



BRINGING NEW PRODUCTS TO MARKET SPEEDILY

To accelerate the new product development process, managers need to understand why faster product development is critical and why new product introductions are usually delayed. In a survey conducted by the authors, new product development managers describe their problems and offer suggestions for accelerating new product development.



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The competitiveness of the US in global markets has declined steadily because the US has been sluggish in turning technological innovations into new commercial products. Both the pressure to develop new products and the uncertainty associated with development are increasing. More than ever, companies now realize that their worldwide competitiveness depends on their ability to develop and market new products quickly.

For example, the following companies have evaluated and accelerated their new product development programs:

- Allen-Bradley, a unit of Rockwell Corp, abandoned its sequential method of developing new

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- industrial control systems and implemented a parallel method in which the company's various functional departments work together—The company reduced the time to develop new electrical contactors from six years to two years.
- Honeywell Inc, until recently, required about four years to design and build a new thermostat—When a customer complained and threatened to go to a competitor, Honeywell established a team of marketing, design, and engineering employees and gave it full development decision responsibility. The team delivered the thermostat in one year.
- Xerox Corp had strangled itself with a matrix organization in which no one person was responsible for getting products to market—Xerox now develops new copiers faster by using product synthesis and crisis teams and involving suppliers in the design process. Xerox has cut the resources and the time it needs to develop comparable products by 50% within a few years.
- Apple Computer established a rigorous schedule of product review meetings to help speed new product development—Engineers, marketing personnel, and senior managers are involved early in new product development, which reduces project cancellations.

- Compaq Computer Corp is fast in developing new products because it believes in doing things right the first time—The company relies, in part, on strategic and detailed business planning.
- IBM, 3M, and Monsanto have established quasi-independent units in order to penetrate markets faster.

Slow product development can prove costly: a model developed by McKinsey & Co shows that high-tech products that come to market six months late but on budget earn 33% less profit during a five-year period than if they were introduced on time. In contrast, bringing products to market on time but 50% over budget cuts company profits by only 4%.¹ Companies with short product development cycles enjoy a tremendous competitive edge; not only can they charge a premium price for their innovative products, but they incorporate more up-to-date technology in their goods and respond faster to emerging market niches. The bottom line is that companies with short product development cycles often outperform companies with longer development cycles.



Companies with short product development cycles can charge a premium price for their innovative products and can respond faster to emerging market niches.

This article describes the results of a study of the new product development process in 12 large technology-based US companies that are known for their active new product development programs. The industries represented in this sample produce electronics, information processing, instrumentation, ceramics and glass, and air-conditioning products. A survey was mailed to managers and technologists from R&D, marketing, engineering, and manufacturing who are involved in developing new products; 80 responded, and 38 were interviewed personally thereafter.

WHY COMPANIES NEED TO ACCELERATE NEW PRODUCT DEVELOPMENT

When asked if their respective companies (or divisions) felt the need to reduce the development time for new products, 88% of the survey respondents said yes. In fact, 87% said that the pressure to develop more new products had increased recently. The respondents believe it is important to strike a

balance between getting the product out early and getting it out too early. Their reasons for accelerating new product development (and the percentage of respondents with this reply) included:

- Increased domestic and global competition (42%).
- The rapid rate of technological innovation (29%).
- Market demand—Customers demand that new products be developed quickly (11%).
- The need to meet corporate growth objectives (11%).
- Shortening of product life cycles—A combined effect of rapid technological change, competitive activities, and changing market requirement (8%).
- Pressure from senior management to speed product development (8%).
- A desire to be first in an emerging market (5%).

One respondent said:

Markets develop, change, and disappear faster with improving technology. The fact that new materials and processes are being developed at an increasingly faster rate demands that we be alert and receptive to using them in new ways, or someone else will.

WHY NEW PRODUCT DEVELOPMENT IS DELAYED

Despite the pressure to develop more new products more quickly, the reasons for past new product development delays persist in 87% of the companies surveyed. Several reasons for development delays were identified as:

- Poor definition of product requirements (71%).
- Technological uncertainties (58%).
- The lack of senior management support (42%).
- The lack of resources (42%).
- Poor project management (29%).
- Other reasons (21%).

