What Leading Companies are Doing to Re-invent their NPD Processes

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Today, many companies are redesigning their idea-to-launch process to be leaner and more agile and at the same time incorporate better governance and portfolio management practices. Some firms have even developed open innovation versions of their phase processes or have moved to fully automated new product development (NPD) systems. In this article, NPD guru Robert Cooper, an originator of Stage-Gate®, (see box on this page), explains what many of these firms are doing and makes recommendations on how to upgrade or tailor your idea-to-launch process.

In recent years, a number of companies have reinvented their idea-to-launch, or Stage-Gate®, processes. Take the example of Emerson Electric: Several years ago, the company’s senior management team set a goal of a faster and more productive new product development (NPD) process to deal with the realities of the 21st century. The company had been effective in NPD by employing their traditional process for many years. (Emerson’s phase-gate system was adapted from the Stage-Gate approach.) Emerson describes its Stage-Gate process as being “based on large-scale studies of product development practices by hundreds of international companies. The process provides a structured pathway of ‘gates’ from idea creation to product launch and follow-up.”

**If your NPD process is more than five years old...then it’s probably time to redesign.**

**How Emerson Electric reinvented Stage-Gate**

“The phase-gate process plays to Emerson’s traditional strengths of excellent execution and process,” says Randall Ledford, Senior Vice President and Chief Technology Officer, Emerson. “It’s no surprise that we have learned so much from it so quickly.”

Acting on an internal benchmarking study involving hundreds of NPD employees in 22 Emerson companies, Emerson identified three vital areas where major productivity improvements could be realized. They then formed three task forces to reinvent their already effective NPD process and raise it to the next level. Some of the actions that were taken include building “continuous improvement” into the process by incorporating an effective post-launch review. Here, some months after launch, actual project results are compared to promised results, gaps are identified, and a thorough analysis of causes results in corrective actions. Another key move was to integrate “voice-of-customer” more effectively into the system by incorporating more robust actions in the first three stages of its NPD process. Making the right project choices is another area where significant gains could be made, and thus “portfolio management methods” were carefully designed, based on best practices both inside and outside the company, and then integrated into the Emerson NPD process. These and other actions helped to elevate an already-proficient process to the next level—Emerson’s NPD 2.0—to yield even greater productivity from research and development (R&D) spending.

The point is that if your NPD process is more than five years old or if your idea-to-launch system does not build in best practices, then it’s probably time to redesign your process, as Emerson Electric did. The original design of Stage-Gate was based on results of studies of successful NPD project teams—how they drove their projects to market quickly and effectively. The system consists of a series of stages, with each stage building in a set of best-practice activities whose goal is to improve the quality and outcome of the project. Preceding each stage is a gate, where management...
members (the gatekeepers) make the key go/kill and investment decisions and commit the necessary resources to the projects in order to move them forward. Therefore, Stage-Gate is much like a football playbook or a cookbook, constructed by watching the best football teams or the best chefs in the world.

Today, leading companies are now reinventing their innovation processes, making them faster, leaner, and more effective, and at the same time, building in best practices in portfolio management, voice-of-customer methods, open innovation, ideation techniques, and so on. Here are some of the actions that leading firms—such as Emerson Electric, Johnson & Johnson, Procter & Gamble, ITT Industries, and GlaxoSmithKline—are taking as they refine their gating processes or move toward a NexGen Stage-Gate process or both.4,5

**NexGen Stage-Gate is risk-adjusted and scalable**

When originally conceiving their NPD process, companies typically designed a single stage-and-gate process—a one-size-fits-all approach. Usually the single process was designed for the most complex development projects, such as major new product projects. Most projects, however, were much simpler—tweaks, modifications, and improvements—and so teams simply circumvented the “large process.” The dilemma was that these small projects consumed the bulk of NPD resources, and so the firm ended up in the untenable position of having most funds spent on projects that were “outside the system.”

Now there are truncated versions of Stage-Gate, including the Lite and XPress versions, which we generically refer to as NexGen Stage-Gate in my firm. These versions are designed to handle lower-risk, simpler projects. For example, in the model in Exhibit 1, all proposed development projects enter Gate 1 (on the left) for an initial screen; 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 higher the risk, the more one adheres to the full five-stage process shown at the top of Exhibit 1.

**Platform and technology development projects**

Stage-Gate is no longer just for NPD projects. Other types of projects—including platform developments, process developments, and exploratory research projects—compete for the same resources and need to be managed, and thus also merit their own version of a stage-and-gate process. Exxon Mobil Chemical, for example, has designed a three-stage, three-gate version of its Stage-Gate process to handle upstream research projects,6 while many other organizations (e.g., Timex, Lennox, Sandia Labs, Donaldson) have adopted a four-stage, four-gate system to handle basic research, technology development, and platform projects.

