NEW DIRECTIONS IN BUSINESS

NEW PRODUCT SUCCESS STORIES

Lessons from LEADING INNOVATORS

ROBERT J. THOMAS

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Robert J. Thomas

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The student contributors to this book offer the following dedication:

This book is dedicated to the faculty who teach in the Georgetown MBA Program. Their wisdom, passion, and commitment have created an exceptional academic community that has greatly enriched our lives and careers.

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Preface

New product success has become increasingly important, especially to organizations in highly competitive business environments. Up to a third of an organization's annual revenues may derive from new products. Even for a new enterprise, survival depends on the success of the first new product. Unfortunately, the mediocre success record of new products and enterprises fosters conservatism among established organizations. They become unwilling to take chances to develop new products with truly new qualities that better satisfy consumer needs than products currently on the market—often when such innovation is needed most.

Overcoming this reluctance to undertake real innovation is the primary purpose of this book. By demonstrating that new product success is achievable in a variety of situations and with a variety of approaches, the stories told here perhaps can reduce the perceived barriers to innovation that plague many organizations and prevent venture capitalists from investing in new companies.

The book contains 24 new product success stories that show how innovative companies used a variety of approaches to achieve new product success. The stories illustrate wide-ranging ways of bringing new products to market—from orchestrating strategic business partners to define a new service (Calyx & Corolla) to spending hundreds of millions of dollars and 13 years to refine the technology for a new razorblade, then bringing in a product champion to resolve conflict and finally launch the product (Gillette Sensor). The book does not provide a "how-to" guide for new product success, but rather gives examples of how success can be achieved through numerous paths and by overcoming a variety of ever-present obstacles.

Structure of the Book

The book is organized into 10 chapters. Chapter 1 introduces the major themes of the book, with an emphasis on what can be learned from studying

success—especially in a field where failure is more likely. Studying failure may not be helpful in situations where failure is more common than success! However, learning from mistakes that when corrected lead to success can be profitable. Chapters 2 through 9 consist of 24 new product success stories, three per chapter. Each chapter title represents a major theme that contributed to success in the stories.

The stories follow a general format of describing the success, briefly outlining the development process in as much detail as possible, and explaining the success in terms of various factors within or outside the organization's control. The last chapter of the book briefly summarizes some of the major lessons that can be learned from the success stories.

New product development is highly situational because of complex and rapidly changing business environments. The underlying thesis of the book is that, under such conditions, exposure to the factors explaining success across a variety of new product situations can sharpen new product thinking. Reading about how 24 new products emerged under a variety of market conditions can provide new insights for anyone involved in or studying new product development.

The 24 stories cover many types of new offerings, including repeat-purchase products, durable products, major technologies, retailers, and services. Also included are stories about well-known and less well-known organizations, old and new organizations, entrepreneurial and established firms, and global, national, and regional marketing situations.

The audience for the book is individuals concerned about new product development in their organizations and in society. Business proprietors, new product managers, senior-level executives, consultants, entrepreneurs, and venture capitalists should find value in reading the book. Also, professors teaching new product development courses may find that the book provides a type of "case study" in new product development and management that is different from traditional "problem-oriented" business school cases. Using success stories for retrospective analysis (identifying the success factors) and prospective analysis (projecting the future of the business on the basis of the success factors) provides a valuable stimulus for lively class discussions.

Finally, this book *is* a new product! It originated during 1992–1993 as a consequence of my teaching an MBA course on new product development at the Georgetown University School of Business. After discussing the general idea of the book, I formulated it into a concept that students used as a basis for selecting and developing success stories. Several of the stories include information from personal interviews conducted by

students, which contributes to the originality of these stories beyond what is commonly known. Once the success stories were completed, they were reviewed and discussed by an advisory team of students prior to final editing. The students have agreed that all advances and royalties from the book are to be assigned to Georgetown University for use by students and faculty in the Georgetown MBA Program.

