THE OPEN INNOVATION MARKETPLACE

CREATING VALUE IN THE CHALLENGE-DRIVEN ENTERPRISE
Praise for The Open Innovation Marketplace

“Seldom is there a book on innovation that aims to innovate both the innovation process and the firm itself. This book shoots high and delivers! The Open Innovation Marketplace is both inspirational and practical. It helps to show how the NIH (not invented here) syndrome can be creatively conquered in a way that honors the role of research. It lays out the foundations for a new kind of twenty-first century firm—the Challenge Driven Enterprise—that is agile, fast, and can leverage capabilities from around the world. This book is a must read not only for R&D managers, but even more so for CEOs and CFOs, especially those CFOs that seek leverage beyond just financial leverage.”

—John Seely Brown, Cochair, Deloitte Center for the Edge; Former Chief Scientist, Xerox Corp; and Director, Xerox Palo Alto Research Center (PARC)

“Many people talk about how work is changing, but Alpheus Bingham and Dwayne Spradlin have actually lived it. This fascinating report from the front lines of open innovation is filled with deep insights for all organizations.”

—Thomas Malone, MIT Sloan School of Management and Author of The Future of Work

“Alpheus Bingham and Dwayne Spradlin are two of the world’s leading authorities on open innovation. I think of no better guides to show us how any business can drive innovation with open challenges. With case studies from pharma to big oil and government to consumer goods, the authors show how any enterprise can harness networks of innovators to create lasting value.”

—David L. Rogers, Author of The Network Is Your Customer: Five Strategies to Thrive in a Digital Age
“InnoCentive’s pioneering work greatly influenced the way that GlobalGiving structured its marketplace for innovation in the international development sector. This book provides a helpful framework and vocabulary for leaders in any sector to use when developing strategies for open-sourced problem solving. Alpheus Bingham and Dwayne Spradlin have delivered an accessible and lively guide to the current state of Challenge Driven Innovation, and they explore the possibility of using a challenge orientation to transform enterprises, management strategy, and the nature of work itself.”

—Mari Kuraishi, Cofounder and President, GlobalGiving Foundation

“Although open innovation has the potential to transform your organization’s innovation efforts, most books on this burgeoning topic are academic tomes. Fortunately, you hold in your hands a book that cuts through the hype and gives you proven strategies based on real-world experiences with dozens of success stories. If you want to tap into the true power of crowdsourcing and collaboration, read The Open Innovation Marketplace. It will open your business…and it will open your mind.”

—Stephen Shapiro, Author of 24/7 Innovation and Personality Poker

“With global economies slowly recovering and former powerhouse economies showing significant lags, open innovation may hold the overall key to any nation’s ultimate productivity. In their book, The Open Innovation Marketplace, Alpheus Bingham and Dwayne Spradlin show readers how to harness the power of millions of individuals, acting independently within the global free market system to help business and people everywhere achieve their true growth and potential. The book clearly lays out a pathway to success and shows every leader and participant in today’s socially networked world how to create value in today’s ‘challenge driven’ economy for themselves and others. It is a must read.”

—Barry Libert, Author of Social Nation and Chairman and Founder, Mzinga
The Open Innovation Marketplace
This page intentionally left blank
The Open Innovation Marketplace

Creating Value in the Challenge Driven Enterprise

Alpheus Bingham
Dwayne Spradlin
To my many dear friends around the world who see a different and better future and aren’t afraid to take the risks to bring it to pass. And finally to my wife, Deidre, who endured more than she usually has to as I was mentally and physically absent, often hunkered out in the barn writing—and then graciously helped me edit the final copy.

—Alph

To Michelle, my wife, soul mate, and best friend. Without your inspiration, patience, and support, this book would not have been possible. To my children, Mitchell, Matthew, and Mark. More proof that you can do anything when you put your mind to it! And finally to my parents, whose love and confidence in me never waned. Thank you.

—Dwayne
This page intentionally left blank
Contents

Foreword by Christopher Meyer . . . . xiii
Acknowledgments . . . . . . . . . . . . . . . . xviii
About the Authors . . . . . . . . . . . . . . . . . xix
Preface . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . xxi

Chapter 1: Introduction . . . . . . . . . . . . . . . . . 1
   Placing Bets . . . . . . . . . . . . . . . . . . . . . . . . . . 1
   Managing the Innovation Process . . . . . . . . . . . . 3
   Balancing a Portfolio . . . . . . . . . . . . . . . . . . . . . 5
   False Positives Versus False Negatives . . . . . . . . 8
   Rationalizing Innovation Failure . . . . . . . . . . . . . 10
   Portfolio Management and Open Innovation . . . 11
   Meta-Innovation . . . . . . . . . . . . . . . . . . . . . . . . 15
   Prize Philanthropy . . . . . . . . . . . . . . . . . . . . . . . 16
   Problem Solving Versus Question Asking . . . . . 17

PART I Challenge Driven Innovation: How
a Marketplace of Innovation Allows
Us to Reframe the Innovation Model,
Improve Performance, and Manage Risk

Chapter 2: The Future of Value Creation . . . . . . . 21
   Overview . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 21
   Transaction Costs and Vertical Integration . . . . . . 22
   Vertical Disintegration . . . . . . . . . . . . . . . . . . . . . 23
   Globalization and Competition . . . . . . . . . . . . . . 25
   Lead Users . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 26
   Open Source Software . . . . . . . . . . . . . . . . . . . . . 27
   Problem Solving in Chat Rooms . . . . . . . . . . . . . 28
   Not by Bread Alone: Diverse Utilities . . . . . . . . . 30
   Count What Counts . . . . . . . . . . . . . . . . . . . . . . . 31
Chapter 3: A New Innovation Framework

Overview
Open Innovation’s Unique Potential
A Rational Compromise
Exploring Problem-Solving Diversity
Risk Sharing
Innovation Marketplaces
Historical Stage-Gate Processes
Seven Stages of Challenge Driven Innovation
The Future of Work and the Workplace
Innovation Tasks: Internal and External
Not-for-Profit Organizations
Open Medicines Development: Early Steps
Case Study: How NASA Expanded Its Innovation Framework to Find New Solutions to Old Problems

Chapter 4: The Long Tail of Expertise

Overview
Defining and Hiring Experts
The Untapped Potential
Tackling the Long Tail
Diversity, Marginality, and Serendipity
The Tear Gas Connection
Eureka! The Right Question at the Right Time
Case Study: How the Oil Spill Recovery Institute Tapped the Crowd to Be Better Prepared for Arctic Spills

Chapter 5: The Selection of Appropriate Innovation Channels

Overview
A Channel Decision-Making Tool
Innovation Channels
Terms Used in Defining Archetypes .......... 100
Project Module Archetypes .................... 102
The Challenge Driven Enterprise .............. 109
Case Study: How Eli Lilly and Company Is Changing from a Closed Company to an Open Network to Provide Medicines for the Twenty-First Century .............. 110

PART II The Challenge Driven Enterprise: Virtualizing the Business Model to Drive Innovation, Agility, and Value Creation

Chapter 6: The Challenge Driven Enterprise .......... 117
Overview ........................................ 117
What Is a Challenge? .............................. 119
Hallmarks of the Challenge Driven Enterprise .................. 128
The Real Challenge ................................ 134
Case Study: How Procter & Gamble Is Innovating Through Connect + Develop .......... 135

Chapter 7: Transformation .......................... 139
Overview ........................................ 139
Organizational Forms and the Emergence of a New Paradigm .................. 141
The Challenge Driven Enterprise as Business Strategy .................. 144
Remaking a Culture .............................. 147
Talent Management 2.0 .......................... 151
The Changing Nature of Work .................. 152
The Role of Senior Leadership Is to Lead ............ 153
The CEO Conundrum ............................ 155
Make This Your Mission ......................... 157
Case Study: Virtual Software Development: How TopCoder Is Rewriting the Code .......... 158

Chapter 8: The Challenge Driven Enterprise Playbook .......................... 163
Overview ........................................ 163
The Playbook ...................................... 164
I. Board of Directors and C-Level Commitment ........................................ 165
II. Promote Early Trial and Adoption ....................................................... 169
III. Virtualize the Business Strategy ...................................................... 172
IV. Establish the CEO Mandate ............................................................. 175
V. Create and Empower the CDE Task Force ............................................ 178
VI. Align and “Ready” the Organization .................................................. 183
VII. Select Enablers and Enroll Partners ............................................... 189
Timelines and the Institutionalization of the CDE ................................. 191
Use the Playbook, Adapt as Needed, and Play to Win ............................ 192
Case Study: How the Prize4Life Foundation Is Crowdsourcing ALS Research ........ 193

Chapter 9: Leadership ................................................................. 199
Overview .................................................................................................. 199
Key Points of the Book .......................................................................... 200
Darwin, Adaptation, and the New Normal ............................................ 203
Joseph Campbell and The Hero’s Journey ............................................ 204
The CEOs Journey: Five Essential Waypoints ...................................... 206
The CEO as the Hero .............................................................................. 208
A Marathon, Not a Sprint ....................................................................... 210
The CDE, Innovation, and Competing in the Twenty-First Century ..... 211
This Will Be Your Legacy ....................................................................... 213
Case Study: How President Obama’s Open Government Initiative Is Reinventing Government and Changing Culture ........................................... 214

Afterword ................................................................................................ 219

Endnotes ............................................................................................... 221
Supplemental Reading ............................................................................ 227
Index ........................................................................................................ 229
Foreword
by Christopher Meyer

Most likely, you picked up this book because you’re interested in innovation. You won’t be disappointed—you’ll find here a tightly reasoned rationale for the spread of open innovation, use cases in large corporations, not-for-profit, and government and practical guidance for employing this approach yourself. Your guides are two experienced entrepreneurs—one an accomplished big-company executive, one a serial startup veteran—who founded an open innovation business whose success required them to conquer one of the business world’s great challenges—get big companies to change their behavior.

