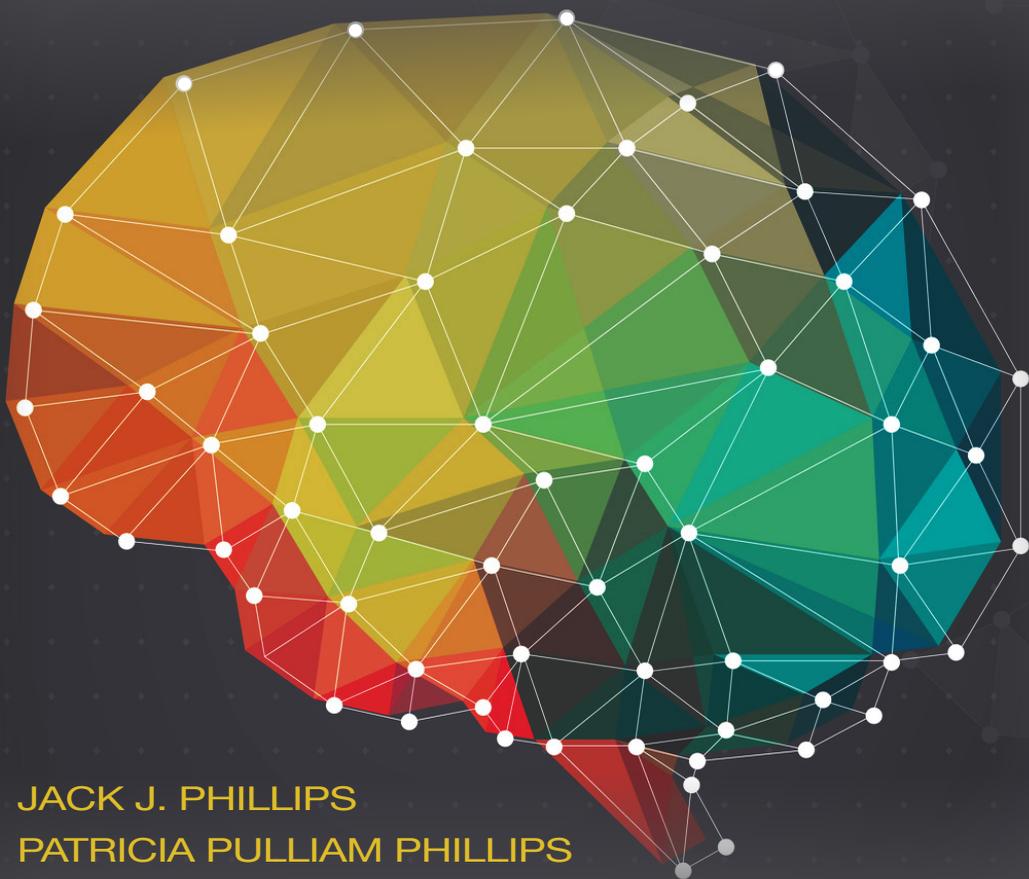


THE VALUE OF INNOVATION

Knowing, Proving, and Showing the Value
of Innovation and Creativity

A STEP BY STEP GUIDE TO IMPACT AND ROI MEASUREMENT



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PATRICIA PULLIAM PHILLIPS

 Scrivener
Publishing

WILEY

The Value of Innovation

Scrivener Publishing
100 Cummings Center, Suite 541J
Beverly, MA 01915-6106

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A Step By Step Guide to Impact and ROI Measurement

**Jack J. Phillips and
Patricia Pulliam Phillips**



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This edition first published 2018 by John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, USA and Scrivener Publishing LLC, 100 Cummings Center, Suite 541J, Beverly, MA 01915, USA
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Library of Congress Cataloging-in-Publication Data

ISBN 9781-119-24237-6

Cover image: [To Come]

Cover design by Kris Hackerott

Set in size of 11pt and Minion Pro by Exeter Premedia Services Private Ltd., Chennai, India

Printed in the USA

10 9 8 7 6 5 4 3 2 1

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Preface

Innovation is everywhere, in every direction we look, in every type of organization, and in almost every part of the world. Leaders are obsessed with innovation, politicians cheer innovation and desire more of it, consumers demand innovation, investors reward innovation, and media coverage of innovation is relentless.

This visibility and popularity translates into billions of dollars being pumped into all types of innovation efforts. Visibility brings out the critics who expose glitches and concerns. Lack of success and high failure rates bring out even more critics. All of this creates the need to show more results.

Innovation Meets the ROI Methodology

For almost two decades, we have had individuals involved in innovation attend an ROI Certification program which involves a week of comprehensive learning. In this process, the participants enter the program with a project in mind that they would like to evaluate at the impact and ROI level. They learn how to do conduct an ROI evaluation in this process, and they pursue the work with virtual support until they complete their project. At the end of this process, the participants obtain the designation of Certified ROI Professional (CRP). With some prompting from our international partners about ten years ago, we hosted a dedicated group of individuals who were just involved in innovation, and had them pursue the certification. We conducted sessions in Copenhagen, Denmark, and Istanbul, Turkey. In these two situations, the results were amazing. The participants tackled all types of innovation projects, followed through to measure the success of their projects along the way, and developed amazing confidence to use this tool. Interest continued and we began to conduct studies globally with companies, governments, NGOs, nonprofits, and universities. As we continued to work, applying this process to innovation, we knew there was a need and a market.

The Need for This Book

When we write a book, we make sure there is not a current book already meeting the need. Writing a book that has already been written is not good for the publisher, and it's not good for us. As we examined potential competing books, we saw nothing that matched the approach and credibility of the ROI Methodology. We have a process that has become the most-used evaluation system in the world. It is built around three pillars: 1) It is user-friendly, not overly complicated or complex; 2) It is based on sound principles, using an enhanced logic model, and is very reliable and valid from a research perspective; 3) Finally, it is CEO- and CFO-friendly, producing data that passes the scrutiny of the CFO and provides data that top executives can support.

This book uses a results-based approach to innovation implementation, focusing on a variety of measures that are categorized into six data types:

- Reaction and Perceived Value of Innovation
- Learning and Confidence to Know How to Make Innovation Work
- Application and Implementation to Make Innovation Work
- Impact, the Consequences of the Innovation
- Return on Investment in the Innovation Project
- Intangibles Linked to the Innovation Project

Connected to it is a step-by-step process for identifying, collecting, analyzing, and reporting all six types of data in a consistent manner that leads to credible results.

Credibility is Key

The Value of Innovation focuses on building a credible process—one that will generate a balanced set of data that are believable, realistic, and accurate, particularly from the viewpoint of sponsors and key stakeholders. More specifically, the methodology presented in this book approaches credibility head-on through the use of

- Balanced categories of data
- A logical, systematic process
- Guiding principles, a conservative set of standards
- A proven methodology based on thousands of users
- An emphasis on implementing the methodology within an organization to ensure that the process is sustained

- A procedure accepted by sponsors, clients, and others who fund projects

The book explores the challenges of measuring the hard-to-measure and placing monetary values on the hard-to-value. It is a reference that clarifies much of the mystery surrounding the allocation of monetary values. Building on a tremendous amount of experience, application, practice, and research, the book draws on the work of many individuals and organizations, particularly those who have attained the ultimate levels of accountability using the ROI methodology. Developed in an easy-to-read format and fortified with examples and tips, this is an indispensable guide for audiences who seek to understand more about bottom-line accountability.

Audience

The primary audience for this book are the managers of innovation projects in an organization. These managers are concerned with the valuation of innovation projects, programs, processes, and people. Although they are strongly committed to their projects, they need to see value in terms executives can appreciate and understand—money.

This book is also intended for professionals, analysts, and practitioners who are responsible for implementing and evaluating the success of innovation projects. The book shows how the various types of data are collected, processed, analyzed, and reported.

Another audience includes consultants, researchers, and professors who are dedicated to unraveling the value mystery, trying to understand more about the difficult and demanding challenges of developing measures and values for a variety of innovation programs.

Types of Innovation Projects

The good news is the ROI Methodology will show the value of all types of projects, including the ten types of innovation as outlined by Keeley.¹ In his beautifully illustrated book, the ten types of innovation are projects that:

1. Are designed to make money
2. Connect with others to create value
3. Organize and align talent and assets
4. Are signature or superior methods to do work
5. Develop distinguishing features and personality

6. Create complementary products and services
7. Support and amplify the value of your offerings
8. Deliver your offerings to customers and users
9. Represent your offerings and businesses
10. Foster compelling interactions

Regardless of what type of innovation, whether it is internal, working with employees, an R&D Center where new products are developed, or the breakthrough innovation that is the basis of the company, this methodology will show how to know, prove, and show the value of innovation.

Flow of the Book

The Value of Innovation flows through three sections. The first section, involving three chapters, sets the stage for the book by reviewing the importance of innovation along with some of the major challenges in the field in the first chapter. Then, the current metrics involved in innovation and the shortcomings in those areas are discussed in the second chapter. Finally, chapter three outlines the necessary requirements for a measurement system for innovation, and introduces the ROI Methodology, which meets those requirements.

This sets the stage for the second section, the major part of the book, built around the ROI Methodology. This section involves thirteen chapters, detailing all parts of the process with examples, scenarios, and stories. Finally, the last chapter focuses on how to make this process work routinely and sustain it over a long period of time.

We are convinced that you will find this a valuable book. If not, we will be happy to refund your money. If you purchase this book and it doesn't add value to your innovation efforts, please drop us a note. Keep the book, and we will send you a refund. We have confidence in this book. We know this methodology has helped many others, and it will help you with your evaluation of innovation. Please enjoy.

Jack J. Phillips, Ph.D.

Patti P. Phillips, Ph.D.

Birmingham, AL - November 2017

Reference

1. Keely, Larry, Ryan Pikkell, Brian Quinn, and Helen Walters. *Ten Types of Innovation: The Discipline of Building Breakthroughs*. Hoboken, NJ: Wiley, 2013.

Acknowledgements

This book had its beginnings over a decade ago when we conducted our five-day ROI Certification workshop for two groups, one in Copenhagen and the other in Istanbul. The participants in both groups were individuals involved with innovation projects, and they wanted to show the return on investment for those projects. They used the ROI Methodology and completed their projects to obtain the designation of Certified ROI Professional (CRP). From that point, we worked with hundreds of other organizations in innovation, including nonprofits, NGOs, and governments. This work clearly revealed that this methodology applies extremely well in the innovation and creativity space. We owe a debt of gratitude to those early adopters of this process in our work with innovation, spanning all continents.

We want to thank our editor and publisher, Phil Carmical for his patience with the delivery of this book. We've worked with Phil for many years, and we are pleased to deliver another book to him at Scrivener, a Wiley Imprint. We also want to thank Hope Nicholas, director of publications at ROI Institute. Hope manages our publications and editorial projects and has done a marvelous job with this book in the midst of hectic schedules, numerous deadlines, and countless interruptions. Thank you, Hope, for another great job. We also want to thank Kylie McLeod, our Communications Coordinator, for putting the finishing touches on the book. Thanks Kylie for a job well done.

Jack would like to thank Patti. Patti is an outstanding consultant, top-notch facilitator, meticulous researcher, and above all, an outstanding writer. She makes our books and our work much more effective and enjoyable. Her books win awards, and her workshops have the highest rating. More important, she is an enthusiastic, creative, and lovely spouse.

Patti would like to thank Jack for putting ROI on the map in terms of its applicability to noncapital investments. Jack laid the foundation on which so many others have built their measurement, evaluation, and analytics practices. Over the years, he has given much more than he has received – and for that, we are all thankful!



About the Authors



Jack J. Phillips, PhD, is a world-renowned expert on accountability, measurement and evaluation, and chairman of ROI Institute. Through the Institute, Phillips provides consulting services for *Fortune* 500 companies and workshops for major conference providers throughout the world. Phillips is also the author or editor of more than 100 books and more than 300 articles.

His expertise in measurement and evaluation is based on more than 27 years of corporate experience in five industries (aerospace, textiles, metals, construction materials, and banking). Phillips has served as training and development manager at two *Fortune* 500 firms, senior HR officer at two firms, as president of a regional federal savings bank, and management professor at a major state university.

Jack has received several awards for his books and work. On three occasions, *Meeting News* named him one of the 25 Most Powerful People in the Meetings and Events Industry, based on his work on ROI. The Society for Human Resource Management presented him an award for one of his books and honored a Phillips ROI study with its highest award for creativity. The Association for Talent Development gave him its highest award, Distinguished Contribution to Workplace Learning and Development for his work on ROI. His work has been featured in the

Wall Street Journal, *BusinessWeek*, and *Fortune* magazine. He has been interviewed by several television programs, including CNN. Jack served as President of the International Society for Performance Improvement for 2012–2013. In 2017, Jack received the Brand Personality Award from Asia Pacific Brands Foundation for his work as an international consultant, author, teacher, and speaker.

Jack has undergraduate degrees in electrical engineering, physics, and mathematics; a master's degree in decision sciences from Georgia State University; and a PhD in human resource management from the University of Alabama. He has served on the boards of several private businesses – including two NASDAQ companies – and several nonprofits and associations, including the Association for Talent Development and the National Management Association. He is chairman of ROI Institute, Inc., and can be reached at (205) 678-8101, or by e-mail at jack@roiinstitute.net.



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1

The Importance and Challenges of Innovation

Clifton Leaf, editor-in-chief of *Fortune* magazine borrowed a stranger's silver and orange bicycle and rode it two kilometers. When he was finished riding, he leaned the bike against a street lamp at a city intersection. Clifton was benefiting from the remarkable business model of Mobike, a Beijing-based start-up whose more than 100 million registered users do much the same thing an average of 20 times a day. This is more than three times the rate of use by other types of ride-share bikes. Many cities have bike-sharing where users typically pay to release the bike from a docking station and return it to another docking station within a particular timeframe. Mobike has eliminated the cumbersome docking process entirely. A user downloads an app, finds a bike nearby, and scans a QR code to unlock it. After using the bike, the user drops off the bike wherever they would like, because GPS and other wireless technologies are built into the bike's chassis, allowing the company to track its whereabouts. A smart-locking system bolts the rear tire in place until the next user shows up [1].

