

We've Come a Long Way Baby¹

Robert G. Cooper

Progress One Step at a Time!

What are the most important factors that underlie new-product success? And why are some new-product projects and products so successful? Do you know? Many people still don't or choose to ignore them—witness the high failure rates of new products, and the large number of businesses with very poor innovation performance. It is estimated that about 40% of new products fail at launch, even after all the development and testing work; further, out of every 7 to 10 new-product concepts, only one makes it to market as a commercial success; and only 13% of firms report that their total new product efforts hit their annual profit objectives! But there are wide variances around these and other performance statistics, with a handful of firms—the best performers—doing dramatically better than the rest! Which begs the question . . . why?

When research into product innovation began in earnest circa 1970, nobody knew much of anything about how to succeed in product innovation. For example, my “literature search” chapter in my PhD thesis in 1973 was pitifully thin—not much had been published on the topics of new product success, failure, innovation performance, or best practices in innovation! Thus the theme of much of the research over the years that followed, research by others and by me, was to probe the “drivers of success.” Some research looked at why new products win or fail; other studies lowered the microscope on businesses and their innovation performance, and sought reasons for their results, both positive or negative; and some focused on particular strategies and methodologies and their impact on performance. Early research often focused on individual projects, typically describing methods associated with notable successes. While case studies continue to be valuable, *JPIM* encouraged broader surveys that examined overall patterns of development activities.

Address correspondence to: Robert G. Cooper, Oakville, Ontario, Canada. www.bobcooper.ca. E-mail: robertcooper@cogeco.ca. Tel: 905 845 7273.

¹The title song of a country-and-western album by Loretta Lynn, 1978.

An understanding of these *drivers of success* was considered vital to improving new-product performance in industry: Such knowledge is fundamental to designing systems, approaches, and practices for conceiving, developing, and launching new products; for managing innovation more effectively; and for making the right R&D investment decisions. Our research,² reported in this virtual issue of *JPIM*, has been much like a coach and the football team watching video replays of football games: Patterns emerge and insights are gained into what works, what doesn't, what to avoid in future games, and what new plays or actions should be built into the new playbook.

The themes covered in these 17 articles in this virtual issue cover many different facets of new-product performance and practices. The first article, “How New Product Strategies Impact on Performance,” was the lead article in the inaugural issue of *JPIM* more than 30 years ago. As the current article title suggests, we sure have come a long way in our understanding of how to excel at product innovation. Some of these earlier articles and the research upon which they were based seem almost primitive and naïve. And by today's standards, they are! But we would not be where we are today were it not for this and others' early research. (“We” refers to a growing new products management community rather than to just those whose research focuses on achieving success.)

Here's a quick summary of the themes you'll find in this issues' articles—they're a “good read”:

Success Factors at the Project Level

A number of articles in this issue probe why some new products succeed, and others fail. This research typically looks at a large sample of winning new-product projects and contrasts these to a large sample of failures from the same firms. By using statistical analysis, such as regression, correlational, and factor analysis, the main *drivers of success* are thus identi-

²The term “our” refers to colleagues and co-workers as well as to me. In particular, Professor Elko Kleinschmidt, who undertook many studies with me, and is a frequent co-author, should be acknowledged.

fied. This type of research—analyzing matched pairs—is more valid than simply looking at a number of winners and drawing conclusions, as so many “populist” studies do. Definitions of “success” and “failure” were also debated and probed, and include meeting sales and profit objectives, the new-product’s profitability, impact on the business, and time-to-market. The principal factors identified as drivers of success—now taken for granted, but not so obvious when this research began—are outlined in the *PDMA Handbook* (Cooper, 2013), and include:

- A unique superior product—a differentiated product that delivers unique benefits and a compelling value proposition to the customer or user.
- Building in the voice-of-the-customer (VoC)—a market-driven and customer-focused new-product process.
- Doing the homework and front-end loading the project—due diligence done before technical development work gets underway pays off!
- Getting sharp and early product and project definition—and avoiding “scope creep” and unstable specs.
- Spiral development—a series of build, test, feedback, and revise iterations—putting something in front of the customer early, often, and cheaply to get the product right.
- The world product—a global product or “glocal” product (global concept or platform, locally tailored) targeted at international markets (versus a domestic product later modified for international markets).
- A well-conceived, properly executed launch based on a solid marketing plan, adequately resourced.
- Speeding to market—there are many good ways to accelerate development projects, but not at the expense of quality of execution.

