Procter & Gamble, Johnson & Johnson, Hewlett Packard, Sony, Kraft Foods and Pfizer, make it seem easy, however—they are the consistent winners with one big new product winner after another. But exceptional performance in product development is no accident. Rather, it is the result of a disciplined, systematic approach based on best practices.<sup>4</sup>

What are the secrets to success in new product development (NPD) that these winning businesses share? This whitepaper highlights the key factors and drivers that distinguish the best performing businesses in NPD from the rest. Those factors and drivers that are common across high-productivity, best performing businesses in NPD were uncovered in a recent and major APQC study into best practices (and in a number of previous investigations).<sup>5,6</sup> Prescriptions on how to translate these best practices into action in your business are also outlined in this paper.

## The Innovation Diamond

Four major factors or forces drive a business's new project performance, according to the studies, and are illustrated as *four points of performance* in the Innovation Diamond shown in Exhibit 1. They are:



1. A product innovation and technology strategy for the business
2. Resource commitment and focusing on the right projects—solid portfolio management
3. An effective, flexible and streamlined idea-to-launch process or *Stage-Gate*<sup>®</sup> system
4. The right climate and culture for innovation, true cross-functional teams, and senior management commitment to new product development.

While many investigations have identified different facets of new product management as key to success, the major “aha” of this recent APQC study is that there is *no one key to success* in product innovation. Thus

management must step back from looking just at single drivers or even individual new product projects, and consider the broader picture. For example, having a great idea-to-launch process is not sufficient—it’s not a standalone driver of positive performance.

The Innovation Diamond in Exhibit 1 highlights the main drivers and practices that are common to the best performers in NPD. So do what the winners do—emulate them! This Diamond proves to be a *valuable model* for helping senior managers focus their efforts to improve their business’s NPD productivity and performance. For example, Procter & Gamble models their new product effort at the business unit level closely on the Innovation Diamond of Exhibit 1.<sup>7</sup>

Here now is a more in-depth look at each of the four points of performance, along with prescriptions for how to make each point work in your business.

### 1. A Product Innovation and Technology Strategy for the Business

Best performing businesses put a product innovation and technology strategy in place, driven by the business leadership team and a strategic vision of the business. This is the *first point of performance* in the Innovation Diamond in Exhibit 1. 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 2, along their impacts—insights into whether each element separates the best from worst performers.

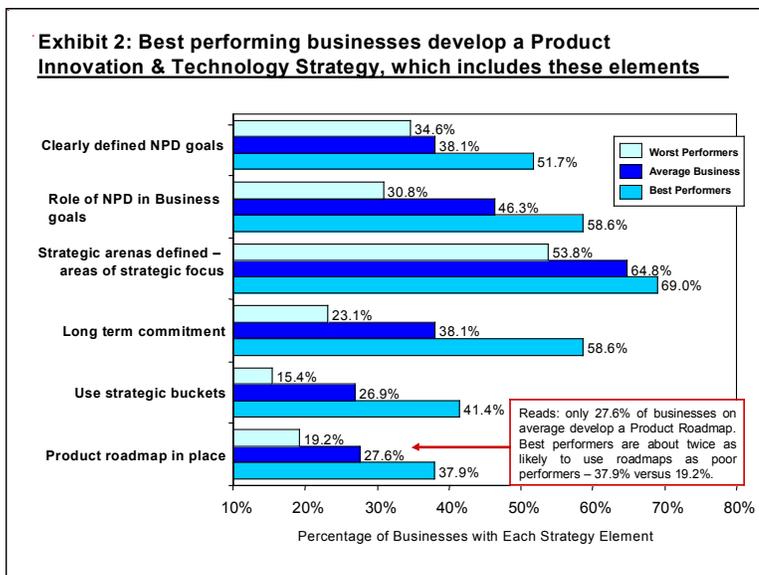
Strategy begins with the goals for the business’s product innovation effort, and how these goals tie into the broader business goals. Many businesses lack these goals, as seen in Exhibit 2; or they are not articulated and communicated well.

Next, strategy delineates the arenas of strategic focus—in which product, market and technology areas the business will focus its product development efforts. Note from Exhibit 2 that innovation strategy found in best performing businesses is more than just a list of this year’s development projects; it has a much longer term commitment.

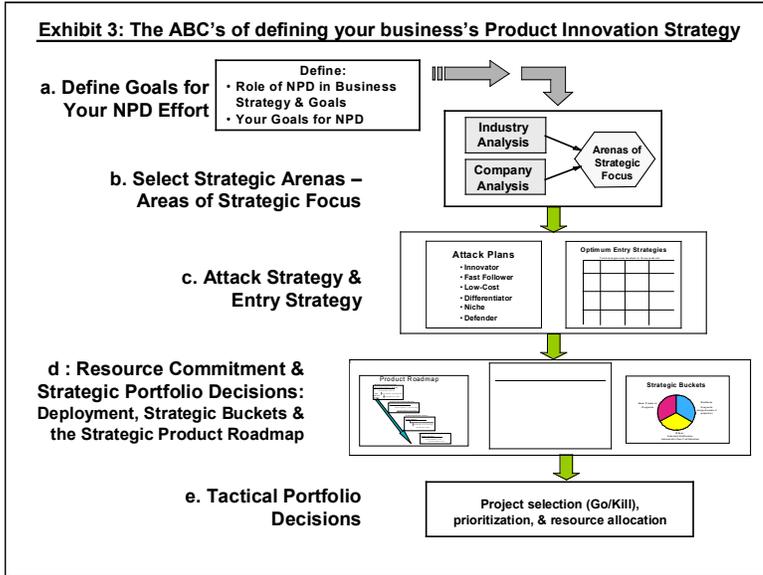
A business’s innovation strategy also maps out the attack plans—not only where the business will focus its R&D efforts, but how it intends to win there. Finally, an innovation strategy deals with resource allocation via *strategic buckets*, and mapping of anticipated major initiatives over a multi-year period to yield the *product roadmap*.

Businesses that build these elements into their product innovation strategy perform better than the rest! Exhibit 2 reveals how each of these strategy elements is more often found in best performing businesses, and by contrast, how they are lacking among poorer performers. For example, from Exhibit 2, note that:

- Twice as many best performing businesses (versus poor performers) clearly define their goals for product innovation, and define how product development fits into their broader businesses goals.
- Three times as many best performing businesses take a long term commitment to new product development. By contrast, poor performers simply focus on the short term, and think that a list of this year’s active projects is “their strategy”!
- Three times as many best performing businesses (versus poor performers) use strategic buckets to help decide resource allocation.
- Twice as many best performing businesses use roadmaps to chart their long term development initiatives, although roadmaps are used by only one-in-four businesses overall.