The old dock-based sharing systems are like the first-generation PCs. According to Davis Wang, CEO and co-founder of Mobike, while

first-generation PCs were attached to desktops, Mobikes, in contrast, are like smartphones—you can take them anywhere you would like. Today, Mobike has more users than Uber, although it has been in business only two years. While few consumers outside of China have likely even heard of this ride-sharing business, the company has already expanded to Singapore, the United Kingdom, and the United States.

Innovation Hype

Innovation is everywhere and is constantly being brought to our attention. In the media, stories, ads, interviews, chats, blogs, and references dominate. It's hard to read articles, stories, or see advertisements without the term innovation being mentioned. Everything we see is innovation and everything that is developed is innovative. We even have innovative leaders now.

Articles

Innovation articles are everywhere, dominating the print space. *Fast Company* magazine, which has been a driving force for promoting innovation, devotes a good portion of its magazine to the subject of innovation, as do other major publications such as *Harvard Business Review*, *Wall Street Journal*, *Bloomberg Businessweek* and *Forbes*, among others. There is even a *Chief Innovation Officer Magazine* dedicated to those who are leading this effort.

Books

Innovation books now dominate the business book scene. A few years back, that wasn't the case. Famed management guru Peter Drucker wrote one of the earliest books on innovation in 1985 when he authored *Innovation and Entrepreneurship: Practice and Principles*.^[2] Tom Peters, legendary best-selling business book author, is another successful innovation author who jumped into the arena with his book, *The Circle of Innovation: You Can't Shrink Your Way to Greatness*. This book put innovation on the map for many readers and business people, as he complained that not enough space had been devoted to this important area. Perhaps the person who has contributed the most is Tom Kelley, a partner in IDEO, one of the world's leading innovation and design firms, who contributed *The Art of Innovation*, *The Ten Faces of Innovation*, and *Creative Confidence*, the latter

co-authored with David Kelley. The person who has contributed the most about disruption from innovation is Clayton M. Christensen. His classic book, *The Innovators Dilemma: When New Technologies Cause Great Firms to Fail*, showed not only the power of innovation but also the many outcomes of the innovation process. Even Google founder Eric Schmidt got into the innovation fray with his book, *How Google Works*. CEOs have also popped into the arena with books ranging from Phil Knight (CEO of Nike), author of *Shoe Dog*, to Steve Case (former CEO of AOL Time Warner), who wrote *The Innovation Blind Spot* and *The Third Wave*. Clearly, the subject of innovation is now one of the most documented and written about areas in the business book market. For example, at Stanford University Press, in the business book category, six of the 23 titles for 2017 were in the innovation area. Amazon now has over 100 pages of books in the innovation category.

Jobs

Job titles have emerged for those responsible for innovation as the responsibility is shifting to one or more individuals. The title of Chief Innovation Officer, VP of Innovation, Director of Business Innovation, and Chief Innovation and Engagement Officer point to a growing desire to have leaders of innovation within organizations. Further down the organizational chain, we have innovation managers, innovation directors, and even innovation champions. A website, www.cio.com, is dedicated to providing resources to these individuals in this job category.

Speeches

You would be hard pressed to see a speech from a top executive recapping the events and success of the organization without a mention of innovation. State-of-the-company addresses and end-of-year summaries are almost always laced with innovation progress, updates, and issues. Politicians from presidents to mayors have proclaimed innovation to be an important part of their campaigns and strategies and have created more innovation for the government. Dubai has made a commitment to be the most innovative city. In Malaysia, there is an appointed Minister of Innovation.

Experience

You don't have to be reading books, articles, or listening to speeches to be innovative. We all experience innovation every day. Imagine the complete

Uber experience compared to the use of a taxi, or the timeliness and efficiency of shopping with Amazon.com, or the amazing innovation that goes into Google's ability to find all the information we would need, not to mention the innovative efforts of organizations like Facebook, Netflix, and Apple. In our daily lives, we are experiencing innovation in a big way—in almost everything we do.

We love innovation because it often brings convenience. Sometimes it makes an entire process feel seamless, as in the Mobike example presented earlier in the chapter. In many cases, it reduces the cost of what we are doing or buying, such as with Amazon. Sometimes it is environmentally friendly, like the use of a ride-sharing program. At other times it makes us healthy, such as the medical devices that keep us alive. Few topics have enjoyed as much hype as innovation, and we've come to expect innovation and appreciate it.

The Realities of Innovation

Although there is much hype surrounding innovation, there are some realities of innovation that point to opportunities and concerns.

Innovation is Not New

Innovation has been around for many years with inventions traced to the ancient Chinese and Greek cultures. Innovation has been progressing for a very long time, but it has mushroomed in the last 50 years. Now, each year it seems to increase at a more rapid rate. Sometimes innovation is older than it looks. For example, Lockheed Martin developed a cargo aircraft, the C5A. At the time of its development, it was the world's largest airplane, much larger than the passenger aircraft Boeing 747. The C5A is huge, but also very versatile with the capability of tanks and large trucks driving through the front of the plane and out the rear. It has the capability to land and take off on unimproved runways. More impressively, it has the capability of taking off, flying, and landing entirely on autopilot. In 1969, over the mountains of North Georgia, the C5A made its first flight completely automated from takeoff to landing. In most of today's aircraft, autopilots are common. Still, many are surprised to know that the capability exists to take off, fly the entire plane, and land without a pilot. What makes this story interesting is that this capability was demonstrated almost 50 years ago. So innovation is not new, but the rate of change is rapidly increasing.

Innovation is Necessary for Survival

Figure 1.1 lists several companies that have had a near-death experience or have actually died, based primarily on their failure to innovate. Unfortunately, there are many familiar suspects on the list. In 1935, the expected life span of a company was 90 years. By 2005 this had fallen to 15 years. Yet at the same time, many companies have survived for over 100 years because they have constantly innovated.[3] For example, Johnson & Johnson, IBM, American Express, 3M, P&G, and Goodrich are on average about 100 years old, and they are still going strong. Innovation is essential; without it, it is almost certain that the company will not exist.

Innovation is Equated with Success

If something is successful, it must be innovative, and usually is. For example, on a recent flight on Delta Airlines, we noticed that *Sky* magazine, Delta's in-flight publication, had a feature on the founder of Delta with the title, "Spirit of Innovation." In this article, Delta was celebrating its success since its founding in 1929. Delta is now one of the largest, most admired, and most profitable airlines with 80,000 employees. They owe much of their success to what the company describes as the innovation driven by the founding CEO, C. E. Woolman. A review of any list of the most admired organizations, the most sustainable organizations, the most profitable organizations, or even the Best Places to Work have much innovation going on, making success almost synonymous with innovation.

Borders	Firestone	MCI world
Kodak	Polaroid	Sears
A&P	Deluxe printing	Philips
Smith corona	Bethlehem steel	RCA
DEC	Control data	Xerox
Westinghouse	Woolworths	Memorex
Siebel systems	Blockbuster	Syntax
Northwest airlines	Radio shack	Compaq
Circuit city	Merrill lynch	GM

Figure 1.1 What is True of All These Companies?

Adapted from: *Lead and Disrupt: How to Solve the Innovator's Dilemma* (Charles A. O'Reilly III and Michael L. Tushman)

Innovation is Truly Global

Innovation is not limited to the United States or even to pockets of creativity around the world. It shows up almost everywhere. The current geographic breakdown of the 2017 *Fortune* Global 500, the definitive list of biggest companies by revenue in the world, points out that the latest rankings are based on no fewer than 232 cities in 34 countries.[4] More than two-fifths of those companies, 109 in total, are based in China. That number is up from only 29 a decade ago. The example of Mobike shows that ideas know no borders. A good idea can permeate borders and turn into a truly global innovation within the marketplace.

Consumers and Investors Expect Innovation

Consumers expect the constant stream of innovation they have come to experience, be fascinated by, and perhaps even hooked on. Sometimes we can hardly wait for the “new and improved” version of our next project. Investors also expect innovation to continue to flow. For example, one has only to witness the constant pressure on Apple to continue its innovation of products and services. When the rate of innovation (new or improved products) declines, so does the stock price.

Innovation is Often Disruptive

Many of the businesses listed in Figure 1.1 were displaced by more innovated approaches. Two of the most visible causes of this are the impact that Amazon has had on bookstores and Netflix on video rental stores. Disruption creates problems because of the displacements that often follow the new processes. Investors in the original companies lose money and employees lose jobs. Even just the mere threat of some of these displacers can cause huge problems. For example, when Amazon recently announced the pending purchase of the Whole Foods supermarket chain, investors assumed that Amazon would transform the entire retail supermarket business, a business that Amazon was already involved in. Merely on the announcement of their interest alone, competitors’ stocks took a dip in one day; Kroger’s stock dipped 9.2%, Target’s stock 4.1%, and Walmart’s stock 4.7%.[5]

Packaged-goods companies additionally experienced a huge dip with the anticipation that Amazon may change the way in which people have their food packaged. It’s helpful to remember that when Amazon took on the book-selling business, it also transformed the way in which books are

published, fueling the e-book market and the Kindle as a device to read the books. This put fear into the packaging industry with General Mills stock falling 2.9%, Kraft-Heinz 2.4%, and Kelloggs 1.7%.

Innovation is Not a Single Event

It is also important to remember that a single event doesn't bring out a major innovation. Consider, for example, the mouse for our computer. The mouse was first displayed in 1968 during a research project funded by the U.S. Department of Defense.[6] The mouse was actually presented at a demonstration. From that meeting, two individuals developed the idea into Alto, the first truly personal computer at Xerox's famed Palo Alto Research Center. Later, Steve Jobs would take many elements of the Alto to create the Macintosh. Even with the invention of the personal computer, while Xerox built the first one, Apple launched the Macintosh with great fanfare in 1984. So, it's not entirely clear, when an invention seems to make commercial success, who invented it or where it was actually created.

Little Ideas Often Make a Big Difference

It's not the incremental product improvements or project improvements or huge breakthroughs that drive most innovation. Innovation doesn't fall neatly into the usual categories that we see in the business press. Most companies aren't disrupting their industry; nor are they sailing for blue oceans or acting like lean startups. Most are not revolutionizing the future of their business or simply improving its core products. The approach to innovation is unique, based on the power of little ideas.[7]

In the book, *Brick by Brick: How LEGO Rewrote the Rules of Innovation and Conquered the Global Toy Industry*, David Robertson tells the story of how LEGO adopted a similar innovation approach in 2003 to recover from its brush with bankruptcy.[8] LEGO's recovery and growth didn't come from just offering a better core product or from reinventing the future of its industry. In fact, LEGO tried both of those strategies and failed. The successful strategy for the toy maker was to go back to the company's core, the box of bricks, understand what the customer wanted from that product, and innovate around the box. When Lego mastered this approach, the company recovered quickly and spectacularly. When LEGO posted its annual results in early 2016, its eight-year average annual sales growth was 21% per year, and profit growth an equally impressive 36% per year. This approach to innovation, neither incremental improvement in current



Figure 1.2 Types of Innovation.

Adapted from: *Ten Types of Innovation: The Discipline of Building Breakthroughs* (Larry Keeley, Ryan Pikkell, Brian Quinn, Helen Walters)

products nor revolutionary disruption of those products, is what the author calls the Third Way to innovate.

Innovation Comes in Many Types and Forms

Innovation comes in many types and forms. Figure 1.2 lists the types of innovation projects that range from R&D efforts to product development to individual innovation, coming through any function or department.[9] Others categorize types of innovation by the nature of the innovation itself. For example, one approach is to think of some innovations as small, where the innovation is a part of the bigger system. These are small initiatives, built into all function processes. A second type is repeatable, where innovation is part of the day-to-day operations as much as possible, and finally, the third category of innovation is custom, where these are separate, but compatible, innovation tasks apart from the day-to-day operations.[10]

Innovation Spans Many Different Horizons

Finally, innovation sometimes spans many different horizons. Figure 1.3 shows the three different horizons where the focus is sustaining innovation and using existing capabilities already deployed in an existing market already served. The idea behind the three horizons framework is not to eliminate uncertainty, but to take the level of uncertainty into account when allocating resources. The bulk of resources are invested in capabilities

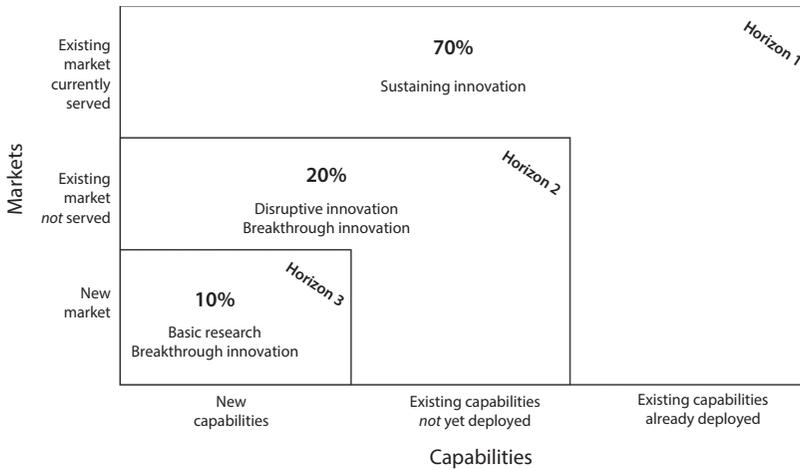


Figure 1.3 Three Horizons of Innovation.