Acknowledgments

Much of the harmony in the Georgetown MBA environment that supports mutual learning between students and faculty emanates from the academic administrators. In particular, Martha K. DeSilva and Nancy D. Moncrief have continually guided students through their two-year experience with patience, caring, and good humor. Virginia N. Flavin, Director of Faculty Services, gracefully and without complaint always manages to get the entire business school faculty through each semester, often under trying circumstances.

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1

Learning from New Product Success

It is possible to fail in many ways . . . while to succeed is possible in only one way (for which reason also one is easy and the other difficult—to miss the mark easy, to hit it difficult).

Aristotle, Nicomachean Ethics

The last thing any organization wants in a new product is failure. The Holy Grail of new product development is *success!* Although any kind of success is appreciated, it is most valued when it comes with a truly innovative new product. That kind of success gives an organization a platform on which to develop a family of profitable new products over the years. It is also the kind of success that gives a segment of consumers solutions to some of their problems and makes life easier for them in some meaningful way.

For example, consider Acuvue disposable contact lenses developed by Johnson & Johnson (J&J).[1] Many consumers who must correct their vision do not wear traditional hard or soft contact lenses on a regular basis because of the discomfort and the cleaning requirements. Through a patented manufacturing technology, J&J was able to produce high quality soft contact lenses at a relatively low cost. The lenses could be marketed at a sufficiently low price to allow consumer disposal after a week's use, yet still be competitive in cost with extended-wear contact lenses. Consumers found the lenses comfortable and easy to use, and cleaning was eliminated because the lenses could be replaced with a new pair each week.

When J&J launched its innovative lenses in 1987, it defined a new market because the new product satisfied the unmet needs of a segment of consumers. Although major competitors targeted this segment a year later, in 1992 J&J still held a 70 percent share of the $300 million market. Perhaps more important is the fact that J&J is using the new product and market position as a platform for continuously improved new vision care products—such as contact lenses that are disposable daily.

Pursuing innovations is not without costs, risks, and hard work to solve a succession of problems that arise during development and after launch. How a firm copes with and learns from these problems throughout development often determines the new product's success or failure. For example, J&J confronted a number of uncertainties and difficult issues during development of the disposable lenses:

- Did a market segment of consumers exist who would benefit enough from contact lens disposability to buy the new lenses on a regular basis?
- Could J&J manufacture the product at a sufficiently low cost to deliver the disposability benefit without sacrificing accuracy of vision?
- Could J&J persuade vision care doctors and other providers that the product was safe and that they would benefit financially from offering it to their patients?
- Could J&J persuade consumers of the logic of disposable contact lenses and get them to try a pair?

Fortunately for J&J, the answer to these questions was "yes," but getting to the answer almost always involved some form of learning. For example, in its first efforts to distribute the product, the company required the up-front purchase of inventory by eye doctors. After monitoring feedback, however, the company discovered that doctors did not like that requirement. Consequently, it developed a just-in-time network of distribution. That action reduced inventory costs for the vision care professionals and provided faster service for customers.

Not all of the learning that went on at J&J in developing Acuvue should be expected to work for every new product. Some lessons learned may be transferable to other situations, but others may not be. What J&J learned may not be relevant for a firm developing a new battery for an electric car or for a firm developing a new fat-free line of frozen dinners. In each situation, consumers are different, competitors are different, technologies are different, and so on. Studying one new product success may not be very

informative. However, *exposure to a variety of different new product successes can provide insights on a range of success factors that, if considered for any particular new product, may positively affect its market performance*—which is the basic thesis of the book. Absorbing insights from 24 different new product successes might arm a person intellectually to undertake new product development.

WHAT IS A NEW PRODUCT SUCCESS?

Success is not always what it appears to be. Is a successful new product one that generates a 20 percent return on investment after its first year on the market? Is it one that breaks even in two years? Is it one that captures 10 percent market share from a competitor? Or are factors other than financial and sales objectives at stake in defining new product success?

Consider the case of Raytheon Company.[2] Perceiving a market opportunity for a fuel-efficient airplane, Raytheon set out to design and build one for the corporate aviation market through its Beech Aircraft division. Beech was not content simply to emulate corporate jets that dominated the market, but instead turned to new technologies to create a truly new airplane. The outcome was its highly innovative Beech Starship, made from carbon composites rather than traditional aluminum.