Success Factors at the Business Level

Why are some businesses so much more successful at product innovation than others? The research continues

BIOGRAPHICAL SKETCH

Robert (“Bob”) Cooper is the creator of the Stage-Gate system; a Fellow of the PDMA; ISBM Distinguished Research Fellow at the Smeal College of Business Administration, Pennsylvania State University; and Professor Emeritus at McMaster University, Canada. He lives in Oakville, Ontario, Canada and Sarasota, Florida, USA.

with the theme “drivers of success,” but *this time focused on the business unit* and not so much on the project as the unit of analysis: In short, what distinguishes the most successful businesses when it comes to innovation performance? Consider now the critical drivers of success that make the difference between winning and losing businesses:

- Having a product-innovation and technology strategy to focus the business on the best strategic arenas, and to provide direction for ideation, roadmapping, and resource allocation.
- Focus—doing fewer development projects, better projects, and the right mix of projects (via a systematic portfolio management method).
- Leveraging core competencies (step-out development projects, which take the business into new areas—new markets or new technologies—tend to fail; collaborative development and open innovation can mitigate some of these risks).
- Targeting attractive markets—growing, large markets, with big problems and high levels of need for new solutions.
- The resources in place—from all relevant functions.
- The right organizational structure and design for innovation (effective cross-functional teams, dedicated teams, solid team leadership).
- The right climate and culture that supports and fosters innovation in the business.
- Top management support for innovation.
- A multistage, disciplined stage-and-gate idea-to-launch system (as opposed to an ad hoc approach or no system at all).

Details of these drivers are in some of the articles in this issue, and also in the *PDMA Handbook* (Cooper, 2013).

Models and Best-Practice Approaches Derived from the Research

From this and others’ research evolved prescriptions to industry, and thus some of the articles in this virtual issue describe practitioner models or tools. The *Stage-Gate®* process, now widely used by industry globally as the way to drive new products to market, was created by me in part based on research. By



Figure 1. A “Systems Approach” to Winning—The Innovation Diamond, Showing Four Dimensions Driving Successful Innovation.

observing what winners did differently than losers, we were able not only to identify best practices, but also to integrate these practices into a “model” to guide project teams as they executed their new-product projects. This stage-and-gate model prescribes a set of recommended or mandatory activities and approaches for each stage, such as building in ample VoC; getting sharp, fact-based product definition; and assembling a cross-functional dedicated project team. The model also proposes a set of criteria to be used at gates to make Go/Kill investment decisions. Over the years, *Stage-Gate* itself benefitted from further research, with new generations of the model evolving (see the 2016, 2011, 2008, and 1994 articles in this issue). For example, the final article in this virtual issue, “The Agile-Stage-Gate Hybrid Model: A Promising Approach and a New Research Opportunity” in 2016, is an outline of how the latest thinking from leading-edge firms has reshaped this venerable gating model.

Other tools were also the result of the research. The *NewProd* model is a screening tool based on a statistical analysis of success/failure antecedents at the project level; today many companies use it or its variants in the form of a scorecard to rate and rank potential development projects. Two articles in this issue are about *NewProd*. Screening and project selection models are but one facet of a much broader topic, namely *portfolio management*—picking the right projects and

making the right R&D investment decisions—which came of age during the lifetime of *JPIM*. Some of our early research revealed the state of portfolio management, the portfolio tools that industry uses, and which ones appear to work best, as noted in an article in this virtual issue.

