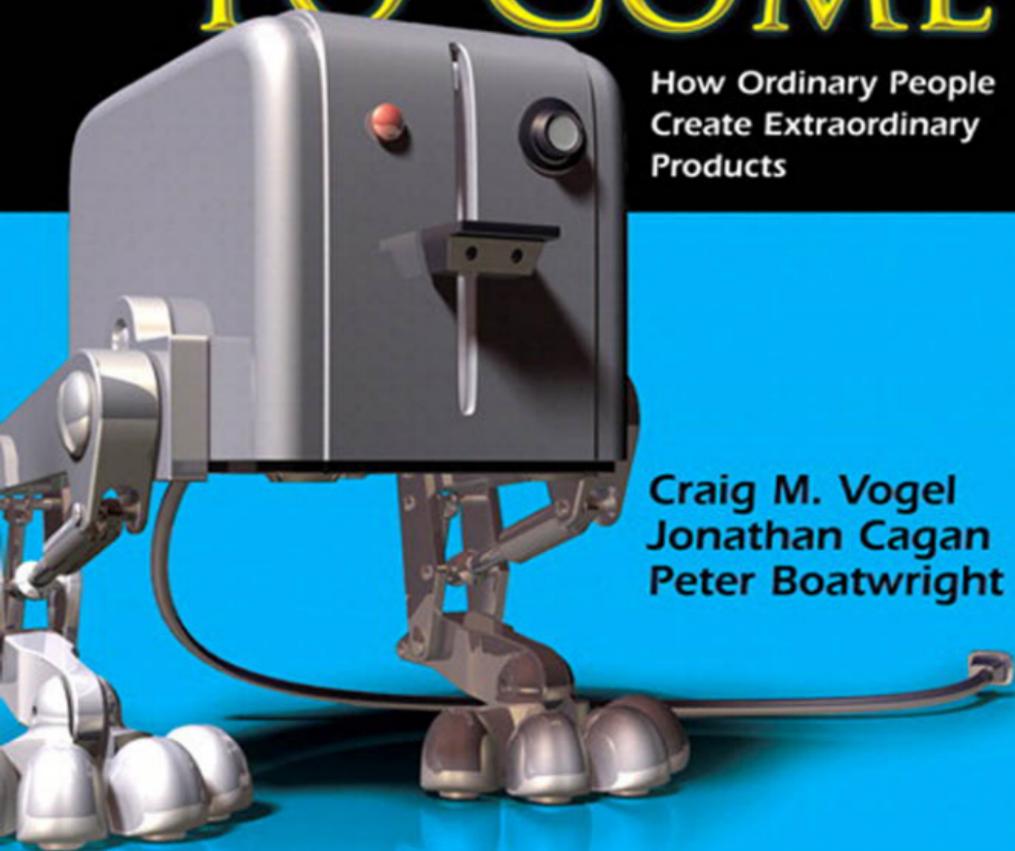


THE DESIGN *of* THINGS TO COME

How Ordinary People
Create Extraordinary
Products



Craig M. Vogel
Jonathan Cagan
Peter Boatwright

Foreword by Keith H. Hammonds, Fast Company

Library of Congress Catalog Number: 2005920661

Publisher: Tim Moore
Executive Editor: Jim Boyd
Editorial Assistant: Kate E. Stephenson
Development Editor: Russ Hall
Marketing Manager: Martin Litkowski
International Marketing Manager: Tim Galligan
Cover Designer: Alan Clements
Managing Editor: Gina Kanouse
Project Editor: Rose Sweazy
Copy Editor: Keith Cline
Indexer: Larry Sweazy
Senior Compositor: Gloria Schurick
Manufacturing Buyer: Dan Uhrig
Art Illustrator: Shane Machir
Additional art by Lisa Troutman

© 2005 by Pearson Education, Inc.
Publishing as Prentice Hall
Upper Saddle River, New Jersey 07458

Prentice Hall offers excellent discounts on this book when ordered in quantity for bulk purchases or special sales. For more information, please contact U.S. Corporate and Government Sales, 1-800-382-3419, corpsales@pearsontechgroup.com. For sales outside the U.S., please contact International Sales at international@pearsoned.com.

Company and product names mentioned herein are the trademarks or registered trademarks of their respective owners.

All rights reserved. No part of this book may be reproduced, in any form or by any means, without permission in writing from the publisher.

Printed in the United States of America

First Printing April 2005

ISBN 0-131-86082-8

Pearson Education Ltd.
Pearson Education Australia PTY, Ltd.
Pearson Education Singapore, Pte. Ltd.
Pearson Education North Asia, Ltd.
Pearson Education Canada, Ltd.
Pearson Educación de México, S.A. de C.V.
Pearson Education—Japan
Pearson Education Malaysia, Pte. Ltd.

This page intentionally left blank

This page intentionally left blank

**To Elizabeth, Melissa, Joshua, Benjamin,
Annabel, and Brayden—next-generation
innovators**

This page intentionally left blank

TABLE OF CONTENTS

Foreword	xiii
Preface	What to Expect from This Book xxi
Acknowledgments	xxix
Chapter 1:	The New Breed of Innovator 1
	The New Breed of Innovator: Pragmatic Business 2
	The New Breed of Innovator: Global Brand and Industrial Design 6
	The New Breed of Innovator: Engineering and Advanced Thinking 13
	So Who Are the New Breed of Innovators? 17
	Innovation Revealed 18
Chapter 2:	Pragmatic Innovation—The New Mandate 21
	A Mandate for Change 22
	Pragmatic Innovation (and How It Differs from Invention) 23
	Moving from Invention to Innovation at Ford: The Redesign of the F-150 29
	Innovation in Start-Ups 32
	Manufacturing Quality—The New Commodity 37
	Innovation—The New Mandate 39
	The Global Dimension of Innovation 42
	Surfing the Waves of Innovation 45
Chapter 3:	The Art and Science of Business 47
	Launching the Adidas 1 49
	The Role of Marketing in the Early Stages of Product Development 52
	The Ambiguity of Figuring Out Winning Products 54
	A Sound Basis for Vision (Yes, You Can Go with Your Instinct) 55
	A Process for Pragmatic Innovation 57
	Identify an Area of Strategic Importance 58
	Research People 59
	Define the Opportunity 60
	Define Design Criteria 60

Achieve the Criteria	61
Go/No-Go Decision	61
The Ground Rules: Understanding the Innovator's View of Procedures	61
Point 1: Thinking Required	62
Point 2: Innovation Yields Differentiation	64
Point 3: Don't Stop at Success	64
Point 4: Motivation Needed	65
Chapter 4: Identifying Today's Trends for Tomorrow's Innovations	67
Lead Users and New Technology	69
Apple: Trend Reader	70
So How Does One Read Trends?	72
Products Impacting Trends	74
In Reading Trends, It Is All About People	78
Designing the Mirra Chair	82
Chapter 5: Design for Desire—The New Product Prescription	87
The Harry Potter Phenomenon	88
Form and Function	90
The Experience Economy	91
The Fantasy Economy	92
Fantasy in Everyday Products	94
Form and Function Fulfilling Fantasy	97
The Harry Potter Fantasy	98
Fantasy-Driven Products in Everyday Experiences	101
Chapter 6: The Powers of Stakeholders—People Fueling Innovation	105
Lubrizol—from Technology to Product	107
The Lens of Powers of 10	112
Powers of 10 in Action	114
Powers of 10 One: Molecular	114
Powers of 10 Two: Blending	116
Powers of 10 Three: Blending Machines	116
Powers of 10 Four: System Operation	117
Powers of 10 Five: Community	119

Powers of 10 Six: Region	120
Powers of 10 Seven: Continent	121
Powers of 10 Eight: Global Environment	121
Scenarios Ensure That People Remain Real	121
Chapter 7: B-to-B Innovation—The New Frontier of Fantasy	125
The Industrial Frontier	128
Fantasy in Industrial Products	129
RedZone Robotics: Going from Projects to Products	131
The Strategic Plan	134
Strategy One: Identify and Understand Stakeholders	134
Strategy Two: Planning the Product	135
Strategy Three: Planning the Corporate Approach to Product Development	137
The Result: Sewer Repair and Beyond	139
The World Above the Sewer	142
Chapter 8: Making Decisions for Profit—Success Emerging from Chaos	145
Complexity in the Decision-Making Process	147
Organizing the Decision-Making Process	149
The Butterfly Effect	153
Chaos Within Structure	155
Interdisciplinary Decision Making	156
Chapter 9: A Process for Product Innovation	163
New Balance	165
Innovation by Cooperation	166
A Case Study in Innovation for New Balance: Four Phases of New Product Development	168
Phase I: Identifying Product Opportunities	169
Phase II: Understanding the Product Opportunity	172
Phase III: Conceptualizing the Product Opportunity	177
Phase IV: Realizing the Product Opportunity	179
Chapter 10: Creating a Blanket of IP to Protect Your Brand from the Elements	183
Swiffer: A P&G Innovation Success	185
Why Is Swiffer Out Front?	187

IP: Utility Patents	188
IP: Design Patents	189
IP: Copyright and Trademark	191
IP: Trade Dress	192
IP: Trade Secret	193
IP: Provisional Patents	193
Using IP for Brand and Product Life Cycle	194
Patenting a Product System	195
Patenting Product Manufacture and Delivery	197
IP in Summary	198
Chapter 11: To Hire Consultants or Build Internally— That Is the Question	199
The Power of Design	201
Using Product Development Consultants	202
IDEO: The Starbucks of Product Design	205
The Consultant Menu	209
Product Insight: Customer Research and Design	211
Hiring to Balance Soft and Hard Quality	214
Managing Design	216
Epilogue: The Powers of Innovation—The New Economy of Opportunity	221
The Power of the Individual	222
The Power to Redirect the Company	224
The Power to Expand the Market	225
The Power to Redefine Our Local Environment	226
The Power of Shifts in the Global Economy	228
The Power of the New Renaissance	230
Index	233

FOREWORD

If there is one lesson from the dot-com craze and meltdown that will endure (until the next time, anyway), it was this: A great idea is not the same thing as a great innovation.

