

Perspective: The Stage-Gate® Idea-to-Launch Process - Update, What's New and NexGen Systems

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This paper appeared in modified format as the lead article in the Journal of Product Innovation Management, R.G. Cooper, "The Stage-Gate Idea-to-Launch Process—Update, What's New and NexGen Systems," *Journal of Product Innovation Management*, Volume 25, Number 3, May 2008, pp 213-232



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ABSTRACT

Stage-Gate has become a popular system for driving new products to market; but there are many misconceptions and challenges in using Stage-Gate.¹ Challenges faced in employing Stage-Gate are identified including governance issues, over-bureaucratizing the process, and misapplying cost cutting measures such as Six Sigma and Lean Manufacturing in product innovation. Solutions are offered, including better governance methods: “gates with teeth”, clearly defined gatekeepers and gatekeeper rules of engagement; and ways to deal with bureaucracy, including leaner gates.

Additionally some of the misconceptions about Stage- Gate – it is not a linear process, nor is it a rigid system – are debunked. Next generation versions of Stage- Gate are introduced including a scalable system (to handle many different types and sizes of projects) as well as even more flexible and adaptable versions of Stage-Gate achieved via spiral development and simultaneous execution. Additionally, Stage-Gate now incorporates better decision-making practices including scorecards, success criteria, self managed gates, electronic and virtual gates, and integration with portfolio management. Finally, progressive companies are reinventing Stage-Gate for use with “open innovation”, while others are applying the principles of value stream analysis to yield a leaner version of Stage-Gate.

INTRODUCTION

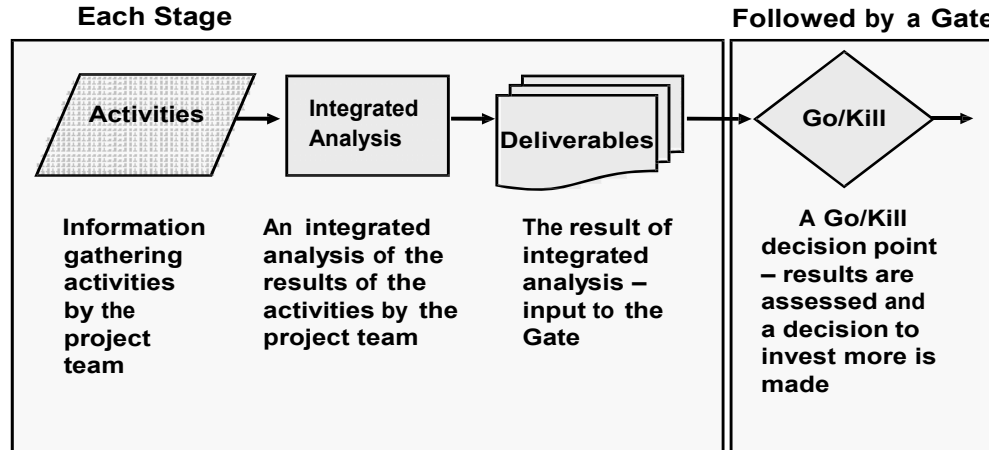
Most best-practice companies have implemented a robust idea-to-launch system, such as Stage-Gate®¹ (Griffin, 1997; Cooper, Edgett & Kleinschmidt, 2002b, 2005). The benefits of such a process have been well documented; indeed many well-managed companies, such as P&G, Emerson Electric, ITT and 3M, have prospered and profited from using Stage- Gate. But benchmarking studies reveal that just as many companies have got it wrong – they missed key facets, principles and methods in the system. So it’s time to get back to the basics, to have a look at what Stage-Gate is and what it is NOT!

That’s the major theme of this article: ensuring that users really do understand the Stage-Gate system and its principles, debunking some of the myths and misconceptions surrounding Stage-Gate and, at the same time, dealing with some of the problems and challenges that users face.

The final part of the article shows what leading firms have done as they have moved beyond the traditional Stage-Gate process and evolved to the next-generation idea-to-launch system.

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Exhibit 1: Stage-Gate Consists of a Set of Information-Gathering Stages Followed by Go/Kill Decision Gates



What is Stage-Gate?

A Stage-Gate® process is a *conceptual and operational map* for moving new product projects from idea to launch and beyond – a blueprint for managing the new product development (NPD) process to improve effectiveness and efficiency. Stage-Gate is a system or process not unlike a playbook for a North American football team: it maps out what needs to be done, play by play, huddle by huddle – as well as how to do it – in order to win the game.

Stage-Gate is based on the premise that some projects and project-teams really understand how to win – they get it! Indeed Stage-Gate was originally developed from research that modeled what these winners do (Cooper, 2004). But too many projects and teams miss the mark – they simply fail to perform. A closer inspection often reveals that these projects are plagued by missing steps and activities, poor organizational design and leadership, inadequate quality of execution, unreliable data, and missed timelines. So they need help – help in the form of a playbook based on what winning teams do. Stage-Gate is simply that playbook.

Stage-Gate, in simplest format, consists of (Exhibit 1):

- a series of stages – where the project team undertakes the work, obtains the needed information, and does the subsequent data integration and analysis
- followed by gates – where Go/Kill decisions are made to continue to invest in the project.

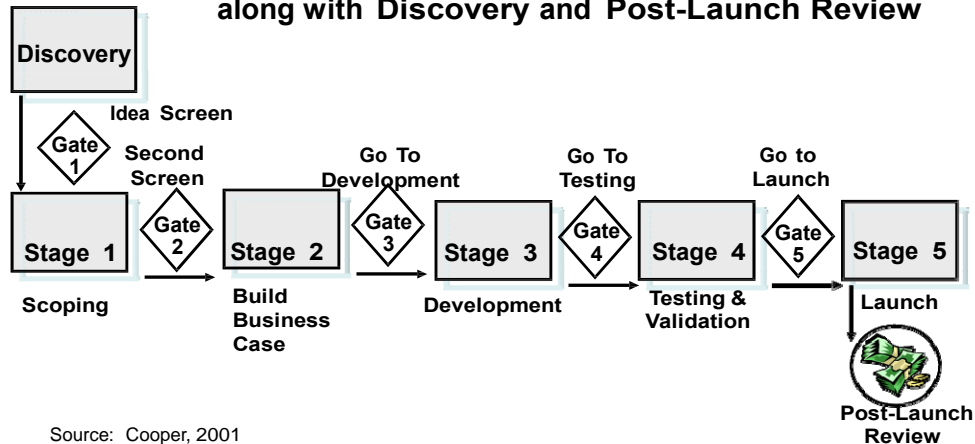
The model is very similar to that of *buying a series of options* on an investment. Initially, one purchases an option for a small amount of money, then does some due diligence, and finally decides whether or not one wishes to continue to invest. A series of these rounds of “due-diligence-and-buy-options” stage constitutes a Stage-Gate framework.

A standard Stage-Gate system designed for major product developments is shown in Exhibit 2 (Cooper 2001). The process begins with an ideation stage, called Discovery, and ends with the Post-Launch review. Note that there are three stages – Discovery plus two homework phases – before serious financial commitments are made at the Go-to-Development gate. While the model in Exhibit 2 is for larger development projects, shorter versions exist for lower risk projects.