But ten years from now *Open Innovation Marketplace* will be remembered for two broader contributions. The book describes the appearance of a new species in the evolution of an information-based economy: a global network of highly specialized expertise, on tap whenever, wherever, it’s needed. The authors then interpret the resulting operating changes in innovation processes in light of the new economics of information and labor. But that’s only the first act: In the second, the authors look through the other end of the telescope to see what these changes imply for corporate organizations beyond the innovation process. They don’t stop until they’ve described a new model of organization fit for the information economy.

Where does InnoCentive (the authors’ company) fit in this story of a new economy? In the 1990s, it was often repeated that “the Internet changes everything.” Clearly, though, it doesn’t change everything at once. New economies don’t spring full-blown from the head of Zeus—they follow a somewhat predictable life cycle, in which new science leads to new technology, which business eventually embraces. Nineteenth century work in the sciences of thermodynamics and chemistry, for example, led to technologies for steelmaking and
petroleum refining, and then to new products, such as automobiles and air conditioners. And because the companies optimized for mass-production required thousands, not dozens, of people, new organizational forms arose to manage activity on this scale, creating the corporate organizational form we took for granted 20 years ago. To get full value from this book, keep this in mind: The corporate organization form that dominated the twentieth century was the solution to a particular challenge—create a structure that can attract capital at a large scale (hence limited liability), achieve the economies of scale the new technology enables (with assembly lines, three shifts, and so on), and coordinate the activities of large numbers of people (using functional hierarchies, cost accounting systems, and company towns).

These arrangements solved a problem that was pressing around 1900. Today we have a new one.

As Stan Davis and I wrote in BLUR, following the same cycle as industrialization, we’re now approaching the fourth stage of the development of the Information Economy. The fundamental sciences of semiconductors and information theory, explored prior to 1950, begat an information technology industry—microprocessors, fibers, routers, software, and the rest. Consequently, today’s businesses are learning to leverage information the way their industrial forebears leveraged energy. The result is a new infrastructure for the economy—just as railroads, national highways, and ubiquitous service stations composed a new “transportation sector,” we now have semiconductor fabs, ISPs, Geek Squads, and the rest of our information industries. The economy is “informationalizing,” the way it previously industrialized. And an important milestone: As autos and appliances distributed industrial technology to individuals, PCs, game consoles, and smartphones have equipped everyone—increasingly, globally, everyone—to participate in the information economy.

What we don’t have quite yet is an organizational form that solves the new challenges to create value in an informationalized world.
If the Information Economy is approaching its fourth “quarter,” we should now be seeing new approaches to organizing economic activity that depart from earlier structures and provide a leap in productivity as the large, functionally organized industrial corporation did. What are the challenges to which these structures must respond in this cycle? They include the reduced cost of communicating anytime, anyplace; the competitive need to accelerate innovation; and the existence of a talent pool distributed widely around the world. Perhaps most important: The unique economics of digitally encoded information that can now be reproduced at essentially zero marginal cost. And seeing them we are.

Linux, the icon of open source software development, became available in 1992. This, too, was a major milestone. First, it demonstrated the practicality of self-organization, creating valuable output through the group adoption of a set of rules rather than through the orchestrated operation of a formal organization. Second, it pioneered a definition of property foreign to the industrial economy: valuable stuff, shared for free.

Not surprisingly, this excited considerable resistance from people making money from digital property, and a decade later the IP wars are far from over in the software, music, movie, or pharmaceutical industries. Nonetheless, leading-edge companies saw the upside in the capability to economically involve skilled, motivated contributors around the world that the Linux community demonstrated. But it took some time to figure out some combinations of governance structures and commercial arrangements that could take advantage of the economics of networks without sacrificing the capability to earn a profit. Around 2000, Procter & Gamble started its “Connect and Develop” approach to innovation. And InnoCentive was founded in 2001.

It’s not coincidental that these developments both centered on innovation. One of the consequences of the connected economy is
the acceleration of change itself. In the mature industrial world, the rule “if it ain’t broke, don’t fix it” made good sense, for business models and for machines. Change was something that happened seldom, was expected to disrupt an organization, and usually was driven by a single novel pressure—Japanese competition in the 1980s, say, or the Quality Movement. Now, innovation capability is coming to be seen as the most productive asset—for an individual, a company, or a country. In 1980, the question “What’s your business model?” would have made you sound like an idiot—now it makes you sound smart.

Because networks accelerate innovation, they also increase the need for it. And the information economy has responded: Innovation used to be a captive function, the purview of R&D groups and strategy officers. Now a new sector of the global economy has emerged, devoted to innovation: VCs, angels and angel funds; legal and accounting practices devoted to startups; corporate venture funds; specialized journals and conferences; and business plan competitions, patent exchanges, and even a new and prestigious profession: serial entrepreneur. (Prestigious, that is, in innovative economies. In Spain, failing at a venture brings shame on your family.)

InnoCentive is a part of this new sector. Its story is important because it is one of the early examples of applying the economics of connectivity, search, and self-organization to an established business function, finding a radically different solution and making it pay.

The authors here share their unique story, but they have a broader point. Networked innovation is indeed one of the new, needed solutions, but it’s more than that: It’s a pathfinder. InnoCentive’s success forces us to ask, how do its principles apply to every function of an organization? And when, collectively, we answer this question, what will be left of the organization form we’re used to? What can we learn from this case about the next organizational solution? In the second half of this book, Bingham and Spradlin take on this question as well.
In the late 1990s, Alph Bingham and I used to speculate about the economy as intersecting networks of capabilities: an “economic web” of companies, and an “organization web” of capabilities inside them. We discussed the increasing permeability of the boundary between the two webs, and the expectation that communications technology would eventually make it so porous that they would merge. The advanced economies remain far from that vision, but InnoCentive is poking new holes in this boundary every day—it is both the product of information technology and the agent of change in informationalized organization. Alph and Dwayne have an unmatched perspective on the fine-grained work it takes to make this kind of progress, a clear-eyed view of what will be possible next, and a deep understanding of the forces impelling the changes.

As William Gibson says, “The future is already here, it’s just unevenly distributed.” If it hasn’t reached you before, it’s arrived in this volume.
Acknowledgments

The authors want to extend a sincere thank-you to those who contributed to this manuscript and without which it would never have been possible. First, thanks to Leah Spiro, a tireless project coach and editor that held our feet to the fire and still took all our copy at the latest possible moment. Confusing thoughts are all ours. She tried, and did the best with what she had to work with (sic). Case studies were assembled by Andrea Meyer and John Dila, which helped make our intervening text come to life. Anne Greenberg checked the facts. And duly warned us when she could not. And not least, we want to thank our publisher, Pearson Education and its team of editors and especially Jeanne Glasser who saw something in an early outline, now barely recognizable.

A special thanks to Eli Lilly and Company, and some key, risk-taking executives for launching and supporting what have become some of the most unusual “laboratories” in which novel innovation models are being tested and proven, InnoCentive, among them.

We could not begin to thank those friends, colleagues, InnoCentive board members and advisors, whose genius provoked us, challenged us and inspired us. It happened over decades and goes on to this very moment.
About the Authors

Alpheus Bingham is a pioneer in the field of open innovation and an advocate of collaborative approaches to research and development. He is co-founder and former president and chief executive officer of InnoCentive.

Alpheus spent more than 25 years with Eli Lilly and Company; he retired as vice president of e.Lilly and vice president of Research Strategy. He had formerly been the vice president of Sourcing Innovation. He served on both the R&D Policy Committee and the corporate Operations Committee. He has deep experience in pharmaceutical research and development, research acquisitions and collaborations, and R&D strategic planning. During his career, he was instrumental in creating and developing Lilly’s portfolio management process and establishing the divisions of Research Acquisitions, the Office of Alliance Management, and e.Lilly, a business innovation unit, from which was launched various other ventures that create the advantages of open and networked organizational structures, including InnoCentive, YourEncore, Inc., Coalesix, Inc., Maaguzi, Inc., Indigo Biosystems, Seriosity, Chorus, and Collaborative Drug Discovery, Inc.

He currently serves on the Board of Directors of InnoCentive and Collaborative Drug Discovery, Inc.; the advisory boards of the Center for Collective Intelligence at MIT and the Business Innovation Factory, and as a member of the board of trustees of the Bankinter Foundation for Innovation in Madrid.

He has lectured extensively at both national and international events and serves as a Visiting Scholar at the National Center for Supercomputing Application at the University of Illinois at Champaign-Urbana. He is also the former chairman of the Board of Editors of the Research Technology Management Journal. Alpheus
was the recipient of The Economist’s Fourth Annual Innovation Summit “Business Process Award” for InnoCentive. He was also named as one of Project Management Institute’s “Power 50” leaders in October 2005.

Alpheus received a B.S. degree in chemistry from Brigham Young University and a Ph.D. degree in organic chemistry from Stanford University.

**Dwayne Spradlin** has been on the forefront of business innovation and leadership for more than 20 years. He is intensely focused on two areas: finding new ways to unleash and focus human potential using technology and defining the role of leadership in driving change in our businesses and culture.