The new Beech aircraft has a unique design. The wings are far back on the fuselage and a propeller engine is mounted on each. The wing tips turn up in a stylish way at a 90-degree angle and there are two small wings on the nose of the plane. Pilots who have flown the plane love its handling, stability, cabin, and cockpit features. Consistent with the Starship name, the plane was marketed as a forward-looking, stylish, and fuel-efficient alternative to the traditional corporate jet, competitively priced at about $5 million.

However, by October 1993, some five years after FAA flight certification, only 23 planes reportedly had been sold—far fewer than the estimated breakeven of 500 planes. With an investment reported to be between $350 and $500 million clearly at risk, can the Starship be classified a failure?

Raytheon had acquired Beech in 1980 to reduce its dependency on government contract work. It installed its own managers at Beech and began the Starship project in 1983. Although the new aircraft apparently was within the general scope of the firm's business, the market in which Raytheon chose to compete—business organizations and corporate jets—certainly challenged its marketing experience. Many factors that

determine strategic success in government markets can be very different in business markets. For example, government purchases typically are carried out in fairly well-defined bidding situations, whereas the purchase of corporate aircraft in business markets is a much more open and competitive process, often accompanied by intense personal selling and negotiations.

After years of dealing with government markets, Raytheon could not be expected to change its product development ways overnight. In this case, selling even one Starship might be considered a kind of success, albeit a costly one, signaling the company's ability to begin to satisfy the needs of a different type of market. With adjustments in its marketing, the Starship may even achieve limited long-run success on a financial basis. For example, Beech turned to an alternative market segment for its future marketing plans. Recognizing that the design of the advanced plane may be too showy for conservative business executives, Beech reportedly focused on the market defined by independent and successful entrepreneurs, who may be more likely to value a stylish and progressively engineered aircraft.

The experience was clearly not a loss for Beech because the company seemed to gain substantial insight into its own operations in competing in a nongovernment market environment. For example:

- During the five years of product development time (originally estimated to be two years), the business environment changed considerably. In particular, fuel prices that were lower than originally estimated eliminated the promise of fuel efficiency as a competitive advantage for the Starship. Beech learned that competitiveness in its rapidly changing markets requires accurate environmental forecasting of gas prices and/or fast product development.
- Unfamiliarity with the new carbon composites (versus aluminum) for the aircraft was cited as one reason for the delayed development. Ultimately, the organization engaged in a "crash" development program to focus resources and complete the project. The problems were solved, but the time and resources expended were substantial. Perhaps developing cross-functional teams very early in the development process to resolve technical, marketing, and manufacturing problems could have enabled Beech to avoid subsequent costly delays. In addition, special technical teams formed early in the process in anticipation of certain engineering problems may have been able to circumvent some of the technical difficulties.

- A new model launched shortly after the first model incorporated numerous improvements. Further, a price reduction of about 12 percent brought the plane's value more in line with the new market segment. These actions represent the flexibility needed to compete in a marketplace more difficult than government markets.

In any case, Beech did not terminate the Starship in the face of slow market acceptance. By considering price reductions, selecting a different market segment, and otherwise recognizing the strengths and weaknesses of the new product, the company was able to learn from experience. The delight of persons who have flown the airplane shows that it holds promise for satisfying its target segment, and Raytheon's investment in learning a new technology may pay off in future new products. Hence, though the Beech Starship may appear to be a failure in the business press, especially in terms of reported sales performance, it may be a long-term success for Raytheon. From Raytheon's point of view, the benefits of learning from experience how to renew the organization's competitiveness in the face of a declining government defense market may far outweigh the costs.

Clearly, new product success cannot be measured in absolute terms. It should be defined and interpreted according to realistic goals and objectives that reflect the specific new product situation. For example, in highly uncertain business environments, success may be defined in broader terms than it is in more stable situations. In any case, to truly understand what determines new product success, recognizing the general types of factors that may drive it is essential.