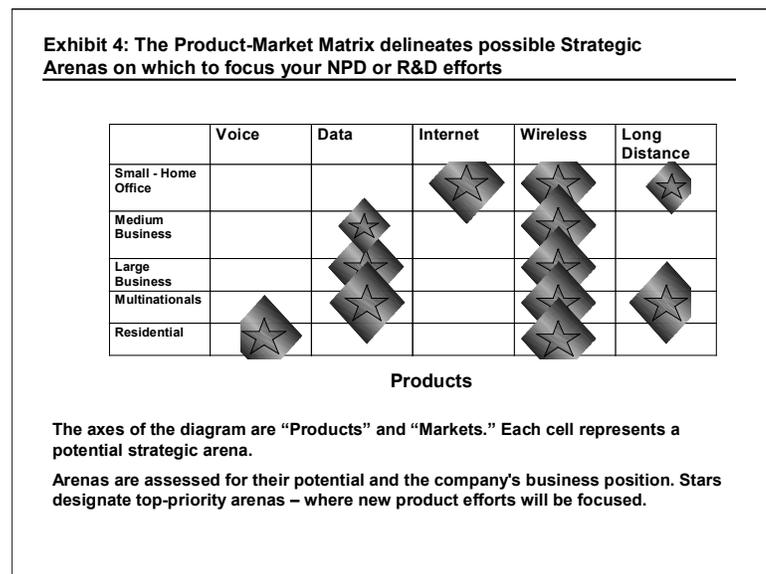
The point is that best performers boast an articulated product innovation strategy, including the elements outlined above and in Exhibit 2, much more so than do poor performing businesses. But words of warning: evidence of a comprehensive and articulated product innovation strategy is missing in the great majority of businesses! Even the best performers are far from perfect here.



The message for senior management is that if your business is one of many that lacks a product innovation strategy, including the elements in Exhibit 2, then this deficiency is likely hurting your performance. The time is ripe to develop and install such a strategy, an effort that should be led by the business leadership team. To help in this undertaking, an A-B-C strategy development framework is outlined in Exhibit 3, which includes the key elements uncovered in best performing businesses. This ABC guide serves as a useful starting point to develop your own product innovation strategy. (Note that a product innovation and technology strategy is often developed as part of the business's overall strategy; if not, then the innovation strategy should be firmly linked to the business's strategy):

**a. Goals and role:** Begin with your goals! The business's product innovation strategy specifies the goals of your business's total new product effort, and it indicates the role that product innovation will play in helping your business achieve its business objectives. It answers the question: how do new products and product innovation fit into your business's overall plan? A statement such as "By the year 2008, 30% of our business's sales will come from new products" is a typical goal.

Another key best practice is to ensure that the role of new products in achieving the business's overall goals is clear and communicated to all (also highlighted in Exhibit 2). The whole point of having goals is so that everyone involved in the activity has a common purpose... something to work towards. What we witness here are very mediocre practices with less than half of all businesses defining and communicating the role of product development in achieving their business goals.



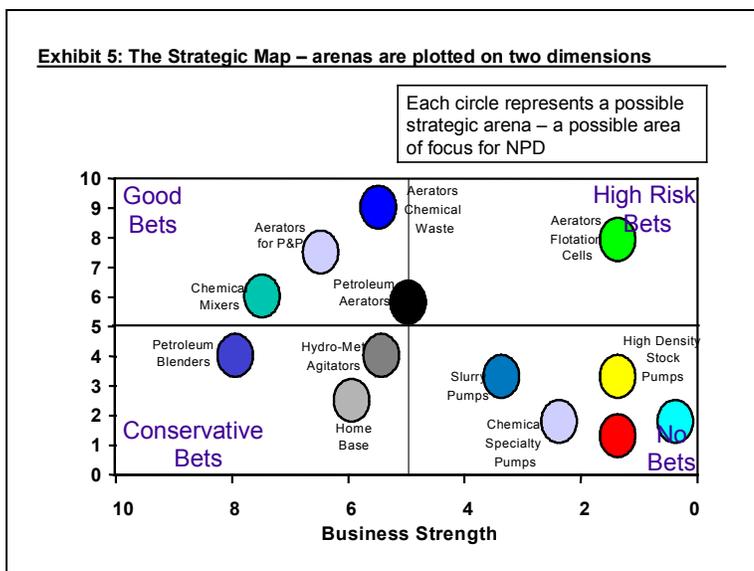
**b. Arenas and strategic thrust:** Focus is the key to an effective product innovation strategy. Your product innovation strategy specifies where you'll attack, or perhaps more important, where you won't attack.

Thus the concept of *strategic arenas* is at the heart of a new product strategy—the markets, industry sectors, applications, product types or technologies on which your business will focus its new product efforts. The *battlefields* must be defined!

The specification of these 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. It is the result of identifying and assessing product innovation opportunities at the strategic level. 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.

The first task is one of identifying a possible set of arenas—areas that offer the business some new and profitable opportunities. The product-market matrix shown in Exhibit 4 is a typical chart that many firms use as they try to define new but adjacent areas to operate in. Each cell in the diagram represents a potential strategic arena on which to focus the business’s R&D efforts, and 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:



- *Arena attractiveness*—how attractive is the arena to the business. This is an external measure and captures characteristics such as size and growth of markets here, 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 is).
- *Business strength*—what strengths the business brings that could be used to advantage in the new arena. This involves an assessment of the business’s core competencies and strengths, and asking whether these could be leveraged if one entered the new arena.

Usually, a set of 6-10 questions is developed for each dimension, which senior management then uses to rate the various arenas under consideration. The result is the *strategic map*, with each arena plotted; an example from a process equipment manufacturer is in Exhibit 5. Arenas in the upper left quadrant—the “good bets”—are designated as the most promising.

**c. Attack strategy and entry strategy:** The issue of *how to attack* each strategic arena should also be part of your business’s product innovation strategy. 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 strategies might focus on being low cost versus a differentiator versus a niche player; or on emphasizing certain strengths, core competencies or product attributes or advantages. An understanding of your business’s core competencies (unique strengths that can be leveraged to advantage in the marketplace) coupled with industry success drivers (what it takes to succeed in this industry, sector or arena) are key analyses that lead to the selection of the appropriate attack strategy.

Additionally, entry plans for new arenas should be defined. Such a plan might be to “go it alone” via internal product development. Alternately, more and more firms are seeking alliances through licensing, partnering and joint venturing as a way to enhance their product development capabilities and succeed in the marketplace.

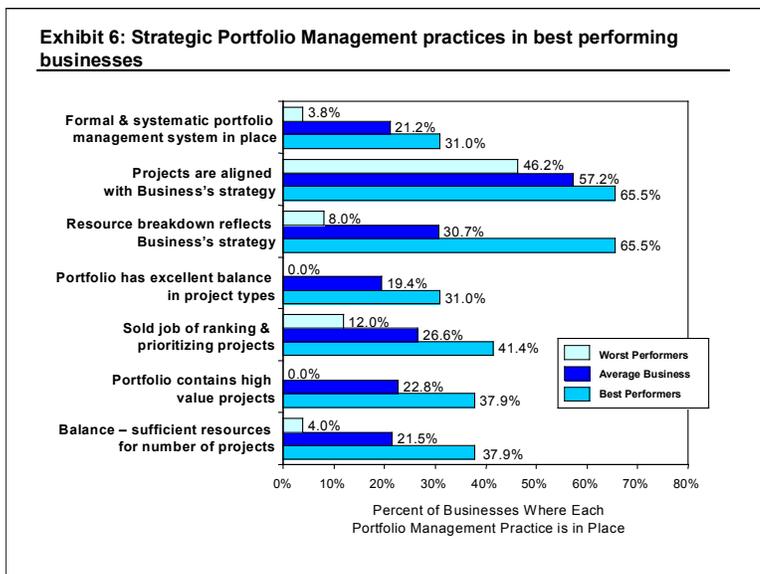
**d. Deployment**—spending commitments, priorities and strategic buckets: *Strategy becomes real when you start spending money!* Your product innovation strategy must deal with how much to spend on product innovation; and it should indicate the relative emphasis, or strategic priorities, accorded each arena of strategic focus. Thus an important facet of a product innovation strategy is *resource commitment* and *allocation*. And ear-marking 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 your business goals.<sup>8</sup> More on this topic next in the section on portfolio management.