Dwayne serves as president and chief executive officer at InnoCentive, the global leader in Open Innovation. Previous positions have included president of Hoovers Online, president and COO of StarCite, senior vice president of Corporate Development VerticalNet, and director at PriceWaterhouseCoopers, where he spent ten years delivering Technology and Strategy solutions to Fortune 500 clients including Intel, Compaq, Caremark, and United Airlines. Dwayne currently sits on the Board of Directors of both InnoCentive and Cortera.

Considered an authority on crowdsourcing, Open Innovation, and the role of Innovation in Philanthropy, Dwayne has been a keynote speaker at events on five continents, He is frequently interviewed and has been featured on CNBC, ABC, NPR, and BBC and quoted in the *Economist, BusinessWeek, The New York Times*, and many other journals and periodicals.

Dwayne holds a B.A. degree in applied mathematics and an M.B.A. degree from the University of Chicago. He lives in Southlake, TX, with his wife and three children.
Preface

Open innovation is actually a pretty straightforward concept. It’s the use of resources other than those internal to an organization, contributing in a meaningful way to an innovative outcome associated—owned if you will—by the organization that benefits directly from its distribution in the marketplace. But, as we unpack the business implications, as we examine the decision processes, as we look more closely at the organizational consequences, it is clearly a profound subject about which much has been and will be written. We feel that our contribution to that body of literature and practice is uniquely informed. As executives of InnoCentive, we have used our own business as a laboratory for understanding open processes and for examining the way innovation is practiced by ourselves and our many customers and partners, as well as the historic practices of the organizations in which we had been previously engaged. And, we strive to continually update our understanding of how and why it actually works to improve on that process for the success of our business and for the success of our customers.

InnoCentive was launched in 2001. At that time, there was no crowdsourcing or broadcast search channel to turn to for business innovation. In fact, those terms hadn’t even been coined yet. Eli Lilly and Company saw the potential for making a change in the way they innovated. They recognized that distributed in an unsearchable crowd were insights, flashes of genius, and ideas that would never be evident on job applications, resumes, or consulting brochures. They would hinge upon the uniqueness of every human experience and the chaotic way in which “aha moments” are distributed among persons of widely varying academic and career qualifications. Lilly saw the potential for tapping that ingenuity and a new business model was
born. It became another “channel” in what was emerging as a rapidly growing world of innovation alternatives to “doing it yourself.”

As we worked to create a successful business around this new model, new language sprang up to characterize it. We already mentioned the subsequent coining of the terms “crowdsourcing” by Jeff Howe and “broadcast search” by Karim Lakhani. Internally InnoCentive used familiar terms in very deliberate ways. Our customers, providing challenging problems to our network, became “Seekers.” And our network was one of “Solvers.” The problems themselves were “Challenges.” And we used these descriptions as we analyzed questions like: What was the value proposition to Seekers? Why did Solvers engage? And how did the properties of the Challenge serve to effectively contribute to its solution? As we authored this book, we were aware that sometimes we meant seeker as one who seeks a solution and sometimes we meant it as a specific player in a business ecology, an entity with the titular role of Seeker. We have striven to be consistent in our use of capitals. In the end, we realized there was no perfect solution. Any single, albeit consistent, default to a rule felt awkward at times. We used our judgment. We hope it worked.

These new approaches to innovation—crowdsourcing, broadcast search, electronic requests for proposals, and public-private partnerships—were joining the more historic ranks of joint ventures, contract labs, university research, and consulting services as a growing number of channels for innovation. The new modalities were being added faster than the techniques for orchestrating and managing them were. Taken altogether, these many marketplaces, platforms, and exchanges were becoming an innovation marketplace—an Open Innovation Marketplace. And in this sense, open means not just external, it means open to any source of contribution, including the efforts of the internal staff and innovation contributors. In the chapters that follow, we will present rationale for why open is better. We will present a framework for creating value in this market reality and rethinking your innovation processes. We will show how to select
appropriate channels when faced with the myriad choices and we will discuss the ways this may transform the very organizational structure of our business as these principles flow throughout.

Like most books, you can pick this one up, turn to page 1, and read it straight through. But inasmuch as we have chosen as our audience executives, foundation leaders, project managers, agency heads, and business students, we have architected the book in such a way that it also serves as its own synopsis.

After the introduction, each chapter is followed by a case study. You can read the chapter’s opening quote, the first paragraph or two, under the subheading “Overview” and the subsequent case study. In this way, the concepts are brought to life through the stories—and theoretical details and background can be later filled in as chosen. Those who might elect to read as such, should also read the synopsis of Chapters 1–8 that appears in the beginning of Chapter 9, “Leadership.”

Two chapters stand somewhat separate from the remainder. These two are intended to serve as a practicum to the main body of the text. Chapter 5, “The Selection of Appropriate Innovation Channels,” establishes a decision-making tool for selecting innovation channels after a project’s properties are defined. And Chapter 8, “The Challenge Driven Enterprise Playbook,” serves as a playbook for change and the transformation to a more virtual organization we refer to as the “challenge driven enterprise.” We recommend that they at least be skimmed for their structure even if the details are to be executed by others in the organization. And, be sure to read the critical case studies at the end of Chapter 5 and Chapter 8.

Though sources are cited, as appropriate, in the notes at the end of each chapter, we have also compiled a reading list of texts and papers that can augment the content and provide better grounding in topics that could only be covered in brief.
This page intentionally left blank
Introduction

“The race is not always to the swift, nor the battle to the strong, but that’s the way to bet.”
—Damon Runyon

Placing Bets

The proclivity to bet on the “swift” might serve you well, especially when it comes to placing bets at the racetrack. But in a new and complex world, few people actually know what “swift” or “strong” means in every context. For example, an executive may know what a “strong” market analyst or a “strong” manufacturing department head looks like when it comes to hiring someone. Yet that same executive might find it hard to identify a “strong” pharmacokineticist, which is a new, highly specialized branch of pharmacology. Indeed, it’s because of this difficulty that universities issue PhDs in pharmacokinetics. You can assume that if people have a PhD, they are certified as “strong,” even if you can’t make that assessment on your own.

But in today’s heavily connected world, what if, instead of relying on handicappers like universities to help you improve your odds, you could sometimes place your bets after the race is run? Wouldn’t this render measurements of “swift and strong” utterly moot? After all, you would know who WON. Not who might have won or even should
have won but who actually won. This contrarian notion is one of several at the heart of this book and will be further developed as the numerous present-day channels, or modalities, of innovation are elaborated and how you can more effectively make these choices and manage them.

Who is this book for? It is directed to the decision makers who are ultimately accountable for driving business performance and innovation in their organizations. These leaders have many different titles and specific roles. They are CEOs, company founders, chief scientific officers, foundation directors, government agency heads, and policy makers, to name a few. They run an equally broad range of entities, from a not-for-profit foundation seeking cures for orphan diseases, to a corporate business unit bringing a new product to market, to a government agency seeking breakthroughs to better provide security for its citizens.

Innovation processes and approaches are undergoing significant change—in business, in philanthropy, and in government. A new lexicon is emerging to describe these changes: terms such as, open innovation, crowdsourcing, prize philanthropy, public-private partnerships, broadcast search, and so on. Through years of practitioner experience with real-world clients, the authors have developed an approach that we call Challenge Driven Innovation (CDI) which is the focus of Part I. CDI brings an approach and rigor. It reframes the innovation and business process in light of the many new channels and partnerships available. And, it helps guide innovation leaders at all levels in the selection of those channels. This is an approach with enough precision to drive innovation, but agile enough to create value everywhere in the organization. We believe that organizations that adopt CDI pervasively essentially virtualize the enterprise and will have an even greater opportunity to drive business performance and market leadership in the twenty-first century. We call that vision the Challenge Driven Enterprise (CDE), the focus of Part II.
What can a business expect from the full adoption and strategic practice of Challenge Driven Innovation? Nothing less than the following:

- More cost effective problem solving
- A greater diversity of approaches to innovation
- Better management of risk
- Not reinventing the wheel
- Accelerated innovation
- Ability to pay for results and not just efforts

Managing the Innovation Process

How business, philanthropy, and government leaders direct the research and development (R&D) resources of their organizations to foster innovation is a critical part of their overall leadership. And, it is crucial to the market performance of many institutions. Ultimately, this leadership and its consequential innovations play a bigger role in society: These innovations underpin the quality of life of every person on earth. Think about it: It was innovation, defined as creativity and implementation, that created efficient farm practices to better feed people, water purification to minimize disease, educational advances to better the understanding of the world, the printing press, the steam engine, the Internet—a near endless list of human advances.

Within the walls of various corporate, nonprofit, and governmental departments charged with innovation are “the geese that have laid the golden eggs.” These “eggs” are the products and ideas on which the company was built and on which it subsequently thrived. And the “geese?” Well, they’re the scientists, designers, technologists, artists—the “creatives” that produced those eggs in the past and are counted on to produce them in the future. Organizational culture and lore often suggest that, “many leaders don’t understand the mysterious innovation process and are as likely to kill those geese as to nourish them,” or so the thinking goes. Given this reality, it certainly
seems risky for a non-R&D leader to tinker with that part of the organization—“let’s just leave it to others,” is a too often accepted groupthink.