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Exhibit 2: An Overview of a Typical Stage-Gate® System for Major New Product Developments

Stage-Gate®: A five stage, five-gate system along with Discovery and Post-Launch Review



Source: Cooper, 2001

The Stages

The innovation process can be visualized as a series of stages, with each stage comprised of a set of required or recommended best-practice activities needed to progress the project to the next gate or decision point.

Think of the stages as plays in a football game – well defined and mapped out, clear goals and purpose, and proficiently executed:

- Each stage is designed to gather information to reduce key project uncertainties and risks; the information requirements thus define the purpose of each of the stages in the process.
- Each stage costs more than the preceding one: The process is an incremental commitment one – a series of increasing bets, much like a game of Texas Hold'em. But with each stage and step-increase in project cost, the unknowns and uncertainties are driven down, so that risk is effectively managed.
- The activities within stages are undertaken in parallel and by a team of people from different functional areas within the firm; that is, tasks within a stage are done concurrently, much like a team of football players executing a play.

- Each stage is cross-functional: There is no “R&D stage” or “Marketing stage”; rather, every stage is Marketing, R&D, Production or Engineering. No department “owns” any one stage.

The Gates

Following each stage is a gate or a Go/Kill decision point, as in Exhibit 2. The gates are like the *huddles* on the football field: Gates serve as quality control check points, Go/Kill and prioritization decisions points, and points where the path forward for the next play or stage of the project is agreed to.

The structure of each gate is similar. Gates consist of:

- *Deliverables* – what the project leader and team bring to the decision point (for example, the results of a set of completed activities). These deliverables are visible, are based on a standard menu for each gate, and are decided at the output of the previous gate.
- *Criteria* against which the project is judged. These include *must meet criteria* or knock out questions (a checklist) designed to weed out misfit projects quickly; and *should meet criteria* that are scored and added (a point count system), which are used to prioritize projects.

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- *Outputs* – a decision (*Go/Kill/Hold/Recycle*), along with an approved action plan for the next stage (an agreed-to timeline and resources committed), and a list of deliverables and date for the next gate.

Debunking the Myths about Stage-Gate

The concept sounds simple, but my colleagues and I are always surprised about how some people get it so wrong. They read the book and claim to have implemented a stage-and-gate process “just like in the book”; but something gets very lost in the translation. Here are some of the frequent ways people misread, misapply and abuse an otherwise excellent system... what Stage-Gate should not be:

Not a functional, phased review process

Don’t confuse Stage-Gate of the 21st century with the traditional “phased review” process of the 1960s-80s. Surprisingly, some companies still use this ponderous phased-review system. The phased-review process, endorsed by NASA and others, broke the innovation process into stages, each stage reporting to a function or a department. Implemented with the best of intentions, the process managed to almost double the length of developments. Why? The process was designed like a relay race – activities in sequence rather than in parallel; there were hand-offs throughout the process, as one function passed the project on to the next department (and with hand-offs, there arise the inevitable dropped balls or worse yet, just throwing it over the wall!); and there was no commitment to the project from beginning to end by any one group – accountability was missing.

By contrast, today’s Stage-Gate system is built for speed. The stages are cross-functional, and not dominated by a single functional area: This is a *business process*, not an R&D or Marketing process. The play is rapid, with activities occurring in parallel rather than in series. The governance process is clear, with defined gates and criteria for efficient, timely decision making. And the project is executed by a dedicated and empowered team of players, led by an entrepreneurial team leader or team captain.

Not a rigid, lock-step process

Some companies’ idea-to-launch systems resemble rule books – a lock-step process full of rules, regulations, mandatory procedures and “thou shalt” that every project should follow regardless of the circumstances. If this describes your process, no wonder people try to avoid it or circumvent it!

Stage-Gate is a map to get from Point A (Idea) to Point B (successful new product). As in any map, when the situation merits, detours can be taken. For example, many companies tailor the model to their own circumstances and build lots of flexibility into their process:

- Not all projects pass through every stage or every gate of the model.
- In any project, activities and deliverables can be omitted or bypassed.
- Similarly, activities can be moved from one stage to another – for example, moving an activity ahead one stage in the event of long lead times.

More on these facets of flexibility later.

Not a linear system

Due to the visual graphics associated with Stage-Gate, some people see it as a linear model – the stages as linear and the activities within each stage as linear. They miss the point that while the stages are laid out in a sequential stepwise fashion, within each stage, activities and tasks are anything but linear. Indeed inside stages, there is much looping, iterations, and back-and-forth play as the project proceeds; some activities are undertaken sequentially, others in parallel, and others overlapping. Even the stages are allowed to overlap (beginning one stage before the previous one is completed), while often the project must iterate back to a previous stage. So the process is anything but linear, even though the traditional graphics depict a neat, linear and logical process.

Not a project control mechanism

I visited an internationally-renown company near Frankfurt, Germany, and was introduced to their Stage-Gate process via a PowerPoint presentation.

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The title slide said it all: “Project Control System”, and the presentation went downhill from there. Stage-Gate is not, and never was, intended to be a *control mechanism* so that executives, auditors and financial people could control, or worse yet, micro-manage projects from their lofty offices. Rather Stage-Gate is a playbook designed to enable project teams and team leaders get resources for their projects, and then speed them to market using best possible methods to ensure success.

Not a dated, stagnant system

Although Stage-Gate has endured many years, today’s version is almost unrecognizable from the original model – it has evolved a lot over time. To put things in perspective, the *marketing concept* was first published in 1960, and its principles – putting the customer first – are still valid today (Leavitt, 1960); but the way we practice marketing today is very much different that the way it was in 1960. Same with Stage-Gate – the principles still hold. But today’s modern Stage-Gate system bears little resemblance to the original model. It has evolved considerably to include new principles of lean and rapid product development; it has built in a number of new best practices that were not envisioned back in the early days; and now there are many different and tailored versions of Stage-Gate.

The point is that Stage-Gate is not a static tool; rather it’s a comprehensive, integrated, evolving and ever-green system that builds in many best practices and methods. And it’s always changing. Many pundits promote one favorite tool or a particular method as the “answer” or replacement to Stage-Gate. While some of these new tools are no doubt useful and indeed many Stage-Gate users incorporate them into their Stage-Gate process, be careful – these tools are typically not a replacement for or alternative to Stage-Gate. For example, *lean product development* offers some very good techniques, principles and methods for removing waste in the innovation process, which companies simply build into Stage-Gate. *Six Sigma* is another valuable tool, and a number of firms such as Ethicon (division of J&J) have integrated DFSS (design for Six Sigma) right into their Stage-Gate process.

Not a bureaucratic system

Sadly, some managers see *any system* as an opportunity to impose more paperwork, lots of forms, unending meetings and committees, and needless red tape. Remember: the objective here is a systematic, stream-lined process, not a bogged-down bureaucratic one. Take a hard look at your idea-to-launch process. If any procedure, meetings, committee, mandatory activity or form does not add value, then get rid of it!

Not a data entry scheme

A notable producer of automotive tires in the U.S. installed their version of a Stage-Gate process, which I was asked to review. What surprised me was that the entire system design was led by the IT department (who knew little about product development), and that software constituted the dominant part of the process. When I logged on to the new system, the first screen asked me for information such as “customer requirements for the new tire” and “intended vehicles and their volumes”.