## 2. Resource Commitment and Portfolio Management

The *second point of performance* in the Innovation Diamond in Exhibit 1 is resource commitment and focusing on the right projects, namely *portfolio management*.

Portfolio management is about 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? It is also about business strategy, for today’s new product projects decide tomorrow’s product-market profile of the firm. Finally, it is about balance: about the optimal investment mix between risk versus return, maintenance versus growth, and short term versus long term new product projects.

Best performing 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 (although, as Exhibit 6 shows, a portfolio

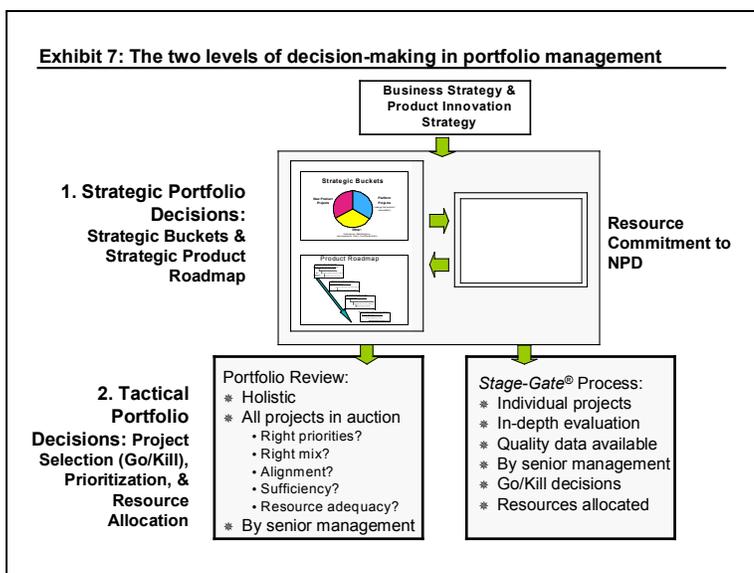


management system is still an elusive goal for almost 80% of businesses). Here are facets of portfolio management that best performers have in place:

- Development projects in best performers are aligned with their business strategy, and resource breakdowns in the portfolio mirror the business strategy.
- There is the right balance of projects in the portfolio (for example, between long term and short term projects; between high risk and low risk; and between major new products and minor modifications).
- Best performing businesses also do an excellent job of ranking and prioritizing projects, and their portfolios generally contain high value projects (by contrast, poor performing businesses have portfolios with too many low value projects!).
- Finally, best performers manage to strike the right balance between resources available and numbers of projects underway, so that a resource crunch, so typical in poor performers, is avoided.

Use Exhibit 6, which lists the ingredients of a solid portfolio approach, to benchmark your own business. If you are typical, your business may be weak on many of these important items. But note how strongly they are embraced or achieved by the best performing businesses. This comparison of your practices versus those in Exhibit 6 may convince you that your business is missing one of the key ingredients in performance, and you may then decide that your business needs more effective portfolio management. If so, here are some pointers:

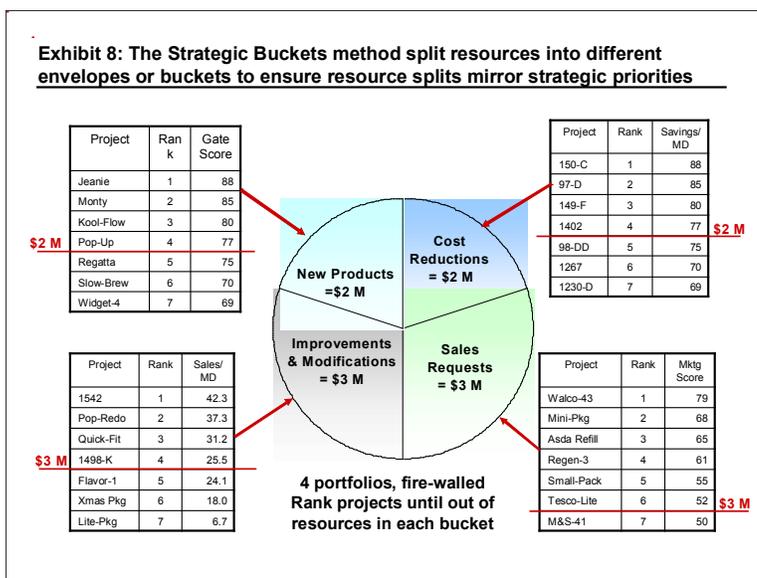
**a. A hierarchical process:** Portfolio management and resource allocation can be treated as a hierarchical process, with two levels of decision-making (see Exhibit 7):<sup>9</sup>



• Level 1—Strategic portfolio management: Strategic portfolio decisions answer the question: 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 effective tools here (more on these methods below).

• Level 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 new product projects should you do? Such decisions are shown at the bottom part of Exhibit while tools for these tactical decisions are outlined later in this whitepaper.

**b. Strategic buckets:** Many best performing 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.<sup>10</sup> Strategic buckets is based on the notion that *strategy becomes real when you start spending money*, and thus translating strategy from theory to reality is about making decisions on where the resources should be spent—strategic buckets. In the example in Exhibit 8, management begins with the business’s strategy and then makes strategic choices about resource allocation: how many resources go to each bucket—“new products” versus “improvements and modifications” versus “cost reductions” versus “salesforce requests”? (For illustration in Exhibit 8, these allocated are rounded to \$2M, \$3M, \$2M and \$3M respectively). Note that each of these project types compete for the same resources; further most companies have far too many of the smaller “low hanging fruit” projects and not nearly enough of bolder and genuine new product projects.<sup>11</sup>



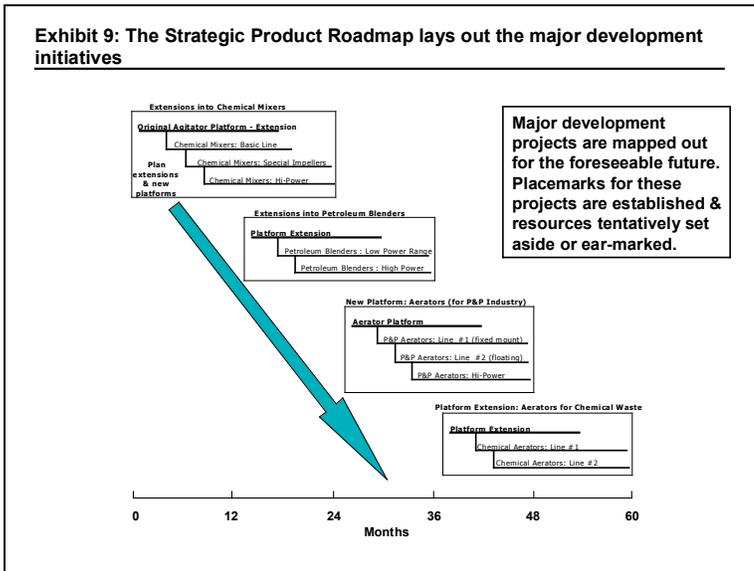
With resources allocation now firmly established and driven by strategy, projects within each bucket are then ranked against each other, until one is out of resources in each bucket. This establishes project priorities. Note that projects in one bucket—such as “new products”—do not compete against those in another bucket, such as “improvements and modifications” or “salesforce 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 “new products” or to “platform developments,” the portfolio becomes much more balanced.

