Stage-Gate® and the Critical Success Factors for New Product Development

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The need for product innovation has never been greater. Product lifecycles are shorter than ever, and pressure continues to mount for organic growth. Companies that fail to innovate face a grim future.

The problem is that winning with new products is not so easy. Only one out of four development projects succeed commercially, and one-third of all new-product launches fail.

What do the winners do differently? What are the critical drivers of success? What is a Stage-Gate® process?

Critical Success Factors

1. Seek Differentiated, Superior Products

The top success factor is the delivery of a differentiated product with unique customer benefits and superior value. But most new products miss the mark here. The majority of products are tired "me too" products with little to distinguish them from the products of their competitors. A second, popular scenario, but one which also yields poor results, is the engineer building a monument to himself – the technical solution in search of a market.

Often, "product superiority" is absent as a project selection criterion, while steps that encourage the design of such superior products are rarely built into the process (such as the voice of customer studies, identifying true and often unarticulated needs and weaknesses in competitors' products).

Indeed, quite the reverse is true: The preoccupation with cycle-time reduction and the tendency to favor simple, inexpensive projects actually penalize the projects that will lead to product superiority. Once you arrive at a viable product concept, test it constantly with the customer.

2. Up-Front Homework Pays Off

Too many new-product projects move from the idea stage right into development with little or no up-front homework. The results of this "ready, fire, aim" approach are usually disastrous. Solid pre-development homework drives up success rates significantly. Sadly, firms devote very little of a project's funding and person-days to these critical activities.

More time and resources should be devoted to the activities that precede the design and development of the product. Up-front homework means undertaking thorough market and competitive analysis, research on the customers' needs and wants, concept testing, and technical and operations feasibility assessments. All of these activities in turn lead to the preparation of a full business case prior to beginning serious development work.

3. Build-In The Voice Of The Customer

The people behind winning new-products have a strong dedication to the voice of the customer. Those projects that feature high-quality marketing actions are blessed with more than double the success rates of projects with poor marketing actions.

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However, a strong market orientation with customer focus is noticeably absent from many businesses' new-product projects.

The voice of the customer must be an integral part of the process. This begins with idea generation – focus groups, customer panels, and working with lead users. Use market research and customer reaction as input into the product's design, not just as a confirmation of it. Make the customer a part of the development process via constant rapid-prototype-and-test iterations. Finally, ensure that the launch is based on solid market information.

4. Demand Sharp, Stable And Early Product Definition

A failure to define the product before development begins is a major cause of both new-product failure and serious delays in time-to-market. In spite of the fact that early and stable product definition is consistently cited as a key to success, firms continue to perform poorly here. Terms such as "unstable product specs" and "project scope creep" describe far too many projects.

Make it a rule: No project moves to the development stage without a sharp definition of the product, including target-market definition; the product concept and benefits to be delivered; the positioning strategy; and, finally, the product features, attributes, performance requirements, and high-level specs.

This definition must be fact-based and signed off by the project team. Senior management should also commit itself to the definition.

5. Plan and Resource The Market Launch Early In The Game

Not surprisingly, a strong market launch underlies the success of any product. For example, winners devote more than twice as many person-days and dollars to the launch as do those that fail. Similarly, the quality of execution of the market launch is significantly higher for winners. The need for a quality launch – well planned, properly resourced, and well executed – should be obvious. But in some businesses, it's almost as though the launch is an afterthought – something to worry about after the product is fully developed.

6. Build tough Go/Kill decision points into your process – a funnel, not a tunnel.

Many projects move too far into development without serious scrutiny. In fact, once a project begins, there is very little chance that it will ever be killed. The result is that many ill-conceived projects continue to move forward and scarce resources are allocated improperly.

Having tough Go/Kill decision points or gates where managers decide whether to continue or not is strongly correlated to the profitability of new-product efforts.

7. Organize Around True Cross-Functional Project Teams

Good organizational design is strongly linked to success. Projects that are organized with a cross-functional team, led by a strong project leader accountable for the entire project from beginning to end, dedicated and focused (as opposed to spread over many projects), stand a better chance of success.

