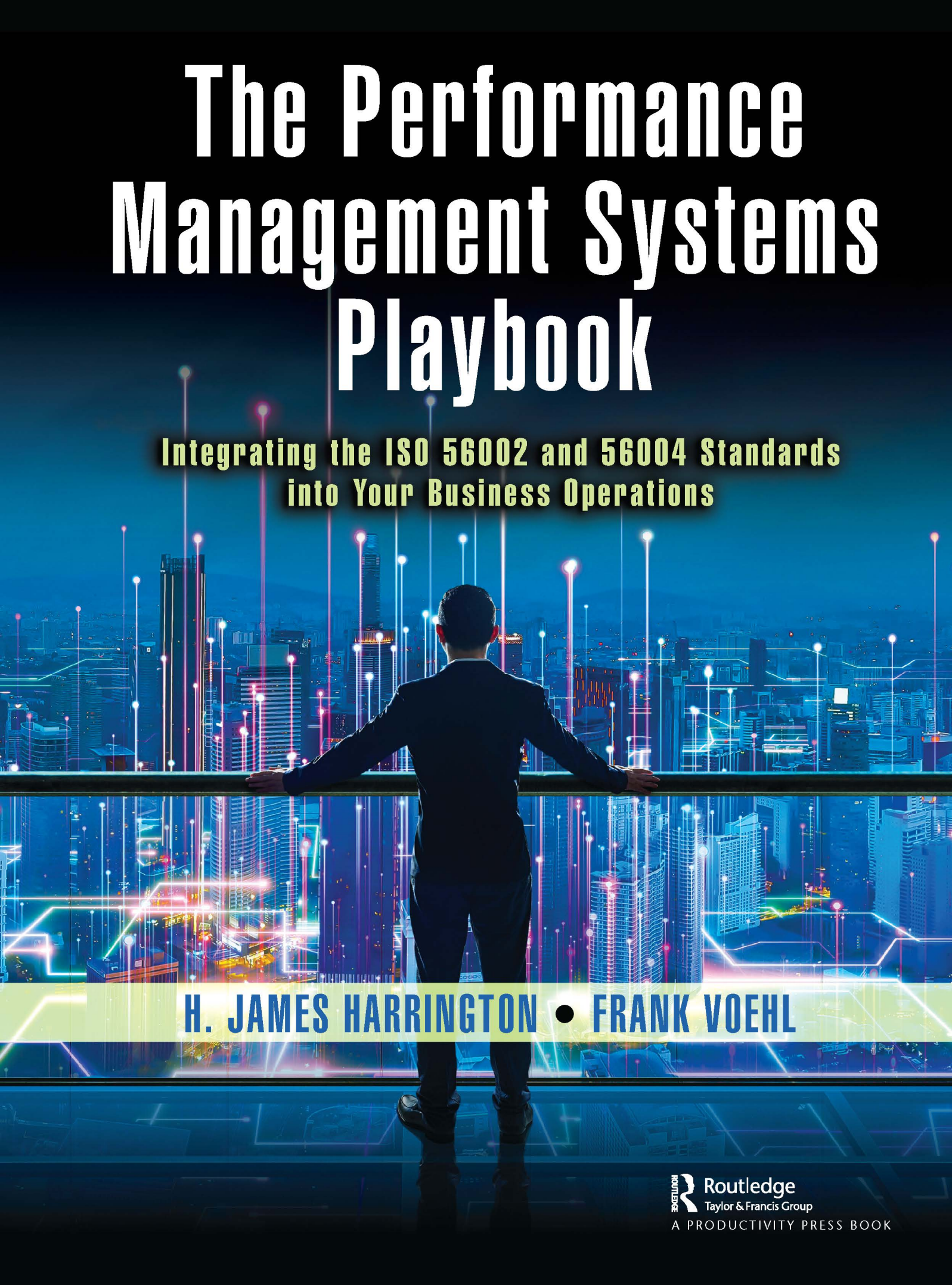
The Performance Management Systems Playbook

Integrating the ISO 56002 and 56004 Standards into Your Business Operations



H. JAMES HARRINGTON • FRANK VOEHL

Routledge
Taylor & Francis Group
A PRODUCTIVITY PRESS BOOK

The Performance Management Systems Playbook

The objective of the ISO 56002 standard is to provide a framework on how to build an innovation ecosystem that can be sustained over time. Similar to the quality management system that ISO established decades ago, this standard provides instructions related to best practices on how to establish an Innovative Management System within an organization. However, it does not provide guidance on how to implement and/or use the standard.

The ISO Standard 56004 Innovation Management Assessment was designed to define the maturity level of an organization's Innovation Management System. The primary purpose of most Innovative Management Systems is to process a continuous flow of new and highly creative outputs that will meet external customers' needs and expectations.

The users of ISO 56002 and 56004 know that they are "what to do" documents. This book, however, shows you how to do it!

Both ISO Standard 56002 and 56004 are focused on improving the organization's innovative management system. This book focuses on how to train employees on how to use the system to add value to the organization's stakeholders. There are no books out on the subject – this book greatly assists managers, business leaders, entrepreneurs, and consultants seeking help in using the innovation management system effectively and efficiently. Essentially, this book presents an effective marriage between the innovative management system and how it will operate when it becomes part of the operating procedures.

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H. James Harrington
Frank Voehl

Routledge
Taylor & Francis Group
NEW YORK AND LONDON

Cover design: © Shutterstock

First published 2024
by Routledge
605 Third Avenue, New York, NY 10158

and by Routledge
4 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an informa business

ISBN: 978-1-032-53771-9 (hbk)
ISBN: 978-1-032-53770-2 (pbk)
ISBN: 978-1-003-41350-9 (ebk)

DOI: 10.4324/9781003413509

Typeset in Garamond
by MPS Limited, Dehradun

I dedicate this book to Candy Rogers, who for the past 26 years has managed my office, got Dr. Jim to meetings on time, found the documents that we thought were lost, and transformed poor spelling into books that we are proud to say "I wrote with her help." Thanks for the years of trying to make me look good and keeping my office running smoothly. Thanks for a lifetime of effort dedicated to making my existence better. You're a very good friend.

Harland James Harrington

We dedicate this book to the US TAG for Innovation Management, TC 279. The efforts of this US Mirror Committee have extended our thinking.

Contents

The Performance Management Systems Playbook

This Playbook is based upon the Taylor and Francis Executive Library series of Innovative Management Systems Operations/Concepts books and the ISO 56000 series of standards. It includes concepts presented in the following books on these subjects published by Taylor and Francis, and co-authored by H. James Harrington and Frank Voehl. These two authors are key members of the ISO's renowned Innovative Team and have served as CEOs and/or Presidents of very successful for-profit and not-for-profit organizations.

