

How Companies are Reinventing their Idea-to-Launch Methodologies

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HOW COMPANIES ARE REINVENTING THEIR IDEA-TO-LAUNCH METHODOLOGIES

Next-generation Stage-Gate systems are proving more flexible, adaptive and scalable.

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OVERVIEW: *The Stage-Gate® system introduced in the mid-1980s has helped many firms drive new products to market. But leaders have adjusted and modified the original model considerably and built in many new best practices. They have made the system more flexible, adaptive and scalable; they have built in better governance; integrated it with portfolio management; incorporated accountability and continuous improvement; automated the system; bolted on a proactive front-end or discovery stage; and finally, adapted the system to include “open innovation.” All of these improvements have rendered the system faster, more focused, more agile and leaner, and far better suited to today’s rapid pace of product innovation.*

KEY CONCEPTS: *Stage-Gate, next-generation Stage-Gate, idea-to-launch process, best practices.*

The Stage-Gate® process has been widely adopted as a guide to drive new products to market (1,2). The original Stage-Gate model, introduced in the mid-1980s, was based on research that focused on what successful project teams and businesses did when they developed winning new products. Using the analogy of North American

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football, Stage-Gate is the playbook that the team uses to drive the ball down the field to a touchdown; the stages are the plays, and the gates are the huddles. The typical Stage-Gate system is shown in Figure 1 for major product development projects.

With so many companies using the system, invariably some firms began to develop derivatives and improved approaches; indeed, many leading firms have built in dozens of new best practices, so that today’s stage-and-gate processes are a far cry from the original model of 20 years ago. Here are some of the ways that companies have modified and improved their idea-to-launch methods as they have evolved to the next-generation Stage-Gate system (3).

Focus on Effective Governance

Making the gates work

Perhaps the greatest challenge that users of a stage-and-gate process face is making the gates work. “As go the gates, so goes the process,” declared one executive, noting that the gates in her company’s process were ineffectual. In a robust gating system, poor projects are spotted early and killed; projects in trouble are also detected and sent back for rework or redirect—put back on course. But as quality control check points, the gates aren’t effective in too many companies; gates are rated one of the weakest areas in product development with only 33 percent of firms having tough, rigorous gates throughout the idea-to-launch process (4).

Gates with teeth

A recurring problem is that gates are either non-existent or lack teeth. The result is that, once underway, projects are rarely killed at gates. Rather, as one senior manager exclaimed, “Projects are like express trains, speeding down the track, slowing down at the occasional station [gate], but never stopping until they reach their ultimate destination, the marketplace.”

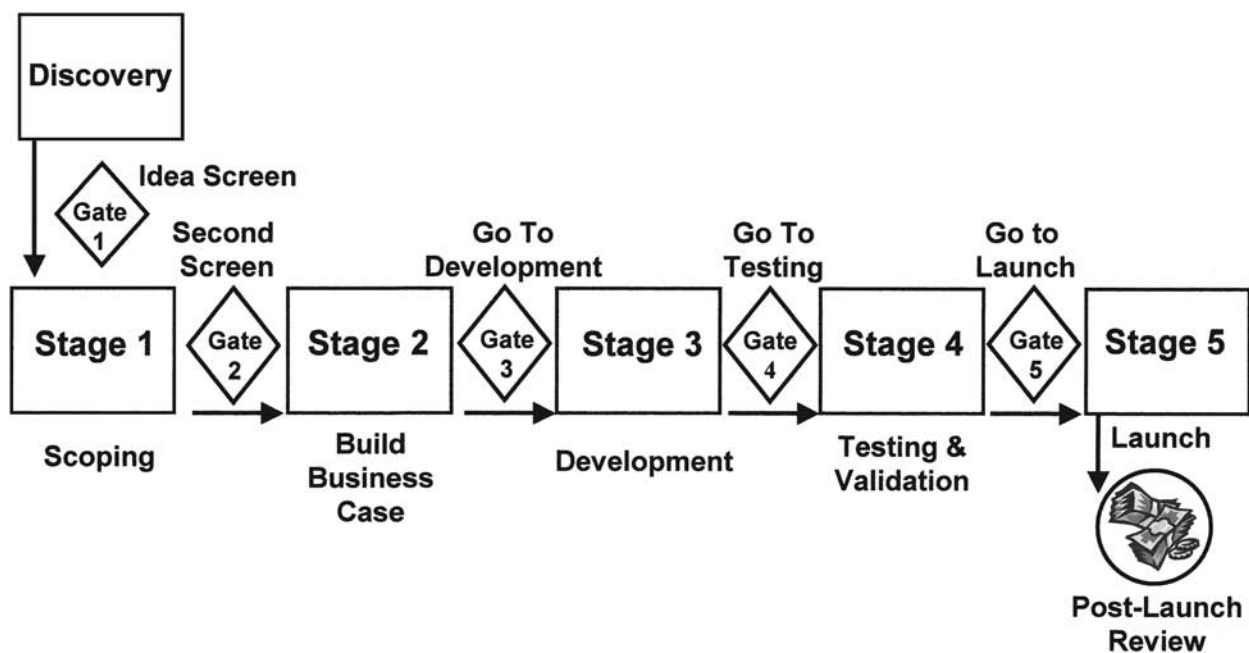


Figure 1.—Many firms use a Stage-Gate® system to drive development projects to commercialization. Shown here is a five-stage, five-gate process typically used for major new product projects. Such a model provides a guide to project teams, suggesting best-practice activities within stages, and defining essential information or deliverables for each gate. Gatekeepers meet at gates to make the vital Go/Kill and resource commitment decisions.