What the system appeared to be was an order entry system, but it was not; it was their take on what a Stage-Gate process should be. There were no gates in the process; and the stages were just nominal ones, each stage asking for additional information. But no- where were best practices, such as doing some voice of customer work, undertaking a competitive analysis, or doing a technology assessment, ever mentioned. Indeed, as one astute employee pointed out: “If I were prepared to ‘fake the numbers’, I could get through the entire idea-to-launch system without even leaving my keyboard.” And this tire company is not alone. I have since seen similar IT-driven models in other well-known companies whose managements should know better.

Stage-Gate is not a data entry system. While software, with its required data entry, can be a valuable tool and facilitator to the process, don’t let the tail wag the dog here. Stage-Gate is comprised of a set of information-gathering activities; the data that these activities yield can be conveniently handled by IT to facilitate document management and communication among project team members. But the software and data entry is a tool, not the process!

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Not just a “back end” or product-delivery process

One executive in a large engineering and manufacturing firm boasted to me that “once the product is defined and the business case accepted, then our stage-and-gate process kicks in and its usually clear sailing from there. It’s all that front-end stuff – before we get into our stage-and-gate process – that causes the problems.” Shocked at his lack of understanding of Stage- Gate, I politely explained that “all that front end stuff” is very much part of Stage-Gate. Look at the flow in Exhibit 2: three of the stages (or half the model) happen before Development begins. The fuzzy front end – ideation, scoping the project, defining the product, and building the business case – is perhaps the *most critical part* of Stage-Gate! Indeed, the game is won or lost in the first few plays, and so the front end of Stage-Gate is vital, and the part of the model that I felt contributed the most to a much higher success rates.

Not the same as project management

Stage-Gate is a *macro* process – an overarching process. By contrast, *project management* is a *micro* process. Stage-Gate is not a substitute for sound project management methods. Rather, Stage-Gate and project management are used together. Specifically, project management methods are applied *within the stages* of the Stage-Gate process. For example, during the larger, more complex stages (Stages 3, 4 and 5, Development, Testing and Launch in Exhibit 2), project management methods must be applied, such as a team initiation task to define the project (its mission and goals), team building exercises, timelines or critical path plans, and milestone review points.

Dealing With Common Errors and Fail-Points

While many companies have designed and implemented an effective Stage-Gate process, some firms continue to be plagued by problems and pitfalls. At conferences, seminars and company visits, I am often asked to comment on the challenges and problems faced in their idea-to-launch systems; here is an over- view of the most commonly-mentioned ones, and some possible solutions.

Problems with the Stage-Gate governance process – making the gates work

Perhaps the greatest challenge that users of Stage-Gate 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; and projects in trouble are also detected, and sent back for rework or redirect – put back on course. But it seems that as quality control check points, the gates aren’t too effective in too many companies, and allow of lot of poor projects to proceed.

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 (Cooper, Edgett & Kleinschmidt, 2002b, 2005). Further, only 56 percent of development projects meet their sales targets (44 percent do not), which means that gates aren’t doing their job: Too many bad projects and too many projects in trouble are sliding through!

Gates with no teeth. The most common complaint is that, while the company has installed a stage-and-gate system, the gates, which are the vital component of the governance or decision-making process, are either non-existent or lack teeth. The result is that 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”. In short, the gates have no teeth: once a project is approved, it never gets killed.

An 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. Some- how 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!

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In too many firms, like this example, after the initial Go decision, the gates amount to little more than a project update meeting, a project review 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 depict 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 that they have a functioning Stage-Gate process.

Hollow decisions at gates: In still other companies, the gate review meeting is held and a Go decision is made, but resources are not committed. Somehow management has missed the point that approval decisions are rather meaningless *unless a check is cut*. The project leader and team must leave the gate meeting with the resources they need to progress 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 for- ever 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 project review meetings or milestone checks! Rather they are a Go/Kill and resource allocation meeting: 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 progress their project.

Who are the gatekeepers? Many companies also have trouble defining who the gatekeepers are. Every senior manager feels that they 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. In other firms, the gatekeepers and project leaders are the same persons, simply because the executives (gatekeepers) are reluctant to delegate authority to lower level people, and thus insist on micro-managing and being the project leaders themselves.

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 Marketing, Sales, Technical, Operations and Finance (as opposed to just one function, such as Marketing or R&D, making the call). Since resources are required from many departments, so 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.

When defining gatekeepers, keep the number small – only the key resource owners – and try to keep “gatecrashers” out of the decision meeting. Since 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 Exhibit 2.

For smaller, lower risk projects, a lower-level gate-keeping group and with fewer gates usually suffices. And although gates are in theory real time decisions, for practical reasons and given executives’ busy schedules, consider setting one day per month aside (perhaps tied in to another senior meeting) for the leadership team to meet and handle Gates 3, 4 and 5 for major projects. Finally, be sure to distinguish between gatekeepers and project leaders: The gatekeepers mentor, oversee and finance the project, much like the owners, managers and coaches of a football team; by contrast, the project leader leads the project and team stage-by-stage down the field to the goal-line, much like the captain of that football team.

Gatekeepers behaving badly. A very common complaint concerns the behavior of senior management when in the role of gatekeepers. I attend many senior gate meetings in different firms, and some of the bad gatekeeping behaviors I consistently witness include:

- Executive “pet projects” receiving special treatment, and by-passing the gates (note that executive pet projects have the highest failure rates (Cooper & Kleinschmidt, 1993), probably because no one had the courage to stand up to the wishes of a senior person, a case of the “emperor wearing no clothes”)

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Exhibit 3: Typical Gatekeeper Rules of Engagement (Example from a Major Flooring Products Manufacturer)

1. All projects must pass through the gates. There is no special treatment or bypassing of gates for pet projects.
2. 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.
3. If a gatekeeper cannot attend, s/he can send a designate that is empowered to vote and act on behalf of that gatekeeper (including committing resources). Gatekeepers can attend electronically (phone or video conference call).
4. 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.
5. Gatekeepers should base their decisions on scoring criteria. Decisions must be based on facts, not emotion and gut feel!
6. 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.
7. When resource commitments are made by gatekeepers (people, time or money), every effort must be made to ensure that these commitments are kept.
8. Gatekeepers must accept and agree to abide by these *Rules of the Game*.

- Gate meetings cancelled at the last minute because the gatekeepers are unavailable (yet they complain the loudest when projects miss milestones on the timeline)
- Gate meetings held, but decisions not made and resources not committed
- Key gatekeepers and resource-owners missing the meeting, and not delegating their authority to a designate (the meeting thus becomes impotent, as the rest of the gatekeepers cannot commit to the project team without that one key resource owner in the room)
- Single-person gate meetings or decisions by “executive edict” – the assumption that one person knows all
- Go/Kill decisions based on opinion and speculation, rather than facts; and even worse, decisions based on a political or personal agenda
- Using personal and hidden Go/Kill and prioritization criteria (rather than robust and transparent decision-making criteria).

While such behavior may be tolerated when bosses are in their own departments, when in the role of a gatekeeper, the rules change. As a gatekeeper, that senior person is no longer a functional boss, but rather a member of a *decision-making team*.