- *The Organizational Alignment Handbook: A Catalyst for Performance Acceleration* (2011)
- *The Organizational Master Plan Handbook: A Catalyst for Performance Planning and Results* (2012)
- *Maximizing Value Propositions to Increase Project Success Rates* (2014)
- *Making the Case for Change: Using Effective Business Cases to Minimize Project and Innovation Failures* (2014)
- *Effective Portfolio Management Systems* (2015)
- *The Innovation Tools Handbook, Volume 1: Organizational and Operational Tools, Methods, and Techniques that Every Innovator Must Know* (2016)
- *The Innovation Tools Handbook, Volume 2: Evolutionary and Improvement Tools that Every Innovator Must Know* (2016)
- *The Innovation Tools Handbook, Volume 3: Creative Tools, Methods, and Techniques that Every Innovator Must Know* (2016)
- *The Framework for Innovation: A Guide to the Body of Innovation Knowledge* (2018)
- *Creativity, Innovation and Entrepreneurship* (2018)
- *Innovative Change Management* (2018)
- *The Innovation Systems Cycle: Simplifying and Incorporating the Guidelines of the ISO 56002 Standard and Best Practices* (2019)
- *Total Innovation Management Excellence (TIME)* (2020)
- *Structuring your Organization for Innovation* (2020)

- *Using ISO 56002 Innovation Management System: A Practical Guide for Implementation and Building a Culture of Innovation* (2021)
- *Managing Innovative Projects and Programs: Using the ISO 56000 Standards for Guidance and Implementation* (2022)
- *The Performance Management System Playbook: Integrating the ISO 56002 and 56004 Standards into your Business Operations* (to be released 2023)

What Are Playbooks?

Playbooks are a set of implementation standards related to a specific topic, process, or set of business practices. By leveraging Playbooks, the improvement team can exponentially increase the amount of impact made by giving the right amount of detail of what to work on, in a format that can be self-managed by the end practitioner. It's like doubling the size of your team without adding any headcount!

This TIME Playbook consists of a series of implementation toolkits that serve as a "one-stop shop" for a particular set of standards. Our implementation toolkit contains (a) simple self-assessment questions, (b) easy-to-read and highly practical descriptions, (c) tools, templates, training, and other great resources related to the topic, and (d) a Workshop/Course showing how to implement the TIME methodology.

The Playbook Translates Vision and Strategy to Tactics

A Playbook defines what needs to be done to win the game, breaking the team's strategy down into actionable plays and defining roles and responsibilities to be successful. Moving from a sports team to other organizations is similar. The Playbook helps the team visualize targets, understand the continuous improvement model, and know what is needed to achieve goals and be successful. The major steps of the workflow are defined and the specific activities in those areas are outlined.

The Playbook Looks at Gap Closures

A part of the Playbook definition includes an assessment of capabilities versus needs. This looks at whether the organization has the leadership, guiding concepts, tools, resources, and training needed to execute each section of the Playbook. The Playbook also defines the areas where performance will be measured and the metrics that will be used. The team uses these metrics to determine baseline, set goals, and define the plays or actions needed to achieve milestones.

The Playbook Communicates to Team Members

In the area of performance management and innovation management problem-solving, the Playbook articulates the critical elements for success. Relevant references are pulled together as background. Self-assessment is included. Because the Playbook clearly defines work and concepts, it becomes an important tool for communicating requirements to the whole organization. This, in itself, is a training tool, with the assessments helping participants understand what they don't know so that they can build their knowledge and move into improvement efforts.

Playbooks Clarify Roles and Integrate Team Efforts

The players who need to be engaged in delivering the strategy are identified within the organizational Playbook. This involves not only the team directly doing the operations, but also all the interested parties, along with stakeholders and players who contribute to delivering outcomes. It helps ensure critical actions won't be overlooked and lays a framework for the team norms that ensure alignment.

The Playbook Drives Best Practices

Playbooks are a form of standardized work. Using benchmarking across many teams doing similar types of work, Playbooks are created with the best methods for achieving desired results. A team member can use the Playbook of proven methods as a resource to follow a step-by-step process for continuous improvement in a given area.

Preface: Your Treasure Chest of Value and Success

In this TIME Playbook, we present the two major documents in ISO's 56000 Innovation Management Systems series: ISO Standard 56002 and ISO 56004. ISO56002:2019 – Innovation Management Systems – guidance document is the standard that is used to communicate the International Standards Association's recommended entities that should be included in an efficient and effective integrated management system. ISO Standard 56004:2019 – Innovation Management Assessment – guidance document is the standard that is used to communicate the International Standards Association's recommended entities that should be included in making an assessment of an innovative management system.

Both of these standards were new documents released in 2019 and are being used around the world to assess organizations in managing their innovation activities. We strongly recommend that you consider using each clause and subclauses in designing and operating your innovative activities that go on within your organization. Select the ones that have value-added impact on your organization's performance. Also, these two standards are the result of years of work by some of the best-known professionals and educators on innovation systems operations. We have also listed some of the other documents and technical reports that are being prepared related to individual parts of the Innovation Management System and recommend that you acquire and study these documents as they are released.

This Playbook helps an innovative organization understand, adapt, and respond to the conditions of its context, pursue new opportunities, and leverage the knowledge and creativity of its employees. And, as stated in ISO 56002:2019*: "An organization can innovate more effectively and efficiently if all necessary activities and other interrelated or interacting elements are managed as a system."* In fact, an innovation management system can aid any organization in determining its vision, strategy, and objectives in relation to innovation. It can also set the support and processes that help an organization reach its intended outcomes. By implementing an innovation system organizations, can see an increased ability to manage uncertainty, increase growth, reduce costs and waste, and increase revenues.

This Playbook represents a substantial core guidance effort for IMS (Innovation Management System) practitioners. Its exercises and frameworks are organized around the following key concepts: (1) the integration of TIME and the Innovation Systems Cycle with the Doblin Periodic Table of Integration. After deployment, you'll be able to pinpoint your most effective improvement initiatives and replicate them across all locations, sharing your most up-to-date best practices in real-time using the Manage-Execute-Engage success method. From there, if you want to further refine a standard, your framework is already in place, allowing you to adapt and scale seamlessly (see Figure P.1).