We saw some truly fabulous ideas come over the transom here at *Fast Company*: There was, for a few shining months, balls.com, proud 24/7 purveyor of any sports ball you could imagine, and gesundheit.com, offering comprehensive relief for the allergy sufferer. But these late, mostly forgotten sites didn't deliver much in the way of value. People didn't need this stuff—not enough, anyway, to pay the bills. Ordering pet food online and having it delivered to your home was a terrific idea, but—no disrespect to the sock puppet—it just wasn't pragmatic.

Now consider Google, a dot-com survivor (needless to say) whose dedication to innovation verges on the maniacal. A Google engineer once explained to me the calculus behind temporarily adding a brief pitch—"New! Take your search further. Take a Google Tour"—to the site's otherwise austere home page. Those nine words, Google knew, comprised 120 bytes of data, which would slow download times for people with modems by 20 to 50 milliseconds. But Google could also measure precisely how many visitors took the tour, downloaded the Google Toolbar, and clicked through for the first time to Google News.

At Google, an idea that provides no demonstrable value to customers just doesn't happen. The company is constantly testing new features on its site. The ones that people use, that don't degrade the search experience, and that fit the business strategy—those are the ones that stick. The others—well, they're just ideas, and they disappear. "We don't show people things that they aren't interested in," said another engineer, "because in the long run, that will kill your business."

The gearheads at Google are pragmatic innovators—exactly the sort that Craig Vogel, Jonathan Cagan, and Peter Boatwright describe in this book. They understand that innovation isn't defined solely (or sometimes, at all) by daring acts of technological invention. Innovation is, instead, about providing advances that are valued by customers.

The difference between the two was brought home to me several years ago in Craig's office, then (and, I assume, still) a crowded reliquary positioned at the intersection of creative destruction and consumerism. The shelves were packed with old rotary telephones, radios, coffeemakers, toasters, and Coke cans.

And with potato peelers. Here was the "Rotato Potato Peeler," a mechanical marvel that applied high tech to the low art of removing a tuber's skin. It worked—but it was cumbersome and ugly, and it removed an eighth of an inch of potato flesh. The seven-dollar OXO peeler, by contrast, was just an incremental advance on the century-old mechanical standard. But that increment—a more comfortable handle, a curved blade, a cleaner look—was valuable. It turned the mundane into something enjoyable, even beautiful.

That's the ballgame today. Not, What can you make? Not even, What can you make that people will buy? But, What can you make that will add enough value to people's lives to sell profitably? That's why one of the coauthors of this book is a marketing guy.

Pay special attention in the pages that follow to the consumer profiles that introduce each chapter. They're important, because they acquaint us with the central players in any discussion of innovation—the people who buy and use your products. Note that they are not just wealthy, well-educated professionals. Consumers of all stripes have become, in the last two decades, remarkably savvy about design and its value in our lives. If this book is about "how ordinary people create extraordinary products," it's also about how ordinary people have become design nuts. Call us the Target Generation.

It's all too easy for companies to forget about their customers—and easy as well to spot the results. (The Rotato! Just \$19.99!) Do this, obviously, at your peril: A new product strategy is not complete unless you understand who these people are, how your innovation will improve their lives, and what that change is worth to them.

If you don't, some nimbler competitor surely will. Motorola and Nokia dominated the growing Chinese cell phone market for years—until a local outfit, Ningbo Bird, became a pragmatic innovator. Instead of producing phones that were simply cheap, Ningbo Bird began studying what Chinese consumers wanted—and making phones that were sexy and easy to use. Its market share jumped from 5 percent to over 50 percent in just a few years.

So, which is it? Is your company a Ningbo Bird, or a Motorola? An OXO, or a Rotato? A Google, or a *gezundheit.com*? This book will help you understand your customers and then create products and services that they want, products and services that are likely to be great innovations and not just ideas.

Keith H. Hammonds

Deputy Editor, *Fast Company* magazine

This page intentionally left blank

ABOUT THE AUTHORS



Craig M. Vogel is a professor in the School of Design and director of the Center for Design Research and Innovation in the college of Design Architecture, Art and Planning at the University of Cincinnati. He has developed an approach to design that integrates teaching and research. He has worked with a variety of companies as a consultant for new product development and strategic planning.



Jonathan Cagan, Ph.D., P.E., is a professor of mechanical engineering at Carnegie Mellon University. His research, teaching, and extensive consulting focus on product development, strategic planning, and design. He has developed team-based tools and computer-based technologies to improve the process of design conceptualization.

Photo by Larry Rippel



Peter Boatwright, Ph.D., is associate professor of marketing in the Tepper School of Business at Carnegie Mellon University. His expertise and teaching focus on new product marketing, consumer marketing, and marketing research methods. In his research, Professor Boatwright has developed new statistical methods, as well as additional theories of consumer behavior.

Photo by Larry Rippel

The authors have worked with a variety of companies, including, Procter & Gamble, International Truck and Engine, Respironics, Alcoa, Kennametal, New Balance, Kraft Foods, Motorola, Lubrizol, Ford, General Motors, Whirlpool, RedZone Robotics, DesignAdvance Systems, and Exxon Chemical.

Professors Cagan and Vogel are coauthors of the book *Creating Breakthrough Products*, which is a detailed approach to navigating the fuzzy front end of product development.

ABOUT THE COVER

Burnie is our animated robotic toaster, the one on the book cover. You may be wondering why we put Burnie there, since he is not a real product like the others in this book. These days, if a product team walked into the office of their VP of New Product and said, “We have just developed the world’s first walking toaster!” the answer might be “Great! But can it walk on water?” Burnie represents the incredible requests made of teams and individuals working in the area of new product and service development. A walking toaster may or may not be what the public wants, nor may it fit a company’s strategic plan. The question is, “How do you know?”

In this book, we give many examples of real products. The teams developed these products only after fully understanding their customers’ needs, assessing the strength and boundaries of their company’s brand, considering how and how far they could extend the brand, and thinking of their company’s strategic needs for innovation and organic growth. A smart shoe, a device for cleaning floors without water, a robot that is not a toaster but that does repair sewer systems, and a pickup truck that fulfills fantasy expectations are part of the array of case studies and their corresponding methods of development we provide to enable you to make the right choice in the design of things to come.

This page intentionally left blank

PREFACE

What to Expect from This Book

Two guys walk into a Starbucks and wave to a woman at a table. After getting their lattes, they head over and join her.

Paul: Hey, Caroline, looks like you got here early.

Caroline: Traffic wasn't bad today. Did you two come together?

Rick: No. We just happened to arrive at the same time. How are you doing? How's work?

Caroline: It's pretty interesting these days. Today we had a planning meeting to set objectives for the next few quarters. We had a poor performance last year, and budgets are getting cut. I was asked to reduce cost by 20 percent and increase profits by 150 percent. [She smiles.]

Paul: Are these just goals to see how high you can jump? Or are they somewhat realistic?

Caroline: It's part of an ongoing internal discussion. We've gotten really efficient at delivering high quality with decent costs. But, you know, everybody else is pretty good at it now. So the discussion is about what to do next. For years, we've had the dual strategy of beefing up quality and reducing costs, and that strategy has worked well for us. But now, we're pretty close to the efficient frontier, and everyone else is catching up pretty quickly.

Rick: I know what you mean. We're lost as to how to respond to the latest competitor who is trying to drag everyone into a death rattle on price. It isn't like there is much more we can do with our manufacturing costs or quality. I am a black belt Six Sigma, and we've integrated the latest on lean manufacturing into our StageGate process. Now that we're accustomed to putting out high quality at low cost, we've settled back into our old bunkers. The sales force is on our back to put out some new product that can compete on cost. But we're putting out great stuff, so we wonder why sales can't move product by just showing buyers our quality difference.