In spite of its intuitive appeal, the use of strategic buckets is a decidedly weak area overall with only

26.9% of businesses developing strategic buckets, as shown in Exhibit 2. But strategic buckets is clearly a best practice, with almost three times as many best performers (41.4%) employing this strategic buckets approach (when compared to worst performers).

**c. The strategic product roadmap:** 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.<sup>12</sup> Although gaining in popularity, especially in high-technology businesses, the use of roadmaps is a weak area generally, with only 27.6% of businesses developing product roadmaps (also shown in Exhibit 2). About twice as many best performers (37.9%) use product roadmaps than worst performers (19.2%).

**Exhibit 9: The Strategic Product Roadmap lays out the major development initiatives**



In use, your business's senior management maps out the planned assaults—the *major new product initiatives* and their timing—that are required in order to succeed in a certain market or sector in the form of a *strategic product roadmap*.<sup>1</sup> This roadmap may also specify the platform developments required for these new products. An illustration of a roadmap (based on the equipment manufacturer in Exhibit 5) is shown in Exhibit 9, where major development initiatives are laid out over time (often as far out as 5-8 years). Placemarks are established for these 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 mapped out in the form of a *technology roadmap*.<sup>2</sup>

**d. Tactical—project selection:** Once these strategic portfolio decisions are made, management can then deal with the next level of decision making: translating strategy into reality, namely the *tactical decisions*.<sup>13</sup> When selecting projects, an important best practice is to make sure that your new product effort has a long term thrust and focus—that your portfolio includes some longer term projects (as opposed to just short term, incremental projects). This is a fairly weak ingredient of the six elements in Exhibit 2, with only 38.1% of businesses having a longer term new product strategy. Indeed this short time horizon of businesses' new product efforts has been a widely-voiced criticism. Ironically, this one ingredient is *one of the most important* of the six strategy elements: a longer term orientation separates top performers from the worst, with 58.6% of the best (and only 23.1% of the worst) adopting a longer term approach.

Tactical portfolio decisions focus on 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? Such tactical decisions are shown at the bottom part of Exhibit 7.

To make effective tactical decisions, best performers use a combination of *gates* and *portfolio reviews*, both working in harmony as shown at the bottom of Exhibit 7. Let's look at each:

- *Gates:* Embedded within your idea-to-launch new product system should be tough Go/Kill decision-points called "gates". Gates provide an in-depth review of individual projects one at a time, and render Go/Kill, prioritization and resource allocation decisions—hence gates must be part of your portfolio management system (bottom right of Exhibit 7).

- *Portfolio reviews*: Doing the *right projects* is more than simply individual project selection at gate meetings; rather it's about the *entire mix* of projects and new product or technology investments that your business makes. Thus many businesses install a second decision process, namely the periodic *portfolio review* (bottom left of Exhibit 7). Senior management meets two-to-four times per year to review the portfolio of all projects. Here, senior management also makes Go/Kill and prioritization decisions, where *all projects* and are considered on the table together, and all or some are *up for auction*. Key issues and questions are:

- ✓ Are all projects strategically aligned (fit your business's strategy)?
- ✓ Do you have the right priorities among projects?
- ✓ Are there some project on the active list that you should kill?
- ✓ Is there the right balance of projects? The right mix?
- ✓ Are there enough resources to do all these projects?
- ✓ Do you have sufficiency—if you do these projects, will you achieve your stated business goals?

**e. Project selection tools:** Myriad tools exist to select and prioritize development projects, and often the choice of method depends on the type of project (Note when using strategic buckets, as in Exhibit 8, multiple portfolios are the result, one for each project type; and each portfolio or list can *thus utilize its own prioritization or Go/Kill method*). Project selection tools include:

*Financial:* The use of NPV, EVA or payback period are traditional and popular methods to make Go/Kill decisions at gates, and even to rank projects from best to worst. Note however that for genuine new products, where there are greater unknowns, financial

tools prove to be the least effective, according to a major study of portfolio methods and their efficacies.<sup>14</sup> This is due not so much to the fact that the tool is unsound, but rather that the quality of data and projections—expected sales, costs, and time to market—is so poor early in the life of a project at the very time the key Go/Kill decisions must be made.

*Productivity index:* A valuable twist on the traditional NPV and a modification designed to maximize the productivity of your portfolio is the use of the *productivity index*.<sup>15</sup> Here take what you are trying to maximize—for example, the NPV—and divide by the constraining resource, for example the person-days to complete the project, as defined in Exhibit 10. In practice, the portfolio manager simply calculates the productivity index for each project—for example

**Exhibit 10: The Productivity Index – an index used to rank development projects**

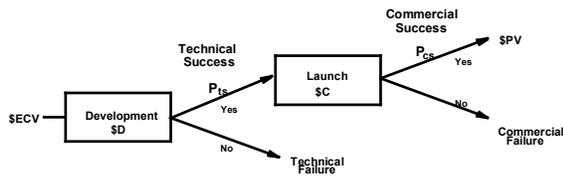
- **Take what you are trying to maximize**
  - Example: NPV
- **Divide by what the constraining resource is**
  - Example: People (expressed as person-days)
  - Or Development funds (\$000)
- **And rank your projects by this index until out of resources**
- **Example:**

$$\text{Productivity Index} = \frac{\text{Output}}{\text{Input}} = \frac{\text{NPV}}{\text{Person-Days}}$$

NPV= forecasted NPV of the project  
 Person-Days = resources required to complete the project

### Exhibit 11: Determination of Expected Commercial Value of a Project

A model of a two-stage investment decision process: First, invest \$D in development, which may yield a technical success with probability  $P_{ts}$ . Then invest \$C in commercialization, which may result in a commercial success with probability  $P_{cs}$ . If successful, the project yields an income stream whose present value is \$PV. More sophisticated versions of this model would entail more stages than the two shown here, and an array of possible outcomes from each stage.



$$ECV = [(PV * P_{cs} - C) * P_{ts}] - D$$

\$ECV = Expected Commercial Value of the project

$P_{ts}$  = Probability of Technical Success

$P_{cs}$  = Probability of Commercial Success (given technical success)

\$D = Development Costs remaining in the project

\$C = Commercialization (Launch) Costs

\$PV = Net Present Value of project's future earnings (discounted to today)

NPV/person-days to complete the project—and ranks your projects using this index and until out of resources. This method yields a higher overall value of your portfolio—NPV is maximized for a given resource expenditure—and at the same time, ensures that you don't have too many projects in your development pipeline for the limited resources available.

*Real options:* Real options (sometimes called options pricing theory or expected commercial value) is a variant of the financial models, and is designed to handle risk and uncertainty. Of course, every new product project has some risk: there is never a 100% chance of either technical success or commercial success. Thus, the pundits argue that any method that fails to accommodate the inherent risk in a financial analysis is naïve. One approach to real options is to use

decision-tree analysis—breaking the project into a series of steps or stages, each step with several outcomes, success or failure, as in Exhibit 11. The consequences of each outcome or tree-branch are determined, and probabilities of each outcome occurring are estimated. The method is more correct than the straight NPV approach above, but is a little more complex to use.<sup>16</sup>

*Scorecards:* The scorecard method works, according to an IRI portfolio management study, although it is not the most popular method.<sup>17</sup> The notion here is that *qualitative factors*, such as leveraging core competencies and competitive advantage, are much more important predictors of success than are financial numbers which are often in error. Many studies have probed new product success factors over the years, and there now exists a solid body of knowledge about which factors are the best predictors of new product success and profitability.