The Innovation Systems Cycle and Types of Innovation

#	Innovation Type	Description
1.	Profit Model	How you make money
2.	Network	Connections with others to create value
3.	Structure	Alignment of your talent and assets
4.	Process	Signature of superior methods for doing your work
5.	Product Performance	Distinguishing features and functionality
6.	Product System	Complementary products and services
7.	Service	Support and enhancements that surround your offerings
8.	Channel	How your offerings are delivered to customers and users
9.	Brand	Representation of your offerings and business
10.	Customer Engagement	Distinctive interactions you foster

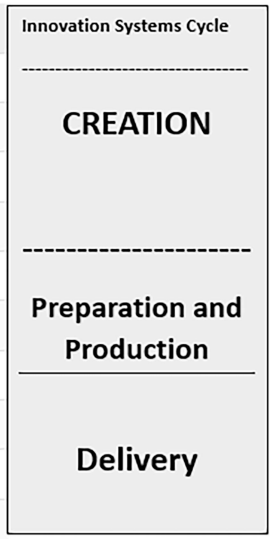


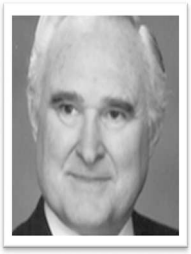
Figure P.1 The innovation systems cycle.

Acknowledgments

We would like to first acknowledge all of the individuals who participated in ISO Technical Committee 279 for their willingness to share their knowledge, ideas, and thoughts with the rest of the team to create an international agreement related to innovation concepts. Without that free exchange of knowledge, the innovation ISO standards would not have been able to be created.

Secondly, we would like to acknowledge the hard work and dedication of Candy Rogers and Michael Sinocchi who have made it possible to translate a rough draft manuscript into a finished book that we both are proud of. Additionally, we recognize Sid Ahmed Benraouane's help in preparing the two chapters on ISO 56002 and 56004, Last, but not least, we would like to acknowledge and give deserving special recognition to the International Standards Association and ANSI for their contributions in organizing and contributing to the management of Technical Committee 279.

About the Authors



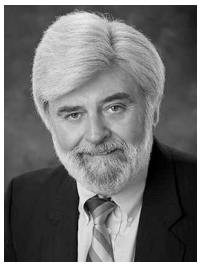
H. James Harrington
Dr. H. James Harrington is a very successful entrepreneur and performance improvement specialist
Background: 40 years project manager with IBM, 10 years plus principal with Ernst & Young, member of 14 different boards of directors of successful and not successful organizations.

Typical accomplishments:

- Served in the US Navy, serial number 785-92-27
- CEO of Harrington Hurd, and Rieker until it was (sold to Ernst & Young)
- CEO, Systemcorp, Montréal Canada project software developers (sold the company to IBM)
- CEO, Harrington Middle East (retired from a successful running business)
- CEO, Define Property designed and constructed 30–50 story buildings until (sold to a competitor)
- Led the redesign of the operating systems for the African Capacity Building Foundation in association with the World Bank
- Appointed in 1984 as the first honorary official advisor to the Chinese government on quality.
- William Clinton, Past President of the United States, assigned him to serve as The Investigator of Goodwill.
- Led the redesign of City Gov. for Dubai to make it more customer-centric.
- Over 20 programs on YouTube
- Author of over 60 books on performance improvement and innovation
- Past President and Chairman of the Board of the American Society for Quality and the International Academy for Quality. Lifetime Honorary President of the Asian Pacific Quality Organization.
- Chairman of the Board and President of the Walter L. Hurd Foundation
- Seven performance improvement and/or student grants are named after him.

- Harrington is one of the few people who were licensed by the government to be a professional quality engineer – license number QU 2180 6/30/87

Frank Voehl, President, Strategy Associates



Brief Bio:

- Certified as a Grand Master Black Belt in Lean Six Sigma and Innovation Excellence; has been an innovation coach since 2008.
- Senior Counselor in Process & Innovation Management, Lean Six Sigma, Design for Six Sigma, Lean Manufacturing, Problem Solving, Accelerated Performance Improvement, and Policy Deployment.
- Thirty-five years of practical experience in leadership for process enhancement, change management, and program development and operations leadership at FPL's QualTec as COO, Strategy Associates CEO/President, 20-20 Innovation CEO, and COO/Chancellor of the Harrington Institute.
- Chairman and Administrator for the US ISO TAG for Innovation Management called TC 279 from 2017 through 2022 year-end
- Trained and coached thousands of teams in Lean Six Sigma, Problem Solving, Innovation Management, TQM, and Process Management. Teams generated over $100 million in savings and averaged over $250,000 each annually
- Noted author and series editor of over 45 books and hundreds of articles and technical papers in the fields of innovation, business management, Lean Six Sigma, change management, and process improvement
- Provided input on the original design of the Malcolm Baldrige National Quality Award and facilitated its crossover to other nations and regions, including the Bahamas, Japan, South America, Europe, and the Czech Republic.

Chapter 1

Why Innovate?

> "Creativity and innovation. Your best opportunities to become a millionaire next year."
>
> **–H. James Harrington**

> "Innovate or Evaporate, perspire or expire."
>
> **–Frank Voehl**

In a Nutshell

Looking for a simple, step-by-step process to manage your innovation efforts? Look no further! This Chapter, designed by well-known consultants in the field of creativity, innovation, and design thinking outlines the process to bring your ideas into the marketplace. It offers specific tools to guide the reader through each step of the innovation process. A practical, easy-to-read, and easy-to-implement guide that will help you see your ideas manifest into reality.

The Best definition of innovation – challenging, interesting, invigorating, fun, satisfying, and rewarding. Creativity and successful innovation management can help you work through even the toughest of issues by changing the way that you think about problem-solving. Think of every problem as a lost opportunity. Focus on problem prevention, rather than problem correction, often, by the time the correction is implemented, the opportunity is gone.

This workbook empowers leaders, change agents, and associates through concrete methods, tools, case studies, and projects to facilitate the innovation management process. By taking a more holistic and scientific approach to the innovation process, the return on your innovation initiatives can be greatly multiplied and enhanced.

Introduction

With the advent of the Internet and the Web, and the increasing adoption in the wired world of English as a successor to Latin and Arabic, many of these

DOI: 10.4324/9781003413509-1

age-old logistical constraints have fallen away. Today, it is possible for individuals from around the world to form communities large and small that are able to not only immediately share facts, research, insights, and hard results, but work concurrently on the same projects as well. The benefits of such real-time access to valuable data have encouraged many in the scientific community to become more open in consequence. It has also allowed communities of like-minded individuals to form that could never have reached critical mass in the past when the pool of similarly interested and skilled individuals from which such a community could be formed was limited to those in geographical proximity.

Managing innovation in a disciplined fashion matters because many well-intentioned ideas and their corresponding projects may flounder due to being overly optimistic, poorly conceived, or underdeveloped. Many innovative companies such as Google, Apple, General Electric, and Phillips understand this discipline and have developed a process for managing initiatives that help to make innovation a habit – not just a once-in-a-while occurrence.

