Optimizing the Stage-Gate® Process:
What Best Practice Companies are Doing (Part Two)

by Robert G. Cooper, Scott J. Edgett, Elko J. Kleinschmidt

Dr. Cooper, Dr. Edgett and Dr. Kleinschmidt focus on the methods and techniques that help companies achieve better project selection and prioritization. The paper examines how to build more effective go/kill decision points – tough gates – and to move toward successful portfolio management.

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Introduction
Now that most businesses have implemented a systematic new product process, what are the leading firms doing to make the process even more effective? Part I of this two-part series focused on adding a new stage, namely Discovery, to enhance the flow of solid new product ideas and opportunities into the process. Harnessing fundamental research by applying a unique form of Stage-Gate method to these projects was also outlined.

Now Part II moves to a critical and difficult topic, namely better project selection and becoming much more discriminating in terms of the projects one undertakes. This translates into building in more effective Go/Kill decision points – tough gates – and moving towards portfolio management.

Building In More Effective Go/Kill Decisions Points
Most companies have too many projects and not enough resources to do them well [1]. The result is that resources are spread too thinly over too many projects, and there simply is not the time or ability to do many of the key activities in the new product project proficiently. Consistently, we hear from senior people that, in spite of the fact that they indeed have a world-class new product process on paper, there is a lack of discipline to adhere to it – that key activities in projects are not executed as well as they should, or when they should be. Often the problem boils down to simply trying to do too many projects and too quickly.

Some specific problems:
Why do firms consistently admit to saying yes to too many projects? And why are the gates so weak – why do so many companies have trouble killing projects or pruning the new product portfolio? Here are some reasons we observe:

1. There are too many “must do” projects: companies seem to respond to customer and sales force requests, often a little too quickly and willingly. “We must have this product ... otherwise we’ll lose this customer,” is the frequent refrain from the sales force.
2. There is no mechanism to kill projects: once projects are born, they get a life of their own. Other than project status meetings and review points, there are no serious Go/Kill decision points built into the project or process.
3. No criteria have been established for making Go/Kill and prioritization decisions. This is a very weak area, with almost 50% of firms confessing to deficiencies here [2]. What’s missing is a scorecard with criteria or metrics for rating the “goodness” of projects, and helping managers make prioritizing decisions in an objective fashion.
4. Senior people are not engaged in the decision process properly. They’re very busy; thus scheduling these critical Go/Kill decision point meetings is difficult. Moreover many senior managers do not understand their pivotal role in product innovation: they confess to not being close enough to the action; they do not understand the key projects fully; and are unprepared or unable to make vital Go/Kill and prioritization decisions.
5. Finally, it’s simply very difficult to “drown puppies”. All the approved projects look good, and it’s difficult to say no to any of them. Besides, given the way senior people are measured, there is often a huge pressure on senior management to get anything to market.

Some solutions – a customer request process
Customer request projects are often small ones, and can be initiated with little formality, sometimes with little more than a chat between the salesperson and a technical manager. The problem is that, while individually these projects consume few resources, collectively they can account for the majority of your resources. At AlliedSignal-Honeywell, for example, the “Other” category of projects – tweaks, modifications and customer requests – was taking an ever increasing piece of the resource pie.
There are several solutions. The first is to use a Strategic Buckets approach to portfolio management.

That is, make conscious decisions on what proportion of your resources will be devoted to different types of projects: platform developments, new product projects, and smaller projects, such as customer requests (Figure 1). Then rank your projects in each category until out of resources in each bucket. This way one sets an upper limit on spending on these “small” projects.

Second, use a stage-and-gate process even for these smaller projects. That is, make your process a flexible and scalable one. The mistake some businesses have made is to rigidly adhere to their standard new product process, regardless of the project size and risk level. And so small projects – customer requests – are seen as too small to move through the process, hence circumvent it. The result is that there is never a “no” decision on these projects.

Progressive firms recognize that their Stage-Gate® process is a risk management model; and that the higher the project’s risk – project magnitude and impact coupled with uncertainties – the closer one should adhere to the standard five-stage, five-gate process as at the bottom of Figure 2. But when risk is low – when the project is smaller, lower impact and has fewer technical and business uncertainties – then detours are possible. One major company has designed three versions of its new product system:

- The SCR process – for significant customer requests (a major customer desiring some new features and functionality in the product). Here the five stages are collapsed to a two-stage, two gate model.
- The Fast Track Process – for projects with moderate risk (technical feasibility is high; and costs are less than $1 million). Here the model is collapsed to three stages: the two up-front homework phases become a single stage, with Gate 2 skipped; and the Development and Testing stages are collapsed into a single stage.
- The Full Process – for larger and higher risk projects. This is the standard five stage process.
Note that the senior gatekeepers only meet for Gates 3, 4 and 5 in the full 5-stage process. But for Gates 3 and 5 in the Fast Track and SCR processes, the gatekeepers are a lower level group (in this company’s case, simply the Gate 2 gatekeepers from the full 5-stage process).