Example: In one major high-tech communications equipment manufacturer, once a project passes Gate 1 (the idea screen), it is placed into the business’s product roadmap. This means that the estimated sales and profits from the new project are now integrated into the business unit’s financial forecast and plans. Once into the financial plan of the business, of course, the project is locked-in: there is no way that the project can be removed from the roadmap or killed. In effect, all gates after Gate 1 are merely rubber stamps.

Management in this firm missed the point that the idea-to-launch process is a *funnel*, not a *tunnel*, and that gates after Gate 1 are also Go/Kill points; this should *not* be a one-gate, five-stage process! In too many firms, like this example, after the initial Go decision, the gates amount to little more than a project update meeting or a milestone check-point. As one executive declared: “We never kill projects, we just wound them!” Thus, instead of the well-defined funnel that is so often used to shape the new product process, one ends up with a tunnel where everything that enters comes out the other end, good projects and bad. Yet management is deluded into believing they have a functioning Stage-Gate process.

In still other companies, the gate review meeting is held and a Go decision is made, but resources are not committed. Somehow management fails to understand that

approval decisions are rather meaningless *unless a check is cut* and the project leader and team leave the gate meeting with the resources they need to advance their project. Instead, projects are approved, but resources are not—a *hollow Go decision*, and one that usually leads to too many projects in the pipeline and projects taking forever to get to market.

If “gates without teeth” and “hollow gates” describe your company’s gates, then it’s time for a rethink. Gates are not merely project review meetings or milestone checks! Rather, they are Go/Kill and resource allocation meetings: Gates are where senior management meets to decide whether the company should continue to invest in the project based on latest information, or to cut one’s losses and bail out of a bad project. And gates are a *resource commitment meeting* where, in the event of a Go decision, the project leader and team receive a commitment of resources to move their project forward.

Example (5): Cooper Standard Automotive (no relation to the author) converted its gates into “decision factories.” Previously management had failed to make many Kill decisions, with most gates merely automatic Go’s. The result was a gridlocked pipeline with over 50 major projects, an almost-infinite time-to-market, and no or few launches. By toughening the gate meetings—making them rigorous senior management reviews with solid data available—and forcing more kills, management

dramatically reduced the number of projects passing each gate. The result was a reduction today to eight major, high-value projects, time-to-market down to 1.6 years, and five major launches annually.

Leaner and simpler gates

Most companies' new product processes suffer from far too much paperwork delivered to the gatekeepers at each gate. *Deliverables overkill* is often the result of a project team that, because they are not certain what information is required, prepare an overly comprehensive report, and in so doing, attempt to *bullet-proof* themselves. The fault can also be the design of the company's idea-to-launch system itself, which often includes elaborate templates that must be filled out for every gate.

While some of the information that gating systems demand may be interesting, often much of it is not essential to the gate decision. Detailed explanations of how the market research was done or sketches of what the new molecule looks like, add no value to the decision. Restrict the deliverables and their templates to the essential information needed to make the gate decisions:

Example (6): "Lean gates" is a positive feature of Johnson & Johnson Ethicon Division's Stage-Gate process. Previously, the gate deliverables package was a 30-to-90-page presentation, and a lot of work for any project team to prepare. Today, it's down to the bare essentials: one page with three back-up slides. The expectation is that gatekeepers arrive at the gate meeting knowing the project, having read and understood the deliverables package prepared by the project team (the gate meeting is not an educational session to bring a poorly prepared gatekeeping group up to speed). Senior management is simply informed at the gate review about the risks and the commitments required. Finally, there is a standardized presentation format. The result is that weeks of preparation work have been saved.

Example (7): One of the compelling features of Procter & Gamble's latest release of SIMPL (its Stage-Gate process) is much leaner gates—a "simpler SIMPL." Previously, project teams had decided which deliverables they would prepare for gatekeepers. Desirous of showcasing their projects and themselves, the resulting deliverables package was often very impressive but far too voluminous. As one astute observer remarked, it was "the corporate equivalent of publish or perish." The deliverables package included up to a dozen detailed attachments, plus the main report.

In the new model, the approach is to view the gates *from the decision-makers' perspective*. In short, what do the gatekeepers need to know in order to make the Go/Kill decision? The gatekeepers' requests boiled down to three key items:

The greatest challenge stage-and-gate users face is making the gates work.

