

Management of New Product Development — MS&E 266

Department of Management Science and Engineering

Winter Quarter 2003

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Case Summaries and Questions

Understanding User Needs

Case: SweetWater

Read: Understanding User Needs

During a backpacking wilderness vacation, Sandy Platter became discouraged with the state of the art in water purification devices. Platter, a successful designer and entrepreneur from the computer peripherals industry, soon became involved in attempting to design an improved product. Early on, Platter recognized the importance of assessing user needs as a step in the product design process.

Questions

1. From your point-of-view, what are the most important user needs in the water purification market?
 2. Using the Kano structure, assign these users needs to the categories (1) Must Have, (2) Linear Satisfier, (3) Delighter, and (4) Indifferent.
 3. How well do the First Need and Pocket Filter products meet these needs?
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Linking Strategy and Innovation: Materials Technology Corporation

Case: Linking Project Selection to Strategy

Read: Creating Project Plans to Focus Product Development

Materials Technology Corporation (MTC), a high-tech materials company, is struggling with its product development portfolio and also to achieve a better record of delivering new products on schedule. There seems to be no linkage of strategy to the selection and funding of new product development projects. There is also a significant problem in determining how many projects the organization can undertake concurrently.

Questions

1. How would you characterize the various projects MTC has undertaken in the framework proposed by Wheelwright and Clark?
2. Is this the right set of projects for MTC?
3. How many projects does MTC have the capacity to have underway at a given point in time?
4. If you were advising Spencer Quinn on how to build MTC into a successful company, what would you tell him?

Additional Information

Of the projects listed in Exhibit 4 of the case, MTC has designated three projects as process platform projects. They are Microstrates, Multi-layer stellar sensor, and Turbine engine rotor.

Working With Lead Users
Case: Innovation at 3M Corporation (A)
Read: Note on Lead User Research

A team from 3M's Medical-Surgical Markets Division introduces and learns a new and innovative methodology called Lead User Research to understand future customer and market needs. In applying this methodology, the team discovers not only new product concepts but also a very promising new business strategy. A decision must be made as to whether to recommend to top management that this new strategy should replace the current strategy, which up to now has been quite successful.

Questions

1. How would you characterize 3M's innovation process and its evolution since the company was founded?
 2. Has the Medical-Surgical team applied the Lead User Research process successfully? Why or why not?
 3. What should the Medical-Surgical Lead User team recommend to Dunlop? What are the risks to the Lead User process at 3M? To the Medical-Surgical business unit?
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Disruptive Technology
Case: Hewlett-Packard: The Flight of the Kittyhawk
Read: Disruptive Technologies: Catching the Wave

The Kittyhawk project team was charged with developing and introducing to the marketplace a revolutionary 1.3-inch disk drive — the smallest drive ever developed prior to 1991. Management of the Disk Memory Division (DMD) created a heavyweight project team and co-located its members in a separate facility. The marketing members of the Kittyhawk team went to extraordinary lengths to understand the potential markets for the Kittyhawk, and listened to leading customers wherever it could find them. Yet the Kittyhawk was not commercially successful.

Questions

1. What would you rate as the strengths and weaknesses of the way H-P Structured and supported the Kittyhawk development team?
2. What do you think of the way the team set out to find a market for the Kittyhawk? What correct turns and what wrong turns did they make?
3. What do you think are the root causes of the failure of the Kittyhawk project?

Note:

This case was originally disguised. There still remain some misidentifications in the company and one of the divisions. When the text reads “Columbia Instrument”, it means “HP”; and when the text reads “Austin”, it means “Corvallis”.

Managing the Engineering-Manufacturing Interface Process

Case: Plus Development Corporation (A)

Although not all general managers agree that manufacturing has a strong competitive role to play in their organization, they do tend to agree that new product development has such a role. We will explore the relationship between the manufacturing function and the engineering function and particularly between product and process development and their support of one another. Plus, a subsidiary of Quantum Corporation, is developing a 10 MB version of Hardcard, a hard disk drive on an expansion board for use in the IBM PC. The product and process are under development by Plus in partnership with JEMCO, a Japanese company. Plus is responsible for product design, marketing, and distribution; and JEMCO is responsible for process design and manufacturing.

Questions

1. What is different about the way the Japanese partner approaches product and process development and the way Quantum approaches development? (You might contrast the traditional Quantum approach to product development with that being presumed and encouraged by JEMCO.)
 2. How far behind schedule do you think the current development effort is?
How important is it to stay on schedule on such a product development effort?
What should Plus do?
 3. Longer term, what does Plus bring to the development effort and the business?
What does JEMCO bring? Does the partnership provide the foundation for a viable, long-run competitive advantage? To whom? Why?
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Leading the Product Development Process

Case: We've Got Rhythm! Medtronic Corporation's Cardiac Pacemaker Business

The founders of Medtronic were the pioneers of the implantable pacemaker technology in the 1950s, and the company they founded quickly grew to dominate the cardiac pacemaker market. The company's market share eroded from about 70% in the early 1970s to below 30% in 1986. This skid was due primarily to the way the company's executives managed the process of defining and developing new products. In 1987 new management took over the product development process in one of Medtronic's component divisions. The discipline imposed on this process led to a remarkable rebound.