Paul, now that I think about it, you guys don't seem to be in this cost battle at the moment. You guys are thinking innovation instead of costs, aren't you?

Paul: Yeah, I told you guys about the new CEO a while back. He has a different focus. Still too early to tell what will happen, but I have to say that there's excitement in the air that wasn't there before. He believes that we can no longer compete on price but instead need to be leaders in innovation. A couple of weeks ago, he sent out a memo with suggested reading. I read an article in *Business Week* about the power of design. Usually, articles about design just talk about industrial design and how they make products better. But this article was different. It said that

product design means that everyone has to be innovative, not just the industrial designers you hire. Another article talked about the challenge of the growth of China, stressing how companies in Asia are getting smarter, not just cheaper, and that means innovation is the only way to compete. He also sent some literature about programs that a number of B schools are teaching on “entrepreneurship and innovation.” He is actually willing to support us getting into those programs. Even he admits the innovation seminars we are constantly attending can only get us to the beginning of what we need to do.

I’ve not yet read the book *The Design of Things to Come* that he suggested, but I’ve heard it has some pragmatic ideas on creating profit and growth by focusing on customer needs and desires, and that it has techniques that any of us can understand and incorporate into our process....

Deconstructing Innovation

Everyone is talking and writing about innovation. It is the fuel of business strategy. Design and innovation are words that are often used together or interchangeably. Design for us is both a broad concept of change through human problem solving and a word used to describe specific fields such as engineering design, interface design, or industrial design. The power of the new design for innovation is fueling an engine of change that is driving the production of things to come. It is the result of interdisciplinary teams, and it dynamically leads to comprehensive solutions that consumers respond to emotionally, cognitively, and then economically. Few books, however, provide an understanding of how to deconstruct the process in a way that anyone can use to turn a cost-centric approach into an innovation-driven strategy. The challenge in design for innovation is to help everyday people stretch and grow to accomplish extraordinary things.

As authors from three different disciplines, we are strongly committed to understanding the innovative process. We represent three core areas that companies rely on for innovation of physical products: business, engineering, and industrial design. As a result of our diversity and commitment to the topic, we believe it is possible to provide a distinct useful, usable, and desirable angle on the current trend of how companies are growing organically through innovation. We have developed an ability to see current and emerging issues through three sets of eyes translated into one common transdisciplinary voice. The result is something that can educate the novice and help experienced practitioners in business alike. The potential in companies is not just the ability to create a pool of talent and capability, but how to give diverse teams of people the power, methods, and courage to be creative and to explore new opportunities. As our own example of the power of teams, writing this book required significant give and take for each of us as individuals. The result is a product that is better than any one of us could have written in isolation.

In our roles as university professors, our work has evolved into a balance of research, consulting, and teaching that has allowed us to become an example of what we talk about in the book. We are not just reporting what we have observed; we have lived it. We know what it is like to manage interdisciplinary teams of bright, headstrong people and help them produce innovative and patentable solutions through our methods. We have impressed company executives with the ability to take a vague discussion of possible new markets and, using an integrated product development process in a university context, produce insightful, thoroughly developed and patented products. We have consulted with a wide variety of consumer and business-to-business companies and helped them produce successful products. The first book of two of the authors, *Creating Breakthrough Products*¹, has been incorporated into the product development process of many small and large companies alike.

1 Cagan, J. and C. M. Vogel. *Creating Breakthrough Products: Innovation from Product Planning to Program Approval*. Financial Times Prentice Hall, Upper Saddle River, NJ, 2002.

As research professors, we have had the opportunity to step back and reflect on what we have observed. We have identified consistent patterns that led to successful innovation. Our goal as writers was to produce a book that organizes and expresses these findings in a way that the Carolines, Ricks, and Pauls of the preceding vignette can incorporate into their way of thinking and practice. In short, it is a book written by people who have lived with, successfully managed, and thoroughly researched the topic. Said another way, we are arm-chair quarterbacks who have also played the game.

This book deconstructs innovation into understandable chunks that form a compelling argument of what innovation is, why it is important, and how you can begin to transform yourself and your company to meet the needs of the current marketplace. You cannot just hire innovative consultants; you have to learn to create an innovative culture organically within your company. That is the only way the core of your brand can be strategically connected to every product you make and service you provide.

This book is also about people who are at the heart of the innovation process. We mention two types of people throughout this book: those who purchase and/or use the product or service, and those in companies who are the innovative developers of the products and services. We include scenarios about the users throughout this book to provide a context for each chapter. The scenarios that start these chapters are fictitious. A common practice used in the early phase of development of new products and services, scenarios are often composites that represent critical aspects of the lifestyle tendencies of the intended market. The second type of people referred to are people in companies, and all of these people that we describe in our chapters are real. They have been extremely helpful and supportive in letting us find out what makes them tick and what enables them to become one of the new breed of innovators. We have worked with them in developing many of the case studies throughout this book.

This book is written to help you leverage your ability to find a way to thrive in the complex world we find ourselves in. As the often-used quote from Dickens' *A Tale of Two Cities* states, it is the best of times and the worst of times. The side of the coin you choose depends on how effective you are at turning obstacles into opportunities. You cannot plan for the future with the hope of always being lucky to succeed, but you can learn to always take full advantage of opportunities when you see them and increase the odds of success. As you look to the future and account for global economic and societal change, innovation is not everything; it is the *only* thing. Innovate or perish. Or, even worse, innovate or struggle to survive in the ever-tightening downward spiral toward cost-focused commoditization. Because there can be only one cheapest provider, no other choice is left.

This book is written in the sequence we would like you to read it, but each chapter stands on its own for the most part. We strongly suggest reading Chapters 1 through 3 before you roam. Chapter 1, "The New Breed of Innovator," talks about the new type of innovator, highlighting three outstanding leaders of innovation and aspects of their approach that anyone can use. Chapter 2, "Pragmatic Innovation—The New Mandate," argues that reliance on quality of manufacture initiatives can no longer be your buoy of survival; instead, innovation is the only approach to differentiation. Chapter 3, "The Art and Science of Business," gives a brief overview of the process of innovation and provides a context for understanding how to make it work for you.

The rest of the chapters discuss various aspects of the innovation process. Chapter 4, "Identifying Today's Trends for Tomorrow's Innovations," talks about reading trends and converting them into product and service opportunities. Chapter 5, "Design for Desire—The New Product Prescription," argues that innovation is about meeting people's desires, about fulfilling their fantasies. Chapter 6, "The Powers of Stakeholders—People Fueling Innovation," presents a new approach to analyzing all the stakeholders who affect or are affected by a product or service, a technique we call a Powers of 10

analysis. Chapter 7, “B-to-B Innovation—The New Frontier of Fantasy,” argues that the business-to-business world is ripe for fantasy-driven innovation, and that a corporate strategic plan must connect the company to its brand and product.

Chapter 8, “Making Decisions for Profit—Success Emerging from Chaos,” highlights the complexity of making decisions during the process of product development. Chapter 9, “A Process for Product Innovation,” then highlights the detailed process focused on the earliest stages of product development, where innovation takes place. Chapter 10, “Creating a Blanket of IP to Protect Your Brand from the Elements,” follows with a discussion of how to protect innovation and develop brands through the intellectual property system. Chapter 11, “To Hire Consultants or Build Internally—That Is the Question,” helps you think about developing in-house innovation groups and complementing internal innovation with external consulting. Finally, the epilogue looks at the power of innovation through people and the opportunities they create.

We begin Chapter 1 with three people who manage large organizations and who have consistently produced innovative solutions in challenging and highly competitive markets. These individuals set the tone and provide the foundation of this book because each exemplifies the attributes of the new breed of innovator. As these three evolved in their professional careers, they connected their vocations and avocations to form a broader view—both of what was presently going on and of what was possible in the companies where they worked. As they developed, they were able to balance creative approaches with practical methods and to understand how to balance cost with a vision of how innovation could increase profits. Through a combination of education, personal ability, and effective partnerships, these three evolved into the role of the new breed of innovator, having established and managed environments for pragmatic innovation.

This page intentionally left blank

ACKNOWLEDGMENTS

As with any major endeavor, there are many people to thank for their input to this book and our thinking about this work.

Particular recognition and thanks go out to Keith H. Hammonds, Deputy Editor of *Fast Company*, for taking the time and interest to write the Foreword for this book.

Many people in the companies we write about have spent many hours speaking with us about their work and ideas. In order of appearance in this book, these include Dee Kapur of International Truck and Engine, Chuck Jones of Whirlpool, Edith Harmon and Josh Kaplan of New Balance, Astro Teller and Chris Kasabach of BodyMedia, Stephen Pierpoint of Adidas, Scott Charon and Gabe Wing of Herman Miller, Paul Basar of Lubrizol, Eric Close of RedZone Robotics, Bob Schwartz of Procter & Gamble, James Kyper of Kirkpatrick and Lockhart, Bruce Nussbaum of *Business Week*, David Kelley of IDEO, and Elizabeth Lewis of Product Insight.

