Leading Product Development: The Senior Manager's Guide to Creating and Shaping

Steven C. Wheelwright
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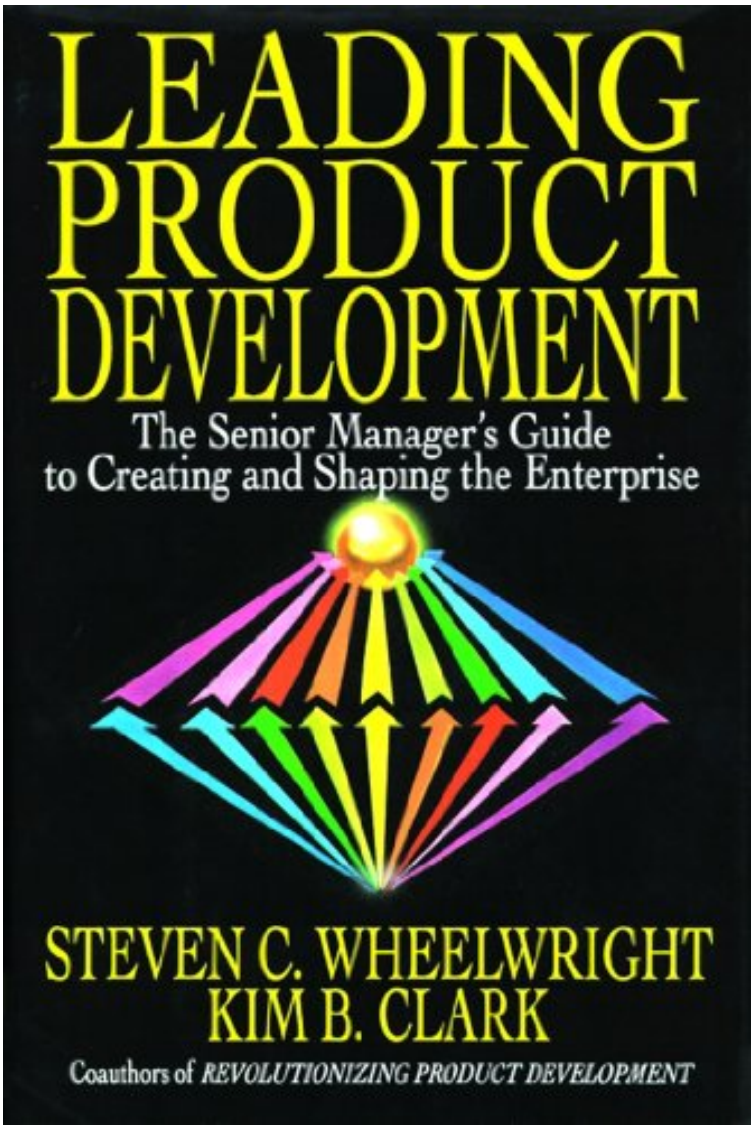

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Steven C. Wheelwright : Leading Product Development: The Senior Manager's Guide to Creating and Shaping before purchasing it in order to gage whether or not it would be worth my time, and all praised Leading Product Development: The Senior Manager's Guide to Creating and Shaping:

10 of 12 people found the following review helpful. Essential for anyone involved with product development.By Jay van ZylThis is definitely a senior executive's reference or summary to product development. Some of the essential concepts in taking products to market are covered. Steven Wheelwright and Kim Clark capture the essence of making

products successful although many concepts have been captured already in the field of software engineering. The importance of senior management's involvement in the process, effective portfolio management and the journey to building effective teams are well laid out. We have found that product managers can relate to the content and use some of the macro principles on projects. Reading this with "Developing Products in Half the Time", "Managing the Design Factory", "Commercializing New Technologies", "Microsoft Secrets", "Seeing Differently", and "The Innovator's Dilemma" will give you a full appreciation of the content.3 of 9 people found the following review helpful. Hard to read, very theoretical, too generalBy steveraj@bigfoot.comI found this book tough to plow through. Straight from the "ivory tower", it belongs in a college classroom, not in the real business world. It is quite general, so perhaps it is helpful in some segments of business. I found it hard to relate to my world of commercial software development.4 of 8 people found the following review helpful. One of the best books that I've ever read on any topicBy J. GroenThis is an excellent book. Thorough plan on how to implement a new product process and senior management's role. We're using this at our company to define the processes.