These reasons are discussed in detail in the following sections.

Poor Definition of Product Requirements

Poorly defining a product was cited as the main reason for product development delays. Approximately 71% of the respondents said that delays result from a poor understanding of:

- Customer requirements.
- The technology behind the products.
- The market forces shaped by competitors, suppliers, and distributors.

Frequent changes in the product development and

marketing plans contribute to delays. Poor intergroup relationships add to the difficulty of defining product requirements. One respondent described this problem as:

Changing product requirements cause more delays in product development than anything else. Nobody has a perfect crystal ball that can tell us exactly what the future requirements are, but I think many times we have inaccurately or hastily set the requirements and regret them later.

Early integration of the R&D, engineering, manufacturing, and marketing departments, with input from suppliers and customers, helps develop clear product requirements. It also boosts the commitment of various interfunctional groups toward developing a new product, thus saving time and money.

Technological Uncertainties

Approximately 58% of the respondents cited technological uncertainties as a major reason for delays in new product development. The desire to incorporate newly available technology during a product's development cycle can contribute to serious delays. Other technological uncertainties include:

- Whether the newly available technology will be compatible with existing product components.
- Whether the incorporation of new technology will affect the company's ability to make incremental product innovations.
- Whether the incorporation of new technology will increase the product's marketability.
- Whether the quality and reliability of the new technology can be ensured.
- How quickly the new technology can be developed or acquired.

The Lack of Senior Management Support

Approximately 42% of the respondents said senior management's lack of support of new product development projects led to delays. Management's unrealistic expectations, short-term orientation, risk averseness, lack of strategic thinking, and unwillingness to learn from past failures caused further delays. Senior management can play an important role in establishing a favorable climate for innovative new product development programs.

The Lack of Resources

Approximately 42% of the respondents cited the lack of resources committed to new product development as an important reason for delay. In part, this problem is attributable to senior management's

lack of support for innovations. Several respondents said that their management only gave lip service to innovation. Inexperienced people were often assigned to work on innovative projects, and resources were withdrawn to slow the progress.

Poor Project Management

Approximately 29% of the respondents attributed development delays to their company's poor project management. Projects in these companies had the following problems:

- Inadequate monitoring of the project's progress.
- A lack of control systems.
- Uninspired teamwork.
- Complexity in organizational structures.
- Ambiguously defined participant roles.

Why Product Development Delays Are Difficult to Overcome

Often, those involved in product development do not understand the problems that cause delays. In addition, they are often unaware of the delays because of ineffective communication channels, or they initially assign low priority to what might later become a revolutionary new product. Risk-averse managers who allocate inadequate resources to new product development programs add to the difficulty of overcoming delays, and no effective means exist to assess the impact of delays on a product's commercial performance.

OTHER PROBLEMS THAT OBSTRUCT NEW PRODUCT DEVELOPMENT

Managing a technological innovation is complicated because it involves the effective integration of people, organizational processes, and plans. Those involved in new product development were primarily concerned by several problems that they typically experience during the development process. These problems are described in the following sections.

Unresponsive Management and Organizational Structure

Approximately 53% of the survey respondents were concerned about their organizations' willingness to take steps that would facilitate innovation efforts. Bureaucratic red tape, organizational inertia, and risk averseness and conservatism hampered new product development efforts. Often, organizations did not have the right mix of people to effectively carry out new product development.

A Lack of Attention to Detail

Approximately 47% of the respondents were frustrated by their companies' lack of attention to detail during the product development process. This problem is reflected in poor-quality market research, frequent changes in product requirements, decisions made without forecasting their effects, and the inefficient use of resources.

Limited Support for Innovation

Senior management often wants innovation but may not commit such needed resources as time, funds, and people to make the innovation happen. Approximately 32% of the respondents were frustrated by watching worthless pet projects garner support while important new products remained neglected. Many were unable to work on new, potentially important projects and watched as key people were taken away from major projects and reassigned to marginal projects.