Many students have worked with us in developing this work. These include Hillary Carey, Mark Hamblin, Harlan Weber, and Erika Wetzell. John Bellinger, Nathan Goldbatt, Rachel Lin, and James Raskob developed the quick-change machine tool interface mentioned in Chapter 7. Joshua Aderholt, Jeremy Canceko, Courtney Chu, Luke Hagan, Patrick Marcotte, Seth Orsborn, and Lisa Tsui developed the intelligent insole discussed in Chapter 9.

We are grateful to Jeff Calhoun of VistaLabs for his detailed comments on this manuscript and the ideas behind it. We also thank Anne Akay for her comments on this book and Stephen Boatwright for his comments on selected chapters.

We are indebted to our editor, Jim Boyd of Prentice Hall, who has made this process as seamless and as easy as possible. His encouragement and support throughout are deeply appreciated.

Several colleagues at Carnegie Mellon have provided inspiration and support. Professor Laurie Weingart of the Tepper School of Business has been our partner in teaching the Integrated Product Development course and has worked with us on several research projects. Ilker Baybars and Ken Dunn of the Tepper School of Business, Adnan Akay of Mechanical Engineering, Pradeep Khosla of the College of Engineering, and Dan Boyarski of the School of Design have been active supporters of our effort and proponents of our course.

We would also like to thank the illustrator, Shane Machir, for the artwork. Additional artwork, by Lisa Troutman.

1

THE NEW BREED OF INNOVATOR



Innovation is about people. Companies focus on customer needs, wants, and desires as they design new products; after all, products are purchased by and for those who will use them. Those who design the products also are people—ordinary people who apply their skills to develop new ideas and products. Yet certain individuals have evolved to a level of innovator who envisions, leads, and manages the complete context of a product or service. These people are the new breed of innovator, and they are the model for all of us to follow. Who are these innovators of today, how did they acquire the insight to innovate products that excite consumers, and how do they simultaneously inspire and motivate the people with whom they work? In this chapter we introduce three of these innovators in order to reveal their mentality and methods.

The New Breed of Innovator: Pragmatic Business

At the age of 18, Dee Kapur left India and arrived in New York City on the first leg of his journey to California to attend Stanford University. His flight was late, and he missed his connecting flight; Kapur found himself stranded in the Big Apple with \$200, his suitcase, his tennis racquet, and little sense of what to do. He eventually got to Stanford, and although economically poorer, he gained a new sense of confidence. With no money to his name, he found that he had to be innovative in small ways every day just to make ends meet. His current drive for innovation in business has its roots in such experiences, when he had to seek new and efficient solutions in daunting circumstances.

After earning a degree in mechanical engineering from Stanford and his MBA at Carnegie Mellon, Kapur eventually landed at Ford Motor Company. At Ford, he continued to seek innovative ways to turn supposed barriers into opportunities. At one point, he ran the most profitable line of vehicles in the United States and was part of the group at Ford that helped transform the SUV and a pickup truck from a service vehicle into a lifestyle vehicle. In 2003, after a successful career at Ford, Kapur was named president of the Truck Division of International Truck and Engine.

Kapur believes in what he refers to as *pragmatic innovation*, a term that perfectly captures the balance between creativity and profit. He recognizes that, even as he leads an organization, he cannot mandate innovation. However, he can institute a management process that fosters it. Kapur models his approach to his employees with one dose inspiration and one dose instruction. The level of interpersonal relationships is reinforced by the practical, by budget allocations, and by reward and recognition. In his work with others and in his business procedures, Kapur holds up innovation as a clear signpost that shows the direction of his leadership. How you allocate your time and money and how you groom your employees show your

priorities and establish incentives within a company. At the end of the day, Kapur keeps an eye on results. Although his upbringing and engineering training continuously ensure attention to facts, logic, and results, often the road to the outcome is newly laid. He likes to set targets for his company that he has “no freakin’ idea how to get to.” These targets are not just goals; they shape corporate culture. The targets create a demand for unconventional input, and, more often than not, they coalesce into a game plan that would not happen with a “safe” goal. In setting such goals, he has developed an instinct for finding the sweet spot between the acceptable and the impossible. Setting the bar where he does helps motivate those under him and creates an environment of creativity. He also sets a positive example by walking the walk; he strives to be the ideal he wants others to be. He has a directness and honesty that you instantly respect. He wastes neither words nor time. He does not look to blame others; instead, he looks to accomplish goals. He never seeks to embarrass people, and he knows the power of win-win.

Throughout his career Kapur has looked to identify the people who, like him, are looking at the broader picture. He realizes that you can never bring everyone along with total conviction, but if you build a core team right away, you can change the way a group or project team works. In any organization, he says, approximately 30 percent of the people are passionate about wanting to win or at least make a difference. The leader’s challenge is to identify those people, groom them, harness their energy, and let them be a beacon for others. If one can garner the allegiance of that 30 percent, that is success. Spend time with the people who want to be motivated. Challenge and “jazz” them, and they will introduce a velocity and energy that will propel the rest along with them.

For Kapur, pragmatic innovation requires a balance of the left and right brain working in unison. Such a balance enables him to see situations in a broader way than many others. He can manage the duality inherent in complex corporate decision making. He intuitively understands the concept of moving from one level of viewing the

problem to another. He attributes this in part to the fact that he not only has an analytical ability to understand engineering and business systems, but he also has a feel for the lifestyle side of products, he appreciates the human reaction, and he recognizes the compulsion that drives prospective buyers. He was raised in the Himalayas in India, but he also spent time in Europe when his father was transferred there in the course of his career. He has a global perspective born of his personal life: high school in the Himalayas, several years in Europe as a child, and an exposure to life's possibilities without the luxuries of coddling.

His ability to see the value of the different major players in the process enables him to manage and motivate others and to unify them toward common goals. It is not who is right or wrong, but what needs to be done to get to the next level. In our work with the auto industry, we saw many examples of managers who were loyal to their area of expertise and defensive about the requests for change or perspectives offered by other areas in the company. Many complain that employees in other areas of the company are myopic. If only they could learn to see the situation from another's perspective, they could move faster and make the right decision. Design stylists complain that others fail to grasp the gestalt, or entirety, of a design; when non-designers pick it apart and make changes to the pieces, they compromise the overall effect. Engineers argue about cost overruns and the inability to deliver on style without compromising performance quality. Manufacturing argues about the feasibility of maintaining tolerances given form complexity or material choices. Human factors and safety specialists constantly call for changes in engineering and styling to ensure a higher degree of safety. Cars are designed to be driven, but human-factors specialists are trained to think about when the car will fail. Marketing argues for details that stylists reject as incompatible with the new approach to style. In short, there are plenty of reasons to disagree. Kapur does not like to take sides; when he must, however, it is to ensure a successful outcome, and he strives to bring his team along with him. A persistent operating theme for him is "integrated execution!"

When Kapur started in automotive design, he was as fascinated with styling as he was with engineering. While directing the Truck Division at Ford, Kapur, along with marketeers Bob Masone and Allison Howitt and head truck designer Pat Schiavone, was viewing an old two-seat roadster with saddle leather interior. The car exuded high class, and at the same time, the leather reminded him of the saddles cowboys used. And those cowboys happen to be customers of pickup trucks. Wouldn't it be great if a pickup had a similarly luxurious interior, one that still connected to the cowboy aura? That leap led to the development of a limited-edition F-150 pickup with saddle leather interior, co-branded with the King Ranch in South Texas. The King Ranch accomplished a number of things inside Ford as well as with the F-150. The project not only made a strong brand statement of innovation for Ford, it also created a great working relationship with the whole team. Trucks and SUVs became the place where everyone wanted to be; it was where the action was. The new line of F-150s introduced in 2004 (and further discussed in the next chapter) was a product of the team that brought you the King Ranch as well as the Harley Davidson F-150 (designed jointly by Gordon Platto and Willie G. Davidson himself). According to Kapur, "The name of the game is to continually change it." That is the focus of Kapur's view on innovation.

Yet Kapur's last assignment at Ford was to deal with the challenging problem of controlling costs in vehicle programs. Controlling costs by itself is not a difficult task—cut out all unnecessary parts, and cheapen those that are integral. But that approach leaves the company with little to sell other than a low price. The challenge is to produce great products while meeting cost goals. More managers are needed who can handle both the creative innovation such as that in the King Ranch and the pragmatics of cost, because the combination of these two positions gives Kapur the ying and yang of what it takes to develop innovative products. Now, Kapur will see whether that same approach can help clarify and rebuild the International brand in the trucking industry.

Kapur sums up his approach to managing innovation in three steps:

1. Make innovation and boldness part of the culture—everyone needs to know what you stand for.
2. Role-model innovation as often and in as many forums as you can.
3. Institute a management process that fosters innovation.

Kapur lives by the vision that “the future for society and the country is vibrancy in innovation.” Kapur is a new breed of innovator.