And decision teams need “rules of engagement” or governance rules – see Exhibit 3. 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!*

Misapplying cost cutting models to innovation projects

A number of companies have implemented methods such as Six Sigma and Lean Manufacturing, and then try inappropriately to apply this same methodology to the innovation process. Wrong! Six Sigma was originally designed to reduce product defects and improve product quality, hence the term “Six Sigma” or six standard deviations in terms of defect rates. Later, when popularized at GE, the method evolved to encompass cost reduction and problem solving activities. But it was never intended, nor should it be used, as an idea- to-launch new product process. Why? Simply because the method assumes a problem and converges on a solution; but it fails to allow for divergent, creative and right brain behavior that typifies the fuzzy front end of most firms’ innovation processes. A noted Six Sigma expert acknowledges the “define, measure, analyze, improve, control” mind-set doesn’t entirely gel with the fuzzy front-end of invention.

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“When an idea starts germinating, you don’t want to overanalyze it, which can happen in a traditional DMAIC framework” (*Business Week* editorial staff, 2007).

Consider the predicament that 3M finds itself in when a number of businesses replaced their successful innovation processes with Six Sigma. As noted in a recent *Business Week* article:

“...the very factors that make Six Sigma effective in one context can make it ineffective in another. While process excellence demands precision, consistency, and repetition, innovation calls for variation, failure, and serendipity. The impact of the Six Sigma regime at 3M was that more predictable, incremental work took precedence over blue-sky research. ‘You’re supposed to be having something that was going to be producing a profit, if not next quarter, it better be the quarter after that,’ a former 3M researcher says. Defenders of Six Sigma at 3M claim that a more systematic new-product introduction process allows innovations to get to market faster. But Fry, the Post-it note inventor, disagrees. In fact, he places the blame for 3M’s recent lack of innovative sizzle squarely on Six Sigma’s application in 3M’s research labs” (Wood, 2007).

Similarly Lean Manufacturing methods work well in the factory to reduce waste and non-value-added activities. But be careful in the over-zealous application of Lean methods to the innovation process – manufacturing is a very different process than innovation.

Trying to do portfolio management without a stage-and-gate process

Some managers mistakenly believe that they can get by with only portfolio management and no stage-and-gate process in place. The argument is that their gates lack the real teeth necessary to make Go/Kill decisions and prioritize projects, and so portfolio management is the answer. Earlier, the point was made that Go/Kill and prioritization decisions occur at the gates; but the gates must have teeth!

An effective Stage-Gate system is essential to sound portfolio management for several reasons. First, by having tough gates in place, the poorer projects are eliminated early in the process – the funneling effect – and thus the overall result is a better portfolio.

Perhaps more important is that a solid stage-and-gate process leads to *data integrity*: best practices and key tasks built into the stages ensure that better data is acquired, while the gates define what information is required from the project team – the deliverables.

Data integrity (or its lack) is one of the top issues identified in a recent APQC portfolio management study (Edgett, 2007). Without a good Stage-Gate process in place, project teams are left on their own about what data to gather and how to obtain it. The end result is that inconsistent data is gathered on projects, and in different ways. Thus it becomes difficult to compare and rank projects against each other, and so effective portfolio management is next to impossible.

Too much bureaucracy in the idea-to-launch process
Having a well-defined and efficient system that speeds new products to market is the goal. Instead what some companies have done is to design a cumbersome, bureaucratic process with a lot of make-work and non-value added activities. Here are some of the common pitfalls we see.

Deliverables overkill. Most companies’ new product processes suffer from far too much information delivered to the gatekeepers at each gate. The project team screams “too much bureaucracy and too much work to prepare for gates” while the gatekeepers complain that they must plow through pages of materials, much of it not relevant to the decision. Several factors create this deliverables overkill:

- Because the project team is not certain what information is required, they over-deliver – they prepare an overly comprehensive report, and in so doing, *bullet-proof* themselves. What is needed is a better understanding between project teams and gatekeepers regarding just what information is needed at each gate: Expectations must be made clear on both sides.
- The fault can also be the design of the company’s Stage-Gate system itself. The system often includes very elaborate templates that must be filled out for each gate regardless. Some experts argue that templates are mind-numbing and encourage unneeded work; others argue that in any process, templates are a useful guide and help to structure the data. Regardless, overly detailed templates, replete with pages of fields to be filled in, can lead to deliverables overkill.

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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. Keep the deliverables and their templates to the essential information needed to make the gate decisions:

An example: Johnson & Johnson’s Ethicon Division has an effective Stage-Gate process that begins with Stage 1 “understanding the opportunity” and ends with Launch. A positive feature of the process is “lean gates”. Previously, the gate deliverables package was a 30 to 90 page presentation, obviously 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 (the gate meeting is not an educational session to describe the project in detail to a poorly prepared gatekeeping group). Senior management is simply informed at the gate review about the risks and the commitments required. Finally, there is a standardized presentation format. The end result is that weeks of preparation work have been saved (Belair, 2007).

Demanding much non-value added work in the stages: Some companies’ processes build every possible activity into each stage, and long lists of required tasks and activities per stage are the result. Moreover most Stage-Gate processes over time become far too bulky as more and more make-work gets added to the system.

An example: ITT Industries boasts a very effective Stage-Gate processes, part of their *value based product development (VBPD)* initiative (which incidentally helped to drive sales from new products from 15 percent in 2002 to 31 percent by 2006). One of the bureaucratic forces that ITT management constantly had to guard against was the tendency for each function to require far too much from the project team. For example, when the Corporate Environment, Health and Safety group got hold of the process, they added a huge amount of work in Stage 2 for the project team – a long list of 20 tasks resulting in a seven-page deliverable template, longer than the full business case!

It seemed as though each department was trying to outdo the next one in terms of how comprehensive they could make their section of the documentation. Instead, what they were creating was a bureaucratic nightmare that no project team could have fought their way through. Had it not been for a very tough-minded executive who oversaw the entire VBPD Stage-Gate process, this added work would have killed their system. Today the process is slim, trim and effective... and it delivers results! (Arra, 2007).

Too much reliance on software as a solution

Some product developers see IT tools solving everything. Not so: The mistaken belief is that the purchase of a software tool will be a substitute for a robust idea-to-launch process, or is the fix for an ineffective innovative system. Software is a *great facilitator* of a stage-and-gate process, yielding many benefits. For example, software tools available for Stage-Gate enable project team members to communicate more effectively and to work on shared documents; they provide an electronic Stage-Gate manual complete with all deliverables templates, lists of task within stages and accompanying worksheets; and they track projects and provide tailored views of all the projects in the pipeline. Thus IT can greatly ease the implementation and use of Stage-Gate. But an IT tool per se is not a substitute for the idea-to-launch process: You need a solid innovation process first, that you then incorporate into your software.

Other IT issues are that the software is too cumbersome and may even overwhelm project teams. Additionally some software requires a lot of unexpected work to configure. Finally a few software vendors oversell their products, and make claims, such as their software is Stage-Gate ready when it is not. When seeking IT in support of your innovation process, take a very close look and ask many questions; one group has begun to evaluate and certify such software, and results are available online. (www.stage-gate.com)

Expecting the impossible from a process

Stage-Gate is not a panacea, and it’s only one piece of the puzzle. As the creator of P&G’s SIMPL Stage-Gate process notes: “Stage-Gate is not stand-alone. Not recognizing this slowed us down – it took us five years to learn this, and five years to implement it [find a solution]” (Mills, 2004).

Perspective: The Stage-Gate® Idea-to-Launch Process – Update, What’s New and NexGen Systems

Many companies face myriad problems in product innovation. The installation of a visible idea-to-launch process is too often assumed to be the magic bullet, the hope being that all these other problems will disappear. Actually quite the reverse is true. By making the innovation process much more visible and transparent, the other weaknesses in the firm’s approach and methods become even more apparent.

