



Commercializing Great Products with Design for Six Sigma

By Randy C. Perry, David W. Bacon

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Optimize Every Stage of Your Product Development and Commercialization

To remain competitive, companies must become more effective at identifying, developing, and commercializing new products and services. Design for Six Sigma (DFSS) is the most powerful approach available for achieving these goals reliably and efficiently. Now, for the first time, there's a comprehensive, hands-on guide to utilizing DFSS in real-world product development.

Using a start-to-finish case study, a practical roadmap, and easy-to-use templates, *Commercializing Great Products with Design for Six Sigma* shows how to optimize every stage of product commercialization. Drawing on a combined sixty-five years of product experience, the authors show how to make better product and portfolio decisions; develop better business cases and benefits assessments; create better concepts and designs; scale up manufacturing more effectively; and execute better launches.

Learn how to

- Establish infrastructure to support successful commercialization
- Use Stage-Gate® processes to minimize risk and optimize the use of people and resources
- Create better plans: Segment markets, define product value, estimate financial value, and position new products for success
- Capture the "Voice of the Customer," analyze it, and use it to drive development
- Choose the right tools: Ideation, Pugh Concept Selection, QFD, TRIZ, and many more
- Develop better products and processes: Process Maps, Cause and Effects Matrices, Failure Modes and Effects Analysis, Statistical Design and Data Analysis Tools, and more
- Test and improve product performance and reliability

- Perform Post Mortems and apply what you've learned to your next project

Whether you're an executive, engineer, designer, marketer, or quality-control professional, ***Commercializing Great Products with Design for Six Sigma*** will help you identify more valuable product concepts and translate them into high-impact revenue sources.

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Editorial Review

From the Back Cover

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About the Author

Randy C. Perry is a master consultant and program manager with Sigma Breakthrough Technologies, Inc. (SBTI), one of the world's leading professional services firms specializing in Six Sigma and Lean deployments. He has consulted and trained with Seagate, Eastman Chemical, Tyco, Celanese, BASF, and other leading firms. He is a certified Six Sigma Blackbelt.

David W. Bacon, SBTI master consultant, is responsible for program development and training in SBTI's Master Blackbelt program.

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Commercializing Great Products with Design for Six Sigma is a unique book that demonstrates the business

value of DFSS in today's highly competitive business environment. Any business that strives for greatness must offer its customers a portfolio of great products. Successful development and commercialization of new products is required of all companies—not only for their growth, but for their survival. Because all products are subject to a product life cycle, companies not continuously updating product lines to meet the changing needs of key markets are faced with stagnation, diminished profits, and bankruptcy.

Commercializing Great Products with Design for Six Sigma is a complete look at the steps companies must follow in order to successfully bring new products to market. The book answers the following three fundamental questions:

- Why should Design for Six Sigma (DFSS) be used in a new product commercialization?
- What steps and tools are required to commercialize products with DFSS and in what sequence should they be executed?
- How should the DFSS methodology be used to develop and bring new plans to market?

Using the tools of DFSS, the book presents step-by-step instructions for business case development, market analysis, product concept development, product design, manufacturing scale-up, and product launch. This book will help business managers and design teams to identify the product concepts that are important to their customers and to efficiently translate those concepts into high-impact sources of new income. Along with a step-by-step discussion of key DFSS tools and road-maps, the book contains a detailed case study example that illustrates tool execution and linkages. You can find supplementary materials, including tool application examples in a complete Excel-based commercialization case study and data sets used to perform statistical analysis in Minitab and Crystal Ball, on the book's Web page, <http://www.prenhallprofessional.com/title/0132385996>.

Why We Wrote This Book

Having worked in industry developing new products for many years, we passionately believe that companies must stay on the cutting edge of product design in order to remain competitive in today's global business environment. We wrote this book not only to inspire senior business leaders, marketing staff, and technical staff to expect great results from their new product development programs, but also to demonstrate how these results can be achieved. Through a detailed case study example, we demonstrate to leaders and practitioners alike how to apply the principles of DFSS in the identification and development of new products and services. In the text, we give step-by-step instructions along with easy-to-use templates and examples for the use of required tools. We discuss and demonstrate the use of each tool in sequence, as shown in the DFSS commercialization roadmap presented in the book.

In *Commercializing Great Products with Design for Six Sigma*, we provide a practical, "how to" guide for the use of DFSS in product commercialization. The product development techniques and roadmaps presented in this book have evolved throughout our combined 65 years of experience in product commercialization. Many of the fundamental concepts presented were learned, developed, and enhanced during the courses of our individual careers. Randy Perry has worked in product commercialization for 25 years, including 18 years at AlliedSignal (now Honeywell), where, under the leadership of CEO Larry Bossidy, Six Sigma became a weapon to drive growth and productivity improvement. David Bacon, inspired as a graduate student by his former research supervisor George Box, has more than 40 years of experience as an engineering professor and industrial consultant. The tools and roadmaps described in this book continue to be expanded, refined, and improved through work with a diverse array of corporate clients and fellow consultants.