In use, scorecards are created that incorporate 6-10 of these key predictive factors. Here is a typical and proven list of scorecard criteria found to be effective in evaluating a new product project:<sup>18</sup>

1. Strategic fit and importance of the project to the business
2. Competitive and product advantage (is the proposed new product differentiated? with a compelling value proposition?)
3. Market attractiveness (market size, growth, margins and competitive intensity)
4. Leveraging core competencies (your ability to leverage the business's strengths in this project)
5. Technical feasibility (size of technical gap; technical complexity; company track record and experience technically in similar projects)

6. Risk and reward (size of reward versus the risk: potential financial payoffs, magnitude of downside risks, and certainty of assumptions).

From this criteria list, an operational scorecard is created. This scorecard is then used at gate meetings by gatekeepers (senior management) to objectively evaluate and rate the project in question. The method has the added advantages of engaging senior management in the decision process in a structured and constructive way, adding some discipline to a potentially chaotic gate meeting, and ensuring that projects are objectively evaluated by an outside-the-team group of experienced people. Scorecards are an excellent method for making early Go/Kill decisions on projects where financial information is limited and often unreliable, for example at the first few gates in the case of genuine new product projects and platform developments.

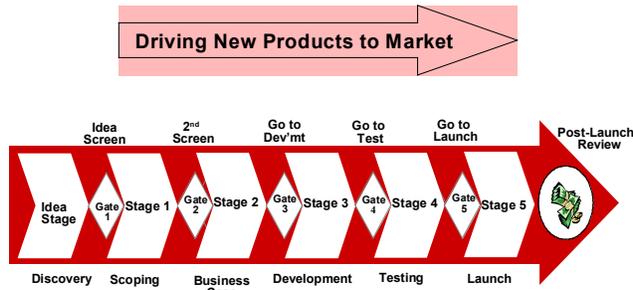
**f. Resource allocation:** Resource allocation is handled in part by the various project selection methods outlined above. For example, by ranking projects at a portfolio review until out of resources using the productivity index, if one is disciplined, the list of projects is just about right for the available resources. But the question of just who works on what projects remains a thorny one. Smaller and less sophisticated businesses handle the issue informally, often letting the project leader propose a list of candidates (people) to work on his or her project. A step up is to use readily available and inexpensive software packages. For example, *MS-Project*<sup>®</sup> is used as a planning tool by most project teams to map out the next steps of their project. But *MS-Project*<sup>®</sup> can also be used to roll up the resource requirements from individual projects into resource requirements for the entire portfolio. Leading businesses increasingly rely on more advanced software also from Microsoft, such as the Microsoft Office Enterprise Project Management solution (MS-EPM).<sup>19</sup> This software provides valuable tools to support the execution of the product development process, such as project scheduling, task-and-resource assignments, and time-and-task-completion tracking.

### 3. An Effective, Flexible and Streamlined Idea-to-Launch System

An idea-to-launch system for product innovation is one solution to what ails so many businesses' new product efforts.<sup>20</sup> Such a system is also one of the *four points of performance* in the *Innovation Diamond* in Exhibit 1. Facing increased pressure to reduce the cycle time, yet improve their new product success rates, companies implement *Stage-Gate*<sup>®</sup> systems to manage, direct, and control their product-innovation initiatives—see an example of *Stage-Gate*<sup>®</sup> in Exhibit 12. That is, these businesses have developed a systematic process—a playbook, game plan or framework—for moving a new product project through the various stages and steps from idea to launch. But most important, they have built into their framework the many *critical success factors* and *industry best practices* highlighted below in order to heighten the effectiveness of their idea-to-launch system.

**Exhibit 12: An Overview of a typical Stage-Gate® idea-to-launch system**

**Stage-Gate®: A 5-stage, 5-gate framework for significant new product projects**



Stage-Gate® is a trademark of Product Development Institute Inc.

Almost every best performing business has implemented a stage-and-gate system to drive their new product projects through to commercialization, according to the APQC benchmarking study; and a solid idea-to-launch process is the most prevalent best practice observed among the sample of businesses.<sup>21</sup> The PDMA's best practices study concurs: "nearly 60% of the firms surveyed use some form of *Stage-Gate*® process. Over half of the firms which have adopted *Stage-Gate*® processes have moved from a basic process to more sophisticated versions with formal process ownership and facilitation (18.5% of the total) or third generation processes with more flexible gates and stage structures".<sup>22</sup>

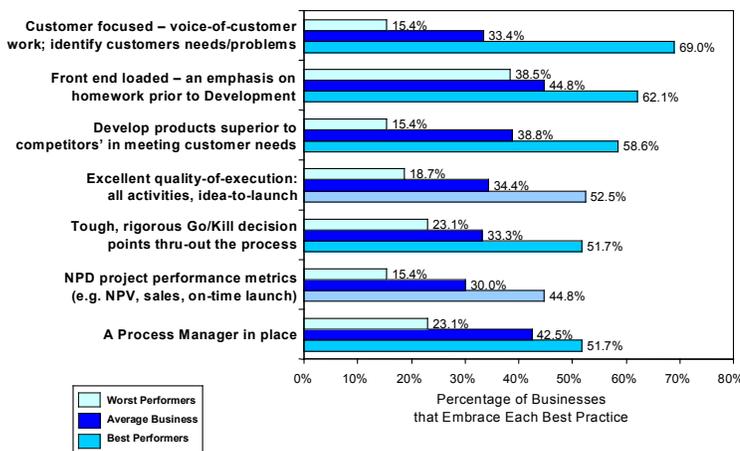
While many companies claim to have an idea-to-launch process, the best performers *seem to get it right more often*, and build in more best practices

(see Exhibit 13 for sample best practices). Best performing businesses build in a strong customer focus and rely heavily on voice-of-customer research in the early days of projects. They front-end load their projects, undertaking appropriate, often extensive up-front homework prior to Development (by contrast, poor performers too often rush a poorly defined, poorly investigated project into Development, and suffer the consequences later!).

And best performers focus on developing differentiated, superior products that meet customer needs better than competitors'. By contrast, poor performers tend much more to develop undifferentiated, vanilla products with little competitive advantage.

In addition, best performers strive for high quality of execution of all activities from idea through to launch; they build very tough Go/Kill decision points into their process (where mediocre projects really do get killed); and their process includes new product project metrics built in, metrics such as NPV, sales and on-time launch, so that performance results from individual projects can be gauged. Finally, there is a process manager in place to champion the process and its proper use and implementation.

**Exhibit 13: Key elements of an effective idea-to-launch system**



Some of these activities and best practices in Exhibit 13 may seem evident and common sense. The problem is that they're not as common as one might think! Indeed, a quick look at Exhibit 13 reveals that only about one-third of companies on average employ each best practice. So take a hard look at your own idea-to-launch

system, and critically assess whether these seven best practices in Exhibit 13 are really built in.