But if leaders had this attitude toward operating divisions such as marketing or manufacturing, it would rarely be tolerated. And yet, for the sanctum sanctorum, areas like R&D and product development, somehow it seems OK. It’s not. Some would simply call this hands-off behavior a dereliction of duty. Whatever you call it, truth be known, the scientists and technical leaders in these innovation departments like this status quo and resist change.

We also want to assure you that we are ever mindful that innovation is hardly a strictly R&D phenomenon. Innovation spans across all areas of a business. Innovative solutions are, of course, needed for new product lines and product improvements. But, we can also talk about innovative marketing campaigns, innovative business strategies, innovative manufacturing processes, and innovative sales approaches. None of that is even a stretch. We must therefore ask that this broad notion of innovation be kept in mind. We sometimes use terms specific to technology or engineering, but that is to allow the use of specific examples, concrete language, and clarity. We sometimes, but not always, use broader language or multiple role descriptors as a reminder of our intention and awareness. Most importantly, the principles we discuss will have application in the broader sense, and that breadth is a key to understanding the CDE, central to Part II of this book.

This book uses a fairly well-established definition of innovation: an event characterized by an act of creation or invention followed by successful implementation and deployment so that the benefits of that creation may be widely enjoyed. By defining innovation as “realized invention,” you can create two distinct subevents which, in practice, have their own separate set of properties, conditions, and approaches. Of the two events, creation/invention and implementation_REALIZATION, the second act of implementation, or realization, is
the one most amenable to processes, structure, and what you would classically think of as managerial intervention.

The first, the creation or invention part, has always been and remains a bit murkier. When you imagine your own personal experience with innovation, it is always much easier to describe to others the implementation part. Just how you went about inventing something isn’t perfectly clear even to you. How can you manage the invention process when it just seems to happen? Surely the “conditions” were right. And so, much effort is given to the managerial duties of creating the right environment. How else to explain all those beanbag chairs on corporate invoices in the 1990s that were supposed to kick-start out-of-the-box ideas?

So, on the one hand, invention seems to be a tricky thing to manage and best left to the inventors. At the same time, we openly accuse general managers of dereliction of duty for having anything less than a robust management strategy for their innovation functions. How can managers resolve this contradiction?

Balancing a Portfolio

The answer isn’t all that complicated as an oversimplistic metaphor can demonstrate. A billboard recently seen in Nevada, where gambling is legal, advertised prime rib dinners with the price of $7.77, showing as three winning numbers on a slot machine. Yet think about slot machines and the casino business. You never know each time you pull the handle or press the button of a slot machine whether you are a winner or a loser. Yet, in spite of the unpredictability of any given play or even any given machine, few casino owners worry about losing money across the casino. The methods for managing systems of probabilities and unpredictable processes have been around for a long time; however, they need to be applied with greater rigor to the innovation processes, on which we survive.
Now, of course, you can fully appreciate that the notion of managing innovation as a portfolio of opportunities is hardly novel. But we can and should explore more deeply the relationship between innovation portfolio management and the historical growth of “open innovation,” which is the use of invention sources independent of the organization charged with delivering the innovation to the marketplace. This phenomenon was defined, and its substantial business impact analyzed in the seminal work *Open Innovation*\(^1\) by Professor Henry Chesbrough and to which we refer the reader for a deeper grounding. What are the strategic opportunities created by a more deliberate integration of the role of “open innovation” into the overall portfolio? When you use the term portfolio, you must, of necessity, mean a *balanced* portfolio. And actually, since a portfolio would be nothing more than a *collection* in the absence of that adjective, “balanced” is always implied. And so what is it that “unbalances” your portfolio? In later chapters, we spend far more time on the topic of diversity, so all those arguments aren’t replicated here. But internally generated projects are bound to possess a certain sameness. Thus, balancing is likely to demand an openness to external ideas, external projects, and external products—namely, ones that originate outside the organization.

Sourcing of more projects from outside the organization is not just a numbers game. Do not trivialize these arguments as merely the admonition to “take more shots on goal.” Plenty of analyses from the sports world suggests that the higher *scoring* team makes a higher *percentage* of attempted shots as well. The processes used to manage a portfolio of innovative ideas must be well designed and rigorously applied, but the tools and specifics—that is, pareto diagrams, decision-trees, and option theories—deliberately remain beyond the scope of this book. The focus of this book is not “how” to manage a portfolio. It is rather to show that new innovation channels offer a portfolio balancing capability, and therefore a desirable outcome,
unavailable with internal projects alone. This notion that a diverse portfolio of assets predictably outperforms a more correlated one is an important concept and one which is approached from multiple angles.

Beyond the factor of diversity, a second factor linking open innovation and innovation portfolio management is risk. There are many complex and valuable ways you can address the topic of risk and far more is said and written about risk than is done to contain it. When advancing an innovation portfolio, you need to worry about three kinds of risk: financial, technical, and execution. Closed innovation systems, where all the invention and creation takes place within the walls of a single institution, compel the innovator to load all this risk into one organizational basket. And that cumulative risk too often results in a “bet the farm” scenario. This risky strategy has resulted in the disappearance of many fine companies across numerous sectors. The pharmaceutical sector stands as a notable example. Think of the various medicines you and your family have taken. Many of the original producers, of well-known products like Motrin, no longer exist as individual entities, including SmithKline, Beecham, Ciba-Geigy, Roussel, Hoechst, Marion, and Merrel. What happened to Parke-Davis, Upjohn, Burroughs, and a host of others? These brands no longer exist. The executive teams no longer exist. The stock in those companies no longer exists. And although the answer is complex and has many elements idiosyncratic to those specific institutions, it is also a generally true statement that their demise could be traced to an over-accumulation of risk within their business entity.

The simple point to be drawn is that open innovation provides an invaluable means to balance an innovation portfolio and share risks. The consequences are so significant that all business leaders should be actively charged to attend to the innovation process and its strategic role.

Now recognize that the implementation of an actively managed innovation strategy won’t be without obstacles. Scientists generally
prefer to be ignored by process-mongers, portfolio managers, and others who might not be there with an agenda that is fully aligned with theirs, which is, first and foremost, peeling away nature’s layers of obscurity. Similar comments could be made about the resistance of technologists or artists. Although there might be plenty of opportunity to talk about the underlying reasons that these creative types, as a whole, have a tenuous relationship with authority, we would rather focus on how the overall systems tend to be biased toward flawed portfolio management. We will look next at how corporate culture and organizational myths distort attempts to effectively manage a portfolio of innovative projects with uncertain outcomes and a frequently low probability of success.

**False Positives Versus False Negatives**

An actively managed portfolio demands judgment calls. The judgments may well be based on quantitative values and careful measurements. But unless you have nearly inexhaustible resources and can see every risky project through to its final conclusion, imperfect judgments will have to be made, running the risk of being wrong. Two simple criteria for effective portfolio management are to make judgments as early as possible and to make as few errors as possible. When speaking of errors in this context, you need to classify two types of error, often referred to as alpha errors and beta errors or, in other contexts, false positives and false negatives, and sometimes just as simply as type I and type II errors.

In a portfolio, a false positive is a project deemed to be “successful” and that gets resources, and advances, but that ultimately fails. A false negative is a project terminated on the assumption that it will fail and then ultimately proves successful. Although each type of error is easy enough to make, it is harder to track false negatives because after
a project is terminated, it is only occasionally reincarnated to prove its ultimate worth. A typical false-negative scenario is one in which the project is terminated, with regard to the expenditure of resources, but is licensed elsewhere, and the licensee ultimately succeeds. When good judgments are made under conditions of incomplete and imperfect knowledge, both these types of error must occur. Logically, any attempt to eliminate one error type results in a greater number of instances of the other type. So if you never want to make the error of a false positive, you need to ruthlessly terminate projects with any hint of potentially failing—to avoid unnecessarily committing resources to them. Thus, you create many more false negatives in the process.

Well-managed portfolios result in both types of error. But what are the cultural pressures that might result in an overcommitment of one error type and consequently the commission of too many errors overall? Naturally, no innovator, whether scientist, technologist, or artist, wants to see their project terminated. So, not surprisingly, there is pressure to commit the error of falsely identifying a project as positive when it ultimately will fail. Consistent with this pressure—and serving the interest of individual project leaders and team members—most organizations have generated highly adverse stories about “the one that got away.”

This doesn’t mean that false negatives are somehow good. All errors are costly: The false positive error consumes resources and capital that, if deployed elsewhere, could have benefited the organization and its customers; and false negatives represent the very project in which the application of additional resources and capital would have served the organization and its customers. Remember that a bias toward one type of error will increase the total error population, and because both types of error represent cost without return, the goal clearly has to be to keep the sum of all errors as low as possible. Errors are a natural part of decision making under uncertainty, but they can be managed well or poorly, and good decision processes are often the difference between your ultimate success versus a competitor’s.
Rationalizing Innovation Failure

How this error type preference works in real organizational life is that the story about the “one that got away” is relayed with such anxiety that every project with an uncertain outcome is identified as yet another example of one which you may “let get away.” This vigilance to avoid any future embarrassment of the false negative results in a host of projects kept alive well beyond their time.

To rationalize this portfolio-inefficient mentality, a variety of other behaviors surface throughout the organization. Researchers wanting to avoid their pet projects being terminated identify closely with this tale, and research leaders adopt the mantra, “we can’t afford to at least not try.” Leaders outside the research departments are drafted to get on board by having it patiently explained to them that waste is a completely natural part of the research process and can’t be avoided if one is to do great things. All parties can count on pithy snippets of history to aid and abet them in this effort. Even the venerable “wizard of Menlo Park,” Thomas Edison, dismissed his critics by insisting that his failures were an integral part of his success by proudly declaring that shareholder investment had absolutely not been wasted because he now knew “10,000 ways not to make a light bulb.”