The New Breed of Innovator: Global Brand and Industrial Design



It was August, and Chuck Jones was at Michigan International Speedway competing in a vintage Indy car race. Jones started racing cars at the rather young age of 8, turned professional at age 15, and now—in addition to his career as vice president of global

consumer design for the world's largest appliance manufacturer, Whirlpool Corporation—at age 44, he still keeps sharp by participating in a half dozen high-speed races each year. Driving at speeds of 168 mph requires a level of concentration that anyone could learn from, and Jones excels at it...he is still winning regional championships against competitors less than half his age. Jones considers this experience to be the kind of event that allows him to escape from the daily grind and keep things in perspective. He learned how to manage quality programs when working at Xerox Corporation, programs that were a major part of the Xerox success story of the 1980s. At Xerox, he directed several successful product programs for new copiers, and he came away with a thorough understanding of digital product interface. The discontinuities between his day job and hobby are very much how he views innovation—the ability to arrive at discontinuous solutions that yield paradigm shifts in your product, service, and brand.

Although Jones's formal degrees are in industrial design and human-factors engineering, his first degree was really from the fields in Indiana, where he grew up in farm country. He knows all about machines and how to disassemble and fix an engine. As a side note, Jones family lore has it that Chuck successfully diagnosed a problem on an engine, disassembled it, reassembled it, and got the engine running at age 5. On the farm, innovation meant having to find a fix for a broken gear on the combine during harvesting season at 4 A.M. when no stores were open. Discontinuity meant working on the family farm at 4 A.M. during harvest season when running the farm was just a family hobby and your dad had a day job as a chemical engineer. Tending to a hobby farm at 4 A.M. as a kid built a strong work ethic and solid values.

Although he trained primarily in industrial design, Jones, like Kapur, has balanced capabilities in the left and right parts of his brain. His engineering side is comfortable with the precision and logic of math, which has enabled him to thrive in management; at the same time, he explores the possibilities of creation through design. After

finishing college, he gained experience in business and quality systems development. He went through several product development cycles at Xerox and had developmental jobs such as running the business strategy office, eventually becoming the manager of industrial design and human interface. Whirlpool recruited him, and he now directs one of the biggest global brand design, user interface, and consumer understanding programs in the world. From the headquarters of little-known Benton Harbor, Michigan, he manages the global design empires of the Whirlpool and KitchenAid product lines in the United States as well as the 11 other Whirlpool global brands, and he manages design for appliances under the Kenmore and IKEA brands.

One brand innovation championed by Jones and a team inside Whirlpool's North America business unit is the Gladiator GarageWorks line of products for garage and basement storage systems. The innovation team that developed the idea of Gladiator GarageWorks recognized that, in many households, women tend to take the lead for purchase decisions in every "living quarters" room—the kitchen, living room, bedrooms, bath. Therefore, the last bastions for men in the home are the basement and garage. With the Gladiator GarageWorks system, consumers may pay up to \$25,000 extra when building or refurbishing a house for the sake of a "dream" garage shop, complete with quality shelving and cabinetry, a "Freezerator" that allows one to adjust the percentage used for refrigeration versus freezing, and a "Beverage Box" to keep 170 cold ones. The appliances sense both hot and cold temperature extremes; they not only refrigerate, they also have built-in heaters, ensuring that the contents stay chilled in a steamy hot garage but are never frozen in an unheated one. This new Whirlpool brand brought in \$25 million in revenue in just its second year!

Jones's timing in going to Whirlpool was perfect. He had just gained experience in a company that went from being a "copier company" to a "document company." Xerox was in the printing business and making some of the most complex modern industrial and business printers in the world. The company was attempting to integrate

complex digital-driven products with electronic, electromechanical, and mechanical systems in one product. The daily use of these machines is intense, and the complexity of interaction and range of users demanded an entirely new approach to the design of the interface of the products. Jones learned the power of digital interface design to connect people to machines. The best copier or printer in the world is useless if you cannot understand how to use it and if you waste more time making mistakes than the copies you want.

Jones understood that the appliance industry was ripe for the same change. He recognized that an appliance company could dominate in the industry if it could figure out how to improve the function and service without making the product interface too complex. He also knew that most appliance companies were still living in the “big white box” world without grasping the fact that the market had changed. Kitchens and laundry rooms were taking on a whole different meaning in the contemporary United States home. The washer and dryer were seen as a bland and generic commodity—a “sea of white,” as Jones likes to call it. The old paradigm was that no one cared about the aesthetics of the laundry room—when one machine broke, you bought any other one, and possibly from the same brand. Only 18 percent of washers and dryers were sold as pairs.

So Jones leveraged the international structure of his group and, along with global engineering and brand marketing in Europe and the United States, helped create the Duet washer/dryer. The Duet adapted a technology platform from Europe to the tastes and reliability expectations of North America. The focus on consumer interaction and ergonomics led to the insight that the washer and dryer should be raised on a pedestal so that consumers do not have to bend over to reach inside the machines. The aesthetic and ergonomic statement of Duet has changed the face of laundry rooms. Today, more than 90 percent of Duets are sold in washer/dryer pairs. The product is so successful that Whirlpool was able to raise the price three times after its initial introduction. Each Duet machine sells for three times the average competitive machine because of its

integrated consumer benefit package of world-class aesthetics, great energy efficiency, and benchmark ergonomics. Consumers see the value, and that is successful innovation!

While the Whirlpool brand has been enjoying tremendous success, there is an equally interesting story in Jones's developments in KitchenAid (another brand of Whirlpool Corporation). The KitchenAid mixer is an icon of the American kitchen and stands head and shoulders above the competition in perceived value. In the age of digital-driven products, the KitchenAid mixer stands alone as a throwback electromechanical marvel. Timeless like any great icon, it sits supreme in a kitchen of baby boomers or newlyweds. Often the anchor gift for a young couple's new kitchen, the mixer will last them until retirement. That's the good news.

The bad news is you cannot sell a lot of products if each lasts a lifetime—that is, unless you can leverage the brand equity, which KitchenAid has done with its new Pro Line series of countertop products. If you go to the nearest Williams-Sonoma store in the United States, you will see a line of products that are all in a neutral, metallic gray. They look like scale models of little factories and embody the heft and robust nature of the KitchenAid stand mixer. These are serious, professional-looking products. This new line is the interaction of organic growth and consulting at its best, designed by the in-house KitchenAid Brand Design Studio with support from Ziba, one of the world's best design consulting firms. The new line of gray KitchenAid children sits right next to the proud mixer parents, which come in a range of colors and finishes. The offspring are contemporary but bear a striking family resemblance both in appearance and in their iconic potential. The price tag of many of these new products is a mere \$300 plus tax. Williams-Sonoma signed an exclusive agreement for six months, and, during Christmas 2003, they could not stock them fast enough. Imagine paying \$300 for a waffle maker, which in the Pro Line series is not a waffle “iron” but a waffle “baker.” On display nearby is a European waffle maker that sells for \$50. Why would someone pay \$300 for a waffle iron?

It is often the case that an experience on a vacation can become the stimulus for the purchase of a new product. For example, your kids may have loved the brunch at a Hilton because of the make-your-own-waffles experience with the large-scale professional-grade waffle iron. This big waffle iron has large handles that lock shut and allow the whole unit to be turned over, enabling users to make two waffles at a time. You walked the children through it the first time, and from then on, they were on their own. The machine steamed and hissed as the waffles cooked. The kids loved turning over that big handle and in a few minutes, out popped huge, thick waffles. Forget the muffins, Danishes, pancakes, and eggs. All the kids wanted to eat were waffles, and lots of them. Wouldn't it be great if you could give your kids the same experience in your home? Somehow the small, single-waffle iron no longer cut it. So when you got home from that vacation, you went to Williams-Sonoma, and there it was. Sitting next to the \$50 Belgian waffle iron is the \$300 KitchenAid waffle baker, just like the one that made the waffles the kids raved about on vacation. People buy SUVs for the experience of height, the roominess, the safety, and sometimes for all-wheel drive. These benefits are worth the extra fuel costs. Similarly, people buy KitchenAid for the experience; cost and size are thrown to the wind. Now Saturday can be a special family event as everyone relives a vacation experience.

What Jones (in a *Field of Dreams* scenario) knew and the team delivered on was that if they could make a compelling product that drafted off the success of KitchenAid, they would succeed—"If they built it, they would come"...and they would buy. The profit margins are enormous, more so than for many traditional Whirlpool products. Giving Williams-Sonoma a six-month exclusive for the new line added to its appeal and supported the price tag. The rest of the story is equally as interesting from a brand perspective. If you go into Target, you will see the same KitchenAid mixer (because this product crosses all demographics), but you will not see the Pro Line series. What you will see instead is a \$50 set of KitchenAid products in Target red and individual KitchenAid tools selling for \$20. This

extension from upscale to box store is not easy to accomplish. Using the KitchenAid mixer as the anchor is an innovative marketing move that so far has paid huge dividends. The idea of updating and extending the brand of KitchenAid caught the competition napping.