Adapted from: *Mapping Innovation: A Playbook for Navigating a Disruptive Age* (Greg Satell)

(e.g., skills and technology) and existing markets, a much smaller portion toward adjacencies, and an even smaller proportion to future opportunities that don't even exist yet. The proportions of 70/20/10 are intended to be general guidelines and do not lend themselves to a strict accounting. The primary insight is that businesses need to pursue all three horizons at once, in different proportions.[11] While the three horizons framework may seem simplistic, it offers a simple framework with a simple language to discuss the core business, adjacencies, and long-term bets.

Trouble in Paradise: The Misconceptions

Unfortunately, not everything is as it seems. There are many misunderstandings and myths about innovation. These often lead to bad decisions, inefficiencies, lack of accountability, and lack of support. Perhaps the individual who has tackled this issue in the most thorough way is Anne Marie Knott, author of *How Innovation Really Works: Using the Trillion-Dollar R&D Fix to Drive Growth*. [12] Dr. Knott is an expert on R&D, having worked in this field for many years. She is also an outstanding researcher and a whiz at analytics. Because she saw so many misunderstandings about investments in R&D, she wanted to tackle the issue in a different way. Realizing that just investment in R&D alone doesn't necessarily translate into innovation or profitability, she developed a different measure called Research Quotient.

RQ is the efficiency of solving new problems. For any given level of R&D spending, high-RQ companies will generate more innovations. For any given innovation, high-RQ companies will invest less in developing it. Accordingly, RQ is mapped into a scale where the mean is 100 and standard deviation is 15. In Knott's research, she brings to light seven misconceptions that can confuse the support for innovation and investment in innovation.

Misconception 1: Small Companies are More Innovative

Although there has been much hype about this, larger companies seem to generate more innovation. They do so because they have more resources to develop innovation, they can spread the cost of R&D over the whole organization, and they can have systems in place to make innovation more systematic and routine within the organization.

Misconception 2: Uncontested Markets are Good for Innovation

Knott makes a strong case for the fact that most innovation is from contested markets that need improvements in efficiency, quality, or cost. This creates a competitive spirit and causes organizations to look for an advantage. An uncontested market, where there is only one active organization, might lead to innovation that is not so efficient and effective.

Misconception 3: Spending More on R&D Increases Innovation

Although it seems obvious that increasing R&D will lead to innovation, in fact, that is not necessarily the case. R&D is an input. R&D teams, especially the large ones, can become bureaucratic and inefficient, not delivering on the promise. Companies want growth because it increases their market share, and the government wants economic growth because it increases the number of jobs. The best way for companies to grow and create jobs is not necessarily to invest more in R&D, but let the competitive spirit drive innovation from all processes.

Misconception 4: Companies Need More Radical Innovation

Radical innovation (or innovation that is new to the world) is very important for the economy. We see much hype paid to these inventions and innovations, from cameras to MP3, and they often take a long time to develop. For example, television took 22 years from invention to commercialization. For the personal computer, 20 years after introduction, only 50% of households

had personal computers. The big hits don't necessarily pay off on a large scale, and certainly not quickly. Most innovation is coming from the incremental, systematic, and routine processes within organizations which makes it more efficient, more cost effective, of better quality, with better design.

Misconception 5: Open Innovation Turbocharges R&D

One of the biggest innovation trends over the past few years has been open innovation or open business models.[13] There is a widely held belief that open innovation increases companies' financial performance. Accordingly, open innovation has been adopted by the vast majority of companies engaged in R&D. Knott argues that, while there is some evidence that open innovation in the form of R&D outsourcing may improve companies' financial performance, the record on idea development indicates that R&D outsourcing not only fails to improve financial performance, it actually degrades it! This occurs because outsourced R&D incurs R&D expenditures without increasing revenues. Thus it decreases profits. Worse, however, it appears that outsourcing R&D is a slippery slope wherein company innovative capability decays, so the company increasingly outsources, and capability decays even further.

Misconception 6: R&D Needs to be More Relevant

The need to be relevant led to widespread decentralization of R&D. The logic of decentralized R&D is that it makes companies more responsive to the market. The view was widely held. In fact, the opposite is true, because companies with centralized R&D tend to a) do more basic research, so are more likely to create new technical possibilities, b) create technology that benefits multiple divisions, and c) derive more of their technology from internal R&D rather than through outsourcing.

Misconception 7: Wall Street Rewards Innovation.

Although investors do get excited about huge R&D expenditures and announcements of improvements in R&D spending, they ultimately reward the companies with the output of the R&D spending, the innovation. Because R&D is not a good indicator of innovation, investors seek other measures, such as IP (Innovation Premium) and RQ (Research Quotient). Without a good measure, their decisions are not optimal.

These misconceptions, fully documented in Knott's work, make the process of innovation confusing to some people because some of the beliefs

that have been promoted, amplified, and explored over the years are not necessarily true. This may have contributed to misguided investments in innovation.

Innovation Challenges

The path of our innovation journey brings us to the challenges of making innovation work. There is no doubt that innovation is necessary, and it must be an important part of any organization's strategy. But these challenges make us rethink our processes and the ways in which we are tackling these issues to make innovation successful, efficiently, within cost, and on time.

Innovation is Expensive

You would have to look no further than the pharmaceutical industry to see what it costs to develop new medications. A study by the Tufts Center for the Study of Drug Development suggests the road to bringing new FDA-approved medicine to patients is long, and the costs are formidable. This study revealed that the average cost to research and develop (R&D) a new medicine has doubled over the past decade to \$2.6 billion. This includes the cost of failures— which tend to be more common than successes, but build on previous advances. When the costs of post-approval R&D were factored in, the estimate increased to \$2.8 billion.

Researchers attribute this growth in R&D to several factors, including an increase in the complexity of clinical trials and a significant decline in clinical approval successes. According to the study, only 12% of drug candidates that enter clinical testing are eventually approved for use by patients.[14]

Basic research and development add tremendous costs to an organization. Even the processes to bring systematic and routine changes and improvements to an organization will be expensive because of the time and efforts involved. The key is to make sure that this is accomplished as efficiently as possible within the cost and time of any budget. It costs virtually nothing to communicate a vision of innovation, set goals and objectives for ideas and innovations, and ask for ideas. It costs very little to run brainstorm meetings, set up an intranet-based suggestion scheme, implement small incremental innovations, empower the team to try more initiatives in their areas, and investigate new collaborations and partnerships.[15]

Managing Innovation is Difficult

Leaders create the willingness to innovate, the ability to innovate, and they cultivate the innovation.[16] The process of leading a team, working exclusively on innovation, is a difficult challenge. The process of stimulating creativity and innovation in an organization, bringing the culture necessary to not only create and nurture new ideas, but to turn them into workable, viable products and services is also difficult. Because of this, most organizations have set up divisions, departments, and units which focus directly on innovation. One of the most interesting new roles has been the creation of the Chief Innovation Officer with the promise that this person will bring innovation to the organization.

Unfortunately, this maybe sends the wrong message and some indicate that this job should be eliminated. According to George Bradt, a *Forbes* magazine contributor, the whole premise behind the Chief Innovation Officer goes beyond useless to completely and utterly counterproductive. [17] If one person oversees innovation, then everyone else is not innovative and they must be. His point is that everyone is responsible for innovation and creativity, and leading this effort should be a part of each manager's job, and even the part of the job of most people within the organization. Everyone shares responsibility to come up with ideas, push those ideas, and help develop those ideas.

An Innovation Culture is Necessary for Success

Another challenge is that an innovation culture is necessary for success. The most innovative companies are those that seem to have a culture for innovation and creativity. Innovation is about extending what is possible. When a person develops a new idea to improve something that was perhaps difficult, now it becomes a little easier. Leading innovation is about inspiring people to see and want better futures, better work, and better processes. Getting people to do what they love the most is an effective way of inspiring creativity and commitment to that better future, and in that sense, a culture is needed.

According to Max McKeown, innovation culture is how we describe effectively or ineffectively people are working together to create and use new ideas.[18] Culture is the sum of the values, beliefs, and assumptions of human groups. Culture is about the personality and behavior of a social group, and it is all about the different factors that shape what groups are likely to do next. McKeown has an interesting way of describing different cultures ranging from *idea-toxic* cultures, where creativity is not welcomed

or rewarded to *idea-wasteful* cultures, where ideas and insights are treated casually and often mismanaged. Then he describes an *idea-friendly* culture where creativity is welcomed and new ideas are valued. These new ideas may get introduced and reviewed by the hierarchy. But the best is obviously the *idea-hungry* culture, where people seek new ideas. They make the world better with improvement beyond existing limits. This is an interesting way to describe the culture in an organization with regard to improvements, new ideas, and new suggestions. Most organizations say they want innovation, but only a few work with it in an effective and an efficient way.

Dr. Amantha Imber has developed what she refers to as The Innovation Formula.[19] Dr. Imber's work identifies 14 science-based keys for creating a culture for innovation. These are based on individual-level factors, including challenge, autonomy and recognition. They also involve team-level factors of debate, team supportiveness and collaboration. They focus on leader-level factors of supervisor's support, senior leader's support, resourcing, and goal-clarity. Lastly, the focus is on organizational-level factors of risk-taking, cohesion, participation and physical environment. Dr. Imber has created an interesting Innovation Culture Audit, which involves two questions for each of these 14 factors and invites individuals to take the survey to discover where they stand in terms of their own internal culture for innovation (www.inventium.com.au).

The important point is that there is a huge challenge to create this culture. It doesn't occur quickly; it evolves over time. If the culture is not there, it will take some time to change and improve it, so it clearly becomes an innovation culture.

Innovation Requires Many Personas

Innovation requires many personas. Innovation takes on a lot of different roles and many different styles. These are often called *personas*, as described by Tom Kelley of IDEO, one of the largest organizations created to help build innovative organizations. In his early work with IDEO, Kelley discusses the ten faces of innovation. These are the personas that may already exist in large organizations, although they may be undeveloped and unrecognized.[21]

According to Kelley, there are three learning personas that help individuals and organizations gather new sources of information to expand their knowledge and grow. These roles are:

1. The *anthropologist* who brings new learning and insights into the organization by observing human behavior and developing a deep understanding of how people interact physically and emotionally with products, services, and space.
2. The *experimenter* who prototypes new ideas continuously, learning by process of enlightened trial and error.
3. The *cross-pollinator* who explores other industries and cultures, then translates those findings and revelations to fit the unique needs of the enterprise.

Also according to Kelley, there are three organizing personas, played by individuals who are savvy about the often counter-intuitive process of how organizations move ideas forward. These personas are:

4. The *hurdler* who knows the path to innovation is strewn with obstacles and develops a knack for overcoming and outsmarting those roadblocks.
5. The *collaborator* who helps bring eclectic groups together, and often leads from the middle of the pack to create new combinations and multidisciplinary solutions.
6. The *director* who not only collects a talented cast and crew, but also helps to spark creative talents.

Kelley goes on to say there is a set of building personas based on roles that apply insights from the learning roles and channels the empowerment from the organizing roles to make innovation happen. These are:

7. The *experience architect* who designs compelling experiences that go beyond functionality to connect at a deeper level with the customers latent or expressed needs.
8. The *set designer* who creates a stage on which innovation team members can do their best work transforming physical environments into powerful tools to influence behavior and attitude.
9. The *caregiver* who builds on the metaphor of the healthcare professional to deliver customer care in a manner that goes beyond mere service.
10. The *storyteller* who builds both internal morale and external awareness through compelling narratives that communicate a fundamental human value or reinforce a specific cultural trait.

These are excellent ways to think about the different roles in innovation. They are needed to bring about the innovation necessary for an organization.

Innovation Success Rates Need to Improve

The failure rate of projects is much higher than it needs to be. There has been, for example, a typical assumption that nine out of ten start-ups will fail. There have been many start-up failures which have been celebrated and almost immortalized. That seems to be changing now, and failure should not be considered the norm. Success should be considered the norm, argues Erin Griffith, a *Fortune* magazine columnist.[20]

Part of this success rate is that innovation needs to be faster, and this is no more obvious than the race to bring out new medications or find cures for diseases. Sometimes it just takes a long time for a breakthrough, but there are opportunities along the way that can speed up the mechanics. R&D sometimes falls into bureaucratic processes and may not be managed efficiently, and may not be delivering in a timely manner. Having a system in place to help manage the process in an efficient way should bring out faster innovations and faster solutions.

The Value of Innovation is Unclear

Over a decade ago, in their book on payback, authors James P. Andrew and Harold L. Sirkin summarized the situation with the value of innovation: “For almost every company, the greatest challenge of innovation is not a lack of ideas but rather, successfully managing innovation so that it delivers the required return on the company’s investment of money, time, and people. Most attempts at innovation fail to deliver this return – they do not generate enough payback.”[22]

About the same time, David Nichols, author of *Return on Ideas*, also expressed concern about the value of innovation:

Innovation is the magic dust that all businesses need to thrive in today’s ultra-competitive markets. It has never been more central to the CEO’s agenda. But success rates are dismal and not improving despite the scrutiny heaped upon the idea development process. The culprit is the Innovation Funnel. The very process put in to make innovation more of a certainty is making it more of a dead duck; stifling it with bureaucracy, poor decision making and a focus on picking faults not building competence.

The alternative mooted by books is to be a rebel, tear up the rule book and reinvent your business from the ground up. This is fine for brilliant mavericks or bored billionaires, but won't do for core brands in core markets that need to carve out growth day in and day out. There has to be a better way.[23]

More recently, authors Madhavan Ramanujam and Georg Tacke, in their book *Monetizing Innovation*, highlighted the frustrations of still not delivering the innovation needed:

Businesses need to innovate to survive, yet the failure rate for innovation is shockingly high. Nearly three out of four new products or services miss their revenue and profit goals – or fail entirely. Companies embark on the long and costly journey of product development hoping they'll make money on their innovations, but not knowing if they will. It doesn't have to be this way.”[24]

While there are many success stories and many organizations that have built fortunes on the foundation of innovation, a process of systematically evaluating innovation hasn't been put in place on a routine basis. What is needed is a method that is not built on the hope that innovation works, but is effective at *knowing* the value of innovation, *proving* the value of innovation and *showing* that value to a variety of stakeholders.