In their groundbreaking book Revolutionizing Product Development, Steven C. Wheelwright and Kim B. Clark demonstrated how project leaders for product development could apply new innovations to bring products to market at breakneck speed. Now, in their new work, they address the general manager's role in leading product development efforts -- at the functional, unit, group, and corporate levels. Up to now, senior managers have merely approved or rejected proposals at the beginning of a project and rushed in at the end to resolve problems. This traditional approach to product development no longer works, the authors contend. A fundamental shift in the role of senior management is taking place: the entire spectrum of new product development is now the responsibility of the general manager -- from pre-project planning to completion. Wheelwright and Clark draw on their combined consulting experience and numerous examples -- such as Kodak, Honda, Hewlett-Packard, and Gillette -- to explain how this new role can be successfully executed in today's competitive arena. The authors show how the margin for error in new product development has become razor thin. Pre-project planning, they show, takes the guesswork out of development so that projects run smoothly from start to finish. Second, they describe how to choose a set of projects that match a company's specific strategic objectives, resources, and "organizational horsepower" -- enabling the development of consistently successful products and capabilities over time. Finally, they reveal how to create a plan for action: how to determine project sequence, what measurements and incentives are crucial, and, most important, how to capture project learning and integrate it back into the ongoing stream of product development. Wheelwright and Clark conclude that the opportunity for rapid, significant development lies in managerial leadership of pre-project planning and commitment to improvement at every step of the product's life cycle. They provide managers with the tools needed to master these processes, making this book necessary reading for every manager who wants the upper hand in bringing timely, efficient, high-quality new products to market.

William J. Miller Chairman CEO, Quantum Corporation Should be part of the reading for any manager whose business depends on competitive product development.About the AuthorSteven C. Wheelwright is the Class of 1949 Professor of Business Administration at the Harvard Business School. He is coauthor of "Revolutionizing Product Development" (Free Press, 1992) and "Dynamic Manufacturing" with Robert H. Hayes (Free Press, 1988).Excerpt. copy; Reprinted by permission. All rights reserved.Chapter 1The Leadership ChallengeWhether it is a Pentium chip from Intel or a birdhouse with a "Spanish tile roof" from Rubbermaid, the successful new product both satisfies and delights customers. It conforms to an increasingly broad range of customer expectations about quality and design as well as delivery and service performance; at the same time, it introduces something different -- a new dimension of functionality, a new feature, something unanticipated in the "package of benefits" provided. For companies such as Intel and Rubbermaid, in industries as seemingly disparate as state-of-the-art ICs and mundane plastic household goods, new product development is at the heart of their business.But one successful new product does not build a successful, enduring enterprise. In today's savage competitive environment, enduring success requires consistent excellence in developing new products. The one-shot successful deal is just that -- it leads nowhere and its impact on the bottom line is fleeting in a world where the demand for new products is relentless.Much has been done in recent years to create new methods and frameworks for making product development faster, more efficient, and more effective. Outstanding firms such as Intel and Rubbermaid have adapted a host of these new tools and techniques and felt their impact. But putting new product development at the heart of the business and achieving consistent excellence in the development of new products is not just a matter of the right tools and techniques or the latest methods and frameworks, powerful as they may be. What counts here -- and what is so often hidden and undervalued -- is the leadership of senior management.Senior managers have the benefit of a rare vantage point. They see the whole of the enterprise and its future, and thus they are in a unique position to understand the importance of product development to the success of the business. When senior managers lead, they recognize the power of product development and their role in it. They understand that:* The consequences of product development have a direct impact on competitiveness. They mean the difference between falling behind a leading competitor in the marketplace and being the competitor

who provides leadership, compelling others to meet similar standards.* The bulk of a company's assets are tied up in how it delivers value to its customers. If it has old products, the wrong products, or even the right products at the wrong time, that value is severely limited. If the firm "does" product development badly, its assets -- particularly its equity with its customers -- will wither and erode.* The success or failure of product development is driven by the entire range of functions and activities -- every dimension of the organization. The development of a new product is the development of every aspect of the business that the product needs to be successful. And consistently successful new products need every aspect of the business working in harmony.