An example: Many companies suffer from too many projects and not enough resources to do them well. In short, there is gridlock in the development pipeline, and not much gets through. While Stage-Gate may bring some relief – the gates will kill some weaker projects and thus free resources – the full solution is likely to lie elsewhere, perhaps via a resource capacity analysis or the implementation of an effective resource tracking and portfolio management system. For example, P&G’s Initiatives Diamond shows their SIMPL stage-and-gate system as one and only one of the four pillars of success (Cooper & Mills, 2005). Two others are portfolio management and resource allocation. All three must work together.

No pain, no gain

The implementation of any system requires some effort, and indeed Stage-Gate makes certain new demands on project teams, leaders and gatekeepers. For example, project teams are expected to meet a certain standard in terms of front-end homework and get the facts on their project – something that may be new to people who are used to pulling numbers out of the air. Similarly, gates do take a bit of effort and represent new demands both for gatekeepers and project teams, especially in a company used to casual or intuitive decision-making or one-person executive edict gate meetings.

All of these new demands may seem like extra work to those new to Stage-Gate. I often hear the argument that “all this extra work is bureaucratic – we can skip over these tasks and save ourselves lots of time and money”. This argument is a convincing one if it weren’t for the huge body of evidence against it. The extra work is well worth the effort, and pays for itself many times in terms of increased success rates, greater project profits, and often shorter times to market in the long run.

The point is that one must be very careful not to confuse *avoiding bureaucracy* (defined as doing work that adds no value) with *intellectual laziness* or *sloppy execution* (skipping key tasks that do add much value, but do take a little more time and effort to do them right). Many project teams and companies are guilty of the latter.

Next Generation Stage-Gate – How Companies Have Evolved and Accelerated the Process

Here now are some of the ways that progressive companies have modified, adjusted and adapted Stage-Gate and have implemented the next generation stage-and-gate process.

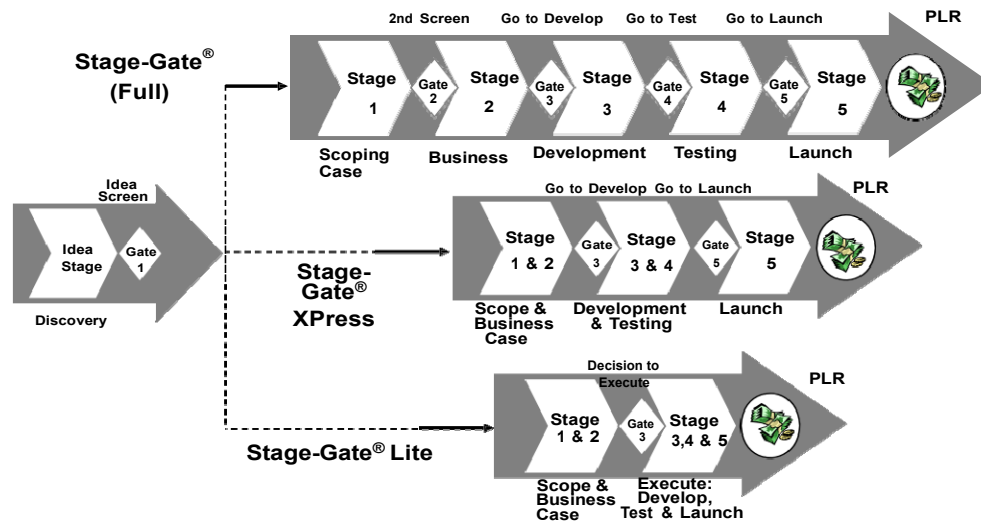
Scaled to suit different risk level projects
Perhaps the greatest change in Stage-Gate over the last few years is that it has become a *scalable process*, scaled to suit very different types and risk-levels of projects – from very risky and complex platform developments through to lower risk extensions and modifications, and even to handle rather simple sales force requests (Cooper and Edgett, 2005; Cooper, 2006a).

When first implemented, there was only one version of Stage-Gate in a company, typically a five-stage, five-gate model. And the rule was that “one size fits all”. But users quickly realized that some projects were too small to push through the full five-stage model, and so they circumvented it. The problem was that these smaller projects – line extensions, modifications, sales force requests and so on – while individually did not use many resources, collectively they consumed the bulk of resources. Thus a contradictory situation existed, whereby projects that represented the majority of development resources went “outside the system”.

Management recognized that 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. Exhibit 4 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.

Perspective: The Stage-Gate® Idea-to-Launch Process – Update, What’s New and NexGen Systems

Exhibit 4: Next Generation Stage-Gate® is Scalable to Suit Different Projects



Major new product projects go through the full five-stage process (top)
Moderate risk projects, including extensions, modification and improvements, use the XPress version (middle)
Sales-force & Marketing requests (very minor changes) use the Lite process (bottom)

In Exhibit 4, all proposed development projects enter Gate 1 on the left for an initial screen, so that Gate 1 is in effect a “clearing house”. The idea screening decision is made here, as is the routing decision – what type of project this is, and therefore what version of Stage-Gate it should be in. The principle for electing which version of Stage-Gate® to use is simple: The higher the risk, the more one adheres to the full five-stage process across the top of Exhibit 4.

Note that 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, Exxon-Mobil Chemical has designed a three-stage, three-gate version of their Stage-Gate process to handle up-stream research projects (Cohen et al, 1998); while numerous other organizations (Timex, Lennox, Sandia Labs, Donaldson) have adopted a four-stage, four-gate system to handle fundamental research, technology development or platform projects (Cooper, 2006b).

A flexible process

Stage-Gate is flexible, as opposed to a rigid “book of rules and procedures” to be religiously followed. *No activity or deliverable is mandatory.* Stage-Gate is a guide that suggests best practices, recommended activities and likely deliverables. But the project team has much discretion over which activities they execute and which they choose to not to do. Every project is unique and merits its own action plan. The project team presents its proposed “go-forward plan” – their best attempt at defining 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.

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An example: At Toyota, the rule is to synchronize processes for simultaneous execution (Morgan, 2005). Truly effective concurrent engineering requires that each subsequent function maximize 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 around stable data as it becomes 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– the risk is 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 the risk must be calculated. That is, the cost of delay must be weighed against the cost and probability of being wrong.

An adaptable process

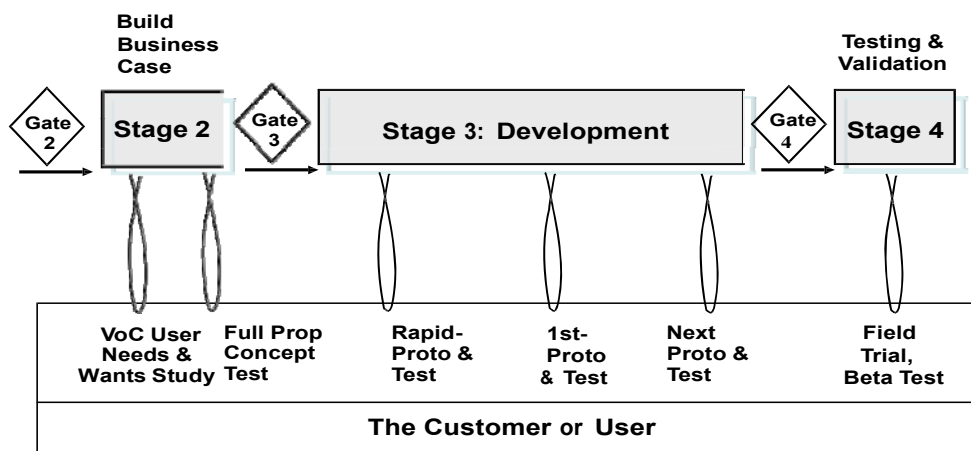
Stage-Gate has also become a much more *adaptable* innovation process, one that adapts to changing conditions and fluid, unstable information.

