

stage-gate innovation process



characteristics

author:	Cooper, Robert G.
country:	Canada
period:	1986
type:	model
role:	consultant, change agent and programme & project manager
activity:	plan, implement and reflect
topic:	innovation & risk, technology & operations and programme & project management
abstr. level:	organisation
perspective:	rational
status:	under review
module:	innovation
comments:	1

related models

diffusion of innovations
project management defined

description:

The Stage-Gate® model describes how a firm should structure its product development process using a sophisticated system of project phases and milestones. The model is based on 60 case studies on efficient product innovation processes. The product development process is seen as one of the key factors that determine the success of new products. The case studies originate from the first half of the 1980s when for the North-American industry time-to-market was the competitive challenge in light of the fast growth of Japanese competitors on their home market. Furthermore, at the time the Western world faced stagflation making the effective use of corporate resources of eminent importance.

The Canadian academic, Dr. Robert G. Cooper, professor of Industrial Marketing at McMaster University's Business School, in Hamilton, Ontario Canada, published the model in 1986. The model and related New Product Portfolio Management concept were further specified in over 100 articles and 10 books. Dr. Cooper is president and co-founder of the "Product Development Institute" that markets and sells these two products under the registered trademark of Stage-Gate.

The Stage-Gate model sees product innovation as a clearly defined process. The model's objective is to increase the quality of product innovation by focusing on the process rather than the product. By subdividing the process into sequential phases, overview can be maintained and when necessary corrected. The result is that products get as fast as possible to market by eliminating unnecessary activities. Managing issues at an early stage maximize the chances that a product becomes a commercial success.

Stage-Gate consists of a number of:

STAGES

where the innovation process is sub-divided into a number of stages or periods where work is performed - preferably by multidisciplinary product development teams.

GATES

the gates or mile stones consisting of a set of specified deliverables and criteria that are placed as quality control checkpoints between each of the gates.

A progress review in the form of a gate has as output a decision (go forward, kill the project, put the project on hold or redo the current stage) and a clear path forward for the next stage. Before starting a new stage, a project plan needs to be approved and a date for the next gate meeting needs to be set. Also, the deliverables for the next gate meeting need to be agreed upon.

As a product moves through its development process towards market launch, each concurrent phase will require more resources from the organisation. But because the insight in the risks becomes greater with the passing of each stage, the risk of the product innovation project as a whole is reduced. When multiple innovation projects run concurrently, portfolio planning can be applied. High risk projects can still be chosen if they just slightly increase the risk of the entire portfolio.

Stage-Gate systems consist of between four to seven stages and gates depending on the organisation's particularities. Cooper's model assesses five stages:

1. SCOPING

a quick-scan of the project's technical merits and market prospects.

2. BUILD BUSINESS CASE

the critical paper based stage that can make or break the project. Technical, marketing and business feasibility are assessed and result in a business case with three main components: product and project definition; project justification; and a project plan.

3. DEVELOPMENT

the business case plans are translated into concrete deliverables. The product development activities occur, the manufacturing or operations plan is drawn up, the marketing launch and operating plans are developed, and the test plans for the next stage are defined.

4. TESTING & VALIDATION

provide validation of the entire project: the product itself is evaluated as is the production process, customer acceptance, and the financial merit of the project.

5. LAUNCH

full commercialization of the product - the beginning of full production and the commercial market introduction.

Cooper's Stage-Gate model provides larger, product based organisations useful tools for coordinating and optimising their product development activities. The underlying assumption is that this kind of organisation does not lack new ideas, but rather the means to achieve their objectives. Corporate innovation power is increased by providing focus in their product innovation activities.

assets:**stage-gate process**

ProvenModels • editor PM • version 0.1 • 105 KB

**stage-gate scorecard**

ProvenModels • editor PM • version 0.1 • 225 KB

pros:

- Efficient organisation of product development. This includes visibility to management, cost control and sophisticated risk management. Most companies have too many projects and not enough resources to do them well. This model helps evaluate projects at a regular interval and terminate projects using a set of explicit criteria.
- The model assesses product development from a project perspective, focusing on phased cost-benefit analysis and systematic prioritization of resources. This rational approach matches with third generation innovation processes as defined in Rothwell's 5 Generations of Innovation. Third generation models try to align R&D and marketing activities in a rational way.

cons:

- The Stage Gate model is linear while many product development processes allow for parallel and iterative flows. The Go/NoGo decisions at each of the Gates enforcing the model's linearity focus on direct market success, but neglect indirect effects such as knowledge creation, cyclic innovation processes and the impact on the wider business ecosystem. Nevertheless, Cooper underwrites the efficiency of a parallel approach and claims that his method supports this.
- Because the model is based on a rational perspective, it overlooks that organisations are political arenas as well where less than optimal deals are struck from a financial/business perspective.
- The importance of the innovation process for a product's commercial success depends on the product's newness. The market characteristics, organisational capabilities, product characteristics, marketing mix and quality of available information are the other factors that need to be considered.
- The model does not include idea generation and creativity. In fact, the model's emphasis on structure and process may even limit out-of-the box thinking. The integration with project risk management seemed a pragmatic relation, but organisations can end in sub-optimal situations from too much focus on effort. As Schumpeter already mentioned, revolutionary innovations almost never happen at the industry's big players.
- Another shortcoming of a process made up of stages and gates is that they tend to force fundamental project decisions to be made prematurely. In a quickly changing market, a phased approach can be applied, but then one needs to steer on time rather than on result/scope increasing the product development project's risk profile.

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