Aware of these challenges facing organizations worldwide, the International Organization for Standardization (ISO) published the Standard **ISO 56002:2019 Innovation Management System – Guidance**. It provides an extensive listing of activities and methods that may be used to improve an organization's Innovation Management Systems (IMS). These are sometimes called best practices.

> Definition: Best practice is defined as a set of guidelines that is known to produce good outcomes if followed. Best practices are related to how to carry out a task or configure something. Strict best practice guidelines may be set by a governing body or may be internal to an organization.

The ISO 56002:2019 Innovation Management System – Guidance standard helps provide a way forward for managing innovation in all kinds of organizations, especially in small and medium-sized enterprises (SMEs). Accordingly, innovation is integral to an organization's performance as a key driver of economic transformation, by unleashing their innovation potential which can facilitate a transition to the digital economy.

Our Playbook is designed to enable organizations to grow and be more creative and profitable. Innovation is more than producing the next big idea; it involves the way you implement portfolios of new ideas and how you shape the culture to sustain the creation of those portfolios. Therefore, implementing such a management system can allow organizations to become more innovative and better problem-solvers to achieve more success with their product, service, process, organizational design, and business model innovations.

An innovation culture requires champions, coaches, managers, associates, and business leaders who are ready to adopt new mindsets and new ways of

working. An Innovation Management System (IMS) provides a systematic approach for any organization to address its innovation challenges. It creates a common language, establishes a credible and shared framework, and enhances the importance of innovation management activities.

The structure of the guidance standard for IMS (ISO 56002) covers seven key high-level elements. These elements are the same for all management system standards. By adopting a common format, organizations can benefit from the integration of different management systems for more effective and efficient operations across functional areas. In comparison, quality management standards have resulted in fewer product defects, more loyal customers, increased regulatory compliance, precision and accuracy in laboratory testing, safety in construction, etc.

ISO 56000 series is a set of standard operation procedures designed to provide a general framework for all organizations, regardless of type, sector, or size, toward successful implementation, maintenance, and continual improvement of an innovation management system. The ISO 56000 series lays out a general guideline for all types of innovation, such as products, services, processes, business models, and methods ranging from incremental to radical, as well as all types of approaches, such as internal and open innovation for user-, market-, technology-, and design-driven innovation activities.

Interestingly, ISO 56002 enables the integration of different ISO management systems, such as the ISO 9001 Series of Standards on Quality Management Systems. The objects of innovation management are innovation, innovation knowledge management, and innovation change management processes. One of the most difficult management challenges today is managing change because change requires cooperation and an understanding of the need for change. In most cases, the changes will be minor and with the normal culture within the organization.

> *The only drastic cultural change is the acceptance of failure as being a learning experience. And who would not like to get by when they fail by simply saying, "That was to be expected and I definitely learned something from it."*

Change management impacts will be much less with innovation than it was in the 1990s with a focus on products instead of processes. Knowledge management is the key innovation enabler. Innovation is the end result of innovative activity, intended for commercial implementation in the form of: (1) a process aimed at creating and implementing fundamentally new or improved ideas, techniques, and methods in any area of activity; and (2) objects – fundamentally new or improved products, technologies, services or activities that have a completed type of product, used for the first time and ready for use and distribution on the market. The period of time between the emergence of innovation and its implementation is called the innovation lag.

"So you want to make a million or more. So, let's innovate."

–H. James Harrington

Managing Change and Innovation

Change management (sometimes abbreviated as CM) is a collective term for all approaches to prepare, support, and help individuals, teams, and organizations in making organizational change. Drivers of change may include the ongoing evolution of technology, internal reviews of processes, crisis response, customer demand changes, competitive pressure, acquisitions and mergers, and organizational restructuring. It includes methods that redirect or redefine the use of resources, business processes, budget allocations, or other modes of operation that significantly change a company or organization. Innovation change management (ICM) considers the full organization and what needs to change, while change management may be used solely to refer to how people and teams are affected by such organizational transition. It deals with many different disciplines, from behavioral and social sciences to information technology and business solutions.

At the center point of this modern revolution in managing change is the concept of "openness," as in Open Innovation. While this still-evolving term has come to mean different things in different contexts, at the minimum it recognizes that a greater good can be achieved through the simultaneous or early sharing of "open information" rather than by keeping it secret until formal publication, in the case of research, or perpetually, in the case of source code or other technical information.

Innovation management is an interconnected set of actions aimed at achieving or maintaining the required level of viability and competitiveness of an enterprise using mechanisms for managing innovation processes. Why is innovation important? Because economic and competitive environments frequently change, and organizations should set a long-term plan and develop contingency plans.

Studies conducted on the basis of studying the experience of applying methods of involving personnel in innovative activities, such as quality groups, initiative creative groups, and project groups, have shown that a characteristic feature of a successful innovative approach is a change in the orientation of management efforts from a consumer to a "non-consumer" or "future consumer." Focusing on future consumers will help direct the efforts of managers and employees to find highly effective innovations, the result of which should be an expansion of the range of consumers and the creation of a basis for dominating the markets.

Introduction to Innovation and Open Development

"The race is on. Let us make you the winner."

–H. James Harrington

In much the same way that vendors realized long ago that open standards could help create larger markets faster, platform vendors are now realizing that making their platforms as open as possible can foster the development of a wide range of products and services by independent software vendors (ISVs) to the mutual benefit of all, and most particularly of the platform vendor itself. As a result, even traditionally closed and controlling vendors, such as telecommunications companies, are now competing to open up their (often Linux-based) mobile telephone operating systems in order to encourage ISVs to make the use of mobile phones more interesting and attractive. Already, several major vendors as well as community efforts have been launched, each with a different approach, and with a different member composition.[1]

Julie Sweet, Accenture's CEO, manages half a million employees that generate more than $40 billion in revenues from servicing large organizations in over 120 countries. Looking at this company provides a unique window into what's going on in the world of business. From her unique knowledge database, the major changes going on in the post-pandemic world are as follows:

- "The first is a shift around the value of tech. We are no longer spending time talking about, whether technology is good or bad and the potential risks. Tech became the lifeline for individuals, societies, businesses, and government."
- "The second big shift has been about speed. The most successful economies, countries, and companies are those whose speed is as fast as possible. We are seeing that every day."

These statements reinforce our position that organizations around the world need to focus on generating more innovative offerings whose revenue-generating lifecycle will be shorter and shorter as new innovative offerings replace them. No organization can be content thinking that they are doing enough to keep their offerings viable. It may just be enough to squeak by today but it is going to fall far short of meeting the needs of tomorrow.