The concept of *spiral* or *agile development* is built in, allowing project teams to move rapidly to a finalized product design through a series of “build-test- feedback-and-revise” iterations (Cooper and Edgett, 2005).

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).

How does spiral development work in practice? A sample set of spirals is shown in Exhibit 5. Note that these loops or spirals are deliberately built in from the front-end stages through the development stage and into the testing stage. The first loop or spiral is the *voice-of-customer study* undertaken early in State 2, where project team members visit customers to better understand their unmet needs, problems and benefits sought in the new product.

Exhibit 5: Spiral Development is a Series of “Build-Test-Feedback-Revise” Iterations or Loops



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At this point, the project team probably has very little to show the customer; and that’s the way it should be: The purpose of this visit is to listen and watch, not to “show and tell”.

The second spiral, which is labeled a full proposition concept test in Exhibit 5, is where the project team presents a *representation of the proposed product*. Depending on the type of product and industry, this representation can be a computer-generated virtual prototype, a hand-made model or mock-up, a very crude protocept, or even a few computer screens for new software. The product obviously does not work at this early stage, and in some presentations, is only two-dimensional. But it is enough to give the customer a feel for what the product will be and do. The product presentation should be accompanied by simulated collaterals or selling materials: a dummy brochure, a simulated spec sheet, a sales presentation on Power Point, or even a storyboard with sound track to simulate a television ad. Interest, liking, preference and purchase intent are thus established even before the project is a formal development project.

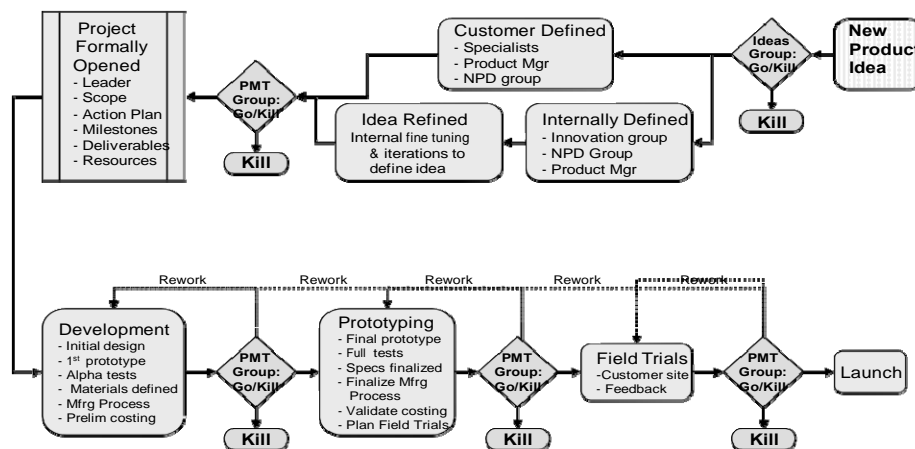
Feedback is sought on dislikes and changes required, and the project team moves to finalize their product definition as part of the Stage 2 Business Case in Exhibit 2.

Moving into the Development Stage in Exhibit 5, within weeks the team produces the next and more complete version of the product, perhaps a crude model or a rapid prototype. They test this with customers, and again seek feedback, which they use to rapidly revise and build the first working prototype... and so on, with each successive version of the product getting closer to the final product, and at the same time, closer to the customer’s ideal.

An efficient, lean and rapid system

Smart companies have made their next generation Stage-Gate process *lean*, removing waste and inefficiency at every opportunity. They have borrowed the concept of *value stream analysis* from lean manufacturing, and have applied it to their new product process.

A *value stream* is simply the connection of all the process steps with the goal of maximizing customer value (Fiore, 2005). 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 or service. The tool known as the *value stream map* is used to identify and document value streams in product innovation, and is critical to identifying both value-added and non-value-added activities, hence is an essential tool to improving your idea-to-launch process (Cooper, 2006a).



The original process chart was drawn on a 30 foot length of paper, but was reduced in size for this article. Many details of the process were also shown: For example, times to complete each task, as well as deficiencies and road-blocks in the process, were also noted on the original process chart.

Source: A manufacturer of process equipment. Disguised & abbreviated.

Exhibit 6: Example of a “Value Stream Map” of the Current New Product Process

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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 (an example is shown in Exhibit 6). All the stages, decision-points and key activities in a typical project are mapped out, with typical times for each activity and decision indicated. In undertaking this mapping, it becomes clear that there is often a difference between the way the process is supposed to work, and the way it works in reality.

Once the value stream is mapped out, the task force lowers the microscope on the process and dissects it. They critically assess each step and activity in the process, posing four key questions:

1. What work gets done at this step, stage or activity?
2. How well do we execute this activity? How long does it typically take?
3. Is this step or activity really needed? If so, how can it be made better?
4. How can it be made faster?

All procedures, required deliverables, documents and templates, committees and decision processes are examined, looking for time wasters.

Once problems, time-wasters and non-value-added activities are spotted, the task force then works to remove them.

More effective governance

Some steps designed to improve gatekeeping were described previously and include:

- Ensuring that gates really have teeth – that they are Go/Kill decision and resourcing meetings
- Defining who the gatekeepers are
- Putting gatekeeper rules of engagement in place.

Here are other ways that the governance or decision-making process has improved in stage-and-gate processes:

Use of scorecards to make better Go/Kill decisions. A number of firms (for example, some divisions at J&J, P&G, Emerson Electric and ITT Industries) use scorecards for early stage screening (for Gates 1, 2 and 3 in Exhibit 2), where the project is scored by the gatekeepers right at the gate meeting on key criteria. Typical criteria for a new product projects are in Exhibit 7; note that *different scorecards* and criteria are used for different types of projects in Exhibit 4.

Factor 1: Strategic Fit & Importance

- Alignment of project with our business's strategy
- Importance of project to the strategy
- Impact on the business

Factor 2: Product & Competitive Advantage

- Product delivers unique customer (or user) benefits
- Product offers customer (or 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 & future potential
- Margins earned by others in this market
- Competitiveness – how intense & tough the competition is (negative)

Factor 4: Core Competencies Leverage

- Project leverages our core competencies and strengths in:
 - Technology
 - Production or Operations
 - Marketing (image, brand, communications)
 - Distribution and 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
- Our technical track record on these types of projects
- 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 & ability to address risks

New-product projects are scored by the gatekeepers 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, and taken out of 100. A score of 60/100 is usually required for a Go decision.

Adapted from: Cooper & Edgett, *Visions* 2006.