Although some previous works have attempted to do this, including the previous three references, no book provides a systematic way of providing it. This book will take a process that has worked so well in many other fields and show you how it is working now in the innovation field to *know*, *prove*, and *show the Value of Innovation*.

Final Thoughts

This chapter briefly summarizes the importance of innovation and how it has become a mainstream, everyday occurrence for billions of people. It also describes the realities of developing innovation and making it work. Then there is a focus on some misunderstandings and misconceptions and some detail around the challenges of innovation. The key is to make innovation more easily accepted and more richly supported, which ultimately will drive better outcomes. To do so requires a process to *know*, *prove*, and *show* the value of innovation. The next chapter focuses on what has been done in terms of measuring innovation to date.



2

Status and Concerns about Innovation Measurement

3M was famous for providing innovators money and then leaving them alone to create new ideas, products, and efficiencies. Just two output measures were really reported: the percentage of revenues from new products and the number of patents. The 3M culture was about the inputs to create fabulous new ideas including their famous 15% slack time (available to work on projects that scientists choose) and spending 5% of their revenue on R&D.

When a new CEO arrived, things changed. James McNerney brought along enough GE-inspired efficiency metrics to clog up the creative veins and arteries of 3M. Too much measurement increased short-term profits and reduced long-term growth.

The next two CEOs, both 3M old timers, reversed the changes. With creative independence restored, the number of new products soared back up to 40% in the next few years. All measurement and no joy makes creativity a chore. [1]

This story shows that the metrics for innovation must be carefully selected, and the process for measuring success must be perceived as a

value-adding process. This creates a paradox, because as Peter Drucker comments sagely, “If you can’t measure it, you can’t manage it.” A measurement system must walk the delicate line between measuring the right things, but not using that data in an improper way. It should be used for process improvement, not necessarily performance evaluation of the team.

Innovation: Definition, Models, and Measures

Many definitions of innovation have been developed. Almost any author of an innovation book has created a definition, and even associations and professional organizations have created definitions. Some organizations have created their own definition. The definition is important because it explains not only what comprises innovation, but something about the process to develop innovation, the sources of innovation, and the culture for innovation. The definition that we prefer is slightly modified from The Conference Board definition:

Innovation is broadly defined as an activity or set of activities that results in the creation and use of 1) a new or significantly improved product or service; 2) a production or operating process; 3) a way of attracting customers by enhancing their experience; 4) an organization practice, work design, human capital competency; or 5) resources that add value. [2]

Along with the definition are the many models of innovation, often reported in articles and books on innovation. An examination of over 100 books that appear to be uniquely focused on innovation, including those often in the best-known categories, reveals that over half of the books present a model for producing, executing, and delivering on innovation. When the models from other sources (e.g., articles, associations, and consulting firms) are added, this means there are at least 100 models focusing on how to do it. That creates a tremendous amount of confusion. Measurement is critical to the model itself and, ideally, should be built into the model.

Measurement is more successful when it is a part of a dynamic model from insight to innovation. Measurement is valuable only to the extent that it helps to improve innovation. The process of measuring should help recognize opportunities for innovation, increase the understanding of what to improve, and shape the innovation efforts for success. According to McKeown, the innovator’s measure of success are:

1. You understand the difference between measurement and improvement.
2. Learning is increased each time you cycle through the measurement loop.
3. The measurement system is custom-made for your purpose and situation.
4. Everyone, at all levels in any hierarchy, is part of the learning process.
5. Measurements adapt as needed to help your innovation succeed.
6. Unwelcome findings are used productively and not just ignored. [3]

Sources of Innovation

“I need 5,000 volunteers,” declared Gerstner, the new CEO of IBM. He inherited a multimillion-dollar loss and wrote to employees asking for the guts to go above, below, around, and through internal hurdles. He wanted innovators willing to take risk in the face of conventional wisdom. As an ex-customer and outsider, he saw that new attitudes and new expectations were needed.

Inspired by this call for volunteers, two frontline network administrators decided to help IBM see and grab opportunities provided by an amazing idea (newborn and immature), the worldwide web. Working with an executive with the influence to get resources, they secretly built IBM’s first website.

This new website was not the idea of the new IBM CEO. But the informality of the leader encouraged informal creativity to deliver what came to be known as e-business. The company grew together with the web. Rebel thinkers were attracted to skunkworks, under-the-radar innovation projects, and then went back into the organization to establish them as business-as-usual.

A reenergized IBM jumped ahead of others. They were first into new problems with new confidence to transform them into stunning new solutions. Since then, IBM has produced more patents than any other firm. It reinvested in Deep Blue, the chess-playing computer, and Watson, the artificial intelligence that beat the quiz show *Jeopardy*. This story underscores that the sources of innovation must be carefully selected and utilized. [4]

Innovation comes from many sources, as shown in Figure 2.1. The two most important sources are within the organization. Those are employees,



Figure 1.1 Where Innovation Comes From.

purposely illustrated to show a larger proportion, and the top leadership which provides the guidance for the innovation inside the organization. The collective energy, creative spirits, determination, and drive of the employees will make the difference. Sometimes, it is helpful to work with the customers, to find out what the customers need or want. But sometimes, that is not enough. For example, many of the Apple products were not built on what customers needed because Steve Jobs was interested in showing them a product that they had not even thought about, describing a need that they did not know they had.

Competitors would be another source. It is always helpful, as the old saying goes, to “keep your friends (clients) close and your enemies (competitors) closer.” We have to find out what they are doing, and learn from them. Maybe we can do it better, or maybe we can build on what they have accomplished. If we don’t do this, we may be accused of having our head in the sand.

We can also look to suppliers, from which a creative spirit comes. Honda, for example, requires that its suppliers be very creative in their work, changing and improving as they provide better quality products, with more features and innovations, and lower costs in some cases. In today’s environment, good creative experiences are coming from crowd-sourcing opportunities. Letting the public, or some portion of the public, offer suggestions and ideas on how things can and should be improved. Additionally, there is basic research developed from external organizations designed to help businesses in other organizations improve. Universities

and research think tanks exist for this purpose. Incubators are designed to develop new products and services.

While there are many sources for innovation, most of it comes from within the organization.

Measurement Shifts

In recent years, we have witnessed a significant change in organizational accountability, especially toward investment in people, programs, projects, and processes. Project sponsors and those who have responsibility for project success have always been concerned about the value of their initiatives. Today this concern translates into financial impact—the actual monetary contribution from a project or program. Although monetary value is becoming a critical concern, it is the comparison of this value with the project costs that captures stakeholders' attention—and translates into ROI.

Measurement Shifts are Common

We've seen this situation evolve in several areas. For example, with leadership development programs, top leaders pumped billions of dollars into leadership development based on the faith that these programs would deliver results. But a lack of clear results and little accountability around these expenditures have forced leadership development directors to show the value in terms that executives can understand. And this often means impact and ROI.

The same situation is now developing with social media. Organizations spend billions on social media for their employees with the hope that they will use it for informal learning and with visions of improved productivity and higher quality of work. Unfortunately, the impact is rarely pursued and often perceived to be a mystery.

Culture is another area where executives strive to maintain the strong culture they have, change their culture to a more effective one, or regain the culture that they once had. The investment in culture is now being subjected to increased accountability with requests to show the value, including impact and ROI.

This is now occurring in the innovation area with many of the funders and supporters of innovation asking for more results. While these executives realize that failure will be an inherent part of this process, they need to see more success along the way.

Value Perception

A few years ago, the team at Rubbermaid, a well-known manufacturer of household rubber products, told us a story involving a new product. The marketing team had a theory. They believed consumers thought Rubbermaid was a manufacturer of rubber gloves for dishwashing, although they were not. The marketing team conducted a market share analysis, asking consumers who made the rubber gloves they were using in their kitchen. Surprisingly, the largest market share was given to Rubbermaid, although they were not in the business. So, Rubbermaid's reaction was to quickly get into the business. They already had the market share, but they didn't have the product.

This is an unusual situation, but it makes a great point that perception and reality must match. The consumer's perception was that Rubbermaid made the product. Rubbermaid had to start producing it, or they had to let people know that they didn't make it. The same situation happens in innovation. With innovation, there is a perceived or anticipated value and it may not be delivered. If we don't show the value, then we will lose support. Perception must match reality.

The Search for Money

"Show me the money" is the familiar response from individuals asked to invest (or continue to invest) in organizational efforts. At times, this response is appropriate. At other times, it may be misguided; measures not subject to monetary conversion are also important, if not critical, to most projects. However, excluding the monetary component from a success profile is unacceptable in this age of the "show me" generation. The monetary value is often required before a project is approved. Sometimes, it is needed as the project is being designed and developed. Other times, it is needed after project implementation.

This issue is compounded by concern that most projects today fail to live up to expectations. A systematic process is needed that can identify barriers to and enablers of success and can drive organizational improvements.

The challenge lies in doing it—developing the measures of value, including monetary value, when they are needed and presenting them in a way so that stakeholders can use them

- Before the innovation project is initiated
- During innovation development, to plan for maximum value

- During implementation, so that maximum value can be attained
- During post-analysis, to assess the delivered value against the anticipated value

The Value of Innovation is a basic guide for anyone involved in implementing innovation where significant expenditures of time and money are at stake. Strategies to assist in forecasting the value of the innovation project in advance and in collecting data during and after project implementation are presented.

Hoping, Knowing, Proving, and Showing Value

The founders of Lyft, a ride-share company that competes aggressively with Uber, recently shared some thoughts about innovation and venture capital. In a Business Radio interview powered by Wharton Business School, John Zimmer and Logan Green said that in the past you could secure venture capital for your ideas with hope that you will have success, that innovation will work and catch on. It wasn't too difficult to get funding on hope. These days, funding is usually based on proof of the concept. The funder must have proof that it will actually work, is needed and will be used by consumers.

So, essentially hoping has evolved to proving. Now, add two more phases to the process, knowing and showing. After hoping comes knowing the value from innovation, knowing where a process breaks down, and knowing what has to be altered to increase the value. Knowing allows us to tackle process improvement in a meaningful way. Proving is having a credible process that can actually withstand the scrutiny of a chief financial officer. Proving should be based on a process that is conservative, reliable, and valid while at the same time being user-friendly. Finally, from proving we need to show the value. Showing the value to all the stakeholders involved, the end user (who may be the consumer), the investors (who need to invest more), and the supporters (who need reinforcement that it is a good thing to be doing). This book is based on this concept...moving from hoping to *knowing*, *proving*, and *showing* the value of innovation. Showing the value builds respect, support, commitment, and yes, funding.

Innovation is Systematic

Recognizing that most innovation will come from within the organization, it is critical to have a systematic way of channeling that innovation into a

productive process. A systematic approach is needed, and these are often defined by the various models that are presented. Here are a few examples. Eric Ries created a model to develop a new idea using a prototype. In this process, Ries suggested that the concept of measure, learn, and build is a systematic process. Measures are needed to observe or predict something and is the beginning point. Then there's learning throughout the process. Learning provides an opportunity to theorize and addresses four questions:

1. What do we need to learn?
2. What have we learned?
3. How do we validate learning?
4. What do we need to build?

This learning is fed back to the observer to make adjustments, and it moves onto building the experiment. This model is labeled as a build, measure, and learn wheel, recognizing that it's a continuous process with constant feedback in early stages. This is an absolute must for some type of system for innovation. [5]

In their book *Innovation and Scaling for Impact*, Christian Seelos and Johanna Mair suggest that the innovation process contains three basic processes: ideas, (leading to) piloting, (leading to) scaling. But along the way, to protect the investment, six danger points are identified that often prohibit success.

1. Never get started
2. Too many bad ideas
3. Stop too early
4. Stop too late
5. Insufficient expiration
6. Innovate again too soon

The important point is that these are phases that follow sequencing and have a focus on searching for the pitfalls to the process. [6]

The design school at Stanford used some principles of design thinking to suggest a systematic way to make ideas come to light. According to Figure 2.2, the process started with empathize, moving to define, ideate, prototype, and then to test, with the feedback to the starting point. Along the way, important learnings take place to make the process work.

There's much research about the individuals who constantly innovate. These serial innovators should be very critical to an organization's success with innovation. The opportunity lies in locating, identifying, and having

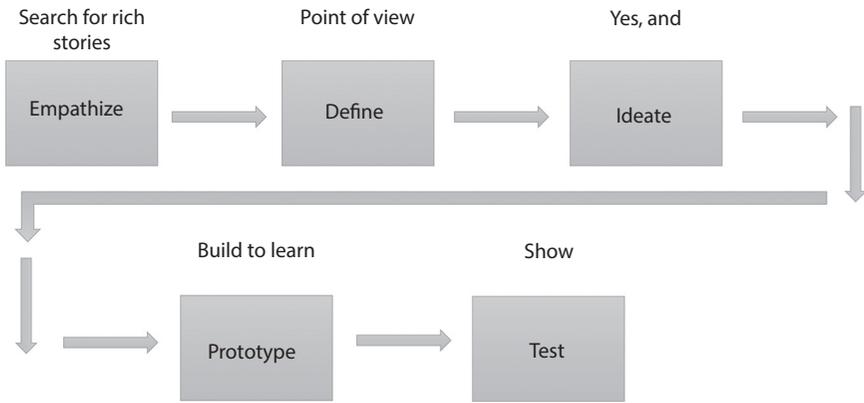


Figure 2.2

Adapted from Guido Kovalskys, the d.school, Stanford

them develop innovation in a systematic way. In a recent book on serial innovators, Abbie Griffin, Raymond, L. Price, and Bruce, A. Vojak suggest a systematic way for serial innovators, moving through a series of steps as follows:

1. Motivation to innovate
2. Find the right problem
3. Understand the problem
4. Invent and validate
5. Execute
6. Create market acceptance
7. Launch flawlessly

Along the way, there’s a lot of circling back and pushing information from one part of the process to another. [7]

These are just a few examples that underscore the fact that innovation will normally occur in a systematic way following some prescribed set of steps with opportunities to make adjustments and changes on the way, but also anticipating problems and inhibitors during the process.