Incorporating tough gates:
The next solution is to ensure that tough Go/Kill decisions are built into your new product process, where all projects are carefully scrutinized, and where weak ones really are killed. A typical five-stage process was shown at the bottom of Figure 2, with five gates or Go/Kill decision points. Note that gates are not merely project review points, status reports or information updates; rather they are tough decision meetings, where the critical Go/Kill and prioritization decisions are made on projects. Thus the gates become the quality control check points in the process – ensuring that you do the right projects, and also do projects right.

Using scorecards to rate and rank projects:
Next, gates must have clear and visible criteria so that senior managers can make Go/Kill and prioritization decisions objectively. But most important these criteria must be effective – that is, they must be operational (easy to use), realistic (make use of available information) and, at the same time, discriminating (differentiate the good projects from the mediocre ones). These criteria can be Must Meet (knock-out questions in a check list, designed to kill the misfit or poor projects outright) and Should Meet items – highly desirable characteristics which are rated and added in a point-count scheme. A sample list of criteria is shown in Figure 3, from which a scorecard can be developed, that can then be used to score projects right at the gate meeting.
A word of caution: many businesses rely on very poor gate decision criteria – more a deliverables check than Go/Kill and prioritization criteria. Examples of poor prioritization criteria:

- Has the Business Case been developed?
- Is the product clearly defined?
- Has a target market been defined?
- Has a value proposition been clearly stated? And has it been validated by the customer?

These are useful questions to ask at a gate review perhaps, but poor scorecard criteria for prioritizing projects.

<table>
<thead>
<tr>
<th>Must Meet Criteria (checklist – Yes/No):</th>
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<tbody>
<tr>
<td>- Strategic Alignment (fits BU’s strategy)</td>
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<tr>
<td>- Reasonable Likelihood of Technical Feasibility</td>
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<tr>
<td>- Meets EHS &amp; Legal Policies</td>
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<td>- Positive Return Vs. Risk</td>
</tr>
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<td>- No Show-Stoppers (killervariables)</td>
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<table>
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<tr>
<th>Should Meet Criteria (scored on 0-10 scales):</th>
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</table>
| 1. Strategic:  
  - degree to which project aligns with BU’s strategy  
  - strategic importance |
| 2. Product Advantage:  
  - unique benefits  
  - meets customer needs better  
  - value for money |
| 3. Market Attractiveness:  
  - market size  
  - market growth  
  - competitive situation |
| 4. Synergies (Leverages Core Competencies):  
  - marketing synergies  
  - technological synergies  
  - manufacturing/processing synergies |
| 5. Technical Feasibility:  
  - technical gap  
  - complexity  
  - technical uncertainty |
| 6. Risk Vs. Return:  
  - expected profitability (magnitude; e.g. NPV)  
  - return (e.g. IRR)  
  - payback period  
  - certainty of return/profit estimates  
  - low cost & fast to do |

Figure 3: Gate Criteria include both Must Meet (knock-outs) and Should Meet items, which are scored. Use a scorecard at the gate meeting to rate the projects.

If the answers were "No" or "Low" to any of these questions, the decision certainly would not be to kill the project – hence they’re poor Go/Kill criteria. Take a look at the criteria in Figure 3 – they’re proven questions and many have been shown to be strongly correlated with new product profits and success [3]. Then, from this or a similar list, develop your gate scorecards.

Engaging senior management:
Senior management must be engaged in the new product decision process – not micromanaging projects from afar, but acting as sponsors and resource providers for selected projects. One specific role for senior people is as gatekeepers – the people who tend the gates, make Go/Kill decisions on projects, and commit the needed resources. The senior gatekeepers are usually the leadership team of the business – a cross-functional group consisting of the heads of marketing, sales, technical, production, and finance. In the model at the bottom of Figure 2, this senior gate keeping group tends the three key gates, namely Gates 3, 4 and 5: "Go to Development" through to "Go to Launch". And since these senior people must act as a decision making team (rather than as individual functional bosses), they need rules of engagement. Figure 4 gives some typical "expected behaviors" and "rules" that various gatekeeping groups have developed in order to govern their own behavior. Timely gate decisions is always an issue. In best-practice businesses, the senior gatekeeping group sets aside a time slot once per month for gate meetings; any project leader seeking approval for the next...
stage of their project (and seeking the needed resources to proceed) signs up in that time slot. Not every project is reviewed at every gate meeting – the perfunctory "let’s spend ten minutes on each of thirty projects". Rather, this is an in-depth review of one or a few projects seeking resources for the next stage.