Exhibit 7: A Best-Practices Gate 3 Scorecard for Project Selection for New Products

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Here’s how an effective scoring session works: The project team presents their project at the gate meeting. A vigorous question-and-answer session ensues, where the gatekeepers challenge the project team. After all questions have been answered, each of the gatekeepers then scores the project on the scorecard independently and privately. The scorecards are collected, and the results are displaced on an Excel spreadsheet on a large screen, including an overall project score. Areas of disagreement among the gatekeepers are highlighted on the spreadsheet, and a further and facilitated discussion ensues. Finally, agreement is reached and a decision is made. For a major project, the facilitated session should last about 60-90 minutes.

Although not the most popular screening method, scorecards certainly are well-liked by their users. They are rated highly in terms of effectiveness (make the right decision) and efficiency (in a timely fashion), and fit management’s style (Cooper, Edgett & Kleinschmidt, 1998,1999). Users also indicate that, although the overall project score is useful to prioritize projects, the real value in the scorecard method is the behavioral aspect – the fact that a group of senior executives meet, discuss the project, walk through a set of key questions, debate the questions, reach closure and then make a decision.

Additionally users like the fact that scorecards render individual judgments of all gatekeepers visible – there is total transparency at the gate meeting, hence less room for politics, gamesmanship and hidden agendas; they also like the fact that gatekeepers not only have an opportunity to challenge the project team, but also to debate differences among themselves in an open fashion, and hence achieve more informed decision-making. So it is the management thought-process, and not so much the project score, that is the real benefit to scorecards.

Employing success criteria at gates. A second selection method, 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” (Cooper and Mills, 2005).

For example, if the project’s estimates fail on any agreed-to criteria at successive gates, the project could be killed.

Self evaluation as an input to each gate. Some companies let the project teams submit their own filled-in scorecard prior to the gate meeting. The view is that the project team’s judgment of the project’s attractiveness is also important information for the gatekeepers. The gatekeepers also score the project as above, but *before seeing the team’s scores*. The two sets of scores are then displayed at the gate meeting, and differences in opinion between project team and gatekeepers are addressed. Alternatively, some companies encourage project teams to submit their evaluation regarding how solid or *reliable the information* is that is contained in the deliverables.

Displays of in-process metrics at gates. In-process metrics are also considered important by some management groups, and hence are displayed at gates. In- process metrics capture how well the project is being executed, and whether is it on course and on target. Poor performance on these metrics is not usually a Kill indicator, but a strong signal that the project and team could be in trouble, and that course corrections are needed:

An example: A noted Austrian electronics firm, Omicron Electronics GmbH, has introduced much more insightful metrics at gates in their Stage-Gate process. They call it their “360 degree feedback at each gate” (see Exhibit 8). Here, three vital metrics are rated and tracked during each stage: meeting project targets; team efficiency; and quality of execution during the stage. The summary 360 degree chart in Exhibit 8 provides the total view of the project on these metrics at each gate meeting, and helps indicate whether the project is on track and on course.

Integrated with portfolio management. Portfolio management and a gating process are both designed to make Go/Kill and resource allocation decisions, and hence are being integrated into a unified system in next generation Stage-Gate. There are subtle differences between portfolio management and gating, however:

- Gates are an evaluation of a *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 project (Gate 1 to Gate 5).

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- 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 take place periodically: twice to four times per year is the norm (Edgett, 2007). They deal with issues such as achieving the right mix and balance of projects in the portfolio, project prioritization, and whether the portfolio is aligned with the business’s strategy.

To enable integration, portfolio displays – bubble diagrams, pie charts and prioritized lists of projects – are available at gate meeting to help the gatekeepers make more informed Go/Kill decisions on individual projects but relative to the entire portfolio (Cooper & Edgett, 2006; Cooper, Edgett & Kleinschmidt, 2002a). In a similar vein, the same portfolio charts along with the productivity index and scorecard results from recent gate meetings are displayed at portfolio reviews in order to provide insights into project prioritization, and the mix and balance of projects in the portfolio.

Accelerating the gates

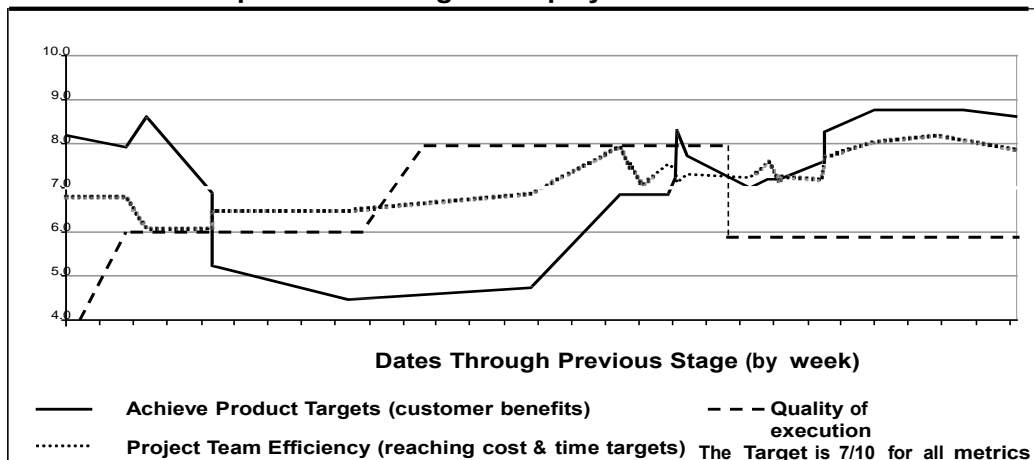
The need for fast Go/Kill decisions combined with global and diverse development teams means that effective and timely gatekeeping has become a major challenge.

If a project is held up awaiting a gate for three weeks, and this happens at all five gates, that’s 15 weeks or almost four months of dead time – unacceptable in today’s fast-paced world. Here’s what leading firms are doing to accelerate the gates:

Leaner and simpler gates. The problem of deliverables overkill was mentioned previously, and illustration from J&J was provided to cut the bureaucracy and speed up the gates. One of its compelling features of Procter & Gamble’s newest release of SIMPL (their Stage-Gate process) is much leaner gates... a “simpler SIMPL”. Previously, project teams had decided what deliverables they would prepare for gate-keepers. Desirous of show-casing their projects (and themselves), often the resulting deliverables package was 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 a handful of key items:

Exhibit 8: Example of a 360 Degree Display of In-Process Metrics



- **A 360 evaluation by management, the project team, the project leader and the product manager**
- **These rating data are summarized & shown at every gate meeting for the previous stage**

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- a. Have you done what you should have – is the data presented based on solid work?
- b. What are the risks in moving forward?
- c. What are you asking for?

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

The emphasis is on making expectations clear to project teams and leaders – that they are not required to prepare an “information dump” for the gatekeepers. Clearly when project teams are preparing one-hundred page reports, but gatekeepers are only reading the first ten pages, there is a serious disconnect about what’s needed and what’s expected! The principles are that:

- information only has a value 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 seem to be the answer favored by progressive firms.

Distinguishing between work done in the stages and deliverables to the gates. Project teams sometimes get confused between trying to show what work they accomplished during the stages versus simply high-lighting the results of that work to management at the gates. The result again is a much bulkier package of deliverables than gatekeepers need to see. Varian’s Italian division (instruments) has clearly separated the end point or deliverable from the process of gathering the information and preparing the deliverables as follows (quotation from the company’s Stage-Gate manual):

“There are templates for each stage in the process. The summary template describes the contents of the report that the project leader must prepare as an output from each stage. In addition to the summary template, there is a guideline for each stage. The guideline is similar to the summary template, but it provides more detail and help on how to prepare the report from the stage.” Thus the end point or deliverable is kept short and efficient, and quite separate from the details of the work in the stage.