- Have you done what you should have—are the data presented based on solid work?
- What are the risks in moving forward?
- What are you asking for?

Now the main gate report is no more than two pages, and there are four required attachments, most kept to a limit of one page.

The emphasis in lean gates is on making expectations clear to project teams and leaders—that they are not required to prepare an "information dump" for the gatekeepers. The principles are that:

- Information has a value only to the extent it improves a decision; and
- The deliverables package should provide the decision-makers only that information they need to make an effective and timely decision.

Page restrictions, templates with text and field limits, and solid guides are the answer favored by progressive firms.

Who are the gatekeepers?

Many companies also have trouble defining who the gatekeepers are. Every senior manager feels he or she should be a gatekeeper, and so the result is too many gatekeepers—more of a herd than a tightly-defined decision group—and a lack of crisp Go/Kill decisions. Defining governance roles and responsibilities is an important facet of Stage-Gate. At gates, the rule is simple: The gatekeepers are the senior people in the business who *own the resources* required by the project leader and team to move forward.

For major new product projects, the gatekeepers should be a cross-functional senior group—the heads of Technical, Marketing, Sales, Operations and Finance (as opposed to just one function, such as Marketing or R&D, making the call). Because resources are required from

The new approach is to view gates from the decision-makers' perspective.

many departments, the gatekeeper group must involve executives from these resource-providing areas so that alignment is achieved and the necessary resources are in place. Besides, a multi-faceted view of the project leads to better decisions than a single-functional view. And because senior people's time is limited, consider beginning with mid-management at Gate 1, and for major projects, ending up with the leadership team of the business at Gates 3, 4 and 5 in Figure 1. For smaller, lower-risk projects, a lower-level gatekeeping group and fewer gates usually suffices.

Fostering the right behavior

A recurring complaint concerns the behavior of senior management when in the role of gatekeepers. Some of the bad gatekeeping behaviors consistently seen include:

- Executive "pet projects" receiving special treatment and by-passing the gates (perhaps because no one had the courage to stand up to the wishes of a senior person—a case of the "emperor wearing no clothes").
- Gate meetings cancelled at the last minute because the gatekeepers are unavailable (yet they complain the loudest when projects miss milestones).
- Gate meetings held, but decisions not made and resources not committed.
- Key gatekeepers missing the meeting and not delegating their authority to anyone.
- Gate meeting decisions by "executive edict"—the assumption that one person knows all.
- Using personal Go/Kill criteria (rather than robust and transparent decision-making criteria).

Gatekeepers are members of a *decision-making team*. And decision teams need "rules of engagement." Senior people often implement Stage-Gate in the naïve belief that it will shake up the troops and lead to much different

behavior in the ranks. But quite the opposite is true: *the greatest change in behavior takes place at the top!* The leadership team of the business must take a close look at their own behaviors—often far from ideal—and then craft a set of *gatekeeper rules of engagement* and commit to live by these. Table 1 lists a typical set.

Portfolio Management Built In

Portfolio management should dovetail with your Stage-Gate system (8). Both decision processes are designed to make Go/Kill and resource allocation decisions, and hence ideally should be integrated into a unified system. There are subtle differences between portfolio management and Stage-Gate, however:

- Gates are an evaluation of *individual projects* in depth and one-at-a-time. Gatekeepers meet to make Go/Kill and resource allocation decisions on an on-going basis (in real time) and from beginning to end of a project (Gate 1 to Gate 5 in Figure 1).
- By contrast, portfolio reviews are more holistic, looking at the *entire set of projects*, but obviously less in-depth per project than gates do. Portfolio reviews two to four times per year are the norm (9). They deal with such issues as achieving the right mix and balance

Table 1.—Rules of the Game: Sample Set from a Major Flooring-Products Manufacturer.

- All projects must pass through the gates. There is no special treatment or bypassing of gates for pet projects.
- Once a gate meeting date is agreed (calendars checked), gatekeepers must make every effort to be there. If the team cannot provide deliverables in time for the scheduled gate, the gate may be postponed and rescheduled, but timely advance notice must be given.
- If a gatekeeper cannot attend, s/he can send a designate who is empowered to vote and act on behalf of that gatekeeper (including committing resources). Gatekeepers can attend electronically (phone or video conference call).
- Pre-gate decision meetings should be avoided by gatekeepers—don't prejudge the project. There will be new data presented and a Q&A at the gate meeting.
- Gatekeepers should base their decisions on the information presented and use the scoring criteria. Decisions must be based on facts, not emotion and gut feel!
- A decision must be made the day of the gate meeting (Go/Kill/Hold/Recycle). The project team must be informed of the decision—face to face, and reasons why.
- When resource commitments are made by gatekeepers (people, time or money), every effort must be made to ensure that these commitments are kept.
- Gatekeepers must accept and agree to abide by these *Rules of the Game*.

of projects in the portfolio, project prioritization, and whether the portfolio is aligned with the business's strategy.