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<tr>
<th>Figure 4: The leadership team of the business should develop and use Gatekeeper “Rules of Engagement” for more effective gate meetings.</th>
</tr>
</thead>
</table>
| 1. **Gatekeepers must hold the meeting & be there**  
  - postponed or cancelled meetings are not an option  
  - if you cannot attend, your vote is “Yes”  
  2. **Gatekeepers must have received, read & prepared for the meeting**  
  - contact the gate facilitator or Team is there are show-stoppers  
  - no “surprise attacks” at the gate meeting  
  - no “last minute reading” at the meeting  
  3. **Gatekeepers cannot request information beyond that specified in the deliverables**  
  - no playing “I gotcha”  
  - not a forum to demonstrate your machoism, political clout or intellectual prowess  
  4. **Gatekeepers must make their decision based on the criteria for that gate**  
  - gatekeepers must review each criterion and reach a conclusion  
  - a scoring sheet or “scorecard” for each gatekeeper  
  5. **Gatekeepers must be disciplined**  
  - no hidden agendas  
  - no invisible criteria  
  - decisions based on facts and criteria – not emotion & gut feel  
  6. **All projects must be treated fairly & consistently**  
  - must pass through the gate – no special treatment for executive sponsored or “pet” projects  
  - subjected to the same criteria & same rigor  
  7. **A decision must be made**  
  - within that working day  
  - if deliverables are there, cannot defer the decision  
  - a system built for speed  
  8. **The Project Team must be informed of the gate decision**  
  - immediately  
  - face-to-face  

Deal with the geographic and time pressures of gates:

The devil is in the details! Often, project selection meetings are ineffective because of small items – for example, some of the key gatekeepers did not show up, but sent their lieutenants instead; senior people arrived at the meeting preoccupied with other issues and spent more time on their cell phones in the hallway; or worse yet, they had not even read the background material on each project they were supposed to discuss and vote on. These "small details" are often the result of a overworked, frenetic businesses leadership team – the result of time, geographic and travel pressures.

Here are some tactics that are useful in dealing with these time and travel pressures faced by senior gatekeepers:

**Virtual gates:** One major paper company has moved to virtual gates, where no one is physically at the gate meeting, except the project team. The virtual gate is this firm’s attempt to deal with the fact of geographic distances between the gatekeepers – they are spread across the world, and they are also very busy. In this system, gatekeepers receive the project team’s deliverables electronically ahead of time. Then each gatekeeper scores the project on his/her computer on a list of gate criteria: they are two different criteria lists – one for new product developments; the other for process developments. These escores (0-10 scales) are compiled electronically. The gate meeting itself is a video conference, and the first screen displayed is the summary rating escores – means and deviations – from all gatekeepers. This helps to highlight areas...
of agreement, area of disagreement, and areas of uncertainty. The gate meeting proceeds, and a Go/Kill
decision is reached relatively efficiently and with no travel and time lost.

**Self managed gates:** Companies, such as Nortel Networks, incorporate self-managed gates, where the
project team runs its own gate meeting. These gates are restricted to only some of the gates in their stage-
and-gate process, and only for certain levels of projects (where the risk is not too high). Although self
managed, the team still is required to prepare the necessary deliverables (a project update with
documentation) and review the project against key gate criteria. In other firms, the team is encouraged to
invite some colleagues who are knowledgeable about the project’s technology and market, but are not on
the project team – no vested interests. This “peer review” can take the place of certain gates and
for lower risk projects.

**Team recommendation:** At companies, such as Kraft Foods, the project team is encouraged to make its own
gate recommendation, along with the rationale. In this way, the senior gatekeepers act more as a second
approval group, and avoid the necessity of digging into the details and debate of many projects,
especially those whose fates are fairly evident.

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**Integrating Portfolio Management into Your Gating Process**

Portfolio management is seen as one way to
improve new product profitability [4].
Portfolio management is about resource
allocation – more specifically, about selecting
the right set of development projects and the
right number of projects [5]. An effective
gating process (as in Figure 2) is only half the
battle; but it does go some of the way towards
effective portfolio management. Properly
implemented, a Stage-Gate process should at
minimum get rid of poor projects at the gates,
thereby improving the overall portfolio. It
should also yield much better information on
projects, the result of solid up-front
homework, which has pay-offs in terms of
better project selection.