**Accelerating the idea-to-launch process—NexGen Stage-Gate®:** A number of businesses have moved to next generation or *NexGen Stage-Gate®* processes and have incorporated techniques to render their product development efforts lean, rapid and profitable. Increased productivity in NPD is the goal! Some worthwhile enhancements and changes include:

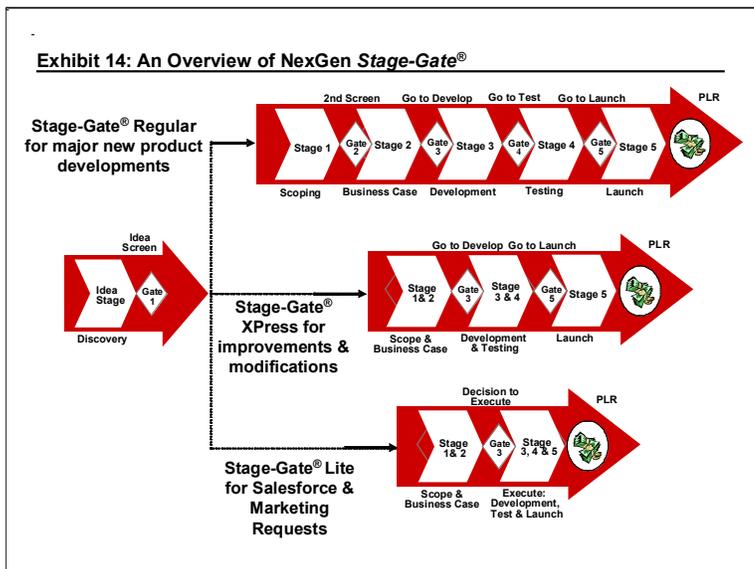
*Viewed as a philosophy:* *Stage-Gate®* is more than a method or process... more than a set of flow charts, templates and check-lists. The best companies now see their new product process as a philosophy or culture that fosters new and desired behavior. Success in product innovation requires many behavioral changes, such as discipline; deliberate, fact-based and transparent decision-making; responsible, accountable, effective and true cross-functional teams; continuous improvement and learning from mistakes; and risk taking and risk awareness. The structure and content of the *Stage-Gate®* process is increasingly viewed as a *vehicle for change*—for changing the way people think, act, decide and work together.

*An automated process:* Progressive companies recognize that automation greatly enhances the effectiveness of their new product process. For one thing, the process is much easier to use by everyone from project leaders to executives, thereby enhancing buy in (cumbersome, hard-to-use processes have been a hindrance to adoption in some companies in the past). A second benefit of automation is information management. Everyone from project team member to senior executive has access to

the best view of relevant information—the information that they need to move their project forward, to cooperate with other team members globally on vital tasks, or to help make the Go/Kill decision. Speaking of decisions, these automated systems are very much decision-support systems, with users reporting that new product decision-making is enhanced.

As a result, *Stage-Gate®* automation software tools, such as *Accolade®* by Sopheon, are increasingly being adopted by leading businesses.<sup>23</sup> For example, *Accolade* integrates strategy, portfolio management, *Stage-Gate®* and idea management—a business decision support system for making new product investment decisions more effectively and efficiently.

*A scalable process:* There is no longer just one version of *Stage-Gate®*. Rather the process has “morphed” into multiple versions. Exhibit 14 shows some examples: *Stage-Gate® XPress* for projects of moderate risk, such as improvements, modifications and extensions; *Stage-Gate® Lite* for very small projects, such as simple



customer requests; and there is even *Stage-Gate*<sup>®</sup> *TD* for technology development projects, where the deliverable is new knowledge, new science or a technological capability.<sup>24</sup>

*Flexible and adaptable:* The notion of a rigid, lock-stepped process is dead! Rather, today's fast-paced *NexGen Stage-Gate*<sup>®</sup> system is adaptable and flexible. It allows the project team considerable latitude in deciding what actions are really needed and what deliverables are appropriate for each gate; and the system adapts to fluid and dynamic information.

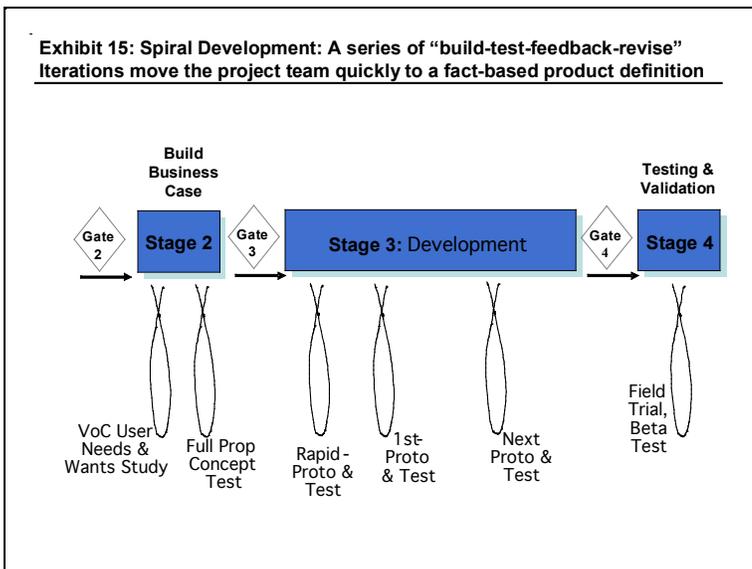
The concept of *spiral development*—building in a series of “build test feedback and revise” loops or spirals from the early days of the project all the way through to field trials—is one way that fast-paced project teams cope with changing, fluid information, and at the same time, get their product definition right. Exhibit 15 show a sample series of loops or iterations, beginning early in Stage 2 with voice-of-customer research followed quickly by a full proposition concept test using, for example, a virtual prototype and a simulated selling presentation. Similar fast-paced iterations or spirals continue through the development stage and right up to pre-Launch.

Further, in a flexible *Stage-Gate*<sup>®</sup> system, activities and stages can overlap, with the principle of *simultaneous execution* employed—not waiting for the total completion of a previous step and 100% perfect information before moving ahead. For example, one does not wait for formal gate approval to move into some facets of the final stage (the Launch stage in Exhibit 12). Rather, long lead-time launch activities—such as salesforce training, preparation of marketing collaterals, and ordering raw materials—are moved forward into the previous stage (Testing in Exhibit 12) in order to accelerate the project, *even though the project may yet be cancelled*.

Here the project team weighs the cost of delay versus the costs incurred by moving activities forward in the event the project is cancelled (along with the likelihood of cancellation occurring).

*Lean:* Management has borrowed the concepts from lean manufacturing and applied them to the new product process in order to remove waste in the process. Here, by analyzing a map of the idea-to-launch Value Stream, all non-value-added items are removed. Every activity, procedure, template, deliverable and committee in the

current process is scrutinized: is it really needed; and how can it be done faster and better? Continuous learning and improvement is a key facet of the lean method, with post-mortems undertaken at the Post Launch Review to provide insights on how to



do projects better and faster (the PLR in Exhibits 12 and 14). The result is a much more efficient and effective idea-to-launch method.