Like Dee Kapur, Jones has learned to see the other perspectives in the company with equal clarity and respect. While he has a keen sense of visual design and style, he also knows the issues that impact the bottom line—the core business architecture. He and his Brand Studio directors oversee a group that includes industrial design, graphic design, interface design, user research, and human-factors engineering. His brand teams are multidisciplinary and work in an integrated way with other areas of the company.

Jones is one of the new breed of innovator. In five years, he has built his global brand group to more than 100 people from the 15 he started with, and his staff are all in demand from other brand- and consumer-driven companies that hope to hire them away and capture some of Whirlpool's success. When Jones was awarded the Smithsonian Institute's National Design Award at the White House in 2003, it was the culmination of his and his team's success of a multi-year strategy to make Whirlpool the most recognized appliance brand in the world and recognized as a design leader. Consistent with Kapur, Jones can "see" the playing field; that is, his experiences have enabled him to see and understand the interconnected challenges of design, engineering, and marketing.

As a leader of innovation, Jones has several main goals:

1. Make the resources—time, space, money—available for the team to explore; 20 to 30 percent of his resources goes to innovation.
2. Use the resources to keep a pipeline of innovation going; on a yearly basis, the group generates hundreds of ideas, explores dozens of the promising ones, and then focuses on a dozen as possible product or brand introductions.
3. Make the tough decisions on which ideas fit the corporate business case.

4. Create an environment where everyone has the opportunity to contribute; to build such a rich team of talent is meaningless unless you use that talent.
5. Track innovation, understand its impact, and make it visible throughout the company so that the value of the group is clear; what gets measured gets attention!
6. Hire people who embody both “book smarts” and “street smarts”—those who can use both sides of their brain.

The New Breed of Innovator: Engineering and Advanced Thinking



Edith Harmon’s bachelor’s and master’s degrees are in mechanical engineering. But today, she heads one of the most dynamic advanced products groups in the clothing industry. Unlike a fashion company that makes shirts or jackets, New Balance makes state-of-the-art technology to support your body while you exercise. Athletic apparel,

then, is more than fashion. It is materials, manufacturing, ergonomics, biomedical, and lifestyle all rolled into some clothes and a pair of shoes. Harmon was exposed to technology during a brief stint at GM followed by a career of designing aircraft engines at GE, and even a stint designing alternative power plants in a start-up in the 1980s. But she wanted to connect with consumers, and she wanted products with shorter life spans that she could follow from inception to market success. In the aircraft industry, you are lucky to see any real innovations, and one product literally lasts a lifetime.

With all of this engineering focus, how did she end up as the manager of future product concepts in what many see as a fashion-focused industry? Like Kapur and Jones, Harmon also has a well-tuned right brain to balance her engineering left brain. Raised in New York City, she grew up with strong exposure to and a love for the arts, with regular visits to museums and the theater. When she was an undergraduate engineering student, her favorite courses were art history and film. She gained an appreciation and respect for the more artistic people, an appreciation that she brought with her to her job at New Balance.

When you meet Harmon, you really aren't sure how to classify her; she fits none of the stereotypes of the engineer, designer, or business executive. Harmon meets the criteria for the new breed of innovator. She is a polyglot and can talk with equal comfort to designers, marketing, material engineers, and manufacturing. She is a skilled manager of the multiple disciplines needed to produce the new ideas developed in the advanced product concepts. Harmon fosters the kind of thinking that allows her team to balance creative possibilities with costs and production realities.

When Harmon hires someone to join her group, team dynamics is one of the main drivers. People need to respect each other. They need to balance each other; there should be no duplication in talents and effort, and each person's skills must be valued in the team. Each person must be self-motivated. Harmon sees her role as finding

talented people who fit this mold and then giving them the environment and resources to excel.

Harmon encourages her team to try new ideas, as long as they fit in the larger business case of New Balance without the need to justify or defend them to the larger company. As a manager, she creates a buffer zone that protects her team and gives them freedom to explore. The goal is for the team to create fresh, usable ideas that balance aesthetic and functional appeal and that do not meet a preconceived notion—in other words, ideas that are innovative.

In managing the Advanced Products Group, Harmon focuses on the process rather than the end result. She gives her team the freedom to explore and meander within the process, the flexibility to obtain insights and findings that will direct their path to an end result. This freedom encourages self-motivation, a critical ingredient for innovation, and the process is a requirement to replace the lone inventor with the group innovator, who churns out a wealth of fresh, workable ideas. The group has balance, whereas the individual typically does not.

One of the many successes for Harmon's Advanced Products Group is the 1100 Ultra Trail Shoe. The shoe is a premium running shoe for trails, featuring waterproof, coated uppers, integral "scree" gaiters to prevent dust and pebbles from getting into the shoe, and rubberized toe bumpers to protect the toes. The outer sole looks almost like a tire tread, engineered for traction in rough terrain, protecting the sole from bruising, and allowing water to pour through the shoe (more on that in a minute).

The team embraced a user-centered design approach from start to finish. In developing the product, they focused on "ultra runners" who race for at least 50 miles and perhaps even 100 miles at a time. By meeting these runners' needs, the team knew that they would meet the needs of the average trail runner as well. The research was holistic, representing a range of stakeholders interviewed from race directors to the publisher of *UltraRunning* magazine—and, of course,

ultra runners. Three different types of ultra runners were interviewed: “newbies” just getting into it, “veterans” to whom ultra running is the center of their lifestyle, and “elites” who are driven to win these grueling races and are often sponsored by shoe companies. Three of each type were interviewed in their homes, on the trail, and at races. The team spent many hours running with these folks and experiencing their world firsthand. To make sure they understood the needs of runners in all different terrains, they conducted studies of runners in places they couldn’t get to, like Utah, Colorado, New Mexico, and Alaska. Here, they sent the runners disposable cameras for them to record their experiences, and then they conducted phone interviews using the images as a catalyst.

One interesting aspect of ultra running discovered by the team was that these runners intentionally run through streams. When running 100 miles, feet begin to burn and swell. Cool water is a way to refresh irritated feet. So Harmon’s team wanted to both allow water in and then whisk it out. Near the toe is an open hydrophobic mesh that lets water in but dries quickly, while in the sole are “drain and dry” holes that open while a person is running to let the water back out.

The team also researched related sports, such as adventure racing and orienteering, and other lifestyle products that address related needs identified through their research. A business case was built, including branding and strategic research, understanding the competitor landscape, and determining how to position and distribute the new product—namely, in specialty stores.

The team followed the type of process we discuss in Chapter 9, “A Process for Product Innovation.” As soon as they understood the opportunity, they began extended brainstorming sessions followed by prototyping of the concepts. Any feasible concepts went immediately into usability testing. Many of the users they had interviewed tried the working prototypes and then gave the team feedback. After making further modifications, the team repeated the process until they had designed a great product.

This process is the ideal product development process. Few teams in practice are given the resources and support to follow such a complete, user-driven design process. But the results speak for themselves. The shoe was awarded a gold award from Running Network, and sales have been at about 10,000 pairs per year—quite good for a specialty product like the 1100 Ultra. It takes a manager like Harmon to develop and support a team and environment for this approach toward innovation and developing new products.

As a manager of the Advanced Products Group, Harmon's goals include the following:

1. Make resources available—not just time and money, but also the freedom to fail.
2. Create innovation groups of individuals, each of whom has some distinct skills to bring to the table, so that the value of each person's ideas contributes to mutual respect within the groups.
3. Foster self-motivation within the groups to encourage enthusiastic participation stemming from belief in and enjoyment of the process and goals.

So Who Are the New Breed of Innovators?

Edith Harmon, Chuck Jones, and Dee Kapur are the new breed of innovators. They have achieved a pragmatic sense of balance between the pressing needs of business and the open-ended possibilities of product opportunities. They also balance the corporate strategic big picture with the needs of particular product programs. It is more than using a different set of methods; they have a different state of mind that they bring to every decision they make. They have acquired this state of mind; they have learned how to manage a process for innovation and how to cultivate people to succeed in that process. It is a

mentality and understanding that you also can learn. We introduce you to these individuals so that you can learn from them. The question to ask yourself is this: What can you do now to become an effective pragmatic innovator?

They have become respected in their companies, even though their approaches are not typical, because they understand how to foster and manage a corporate environment of innovation in companies such as Ford, Whirlpool, and New Balance. Although these three innovators are all in larger companies, innovators exist in every type and size of company. The next chapter describes the young and the restless team from start-up BodyMedia, and later in this book, you will read the case study of Eric Close, president and CEO of RedZone Robotics. In contrast, these individuals have made pragmatic innovation work in small start-up companies. This book also discusses David Kelley of IDEO and others in product-development consulting firms.