* Product development is the means by which a company builds capabilities. Through new product development, an organization creates the "energy" -- the skills, processes, knowledge, and motivation -- that drives its future. Put another way, these capabilities become the resource pool it draws from to meet future customer requirements. Thus, when product development becomes central to the business, it becomes a self-renewing wellspring of capabilities.* Effective senior managers recognize that their most important contribution is their cumulative impact, rather than their influence on any single project. They act on the development process as a whole.* Senior management touches everything the company does; what senior managers do sets the pattern and example for everyone in the business. Senior managers have a decisive influence on functional integration and the building of capability. Whether the business achieves integrated solutions in the short run and critical capacity for action in the long run depends on senior management leadership.The ProblemFew senior managers would argue that new product development is unimportant; fewer still would imply that it is unrelated to "mainstream" business issues. However, the actions of many suggest that new product development is neither at the heart of their business nor central to their personal agenda. The critical issue is whether senior management leads product development so that developing new products is a primary focus of attention and commitment throughout the organization. The following kinds of comments are typical when product development is not a critical issue for senior management:"Product development? We have a very talented product development group; their department is on the far side of the building. We've recently increased their budget, added some bright young people, and put in some new workstations. Product development is a priority here.""Product development? We've organized a senior management review committee that meets monthly to monitor progress on the projects under way. Our staff helps prepare the background for these meetings, and then we ask the tough questions. When the folks working on product development don't have good answers, we send them back to the drawing board.""Product development? Well, our budget in that area is about 4% of revenues, and that's better than most in our industry. Our chief technical officer manages the area and requests help from others as needed. So far, his group has done a great job of maintaining our image as an innovator.""Product development? We've got a lot of sophisticated, hot new products under way -- they're what our customers seem to want. Because these are highly technical and aimed at leading customers, we have our best people in RD and marketing involved. My job is to help select projects and allocate resources, and then get out of the way. I believe firmly in delegation, lending support when it is requested and occasionally intervening if things get off track.""Product development? Well, as the chief operating officer, my principal focus is on day-to-day operations. But from time to time, a project does get my personal attention. Especially when it threatens our corporate performance. Then, I roll up my sleeves and really dig in. Decisions -- hard decisions -- have to be made, and only I can make them."On the surface, the senior managers behind these quotes are doing things to help product development. They are investing in new equipment, setting up processes to provide senior management input, employing their very best people, and empowering people to act. All are well intentioned, all are doing some things well, and all are involved in product development. But below the surface, there is something missing, and -- in most cases -- what is missing is very significant.These senior managers have set limits on product development and delegated significant responsibility for its success. Product development is not at the heart of their agenda, and they do not lead. They may look at projects at a handful of key decision-making points, for example, when resources are required or when major milestones (or calendar dates) are reached. Senior managers at these points may step in to be a project's patron saint, or at least a cheerleader. But this is not enough. Although many efforts in such businesses are conceived in a spirit of hopefulness and enthusiasm, all too many end up with insufficient resources, missed deadlines, inadequate performance, and burned out, disappointed project participants. Senior managers wind up fighting fires and trying to save the day at the eleventh hour. Simply put, good intentions and close involvement will not do the job.Because product development is so difficult to do well, the plain fact is that it needs far more timely, comprehensive, coherent action by senior management. What makes development so hard is precisely what makes doing it well so rewarding:* Product development touches everything the business does. By the time a new product reaches the market it will have passed through every function, to one degree or another, in the business. Put another way, as a firm develops a new project, it is basically simulating the entire business. It must think about how the product will be manufactured, what sourcing will be involved, what the supplier chain will look like, who will be involved in distribution, and how the new product will be promoted and serviced. Additionally, the firm must think about how customers and competitors will view and experience the product and, crucially, how it will fit into the product line.* What matters exists in an uncertain future. Product development necessarily entails uncertainty -- about competitors, about technology, about the organization's ability to execute, and, most important, about customer acceptance of something that will arrive in the future. This last