A Multi-Dimensional Systems Approach

As one stands back and looks at this and others’ research, one thing is clear: Success in product innovation cannot be explained by one or a few factors; nor is winning the result of doing a few things well. Life in the world of new-product development is not quite so simple! Indeed following any process, alone, cannot guarantee success.

Multiple factors impact on new-product project and company success, and many elements must be in place to achieve a positive outcome. Future research and prescriptions thus should take a more *holistic and “systems approach”* both to study innovation performance and its antecedents and then to prescribe best practices for business.

Over the years, my colleagues and I have attempted to integrate the many success factors into a “grand model” that captures these many elements, success drivers, and best-practice approaches—our *Innovation Diamond* in Figure 1 (Cooper, 2011). This

model shows a *multi-dimensional product innovation system*—a useful way to conceptualize new-product research, position the research, integrate research findings from different studies, and most important, to explain the results and prescriptions to the business practitioner. For example, each of the research studies or articles in this virtual issue can be conveniently pigeon-holed into one of the four dimensions of the *Diamond*. And some firms, such as Procter & Gamble, actually implemented their version of the diamond model to guide new-product efforts in their businesses (Cooper and Mills, 2005).

Here are the *Innovation Diamond's* four main dimensions; each dimension in turn is comprised of many elements: research results and insights; success drivers; and prescriptive tools, methodologies, and approaches. At the same time, each dimension has many voids, knowledge gaps, and challenges, and thus presents many research opportunities.

Dimension 1: A Product-Innovation Strategy to Focus R&D and NPD on the Right Strategic Arenas

One key to success is focus—the opposite of a scatter-gun approach. Sadly, research shows that many businesses lack an innovation strategy, have no focus, or direct their new-product efforts to the wrong areas—flat markets, mature technologies, and tired product categories. Thus a *product-innovation and technology strategy* is a key element in the “grand model” as shown in Figure 1. Such a strategy includes:

- The *goals and objectives* for the business’s total new-product efforts.
- The areas of strategic focus or *strategic arenas*—often displayed on a Strat-Map. The identification and selection of these arenas is the result of using a number of methodologies, such as analyzing disruptive technologies, VoC work, core competency assessment, peripheral visioning, and market analysis.
- The *attack plans*, or how one will win in each of the chosen arenas: for example, one’s strategic thrust (innovator, fast follower, defender, niche player); the basis of competition (differentiator, low cost provider, etc., or perhaps competing by leveraging a specific core competency); and globality (domestic, global, or “glocal” strategy).

Dimension 2: Resource Management

Making the Right Investment Decisions and Focusing Resources Via Effective Portfolio Management: There are two ways to win at new products. One is by doing projects right; the second is by *doing the right projects*. Thus any “systems approach” to innovation must include the topic of resource management and portfolio management, which becomes a key facet of the *Innovation Diamond*. Research shows that often senior management *lacks the right tools, methods, and information* to make the key Go/Kill decisions on development projects, especially in the case of riskier decisions on breakthrough projects. A variety of screening and selection models are available, including traditional financial tools (popular, but may not be the best), the productivity index, scoring models and success criteria, and probability and risk models.

A second investment issue is *portfolio balance and mix*: Firms seem naturally to gravitate toward conservative, low-risk portfolios, and often end up with the *wrong mix and balance of projects*—too many small, incremental development projects and not enough bolder ones. Methods to address balance issues and to ensure a reasonable number of more important initiatives include strategic portfolio approaches, such as Strategy Buckets and Roadmapping (the latter lays out the major projects envisioned over a three-to-five year period, and makes tentative resource allocations—placemarks—for each).

Dimension 3: Creating Big Ideas and Then Executing Developments with an Adaptive, Agile, and Accelerated Idea-to-Launch Process

Big ideas lead to big concepts and big solutions—the growth engines of the future. Research has identified many proven ways to create big, bold innovation ideas, some more effective or popular than others. And newer methods have found their way into our ideation repertoire in the days since our research began: Open Innovation, Design Thinking, and Ethnography, to name a few.