An Overview of the Content

Commercializing Great Products with Design for Six Sigma consists of five sections: (I) Getting Started, (II) Preparing the Business Plan, (III) The Voice of the Customer, (IV) Product/Process Development, and (V) Product Launch and Project Post-Mortem Analysis. Within these sections, the book contains 38 chapters and follows the development of a new product or service from business concept through final product launch. This section provides a brief description of each section and the chapters within it.

Section I: Getting Started

In this section, we begin by summarizing the history of Six Sigma and of Design for Six Sigma before quickly moving into a discussion of key business infrastructure needed to support a successful commercialization program. The section begins with a brief overview of how companies, markets, and products are constantly changing, and how these forces of change drive the need for new products. After a detailed discussion of how financial metrics are used to measure the value of DFSS, the first section concludes with a discussion of how to select new projects and manage the company's new-product portfolio.

In Chapter 1, we begin with the overview, "What Is Design for Six Sigma?" In this chapter, we trace the history of Six Sigma and discuss various DFSS roadmaps in use for new product commercialization today.

In Chapter 2, "The Business Case for DFSS," we discuss why business management should aggressively work to implement DFSS in the company's new product development processes. In this chapter, we demonstrate and discuss the devastating consequences of failing to continually replenish the company's pipeline of new products.

In Chapter 3, "Six Sigma Financial Metrics," we present a detailed look at how to place a value on Design for Six Sigma projects. Assessing the financial value of DFSS projects is critical as we track the benefits realized by improving our knowledge of customer needs and reducing product development rework. In this chapter, we introduce the Candy Wrapper Film Case Study, which is used throughout the remainder of the book to illustrate precisely how and when required DFSS tools are to be executed.

In Chapter 4, "Project Identification and Portfolio Management," we discuss the critical need for a dynamic project selection process. The commercialization pipeline of new products represents a company's future. Careful tracking and management of this product portfolio using the methods discussed in this chapter are essential.

In Chapter 5, "Stage-Gate Processes," we discuss the general concept behind the use of Stage-Gate in product commercialization. The benefits of using Stage-Gate to minimize the risk of using people, time, and money inefficiently on projects are examined.

In Chapter 6, "Project Management," we discuss the need for project management discipline to produce the Stage-Gate deliverables. A review of good project management techniques is presented.

Section II: Preparing the Business Plan

In Section II, we deal with the preparation of a business plan for a new product. We discuss various key components of a business plan in detail, including performing market segmentation, identifying market opportunities, defining product value, and estimating the financial value of a project. We end this section with a discussion of how to best position a new product for success in the marketplace.

In Chapter 7, "Business Plan Overview," the concept of developing a business plan to describe the business,

marketing, and operating strategy for a new product is introduced. The contents of a good business plan are presented and reviewed.

In Chapter 8, "Market Segmentation," the value of strategically grouping customers having similar characteristics and needs with the goal of improving overall business profitability is discussed. Methods and techniques for segmenting markets are presented.

In Chapter 9, "Identifying Market Opportunities," two specific tools for examining new market opportunities—the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis and the Market Failure Modes and Effects Analysis (FMEA)—are discussed. Specific instructions and an example for execution of each of these tools are presented.

In Chapter 10, "Defining Product Value," the concept of customer value is introduced. In this chapter, we discuss how customers buy products based on value, not based on price. A discussion of value chain mapping techniques and how this information can be used in making strategic decisions is presented.

In Chapter 11, "Estimating Financial Value," methods to estimate the financial value for a product under development are discussed. Financial Excel models are constructed and sensitivity analyses using Crystal Ball are conducted.

In Chapter 12, "Product Positioning," two primary tools for product positioning are discussed: the Market Perceived Quality Profile and the Product Positioning Map. The purpose of these tools is to establish what major product and service attributes most influence a customer's decision to purchase products and then to define how our current products are positioned compared to those of competitors in these key requirement areas.

Section III: The Voice of the Customer

In Section III, we provide an in-depth discussion of how to gather and analyze "The Voice of the Customer." In this section, we emphasize techniques to identify the business-critical needs of key customers, and then we explore the use of interview techniques that allow us to examine these needs more deeply. We continue our discussion in Section III with a detailed look at the use of KJ Analysis to determine which needs identified during customer interviews are most important. Later in the section, we examine new product ideation and concept generation/selection techniques. We end Section III with a detail...

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