is the most vexing, for so often a product's acceptance or rejection lies in the details and specifics. Say a business wants to introduce a new "anti-aging" face cream. It invests heavily in the chemical formulation it will put in the jar. But the customer's experience is also determined by all sorts of details about the product's packaging, fragrance, aesthetics, feel, and color, its consistency and quality in production, how it is sold and where, and above all, how it is advertised. All of these details must work together as a total system. And all this has to be anticipated and addressed anywhere from several months to several years in advance.Coping with complexity and uncertainty in an individual project is hard enough. Here the challenge is to achieve excellence in product development consistently. This calls for senior managers who can see the business as a whole, clarify what needs to be done, and pull the organization together to make it happen. Unfortunately, the pressures senior managers confront and their own instincts often get in the way of effective action. Thus, not only is product development fiat out hard to begin with, but natural tendencies in senior management make it even harder.* The pressure is on to respond to competitors -- immediately. Pressure can come from many sources within the organization. When driven by senior managers, its consequences by and large are more immediate -- and pervasive. Consider, for example, a senior manager who visits a major customer. During the conversation, the customer asks, "Why don't you have a purple square one? We get our purple square ones from Company X, your competitor. If you had one, we'd buy yours." This is brand-new information to the senior manager, who returns to the office, hauls in the development folks, pounds the table, and demands: "Why don't we have a purple square one?" Sure enough, pretty soon a project to develop a purple square one is under way.Perhaps the senior manager also visits a key supplier, who notes, "We're on this project to incorporate a new material of course it's for one of your competitors, but boy, this stuff is terrific." Back at the office, the development folks are ordered, "We've got to make use of this new material. We've got to get that technology; it's where the competition is going." That project, too, enters the pipeline, and the result is a hodgepodge of efforts under development.* The illusion of activity. This problem exacerbates all the others. Senior managers want to ensure that people are productive, that action is being taken, that things are happening. This can be summed up as "more is more." Thus, in the absence of a sufficiently comprehensive and strategic process for evaluating what should become a project and why, the bias is to keep on adding projects -- both to ensure that "things happen" and to demonstrate responsiveness to customers' wishes and competitors' threats. When there is activity, the organization looks productive. The illusion of activity, however, is deadly. It leads to scattershot efforts, badly focused resource allocation, and overloading of resources. Everything in the pipeline is jeopardized. In the end, "more is less."* Projects are where the action is. In companies without strong connections between business strategy and development projects, projects become places where important issues are resolved. To keep the business on the right course, senior managers feel compelled to make key decisions. But they often slow a project down or come into it late, when the project has veered off track. The result is heroic firefighting -- something senior managers often enjoy and at which they excel. But although such activity does put out fires, it does not build capability or deliver distinctive value to the marketplace.All of these problems are evident in the tale of Global Electronics, a disguised case history that reflects an all too common reality.Global Electronics' Compact Disc ProjectThe marketing group of the personal stereo systems unit at Global Electronics, a large international consumer electronics company, was concerned that a key competitor was working on a new portable compact disc system and that Global would have to respond quickly to meet this challenge. The personal systems product manager presented a concept development plan to the head of marketing for a new, competitive system that would be more sophisticated and make use of better technology. The plan indicated a project development cycle time of one year, running from September to September, thereby allowing volume production to meet expected Christmas demand (see the initial row of Figure 1-1 for the original time line). With the strong support of marketing, senior management signed off on the concept development plan for the product (code-named Falcon), and prospects looked bright.Things began to go wrong from the outset and only got worse. First, the concept development stage was completed six weeks late because of significant disagreements about what features Falcon should have and where it should fit in the product line; no change was made to the commercial introduction schedule to reflect this early delay (see Figure 1-1 for the updated time line). Furthermore, eight weeks were added to the prototype build and test schedule because the engineering group decided to use a new signal processing chip and identified several additional technical challenges during the concept development stage.Not long after concept development, other problems with design deadlines emerged (there was limited capacity in the drafting department), and the design completion and prototype/test schedules were revised; however, no revision was made to pilot or ramp-up schedules because everyone agreed that pre-Christmas introduction was essential. Meanwhile, even though the design was not finished, process engineering and manufacturing groups began work on the manufacturing process.A month after the revised deadline for design completion passed, design engineers were still hard at work, wrestling with a new set of problems related to product weight and cost. Concerns about weight had surfaced in market research, and new targets had been set following the introduction of Global's XR22, a midrange product, just a few months earlier. Marketing felt that Falcon had to be priced only $50 above the XR22 to fit in the product line. At the same time, new prototype and production process difficulties emerged. Two key product engineers had been pulled off Falcon to handle a crisis during the launch of the XR22 (the disc changer mechanism was damaging the CDs), and work on the Falcon prototypes was essentially put on hold for the three