A Lack of Strategic Thinking

Approximately 18% of the respondents were frustrated by senior management's lack of strategic thinking. They described their frustration in various ways:

- "Management is busy fire-fighting."
- "No one sees the big picture."
- "The company lacks focus."
- "Management has a pigeon-hole mentality."
- "Functional groups work in isolation."
- "Management is not seeing that competition is emerging from several unrelated industries."
- "Senior management's timeframe is too short. They only look 30 days down the road. They don't even want to tell you how much money you have for the year. They cannot grasp the level of risk, the timeframe, and the uncertainty that is basic to new product development."

A lack of strategic thinking was also a concern at the functional level. About 58% of the survey respondents expressed concern at the low priority given to new product development efforts by functional groups. Functional departments seemed to be too busy solving the more routine product-line problems. The survey respondents cited the following ways that functional groups can delay new product development:

- The failure to give priority to new product development programs (58%).
- Continually changing product requirements (58%).
- Poor intergroup relationships (34%).
- Slow response to requests (26%).

Developing products quickly and successfully requires teamwork as well as support from senior management. Senior management can help remove unnecessary restraints that block teamwork and create a favorable climate for new product development.

Poor Manufacturing Capabilities

Approximately 16% of the respondents had concerns regarding the adequacy of their organizations' manufacturing facilities; they cited such problems as the unavailability of proper tools; inadequate plant facilities; unrealistic and noncompetitive production times and costs; and outdated manufacturing facilities. One company that recognizes this problem is Intel—to accelerate product development, Intel puts manufacturing high on its priority list, on a par with technological leadership, customer service, and human resource development.²

FIVE WAYS TO ACCELERATE NEW PRODUCT DEVELOPMENT

When the survey respondents were asked how the new product development process could be accelerated in their companies, they agreed on five primary suggestions, as detailed in the following sections.

Make Sure Senior Management Is Actively and Visibly Committed

Senior management was ascribed a pivotal role in providing strategic vision, resources, and a sustained commitment to product innovation. Several respondents said that the Japanese are leaders in new product development because they back their programs with a clear commitment of resources. In innovative US companies (e.g., 3M and Corning Glass), support for product and process innovation programs comes directly from the CEO's office.

Poorly defining a product was cited as the main reason for product development delays.

The respondents emphasized the need for senior management to balance short-term operating demands with long-term innovation needs, to insist on better allocation of R&D efforts and resources, to streamline decision-making, to reduce the number of approvals needed, and to be less risk averse. Senior management support was recognized as the greatest contributor to a shorter product development cycle. Management commitment in terms of financial and personnel resources were viewed as crucial. Some

respondents stressed the need for management to be aware of potential problems in the product development process and to encourage innovation effectiveness programs and innovation audits.

Involve Functional Groups Early

New product development is a complex, iterative process requiring input from various functional groups with divergent viewpoints and priorities. Coordinating the efforts of these functional groups is key to successful new product development. According to 40% of the respondents, such groups as R&D, marketing, engineering, and manufacturing should be involved early in new product development in order to accelerate the process. Interdepartmental communication could be promoted through job rotation, regular joint review meetings, seminars, joint customer visits (by R&D, engineering, manufacturing, and marketing personnel), social interactions, and through the physical proximity of work places.

For example, every five years or so, Phillips NV moves its researchers out of its labs into other functional departments. Such a strategy helps other departments to appreciate research, and it prevents researchers from being viewed as isolated in the company. Researchers are later sent back to their labs, where they better appreciate the company's profit motives.³

Adopt a New Work Style

About one-third of those surveyed suggested that their organizations should adopt a new work style. The new style should feature:

- Increased use of new communication technology for information processing and project management.
- Increased use of multiple approaches to problem solving.
- A greater sense of urgency.
- Parallel execution of product development tasks.
- A flexible and more informal work environment, where priority is given to informal communication, not just to formal memos and reports.

Conduct Early Market and Technical Testing

Ensuring that a product fits the customers' needs is important to avoiding development delays. Approximately 25% of the survey respondents emphasized the need to test the product concept early, and they insisted on continual testing. The need to involve customers early in the product testing and evaluation phase was also stressed.