Questions

1. What were the key root causes of the difficulties that Medtronic faced in 1986?
Which of the improvements in the product development process were the most crucial in turning the company around?
2. What are the pros and cons of the "train schedule" concept implemented by the Medtronic management team?
3. What was done to remove uncertainty from the product development process?
4. What are the building blocks of the new process?

Market Selection Strategy

Case: Disruptive Technology a Heartbeat Away: Ecton, Inc.

Ecton is a startup which develops imaging machines. Their compact Doppler echocardiography instrument is small, cheap, and portable; but it cannot create images as clear as those that large expensive instruments can make. Michael Cannon, the president, is searching for a market for this product. Cannon's original plan was to position Ecton to be acquired since it currently has no capabilities in marketing, sales, and production. However he is concerned about whether an acquisition would be best for the investors and for the founding team.

Questions

1. How does the Ecton machine differ from the existing technology in the market?
What characteristics/applications does it have that are similar to the conventional machines?
What characteristics/applications are different?
 2. Where is Ecton positioning itself in the current ultrasound imaging marketplace?
Is it a sustaining or disruptive technology?
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A Product Development Process to Get New Technology to the Market

Case: alphaWorks: IBM's Technology Talent Agents

Read: Product Platforms in Software Development

AlphaWorks has catalyzed IBM researchers and offered them a new path to take technology to market. With success, though, comes new organizational challenges. Chris Bahr must recommend a plan for alphaWorks that addresses the short-term, the medium-term, and the long-term in the face of some resistance to the very concept of alphaWorks. Possibilities include extending alphaWorks to all IBM labs, refocusing, or shutting down its operation as a separate entity.

Questions

See questions at the end of the case.

A New Product Leads to a New Business

Case: Inktomi: Scaling the Internet

Inktomi invented the world's first truly scalable architecture for the internet. This core technology provides a platform for a variety of innovative applications. Just seven months after its founding, a decision must be made about whether or not to enter a second business. This new web caching business would require a different business model, different capabilities, and a different organization than its core search engine business.

Questions

1. What made Peterschmidt's job of implementing a different product development process easy?
What made it difficult?
2. What are your primary reservations about entering the network caching business at this time?
3. What decision would you advise Peterschmidt to make? Support your recommendation.

Dealing With Uncertainty

Case: Product Development at Dell Computer Corporation

Read: Agile Product Development: Development Flexibility in Uncertain Environments

Read: Developing Products on “Internet Time”: The Anatomy of a Flexible Development Process

Following a major product setback and a significant decline in firm profits in 1993, Dell redesigned their new product development process. In developing a new line of portable computers, Dell would like to incorporate long-life lithium ion batteries. However this would be a risky course because Sony is not yet able to reliably produce these batteries in volume. One possible way of managing this risk is to provide product design flexibility for the early part of the development process. An important question is whether or not this flexibility is worth the additional cost.

Questions

1. What are the competitive forces shaping the computer industry in 1993?
 2. Why has Dell's senior management introduced the new 18-month development process?
What are they trying to change or improve?
 3. Should the Holliday team stick with the proven NiHi battery technology, go with the new LiOn technology, or defer the decision until the qualification phase review?
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Experimentation and Integration

Case: Team New Zealand (A)

By the 1990s, the America's Cup had become as much a competition among high-tech boat designs as it was a test of the world's best sailors. The resulting spiraling costs caused the organizing committee to limit each team to two boats in the 1995 competition. Significant advances in computer-aided design programs and computer speed had enabled many syndicates, for the first time, to make use of simulation in their development process. It was a challenge to strike a balance between the use of simulation and the use of traditional experimentation methods.

Questions

1. How would you evaluate Team New Zealand's use of simulation in the design process?
How did their approach to simulation differ from that used by other syndicates?
2. What decision should Doug Peterson make regarding the design and timing of the second boat?

Responsiveness in Extreme Environments

Case: Living on Internet Time: Product Development at Netscape, Yahoo!, NetDynamics, and Microsoft

Four organizations successfully compete in an internet environment by emphasizing rapid cycles of experimentation and rapid integration. This extreme environment places a premium on flexibility, speed, and responsiveness. Their approaches leverage the power and speed of the internet, using it both as a medium for managing projects and a way of integrating with customers.

Questions

1. What are the similarities and differences between the four approaches to product development? What drives the the differences?
2. A friend has come to you with a great video game idea. The game would be aimed at high school and college students, and would allow them to play with or against each other on the internet. Your friend has experience in writing software for complex games such as this, but would like your help in designing a process for taking this idea to market. You decide to accept this challenge. Assume that you have funding to hire enough (about six) software developers, and any equipment you might reasonably need.

You should specify a sequence and the relative timing of project phases and milestones, as well as any specific methodologies that you think you should use.

Challenges for the Future

Read: The R&D Challenges of the 1990s

In the early 1990s, comparative studies were made in an attempt to determine how the Japanese were able to make such great strides in computers and computer-related products. In fact, they took over leadership from the U.S. and Europeans in a number of areas. In processors for large computers they exhibited a substantial lead in two critical measures of effectiveness in new product development — engineering productivity and development time. U.S. and European firms completely abandoned the field of DRAMs and were forced into partnerships and strategic alliances in the field of microprocessors in order to survive. An obvious conclusion is that some models of product development are better than others. Interestingly, the trends that were observed in the early 1990s are every bit as evident today as they were then.