weeks they were gone. For its part, process engineering was grappling with delays in tooling as it received a steady stream of engineering change orders to deal with modifications to Falcon's cost and performance. Prototype completion was rescheduled for August and pilot production and ramp up would swiftly follow: the final September date was still in effect, in part because no one working 80-hour weeks on the project wanted to be the messenger who brought such a significant date change -- one that meant missing the Christmas market -- to senior management.More problems subsequently appeared, primarily because the product design and the new automated assembly equipment did not work together successfully. The equipment had been specified and installed by manufacturing to meet cost targets and reduce variable costs, but it needed extensive debugging and some of its characteristics conflicted with those of the product design. These problems only surfaced at the prototyping phase, however. As a result, the original project deadline was missed, along with the Christmas season. Prototype testing was finally completed the following February.At this point, the product's "aesthetics" were deemed out of date (competitors had introduced new products); in response, marketing pushed through a redesign of the packaging, which meant that engineering needed a crash program entailing new tooling and testing. The redesigned product finally went into production in late summer. Meanwhile, manufacturing was debugging the redesigned assembly equipment (to deal with the packaging redesign) and testing for quality. In September, one year later than planned, volume production geared up to meet that year's Christmas season. Demand, while adequate, hardly matched original expectations; worse, design engineering and manufacturing soon faced quality problems from the field (the new manufacturing process and the design were not as complementary as planned), and these led to more engineering change orders, particularly to improve manufacturability. As a consequence, design engineering launched yet another crash program to improve quality and reliability.Looking back, the Falcon was a challenging project, but the complexity and uncertainty it faced differed little from that of scores of projects Global had completed over the years. In fact, the Falcon experience was not atypical. Veterans at Global could recount story after story about projects that met a similar fate. Behind much of the history of poor performance (and behind the poor performance of Falcon) lay the attitudes and behavior of senior management. Believing that more is more, they had loaded a project into an overstressed organization, failed at the outset to connect it fully to the business strategy or even to other products in the line, did not give it the resources it needed, failed to recognize the need for new skills, added even shorter time requirements, and changed direction midstream in response to competitors' moves. While each of these factors could have been handled individually, collectively they spelled pain and disappointment.Of course, there were many other problems behind the design changes, tooling delays, prototyping errors, and mismatch between the design and the manufacturing process. But of all the problems Falcon confronted, its basic difficulty was that the various pieces of the project puzzle -- from the project's intent to its execution -- were never considered as a whole and effectively integrated. When considered in isolation, the idea behind the Falcon-to confront the competitor's threat with a more technologically sophisticated product -- seemed reasonable. But Falcon could not be developed in isolation. From the standpoint of the business, Falcon had to fit into Global's product line and technology strategy and rely on the same resources demanded by other projects. Failure to address those critical connections and interactions early in the project led to delays and costly redesigns much later.The project also suffered from a lack of integration in execution. Because actions and decisions by the functional groups were not integrated, almost everything that could go wrong did. And once things started going wrong, difficulties compounded themselves. Marketing problems beget engineering problems, design problems beget manufacturing process problems, manufacturing problems beget scheduling delays, which beget other problems and delays, and so on.The failure of Falcon and so many projects like it was all the more frustrating because Global had such outstanding talent and so many committed people throughout the organization. One could go into any function and find examples of excellence: creative marketing, state-of-the-art technology, highly efficient process design, responsive customer service. But excellence in the parts does not automatically lead to excellence in the whole. Without significant change in the way it managed product development, and especially without new leadership from its senior management, Global was destined to repeat its Falcon experience again and again. With the right kind of leadership, however, Global could build consistent excellence