We have finally given a name to the common denominator of a life of projects and thinking about projects: meta problem-solving. Meta problem-solving is the set of conscious measures we take to monitor and control our problem-solving efforts. A core premise of this Playbook is that we are powerfully guided by our mental models of the world. These models are purpose and value-driven. They

Figure 1.1 Competing for customers versus growing the market.

are not only powerful organizers of the information available to us, but they are also powerful filters, excluding every input considered extraneous.

Every organization needs to look at what they're doing today to keep their offerings attractive enough to bring back customers and solve their problems, those that have already been serviced, and attract potential new customers. We can no longer survive by only trying to steal customers from our competitors. We need to focus on growing the market and sharing in the Creative Commons rather than competing for larger shares in the present market (see Figure 1.1).

The Role of the Creative Commons

The goal of the Creative Commons is to encourage wider reuse of copyrightable works by providing easy-to-use free legal tools that creators can use to provide such rights, for such purposes, and to such types of users, as they wish. This is accomplished through a series of plain language licenses (now translated into 43 languages) that make it easy for creators to make their work as freely and easily available as they wish.

As explained on the Creative Commons Website: In the words of Thomas Jefferson, "He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine receives light without darkening me." An idea is not diminished when more people use it. Creative Commons aspires to cultivate a commons in which people can feel free to reuse not only ideas, but also words, images, and music without asking permission – because permission has already been granted to everyone.[2]

Generalized mental models, or frames as we call them, are functional things that have problem-solving capabilities like calculation and logic attached to them. They are specifically designed to be manipulated. For all their power, mental models have serious flaws leading to overconfidence and error. The problem-solving principles that we propose in this book can be employed to monitor innovative problem-solving and reduce errors inherent in the problem-solving process.

Human activity has been described as a pandemonium of problem-solving. We are constantly trying to improve our world, or at least maintain and repair it,

so it will function to our liking. These efforts, the thrashing about of seven billion people, interact to create a dynamic kaleidoscope of action and reaction.

Most organizations today focus on getting a bigger percentage of the market but in the future, we are going to see a closer harmony between competing organizations working together to grow the market, rather than competing with each other to grow their market share. Growing the market provides a win-win situation for all organizations, for when you grow your market share someone else is losing his or her market share.

Basic research has become so expensive that it has forced the private industry to break away from basic research and apply its R&D resources to dedicated research. More and more the only ones that can afford to do basic research are universities and the government. One of the most practical ways to allow R&D resources to be redistributed is by reducing the difficulty and the failure rate of new products and services. The failure rate of new innovative product/system endeavors is estimated to run as high as 75%. I realize that from an innovation standpoint, failures are considered learning experiences. We need to learn more from sharing our knowledge with other people rather than depend upon self-learning by failing. There is a new saying:

- One failure – Poor management
- Two failures – Learning experience
- Three failures – Spend your time looking for a new job

What does all this mean? It means you've got to improve your PIC to significantly increase the number of new opportunities that enter your portfolio, as each entity moves through the portfolio much faster and has a higher percentage of successful projects.

> "The best way for you to make your first million dollars next year is by being innovative."
>
> **–H. James Harrington**

Today's Dilemma

- Everyone's talking about it – You can't pick up a magazine, newspaper, business book, or attend a conference without a primary part of it being dedicated to the importance of improving innovation within the country and every business.
- Everyone feels it's necessary – Customers want the newest, brightest, and leading-edge products and services. Companies that are the first to market continuously are the ones that are most profitable and most admired. People stand in line for hours waiting for the latest Apple products to go on sale.

- Every organization wants to do it – There's an old saying, "If you build a better mousetrap, customers will flock to your door." Certainly, all organizations realize that if they are the only leader in their field, they will have a tremendous advantage over their competition. The big "but" is, "How do we do it?" We are coming up with new ideas all the time but what do we stop doing in order to fund the development of the potentially good ideas that may or may not provide value-added return? After all, 75% of the new initiatives fail to produce the promised results. Management wrestles with, "What little I can afford to invest in discretionary spending do I invest in developing new products, improving processes, artificial intelligence, basic research, or in my people? My Board of Directors wants me to do more with less but that can only go so far until all the fat is off the bones.
- But few agree on what it is – When is an organization innovative? I'm ISO 9000 certified by an independent organization that validates our organization as implementing continuous improvement. Does that mean you are already an innovative organization? Who do I want to believe that our organization is innovative? Is it just my customers and my investors? If so, is it primarily product-related? For productivity innovation, does it have to be something that the customer hasn't seen or cannot get from another source?

Addressing the "Unaddressable"

Start out by addressing the issue that is most debated by the leaders who are documenting, teaching, advising, and implementing IMS. It certainly is very obvious that you first need to define what innovation is if you're going to improve your organization's innovation activities.

To help us get our arms around defining innovation, let me define some of the common terms that are frequently associated with the definition of innovation.

- Definition of unique: The Oxford Dictionary defines it as being the only one of its kind; unlike anything else. Particularly remarkable, special, or unusual.
- Definition of value added: Cambridge dictionary defines it as the total output (= value of all the products, services, etc.) in a particular region, economy, etc. after taking away the value of inputs (= materials, labor, etc.):
- To provide the reader with a more innovation-oriented definition of value added, I define it as the following: "Value added is the total combination of positive and negative impacts that a change or a new entity has on an organization and its stakeholders. It includes both tangible and intangible impacts and effects."

- Definition of creative: Being creative is using the ability of individuals to make or think of new things involving the process by which new ideas, stories, products, etc., are created.
- Definition of create: Create is the act of making something: to bring something into existence

There are some words in the English language that are difficult, if not impossible, to get everyone to agree on their definition. Typical examples would be "pretty, quality, and innovation." Scholars have debated for almost, without exception, every book you pick up, and every consultant you talk with has a different definition of "to innovate" is. Definitions run from "any time an individual does anything different, he/she is being innovative" to things such as, "something that is so unique and different than anyone has done before and the stakeholders consider as of value."

Think of something that would have an impact when implemented that is so rare. Innovation occurs when a new and unique idea is developed to the point that it creates positive value added to all of the organization's stakeholders. Others believe that anything that is creative is innovative, while some think that innovation represents only a small percentage of creative thoughts and ideas.