Generating great ideas is half the battle. The other half is *getting from the idea stage through to development and into the marketplace*—through the corporate equivalent of the “valley of death” (the gap between conception versus moving that concept through to a commercialized product). That’s where an effective yet *rapid idea-to-launch process or engine*—a stage-

and-gate process—is needed. The goal is “entrepreneurship but with discipline and due diligence,” which is quite different than “shooting from the hip.” A second issue is that most businesses’ current stage-and-gate processes are designed for “known projects” with few uncertainties and little ambiguity—modifications and product improvements—but are not well-suited to big, innovative projects nor to technology platform developments. Idea-to-launch engines designed to handle bolder, more ambiguous innovations thus must be more *adaptive and flexible* than in the past. Another issue is speed, more specifically the need for the idea-to-launch engine to be *agile and accelerated*. Many of the gating systems that companies use today have their roots in the 1980s and 1990s, and are *too cumbersome, too linear, and too rigid* to deal with the realities of today’s fast-paced world. A handful of leading firms, however, have re-invented their innovation processes by building in Agile³ methods from the IT world, thereby creating an *Agile-Stage-Gate* hybrid model, which makes the process more *iterative and adaptive* (Cooper, 2014, 2016).

Dimension 4: An Innovative Climate, Culture, Organization, and with Leadership from the Top

The right climate and culture that fosters innovation is vital to success. That is, 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 appears to be *the number one factor that distinguishes top innovation companies*, according to our extensive studies of business’s 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. One challenge here is that an organization’s culture and climate are difficult to measure, and even more difficult to change!

Similarly, having the right senior leadership—women and men who drive and support the innovation effort with words as well as through actions, and foster an innovative climate—is vital to success. Not every senior executive can be a Steve Jobs, Elon Musk, Richard Branson, or Thomas Edison; but there are

³Agile: A set of methods and principles for developing software products, as outlined in the 2001 Agile Manifesto.

actions that any senior executive can take to make him or her a *leader of innovation* in their business.

Sadly, research shows that most businesses lack the needed climate, culture, and leadership for innovation. This is surely an area that needs more research attention.

Moving Forward

Philosopher and statesman Edmund Burke once said, “Those who don’t know history are destined to repeat it.” Today, we appear to know much more than we did about new-product best practices and success drivers than we did when *JPIM* began publishing. But have we *really learned anything?* Performance data in new-product development in industry do not reveal dramatic improvements in performance over this 33-year period. Could it be that we have not heeded the lessons of history and the findings of our research?

There are obviously many challenges that face product developers—both in industry and in academia—in the years ahead. The world is faster, less predictable, more ambiguous, more global, and more competitive than it was when I wrote that first article in *JPIM* in 1984. And there are many new and sometimes not-so-new solutions proposed from a plethora of sources. The *Innovation Diamond*, a systems-oriented view of the field, identifies the dimensions and their elements that are relevant to our quest for success. Each of the four dimensions in Figure 1 has embedded within it a number of research findings, insights, approaches, methodologies, and “proposed solutions”; but there remain many more issues, problems, and challenges than there are proven solutions. Big challenges always present big opportunities, however, and so the future for research in our field is even richer than in the past: Find big problems, look for big solutions!

References

- Cooper, R. G. 2011. *Winning at new products: Creating value through innovation* (4th ed.). New York: Basic Books, Figure 1.2.
- Cooper, R. G. 2013. New products—What separates the winners from the losers and what drives success. In *PDMA handbook of new product development* (3rd ed.), ed. K. B. Kahn, 25–33. Hoboken, NJ: Wiley.
- Cooper, R. G. 2014. What’s next? After Stage-Gate. *Research-Technology Management* 157 (1): 20–31.
- Cooper, R. G. 2016. Agile-Stage-Gate hybrids: The next stage for product development. *Research-Technology Management* 159 (1): 21–29.
- Cooper, R. G., and M. Mills. 2005. Succeeding at new products the P&G way: A key element is using the “Innovation Diamond.” *PDMA Visions* XXIX (4): 9–13.