into its product development, thereby creating a source of significant advantage."The New Product Machine"In its February 7, 1994, issue, Fortune magazine named Rubbermaid "America's Most Admired Company" (it had been one of the most admired for nine years running). In its June 6, 1994, issue, Business Week named two Rubbermaid products, a storage shed and a tool box, bronze winners in its annual "Best Product Designs of the Year" competition. As these and other plaudits roll in, Rubbermaid continues to roll out one new product a day. (Interestingly, the company considers the storage shed winner in Business Week's design contest a line extension, not a new product.) Rubbermaid's business goals go beyond the "one- a-day" formulation, however; they include entering a new product category every 12 to 18 months, deriving one-third of annual sales from products introduced in the previous five years, and ensuring that one-quarter of total revenues come from non-U.S, markets by the year 2000.Rubbermaid can commit itself to such ambitious goals because it has a robust, consistently reliable product development system in place. The goals themselves provide a sense of direction to a broad development/business strategy, which is embraced at the highest level. In 1993, Rubbermaid invested nearly $142 million (funded from operations) in property, plant, and equipment to "expand capacity, improve productivity,

and tool the new products needed to support future growth," according to its 1993 Annual Report. Fourteen percent of profits went toward RD. A crucial part of this investment was devoted to developing everything from new product designs and manufacturing technologies (including computer-aided design, computer-aided engineering, and computer-aided manufacturing tools) to a Space Management System technology that helps retailers learn how best to display Rubbermaid products. These are the support systems that aid almost every new product development effort throughout the organization.The company, from top to bottom, is focused on product development. As Fortune noted, "Even Rubbermaid top management has acquired the habit of seeing new product ideas everywhere." (Examples include senior managers' viewing an exhibit of ancient Egyptian artifacts that suggested some "new" design approaches to kitchen utensils!) At the same time, the company's team structure ensures that product line organizations are entirely absorbed by their offerings. Without such a focus, who would be dedicated to improving ice cube trays? Ice cube trays, humble as they are, can be highly profitable if you are the market leader and insist on creating projects that will enable you to remain in that position.It is this powerful combination of senior management dedication, wise and significant resource allocation, and concentrated team effort that make Rubbermaid a "new product machine." Record earnings in 1993 not only represented the 56th consecutive year of profitability for the company, but also marked the 39th consecutive year in which its dividend per share increased.Being Good at Product Development Makes a DifferenceCompanies that are good at product development have senior managers who explicitly connect development to the business strategy. They see the connections between the parts and the whole, and take action to make those connections a reality. They work together as a team, and by example foster teamwork and integration. They recognize the power of consistency in product development because they have seen its impact on growth and profitability, market position, and morale and energy in the organization. They have placed product development at the center of the business.But senior managers who lead product development also know that consistent excellence in new products is a journey. They are acutely aware of where they have come from, how they got where they are, and where they are going. Moreover, they know they have only begun to tap the potential for success in their organization. Although it may look like they have everything figured out, they still see great room for improvement. In fact, it seems that the better they get, the more they learn about how to make things work even better.Something like this journey is behind one of the great success stories in the annals of product development and business performance: the creation of Hewlett-Packard's DeskJet printer for personal computers. The DeskJet printer project -- the starting point for HP's dominance in the market for personal computer printers -- was born of a crisis: the division faced extinction if it could not come up with a successful next-generation product. As the DeskJet story below reveals, the division became adept at executing a stream of projects that built a new business. The DeskJet and its many generations of "offspring" became not only a major source of revenue and profits (as well as a significant business) for HP, but also an example of what the rest of HP's organization needed to tackle: consistent, broad-based excellence in product development that could consistently deliver a stream of outstanding products to the marketplace.Hewlett-Packard' s DeskJet ProjectIn 1985, HP's Vancouver division, responsible for developing and marketing "impact" printers, was in trouble. Its products were being squeezed: on the high end, expensive laser printers provided much better quality, while on the low end, dot matrix printers offered acceptable quality at a very low price -- and Epson had an 80% share of the low-end market. After reviewing its entire printer line, HP's printer group senior management gave the Vancouver division a mission: concentrate on developing a low-end printer for personal and office use. Vancouver's senior management endorsed this recommendation, and began to shape a new business strategy and to define the project. This situation