8. Attack From A Position Of Strength

This may be an old adage, but it certainly applies. The new product fares better when it leverages the business's core competencies. This means having a strong fit between the needs of the project and the resources, strengths and experience of the company in terms of marketing, distribution, selling, technology, and operations. These ingredients

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become checklist items in a scoring or rating model to help prioritize new-product projects. If your leverage score is low, then there must be other compelling reasons to proceed with the project. Leverage is not essential, but it certainly improves the odds of winning.

9. Build An International Orientation Into Your New-Product Process

New products aimed at international markets and with international requirements built in from the outset fare better. By contrast, products that are developed for domestic markets and sold locally are not nearly as profitable. The strategy of "design for local needs and adjust for export later" usually does not work well.

The goal is either a global product (one development effort and one product for the entire global market) or a 'glocal' product (one development effort and one product, but with slight variants to satisfy each international market). An international orientation also means using cross-functional teams with members from different countries, and gathering information from multiple international markets.

10. The Role Of Top Management Is Central To Success

Top management support is required for product innovation. But, many senior people get it wrong. Top management's main role is to set the stage for product innovation – to be a "behind-the-scenes" facilitator who is much less an actor, front and center. This stage-setting role is vital. Management must make the long-term commitment to product development a source of growth. It must develop a vision, objectives, and strategy for product innovation. It must make available the necessary resources and ensure that they aren't diverted to more immediate needs in times of shortage. It must commit to a disciplined game plan to drive products to market. And, most important, senior management must empower project teams. Senior management's role is not to get involved in projects on a day-to-day basis, nor to constantly meddle and interfere in the project, nor to micromanage projects from afar, but to provide the needed leadership.

The Structure of the Stage-Gate® Process

Fashion these critical success factors into a Stage-Gate new product game plan – a conceptual and operational model for moving a new product project from idea to launch. This Stage-Gate system is a blueprint for managing the new product process to improve effectiveness and efficiency.

The Stage-Gate system breaks the innovation process down into a predetermined set of stages, each stage consisting of a set of prescribed, cross-functional, and parallel activities (see Exhibit 1). The entrance to each stage is a gate: These gates control the process and serve as the quality control and Go/Kill checkpoints.

The Stages

The Stage-Gate system breaks the new product project into discrete and identifiable stages, typically four, five, or six in number. Each stage is designed to gather information needed to move the project forward to the next gate or decision point. Each stage is multi- or cross-functional: There is no "R&D stage" or "marketing stage." Rather, each stage consists of a set of parallel activities undertaken by people from different functional areas within the firm, but working together as a team led by a project team leader.

In order to manage risk via a Stage-Gate scheme, the parallel activities within a stage must be designed to gather vital information (technical, market, financial, and so on) in order to drive down technical and business uncertainties. Each stage costs more than the preceding one, so that the game plan is one of incremental commitment. As uncertainties decrease, expenditures are allowed to mount.

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Finally, flexibility is built in to promote acceleration of projects. In order to speed products to market, stages can overlap each other; long lead-time activities can be brought forward from one stage to an earlier one; projects can proceed into the next stage, even though the previous stage has not been totally completed; and stages can be collapsed and combined.

The general flow of the typical or generic Stage-Gate process is shown pictorially in Exhibit 1. Here the five key and overlapping stages are as follows:

Stage 1. Preliminary Investigation: a quick investigation and scoping of the project.
Typically, this stage is undertaken by a very small core team of technical and marketing people; it includes the first-cut homework, such as preliminary market assessment, preliminary technical assessment, and preliminary business assessment.

Stage 2. Detailed Investigation: the detailed homework leading to a business case. Stage 2 includes market research (a user needs and wants study to identify requirements for the ideal product; competitive analysis; and a concept test to confirm purchase intent); detailed technical and manufacturing assessment; and a detailed financial and business analysis. This stage should be undertaken by a core team of marketing, technical, and manufacturing people – the beginnings of the ultimate project team in Stage 3. The deliverables from Stage 2 include a defined product (on paper: target market, product concept and benefits, and product requirements); a business justification (economic and business rationale); and a detailed plan of action for the next stages (including resource requirements and timing).