Self managed gates. In the case of smaller and lower risk projects, some gates are now self managed (for example, Gates 2 and 4 in Exhibit 2). In effect, the project team conducts their own review and makes their own Go/Kill decision. Nortel Networks has experimented with this approach (an alternative is simply to adopt a three stage process, as in Exhibit 4).

Electronic and virtual gates. The advent of global development teams and gatekeeping groups means that gate meetings in some companies have become electronic, global and in some cases even virtual. A major paper company experimented with remote electronic gates: Here, the gate deliverables are distributed to gatekeepers automatically, electronically and globally. Then, independently of each other, the gatekeepers score the project on an electronic scorecard, and also add comments. Subsequently, the global gate-keeping group assembles in an electronic video conference to debate the scores, resolve their differences, and make the Go/Kill decision. The use of extensive IT – for information dissemination, the scoring and integration of scorecard results, and the meeting itself – enables these electronic gates.

With virtual gates, there is no actual gate meeting; rather gatekeepers simply review the deliverables and sign-off on the Go/Kill decision electronically and independently of each other. The goal here is to reduce absenteeism of key gatekeepers, to get input of people normally not at the gate meeting, and to speed up the decision process, especially in the case of remotely located gatekeepers. While the advantages of virtual gates are obvious, the big negative is that because no meeting actually takes place, the gatekeepers do not have the opportunity to engage in back-and-forth discussion and the learning that ensues. Hence they make the Go/Kill decision without benefit of full knowledge.

Accountability, the Post Launch Review, and Continuous Improvement

Next generation Stage-Gate systems build in a tough 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.

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Continuous improvement in NPD has three major elements (Cooper and Edgett, 2005, Cooper, 2006a):

1. *Having performance metrics in place.* These metrics measure how well a specific new product project performed. For example, were the product’s profits on target? Was it launched on time?
2. *Establishing team accountability for results.* All members of the project team are fully responsible for performance results when measured against these metrics.
3. *Building in learning and improvement.* When the project team misses the target, or when deficiencies occur, focus on fixing the cause – stop this from happening again – rather than putting a band-aid on the symptom, or worse yet, punishing the team.

An example: At Emerson Electric, traditionally 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 (Ledford, 2006).

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 (Cooper and Mills, 2005): “Winning in the marketplace is the goal. In many firms, too much emphasis is on getting through the process; that 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 account-ability* for the project team. Actual results achieved are determined: for example, the first year’s sales, the actual launch date, 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 agenda of this vital best-practice review: Did the team achieve what was promised when measured against the success criteria?

Continuous learning and improvement must be in place too: If results are measured and deficiencies are identified, but no action is taken, the system never gets better 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 try 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.

An example: EXFO Engineering (winner of the PDMA’s outstanding corporate innovator award) boasts a solid Stage-Gate system coupled with an outstanding portfolio management process. EXFO has added an additional gate in their 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 reviews 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.

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 life of the product (Bull, 2007).

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An “open system”

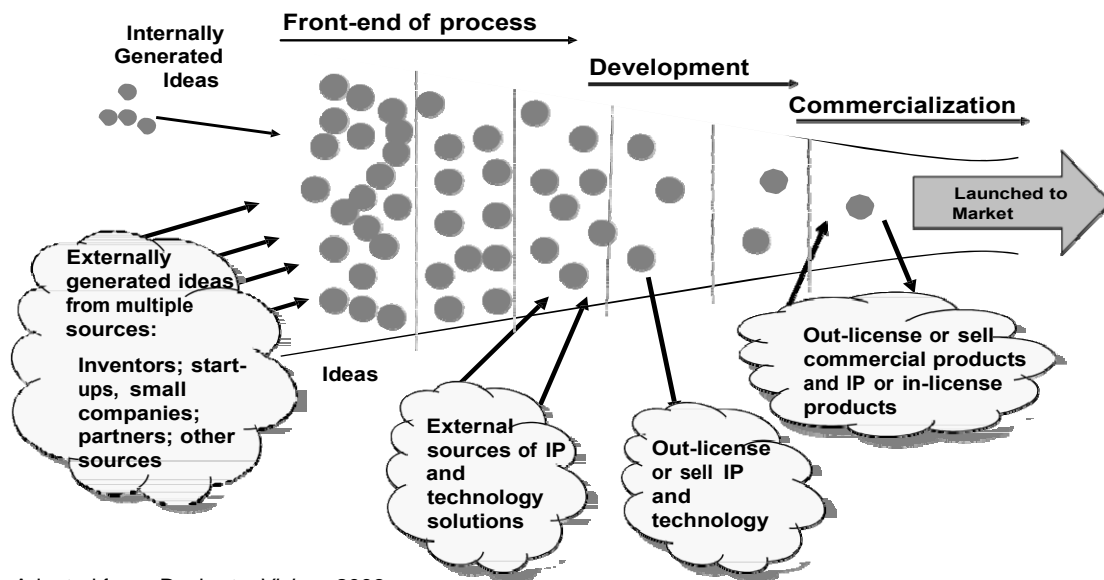
Stage-Gate has also been modified to accommodate *open innovation*. Best performers have reinvented their NPD process to handle the flow of ideas, IP, technology and even totally developed products into the company from external sources, and also the flow outward (Chesbrough, 2003). Companies, such as Kimberly Clark, Air Products & Chemicals, and P&G, have moved to *open innovation*; and they have modified their Stage-Gate process – built in the necessary flexibility, capability and systems – in order to enable this network of partners, alliances and outsourced- vendors from idea generation right through to launch. For example, some progressive firms’ latest versions of their Stage-Gate systems are now designed to handle externally-derived ideas, IP, technologies and even fully developed products (Cooper and Edgett, 2007).

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 (Docherty, 2006). By contrast, in open innovation, *companies look inside-out and outside-in*, and 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 Exhibit 9 (Docherty, 2006):

- *Ideation or Discovery stage*: 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 external to 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.

Exhibit 9: Stage-Gate Has Been Adapted to Become an Open Innovation Model



Adapted from: Docherty, *Visions* 2006.

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- *Launch or commercialization stage:*
Companies sell or out-license already commercialized 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.

Making it Work

An effective Stage-Gate system yields positive results in terms of getting new products and services to market quickly, efficiently and profitably. The fact that some many well-managed companies have made it work to their advantage is the proof. At the same time, as with any management approach, some struggle with the concept.

This article has outlined the background, theory and some of the details of Stage-Gate. At the same time, it has tackled some of the more serious challenges that companies face in its implementation. And finally some new approaches that firms have built into their next generation Stage-Gate systems have been outlined – making the system more flexible, adaptive and scalable; building in better governance; integration with portfolio management; incorporating accountability and continuous improvement; and finally adapting the system include open innovation.

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Endnotes

¹ Stage-Gate® is a registered trademark of Stage-Gate, Inc.

² Software evaluations on line at www.stage-gate.com

³ Source: Five I’s Innovation Management, Austria, a firm specializing in the design & installation of Stage-Gate in Europe.

⁴ Source: Private discussions with M. Mills at P&G; used with permission.

⁵ Source: U3 Innovation Management, Copenhagen DK, a firm specializing in the design & installation of Stage-Gate in Europe.



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