These individuals know that innovation is all about people, from the team who develops the product to the customers who use it. They know how to identify motivated and skilled people with whom to work and that innovation is about succeeding with others and learning how to set goals. These leaders are comfortable with and often enjoy the challenge of finding innovative solutions in seemingly contradictory situations. Where others see risk, they see opportunity. Their managing style is reminiscent of hockey great Wayne Gretzky's style of playing (when he was still playing): Instead of skating to where the puck was, he skated to where the puck would be.

Innovation Revealed

This book is about people. It is about the innovators who envision and create new products and services for the new global economy. It is also about the people who demand innovation at home, work, and play; in other words, it is about you. Throughout this book are many

case studies about people and companies that innovate solutions for the consumer and the business-to-business world. These people and case studies are real, many taken from our consulting, research, and educational initiatives—people like Kapur and Jones and Harmon. But also throughout this book, especially at the beginning of many chapters, are stories about users of these products. Because innovation is about understanding the needs, wants, and desires of those people who affect the success of the product in the marketplace, scenarios of these people are a critical tool in the practice of innovative product development. These scenarios are developed by product developers to provide product-use context. Although they are projections of real people, these stories of end users are not real.

This book is also about the process of innovation. It is not about managing new products after the fact, where a new product created elsewhere in the company now requires strategic marketing. It is not about the traditional business topics that fall under the label of innovation management. It is about the business of innovating—the business of finding opportunities in the marketplace and of developing products to achieve those opportunities. The tools, methods, and insights discussed result from our consulting and research projects. These are the tools of the new breed of innovator.

The result is a step-by-step guide to help you through the innovation process. It is not, however, a set of mindless instructions, a checklist that will do the work for you. Innovation requires thought. You, the reader of this book, can excel at it if you take the time to think about the context of the world around you. If you are looking for a way to reshape the way you lead, direct, manage, think, and practice, this book helps you learn how to fish in the seas of opportunity that exist in the interconnected new global economy. If you are someone who just wants to view the excitement of innovation up close, to understand what it takes to create a great product and deliver it to your door, this book gives you front-row insight into great companies, processes, people, and ideas in product and service development today.

This page intentionally left blank

INDEX

- 3M, 213
- 1100 Ultra Trail Shoe, 15
- 2002 Gold Business and Industrial Product
IDEA award, 129
- AARP (American Association for Retired
Persons), 226
- Adidas 1, launching of, 49-51
- Advance Products Group, 15
- advertising. *See* marketing
- Aearo Company, 130, 212
- Aeron chair, 79
- aesthetics (as a value opportunity), 174
- agriculture industry, fantasy in B-to-B
products, 129
- Aliberti, David, 36
- American Association for Retired Persons
(AARP), 226
- analysis
 - of customers in the field, 176
 - Powers of 10, 112-121
 - stakeholders, 134
- Annual NeoCon International furniture
show, 82
- anticipatory design, 73
- Apex Fitness, 34
- Apple, 70-78
- areas of strategic importance, identification
of, 58
- Asia, shifts in global economies, 228
- B-to-B innovation
 - industrial products, 128-131
 - profits, 142-143
 - RedZone Robotics, 131-134
 - strategic design plans, 134-139
- balancing hard and soft quality, 214-215
- Bayesian statistics framework, 57
- Beetle (Volkswagen redesign of), 40
- Bernie Bott's Every Flavor (Jelly) Beans, 99
- Between a Rock and a Hard Place*, 152
- Big Top peanut butter, 186
- biodegradable materials, 26
- Black & Decker, 190
- BodyMedia, 18, 26, 33-35, 41
- brands, 7-13, 194
- Braungart, Michael, 82, 226
- Bronze IDEA award, 130
- Bryant, Kobe, 218
- Buckeye Oil Company, 186
- business design, 201
- Business Week*, 95
 - 2002 Gold Business and Industrial
Product IDEA award, 129
 - "*Power of Design, The*", 201
 - shifts in global economies, 228
- butterfly effect, the, 153-154
- CAD (computer-aided design), 63
- Cagan, J., 168
- Calhoun, Jeff, 128
- Carnegie Mellon University, 36, 167

- case studies, analysis of, 53
- Cat in the Hat, The*, 99
- celebrity endorsements, 166
- chaos within structure, 155-161
- Charles, Nelson, 83
- Charon, Scott, 83
- Chernobyl (RedZone Robotics), 132
- China, 42, 92, 224-229
- Chrysler, 26, 228
- Cincinnati, Ohio, 185
- Close, Eric, 18, 132, 141, 176
- Coca-Cola, 193
- College of Engineering (Carnegie Mellon University), 36
- community (Power of 10 analysis), 119
- complexity in decision-making processes, 147-149
- computer-aided design (CAD), 63
- consultants
 - design management, 216-219
 - firms for hire, 209-210
 - IDEO, 205-209
 - Product Insight, 211-213
 - quality (balancing hard and soft), 214-215
 - use of in product development, 202-204
- consumption, 42-44
- continents (Power of 10 analysis), 121
- Cooper, Robert G., 40, 151
- copyrights (intellectual property), 191
- core technology (as a value opportunity), 175
- corporate mindsets, 41
- costs, controlling, 5
- creativity, pragmatic innovation, 2-3
- Crisco, 186
- criteria, achieving (pragmatic innovation process), 61
- cultural mindset of corporations, 41
- customers
 - in the field (analysis of), 176
 - trends (reading), 78, 80
- Daimler Chrysler, 26, 228
- Daly, Daniel T., 109
- Davidson, Willie G., 5, 32
- Debreu, Gerard, 33
- decision-making
 - butterfly effect, the, 153-154
 - chaos within structure, 155-161
 - complexity in, 147-149
 - go/no-go, 61
 - organizing, 152
 - for pragmatic innovation, 57-61
- delivery of patents, 197-198
- Dell Computers, 228
- design
 - business and industrial (interaction of), 201
 - consultants, 202-210
 - criteria (defining), 60
 - experience economy, 91
 - fantasy economy, 92-103
 - form and function, 90-91
 - global brand and industrial, 7-13
 - IDEO (as consultants), 205-209
 - industrial products, 128, 131-143
 - interaction design, 206
 - management, 216-217, 219
 - of Mirra chairs (Herman Miller), 82, 85
 - patents (intellectual property), 189-190
 - Product Insight (as consultants), 211-213
- Design Within Reach (DWR), 79
- DesignAid technology kit, 130
- designers, role of, 201
- development
 - analysis of, 54-55
 - fantasy (in everyday products), 94-98
 - goals of, 17
 - launching of Adidas 1, 49, 51
 - processes (engineering), 13-17
 - products. *See* products
 - role of marketing in early stages of, 52-53
- diesel fuel (Lubrizol case study), 107-110
- Digital Ink, 36
- digital music, 69. *See also* iPods; MP3
- Dippin' Dots (patents), 197-198
- Disney World, 93
- Drucker, Pete, 57
- Duet washer/dryer (Whirlpool Corporation), 9
- DWR (Design Within Reach), 79
- Eames, Charles, 112
- Eames, Ray, 83, 112
- economies, 91-103
- Edison, Thomas, 23
- EHF (Emulsified Heating Fuel), 114
- emotion (as a value opportunity), 173
- Emulsified Heating Fuel (EHF), 114
- engineering, 13-17
- environments, redefining local, 226
- ergonomics (as a value opportunity), 174
- EU (European Union), 42
- expanding markets, 225
- experience economy, 91-103
- fantasy economy, 92-103
- Finland, 43, 229
- FitzGerald, Niall, 72
- Ford Motor Company, 2, 18
- F-150 (redesign of), 29-31
- redefining local environments, 227
- shifts in global economies, 228
- trends (reading), 74
- use of consultants, 205
- Ford, Henry, 227
- form (and function), 90-91, 97-98
- fuel-cell technology, 26
- function (form and), 90-91, 97-98
- fuzzy front end of innovation, 59