Besides relying on traditional financial criteria, here are methods that companies use to improve portfolio management within Stage-Gate (10);

1. Strategic buckets to achieve the right balance and mix of projects

The business's product innovation and technology strategy drives the decision process and helps to decide resource allocation and strategic buckets. Using the strategic buckets method, senior management makes *a priori* strategic choices about how they wish to spend their R&D resources. The method is based

on the premise that *strategy becomes real when you start spending money*. So make those spending decisions!

Most often, resource splits are made across project types (new products, improvements, cost reductions, technology developments, etc.), by market or business area, by technology (base, pacing, embryonic) or by geography. Once these splits are decided each year, projects and resources are tracked. Pie charts reveal the actual split in resource (year to date) versus the target split based on the strategic choices made. These pie charts are reviewed at portfolio reviews to ensure that resource allocation does indeed mirror the strategic priorities of the business. The method has proven to be an effective way to ensure that the right balance and mix of projects is achieved in the development pipeline—that the pipeline is not overloaded with small, short-term and low-risk projects.

2. Scorecards to make better Go/Kill and prioritization decisions

Scorecards are based on the premise that qualitative criteria or factors are often better predictors of success than financial projections. The one thing we are sure of in product development is that *the numbers are always wrong*, especially for more innovative and step-out projects. In use, management develops a list of about 6–8 key criteria, known predictors of success (Table 2). Projects are then scored on these criteria right at the gate meeting by senior management. The total score becomes a key input into the Go/Kill gate decision and, along with other factors, is used to rank or prioritize projects at portfolio review meetings. A number of firms (for example, divisions at J&J, P&G, Emerson Electric and ITT Industries) use scorecards for early-stage screening (for Gates 1, 2 and 3 in Figure 1). Note that different scorecards and criteria are used for different types of projects.

3. Success criteria at gates

Another project selection method for use at gates, and one employed with considerable success at firms such as P&G, is the use of *success criteria*: “Specific success criteria for each gate relevant to that stage are defined for each project. Examples include: expected profitability, launch date, expected sales, and even interim metrics, such as test results expected in a subsequent stage. These criteria, and targets to be achieved on them, are agreed to by the project team and management at each gate. These success criteria are then used to evaluate the project at successive gates”(11). For example, if the project's estimates fail on any agreed-to criteria at successive gates, the project could be killed.

Table 2.—A Typical Scorecard for Gate 3, Go to Development: An Effective Tool for Rating Projects (10).

-
- Factor 1: Strategic Fit and Importance**
- Alignment of project with our business's strategy.
 - Importance of project to the strategy.
 - Impact on the business.
- Factor 2: Product and Competitive Advantage**
- Product delivers unique customer or user benefits.
 - Product offers customer/user excellent value for money (compelling value proposition).
 - Differentiated product in eyes of customer/user.
 - Positive customer/user feedback on product concept (concept test results).
- Factor 3: Market Attractiveness**
- Market size.
 - Market growth and future potential.
 - Margins earned by players in this market.
 - Competitiveness - how tough and intense competition is (negative).
- Factor 4: Core Competencies Leverage**
- Project leverages our core competencies and strengths in:
 - technology
 - production/operations
 - marketing
 - distribution/sales force.
- Factor 5: Technical Feasibility**
- Size of technical gap (straightforward to do).
 - Technical complexity (few barriers, solution envisioned).
 - Familiarity of technology to our business.
 - Technical results to date (proof of concept).
- Factor 6: Financial Reward versus Risk**
- Size of financial opportunity.
 - Financial return (NPV, ECV, IRR).
 - Productivity Index (PI).
 - Certainty of financial estimates.
 - Level of risk and ability to address risks.

Projects are scored by the gatekeepers (senior management) at the gate meeting, using these six factors on a scorecard (0–10 scales). The scores are tallied and displayed electronically for discussion. The Project Attractiveness Score is the weighted or unweighted addition of the six factor scores (averaged across gatekeepers), and taken out of 100. A score of 60/100 is usually required for a Go decision.

4. The Productivity Index helps prioritize projects and allocate resources

This is a powerful extension of the NPV (net present value) method and is most useful at portfolio reviews to prioritize projects when resources are constrained. The Productivity Index is a financial approach based on the *theory of constraints* (12): in order to maximize the value of your portfolio subject to a constraining resource, take the factor that you are trying to maximize—e.g., the NPV—and divide it by your constraining resource, for example the person-days (or costs) required to complete the project:

$$\text{Productivity Index} = \frac{\text{Forecasted NPV}}{\text{Person-Days to Complete Project}} \quad \text{or}$$
$$\text{PI} = \frac{\text{Forecasted NPV}}{\text{Cost to Complete Project}}$$

Then rank your projects according to this index until you run out of resources. Those projects at the top of the list are Go projects, are resourced, and are accelerated to market. Those projects beyond the resource limit are placed on hold or killed. The method is designed to maximize the value of your development portfolio while staying within your resource limits.

