CHAPTER 11
Managing the New Product Development Process

SYNOPSIS OF CHAPTER
For the new product development process to be successful, the objectives of maximizing fit with customer requirements, minimizing time-to-market, and controlling development costs must be achieved. This chapter overviews some of the best practices for improving both the effectiveness and efficiency of new product development. First, many firms have succeeded in reducing costs and shortening development time by using a parallel development process instead of a sequential process. Including all functions in the process and anticipating project needs reduces the need for costly and time-consuming iterations. Second, the new product development process can also be improved by involving customers or suppliers in the design process, and by using project champions. Third, firms can utilize tools such as stage-gate processes, quality function deployment, design for manufacturing and CAD/CAM systems. Finally, firms should measure their performance at new product development to identify opportunities for improvement. While the role of new product development teams is also extremely important to the new product development process, the richness and complexity of that discussion warrants covering them in a separate chapter -- the constitution and management of new product development teams is covered in Chapter 12.

LEARNING OBJECTIVES
1. Explain the three objectives new product development projects must achieve in order to be considered a success: maximize fit with customer objectives, minimize time-to-market, and control development costs.
2. Compare the strengths and weaknesses of “best practices” used in managing the new product development process.
3. Employ the metrics used to evaluate new product effectiveness and innovation performance.
CHAPTER OUTLINE

I. Overview
   A. While successful new product development is one of the key factors in firm success, the high failure rate for such projects underscores the importance of identifying the most effective process for managing new product development.
   B. Key objectives of the new product development process are maximizing fit with customer requirements, minimizing cycle time, and controlling development costs.
   C. The means by which these objectives may be accomplished include adopting parallel development processes, using project champions, involving customers and suppliers in the process, and using tools that may improve the process include a Stage-gate process with Go/Kill decision points, design targets with Quality Function Deployment, Design for Manufacturing and CAD/CAM systems, and assessing process performance.

II. Objectives of the New Product Development Process
   A. Maximizing fit with customer requirements requires knowing which features are most important to customers, what a customer is willing to pay, and how to resolve competing customer desires.
      1. Apple’s Newton Message Pad and Philips CD-i are examples of products that were well designed with excellent features, but failed to meet customer expectations. Newton’s size made it untenable as a handheld device and, at twice the price of alternative game systems the CD-i’s cost outweighed the value in customer’s minds.
      2. Minimizing development cycle time can afford a firm the opportunity to be first to market with a new product (i.e. better opportunity to build brand loyalty, capture scarce assets, build customer switching costs, and develop complementary goods). A shorter development process is also required to minimize costs (including providing a longer period of time over which to amortize costs).
      3. Controlling development costs is also important because even if products are a good fit with customer requirements and are brought to market quickly, if development costs are uncontrolled the firm will have a difficult time recouping its expenses.

III. Sequential versus Partly Parallel Development Process
   A. Prior to the mid-1990’s, most businesses conducted development in a sequential process; with a decision-making “gate” at the end of each step where managers would determine if the process should continue, be revised or stopped. Working this way often resulted in multiple product revisions and lengthy cycle times.
B. In a partly parallel development process the development states overlap, both shortening overall cycle and enabling developers to communicate requirements in the next phase. There are some disadvantages, however, to partly parallel processes. If later stages proceed too early, it is possible that the project will have to be reworked if design features are later revealed to be ineffective.

IV. Project Champions

A. Assigning a senior executive to champion a new product development project can shorten cycle time and ensure that the product attributes match customer requirements by facilitating the allocation of resources to the project and by ensuring proper communication and cooperation among the different functional groups needed on the project.

1. Zantac’s project champion was able to gain approval for a change in the testing process that ultimately enabled Glaxo Holdings to bring the product to market in half the normal time and capture the number one spot for this type of drug.

B. Risks of Championing include the loss of objectivity by the project champion that can result in an inability to admit when a project has no future and if the champion occupies a senior level position in the organization others may be reluctant to express their true thoughts regarding the value of the project. To counteract these risks, firms may create the role of “anti-champion” to play devil’s advocate.

C. Stephen Markham and Lynda Aiman-Smith identified five myths about product champions.

1. Projects with champions are more likely to be successful in the market. Empirical data indicates projects with champions are just as likely to fail as to succeed in the marketplace.

2. Champions get involved because they are excited about the project, rather than from self interest. Champions are more likely to choose projects that will benefit their own department.

3. Champions are more likely to get involved with radical innovation projects. Incremental projects are championed just as often as radical developments.

4. Champions are more likely to be from high (or low) levels in the organization. Champions are equally likely to come from all levels of the organization.