- Gamble, James, 185
 GDP (Gross Domestic Product), 91
 Gehry, Frank, 63
 Gemperle, Francine, 36
 General Motors, 26
 Gillette, 185
 Gilmore, J. H., 91
 Gladiator GarageWorks, 8
 global brand designs, 7-13
 global economies, shifts in , 228
 global environment (Power of 10 analysis), 121
 globalization, 42-44, 92
 go/no-go decisions, 61
 Gold Design of the Decade award (OXO International), 95
 Graf, Robert T., 109
 grilles (automobile), redesign of, 158-161
 Gross Domestic Product (GDP), 91
 growth, 39-41, 205
 Guggenheim Museum (Bilbao, Spain), 63
- Haier, 43
 hard quality, balancing, 214-215
 Harmon, Edith, 13, 15, 17, 167
Harry Potter and the Sorcerer's Stone, 101
 HCI (human-computer interaction), 214
 Hear Music Coffeeshouses, 103
 Helen of Troy, 95
 Herman Miller, 79-80
 holistic "360-degree innovation", 187
 Honda, 27, 228
 Howitt, Allison, 5
 Hummer (General Motors), 26
- IDEA (Industrial Design Excellence Awards), 201
 identity (as a value opportunity), 174
 IDEO, 18, 25, 204-209
 IDSA (Industrial Designers Society of America), 95, 201
 IKEA, 8
 impact (as a value opportunity), 174
 India, 42, 228
 innovation
 B-to-B, 129, 131-143
 deconstructing, 222
 globalization of, 42-44
 goals of, 12-13
 growth potential of, 39-41
 in start-ups, 32-37
 interaction between business and industrial design, 201
 IP (intellectual property), 188-198
 management of, 5
 moving from invention to (redesign of Ford F-150), 29-31
 Powers of 10 analysis, 114-121
 pragmatic, 2-3, 23-28, 57-61
 product development, 165
 quality, 37-39, 214-215
 uncertainties of, 55-57
 waves of, 45
 innovators, 61-66
 intellectual property. *See* IP
 interaction design, 201, 206
 interdisciplinary decision making, 156-161
 inventions, 23-31
 IP (intellectual property), 184
 brand and product lifecycles, 194
 copyrights, 191
 design patents, 189-190
 products, 195-198
 provisional patents, 193
 Swiffer (Proctor & Gamble), success of, 185-188
 trade, 192-193
 trademarks, 191
 utility patents, 188
 iPods, 70-78
 iTunes, 77
- Jaguar, 228
 Jobs, Steve, 71
 John Deere, 63
 Jones, Chuck, 6-7, 9, 11, 13, 17, 176, 204
 Jones, Curt, 197
 Jordan, Michael, 218
- Kaplan, Josh, 176
 Kaplan, Zach, 130
 Kapur, Dee, 2-3, 5, 17, 29-31
 Kasabach, Chris, 34, 36
 Kazaa, 76
 Kelley, David, 18, 206
 Kelley, Tom, 25
 Kenmore, 8
 King Ranch, 5
 KitchenAid, 10
 Kodak, 193
 Korea, 228
 Kuwait Petroleum Italia SpA (KPIT), 107
- L.A. Gear, Inc. v. Thom McAnn Shoe Co.* (1993), 189
 LA Lakers, 218
 Laffley, A. G., 187
 lead users, 69
 Lewis, Elizabeth, 130, 211
 lifecycles, 194
 Limewire, 76
 local environments, redefining, 226
Lord of the Rings, 100
 Lubrizol, 65, 110
 Lucky Gold Star, 143
- MacKinnon, Don, 103
 mandates for change, 22-23
 manufacturing, 37-39, 197-198

- marketing
 - of innovations, 24
 - Procter & Gamble, 188
 - role of early stages of development, 52-53
 - tests, 54-55
- markets, expanding, 225
- Masone, Bob, 5
- McDonough, William, 82, 226
- Michigan International Speedway, 6
- micro views, 114
- micro-level analysis, 135
- Mirra chair (Herman Miller), 79-85
- Model T, 23
- Moggridge, Bill, 206
- molecular level (Power of 10 analysis), 114
- motivation, need for, 65-66
- Motorola, 25
- MP3, 69, 74-78
- Mr. Clean AutoDry Car Wash, 196
- Mullay, John A., 109

- nanotechnology, 26
- Napster, 76
- Nassar, Jac, 74
- Nelson, George, 83
- NESCAUM (Northeast States for Coordinated Air Use Management), 120
- New Balance, 13-18, 49
 - product development, 165-180
 - shifts in global economies, 228
 - use of consultants, 205
- New Holland (fantasy in B-to-B products), 129
- new product development (New Balance), 168-180
- new renaissance, the power of, 230-231
- new technology, 69
- Nike, 49, 228
- nitrous oxide (NOx), 109
- Nokia, 43
- noninvasively performed surgery, 26
- Normann, Wilhelm, 186
- Northeast States for Coordinated Air Use Management (NESCAUM), 120
- Nussbaum, 201

- O'Neal, Shaquille, 218
- offshoring, 39
- Ohio, Marysville, 228
- Order of the Phoenix, The*, 98
- organic growth, 39-41, 205
- OXO International, 94

- Pacione, Chris, 34, 36
- paggers (Motorola redesign of), 25
- Palm PDA devices, 25
- Pampers (Procter & Gamble), 185
- patents, 184, 188-198
- PayPal, 93

- phases of product development (New Balance), 168-180
- Pierpoint, Stephen, 50-51
- Pine, B. J., II, 91
- Pirkil, Jim, 225
- Platto, Gordon, 5
- Pledge Grab-It (S. C. Johnson), 187
- Poland, 43
- Post-It (3M), 213
- Postrel, V. I., 25
- Potter, Harry, 98-99, 101
- Powers of 10 analysis, 112-121
- Powers of 10* (movie), 112
- pragmatic innovation, 2-3, 23-28, 57-61
- Prius (Toyota), 27
- Procter & Gamble, 184
- Procter, William, 185
- Product Insight, Inc, 130, 211-213
- Production, 37-44
- products
 - analysis of, 54-55
 - consultant firms for hire, 209-210
 - decision-making, 147-161
 - development, 138-139, 153-166, 210-204
 - form and function, 90-91, 97-98
 - IDEO (as design consultants), 205-209
 - impact of (stakeholders), 112
 - industrial, 128-139
 - IP (intellectual property), 194-198
 - Lubrizol (case study example), 107-110
 - Product Insight (as design consultants), 211-213
 - role of marketing in development, 52-53
 - steps for satisficing development, 61-66
 - trade dress, 192
 - trends (impacting), 74-78
- profiles of stakeholders, 121-123
- profit, 2-3
 - B-to-B innovation, 142-143
 - of innovations, 24
 - trends (reading), 74
 - Wal-Mart, 38
- protection (intellectual property), 191
- prototypes, 36
- provisional patents (intellectual property), 193
- PT Cruiser (Chrysler), 26
- PuriNOx, 107

- Q White, 107
- quality, 24, 37-39, 175, 214-215

- radio frequency-enabled (RF) pressure switch, 180
- Ralston, Aron, 152
- reading trends, 70-85
- redefining local environments, 226
- redesign of Ford F-150, 29-31
- RedZone Robotics, 18, 131-134
- regions (Power of 10 analysis), 120

- researching people, 59
 results of strategic design plans, 139-141
Return of the King, The, 100
 RF (radio frequency-enabled) pressure switch, 180
 Roche Diagnostics, 34
 Rowling, J. K., 98-99, 101
 Russia, 42
- S.C. Johnson (Pledge Grab-It), 187
 Sandbox Advanced Development, 36
 Sanders, Liz, 211
 satisficing, 58-66
 Schacht, Keith, 130
 Schiavone, Pat, 5
 Schultz, Howard, 103
Sciences of the Artificial, The, 57
 Scully, John, 71
 Segway, 27
 SenseWear armband body monitors, 34, 36
 September 11, 2001, 74, 93, 165
 services, 91-98
 SET (social, economic, and technical) factors, 44, 59, 230
 Seuss, Dr., 99
 shareware software, 76
 shifts in global economies, 228
 Simon, Herb, 57-58
 Six Sigma, 38
 Smithfield Street Bridge, 32
 social, economic, and technical factors. *See* SET
 soft quality, balancing, 214-215
 Sonic Rim, 212
 SRI (Stanford Research Institute), 207
 StageGate, 40, 151
 stakeholders
 analysis, 134
 impact of, 112
 Lubrizol case study, 107-110
 Powers of 10 analysis, 114-121
 profiles of, 121-123
 Stanford Research Institute (SRI), 207
 Starbucks, 103, 198
 start-ups, 33-37, 49-51
 Stivoric, Ivo, 34, 36
 strategic design plans, 134-141
 strategic importance, identification of areas of, 58
 Strong, Russell, 129
 Studio 7.5, 82, 84
 success, measurements of, 64
 Swiffer (Proctor & Gamble), 184-188
 Syracuse University, 225
 system operations (Power of 10 analysis), 117
- Teller, Edward, 33
 terrorism, 74, 93, 165
Thomas & Betts Corp. v. Panduit Corp. (1995), 189
 Three Mile Island (RedZone Robotics), 132
 Tolkien, J. R. R., 100
 Toyota, 27
 trade dress, 192
 trade secrets, 193
 trademarks (intellectual property), 191
 trends
 Apple (reading), 70-72
 design of Mirra chairs (Herman Miller), 82, 85
 effect of customer demand, 78-80
 lead users and new technology, 69
 process of (reading), 74
 products impacting, 74-78
- United States, 42, 92, 228
 utility patents (intellectual property), 188
- value opportunities, 173
 view of stakeholders, identification of, 112
 VistaLabs, 128
 Vogel, C. M., 168
 Volkswagen (redesign of Beetle), 40
 Volvo, 228
- Wal-Mart, profits, 38
 WetJet (Proctor & Gamble), 184
 Whirlpool Corporation, 7, 18, 204-205
 William T. Young Company, 186
 Williams-Sonoma, 10
 Wing, Gabe, 83
 Wu, Xiangyang, 224
- Target, 11
 televisions, global production of, 43
 Teller, Astro, 33, 36