None of this is to say that there is some magic formula by which research will just progress from one success to another, or that at some high standard of portfolio management, payment for failure magically disappears. We challenge these institutionalized versions of R&D simply because they have become so entrenched that they are all but invisible and leaders are too quick to accept the “nature of the beast” as part of institutional lore. Making these myths apparent is only a tiny first step to more effectively addressing them. And what should now be clear is that the addressing of these issues is the responsibility of all organizational leadership and not just those directly charged with executing the innovation projects upon which the future of the organization inevitably rests.
Portfolio Management and Open Innovation

After promising to tie this issue of portfolio management to open innovation, it may appear that this promise was sidetracked. Not so. One important component of open innovation is that it creates an opportunity to share risks and expenses with external parties. The adverse consequences of the false positive are effectively neutralized when someone else is underwriting some or all of the costs. Details of how you can manage this risk-sharing, and the organizational structures that support it, will be covered in subsequent chapters. But, for now, error minimization, portfolio management, and open innovation need to be integrated into a total innovation management system that copes effectively with risk and probability, and that manages to a desirable economic outcome.

Many companies—and even whole industry sectors—compete primarily on the basis of innovation, for example, pharmaceutical companies that must routinely invent new medicines or the advertising industry that constantly must come up with snappy original taglines. Innovation is what enables these companies to maintain a competitive “edge” as opposed to competing on price, convenience, added services, or some other aspect of business. Even as the argument is made for other modes of competing, one cannot help but be reminded that convenience, services, and low-pricing is often the opportunity presented by an innovation of some type. No, the reality in the twenty-first century is that virtually all businesses are months away from a wave of novel competitors. Innovative companies survive.

Historically, innovation competition has revolved around each company’s capability to assemble creative departments—and most important, teams of exceptional talent that strive to out-innovate their competition. This was accomplished by smart people, with excellent equipment and facilities, inventing new products—and even new technologies—and often making fundamental advances in science.
Think Bell Labs as a prototype. Of course, even though Bell Labs continues as a distinct entity, it has not fully survived in the form that characterized it in its heyday because it has been altered by spinoffs, layoffs, mergers, and mission changes.

No doubt many factors contributed to the transformation of the central lab, with a broad remit for science. It is not the intent to thoroughly analyze Bell Labs or even to propose a scholarly hypothesis to explain its mutation. Surely some of those factors must include the broader access to knowledge because of the “information age.” Business, also, has become more sophisticated in its capability to locate and license ideas. This decreased the need to invent it all in-house. The adage that “none of us is as smart as all of us” has been scaled up and globalized.

Even so, an enormous percentage of the applied science and technology, and ultimately, “reduction to practice” remained an internal skill. Responding to this reality, a significant number of graduating scientists, engineers, and technologists historically went to work for large corporations—as did designers, graphic artists and draftsmen. The shift to “distributed innovation” has taken place slowly—over decades—until today, when many sectors can point to significant fractions of their new product introductions and underlying technologies as originating outside of their corporate labs. **Distributed innovation** is a gathering of ideas and solutions from many quarters and the integration of the pieces, by a central organization into what would be considered the final innovation. Some, such as Procter & Gamble, have even declared this as a strategic intent, one they call “Connect and Develop,” or C+D. They have set quantitative goals to increase licensing as the primary mode of innovation growth while maintaining a more constant level of internal R&D resources. This initiative is one you learn more about in the case study at the conclusion of Chapter 6, “The Challenge Driven Enterprise.”

Now is the era of “Open Innovation.” The shift to contract labs and licensed technologies is currently the major part of the open
innovation movement. But recent increases in broadband Internet access and other leaps in communication enable you to imagine a future in which technical problem solving, on the spot invention, and on-demand innovation can be realized—maybe even predominantly—through open communities of scientists. Examples of these open innovation communities are InnoCentive, the authors’ company, and TopCoder. These enabling platforms, and their attendant business entities, in which the network is managed on behalf of other institutions, have been named innomediators by Professor Mohanbir Sawhney at Northwestern University’s Kellogg School of Management.

Later chapters discuss how the various innovation channels are selected, how they play off against one another, and how they are ultimately integrated for innovation. Putting all this together ushers in new organizational and partnering realities: Marketplaces in which intellectual property—with or without its legal appendages—is exchanged as readily as Hummels on eBay. Maybe that’s a bit of an exaggeration in 2011, but stay tuned.

### Exploration Versus Exploitation

The need to constantly challenge your assumptions and your frame of reference was previously mentioned. Especially because time and familiarity renders your assumptions and frames of reference invisible, even to yourself.

I am reminded of how stubborn some of my own biases were at a conference sponsored by the Santa Fe Institute. The speaker was David Stark, a sociologist at Colombia University. He began with a story of the Naskapi Indians, a tribe native to Labrador. Inasmuch as this was a conference for business executives, and not sociologists or anthropologists, it was clear that his story was to be a metaphor for teaching a concept to the business community. I sat listening to the story and imagining the message that was to follow. I thought I had it completely figured out. And the wrongness of my conclusions reminded me of the extent to which certain patterns of
analyses had crept in and prevented me from seeing things in a fresh light.

Stark’s story told of the elk feasts during the hunting season when all the village would gather to prepare and to share the elk meat brought in by the young hunters. At the conclusion of each feast, the shoulder bone from the day’s catch was waved over the campfire until it was mottled with soot. The partially blackened shoulder blade was handed to the tribe’s shaman who interpreted the marks as a map that would guide the hunters to elk the next day. Listening to this story, I concluded that it must be an allegory for the wisdom of the corporate elders. Yes, I admit, I was getting old and quickly imagined this was a reminder that the brash, youthful ideas just imported along with newly minted MBA degrees required the tempering of experience and wisdom to be effectively implemented.

Wow! Did I get it wrong.

The actual conclusion and lesson to be taken from the Naskapi ritual was that the shaman didn’t have the faintest idea what the patterns meant nor where the elk would be foraging on the following day. The entire ritual served only to inject an element of randomness into the hunt—randomness that sometimes led to the discovery of new populations of elk; but more often, led to the hunters returning empty-handed at the end of the next day. And yet, over time this failure was interpreted to have led to the longer-term sustainability of both tribe and elk by avoiding what would have been the inevitable hunting out of entire elk populations—by hunters who measured their immediate worth only in terms of bringing in fresh kill. Stark then told other stories further establishing the relationship between survivability and the exploration-exploitation balance.

Although many of you may have immediately divined the correct message in the shaman’s reading of the shoulder bone, my own inability to see it was insured by more than one bias as the story unfolded. First, there is a tendency to perceive randomness as a “bad” thing—a symptom that something is out of control. We strive to make our world ever more deterministic and ever more predictable, and randomness seems evidence of failure—the same sense of failure felt by the young hunters more concerned with
their reputation on the morrow than they were about the preservation of the food supply for decades into the future. The intention here is not to go down the sidetrack of corporate shortsightedness, as tempting as it is to take pot shots at that target-rich environment. Rather, the point is this: Today’s technologies make exploring for innovative ideas easier than ever before, while at the same time, today’s competitive and economic realities make the bias toward pure exploitation harder to resist than ever before. As our organizations strive to articulate clear strategies for innovation, it is crucial that they maintain a balance between exploration and exploitation.

Just as the random soot patterns created the ability for the Naskapi to explore unknown regions, so too, do the various modes of open innovation enable organizations to explore unknown and unbiased, or at least differently biased, regions of technology, design, or policy, in ways previously too costly or too difficult.

**Meta-Innovation**

In examining the broad topic of open innovation a little more deeply, you find that some innovation modalities or innovation channels have been around a long time. One example would be the specialty labs that have long been used for customized testing or analyses or to which selected operations may be outsourced. On the other hand, some open innovation modalities are newer, with only limited examples of historical use: for instance, tech-scouting, crowdsourcing, and public-private partnerships. Taken altogether, the introduction of these new modalities, and even more important the integration of all modalities, into an innovation effort is a new approach to innovation strategy. It is what creates an Open Innovation Marketplace—a collection of channels and exchanges, an innovation bazaar, where creativity and ideas can be contracted, openly sourced, or globally
brainstormed. It represents what *The Economist*’s Tom Standage cleverly termed “meta-innovation: innovating on how we innovate.”

The 1990s saw many varieties of open innovation emerge or increase. There was also a growing movement in **open source software**. Although open source software development was indeed “open to the source of the solutions,” the term referred to the underlying code, the “source code,” and its intent to be “open to the public,” meaning not copyrighted but placed in the public domain. Thus, the novel development practice of being “open to the source of ideas” didn’t actually have a name of its own. There were a few examples near the turn of the century, such as Hello Brain, InnoCentive, TopCoder, BountyQuest, and X-Prize; although, X-Prize is a not-for-profit foundation that also fits the category of prize philanthropy.

As this approach was replicated at varying levels of complexity, rapid-fire, problem solving and consulting appeared in models such as e-Lance: a website that matches freelancers and work assignments; Gerson-Lehrman, a website that says it “connects the world’s leading institutions with the world’s leading experts”; and later Amazon’s Mechanical Turk, a website that matches software developers with businesses and entrepreneurs who want mechanical tasks done; and Google Answers, an “online knowledge market” offered by Google that enabled users to post bounties for well-researched answers to their queries.