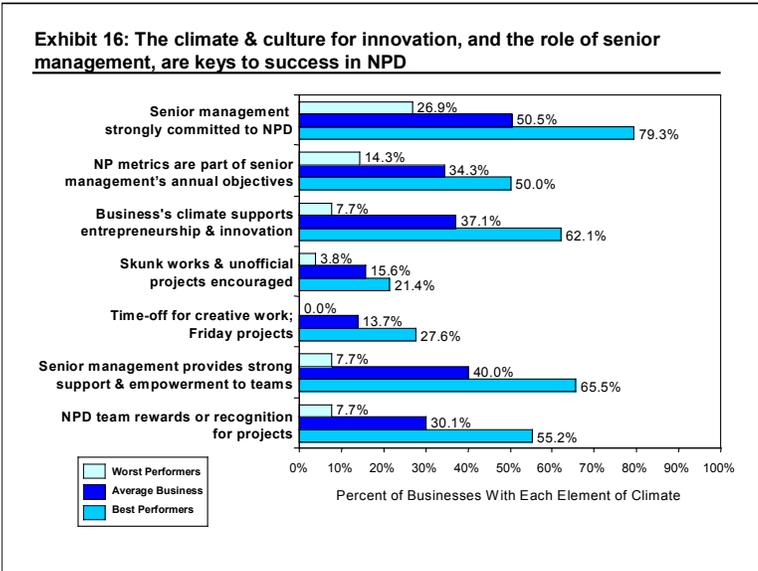
*Partnering and alliances:* Since so much of product innovation involves partners, alliances and out-sourced vendors, increasingly leading firms build in an *alliance sub-process* into their traditional new product process. Embedded within in stages of the *NexGen Stage-Gate®* process are key external activities, such as identifying the need for partners, seeking potential partners, and vetting candidate partners. Similarly, in addition to the usual gate deliverables, such as results of market and technical assessments or a financial analysis, are items such as “letters of intent” and “memoranda of understanding” from potential partners. And gate criteria also build in partnering issues, for example evaluating a project with and without a partner in place.

#### 4. A Positive Climate and Environment for Innovation

People, culture and leadership is the *fourth point of performance* in the Innovation Diamond in Exhibit 1, and although difficult to measure and even harder to change, proves to be the strongest driver of businesses’ product innovation performance results. Senior managers in best performing businesses lead the innovation effort and they are strongly committed to new product development, as shown in Exhibit 16. An example is at Procter & Gamble, where the CEO, A.G.. Lafley (Chairman of the Board, President and Chief Executive), makes 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.”<sup>25</sup>

A significant minority of businesses are now making product innovation results part of senior management’s performance metrics, and in some cases tying variable pay and bonuses to the business’s innovation performance. 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 performing companies almost four-times as often as in poor performers.

Senior management plays a lead role in championing the innovation effort in best performing businesses, creating a positive climate and culture for innovation and entrepreneurship as shown in Exhibit 16, much more so than in poor performing businesses. For



example, they foster creativity and innovation by allowing time off for scouting or “Friday projects” as in Kraft Foods and W.L. Gore & Associates; they are not overly risk averse and invest in the occasional high risk project; and they encourage skunk works—projects and teams working outside the official bureaucracy of the business. Senior management also nurtures a team culture within best performing organizations, fosters effective cross-functional NPD teams, and provides strong support and empowerment to these teams. Finally NPD team rewards and recognition are provided in best performing businesses.

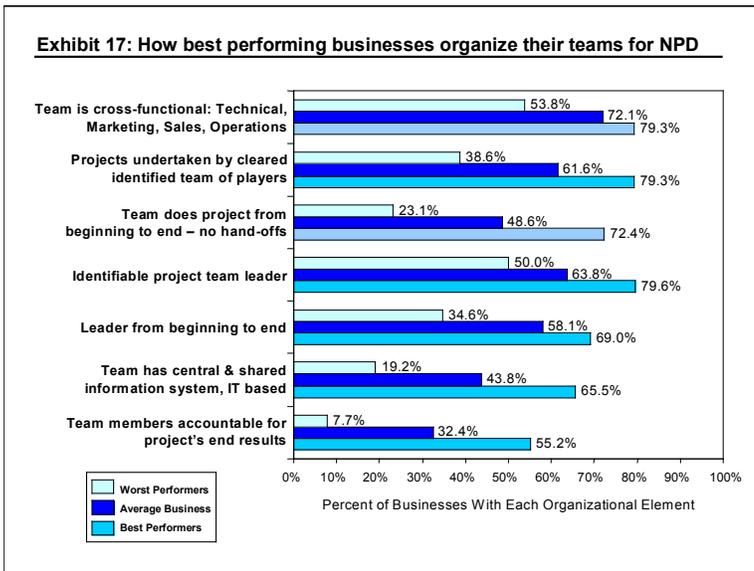
Many so-called cross-functional teams aren’t very effective at all, according to the APQC study, being closer to “dysfunctional teams” or simply a disparate group of representatives from functional departments. But a *truly holistic approach* to product innovation, one of the keys to reducing time to market, demands effective cross functional teams. Best performing businesses rely heavily on effective cross-functional teams to undertake their significant new product projects, with members seconded from key functions. Note that each team member is very much a part of the project team and has an equal stake in it.

Best practices regarding new product project teams are outlined in Exhibit 17. On exiting each gate, best performing businesses define clearly who is on the team and who is not, (in some businesses, it’s not clear just who is accountable for the end result!). They keep the team on the field from end to end—hand-offs to another team or department are not allowed in best performers’ team cultures. As well, a project leader is clearly defined for each significant project, remains on the project from beginning to end, is given some authority over team members, and acts as

a entrepreneur-leader rather than an administrator. Team performance is improved by the use of a shared information system based on software such as *Accolade*® (mentioned earlier), with almost four times as many best performing businesses having such information systems in place as poor performers, as seen in Exhibit 17.

Finally, in return for their empowerment and authority, project teams are held accountable for project results, for example, at the Post Launch Review (PLR). At these PLRs, the results achieved on *success criteria* are compared to the results promised at the key gates on these same success criteria. Exhibit 12 shows that a PLR is part of the *Stage-Gate*® process, but it is missing in most businesses: 78% of businesses don’t even conduct a proper Post Launch Review! Note also from Exhibit 17

that less than one-third of businesses hold project teams accountable for the project’s results, but that this is a clear best practice with best performers endorsing this approach by an eight-to-one ratio versus poor performers. Be sure to employ success



criteria at each gate, base the Go/Kill decision on these criteria, and then hold the team accountable to achieve the result, with the final PLR being the final accountability review.

## 5. Winning at Product Innovation

There is no magic to winning at product innovation. Indeed, the APQC study and others have identified countless success drivers (as shown in Exhibits 2, 6, 13, 16 and 17) and summarized in the Innovation Diamond. The real challenge is making them work in your business.

The four themes—innovation strategy, a solid idea-to-launch process, portfolio management, and climate, effective teams and leadership—make up the *four points of performance* of the *Innovation Diamond* and provide a sound framework for guiding your business's product innovation efforts. Use the diamond to help structure your efforts as you move forward to improve your business's product development productivity, and then drill down and consider implementing some of the best practices outlined in this whitepaper—each practice has been shown to work, and to lead to better results. The diamond works, so *work the diamond!*

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Dr. Cooper is a world expert in the field of new product management, and the father and developer of the *Stage-Gate® process*, now widely used by leading firms around the world to drive new products to market. Bob is a thought-leader in the field of product innovation management: he has published 100 articles in leading journals on new product management, with many award winners; and he has also written six books on new product management, including the popular, *Winning at New Products: Accelerating the Process from Idea to Launch*, with over 160,000 copies sold; and his just released *Product Leadership: Pathways to Profitable Innovation*.