5. Champions are more likely to be from marketing. Champions may come from many functions.

D. It is worth noting to students that while Stephen Markham and Lynda Aiman-Smith observed that champions are equally likely to come from all levels of the organization, many of the advantages arising from using a champion are linked to the champion’s seniority (e.g., access to resources, ability to communicate well
with multiple parts of the organization, sustain momentum in the face of resistance, etc.)

V. Involving Customers and Suppliers in the Development Process

A. Involving customers and suppliers in the development process may ensure that products fulfill customer performance/price requirements, and help control costs while speeding up development.

1. **Involving customers** often involves *beta testing* early version of a product by customers to get early feedback. Reliance on “**lead users**” (i.e. those who often recognize a need in advance of the general market) may more effective and practical than relying on a random sample of users.

2. **Involving suppliers** can improve the new product development process by sourcing information regarding *alternative inputs* and by improving coordination between the firm and its suppliers that should result in the **timely availability of inputs**. Evidence shows firms that involve suppliers produce new products in **less time**, at **lower cost** and with **higher quality**.

VI. Tools for Improving New Product Development Process

A. The **Stage-Gate Processes** applies a tough multi-functional review at the end of each stage of the design process to ensure that only those projects demonstrating increasing certainty with regard to success move forward. Prior to moving to the next stage the project must clear a **Go/Kill gate** at which three components are reviewed: **deliverables** (i.e. results of the previous stage and inputs for the review), **criteria** (i.e. questions or metrics used to make Go/Kill decision) and **outputs** (i.e. results of the gate review process). This is important since risks and costs escalate as a project proceeds.

1. **Quality Function Deployment** or the “**House of Quality**” was developed in Japan as a comprehensive process for **improving communication and coordination** between engineering, marketing and manufacturing personnel. The house of quality **maps customer requirements and product attributes** and provides a **common language and framework**, through which teams can understand the **relationship between product attributes and customer requirements**, identify **design tradeoffs**. highlight the competitive shortcomings of existing products and identify the steps to improve them. Steps in the process are as follows:

2. **Identify customer requirements**.

3. **Weight customer requirements** in terms of relative importance to the customer.

4. **Identify engineering attributes** that drive product performance.

5. **Enter correlations** between the different engineering attributes to assess the degree to which one characteristic may positively or negatively affect another.
6. **Complete the body of the matrix**, indicating the relationship between an engineering attribute and a customer requirement.

7. **Calculate the relative importance of each engineering attribute** by multiplying the customer importance rating by the feature’s relationship to an engineering attribute.

8. **Evaluate the competition** by rating their success in meeting customer requirements.

9. **Determine target values** for each design requirement by comparing the relative importance ratings (step vi) to the competitor’s score (step vii).

10. **Evaluate the new design** by assigning a score measuring how well the design meets each customer requirement.

B. **Design for manufacturing** ensures that **issues of manufacturability** are considered **early in the design phase**. It is usually done by engineering and manufacturing **agreeing on a set of design rules**. When the rules are followed, products are easier to manufacture, development cycle time is shortened, costs are reduced and quality increases, all with a concurrent increase in customer satisfaction.

C. Computer Aided Design (CAD)/Computer Aided Manufacturing (CAM) enable engineers to build a “**virtual**” **prototype** of a new product that is much less expensive and faster than building actual prototypes. Computer aided manufacturing utilizes machine-controlled processes to increase flexibility and speed.

VII. **Tools for Measuring New Product Performance**

A. While the means used to conduct an assessment may vary, many firms use some means of **evaluating the new product development process** in order to **identify which projects met their goals** and why, and to **benchmark performance** against competitors or historical experience. Results of the assessment are used to improve resource allocation, employee compensation and to refine future innovation strategies.

B. **Multiple measures** must be used so the result is not skewed by the vantage point of a particular measurement. Also, it is essential that the assessment be viewed within the **context of reasonable expectations** for a firm in the same industry, the firm’s strategy and other environmental circumstances.

C. **New product development process metrics** include:

1. What was the **average cycle time** (time to market)? How did this vary for projects characterized as **breakthrough, platform** or **derivative**?

2. What **percentage** of development projects undertaken within the last five years **met all of most** of the **project deadlines, stayed within budget and resulted in a completed project**?

D. **Overall Innovation Performance** measures include:
1. What is the return on innovation (i.e. ratio of firm’s total profits from new products to total expenditures, including R&D, retooling and staffing production facilities, and initial commercialization and marketing)?

2. What percent of projects achieve sales goals?

3. What percent of revenues are generated by products developed within the last five years?

4. What is the firm’s ratio of successful projects to its total project portfolio?