Establish an Effective Organization for the New Product Development Group

Many respondents suggested that companies need to replace weak matrix approaches with strong product champions. One respondent expressed his disenchantment with the matrix system this way:

We've parted from the pure matrix approach to one in which projects are often run in a single organizational group. This simplifies the overall coordination of people. Conceptually, matrix management works when you try to coordinate one project, but when you try to coordinate numerous projects at the same time it becomes a monumental task.

The survey respondents emphasized the importance of building teams for new product development. They suggested that team membership should be guided by voluntary compliance, not by edict. The importance of a product champion was stressed this way:

The best way to overcome many new product development obstacles is to have a strong champion. The champion should be allowed to pick the members of the team—People who will identify with, work with, and who will live the project. We need fewer people involved in each team, and we need to give them more authority and ownership.

CONCLUSIONS AND THEIR IMPLICATIONS

The survey results suggest that product development delays can be reduced and that new products can be developed faster. Unfortunately, most of the reasons that have traditionally delayed new product development in companies continue to exist. This is both surprising and disturbing. There is a strong need to rethink the process. The survey identified many factors that have a significant impact on the performance of the development process in terms of its speed, cost, flexibility, product quality, differentiation, profitability, and customer value and satisfaction. These factors, derived from both the problems cited and the suggestions provided by the survey respondents, can be grouped into the four major categories described in the following sections.

Senior Management Support for New Product Development

As noted by the survey respondents, the support of senior management is essential to successful new product development. Such support helps new product development teams deal with uncertainties, and it gives new product development a high prior-

ity in the company. Senior management can make its support more visible by:

- Allocating sufficient resources to new product development.
- Allowing time for informal, off-line projects.
- Balancing the short- and long-term needs of the business.
- Providing strategic vision for new product development projects.
- Maintaining open channels of communication with people involved in new product development.
- Streamlining the decision-making processes and delegating authority to product development personnel.
- Setting up visits between product development groups and the company's customers and suppliers.
- Holding progress review meetings with the product development team.

Early Integration of Functional Expertise

Another key implication of the survey is that R&D, marketing, engineering, and manufacturing need to be involved early on with customers, suppliers, and distributors during the product development process. Such an integrated effort would help in:

- Forecasting the product launch environment.
- Understanding the customer requirements, technical feasibility, manufacturability, and marketability of the product.
- Assessing the market potential of new products.
- Communicating changes in the product requirements in a timely manner.
- Achieving trust and commitment from functional group members to enhance communication with the product development team.
- Developing a sense of urgency within functional groups, thereby reducing interdepartmental response time.
- Testing product concepts early.
- Avoiding false starts.
- Enhancing organizational learning.

Availability and Effective Management of Resources

The survey respondents stressed that successful product development required the right people and the right facilities, tools, manufacturing capabilities,

and technology. The effective management of product resources is essential for speedy new product development. Resource management involves:

- Assessing resource requirements early.
- Identifying the sources of these resources.
- Determining the adequacy of existing manufacturing, designing, and testing facilities.
- Monitoring project schedules closely.

Organizational Environment that Supports Teamwork

The fourth major implication of the survey focuses on how well the new product development team is able to carry out its responsibilities. Teamwork can be facilitated by:

- Training and coaching personnel for product development assignments.
- Arranging the group to facilitate team spirit (e.g., by reducing physical separation between key groups involved in product development).
- Rewarding teamwork and individual performance.
- Encouraging teams to identify, capture, and transfer their experiences to other product development teams.

During the 1990s, speed is the name of the game. Companies cannot afford to nurture second-rate new product development efforts. To gain a global competitive edge, accelerating the development and introduction of new products in the marketplace must become a top priority, especially for companies whose products have short life cycles. The holistic approach to new product development described in this article should help bring products to market sooner. ■

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Notes

1. "How Managers Can Succeed Through Speed," *Fortune* (February 13, 1989), pp 54-59.
2. *Intel Corporation Annual Report 1988*, Intel Corp internal publication, p 25.
3. "Enough With the Theory—Where's the Thingamajig?" *Business Week* (March 21, 1988), pp 154-158.