The following are some more typical examples:

1. Innovation is a unique creative idea that is marketable.
2. Innovation is the process of creating a unique idea that is marketed.
3. Innovation is a unique creative idea that adds value to the organization's external customers
4. Innovation is a unique creative idea that adds value to the organization's stakeholders.
5. Innovation is a unique creative idea that generates profit.
6. Innovation is a unique creative idea that when implemented, provides value to the receiver of the output that is greater than the resources required to produce.
7. Innovation is the successful conversion of new concepts and knowledge into new products, services, or processes that deliver new customer value to the marketplace (sourcebook entitled *The Executive Guide to Innovation* published by the American Society for Quality).
8. Innovation is people creating value through the implementation of new, creative, and unique ideas that generate combined measurable added value to the organization's stakeholders. Innovation is how an organization adds value to the stakeholders by implementing creative new ideas.
9. In most dictionaries, **innovation** is commonly defined as the "carrying out of new combinations" that include "the introduction of new goods, … new methods of production, … the opening of new markets, … the conquest of new sources of supply … and the carrying out of a new

organization of any industry" (Source: Wikipedia) Other dictionaries define innovation as the use of a new idea or method.

10. According to ISO Technical Committee WG 2 which wrote 56000 Innovation Management Systems – Fundamentals and Vocabulary Standard: Clause 4.1.1 Innovation is a new or changed entity realizing or redistributing value.

There's an old saying that, "A camel is a horse designed by a committee." This is probably a little true when applied to the 56000 standard's definition of innovation. But its definition is the one that we should be using as it is the agreed-to standard in most major countries around the world from Russia, China, Japan, the United States, to Germany. It's particularly good because it's broad enough to cover most of the definitions although it may include some conditions that specific individual definitions would not classify as being innovative.

The authors prefer to define innovation as "changes that the consumer perceived as advances in the state-of-the-art that are value-added to the stakeholders." After many long conversations with the ISO Technical Committee 279 – Innovation Management Systems studying and analyzing the previously presented definitions of innovation, and research related to a number of papers and conferences we attended, we came up with the following personal definition of innovation (Figure 1.2).

> "Innovation is a new or unique idea or concept that adds value to the organization and its stakeholders. Innovation is the act of taking new, unique, and creative ideas developed and funded, produced, and distributed to external customers that results in creating value to the organization, the consumers and the organization stakeholders.
>
> Authors' Definition of Innovation

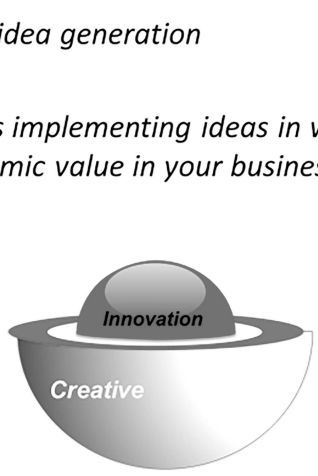


Figure 1.2 Magnitude of creativity versus magnitude of the innovation.

"You can have creativity without innovation. You cannot have innovation without creativity."

–H. James Harrington

Factors Affecting Innovation

There are many factors that need to be considered when you apply the word "innovation" to the activities that go on within an active worldwide environment. Some of them are as follows:

- Does it apply to only the perception of the end-user/general public?
- Does it include continuous improvement that is standard in most entities?
- Do we have to consider negative, as well as positive, impacts on all the organization's stakeholders?
- How does it apply to the entertainment industry (sports, music, art, movies, TV, etc.)?
- How does it apply to not-for-profit organizations?
- How does it apply to the military?
- How does it apply to government offices?
- How does it apply to education?
- How frequently do you have to do something innovative to be considered an innovative organization?
- Is every change within the organization an innovative change? If not, how do we know which ones are not?
- What parts of the business should be focused on to improve the organization's innovation?
- How do we translate intangible gains like reduced cycle time, lives saved, increased customer satisfaction, improved morale, the impact of culture change, etc. into a dollar value that can be considered when you're calculating return on investment?

The Five Types of Innovation

There are five types of innovation based on the output from the project/program. They are as follows:

1. Product Innovation, primarily leads to upgrading and producing a current product so that it has a competitive advantage over the products that will be available. In other cases, it results in the delivery of a new product that is not available at the present time.

2. Process Innovation, which primarily leads to producing a competitive advantage through lower prices, reduced cycle time, improved reliability, or a combination of all three.
3. Sales and Marketing Innovation, which primarily leads to producing a competitive advantage or a marketing mix (target market, distribution, product, price, and promotion).
4. Management Innovation, which primarily leads to producing a competitive advantage through better organizational ways of achieving the organization's goal and/or better use of the organization's resources.
5. Service Innovation, which applies to servicing the customer before and after they have purchased the item, and services to internal organizations. This basically drives improved responsiveness, understanding of the consumer's environment, and improved relationships.

The Three Subcategories of Innovation

For each of these types of innovation, there are three subcategories. They are

- **Breakthrough innovation:** This is when a radical new design and/or approach is created and implemented. It's often referred to as *AHA* innovation
- **Evolutionary or Gradual innovation:** This is when a logical expansion of an existing product, process, or strategy is implemented. It typically does things like making it smaller, making it faster, and adding additional capabilities. This is when many small improvement activities are implemented throughout the organization. This is commonly called "continuous improvement" in product and employee performance. It can be as simple as a janitor finding a new broom that sweeps better, to the project engineer that uses the next generation technology to perform the same or similar function as the present one.
- **Open innovation:** Open Innovation has a long history, a high rate of adoption, and is accompanied by compelling economic figures. It clearly offers a lot of potential to solve important challenges in the context of increased globalization and competitiveness, particularly with regard to advancing research and the application of existing solutions to new areas. However, it is also somewhat fragile and depends on a certain amount of goodwill between stakeholders, a certain degree of fairness in markets, and a certain amount of recourse for injured parties when either goodwill or fairness is found to be lacking.[3]

TRIZ Five Levels of Innovation

> "The greatest danger in times of turbulence is not the turbulence; it is to act with yesterday's logic."
>
> **–Peter Drucker**

Many of our experts argue continuously about whether an activity is a continuous improvement or innovation. Others argue that continuous improvement is part of innovation. In support of the separation of continuous improvement and innovation, ISO 56002:2019 Standard for Innovation Management Systems only specifies that continuous improvement can be applied to the IMS itself. But if you look at it in the broadest sense, any change that adds value to the organization and/or the customer is a form of improvement.

The improvement opportunities can be broken down into five levels. Based upon a massive study of thousands of patents and technology systems, Genrich Altshuller divided the improvement opportunity as follows (see Table 1.1).

Figure 1.3 displays the five levels of improvement in a graphic format (see Figure 1.3).