Macro View of Measurement

It’s helpful to understand the concept of measurement from both the macro view and the micro view. The macro view is examining innovation across an entire country, or maybe measuring innovation across a group

of organizations in a country (a sector, for example), or measuring innovation at the company or organizational level. This provides a view of the value of innovation at these different macro levels. The micro view is to examine measures of innovation success for a particular project. Ideally, the micro data will roll up into the macro level scorecard.

For the country level, there have been several possibilities. One is the Global Innovation Index (GII), co-published by Cornell University, INSEAD, and The World Intellectual Property Organization. This index is two subparts of innovation inputs and innovation outputs. The input involves human capital and research, infrastructure, market sophistication, and business sophistication. The output covers the creative outcomes and knowledge and technology. [8]

The European Innovation Scorecard (EIS) is constructed by the European Commission. It aims to compare the innovation performance of 27 European Union member countries. The scorecard provides a summary innovation index with an overview of innovation performance in the country. There are three building blocks: enablers, firm activities, and outputs. The enablers include human resources, finance, and support. Firm activities include firm investments, linkages, entrepreneurship, and throughputs. Outputs include innovators and economic effects. [9]

The Global Creativity Index (GCI) is constructed by Martin Prosperity Institute. This index measures creativity of 139 countries based on three pillars: technology, talent, and tolerance. [10] Technology includes R&D spending and number of patents. Talent includes educational attainment and employment in creative occupations. Tolerance is based on efforts with minorities, gays, and lesbians.

The Global Entrepreneurship Index (GEI) was constructed by the Global Entrepreneurship and Development Institute. This index attempts to measure the entrepreneurship process in 130 countries. The index is based on three pillars: entrepreneur attitudes, abilities, and aspirations. It uses both individual data and macro data from institutions. [11]

The Portfolio Innovation **Index. PII** is constructed by the Indiana University's Kelly School of Business and is supported by the U.S. Development Administration. The index aims to help regional practitioners identify their strengths or weaknesses of innovation performance in the United States. This index has four pillars: human capital, economic dynamics, productivity and employment, and economic well-being. [12]

These indices, while helpful, are notoriously inaccurate and incomplete. They focus on inputs and are lagging indicators. While they have critics, they do serve a useful purpose of attempting to compare innovation across countries or, in the case of the last one, within a country.

Industry Level Measures

In some cases, industry-level measures are available that focus on a very important industry and examine some of the innovation measures across a particular segment. The Service Sector Innovation index uses data from a community innovation survey and covers nine themes for 17 countries: [13]

- Human resources
- Innovation demand
- Public support for innovation
- Inputs to product and process innovation
- Outputs of product and process innovation inputs
- Inputs of non-technological innovation
- Outputs of non-technological innovation
- Outputs of commercialization
- Outputs of intellectual property

The National Endowment for Science and Technology in the Arts (NESTA) has carried out research on innovation measurement in the industry level. This index presents a relative innovation performance of each industry by three innovation stages. [14]

The Productive Innovation Index in the pharmaceutical industry focuses on a ranking of 30 pharma companies based on commercializing new products. Component variables for this index are global sales, market capitalization, regulatory efficiency, attrition rate, and value proposition. [15]

Finally, the Elastic Innovation Index of the Financial Services produced by Innotribe attempts to measure or evaluate financial service firms' ability and readiness for innovations and operating models, with a focus on digital-related operating processes. [16]

This index uses data from 60 financial service firms on five themes—content of communication, technology platform, leadership related to innovations, strategy, and externalization. Then the researchers rank firms by each theme. They identify the top five qualities of becoming a capable innovation firm.

These sector indices have some weaknesses but show that some progress is made by attempting to measure innovation at the macro level. It is a struggle to develop the data and the results are sometimes inaccurate for measuring what really matters. But it's a start for these sectors and even in the countries.

Company Level

There have been several attempts to measure innovations that can cut across companies. For example, the global surveys of McKinsey reports on company innovations each year using data from its global survey. [17] They often cover different themes each year, so the surveys cannot be compared from one year to another, necessarily.

The global surveys at Boston Consulting Group are also an attempt to measure innovation. These surveys have been conducted since 2008 and collect data on innovation priority among business strategy, innovation spending, rate of return, drivers for innovation for top management, innovation metrics, and innovation hurdles. [18]

The Technology Innovation Survey from KPMG focuses on barriers to commercialize digital innovation, business functions driving innovations, business functions identifying and nurturing innovations, innovation metrics, innovation incentives, factors enabling innovations within a company, and topics related to specific types of digital innovations. [19]

Concerns about Company Level Measures

Several concerns surface about company level measurement. The Conference Board provides an excellent summary of the concerns about these measures in these categories. [20]

1. **Overall, companies do not have a wide range of innovation measures readily available.** The McKinsey survey shows a lack of measurement—out of the 1075 respondents, 51% indicate that their organizations pursue business model innovations, but only 28% say that their organizations formally assess the innovation. The patterns are similar for process innovation (61% vs. 37%), service innovation (65% vs. 37%), and production innovation (71% vs. 54%). [21]
2. **Companies do not measure the entire life cycle of innovation.** Companies are more likely to use measures of innovation outputs than inputs. A shortcoming of output measures is that they are usually lagged and cannot provide timely information on ongoing innovation projects. As such, they could be useful for evaluation or assessment of existing efforts but they are silent on future activity without

further analysis (especially because in the world of innovation past performance is no guarantee of future success). Cordero reviews innovation measures in firms and finds that firms measure resources (for example, R&D spending) and outputs (for example, market share of new products), but tend to ignore the intermediates in the innovation process (1990). [22]

3. **Measuring innovation in a too strict manner can in fact impede the process of innovation, especially if the focus is on output measures.** Morris warns that if we define innovation as discovering the unknown, and if we try to pin down unknowns too fast, we are likely to “measure the wrong things at the wrong time,” and that hurts learning, discovery and risk taking of the innovation process. [23] He uses return on investment (ROI) as an example to warn readers about the danger of innovation measurement impeding the innovation process. For example, ROI works better for short-term innovations and tends to exclude long-term innovations and breakthroughs. Premature use of ROI to measure innovation thus endangers the very thing you want to measure, and makes less likely the achievement of the end goal of the process. Researchers likely do not know the potential market value of their innovations. And if they are asked to be responsible for the future ROI, they may abandon the innovation for the sake of their performance review. The VP of Global Innovation of McCain Food, Sue Jefferson, says that companies must remove any metrics that are affecting the innovation process detrimentally. The KPIs which a company chooses are inherently linked to the way it defines progress, and its culture. Jefferson correctly points out that choosing the right set of metrics is the key in developing innovation metrics for a specific company. [24]

Some suggest that there are certain factors within a firm that should be measured, regardless of what that specific system may be in place. For example, J. Tidd, J. Bessant, and K. Bavitt suggest that the measurement should always include five points, referred to as the diamond model. They suggest that the framework should measure strategy, process, organization, linkages, and learning. [25]

Micro View of Measurement

Perhaps a more accurate and more manageable process is to examine at the micro view. The micro view is the process internally at an organization that serves as a guide to not only develop successful innovation, but to measure it along the way. This micro view provides a process to measure any particular project through this system. And, in theory, when all of the measures from the different innovations projects are rolled up into an overall company, a macro scorecard is created.

Several attempts to do this include the idea management model, which suggests that the idea of management focuses on three phases: idea generation, idea conversion, and idea diffusion as shown in Figure 2.3. Idea generation has three different components: 1) in-house creation within a unit, cross-pollination across units and external collaborations with third parties outside the firm; 2) idea conversion is screening and initial funding and moving from idea to first result; and 3) idea diffusion is the dissemination across the organization. [26]

A more popular process is the innovation funnel, which starts with inputs to the process and moves through several steps leading to the final outcome of sales. Figure 2.4 shows how this process flows.

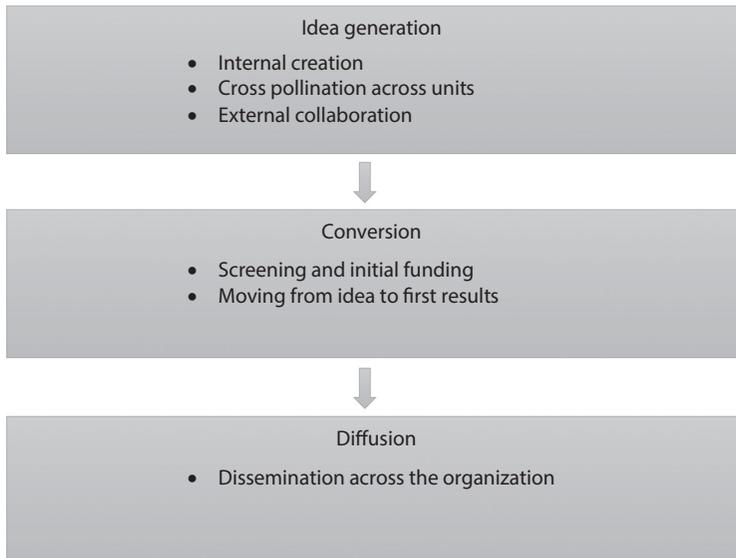


Figure 2.3 Measurement Framework for Idea Management.

Adapted from Hansen and Birkinshaw, 2007

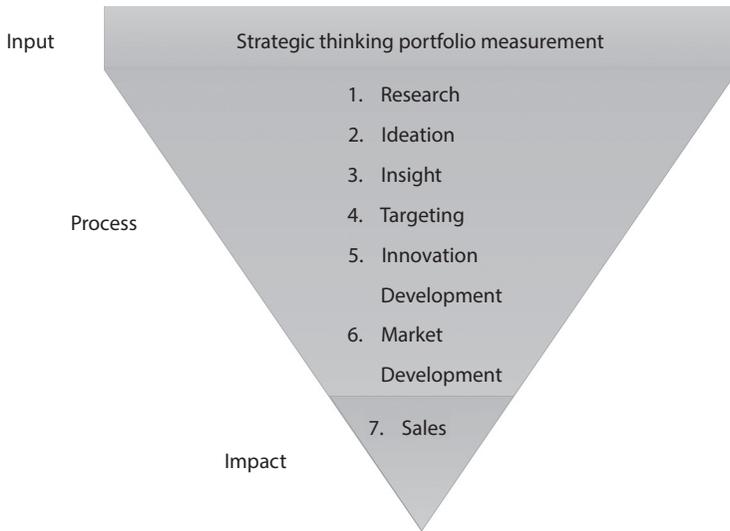


Figure 2.4 Measurement Framework for Innovation Funnel.
Adapted from Morris (2008)

Morris suggests this measurement framework allows companies to develop innovation ideas/projects, eliminate less-promising ideas/projects along the process, and bring the rest of ideas/projects into successful innovations. He recommends lists of qualitative and quantitative metrics that can be used to measure each of the innovation stages. [27]

Linear models are easier to implement than complex flow and feedback models, but we need to judge them on their merits. Linear models view innovation as a sequential process, and allow companies to manage innovation using a gate system, where a gatekeeper decides if an innovation project can move to the next phase or be terminated. The gate system tightly controls the development of an innovation project and it is relatively safe for innovation beginners, but it takes a long time for an innovation project to move from one gate to another. It is suitable for incremental innovations, but not radical innovations. It cannot sufficiently manage the complex and dynamic processes. [28]

Perhaps the most comprehensive approach to this is the conference board model for measuring innovation activities. This is an attempt to capture metrics along a value delivery chain. And this can work across different key dimensions, which are labeled signposts, as illustrated in Figure 2.5. Thus for a given signpost, there are inputs throughputs and outputs. This value chain becomes an essential part of thinking through the value of innovation in this book. Later, a process is presented by combining some

Signpost	Input	Throughput	Output
Technology	R&D	Patents	Receipts of license fees
Digitization	ICT spending	ICT access index	ICT and business model creation
Environmental & social sustainability	Investment in operational sustainability	Number if ISO 14001 environmental certificates	Environmental performance index
Customer experience & Branding	Spending on advertising	Relationship duration	Customer satisfaction
Internal innovation networks (leadership & organization, processes & tools, people & skills, and culture & values)	Spending on innovation projects	Number of new ideas created internally	Number of new products developed from new ideas
External innovation Ecosystems	Venture capital access (links with government, research & education and access to finance)	University/industry collaboration	innovators (% of SMEs)
Profit and Revenues	Innovation budget	potential of entire new product/service portfolio to meet growth targets	% of sales revenues from new products/services

Figure 2.5 Conference Board Measurement Framework.

Adapted from The Conference Board (Janet X. Hao, Bart van Ark, and Ataman Ozyildirim)

of these processes, putting more emphasis on the steps and the process to provide a systematic way of achieving innovation.

Final Thoughts

This chapter reviewed the status of measurement in the innovation field, presenting some current trends, successes, and concerns. While most all systems seem to measure input, the output measurements vary considerably. Very few systems are actually measuring the throughput, what's actually occurring to deliver the output. Several different measurement models are presented and the different views of measurement, from both the macro and micro level, were explored. Along the way, many concerns have evolved that frame the need for a systematic, proven process that can measure data ranging from inputs to outputs and all the processes in between. The specifications for this are outlined in the next chapter.

3

The Case for a New System

After speaking on the use of ROI for non-capital investments to the British Chamber of Commerce in Singapore, we were invited to visit the local offices of a European-based chemical company. The largest chemical company in the world, with customers in over 190 countries, made the decision to move much of its R&D operations from Europe to Asia. Our host was the executive responsible for R&D and he was concerned about the value of this large R&D operation, based in Asia with most of it located in India. He wanted to know how to show the ROI of all of their research and development efforts.