### About the Microsoft Enterprise Project Management Solution:

Microsoft's Enterprise Project Management Solution is used by many of the world's best performing product development organizations to support their innovation. For more information on the Microsoft EPM Solution and companies who use it in the product development process, and on partners that work with us in new product development, please visit [www.microsoft.com/proddev](http://www.microsoft.com/proddev)

## Endnotes & References:

### (Footnotes)

1 The term “product roadmap” has come to have many meanings in business. Here I 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, tweak, etc.

2 The term “technology roadmap” also has several different meanings. Here I use the term to denote your business’s technological developments or technology acquisitions; by contrast, the term “technology roadmap” is sometimes used to describe what new technologies are anticipated in an industry—more of an industry technological forecast.

### (Endnotes)

<sup>1</sup> *Fast, Focused, Fertile: The Innovation Evolution*, Cheskin and Fitch: Worldwide, 2003.

<sup>2</sup> Source of data: Arthur D. Little. *How Companies Use Innovation to Improve Profitability and Growth*. Innovation Excellence study, 2005.

<sup>3</sup> APQC benchmarking study; see: R.G. Cooper, S.J. Edgett & E.J. Kleinschmidt, *New Product Development Best Practices Study: What Distinguishes the Top Performers*, Houston: APQC (American Productivity & Quality Center), 2002; and: R. G. Cooper, S.J. Edgett & E.J. Kleinschmidt, *Best Practices in Product Innovation: What Distinguishes Top Performers*, Product Development Institute, 2003 ([www.prod-dev.com](http://www.prod-dev.com)).

<sup>4</sup> This whitepaper is based on a new book by the author: R.G. Cooper, *Product Leadership: Pathways to Profitable Innovation*, 2<sup>nd</sup> edition. Reading, MA: Perseus Books, 2005. Also available at: [www.stage-gate.com](http://www.stage-gate.com)

<sup>5</sup> APQC study, see endnote 3.

<sup>6</sup> A good summary of research conclusions from many studies into what makes for successful product innovation is found in: R.G. Cooper, *Winning at New Products: Accelerating the Process from Idea to Launch*, 3<sup>rd</sup> edition. Reading, MA: Perseus Books, 2001, pp 22-112. See also: R.G. Cooper, “New products: What separates the winners from the losers,” chapter 1 in: *The PDMA Handbook of New Product Development, 2nd Edition*. New York, NY John Wiley & Sons, 2004.

<sup>7</sup> Procter & Gamble calls their diamond the “Initiatives Diamond”; it was modeled on our results from an earlier best practices study. See: M. Mills, “Implementing a Stage-Gate™ process at Procter & Gamble”, Association for Manufacturing Excellence International Conference, “Competing on the global stage”, Cincinnati, Ohio, October 2004.

<sup>8</sup> For an outline of portfolio management methods, including strategic buckets, see: R.G. Cooper, S.J. Edgett & E.J. Kleinschmidt, *Portfolio Management for New Products, 2<sup>nd</sup> edition*. Reading, MA: Perseus Books, 2002; also: R.G. Cooper, S.J. Edgett & E.J. Kleinschmidt, “Optimizing the Stage-Gate® process: What best practice companies are doing—part II”, *Research-Technology Management*, 45, 6, Nov-Dec 2002.

<sup>9</sup> Parts of this section are taken from an article by the author: R.G. Cooper, “Maximizing the value of your new product portfolio: Methods, metrics and scorecards”, *Current Issues in Technology Management*. Hoboken, N.J.: Stevens Institute of Technology, Stevens Alliance for Technology Management, 7, 1, Winter 2003, 1.

<sup>10</sup> Section taken from: R.G. Cooper, “Your NPD portfolio may be harmful to your business’s health”, *PDMA Visions*, XXIX, 2, April 2005, 22-26; see also endnote 8: *Portfolio Management for New Products*.

<sup>11</sup> See: R.G. Cooper, “Your NPD portfolio may be harmful to your business’s health”, *PDMA Visions*, XXIX, 2, April 2005, 22-26.

<sup>12</sup> See: R.E. Albright & T.A. Kappel, “Roadmapping in the corporation”, *Research-Technology Management*, 46, 2, March-April, 2003, pp. 31-40; also: A. McMillan, “Roadmapping—Agent of change”, *Research-Technology Management*, 46, 2, March-April, 2003, 40-47; and: M. H. Myer & A. P. Lehnerd. *The Power of Product Platforms*. New York: Free Press, 1997.

<sup>13</sup> Parts of this section are taken from an article by the author; see endnote 9.

<sup>14</sup> IRI study of portfolio methods used versus results achieved. See: R.G. Cooper, S. J. Edgett & E.J. Kleinschmidt, “Portfolio management for new product development: Results of an industry practices study”, *R&D Management*, 31, 4, October 2001, 361-380. See also endnote 8: *Portfolio Management for New Products*, pp 163-164.

<sup>15</sup> The Productivity Index is illustrated in more detail in endnote 8: *Portfolio Management for New Products*, p 40.

<sup>16</sup> The real options or expected commercial value method is explained in more detail in endnote 8: *Portfolio Management for New Products*, p 42.

<sup>17</sup> IRI study; see endnote 14.

<sup>18</sup> Source of scorecard criteria is endnote 8: *Portfolio Management for New Products*, p 54.

<sup>19</sup> Tradename of Microsoft Corporation. Microsoft offers different levels of resource management software, including MS-Project, MS-Project Professional and Enterprise Project Management. See [www.microsoft.com](http://www.microsoft.com)

<sup>20</sup> *Stage-Gate®* is a registered tradename of the Product Development Institute Inc. This section describing *Stage-Gate®* is based on material from many sources; see for example: R.G. Cooper, “Doing it right—winning with new products,” *Ivey Business Journal*, July-August 2000, 54-60; R.G. Cooper, *Winning at New Products: Accelerating the Process from Idea to Launch*, 3<sup>rd</sup> edition. Reading, MA: Perseus Books, 2001; R.G. Cooper, “Stage-Gate new product development processes: a game plan from idea to launch”, in: *The Portable MBA in Project Management*, ed. by E. Verzuh, Hoboken, N.J.: John Wiley & Sons, 2003, pp. 309-346. The term “Stage-Gate” was first used in print in early publications, such as: R.G. Cooper, “The new product process: a decision guide for managers”, *Journal of Marketing Management* 3, 3, Spring 1988, 238-255; and: R.G. Cooper, “Stage-gate systems: a new tool for managing new products”, *Business Horizons* 33, 3, May-June, 1990.

<sup>21</sup> APQC benchmarking study; see endnote 3.

<sup>22</sup> Quotation taken from PDMA best practices study; see: A. Griffin, *Drivers of NPD Success: The 1997 PDMA Report*: Chicago, Product Development & Management Association, 1997.

<sup>23</sup> *Accolade®* is a registered tradename of Sopheon Inc. *Accolade®* is a *Stage-Gate®* automation software package; see [www.sopheon.com](http://www.sopheon.com)

<sup>24</sup> See endnote 4: *Product Leadership: Pathways to Profitable Innovation*, p 233.

<sup>25</sup> Source of quotation: M. Mills in endnote 7.