and subsequent events provide an opportunity to see senior management leadership in action. This was a business in need of a new strategy, new capabilities, and a new series of products. There was no hesitancy or wavering: senior management put product development at the center of the business. It was this leadership that provided focus and brought new energy and resolve to the people who had to make the future happen.The vision that emerged at Vancouver was to create a new segment of the market -- a family of products with print quality close to that of laser printers but at a price so much lower that it would virtually eliminate sales of impact and dot matrix printers for general computer use. Thus, Vancouver's leaders envisioned a future where HP (with its proprietary technology) would emerge as a formidable player in the retail end of the computer printer market. This would not be a one- or two-year effort. If successful, it would require sustained activity and achieve superior profitability over the course of a decade.The project to realize that strategy was designed to take HP's ink jet technology and develop it into a platform that could be the basis for a whole family of products. The product targeted as the initial offering, and thus the focus of substantial effort in Vancouver, was the DeskJet printer. The concept behind the DeskJet was simple, yet powerful: a laser-quality printer for less than $1000.The project, however, had to do more than create the DeskJet. It had to develop a line of products, and ultimately a business, that would match the dynamics of the computer industry. It therefore had to build a range of capabilities -- the energy and the skills-that would lay the foundation for these products over time. And these capabilities were formidable. Vancouver needed to learn how to produce a sophisticated product in high volumes and at low cost. It had to bring its ink jet technology, previously targeted only at professional customers but used in the DeskJet product, to the retail market. And related to these challenges, it had to learn how to operate in the retail market and understand the consumer in that market.The DeskJet, introduced in September 1987,

was a significant success. The initial product came to market within the 22-month planned development schedule (much faster than the norm) and exceeded shipping rate expectations by a factor of three. HP's market share rose dramatically. Subsequent products over the years-improved variants of the basic DeskJet, including high-end color and portable versions -- have been equally successful. HP has leveraged its investment in the initial DeskJet project many times over.At every turn, senior management leadership was crucial to that success. They made the business strategy clear, linked it to the project's charter, and defined a compelling, easily understood mission for the project team. Thus, the team that executed the DeskJet project began with a common purpose that guided its efforts as the nitty-gritty work of development proceeded. Senior management set the direction and launched the team on a successful path.But senior management leadership went beyond strategy and direction. It took specific actions to build capability for the longer term and at the same time to provide the team with what it needed for success. Its objectives were a much tighter focus on cost, deeper integration across functions, and closer links with the customer. Rather than run the project in RD, for example, senior management elevated marketing and manufacturing to equal status on the team and co-located the core team members. It created a new manufacturing engineering group dedicated to the DeskJet, and focused it on achieving low-cost, high-volume production. Under senior management direction, the team also implemented a new approach to prototyping (earlier, more systematic, more cross-functional) and showed prototypes to retail customers -- and used their reactions -- very early in the project.We do not want to leave the impression that because senior management set the direction and shaped the project, everything subsequently flowed smoothly. Like any project, this one faced myriad problems, complications, and unforeseen difficulties. But this effort, unlike its counterpart at Global Electronics, had the crucial ingredients of success: senior management leadership in articulating the business strategy and translating that strategy into a specific charter that the team could grasp and own, as well as in committing resources, managerial attention, and effort to ensure that the project fulfilled not only its immediate objective (the product) but also the longer-term aim of building capability to drive subsequent projects and build the business. These actions had a decisive impact; they set the stage for DeskJet and paved the way for other projects to follow.As many have learned since HP's successful DeskJet project, senior management leadership is crucial to consistent excellence in product development. The most successful senior managers have radically rethought what product development signifies in their organization and recast their involvement in the process. They recognize the power of new products in competition and the central role they must play in making them happen. They understand that the success of a project is directly proportional to its relevance to business goals, how it fits with other projects under way, how carefully it has been planned at the outset, and how well it has been executed. But they also understand that to achieve such connections and performance time after time requires consistent action on their part. They recognize that if they do not lead the effort, important things simply will not get done. In short, they have put product development at the heart of the business and shouldered the responsibility of leadership.