The next week, we received a request from a consulting firm in the United Arab Emirates (UAE) to show the ROI of innovation. As they explained, the UAE government had pumped millions of dollars into all types of innovation projects and now government leaders are asking for ROI. They see many activities, some ideas developing, and a few ideas that can be converted into useable business, but there's a sense that not enough value is being delivered. In short, they need to see the ROI on innovation efforts. They're requesting that we conduct our ROI Certification for these innovation champions and leaders so they can show the ROI of their projects.

Both of these scenarios, occurring within a week in June 2017, illustrate the concern in the organizations about the ultimate accountability, the return on investment. This is an important measure, although it can be misused and abused in the innovation field, or in any other field for that matter. There is a place for ROI, particularly when the funder is requesting it. The key is to make sure that ROI is perceived as only one measure out of a possible set of balanced measures and that the emotion around ROI be control. Many innovation projects will result in a negative ROI, and that's expected. However, as we indicated earlier, more projects need to deliver a positive ROI, and that's anticipated. What's needed is a system that will deliver ROI while at the same time, offer a set of measures that enables process improvement and consistency.

Innovation: A Cost or an Investment?

It is helpful to think about how executives view the expenses connected with innovation. Do they see this as a cost or an investment? Most would respond quickly by suggesting that innovation is an investment. We invest in innovation to reap positive returns. Most executives, in conversations, interviews, and certainly speeches, will showplace their investments in innovation, and even characterize their spending on this area as investing in innovation. This is important because if it's an investment, they will continue it, support it, enhance it, and maybe increase it, significantly in some cases. But if they see it as a cost, then it will be controlled, reduced, and sometimes even eliminated, and perhaps folded into operating processes. Since most of innovation is small improvements in all type of functions, innovation may not appear in the classic R&D budget. These could easily be cut.

We've seen examples where companies have sliced their innovation expenses because they are not seeing the value of the process, and other companies reluctant to invest more in innovation because they don't know for sure if it's making a difference. It's good to reflect on the perspective of top executives. In uncertain times, too many executives, in search of short-term profits, slice all types of costs, including innovation. And cost reductions or cost control is a way some executives see their way to profitability or even prosperity. A lean Six Sigma project in the quality section, a brainstorming program in organization development, or a design thinking workshop in learning and development could easily become victims of cost cutting.

A good example of this occurred in 2015 when two individuals purchased Kraft and Heinz, two storied brands. Warren Buffett in the United States teamed up with Carlos Alberto Sicupira in Brazil. The *Financial*

Times, in London, interviewed Carlos and asked about the value they saw with these two companies as they would be combined in a merger. Carlos replied that there are many costs that can be cut. Costs are like fingernails. You have to constantly cut them. As those two companies have come together, both have witnessed a tremendous amount of cost cutting. And many of the decisions around cost cutting involve whether the function, department, or project can show the value that they deliver. The value that they would like to see is the financial ROI. If it could not, then that budget was slashed significantly.

Figure 3.1 shows the consequences of what happens when executives see innovation as a cost. Not only will they want to control it, reduce it, or even eliminate it, but other consequences are critical such as a loss of influence, support, and even funding. On the other hand, if innovation is perceived to be an investment, then the investment may be maintained, protected, or enhanced. And the consequences are impressive. Business partnerships flourish, client relationships improve, support is increased, and funding is much easier. In short, for some major projects and processes, ROI for innovation is needed.

An ROI calculation using a standard return on investment formula from the finance and accounting field removes any mystery about innovation as an investment. And if the ROI is very positive, innovation may attract more investments.

The challenge is to take those innovation activities or projects that have the most executive concern about their feasibility and value and push the evaluation to ROI. It's absolutely essential in today's environment. When

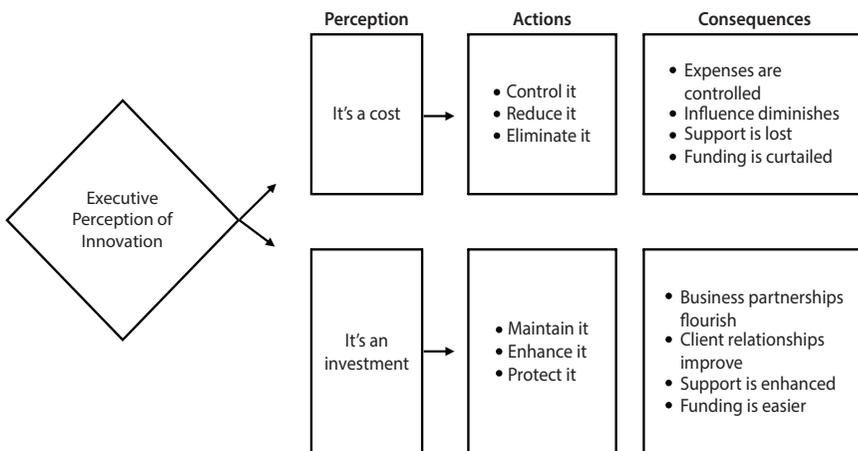


Figure 3.1 Costs Versus Investment Perception.



Figure 3.2 Use Results to Optimize and Allocate.

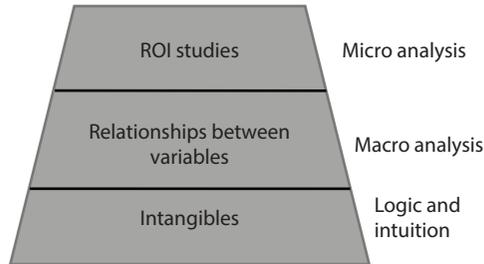


Figure 3.3 The Value of Innovation.

this is achieved, innovation can be evaluated at different steps in the process. Evaluation data are used to make changes or improvements along the way, essentially enhancing the ROI. This process is optimizing the return on investment. When this is achieved, a much better case can be made for allocating more budget. In essence, evaluation leads to optimization which leads to allocation, as shown in Figure 3.2.

The Value of Innovation: A Summary

At this point, it's helpful to summarize what's needed to demonstrate the value of innovation, which places the value being derived from three major bodies of work. As shown in Figure 3.3, the three major pillars for value are the intangibles, relationship between variables, and ROI studies.

Intangibles and the Fear of not Investing

Most investment in innovation has been made on logic and intuition. Executives know that they must have innovation. And they must invest in innovation whether it's in the R&D budget, allocating portions of a department or division's funds for innovation, or having innovation built into each unit as a systematic process. In either case, these investments are being made on the faith and hope that innovation is going to work and that it will deliver value. And all it takes is a few successes to validate this assumption.

These same executives have a fear of what happens without innovation. They see the organization going stagnant, becoming irrelevant, and ultimately dying. This fear of the consequence of not investing drives many innovation budgets, even today. These organizations want to be recognized as the most innovative organization. They want to be on the most admired list and the most sustainable list. They want to be the great place to work, the family-friendly company, or the company that protects the environment. To make these lists, investments in innovation are needed, doing things in a different way, making new products and services much better.

As mentioned previously, investments on faith and hope leave an unsettling feeling. Investing a huge amount of money based on perception is dangerous. Without any output data that's substantial, and no evidence of proof, we're funding effort and activities in the hope that it will deliver. Many executives want to move beyond this approach. As they often tell us, "We want to move out of the intangible world, move closer to the tangible proof." This leads us to our next body of knowledge.

Relationship Between Variables

As mentioned in chapter two, there are many macro levels which can show the variables that seem to be the important predictors of success, apart from just R&D spending. They include measures such as trademarks, patents, and copyrights. Which may lead to new products. While there may be a relationship between R&D spending and revenue growth, other relationships between variables may be possible. For example, is there a relationship between innovation culture and innovation outputs? Is there a relationship between the ideas generated from a suggestion system and innovation outputs? If we spend money, we should have outcomes.

Investors are always seeking a measure to predict innovation apart from R&D spending. A sophisticated approach to valuing innovation is Holt's Innovation Premium (IP). Holt is a division of Credit Suisse that develops tools for evaluating investments. Its IP measure is the basis for *Forbes's* annual innovation ranking. IP is defined as the difference between market capitalization and a net present value of cash flows from existing businesses. Figure 3.4 presents the top ten most innovative companies in 2017 based on IP.[1]

The IP is the bonus given by equity investors on the educated hunch that the company will continue to come up with profitable new growth. It is not fundamental analysis that allows you to value innovation. It is almost the opposite—it reports back to investors how much value they

Rank	Company	Industry	Country	Innovation premium
1	Salesforce	Application Software	USA	82.46
2	Tesla	Automobile manufacturers	USA	78.43
3	Amazon.com	Internet & direct marketing retail	USA	72.78
4	Shanghai raas blood products	Biotechnology	CHN	71.72
5	Netflix	Internet & direct marketing retail	USA	71.54
6	Incyte	Biotechnology	USA	70.91
7	Hindustan unilever	Household products	IND	68.59
8	Asian paints	Specialty chemicals	IND	68.28
9	Naver	Internet software & services	KOR	65.85
10	Regeneron Pharmaceuticals	Biotechnology	USA	64.40

Figure 3.4 The Top Ten Most Innovative Companies.

have already attached to a company's innovation. Accordingly, IP does not correlate with subsequent returns, as noted on the *Forbes* website: (IP) is also not a statement about expected excess returns—in fact...Knott went back through the data for the past 20 years and found that there is no correlation of IP with subsequent return to investors.[2]

Knott argues that Research Quotient (RQ) is the most intuitive measure you could construct for R&D effectiveness. It captures a company's ability to generate value from its R&D investment in a very precise way. In particular, RQ is the percentage increase in revenue a company obtains from a 1% increase in R&D, while keeping everything else the same.

These relationships are important and we expect many to come, particularly with the efforts to use analytics in the marketing, research, and development areas. Still, while these relationships are helpful, they are not always accurate and they are the macro view. It's the data across the entire organization including all innovation projects. Sometimes the data are aggregated across firms or the entire country, or even in some cases, globally. They are helpful to understand relationships, how variables are connected, and to realize that there are some important outcomes that are connected to innovation and creativity in an organization. Still, it leaves executives wanting more. If we're spending x amount of money on an innovation lab for example, what's the payoff? Or maybe we're spending on a particular new product; what's the payoff? Or we invest in a design-thinking workshop; what's the payoff? These are now micro-analysis issues and deserve attention as well.

ROI Studies

ROI studies involve evaluating the success of an innovation project with multiple levels of data, including the financial ROI. It's helpful to think about ROI for a small but significant number of innovation projects. While projects could be the different types detailed in Chapter Two, this type of analysis should be researched for projects that consume a lot of time and money, where executive expectations are high, and there is a need to understand more clearly the outcomes. The ROI analysis shows the actual value for investing in these projects. As mentioned earlier, there's a need for ROI in the innovation field. It is needed by the funders, supporters, and even for the critics. They all need to see the value at this level. This leads to the development of ROI for many innovation projects, which is the basis for this book.

Types of Data

An attempt to summarize what's needed in the innovation area brings into focus some very key issues that have been presented in the previous two chapters, as well as in this chapter. This must be considered from perspectives of principal funders of innovation, as well as the need for the various stakeholders that are involved. Add to this the need to have a systematic, logical flow of data for an evaluation and you have the data set in Figure 3.5 with inputs into the process and the six categories of data arranged in a logical chain of value, moving from inputs through five levels of outcomes, including the financial ROI.

Inputs

In any innovation project, there are inputs. These are usually the people who are involved, both in terms of number and the time they're involved in the activity, and the cost of the process. This is important because having the right people involved is critical. We have seen from some previous works that it takes a unique person to be a good innovator. The profile of the serial innovator is very impressive and clear. We want people involved who want to be involved in an engaged way. Therefore, the starting point for seeing, knowing, and proving the value is having the right people involved at the right time with the right amount of time available and on the right project. Input is important, but doesn't speak to the outcomes, the results.

Level	Measurement Focus	Typical Measures
0-Inputs 	<ul style="list-style-type: none"> Inputs into innovation projects including indicators representing scope, volumes, times, costs, and efficiencies 	<ul style="list-style-type: none"> Types of innovation Number of projects Number of people involved Hours of involvement Costs
1-Reaction and Planned Action 	<ul style="list-style-type: none"> Reaction to the innovation projects including their perceived value and planned action to make them successful 	<ul style="list-style-type: none"> Relevance Importance Usefulness Appropriateness Intent to use Motivational Recommended to others
2-Learning 	<ul style="list-style-type: none"> Knowledge gained, learning how to develop concepts and how to use skills and competencies to drive innovation 	<ul style="list-style-type: none"> Skills Learning Knowledge Capacity Competencies Confidences Contacts
3-Application and Implementation 	<ul style="list-style-type: none"> Application and use of knowledge, skills, and competencies, including progress made and implementation success 	<ul style="list-style-type: none"> Behaviors Extent of use Task completion Frequency of use Actions completed Success with use Barriers to use Enablers to use Engagement
4-Impact 	<ul style="list-style-type: none"> The impact of the projects and processes expressed as business impact measures 	<ul style="list-style-type: none"> New products Enhanced products Productivity Revenue Quality Time Efficiency Incidents Retention Customer Satisfaction
5-ROI	<ul style="list-style-type: none"> Comparison of monetary benefits from the project to project costs 	<ul style="list-style-type: none"> Benefit Cost Ratio (BCR) ROI (%) Payback period

Figure 3.5 Six Categories of Data.

Reaction and Planned Action

Reaction is often omitted from current models of measurement under the assumption that people involved in innovation are involved because they want to be. They see value in the process and they see it as important to their success as well as the success of the organization. But that may be a

false assumption. The key is to collect data at this level, to make sure that the people involved in the innovation projects see those projects as relevant to the needs of the organization, important to their individual success and to the success of the organization, and as something that is useful, and helpful, and appropriate. They should intend to make the project successful and are motivated to do it. Perhaps they would even recommend that others be involved as well. Without this proper reaction, the efforts will be minimal at best. Some of the people involved in innovation may see these activities as a waste of time or money. Others would see these efforts as additional work. Still others may see efforts to focus on creativity and innovation as silly and inappropriate. When this is the case, the results will not materialize. Consequently, our first set of data is a very important first outcome level.