WHAT FACTORS LEAD TO NEW PRODUCT SUCCESS?

The study of new product success (and failure) has been a preoccupation of academic researchers for several years. A 1993 study of new product performance measures identified 61 research projects concerned with discovering the factors leading to new product success.[3] However, because these studies use different measures and cover a variety of industries and market situations, drawing valid comparisons and conclusions is difficult. Sound generalizations about the factors leading to new product success are therefore lacking, but two central points are clear: (1) *new product success is highly situational* and (2) *no one factor drives new product success.* Individuals and organizations developing new products must carefully

analyze their situation and recognize that multiple factors may determine success. The following sections describe eight major categories of factors related to new product success.[4] These categories are also the basis for the next eight chapters of success stories.

Aligning Strategic Opportunities

Competitive strategy is the direction the organization pursues to gain a long-term advantage. New products are playing an increasingly important role in business strategy. In a 1990 study of new product development practices, respondents revealed that 32.6 percent of their sales in the previous five years came from internally developed new products and 8.9 percent came from products acquired from external sources.[5] They also indicated that over the next five years those proportions would increase to 38.8 percent and 13.3 percent of sales, respectively.

Perhaps the most important first step in new product development is conducting a *situation analysis* to help define the organization's competitive strategy. A situation analysis identifies and assesses an organization's strengths and weaknesses in relation to the opportunities and threats in its business environment. Aligning an organization's strengths and weaknesses with its opportunities and threats reveals valid strategic options. The extent to which new products fit into these options defines their strategic role. In particular, the synergy realized when a new product facilitates the alignment of an organization's competencies with its business opportunities may propel the product to success.

Black & Decker Corporation, for example, identified a market opportunity for a new line of high quality power tools among a segment of trade craftsmen.[6] However, the company ascertained that the Black & Decker name was not strong in that market segment. Consequently, to capitalize on the opportunity, it acquired a power tool business with a brand name strongly associated with quality in that market segment (DeWalt) and developed a new line of power tools for it. The products were very successful, despite heavy competition from an entrenched high quality Japanese competitor (Makita).

Black & Decker's acquisition of a high quality brand name helped to balance the organization's weaknesses in a particular market segment and accomplish long-term strategic objectives for the division. This example shows how success derives from the many factors that help an organization align its competencies with its opportunities through new products.

Capitalizing on the Business Environment

A business environment comprises numerous forces and mediators that interact to create market opportunities. Key environmental forces include trends in natural resources, population, cultural values, technology, economic systems, and laws and regulations. Politicians, regulatory agencies, financial institutions, mass media, industry associations, and various special interest groups (such as consumer activists and trade unions) mediate these global forces. Although environmental forces tend to be pervasive and to have long-term consequences, understanding the major trends in these forces and the actions of various mediators can reveal specific opportunities on which to build new product success.

For example, Rubbermaid, Inc. capitalized on trends in population, ecological concern for natural resources, and its own technological capabilities through the Sidekick "litterless" lunch box for children.[7] During the 1980s and into the 1990s, the post–World War II baby-boom generation began to settle down and have families, creating a sizable market of children. Through classroom discussions, these children became sensitized to ecological concerns, even to the point of lecturing their parents on the topic and becoming active participants at home in sorting garbage for more efficient recovery of resources.

Rubbermaid designed a new lunch box for these children that responded to the need to reduce waste. The lunch box included separate sealable and reusable containers for sandwiches, drinks, cookies, and other lunch items. Children could pack their lunch without using any paper, foil, plastic, or other throw-away materials. The new product was a major success with children (and in sales for Rubbermaid), even at a premium price in relation to traditional lunch boxes. Clearly, major environmental trends drove the opportunity, but a proactive product development capability was necessary to capitalize on it. Proper attention to the needs of potential buyers is central to this capability.