Make the System Lean, Adaptive, Flexible and Scalable

A leaner process

Over time, most companies' product development processes have become too bulky, cumbersome and bureaucratic. Thus, smart companies have borrowed the concept of *value stream analysis* from lean manufacturing, and have applied it to their new product process in order to remove waste and inefficiency. A value stream is simply the connection of all the process steps with the goal of maximizing customer value (13). In NPD, a value stream represents the linkage of all value-added and non-value-added activities associated with the creation of a new product. The *value stream map* is used to portray the value stream or product development process, and helps to identify both value-added and non-value-added activities; hence, it is a useful tool for improving your process (14).

In employing value stream analysis, a task force creates a map of the value stream—your current idea-to-launch process for typical development projects in your business. All the stages, decision points and key activities are mapped out, with time ranges for each activity and decision indicated.

Once the value stream is mapped, the task force lowers the microscope on the process and dissects it. All procedures, activities and tasks, required deliverables, docu-

Most companies' product development processes have become too bulky and bureaucratic.

ments and templates, committees and decision processes are examined, looking for problems, time-wasters and non-value-added activities. Once these are spotted, the task force works to remove them.

Example: In one B2B company, field trials were found to be a huge time waster, taking as much as 18 months and often having to be repeated because they failed. A value stream analysis revealed this unacceptable situation, and a subsequent root cause analysis showed that there were huge delays largely because field trials could be done only when the customer undertook a scheduled plant shut-down—in this case a paper machine, costing in excess of \$100 million—and further there was little incentive for the customer to agree to a field trial, especially one that did not work. The lack of early involvement of technical people (the first phases of the project were handled largely by sales and business development people) meant that technical issues were often not understood until too late in the project and after commitments had been made to the customer. Solutions were sought and included: first field trials on a pilot paper machine (several universities rented time on these in their pulp and paper institutes); involving technical people from the beginning of the project; and offering the customer incentives such as limited exclusivity and preferential pricing.

Value stream analysis can result in *leaner gates*, a topic mentioned earlier, but it goes well beyond gates and looks for efficiency improvements in *all facets of the process* as noted in the example. The result of a solid value stream analysis invariably is a much more streamlined, less bulky idea-to-launch system.

An adaptable, agile process

Stage-Gate has also become a much more adaptable innovation process, one that adjusts to changing conditions and fluid, unstable information. The concept of *spiral or agile development* is built in, allowing project teams to move rapidly to a final product design through a series of “build–test–feedback–and–revise” iterations (15). Spiral development bridges the gap between the

need for sharp, early and fact-based product definition before development begins versus the need to be flexible and to adjust the product's design to new information and fluid market conditions as development proceeds. Spiral development allows developers to continue to incorporate valuable customer feedback into the design even after the product definition is locked-in before going into Stage 3. Spiral development also deals with the need to get mock-ups in front of customers earlier in the process (in Stage 2 rather than waiting until Stage 3).

A flexible process

Stage-Gate is a flexible guide that *suggests* best practices, recommended activities and likely deliverables. *No activity or deliverable is mandatory.* The project team has considerable discretion over which activities they execute and which they choose not to do. The project team presents its proposed "go-forward plan"—what needs to be done to make the project a success—at each gate. At these gates, the gatekeepers commit the necessary resources, and in so doing, approve the go-forward plan. But note that it is the *project team's plan*, not simply a mechanistic implementation of a standardized process.

Another facet of flexibility is *simultaneous execution*. Here, key activities and even entire stages overlap, not waiting for perfect information before moving forward. For example, it is acceptable to move activities from one stage to an earlier one and, in effect, overlap stages.

Example: At Toyota, the rule is to synchronize processes for simultaneous execution (16). Truly effective concurrent engineering requires that each subsequent function maximizes the utility of the stable information available from the previous function as it becomes available. That is, development teams must do the most they can with only that portion of the design data that is not likely to change. Each function's processes are designed to move forward simultaneously, building on stable data as they become available.

Simultaneous execution usually adds risk to a project. For example, the decision to purchase production equipment before field trials are completed, thereby avoiding a long order lead-time, may be a good application of simultaneous execution. But there is risk too—that the project may be cancelled after dedicated production equipment is purchased. Thus, the decision to overlap activities and stages is a *calculated risk*, but it must be calculated. That is, the cost of delay must be weighed against the cost and probability of being wrong.

Scaled to suit different risks

Stage-Gate has become a *scalable process*, scaled to suit very different types and risk levels of projects—from very risky and complex platform developments through

to lower-risk extensions and modifications, and even to handle simple sales force requests (17).

When first implemented, there was only one version of Stage-Gate in a company, typically a five-stage, five-gate model. But some projects were too small to put through the full five-stage model, and so circumvented it. The problem was that these smaller projects—line extensions, modifications, sales-force requests—while individually small, collectively consumed the bulk of resources. Thus, a contradictory situation existed whereby projects that represented the majority of development resources were "outside the system."