Table 1.1 The 5 Levels of Improvement

Level 1 – Apparent solutions (Gradual innovation)	= 68.3% of the changes.
Level 2 – Minor improvements (Gradual innovation)	= 27.1% of the changes.
Level 3 – Major improvements (Evolutionary Innovation)	= 04.3% of the changes.
Level 4 – New paradigm (Breakthrough innovation)	= 00.24% of the changes.
Level 5 – Discovery (Breakthrough innovation)	= 00.06%

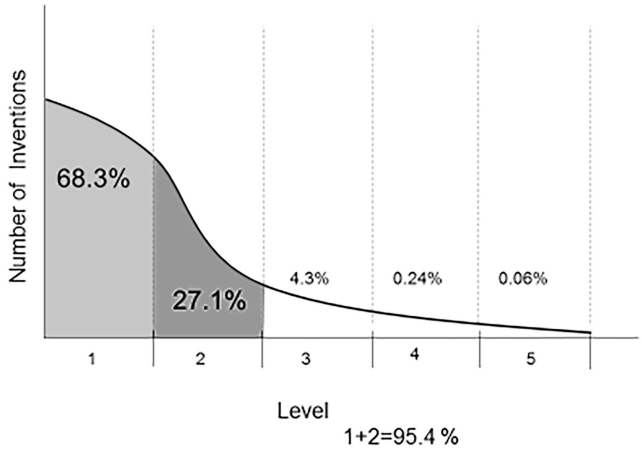


Figure 1.3 Five levels of improvement.

We found this knowledge on the shocking side, but it was very interesting. It indicates that 95% of all ideas that are patentable fall into the evolutionary or gradual changes to our products, processes, and services

- Level 1 – Apparent Solutions:
  Is Apparent Solutions more continuous improvement or is it new and unique so it can be classified as innovative? We would estimate that the 3 Sigma of this population would be classified as continuous improvement, not as innovation.
- Level 2 Minor Improvements:
  What percentage of the Minor Improvements is continuous improvement and what percentage is innovative? Based on looking at a small sample of data, we would estimate that 80 to 85% of the minor improvements are continuous improvement and only 15% could be classified as innovative.
- Level 3 Major Improvements:
  What percent of the Major Improvements is continuous improvement and what percent is innovative? We estimate as little as 20 to 30% are continuous improvement and as much as 70 to 80% are innovative.
- Level 4 New Paradigm:
  What percent of the new paradigms are continuous improvement and what percent is innovative? Here a whopping 95% plus of the patents would be considered innovative and less than 5% of the opportunities would be considered innovative.
- Level 5 Discoveries:
  What percentage of the discoveries are continuous improvement and what percentage is innovation? Again, this ratio is more than 99% for innovative and less than 1% for continuous improvement.

The Doblin Periodic Table of Innovation Elements[4]

Using a list of more than 2,000 successful innovations, including Cirque du Soleil, early IBM mainframes, the Ford Model-T, and many more, the innovators at Doblin applied a proprietary algorithm and determined ten meaningful groupings – the Ten Types of Innovation – that provided insight into innovation (see Figure 1.4).

A Handbook called *The Ten Types of Innovation* explores these insights to diagnose patterns of innovation within industries, identify innovation opportunities, and evaluate how firms are performing against competitors. The framework has proven to be one of the most enduring and useful ways to start thinking about transformation.[5]

#	Innovation Type	Description
1.	Profit Model	How you make money
2.	Network	Connections with others to create value
3.	Structure	Alignment of your talent and assets
4.	Process	Signature of superior methods for doing your work
5.	Product Performance	Distinguishing features and functionality
6.	Product System	Complementary products and services
7.	Service	Support and enhancements that surround your offerings
8.	Channel	How your offerings are delivered to customers and users
9.	Brand	Representation of your offerings and business
10.	Customer Engagement	Distinctive interactions you foster

Innovation Systems Cycle

CREATION

Preparation and Production

Delivery

Figure 1.4 The Doblin 10 types and the innovation systems cycle.

The Doblin method is useful in that it provides details on how you can use these 10 innovation principles to bring about meaningful – and sustainable – growth within your organization. The Ten Types of Innovation concept has influenced thousands of executives and companies around the world since its discovery in 1998. *The Ten Types of Innovation* is the first book explaining how to implement it and is organized into three parts (see Figures 1.5 and 1.6)

Part 1: Four Elements Aligning with the ISC Creation Cycle

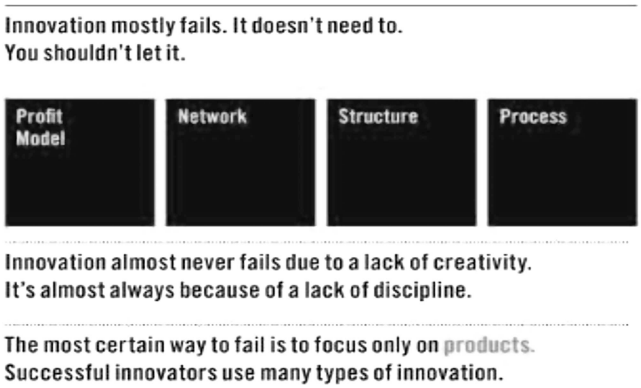


Figure 1.5 Four elements aligning with ISC creation cycle.

Parts 2 and 3: Preparation and Production + Delivery

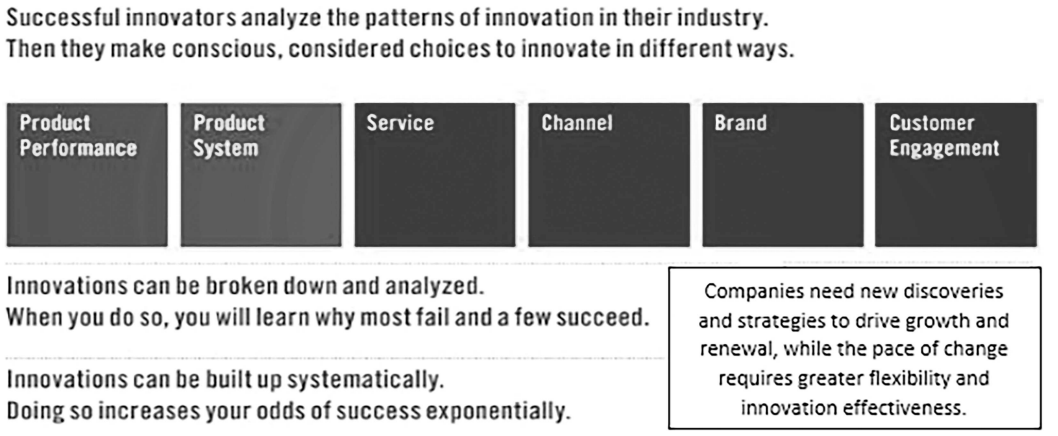


Figure 1.6 Preparation and production.