**Flexibility using simultaneous execution**

The notion of a rigid, lock-stepped process is dead. Today’s fast-paced Stage-Gate is flexible, allowing the project team considerable latitude in deciding what actions are needed and what deliverables are appropriate for each gate, and adapting to dynamic information. The system simply provides a guideline, with the team free to craft its own action plan, subject to the approval of senior-management members, who are acting as gatekeepers. Flexibility is also incorporated into the process by employing...
the principle of “simultaneous execution”—activities that were traditionally done in a series overlap and are done in parallel. Within a stage, for example, don’t necessarily wait for perfect information before moving ahead with the next activity in a project; instead, if the information is stable and reliable, move forward based on that information.

Today stages are even allowed to overlap in NexGen Stage-Gate, with teams not waiting for formal gate approval before moving into some facets of the next stage. Rather, long lead-time activities that are usually reserved for subsequent stages (e.g., sales force training, preparation of marketing collaterals, or even ordering production equipment) can be moved into the previous stage to accelerate the project via concurrency. Note that these deliberate overlaps are designed into the project plan and approved at previous gate meetings.

Simultaneous execution usually adds risk to a project. For example, ordering sales materials early or moving the timeline forward on production equipment runs the risk that the project may be canceled after dedicated production equipment is purchased or sales training materials are prepared. Thus the decision to overlap activities and stages is a calculated risk—that is, the cost of delay must be weighed against the cost and probability of being wrong. And often the cost per day of delay is huge, so that shortening the timeline even a few months can more than justify the risk of moving forward.

Spiral development

“Spiral development” is one way that fast-paced companies cope with changing or fluid information as the project proceeds. Most of us have witnessed NPD projects where a project team charges into development with a product definition based on information that was right at the time, or thought to be right. But the information wasn’t correct or customer requirements changed or the market shifted or a new competitive product was introduced. And when the product is developed and into the testing or market-launch stage, it’s discovered that the product is not quite right for the market.

This traditional linear approach means that the team must then recycle back to the development stage and make the necessary changes to the product and its design. Unstable product specifications and project scope creep are two of the biggest wasters of time in NPD.

By contrast, “adaptive-spiral project teams” practice spiral development and adapt and adjust their project over time (see Exhibit 2). Like the “linear team” above, they do their front-end homework (e.g., voice-of-customer work, competitive analysis, concept testing) and define the product based on current, best-available information. But here’s the difference: Very quickly, the adaptive-spiral team creates the first version of the product (often a virtual one) and tests it with the customer, seeking immediate feedback. Customers don’t know what they’re looking for until they see the product, so it’s best to get a version of the product in front of the them as early as possible to confirm the design. The team uses this feedback to produce the next, more complete version of the product—a working model or prototype. That way, these fast-paced teams remove unnecessary rework and quickly move to the finalized product by undertaking a series of these iterative steps, or loops: build, test, obtain feedback, and revise. Therefore, by the time the product is ready for customer trials or tests, the customer has already seen “the product” at least several times. The loops are built into the entire process, from scoping through testing, and when sketched on a flow diagram, they appear as spirals.

A leaner system

Smart companies streamline their NPD processes, removing waste and inefficiency at every opportunity. They borrow the concept of “value stream” analysis from lean manufacturing and apply it to their NPD process to remove waste in the system.

A value stream is simply the connection of all the process steps with the goal of maximizing customer value. 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. Typically, a task force develops a map of the current value stream—all the steps that happen in a normal product development in the company. By analyzing this map, all non-value-added items are removed. Every activity, procedure, template, deliverable, and committee in the current process is scrutinized: Is this task or deliverable really needed? If so, how can it be made faster or better? The result is a more efficient and lean idea-to-launch method.

More effective governance

As go the gates, so goes the process! One of the most glaring
errors in NPD is that gates lack teeth. Review meetings are held but rarely are projects ever killed—it’s almost an automatic go. Yet history reveals that many projects have low value to the corporation and thus should be killed, much like an astute poker player walking away from a bad poker hand. Another serious problem is “hollow gates”: Go decisions are made, but resources are not committed. The result is too many projects under way and insufficient resources are committed to each one of them.

If “gates without teeth” and hollow gates describe your company’s gates, then it’s time to rethink your process. 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 the latest information or cut its losses and bail out of a bad project. Gates are also 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.

Many companies have trouble defining who the gatekeepers are. Most senior managers feel that they should be gatekeepers; the result is too many gatekeepers and a lack of crisp go/kill decisions. At gates, the rule is simple: The gatekeepers are the resource owners of the assets required to move the project through the next stage. Thus, the gatekeeping team must be cross-functional so that alignment exists across functional areas and that the needed resources from all functions are committed. Additionally, define different gatekeeper groups for different project magnitudes. For example, there should be different gatekeepers for Lite, XPress, and regular projects (see Exhibit 1); most firms use lower-level gatekeeper teams for the early gates in the process.