Each of these projects—big and small—has risk, consumes resources, and thus must be managed, but not all need to go through the full five-stage process. The process has thus *morphed into multiple versions* to fit business needs and to accelerate projects. Figure 2 shows some examples: Stage-Gate *XPress* for projects of moderate risk, such as improvements, modifications and extensions; and Stage-Gate *Lite* for very small projects, such as simple customer requests.

Multiple versions for platform/technology development projects

There is no longer just Stage-Gate for new product projects. Other types of projects—platform developments, process developments, or exploratory research projects—compete for the same resources, need to be managed, and thus also merit their own version of a stage-and-gate process. For example, ExxonMobil Chemical has designed a three-stage, three-gate version of its Stage-Gate process to handle upstream research projects (18); while numerous other organizations have adopted a four-stage, four-gate system to handle fundamental research, technology development or platform projects (more on this topic later).

Add a Robust Post-Launch Review

Next-generation Stage-Gate systems build-in a rigorous post-launch review in order to instill *accountability for results*, and at the same time, foster a culture of *continuous improvement*. Continuous improvement is one of the main tenets of lean manufacturing and lends itself readily to application in the field of product innovation.

Continuous improvement in NPD has three major elements (19):

- *Having performance metrics in place* that measure how well a specific new product project performed. For example, were the product's profits on target? Was it launched on time?
- *Establishing team accountability for results*, with all members of the project team fully responsible for

performance results when measured against these metrics.

- *Building-in learning and improvement*, namely, when the project team misses the target, focus on fixing the cause rather than putting a band-aid on the symptom, or worse yet, punishing the team.

Example (20): At Emerson Electric, the traditional post-launch reviews were absent in most divisions' new product efforts. But in the new release of Emerson's idea-to-launch process (NPD 2.0), a post-launch review is very evident. Here, project teams are held accountable for key financial and time metrics that were established and agreed to much earlier in the project. When gaps or deficiencies between forecasts and reality are identified, root causes for these variances are sought and continuous improvement takes place.

Emerson benefits in three ways. First, estimates of sales, profits and time-to-market are much more realistic now that project teams are held accountable for their attainment. Second, with clear objectives, the project team can focus and work diligently to achieve them—expectations are clear. Finally, if the team misses the target, causes are sought and improvements to the process are made so as to prevent a recurrence of the cause—*closed loop feedback and learning*.

It works much the same way at Procter & Gamble (21): "Winning in the marketplace is the goal. In many firms, too much emphasis is on getting through the process, that

Next-generation Stage-Gate systems build-in a rigorous post-launch review.

is, getting one's project approved or preparing deliverables for the next gate. In the past, P&G was no different. By contrast, this principle emphasizes winning in the marketplace as the goal, not merely going through the process. Specific success criteria for each project are defined and agreed to by the project team and management at the gates; these success criteria are then used to evaluate the project at the post-launch review, and the project team is held accountable for achieving results when measured against these success criteria."

The post-launch review is the final *point of accountability* for the project team. The project's results are gauged, for example: the first year's sales, the launch date achieved, and the NPV based on latest results. These numbers are then compared to the projections—to the original success criteria. Accountability issues are high on the

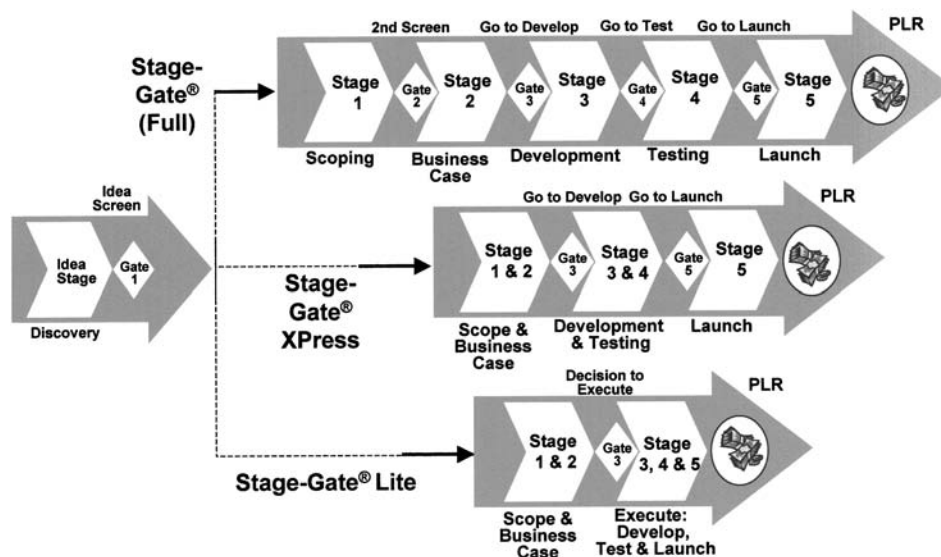


Figure 2.—The next-generation Stage-Gate® is scalable. Use Stage-Gate Full, XPress and Lite for different project types. Major new product projects go through the full five-stage process (top); moderate risk projects (extensions, modifications and improvements) use the XPress version (middle); and sales-force and marketing requests (very minor changes) use the Lite process (bottom).

agenda of this vital best-practice review: Did the team achieve what was promised when measured against the success criteria?