Leading firms are moving beyond operating
an effective gating process however, and are
integrating portfolio management into their
new product process. Portfolio management
has four main goals:

1. **Selecting high value projects:** Here one
can use the scorecard method (a scoring
model scheme, as in Figure 3) along with
financial criteria to help drive the high
value projects to the top of priority list. A
recent benchmarking study revealed that
businesses that utilized such scorecard
methods obtained a higher value portfolio
than did other firms [6]. A major
deficiency, however, is lack of data
integrity: the sophisticated portfolio tools
are worthless without solid market and
technical data, hence the need to
emphasize the “homework activities” in
the early stages of the new product process
(Stages 1 and 2 in Figure 2).

2. **Achieving the right balance of projects:**
Various charts – bubble diagrams and pie
charts – are useful in order to display
balance in the portfolio (the split in
projects and in resources being spent) on
any dimension relevant to management.
The most popular bubble diagram is the
risk-reward chart, while popular pie charts
depict resource splits by project type,
market sector and product line or group
[7].

3. **Selecting the right number of projects:**
In effective portfolio reviews, all
projects are up for auction. One ranks
projects according to criteria (such as
in a gate scorecard) until one runs out
of resources. Projects past this
resource limit are either killed or put
on hold. In our experience, the first
time one undertakes such a portfolio
ranking, approximately half the
projects are removed from the active
portfolio. The end result is a
significant reduction in time to market.

4. **Strategic alignment:** The over-riding
goal of effective portfolio management
is to ensure that the portfolio of
projects and where the resources are spent
both mirror the strategic priorities of the
business. Various strategic tools include:
building strategic criteria into the gating or
scorecard model (as in Figure 3); using
strategic buckets (to allocate resources into
envelopes for different project types,
different market sectors, and different
product groups – Figure 1); and
developing product roadmaps (a tool
which maps out the major initiatives
required in order to realize the business’s
strategy) [8].
Some firms have piggy-backed effective portfolio management on top of an already proficient new product gating process [9]. Gates are run as two-part meetings, as shown in Figure 5. The first part – the first diamond on the left – is the traditional gate meeting, where the project in question is scrutinized against an *absolute set of standards*: does the project fit your strategy; does it leverage your strengths; is its NPV positive; is the payback less than 3 years; and so on. If the answers are positive, the decision is not Go, but merely a Pass. Negative answers signal a Kill decision.

![Diagram of gate meetings](image)

**Figure 5**: Gate meetings are a two-part decision process: the first part (left) – to make Pass/Kill decisions on individual projects; the second part (right) – to prioritize the project against the rest and to allocate resources.

Next, the second part of the gate meeting – the second diamond on the right in Figure 5 – looks at the *impact of adding this one project to the portfolio*. That is, this project is considered in a *relative sense* – relative to the other active and on-hold projects.
Questions are:

- Does this project improve the overall value of the portfolio (does it have a higher value to the business than the other projects underway? Or lower?)
- Does it improve the balance of projects in the portfolio (or do you already have too many of this type of project)?
- Are the resources available? Does this project avoid over-straining your limited resources (or does it suck resources away from other important projects)?
- Does the project improve the strategic alignment of the portfolio (does it fit your strategy; does this spending mirror your strategic priorities)?

If the answers are positive, then the project is resourced, and becomes an active one. Otherwise it is put on hold (on its own, it may be a decent project, but it simply does not impact the portfolio positively; perhaps it’s time will come).

This two-part gating structure, combined with periodic portfolio reviews, where all projects are considered together, are ways that progressive companies are trying to build portfolio management into their new product processes and methods.

**The Challenge Ahead**

How well your business manages its new product projects and pipeline may well determine your future prosperity. Putting in place an effective new product process, such as *Stage-Gate®*, is a first step. Next, ensure that you practice some discipline here ... really commit to using the process. Then move to improving the process. First, begin with some great new product ideas: build in an idea capture and handling system, and then try some proactive idea generating activities – camping out with your customers, as at Fluke; an MRG event as at OMNOVA Solutions; scenario generation; or working with lead (very innovative) customers as at Hilti and 3M. If fundamental research is undertaken at your business, make sure it is directed research: develop a stage-and-gate process for such research projects.

Now that you’ve tackled the issue of “doing projects right”, turn to the challenges of “doing the right projects”. Ensure that the gates in your new product process are well defined, rigorous and based on visible criteria: use a gate scorecard to help select projects. Finally implement portfolio management, seeking high value projects, the right number of projects, a balanced mix of projects, and strategically aligned projects.

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References:

8. Methods described in references in endnote 7.
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