These examples are hardly exhaustive, but you get the idea. In this climate, Jeff Howe’s *Wired* article in 2006 introduced the term **crowdsourcing**—a descriptor that has gained considerable traction. The term has been comfortably applied to both the quick response “answers” systems and more complex endeavors, such as InnoCentive.

**Prize Philanthropy**

On the not-for-profit side of the spectrum, the phrase **Prize Philanthropy** is defined as the use of donated prizes to incentivize
breakthroughs perceived as having some sort of broad social or philanthropic intent. In this expanding sector, you see diversification of the widely familiar X-prize efforts—the addition of the Virgin Earth Challenge, to find means for scrubbing atmospheric carbon dioxide; the Prize4Life, a foundation focused on treatment and detection of Lou Gehrig’s disease; and other examples as well. What characterizes this end of the spectrum is that the qualifying submissions are often heroic in execution and require considerable investment and likely a coalition of talents and disciplines to pull off. However, Prize Philanthropy is rapidly moving “down-scale” to seek modular, turnkey solutions that are part of a bigger ecology in global problem solving. These would include many independent efforts, and collaborative efforts in which existing open innovation platforms serve the needs of foundations and obviate the need for massive duplication of efforts in platform construction.

**Problem Solving Versus Question Asking**

When all the world becomes “the innovation lab,” how do innovation competitors compete? As pointed out by Michael Raynor and Jill Panetta in *Harvard Business Publishing*’s higher education newsletter, the new basis for innovation competition shifts from controlling the prior “limiting resource” of problem solvers to the new limiting resource of question-askers. In open innovation, in which resources well beyond any imaginable corporate lab are available to solve problems, solvers often respond to the innovation challenges because they perceive a commitment to manufacture, market, and make their invention available to the public. In the two parts of innovation— invention and realization—this new openness, and the ease with which it can be accessed, represents a leap forward for the “invention” part, with the commitment to “realization” being a form of currency to the inventor.
Essentially, you pay people by selling what they invent. That is, the resources an idea seeker will use to distribute and commercialize an invention is beyond the scope of many would-be inventors who will engage with an expectation of some monetary return, but also with the prospect of being “paid” by having their invention marketed or even freely distributed and thus, the ability to make a difference.

This question-based competition also redefines the role for internal corporate staff, a topic addressed in much more detail in Chapter 3, “A New Innovation Framework.”

In summary, innovation strategy is not an oxymoron. Failure by an organization to own that at the highest levels is a dereliction of duty.
INDEX

A

“a new way to…” archetype, 105-106
accessing talent, potential of open innovation in, 40-42
Action stage (CEO’s journey), 207
adapting CDE Playbook, 192-193
ALS (Amyotrophic Lateral Sclerosis) research case study, 193-197
Anderson, Chris, 67, 85
Ansari X PRIZE, 195
Applied Analytical, 96
Apps for Healthy Kids, 217
Arbesman, Harvey, 196
archetypes
“a new way to…,” 105-106
“directed stumbling,” 104-105
“explore problem solving space,” 106-107
“fix MY house,” 107-108
“follow the directions,” 103-104
“regulated recipe,” 103
terminology for, 100-101
“under the radar,” 102-103
Archimedes, 82, 84-85
assembly and integration in
CDI (Challenge Driven Innovation), 50
Asthmapolis, 217

B

balancing portfolios, 5, 8
Baldwin, Carliss, 48, 109
Bass, Gary, 216
Bedilion, Tod, 75
behavioral change, preparation for CDE, 188
Bell Labs, 12
Bentham, Jeremy, 31
BHAGs (Big Hairy Audacious Goals), 175
Birkinshaw, Julian, 75, 161
Blockbuster, 212
Blur: The Speed of Change in the Connected Economy (Davis and Meyer), 41, 52
Board of Directors, commitment of, 165-169
planning and budgeting, 166-168
securing, 168-169
Bonabeau, Eric, 109
boundary objects, 84, 123
Bradin, David, 82
broadcast search
characteristics of the crowd, 77-81
serendipity and challenge presentation, 82-86
tear gas example, 81-82
in Long Tail concept, 74-77
OSRI (Oil Spill Recovery Institute) case study, 86-89
Brown, John Seely, 35-36
budgeting, CEO commitment to, 166-168
**Built to Last** (Collins and Porras), 175
bureaucratic form, 141-142
business, purpose of, 211
business development,
preparation for CDE, 187
business evolution, 203-204
business models in **Challenge Driven Enterprises**, 128-131
business strategy
Challenge Driven Enterprise (CDE) as, 144-147
virtualizing, 172-175
  *focusing the strategy, 174*
  *guiding principles, 172-173*
  *modeling long-term shareholder value, 174-175*

**C**
Cainer, Stuart, 161
Campbell, Joseph, 199, 204-205
Carlile, Paul, 84, 123
**CDE (Challenge Driven Enterprise)**, 2, 117-118
  as business strategy, 144-147
CEO conundrum, 155-157
components of, 128-129
corporate culture in, 147-151
difficulty in achieving, 134-135
importance of becoming, 211-212
importance of pursuing, 157-158
leadership legacy, 213-214
open business models in, 129-131
Open Government Initiative case study, 214-218
organizational culture in, 133
Procter & Gamble case study, 135-138
role of leadership in, 153-155
talent management in, 132-133, 151-152
  *changing nature of work, 152-153*
TopCoder case study, 158-161
**CDE Playbook**, 164-165
adapting, 192-193
Board of Directors and CEO commitment, 165-169
  *planning and budgeting, 166-168*
  *securing, 168-169*
CDE task force, 178-183
  *collaboration opportunities, 182*
  *communications from, 182-183*
  *coordination by, 179-181*
  *installing leader of, 178-179*
  *prioritizing reengineering opportunities, 181*
enablers and partners, 189-192
  *institutionalization of CDE, 191-192*
  *in methodology and training, 189-190*
  *open innovation companies, 190-191*
establishing mandate, 175-178
  *communication of, 177-178*
cultural change, 177
  *involving senior leadership, 176*
preparation of organization, 183-187
  *behavioral change, 188*
  *business development, 187*
compensation and incentive systems, 187-188
HR, 187
management systems, 183-184
problem-solving skills, 185
R&D, 186
recognition systems, 188
structural barriers to adoption, 184-185
promoting early trials, 169-172
challenge events, organizing, 169
evaluating impact of, 171
successes of, 172
virtualizing business strategy, 172-175
   focusing the strategy, 174
guiding principles, establishing, 172-173
modeling long-term shareholder value, 174-175
CDE task force, 178-183
   collaboration opportunities, 182
   communications from, 182-183
   coordination by, 179-181
   installing leader of, 178-179
   prioritizing reengineering opportunities, 181
CDI (Challenge Driven Innovation), 2, 48
   stages of, 49-52
CEO conundrum, 155-157
CEOs, commitment of, 165-169.
   See also leadership
   planning and budgeting, 166-168
   securing, 168-169
challenge culture in Challenge Driven Enterprises, 129, 133
Challenge Driven Enterprise (CDE), 2, 117-118
   as business strategy, 144-147
   CEO conundrum, 155-157
components of, 128-129
   corporate culture in, 147-151
   difficulty in achieving, 134-135
   importance of becoming, 211-212
   importance of pursuing, 157-158
   leadership legacy, 213-214
   open business models in, 129-131
Open Government Initiative case study, 214-218
   organizational culture in, 133
   Procter & Gamble case study, 135-138
   role of leadership in, 153-155
   talent management in, 132-133, 151-152
   changing nature of work, 152-153
   TopCoder case study, 158-161
Challenge Driven Innovation (CDI), 2, 48
   stages of, 49-52
challenge presentation, serendipity and, 82-86
Challenges
   defined, 119-120
   defining the problem, 122-124
   examples of, 120
   inducements for, 126
   organizing events around, 169
   organizing work via, 124-126
   as strategy tool, 127-128
change
   commitment by leadership, 210
   evolutionary versus revolutionary, 33-34
channel distribution in
   CDI (Challenge Driven Innovation), 50
channels
archetypes
“a new way to...,” 105-106
“directed stumbling,”
104-105
“explore problem solving
space,” 106-107
“fix MY house,” 107-108
“follow the directions,”
103-104
“regulated recipe,” 103
terminology for, 100-101
“under the radar,” 102-103
defined, 92
selecting
constraints on, 92-94
Eli Lilly case study, 110-113
research on, 108-109
tools for, 94-95
types of
consulting, 99
CRO (contract research
organization), 96
crowdsourcing ideation, 97
crowdsourcing reduction to
practice, 98
e-RFP (electronic request for
proposals), 96
internal, 96
joint ventures, 99
off-shoring, 97
right of first refusal, 99
university contracts, 98
chat rooms
expert help desks versus, 29
problem solving in, 28-30
Chopra, Aneesh, 62, 215
Churchill, Winston, 117
Circuit City, 212
Clark, Kim, 48
Cleveland, Harlan, 53
Coase, Ronald, 22-23, 200
COGS (cost of goods sold), 32
collaboration opportunities, 182
Collins, Jim, 144, 151, 175
commitment to change by
leadership, 210
communication
of CDE mandate, 177-178
from CDE task force, 182-183
in corporate culture change,
150-151
compensation systems,
preparation for CDE, 187-188
Competing in a Flat World:
Building Enterprises for a
Borderless World (Fung and
Wind), 36, 52
competition in innovation, 11
globalization and, 25-26
problem solving versus question
asking, 17
Competitive Strategy (Porter), 144
confidentiality, defined, 103. See
also secrecy
Connect + Develop
(Procter & Gamble case
study), 135-138, 146
consulting, as innovation
channel, 99
contract research organization
(CRO), 96
coordination by CDE task force,
179-181
corporate culture, changing,
147-151
corporate strategy, Challenges in,
127-128
corporations
evolutionary versus revolutionary
change, 33-34
formation of
transaction costs and
vertical disintegration,
23-25
transaction costs and
vertical integration, 22-23
INDEX