The continuous learning and improvement facet must be in place too; if results are measured and deficiencies are identified but no action is taken, there's no improvement and one keeps repeating the same mistakes. Thus, at the post-launch review, when a project team misses the target, a *root cause analysis* ensues to determine the cause of the deficiency and to prevent its recurrence. The focus is on continuous improvement—a learning organization—rather than on blaming the team and creating a culture of fear and retribution.

Example (22): EXFO Engineering boasts a solid Stage-Gate system coupled with a strong portfolio management process. EXFO has added an additional gate in its process—Gate 5—whose purpose is to ensure the proper closing of the project (Launch is Gate 4.1 in this company's numbering scheme). At this final gate meeting, management ascertains that all the outstanding issues (manufacturing, quality, sales ramp-up, and project) have been addressed and closed. Feedback is presented based on a survey of initial customers; the project post-mortem is reviewed, which highlights the project's good and bad points; and the recommendations for improvement from the team are examined. Typically, Gate 5 occurs about three months after initial product delivery to customers. Additionally, sales performance and profitability (ROI) of the project are monitored for the first two years of the product's life.

Build-In a Discovery Stage To Feed Innovation Funnel

Feeding the innovation funnel with a steady stream of a new product ideas and opportunities has become the quest in many companies as they search for the next blockbuster new product. Traditionally, the “idea” has been shown as a light-bulb at the beginning of the new product process, with ideas assumed to happen magically or serendipitously. No longer. Now, progressive firms such as P&G, Swarovski AG, ITT Industries, and Emerson Electric, have replaced the light-bulb with a new and proactive Stage 0 called Discovery (see Figure 1). Discovery encompasses some of the following activities:

Fundamental research and technology development

Organizations like ExxonMobil Chemical, Timex, Donaldson, and Sandia Labs recognize that technology development projects—where the deliverable is new knowledge, a new technical capability, or even a technology platform—are quite different in terms of risk, uncertainty, scope, and cost from the typical new product project found in the Stage-Gate model of Figure 1.

Moreover, these technology development projects are often the platform that spawns a number of new product (or new process) development projects and hence acts as a trigger or feed to the new product process. Thus, such organizations have modified the front end of their Stage-Gate process and in effect “bolted on” a *technology development process* that then feeds the new product process, as shown in Figure 3 (23). The “Stage-Gate TD process” is technologically driven and features quite different stages with more opportunity for experimentation and iterating back, and the system relies on less financial and more strategic Go/Kill criteria at the gates.

Other Discovery stage elements

In addition to technology development projects, progressive firms have redefined Discovery to include many other ideation activities, including:

- *Voice-of-customer* methods, such as ethnographic research (24), site visits with depth interviews, customer focus groups to identify customer “points of pain,” and lead-user analysis (25).
- *Strategically driven ideation*, including crafting a product innovation strategy for the business in order to delineate the “search fields” for ideation, exploiting disruptive technologies (26), peripheral visioning (27), competitive analysis, and patent mining.
- *Stimulating internal ideation*, such as installing elaborate systems to capture, incubate and enhance internal ideas from employees, much as Swarovski has done (28).
- *Open innovation* as a source of external ideas, outlined next.

Make Your Process an “Open System”

Stage-Gate now accommodates *open innovation*, handling the flow of ideas, IP, technology, and even fully developed products into the company from external sources, and also the flow outward (29). Kimberly-Clark, Air Products & Chemicals, P&G, and others have modified their Stage-Gate processes—built in the necessary flexibility capability and systems—in order to enable this network of partners, alliances and vendors from idea generation right through to launch. For example, P&G's SIMPL 3.0 version of its system is designed to handle externally-derived ideas, IP, technologies, and even fully developed products.

Innovation via partnering with external firms and people has been around for decades—joint ventures, venture groups, licensing arrangements and even venture nurturing. Open innovation is simply a broader concept that includes not only these traditional partnering models, but all types of collaborative or partnering activities, and with a wider range of partners than in the past.