Pursuing Market Acceptance

The developer of a new product may believe that potential buyers are eagerly awaiting its arrival at local stores. Typically, however, market acceptance of new products is a slow process that is sometimes painful for the innovating organization. In fact, success often depends on interaction between the developing organization and potential buyers both before

and after market launch. Such interaction is especially important for products that are really new to the market and require potential buyers to change their patterns of behavior.

For example, Apple Computer, Inc. launched its Newton MessagePad in August 1993 after a period of considerable marketing hype.[8] The MessagePad is a small hand-held computer operated with a pen instead of a keyboard. With a pen, or stylus, the user performs operations by tapping icons or writing on a small screen. The handwriting on the screen, whether text or numbers, is input to files and databases for processing. The MessagePad can be connected to a telephone for the electronic communication of messages and files (such as faxing). The Newton technology promised to bring together a variety of capabilities in a single hand-held device.

The acceptance of highly innovative products among potential buyers typically follows a diffusion process of growth. So-called *innovators*, a small proportion of the total potential market, are very eager to buy the new product, and do so. The hope is that *imitators* will soon follow innovators into the market and boost the volume of sales. However, if a product is relatively new, other buyers may be slow to follow, especially if the product's benefits and value are not entirely clear. The result is market growth that rises slowly at first, then accelerates rapidly as potential buyers learn more about the new product. Ultimately, sales growth slows as the market reaches its potential. This pattern of growth is the so-called S-shaped diffusion curve.

Critics began to pan the Newton MessagePad in their reviews even before launch. A popular comic strip in the daily newspapers (*Doonesbury*) ran a week-long series poking fun at the new product. One consequence of negative publicity can be uncertainty about the new product among potential buyers, which translates into delayed purchases. The major problem appeared to be that the handwriting recognition feature of the product did not perform according to expectations. The core benefit of a pen-based computer could not be realized. Although this deficiency was in part a product-refinement problem, Apple's extraordinary marketing hype had created expectations that greatly exceeded product performance, thus heightening uncertainty about the product.

The Newton MessagePad situation illustrates the pursuit of market acceptance in the face of widespread rejection. The business press expressed doubt about Newton's success. A stream of articles after the Newton launch appeared to document the rise and fall of the MessagePad. Consider the following article titles published in *The Wall Street Journal* from the date just prior to launch to about six months later:

7/30/93	"Imminent Debut of Newton MessagePad Has Apple Crowing and Critics Carping"
8/5/93	"In Newton, Apple Has the Germ of an Idea with Weighty Potential"
8/19/93	"Apple's Newton Moves Briskly in Early Sales"
10/1/93	"Apple Reports Brisk Sales of Its Handheld Computer"
12/13/93	"Sales of Apple's Hand-Held Computer Have Weakened Since Its Introduction"
1/25/94	"Apple's Sales Data Suggest to Analysts that New MessagePad Is Floundering"
2/3/94	"First Hand-Held Data Communicators Are Losers, but Makers Won't Give Up"

Part of the reason the makers did not give up was that they saw a market need for an easy-to-use hand-held computer. Although sales were less than expected, Apple sold some 80,000 Newton MessagePads during its first six months on the market. As a consequence, some competitors delayed launch plans for their new hand-held computers (to improve their performance), and analysts reduced estimates of market growth. Apple only had to recall its own experience with the innovative MacIntosh computer launched in 1984. Initially, the new computer with a graphical user interface and a "mouse" did not sell rapidly. However, with the advent of software that provided new applications and as buyers learned about the product's benefits, sales accelerated.

Market opportunity is open for the MessagePad and its competitors. As with many new technology-based products, however, acceptance by potential buyers may be slow as manufacturers improve product performance and buyers overcome their uncertainty and concern about product benefits. Successive generations of the MessagePad may better address buyer needs and concerns. Further, as in the case of the MacIntosh, new application software will enhance market acceptance of the new product. By working closely with potential buyers to understand their needs, innovating organizations can improve a new product's chances for success. Members of the organization must be motivated to discover buyer needs and revise the product or service design to meet them.

Motivating the Organization

Organizations bring stability to complex and dynamic business conditions. Not surprisingly, when faced with the problem of something new,