Learning

The next logical step is learning, and this is closely related to reaction. In fact, the reaction would normally be influenced by what the people involved in the project are learning. This is knowing about the process that they're involved in, the rules and the conditions under which they are operating, and the power of what they're working with and how it can make a big difference. The more they know, the more the resistance reduces and motivation increases.

Some authors equate innovation with learning. It's all about learning new ways, new processes, and new products through exploring, experimenting, and adjusting. As Thomas Edison famously said, he spent more time learning from the things that don't work than he spent learning from the things that do work. Learning is critical, and we must measure it. Learning measurements ensure that the knowledge, skills, and competencies are there, with the confidence to make it work, and the contacts to make it successful. Learning measurement is necessary, but is still a long way from the end game.

Application and Implementation

For some stakeholders, the big challenge of getting innovation going is this level. We have people doing something. They're generating new ideas. They're testing new concepts, trying new processes, exploring options, and identifying other possibilities. The group is mobilized, making progress, and there are actions. This is helpful because at this level of outcome, resistance has been reduced to a certain extent, as well as the

inertia that holds people back from getting things done. It's also critical because innovation must follow certain procedures, such as the drug development protocol in the pharmaceutical industry. Application and implementation includes all processes and procedures necessary to make the trials successful, such as tasks, actions, checkouts, and policies. This is powerful and it can only be accomplished when participants learn what to do.

Impact

The level or measure is critical to funders. The impact is the consequence of actions, such as the new idea is working, the new product is developed, the new approach is seamless, or the new system is functional. The impact is new products, increased productivity, improved quality, or improved times. These impacts are in the system, and they define the organization. They are the impacts that will make the difference. Not only do we have the tangible impacts that we've just described, but the intangible ones as well. These usually include customer satisfaction, image, stress, teamwork, collaboration, alliances; impacts that are important but maybe not easily converted to money.

Impacts at this level are divided into tangibles and intangibles. The tangibles are those that can be converted to money for the ROI calculation and the intangibles are those that cannot be converted to money credibly with a reasonable amount of effort. This makes it all worthwhile in the minds of some of the supporters and funders. For some, you still need more. You need that ultimate accountability, ROI.

Return on Investment

As mentioned earlier, the return on investment is needed, and this can be measured in three very common ways. One is the benefit-cost ratio, which is the monetary benefits from the innovation project divided by the cost of the innovation. Benefit-cost analysis has been around for a long time and is very meaningful to many executives, particularly those in nonprofits, governments, and NGOs.

Next, there's the ROI, expressed as a percentage, which is the net benefits divided by the cost times 100. The net benefits are the monetary benefits minus the project costs. This is a very common measure in businesses and often is even understood by consumers, as they clearly see their ROI for investing their money in a savings account in a financial institution. The ROI formula comes from the finance and accounting literature.

Finally, the payback period is another possibility and this is basically a calculation of how long it takes to get the money back from this investment. This is also a financial measure. ROI measures keep the CFO and the CEO happy. As Warren Buffett says, the ROI is a way to keep score. And it's the ultimate accountability. For most executives, it shows the efficient use of funds. Just getting the impact is one thing, but seeing how this could be achieved with less cost is another. The higher your ROI, the more efficient the use of the funds.

So, there you have it. Six categories of data that are necessary, arranged in a logical flow so that one block or one category is a precondition for the others. This is a foundation that will be critical for the material in the book, but there's more.

How Does Your Current System Stack Up?

For the most part, the current systems of measuring and evaluating innovation projects fall short of providing the proper system for accountability, process improvement, and results generation. As we examined, the ways in which projects are evaluated, ten criteria are identified for an effective evaluation system. Figure 3.6 lists each issue and presents what is needed for improvement. It also shows how the ROI Methodology, presented in this book, addresses all ten of these areas.

Focus of Use

Sometimes evaluation looks like auditing. Usually during a surprise visit, someone checks to see whether the project is working as planned, and a report is generated (usually too late) to indicate that a problem exists. Evaluation of many capital expenditures, for example, is often implemented this way. The project is approved by the board, and after it is completed, a board-mandated follow-up report is produced by internal auditors and presented to the board. This report indicates what is working and not working, often at a point that is too late to make any changes.

Even in government, social sciences, and education, the evaluations are often structured in a similar way. For example, our friends in the British government tell us that when new projects are approved and implemented, funds are set aside for evaluation. When the project is completed, an evaluation is conducted and a detailed report is sent to appropriate government authorities. Unfortunately, these reports reveal that many of the programs are not working, and it is too late to do anything about them. Even worse,

Topic Focus of use	Problem or issue	What is needed	ROI methodology
	Audit focus; punitive slant; surprise nature	Process improvement focus	This is the number one use for the ROI methodology
Standards	Few, if any, standards exist	Standards needed for consistency and credibility	Twelve standards accepted by users
Types of data	Only one or two data types	Need a balanced set of data	Six types of data representing quantitative, qualitative, financial, and non-financial data
Dynamic adjustments	Not dynamic; does not allow for adjustments early in the project cycle	A dynamic process with adjustments made early and often	Adjusts for improvement at four levels and at different time frames
Connectivity	Not respectful of the chain of value that must exist to achieve a positive impact	Data collected at each stage of the chain	Every stage has data collection and a method to isolate the project's contribution
Approach	Activity based	Results based	Eight steps are used to design for results
Conservative nature	Analysis not very conservative	A conservative approach is needed for buy in	Very conservative: CFO and CEO friendly
Simplicity	Not user friendly; too complex	User friendly, simple steps	Ten logical steps
Theoretical foundation	Not based on sound principles	Should be based on theoretical framework	Endorsed by hundreds of professors and researchers; grounded in research and practice
Acceptance	Not adopted by many organizations	Should be used by many	More than 5,000 organizations using the ROI Methodology

Figure 3.6 Problems and Opportunities with Current Measurement Systems.

the people who implemented the project are either no longer there or no longer care. When accountability issues are involved, the evaluation reports usually serve as punitive information to blame the usual suspects or serve as the basis for performance review of those involved.

It is not surprising that auditing with a punitive twist does not work with innovation projects. These project evaluations must be approached with a sense of process improvement—not performance evaluation. If the project is not working, then changes must take place for it to be successful in the future.

Standards

Unfortunately, many of the approaches to evaluate innovation projects lack standards unless the project is a capital expenditure, in which case the evaluation process is covered by Generally Accepted Accounting Principles (GAAP). However, most innovation projects are not capital expenditures. In these instances, standards must be employed to ensure consistent application and reliable results. Overall, the standards should provide consistency, conservatism, and cost savings as the project is implemented. Use of standards allows the results of one project to be compared to those of another and the project results to be perceived as credible.

Types of Data

The types of data that must be collected vary. Unfortunately, many projects focus on impact measures alone, showing new products, cost savings, less waste, improved productivity, or improved customer satisfaction. These measures will change if this project is implemented. The types of measures also include intangibles.

What is needed is a balanced set of data that contains financial and non-financial measures, as well as qualitative and quantitative data. Multiple types of data not only show results of investing in healthcare projects, but help explain how the results evolved and how to improve them over time. To effectively capture the return on investment, six types of data are needed: reaction, learning, application, impact, ROI, and intangible benefits.

Dynamic Adjustments

As mentioned earlier, a comprehensive measurement system must allow opportunities to collect data throughout project implementation rather than waiting until it has been fully completed (perhaps only to find out it never worked from the beginning). Reaction and learning data must be captured early. Application data must be captured when project participants are applying knowledge, skills, and information routinely.

All these data should be used to make adjustments in the project to ensure success, not just to report post-program outcomes at a point that is too late to make a difference. Impact data are collected after routine application has occurred and represent the consequences of implementation. These data should be connected to the project and must be monitored and reviewed in conjunction with the other levels of data. When the connection is made between impact and the project, a credible ROI is calculated.

Connectivity

For many measurement schemes, such as the balanced scorecard, it is difficult to see the connection between an innovation project and the results. It is often a mystery as to how much of the reported improvement is connected to the project or even whether a connection exists.

Data need to be collected throughout the process so that the chain of impact is validated. In addition, when the business measure improves, a method is necessary to isolate the effects of the project on the data to validate the connection to the measure.

Approach

Too often, the measurement schemes are focused on activities. People are busy. They are involved. Activity is everywhere. However, activities sometimes are not connected to impact. The project must be based on achieving results at the impact and ROI levels. Not only should the project track monetary results, but also, the steps and processes along the way should focus on results. Driving improvement should be inherent to the measurement process.

By having a measurement process in place, the likelihood of positive results increases. A complete focus on results versus activity improves the chances that people will react positively, change their attitude, and apply necessary actions, which lead to a positive impact on immediate and long-term outcomes.

Conservative Nature

Many assumptions are made during the collection and analysis of data. If these assumptions are not conservative, then the numbers are overstated and unbelievable, which decreases the likelihood of accuracy and buy in. The results, including ROI, should be CFO- and CEO- friendly.

Simplicity

Too often, measurement systems are complex and confusing for practical use, which leaves users skeptical and reluctant to embrace them. The process must be user-friendly, with simple, logical, and sequential steps. It must be void of sophisticated statistical analysis and complicated financial information, at least for the projects that involve participants who lack statistical expertise. It must be user-friendly, even to those who do not have statistical or financial backgrounds.

Theoretical Foundation

Sometimes measurement systems are not based on sound principles. They use catchy terms and inconvenient processes that make some researchers and professors skeptical. A measurement system must be based on sound principles and theoretical frameworks. Ideally, it must use accepted processes as it is implemented. The process should be supported by professors and researchers who have used the process with a goal of making it better.

Acceptance

A measurement system must be used by practitioners in all types of organizations. Too often, the measurement scheme is presented as theoretical but lacks evidence of widespread use. The ROI Methodology, first described in publications in the 1970s and 1980s (with an entire book devoted to it in 1997), now enjoys more than 5,000 users. It is used in all types of projects and programs from technology, quality, marketing, and human resources, among others. In recent years it has been adopted for green projects and sustainability efforts and now innovation.

The success of the ROI Methodology will be highlighted in detail throughout this book with examples of applications in innovation. It is a comprehensive process that meets the important needs and challenges of those striving for successful innovation projects.

Using Design Thinking to Deliver and Measure Results

It is useful to think about using an innovation technique to actually deliver the value from the innovation project and actually capture the data. A very popular concept in innovation is the concept of design thinking. This process rests on the assumption that success is clearly defined, and the entire team designs for that definition of success. If you want high quality, everyone works on that. If you want low costs, everyone is focused on that issue. If you want functionality, the focus is there. For innovation projects, success is achieved when the impact has occurred. This can mean low costs in a new product, or better quality, or more convenience.

With that success defined, the team works through a series of steps, using design-thinking principles to reach the success that's desired. Although design thinking had its beginnings a few decades ago with the first book written in 1987, it really gained popularity with a book called *Change by Design* from Tim Brown with IDEO.[3] A more recent book seemed to

Basic principles

1. A problem-solving approach to handle problems on a systems level
2. A mind-set for curiosity and inquiry
3. A framework to balance needs and feasibility
4. A way to take on design challenges by applying empathy
5. A culture that fosters exploration and experimentation
6. A fixed process and a tool kit
7. A storytelling process to inspire Senior Executives
8. A new competitive logic of business strategy
9. A means to solve complex or wicked problems
10. A means to reduce risks

Figure 3.7 Design Thinking.

Mootee, Idris. (2013). *Design Thinking for Strategic Innovation*. Hoboken, NJ: Wiley.

broaden the scope and the flexibility of the process, and this is *Design Thinking for Strategic Innovation*.^[4] Figure 3.7 lists some of the common design-thinking principles, though they're not universal from one author to another. This figure lists ten principles that seem to be common, taking the first eight principles and placing them in the classic steps to implement an innovation project that takes eight steps to design an innovation project for results, capture that data, and make the case for more investment.^[5] This is fully described in Figure 3.8. For each of these steps, the design-thinking principle used is highlighted.

Start with Why: Aligning Projects with the Business

In this step, the design-thinking principle is to use a problem-solving approach at the systems level. The first step is defining clearly why we're pursuing the innovation project, and this is usually one or more impact measures, described earlier. Obviously, in some innovation where new experiments and ideas are generated, the impact may not be clearly known, but the general categories of impact should certainly be identifiable. Essentially, this requires the person involved in the innovation to ask the question: is it a problem we're trying to solve, or an opportunity we want to pursue? For example, the creators of Uber wanted a lower-cost, more convenient, and efficient way to catch a ride from one place to another. Essentially, the problem was that it was costing too much and taking too long to get it done. Taxis are notoriously inefficient and expensive. At the same time, they saw a great opportunity to build loyal customers, provide

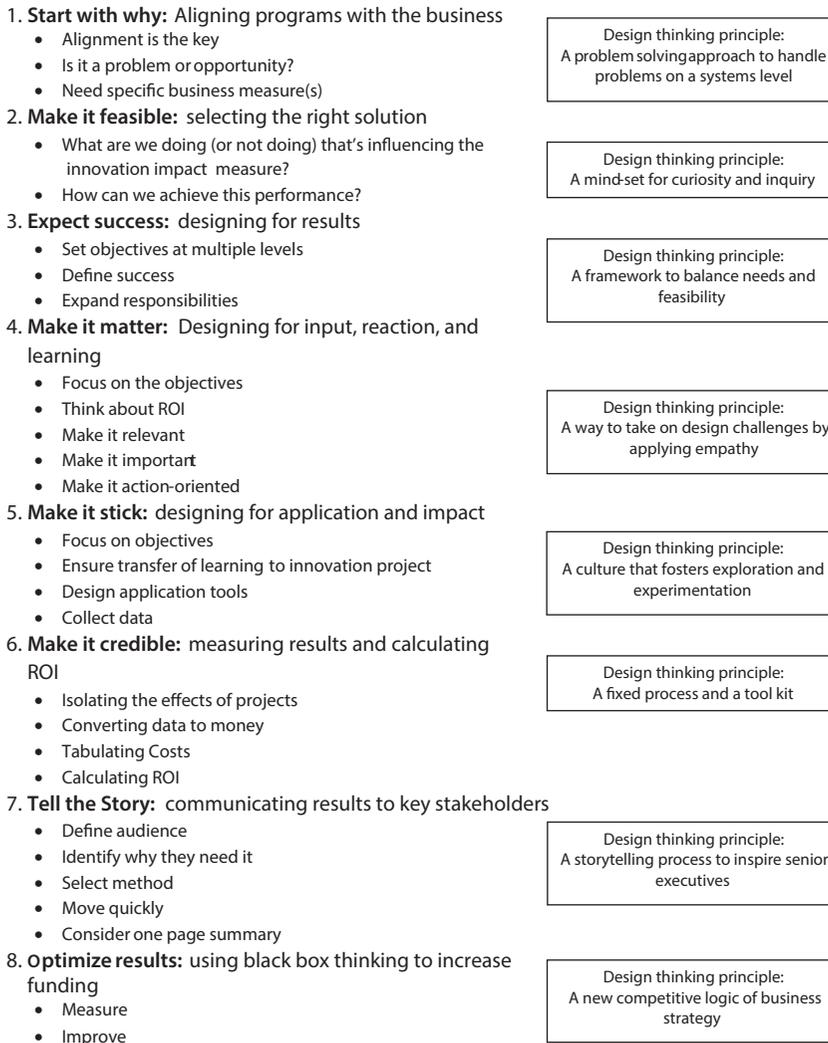


Figure 3.8 Designing for Results.