cost of goods sold (COGS), 32
Covance Labs, 96
Cragin, Bruce, 64
Crainer, Stuart, 76
CRO (contract research organization), 96
crowdsourcing, 16, 28
ALS research case study, 193-197
characteristics of the crowd, 77-81
  serendipity and challenge presentation, 82-86
tear gas example, 81-82
finding stars metaphor, 78-79
in Long Tail concept, 74-77
of ideation, 97
OSRI (Oil Spill Recovery Institute) case study, 86-89
of reduction to practice, 98
crowdsourcing (Howe), 160
cultural change in CDE mandate, 177
culture of corporation
  in Challenge Driven Enterprises, 129, 133
  changing, 147-151

cultural change in CDE mandate, 177
culture of corporation
  in Challenge Driven Enterprises, 129, 133
  changing, 147-151

cultural change in CDE mandate, 177
culture of corporation
  in Challenge Driven Enterprises, 129, 133
  changing, 147-151

D

Darwin, Charles, 203
Davis, Jeff, 63, 65
Davis, John, 88
Davis, Stan, 41, 52
Decision stage (CEO’s journey), 207
defining problems, 122-124
Deming, W. Edwards, 150
Democratizing Innovation (von Hippel), 26, 73
“directed stumbling” archetype, 104-105
dissection in CDI (Challenge Driven Innovation), 49
distributed innovation, 12
diversity
  in crowdsourcing, 77-78
  open innovation in, 42
  in portfolio balancing, 6
  problem-solving and, 43-44
    in Long Tail concept, 72-77
  rational compromise in, 42
Drucker, Peter, 21, 34, 139, 211
Durchslag, Scott, 36

E

e-business, 191
e-RFP (electronic request for proposal), 96
early trials, promoting, 169-172
  challenge events, organizing, 169
  evaluating impact of, 171
  successes of, 172
economic theory, utilitarian economics, 30-31
Edison, Thomas, 10, 79
80/20 rule, 54
Einstein, Albert, 31, 41, 122
electronic request for proposal (e-RFP), 96
Eli Lilly and Company, xxi, 42, 137, 160
  case study, 110-113
emergency response systems, 217
employee recruitment strategy, open innovation and, 40-42
employment diversity, open innovation in, 42. See also diversity
empowerment for corporate culture change, 150-151
enablers, selecting, 189-192
institutionalization of CDE, 191-192
in methodology and training, 189-190
open innovation companies, 190-191
errors
  false positives versus false negatives, 8-9
  rationalizing innovation failure, 10
evaluating pilot program impact, 171
evaluation/confirmation in CDI (Challenge Driven Innovation), 50
evolution of business, 203-204
evolutionary change, revolutionary change versus, 33-34
expert help desks, chat rooms versus, 29
experts, defining and hiring, 69-72
exploitation, exploration versus, 13-15
exploration, exploitation versus, 13-15
“explore problem solving space” archetype, 106-107
external resources in open innovation framework, 54-57

F
false negatives, 8-9
false positives, 8-9
Fannie Mae, 212
Faraday, Michael, 41
filtering in CDI (Challenge Driven Innovation), 49
finding stars metaphor, 78-79
FIPCo (fully integrated pharmaceutical company), 110-113
FIPNet (fully integrated pharmaceutical network), 110-113
“fix MY house” archetype, 107-108

focusing the business strategy, 174
Fogarty, Jennifer, 65
“follow the directions” archetype, 103-104
Ford Motor Company, 153
framework for innovation, 39-40
  CDI (Challenge Driven Innovation), 48
    stages of, 49-52
  future of work, 52-54
  innovation marketplaces, 46
  internal versus external resources, 54-57
  NASA example, 62-65
  not-for-profit organizations in, 57-58
  pharmaceutical research example, 58-62
  potential of, 40-42
  problem-solving diversity, 43-44
  rational compromise, 42
  risk sharing, 44-46
  stage-gate process versus, 47-48
framework for transformation.
  See CDE Playbook
Free Agent Nation (Pink), 152
Friedman, Thomas, 25, 53
Fung, Victor, 36, 52
Fung, William, 36, 52
future of work, 52-54
The Future of Work (Malone), 33, 53
fuzzy
  defined, 101
  “directed stumbling” archetype, 104-105

G
General Electric, 139
Gerson-Lehrman, 16
Gerstner, Lou, 157, 209-210
globalization, competition and, 25-26
Globalization 3.0, 53
Goldcorp, 43-44
Good to Great (Collins), 144
Google Answers, 16
gross profit margin, 32
guiding principles, establishing, 172-173

H
Hagel, John, 35-36
help desks, chat rooms versus, 29
Hemingway, Ernest, 34
hero’s journey, leadership as, 204-210
Action stage, 207
Decision stage, 207
Realization stage, 206
Resolve stage, 208
Vision stage, 206-207
The Hero’s Journey (Campbell), 204-205
Herrold, Charles, 35
Hier, 82-85
hiring experts, 69-72
history of organizational forms, 141-144
Howe, Jeff, xxii, 16, 160
HR (human resources)
department
in Challenge Driven Enterprises, 132-133
preparation for CDE, 187
Hughes, Jack, 159
Huston, Larry, 136

I
IBM, 209-210
IBM 2008 Global CEO Study, 140
idea gathering in CDI (Challenge Driven Innovation), 49
ideation, crowdsourcing of, 97
Immelt, Jeffrey, 139
incentive systems, preparation for CDE, 187-188
inducements for Challenges, 126
innomediators, 13
innovation
defined, 4
preparation for CDE, 186
innovation channels
archetypes
“a new way to….,” 105-106
“directed stumbling,” 104-105
“explore problem solving space,” 106-107
“fix MY house,” 107-108
“follow the directions,” 103-104
“regulated recipe,” 103
terminology for, 100-101
“under the radar,” 102-103
defined, 92
selecting
constraints on, 92-94
Eli Lilly case study, 110-113
research on, 108-109
tools for, 94-95
types of
consulting, 99
CRO (contract research organization), 96
crowdsourcing ideation, 97
crowdsourcing reduction to practice, 98
e-RFP (electronic request for proposals), 96
internal, 96
joint ventures, 99
off-shoring, 97
right of first refusal, 99
university contracts, 98
innovation competition, 11
  problem solving versus question
  asking, 17
innovation marketplaces, 46
innovation process, managing,
  3-5. See also value creation
  exploration versus exploitation,
  13-15
false positives versus false
eoltives, 8-9
meta-innovation, 15-16
open innovation and portfolio
  management, 11-13
portfolio balancing, 5, 8
Prize Philanthropy, 16
rationalizing failure, 10
innovation terminology, xxii
institutionalization of CDE,
  191-192
internal innovation channel, 96
internal resources in open
  innovation framework, 54-57

J–K
Jacobs, Garry, 53
Jeppeson, Lars, 75
Johnson, Peter, 112
joint ventures, 99
Joy, Bill, 40
judgment
  “a new way to…” archetype,
  105-106
defined, 100
  “directed stumbling” archetype,
  104-105
  “explore problem solving space”
  archetype, 106-107
  “fix MY house” archetype,
  107-108
Kennedy, John F., 124
Kremer, Avi, 193-197

L
Lafley, A.G., 136, 139, 146,
  157, 209
Lakhanı, Karim, xxii, 75, 80, 122
launch in CDI (Challenge Driven
  Innovation), 50
lead users, 26-27
  in Long Tail concept, 74
leadership
  in business evolution, 203-204
  of CDE task force, 178-179
  CEO conundrum, 155-157
  commitment to change, 210
  in corporate culture changes,
  149-150
  as hero’s journey, 204-210
    Action stage, 207
    Decision stage, 207
    Realization stage, 206
    Resolve stage, 208
    Vision stage, 206-207
  legacy of, 213-214
  Open Government Initiative
    case study, 214-218
  role in Challenge Driven
    Enterprise (CDE), 153-155
  senior leadership, involving in
    CDE mandate, 176
Lechleiter, John C., 110
Lee, Everett, 160
legacy of leadership, 213-214
Leitner, Melanie, 196
Li & Fung Ltd, 119, 143
  case study (value creation),
  35-37
Lilly. See Eli Lilly and Company
Lindbergh, Charles, 120
local
  defined, 101
  “fix MY house” archetype,
  107-108
Lohse, Peter, 75
Lombardi, Vince, 163, 193
Long Tail concept
  broadcast search in, 74-77
  characteristics of the crowd, 77-81
  serendipity and challenge presentation, 82-86
  tear gas example, 81-82
  experts, defining and hiring, 69-72
  explained, 67-68
  finding stars metaphor, 78-79
OSRI (Oil Spill Recovery Institute) case study, 86-89
untapped potential in, 72-74
long-term shareholder value, modeling, 174-175
Longitude Prize, 120
Lou Gehrig’s disease research case study, 193-197