A final improvement is the move to “lean gates.” For instance, at Johnson & Johnson’s Ethicon division, the gate deliverables package was cut from a bulky 30-to-90-page presentation down to the bare essentials: one page with three back-up slides. The expectation is that gatekeepers will arrive at the gate meeting knowing the project (the gate meeting is not an educational session); senior management is simply informed at the gate review about the risks and the commitments required. In addition, there is a standardized presentation format. The result is that weeks of preparation work have been saved.⁹

**Accountability, the post-launch review, and continuous improvement**

In many firms, too much emphasis is on getting through the process—that is, on getting one’s project approved or deliverables prepared for the next gate. Procter & Gamble was no different. In a major shift, P&G changed its emphasis to 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.”⁹

NexGen Stage-Gate systems thus 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 in NPD has three major elements: having performance metrics in place to measure how well the NPD project performed; establishing project team accountability for results, with all members of the project team fully responsible for performance results when measured against these metrics; and building in learning and improvement. This last item means that when the project team misses the target, or when deficiencies occur, focus on fixing the cause, rather than putting a bandage on the symptom—or worse yet, punishing the team.

**Portfolio management**

There are two ways to win at new products: doing projects right and doing the right projects. And that’s where portfolio management—picking the right projects—comes into play.

The gates in a Stage-Gate system are important facets of portfolio management. Here management undertakes in-depth evaluations of individual projects one at a time. Gatekeepers meet to make go/kill and resource allocation decisions on an ongoing basis (in real-time) and from the beginning to the end of the project.

Be sure to utilize portfolio reviews as well. These reviews are more holistic, looking at the entire set of projects, but obviously less in-depth per project than gates are. Portfolio reviews take place periodically: two to four times per year is the norm.¹⁰ 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 company’s strategy.¹¹
An effective Stage-Gate system is essential to 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. Note that the lack of data integrity is one of the top issues identified in a recent APQC portfolio management study.¹⁰

Open innovation
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 from the company from external sources, and the flow outward.¹² Companies such as Kimberly-Clark, Air Products and Chemicals, Inc., and P&G have moved to open innovation, and they have modified their Stage-Gate process—building in the necessary flexibility, capability, and systems—to enable this network of partners, alliances, and outsourced vendors from idea generation through launch. For example, P&G’s SIMPL 3.0 version of its Stage-Gate system is designed to handle externally derived ideas, IP, technologies, and even fully developed products.¹³

Modifying Stage-Gate for open innovation means building in the necessary activities to handle external ideas, IP, and products. Examples include the following:

• Creating an open ideation system, where outsiders can log on and contribute new product ideas (as in P&G’s Connect & Develop webpage)

• Building in the necessary due diligence activities in the early stages to identify the need for partners or outsourced vendors, locate and vet potential partners, determine the scope of outsourced or partner work, and put the required legal work in place (e.g., IP strategy, letters of intent, memoranda of understanding, contracts)

• Setting up the right communications system to enable team members from inside and outside the company to work closely together (this also involves various joint team activities, visits, and so on)

• Modifying the gate procedures and even the gate criteria to allow the involvement of external partners at the go/no-go meetings and to evaluate the attractiveness of the NPD project with and without the availability of external capabilities

• Setting up the infrastructure and processes to allow internally created IP or products to be spun off or sold externally when there is no desire to commercialize the technology internally

An automated system
Progressive companies recognize that automation greatly increases the effectiveness of their new product processes. With automation, project leaders and executives, among others, find the process much easier to use, enhancing buy-in. Another benefit is information management: The key participants have access to effective displays of relevant information—what they need in order to advance the project, cooperate globally with other team members on vital tasks, help make the go/no-go decision, and stay on top of a portfolio of projects. There are several certified automation software programs available for Stage-Gate.¹⁴

Next steps
This article has outlined some of the new approaches that firms have built into their next generation Stage-Gate systems—making the system more flexible, adaptive, and scalable; building in better governance; integrating with portfolio management; incorporating accountability and continuous improvement; automating the system; and adapting the system to include open innovation. The next step is yours: Take a hard look at your current and potentially out-of-date NPD process and systematically reinvent the process to build in the latest thinking, approaches, and methods in order to move to the NexGen Stage-Gate system. §

Endnotes
3. Stage-Gate® is a registered trademark of the Product Development Institute Inc.
5. This article draws on material from several previous articles by the author. See: R.G. Cooper, “Formula for Success,” Marketing Management Magazine (March–April 2006): 21–24. See also endnote 4.
14. A number of software products have been certified for use with Stage-Gate. See http://www.stage-gate.com.

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