Taken from Phillips, Patti P. and Jack J. Phillips. (2017). *The Business Case for Learning: Using Design Thinking to Deliver Business Results and Increase the Investment in Talent Development*. West Chester, PA: HRDQ and ATD Press.

a great experience, and also solve the problem of time and costs. In this step, it's important to have as many specific measures identified as possible.

Make it Feasible: Selecting the Right Solution

In this step, the design-thinking principle is a mind-set for curiosity and inquiry. This means that the way in which the innovation project unfolds

is identified. If we want to make a better-quality process, what is our way of working through that? What is our technique? Is it a dedicated person? Is it a specific technique? Is there a task force needed? What is the right solution to get there? This defines what people will be experiencing as they use the product or the process. If it's tackling an existing process, this is a clear indication of what we're doing now that is not working or what is it we need to be doing that we're not doing now that would make the impact measure improve? For example, taxis were not using technology to connect with riders for the most part. The solution is to use technology to the fullest extent to connect the automobile to the customer quickly, then quickly take them to the new location.

Expect Success: Designing for Results

Three issues are addressed here. The first is to make sure that objectives are set for the innovation project along the five levels or outcomes mentioned in the previous data categories. These objectives, particularly at the application and impact level, indicate what the individuals involved in the project will be doing and the impact that should occur. This also requires the success definition to be provided to all members of the group, particularly the participants of the process and others who are supporting it. And third, this definition of success is provided to all the designers, developers, and other team members who are supporting the process. All of these stakeholders can clearly see what will be done and their role in making it work. They will also design for the outcome.

Make it Matter: Designing for Input, Reaction, and Learning

In this step, the design-thinking principle is a way to take on design challenges by applying empathy. Here, all members of the group are putting themselves in the position of the people who will use and support the innovation. In the Uber example, this requires the designers and developers working on the technology to think about the driver and how this technology can be used without being distracting and without any delays. Also, thinking about the customer, the customer experience must be designed from their perspective. They may be in a hurry, they may be at a location that's not easy to find, and they need to know not only an accurate description of when someone will be there, but where they are now in the progress they're making to pick them up. This step is focusing on making sure that the innovation will be relevant, important to the parties involved, and it's

something that is action-oriented. It's something that they will do to make this work.

Make it Stick: Designing for Application and Impact

The design-thinking principle is a culture that fosters exploration and experimentation. In this process, it's making sure the designers and developers are doing what's necessary to achieve success. They're following through on the plans, they're taking the steps, and there is action in place to achieve what needs to be accomplished to meet the end goal, the impact. This is essentially transferring what needs to be done to the environment where it is actually being done now; transferring it to the workplace, the company, the customer, and where it needs to be. This requires data collection at this level, to make sure that things are going properly, and built-in tools are available to measure, drive, and influence the success at the application and impact.

Make it Credible: Measuring Results and Calculating ROI

In this step, the design-thinking principle is using a fixed process and a toolkit. This step produces data that is important to all stakeholders, but particularly those who fund it. This step shows the actual business results that are achieved with the innovation and the calculated financial ROI of this investment in the innovation project.

This requires you not only to monitor the outcome measure, but also to isolate the effects of innovation from other influences. This is important because when you tackle an impact measure, there may be others working on the same measure. For example, if you're trying to speed up the time for a task with an innovative approach, there may be something inherent in the system or in the environment that's focusing on the same issue. Consequently, isolating the effects of the innovation project from other factors is an absolute must.

This also means converting the impact data to money. What's it worth to be able to improve the time and offer convenience? Sometimes it's easy to convert, such as there may be too many errors and mistakes now, and the new innovative approach is going to reduce them, and there's a monetary value for the mistake. It could be we're trying to attract more new customers with some innovative product, and we already know the value of a new customer. Sometimes the value is not there, such as the convenience of getting an Uber car in three minutes compared to a 30-minute wait for a

taxi. But it's worth something, and the challenge for the team is to try to place some monetary value on this. This helps in the pricing of the service, which will influence the ROI of the project. This step will be using standard approaches for isolating the effects of the project and converting data to money.

This also involves tabulating all the costs of the project so that the monetary benefits, when the data is converted to money, are compared to the costs of the classic ROI calculation. And the final part is the actual calculation of ROI and/or benefit cost ratio.

Tell the Story: Communicating Results to Key Stakeholders.

In this step, the design-thinking principle is the use of storytelling. Even with results in hand, the efforts are not finished. The results must be communicated to all the stakeholders as quickly as possible to let them know the success of the project. In case of a lack of success, the data will show what needs to improve to make it better. Storytelling will inspire senior executives and others. Audiences love stories, and now the story can be told with different levels of data. It makes a more powerful story when they can clearly see that the dramatic events, the interesting anecdotes, and the insightful comments are backed up with proof that this project has made a difference.

Optimize the Results: Using Black Box Thinking to Increase Funding

The design principle used is a new competitive logic of business strategy. The next step is to use a concept of black box thinking to analyze the results, and use them to increase funding. The key concept is to make sure that innovation is properly supported and properly funded. This can be accomplished when the improvements are made, especially when there's a lack of improvement. Even when there is success, improvements are made to make it deliver even more value. Ultimately, the ROI is optimized, and this optimization leads to the allocation of more funds, as illustrated in Figure 3.2 earlier in the chapter. This builds the case for more investment (instead of less investment) in innovation because there is a positive return on the investment. This series of events are powerful: design for the needed results, capture data to tell a compelling story, use data to improve the innovation and optimize ROI, and then make the case for more funding. It's a novel way to think about the power of an innovation technique (design thinking) to show the value of innovation.

Requirements for the Value of Innovation: A Measurement Process

Now our work is complete, we identify all the factors and processes that must be in place for an evaluation system. Based on these two chapters, it appears that the following are needed.

1. A process must be in place to systematically show the value of the innovation process as it unfolds logically.
2. The process must be dynamic, to make adjustments along the way, as enablers and inhibitors are identified.
3. A variety of data is necessary, ranging from qualitative to quantitative, taken from different sources in different time frames.
4. Both financial and non-financial data are needed, which means that the financial ROI must be an important part of the process to be CFO-friendly.
5. The hard-to-measure and hard-to-value measures are still important and need to be an important part of this process.
6. The process must be able to predict success before the innovation project is implemented in a ROI forecast, as well as a follow-up ROI evaluation.
7. The process must be based on sound theories and theoretical frameworks. It must be researcher- and professor-friendly.
8. It must have standards that guide the use of the process and these standards must be conservative for executives to buy into, and support, them.
9. The process must be user-friendly, void of complicated mathematics and long, complicated tasks.

When these are considered, the ROI Methodology developed by the ROI Institute meets these requirements. As mentioned earlier, for over a decade the experts and practitioners in the field of innovation have experimented with the use of the ROI Methodology, and have essentially performed a proof of concept in the innovation field, showing how the ROI is developed on a variety of innovation projects. This is not only happening in the United States, but also in other countries - in particular, Copenhagen, Istanbul, and Singapore. It is now, through this book, we bring this to the mainstream of professionals in the innovation area.

Now, let's introduce the ROI Methodology in more detail.

ROI Measurement Methodology™

ROI Methodology measures the success of innovation in all types of organizations: corporations, small businesses, service organizations, universities, cities, states, countries, and non-governmental organizations. The process collects six types of data: reaction, learning, application, impact, ROI, and intangibles. Data are collected, analyzed, and reported using a systematic and logical model. Conservative standards generate results that are both CEO- and CFO-friendly.

The methodology was created and has been continuously improved by ROI Institute, a global center of excellence that focuses exclusively on this methodology. ROI Institute was founded to meet the need to evaluate the results of complex but “softer” non-capital programs. ROI Institute founders are the authors of this book.

During the last 20 years, the ROI Methodology has been applied at more than 5,000 client organizations across the globe, through client ROI projects and capability building sessions. ROI Institute has authored many award winning books that explain how the methodology is best applied in a wide range of organizational applications. Many detailed case studies have been published, to show how the method is tailored to the unique needs of individual organizations.

Most readers are familiar with the Balanced Scorecard, a concept developed in the 1990s to measure indicators of business performance. In the typical Balanced Scorecard, KPIs are developed in each of four quadrants: financials, customers, internal operations, and continuous improvement. [6] Well-conceived and implemented, the Balanced Scorecard approach has proven helpful to many executives for many years. This is a macro-level scorecard for an organization.

The limitation of the Balanced Scorecard is that it is a report of the current status of measures, usually at the business unit level. It is usually one or more of these measurements are not performing very well that drives the need for a new approach, an innovation project.

As the innovation project is implemented, the six types of data, five levels of outcomes plus intangibles are collected. The six types of data can be considered to be leading indicators (Reaction, Learning, and Application) and lagging indicators (Impact, ROI, and Intangible Benefits) as shown in Figure 3.9. For these measures, the focus of the analysis is to make the innovation matter to an important group. In the last three measures the focus is on being credible with the analysis. Objectives for each level are built into the design and planning phase of a project, and these measures are

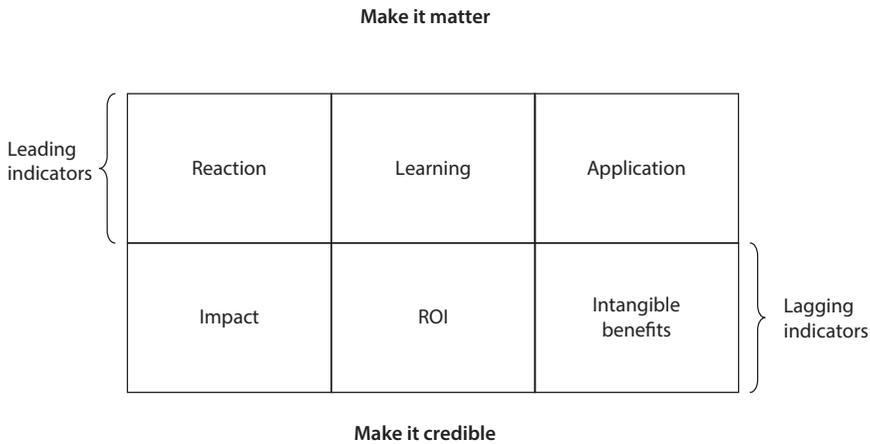


Figure 3.9 The Data from the ROI Methodology.

subsequently evaluated during the implementation and post-implementation. The ROI Methodology is complementary to the Business Scorecard.

Terminology: Projects, Solutions, Participants . . .

In *The Value of Innovation*, the term *project* is used to describe a variety of processes that can be evaluated using the ROI methodology. This is an important issue because readers may vary widely in their perspective. Individuals involved in technology applications may use the terms *system* and *technology* rather than *project*. In public policy, on the other hand, the word *program* is prominent. For a professional meetings and events planner, the word *program* may not be very pertinent, but in human resources, *program* fits quite well. Finding one term that fits all these situations would be difficult. Consequently, the term *project* is used in most. Figure 3.10 lists these and other terms that may be used depending on the context.

The term participant is used to describe the person involved in the innovation project, the person who should make it successful. Examples are provided in the figure. Sometimes there are multiple groups as participants.

Final Thoughts

This chapter makes the case for a new measurement system, describing the different criteria that must be addressed in adopting a new system

Term	Example	Participant
Program	Innovative leadership for senior executives	Senior executives
Project	A reengineering project for the plastics division	Team members
System	A fully interconnected network for all branches	System users
Initiative	An innovative faith-based effort to reduce recidivism	Prisoners
Policy	A new preschool plan for disadvantaged citizens	Students
Procedure	A new scheduling arrangement for truck drivers	Truck drivers
Event	A healthy living event	Attendees
Meeting	U.S. coast guard innovations conference	Delegates
Process	Sampling to improve product quality	Employees
People	Staff additions in the R&D center	Team members
Tool	An innovative approach to selection for the hotel staff	Recruiters

Figure 3.10 Terms and Applications.

for innovation. Clearly, current systems are not working. The funders of innovation are restless and the various supporters and stakeholders need to make sure that value is being delivered so that their participation in the process is at the optimal level. This chapter ends with the introduction to the ROI Methodology, which meets the measurement needs for knowing, proving, and showing the value of innovation. The good news is that it has been used in innovation now for over a decade and with this book we want to bring it to the mainstream of innovation globally.