M
Malone, Thomas, 30, 33, 53, 76
management systems, preparation for CDE, 183-184
managing innovation process, 3-5
  exploration versus exploitation, 13-15
false positives versus false negatives, 8-9
meta-innovation, 15-16
open innovation and portfolio management, 11-13
portfolio balancing, 5, 8
Prize Philanthropy, 16
rationalizing failure, 10
mandate, establishing CDE as, 175-178
  communication of, 177-178
  cultural change, 177
  involving senior leadership, 176
  marginality in crowdsourcing, 80
McEwen, Rob, 43
McLaughlin, Neil, 80
Mechanical Turk, 16
Mendel, Gregor, 40
meta-innovation, 15-16
methodology, adopting, 189-190
metrics
  CEO commitment to, 166-168
  productivity metrics, value creation and, 31-33
Meyer, Christopher, 41, 52
Mill, John Stuart, 31
Miller, Ellen, 216
motives in economic theory, 30-31

N
NASA case study in open innovation framework, 62-65
Nathan’s Battle, 61
nature of work, changing, 152-153
network form, 143. See also CDE (Challenge Driven Enterprise)
  network orchestration, Li and Fung case study, 35-37
NineSigma, 137
not-for-profit organizations in open innovation framework, 57-58

O
Obama, Barack, 149, 155, 213-218
Obama, Michelle, 217
off-shoring, 97
Oil Spill Recovery Institute (OSRI) case study, 86-89
open business models in Challenge Driven Enterprises, 128-131
Open Government Initiative case study, 214-218
open innovation
defined, xxi
framework for, 39-40

  CDI (Challenge Driven Innovation), 48-52
  future of work, 52-54
  innovation marketplaces, 46
internal versus external resources, 54-57
NASA example, 62-65
not-for-profit organizations in, 57-58
pharmaceutical research example, 58-62
potential of, 40-42
problem-solving diversity, 43-44
rational compromise, 42
risk sharing, 44-46
stage-gate process versus, 47-48
meta-innovation and, 15-16
in portfolio balancing, 5, 8
portfolio management and, 11-13
open innovation companies, partnering with, 190-191
open source movement in value creation, 27-28
open source software, 16
“Optimal Marginality” (McLaughlin), 80
orchestration, Li and Fung case study, 35-37
organization, preparing for CDE, 183-187
behavioral change, 188
business development, 187
compensation and incentive systems, 187-188
HR, 187
management systems, 183-184
problem-solving skills, 185
R&D, 186

  recognition systems, 188
structural barriers to adoption, 184-185
organizational culture in Challenge Driven Enterprises, 129, 133
organizational forms, history of, 141-144
organizing
  challenge events, 169
work via Challenges, 124-126
Ortiz Prize, 120
OSRI (Oil Spill Recovery Institute) case study, 86-89
outsourcing, off-shoring versus, 97

P

P&G case study, 135-138
Panetta, Jill, 75, 195
partners, selecting, 189-192
institutionalization of CDE, 191-192
in methodology and training, 189-190
open innovation companies, 190-191
Patton, George, 150, 158
Pegau, Scott, 88
Petersen, Josh, 67
pharmaceutical research example in open innovation framework, 58-62
pilot programs, promoting, 169-172
  challenge events, organizing, 169
  evaluating impact of, 171
  successes of, 172
Pink, Daniel, 152
Pisano, Gary, 63, 109
planning, CEO commitment to, 166-168
playbook. See CDE Playbook
Porras, Jerry, 175
Porter, Michael, 144
portfolio management, open innovation and, 11-13
portfolios
balancing, 5, 8
false positives versus false negatives, 8-9
power functions
explained, 67-68
self similarity in, 74
precise
“a new way to…” archetype, 105-106
defined, 101
“explore problem solving space” archetype, 106-107
“fix MY house” archetype, 107-108
preparation for CDE, 183-187
behavioral change, 188
business development, 187
compensation and incentive systems, 187-188
HR, 187
management systems, 183-184
problem-solving skills, 185
R&D, 186
recognition systems, 188
structural barriers to adoption, 184-185
prioritizing reengineering opportunities, 181
Prize Philanthropy, 16
Prize4Life case study, 193-197
Probion Analysis, 96
problem-solving capability
characteristics of the crowd, 77-81
serendipity and challenge presentation, 82-86
tear gas example, 81-82
OSRI (Oil Spill Recovery Institute) case study, 86-89
problem-solving diversity, 43-44
in Long Tail concept, 72-77
problem-solving in chat rooms, 28-30
problem-solving innovation, 16
Prize Philanthropy, 16
question-asking realization versus, 17
problem-solving skills, developing, 185
problems, defining, 122-124
Procter & Gamble, 139, 146, 209
case study, 135-138
productivity metrics, value creation and, 31-33
promoting early trials, 169-172
challenge events, organizing, 169
evaluating impact of, 171
successes of, 172
Q–R
question-asking realization,
problem-solving innovation versus, 17
R&D, preparation for CDE, 186
randomness, need for, 13-15
rationalizing innovation failure, 10
Realization stage (CEO’s journey), 206
recipe
defined, 100
“follow the directions” archetype, 103-104
“regulated recipe” archetype, 103
recognition systems, preparation for CDE, 188
reduction to practice, crowdsourcing of, 98
reengineering opportunities, prioritizing, 181
regulated
  defined, 100
  “follow the directions”
    archetype, 103-104
  “regulated recipe”
    archetype, 103
  “regulated recipe” archetype, 103
Resolve stage (CEO’s journey), 208
revolutionary change,
  evolutionary change versus, 33-34
rewards for Challenges, 126
right of first refusal, 99
risk
  “a new way to…” archetype,
    105-106
  “explore problem-solving space”
    archetype, 106-107
  “fix MY house” archetype,
    107-108
  in portfolio balancing, 7
risk-sharing, open innovation and, 42-46
risky, defined, 101
Roche Diagnostics, 75
Runyon, Damon, 1, 40
Rutkove, Seward, 197

S
  Sakkab, Nabil, 136
  Salmons, Joshua, 216
  Sawhney, Mohanbir, 13
  secrecy
    defined, 100
    under the radar’ archetype,
    102-103
  securing CEO commitment,
    168-169
  selecting innovation channels
    “a new way to…” archetype,
    105-106
    archetype terminology, 100-101
  constraints on, 92-94
  consulting, 99
  CRO (contract research organization), 96
  crowdsourcing ideation, 97
  crowdsourcing reduction to practice, 98
  “directed stumbling” archetype,
    104-105
  e-RFP (electronic request for proposals), 96
  Eli Lilly case study, 110-113
  “explore problem-solving space”
    archetype, 106-107
  “fix MY house” archetype,
    107-108
  “follow the directions”
    archetype, 103-104
  internal channel, 96
  joint ventures, 99
  off-shoring, 97
  “regulated recipe” archetype, 103
  research on, 108-109
  right of first refusal, 99
  tools for, 94-95
  “under the radar” archetype,
    102-103
  university contracts, 98
self similarity in power
  functions, 74
  senior leadership, involving in
    CDE mandate, 176. See also
  CEOs; leadership
serendipity in crowdsourcing, 80
  challenge presentation and,
    82-86
  tear gas example, 81-82
Shapiro, Stephen, 122
shareholder value, modeling, 174-175
Shirky, Clay, 67
solution surface, defined, 101
space searches metaphor, 78-79
stage-gate process, 47-48
Standage, Tom, 16
stars metaphor, 78-79
Stevenson, Cheryl, 88
strategy tools, Challenges as, 127-128
structural barriers to adoption, addressing, 184-185
successes of pilot programs, promoting, 172
_The Sun Also Rises_ (Hemingway), 34

T

talent management in Challenge Driven Enterprise (CDE), 128, 132-133, 151-152
changing nature of work, 152-153
Tapscott, Don, 28
task force. See CDE task force
tear gas example (serendipity), 81-82
terminology of open innovation, xxii
TopCoder case study, 158-161
training, establishing, 189-190
transaction costs
vertical disintegration and, 23-25
vertical integration and, 22-23
transformation
of business strategy, 144-147
CEO conundrum, 155-157
of corporate culture, 147-151
framework for. See CDE Playbook
importance of pursuing, 157-158
role of leadership in, 153-155
of talent management, 151-152
changing nature of work, 152-153

U–V

“under the radar” archetype, 102-103
university contracts, 98
utilitarian economics, 30-31
value creation, 21
evolutionary versus revolutionary change, 33-34
globalization and competition, 25-26
lead users, 26-27
Li and Fung case study, 35-37
open source movement, 27-28
problem solving in chat rooms, 28-30
productivity metrics and, 31-33
transaction costs and vertical integration, 22-23
utilitarian economics, 30-31
vertical disintegration, 23-25
Verganti, Roberto, 109
vertical disintegration, transaction costs and, 23-25
vertical integration, transaction costs and, 22-23
Virtual USA, 217
virtualizing business strategy, 172-175
focusing the strategy, 174
guiding principles, establishing, 172-173
modeling long-term shareholder value, 174-175
Vision stage (CEO’s journey), 206-207
von Hippel, Eric, 26, 30, 73, 109
W–Z

Wandless, Tom, 45
Welch, Jack, 139
Who Says Elephants Can’t Dance (Gerstner), 210
Wikinomics (Tapscott and Williams), 28
Wikipedia, 39
Williams, Anthony, 28
Wind, Jerry, 36, 52
work, organizing via Challenges, 124-126
workplace, future of, 52-54
The World Is Flat (Friedman), 25, 53
Yet2.com, 137
YourEncore, 137