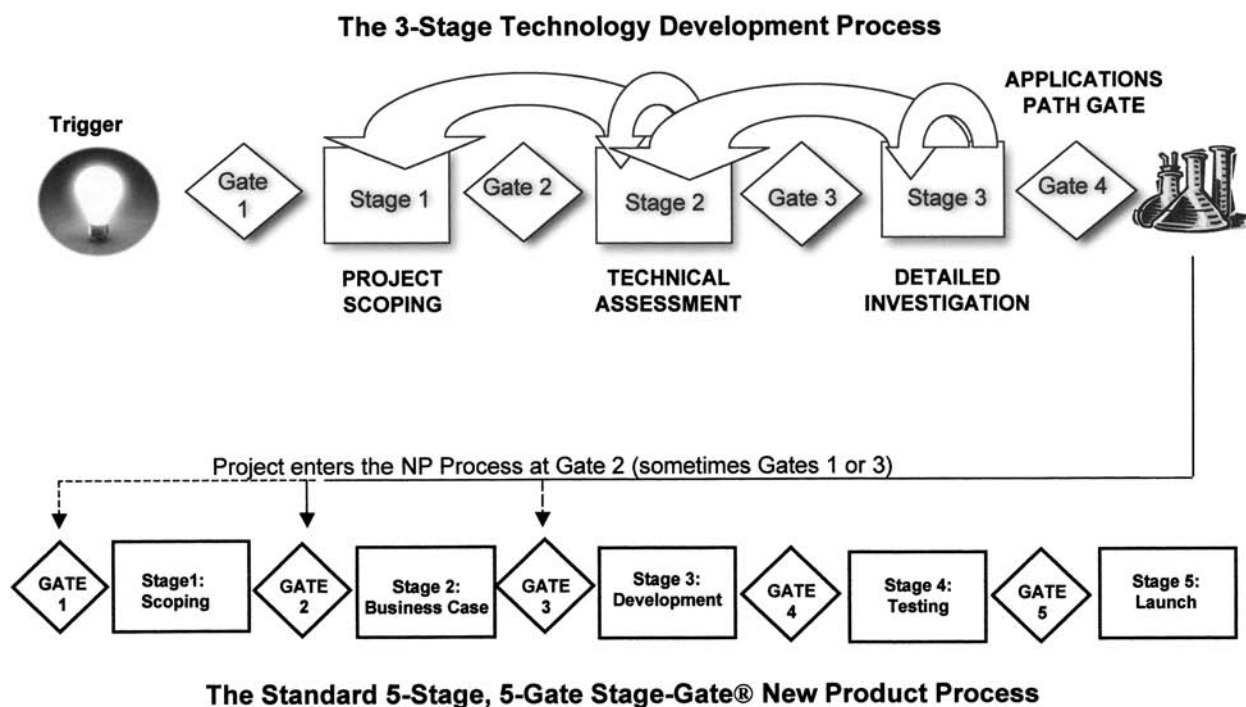


Figure 3.—The Technology Development Process handles fundamental science, technology development, and technology platform projects. It typically spawns multiple commercial projects which feed the new product process at Gates 1, 2 or 3. Note that the TD Process (top) is very flexible: it is iterative and features loops within stages and potentially to previous stages. Gates rely less on financial criteria and more on strategic criteria (23).

In the traditional or *closed innovation model*, inputs come from internal and some external sources—customer inputs, marketing ideas, marketplace information, or strategic planning inputs. Then, the R&D organization proceeds with the task of inventing, evolving and perfecting technologies for further development, immediately or at a later date (30).

By contrast, in open innovation, companies look inside-out and outside-in, across all three aspects of the innovation process, including ideation, development and commercialization. In doing so, much more value is created and realized throughout the process (see Figure 1):

- *Discovery stage:* Here, not only do companies look externally for customer problems to be solved or unmet needs to be satisfied, but to inventors, start-ups, small entrepreneurial firms, partners, and other sources of available technologies that can be used as a basis for internal or joint development.
- *Development stage:* Established companies seek help in solving technology problems from scientists outside the corporation, or they acquire external innovations that have already been productized. They also out-license internally-developed intellectual property that is not being utilized.
- *Launch or commercialization stage:* Companies sell or out-license already-developed products where more

value can be realized elsewhere; or they in-license—they acquire already commercialized products that provide immediate sources of new growth for the company.

Automate Your Stage-Gate System

Progressive companies recognize that automation greatly increases the effectiveness of their new product processes. With automation, everyone from project leaders to executives finds the process much easier to use, thereby enhancing buy-in. Another benefit is information management: the key participants have access to effective displays of relevant information—what they need to advance the project, cooperate globally with other team members on vital tasks, help make the Go/Kill decision, or stay on top of a portfolio of projects. Examples of certified automation software for Stage-Gate are found in Ref. 31.

The Path Forward

This article has outlined new approaches that firms have built into their next-generation Stage-Gate® systems. If your idea-to-launch system is more than five years old, if it's burdened with too much “make work” and bureaucracy, or if it's getting a bit creaky and cumbersome, the time is ripe for a serious overhaul. Design

your innovation process for today's innovation requirements—a faster, leaner, more agile, and more focused system. Reinvent your process to build-in the latest thinking, approaches and methods outlined above and move to the next-generation Stage-Gate system. ☺

References and Notes

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