Stage 3. Development: the actual design and development of the new product. Here the development plan is implemented; a prototype or sample product is developed; and the product undergoes in-house testing along with limited customer testing (for example, rapid-prototype-and-tests with potential users). Additionally, the manufacturing process and requirements are mapped out; the marketing launch plan is developed; and the test plans for the next stage are defined. Stage 3 sees the project gain momentum, with a marked increase in resource commitment: Here the full cross-functional project team – marketing, technical, manufacturing, and perhaps quality assurance, purchasing, sales, and finance people – is in place.

Stage 4. Testing and Validation: the verification and validation of the proposed new product, its marketing, and its production. This stage witnesses extensive in-house product testing; customer field trials or trials in the marketplace; pilot or preproduction trials in the plant; and even test marketing or a trial sell. The deliverable is a fully tested product and production process, ready for commercialization. The project team and leader from Stage 3 remain accountable for actions and deliverables in Stage 4.

Stage 5. Full Production and Market Launch: full commercialization of the product. Stage 5 marks the beginning of full production and commercial selling. This stage sees the implementation of the marketing launch plan, the production plan, and the post launch activities, including monitoring and adjustment. While new members may be added to this "commercialization team" (for example, from the sales force and from operations), the core project team from Stages 4 and 5 remains in place and accountable for commercialization and beyond. There are no handoffs in this game!

Note that there are two homework stages in this process: Stage 1, a quick homework phase, and Stage 2, which provides for a more detailed investigation. The result is superb up-front homework and sharp, early product definition (goal 4). Additionally, constant customer contact and a market orientation are evident throughout all five stages: The actions outlined in goal 3 are heavily featured in the process. These actions heighten the odds of delivering a superior product with real value to the customer (goal 6). Finally, a cross-functional team approach is mandatory in order to successfully execute each stage (goal 5).

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The Gates

Preceding each stage is an entry gate or a Go/Kill decision point, shown as diamonds in Exhibit 1. Effective gates are central to the success of a fast-paced new product process:

- Gates serve as **quality-control checkpoints**, where quality of execution is the focus: Is this project being executed in a quality fashion?
- Gates also serve as *Go/Kill and prioritization decision points*. Gates provide for the funneling of projects, in which mediocre projects are culled out at each successive gate.
- Finally, gates are the points where the **path forward** for the next play or stage of the process **is decided, along with resource commitments**. Once again, quality of execution becomes a central issue.

Gate meetings are usually staffed by senior managers from different functions, who own the resources required by the project leader and team for the next stage.

Source: Stage-Gate Inc. - SG Navigator™

Figure 1. Stage-Gate Five State Innovation Process

Gates have a common format:

- **Inputs:** These are the deliverables to a gate review – what the project leader and team deliver to the meeting; they are the results of the actions of the previous stage, and are based on a standard menu of deliverables for each gate.

- **Criteria:** these are questions or metrics on which the project is judged in order to make the Go/Kill and prioritization decision. They include both qualitative (for example, strategic fit; product superiority; market attractiveness) and quantitative criteria (financial return; risk via sensitivity analysis), and can include must-meet (mandatory) as well as should-meet (desirable) criteria.

- **Outputs:** These are the results of the gate review – a decision (Go/Kill/ Hold/Recycle); a prioritization level; resource commitments and action plan approved; and date and deliverables for next gate agreed on.

In the fastest Stage-Gate processes, gate decisions are made with incomplete information: This means that the project team is given a "Go" decision, conditional on positive results occurring early in the next stage. In this way, the project is not held up, awaiting the completion of one or two tasks from the previous stage.

Understanding the critical success factors – what separates high-performing business units and winning new products from the rest – is the first step toward improving one's own performance. Overhauling your new product process, and incorporating these success factors into this Stage-Gate process, is the way many companies are now winning at new products.

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Notes

Much of this aritcle has been adapted from *Winning at New Products*, by Cooper, R.G., 3rd ed., Perseus Books, Cambridge, Mass., 2001, For the service sector see *Product Development for the Service Sector* by Cooper, R.G. and Edgett, S.J. Perseus Books, Cambridge, Mass., 2001. For other books by the authors see www.stage-gate.com

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Dr. Robert G. Cooper and **Dr. Scott J. Edgett** are founders of the Product Development Institute (PDI) and Stage-Gate Inc. (SGI). Theses two organizations are dedicated to helping companies improve their approach to product innovation and portfolio management. For more information on books and other articles, or to contact the authors, visit www.stage-gate.com .

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