According to the Doblin framework, previous companies focus solely on product innovation but this type of innovation is copied easily. As a result, rival companies evaluate other businesses' competitive advantages regarding products, and next, copy the innovations. Because of this, Doblin's Innovation Framework identified 10 types of innovation on which businesses should concentrate to remain or become competitive.

Doblin's 10 Types of Innovation can be used to evaluate innovation opportunities that help the business grow sustainably and master the discipline of building breakthroughs. It can additionally be used to assess the firm's performance, and thus, benchmark the business performance with that of rival companies. It can additionally be used to evaluate the industry. For this reason, effectively integrating the framework is going to help the business develop.

It is essential to mention that the type of innovations may differ per industry, by type of culture, or even by the Innovation Strategies employed. It is therefore essential to identify the capabilities of the organization, but more importantly, assess how the capabilities can be used to create new opportunities or make use of new ones. Doblin's 10 Types of Innovation is a helpful framework that helps to identify elements of the business that can be innovated. The framework can help to identify radical and incremental innovations, products, and process innovations, architectural and component innovations, and competence-enhancing and destroying innovation.

Conclusions Related to Types of Innovations[6]

You may not agree with the exact ratio that we are estimating, but it should give you an idea of the magnitude of the continuous improvement initiative's

part of the normal day-to-day continuous improvement activities and innovation for each of the five categories. More important is to point out that approximately 95% of all the improvements that are new and creative fall into the categories of apparent solutions and minor improvements. This would indicate that the innovative system needs to focus on 5% of the total improvements that have made up Levels 3, 4, and 5.

It's also important to point out that these are the types of changes that give an organization a very significant competitive position and reputation. Often a Level 4 change will be the trigger that promotes many of the Level I and 2 changes. Level I and 2 type changes require a much less sophisticated IMS that is less expensive to operate. Most organizations exist by focusing all their improvement activities on Level 1 and 2 types of change, allowing competitive organizations to focus their attention on Levels 3, 4, and 5 types of opportunities.

This greatly reduces their R&D costs and their project failure rates. The disadvantages put them in a following-type mode rather than a leadership role. Most times, they try to make up for this by transferring research and development funding into the sales and marketing campaign.

Common Creativity Innovation Killers

Source: Book entitled *Creativity Toolkit* (McGraw-Hill), page 17

Are you an innovation killer? Do you encourage or repress creative and innovative thoughts? A newly hatched idea is fragile. We need to encourage it, cultivate it, and help it to develop and grow, not casually discard it. The following are 12 commonly used phrases that discourage innovative thinking.

- It won't work.
- It makes me afraid.
- We tried it already.
- That can't be done.
- It will never work here.
- Let's be serious.
- That's ridiculous.
- What's original about that?
- How dumb can you be?
- You obviously don't understand the situation.
- That's a silly idea.
- That's impossible.

> "We can't build a better tomorrow by using yesterday's methods. Businesses that expect to make it in today's global marketplace must begin by tapping the innovative of all employees, not just a few maverick inventors or dynamic CEOs. Competitive advantage today comes from continuous, incremental innovation."
>
> **–Harold R. McAlindon**

Now here are thirteen quick techniques you can use to resist the above-mentioned putdowns and turn on your innovative powers:

- Create innovative mental pictures in your mind and turn these pictures into reality.
- Keep your mind open to new ideas by presenting new experiences to your senses. Be a keen observer of the environment that you come in contact with. Provide the mind with the raw materials that it needs to be creative and innovative.
- Do something creative each day. Set aside a specific time each day to review the creative and innovative things that you accomplished.
- Gather data to prove you were right. Focus your creativity and innovation on simplifying the old and new approaches.
- Maintain a questioning attitude. Remember, there is always a better way and if you don't find it, someone else will and use it as their stepping stone to get ahead of you.
- Don't be afraid to take a risk. You will never fulfill your true potential if you play it safe.
- Record your ideas as soon as you get them. Keep a notepad with you at all times.
- Take time to relax and unwind. Take a long walk or a long hot bath. Play golf or restful music. Try meditation or yoga.
- Don't accept limiting factors as being unchangeable or correct.
- Gain confidence and enthusiasm by first focusing your innovative effort and ideas on things that are within your control to implement.
- Help others to be innovative by pointing out the good points related to their ideas, not the bad points. We already have too many devil's advocates. Be an angel's advocate.
- Find your creative/ innovative time of the day. Some people are morning people. Others are evening people. We all function differently. Sample your emotions and creative/innovative powers to determine when you are the most creative and innovative. Then, set that sacred time aside to work on developing new concepts.
- Start today to improve your creative and innovative processes. It has been said, "Yesterday is history, tomorrow is a mystery. Today is a gift. That's why it's called the present."

"I am a great believer in luck, and I find the harder I work, the more of it I have."

—Stephen Leacock

Your Creative and Innovative Powers

As we begin to review the many techniques you can use to turn on your creative and innovative powers, here are some affirmations about you and others like you that serve as a foundation for our ideas:

- We are confident that you are or can be creative and innovative.
- We are confident that you can improve your creativity and innovation. It has been estimated that Leonardo DaVinci and Thomas Edison used less than 50% of their potential creativity capabilities.
- We are confident that the regular use of the mind expanders defined in this book will improve your innovation.
- We are confident that risks, innovation, and rewards go hand-in-hand.
- We are confident that creativity and innovation will become even more critical to real success in the 21st century than ever before.
- We are confident that creative people get more joy from life.
- We are confident that if you do not use your creative and innovative powers, you will become less capable of using them.
- We are confident that real success goes to creative and innovative people who can implement their ideas and concepts.

"The things that get done are the things that are easy to do and where the rewards are the highest."

–H.J. Harrington

The 10 S's

Successful growing companies have found that the answer to many of their problems is to become more creative and innovative. Of course, that's easier to say than to do. As a result, we have focused on defining the innovation drivers. We started out by focusing on the tried and proven McKinsey 7 S's, which are as follows:

1. Shared vision
2. Strategy
3. Systems
4. Structure
5. Skills
6. Styles
7. Staffing

Now Harrington will admit that he is not a big fan of "McKinsey," but after working over 10 years with Ernst & Young, he got to really know the McKinsey organization, which was his competitor. He admits that McKinsey had some brilliant creative people working for it. When we started comparing these 7S's, which we will refer to as performance drivers, to the activities going on in some of the best-known innovative organizations, we found that all seven were relevant and important performance drivers that must be considered and addressed in establishing an innovative organization.

As we gained more experience in innovation transformation, we found that there were three other performance drivers that needed attention to keep pace with the fast-changing technology environment/competition organizations face today. They are as follows:

- Specialized technology – information technology systems
- Systematic change management
- Strategic knowledge management

Adding these 3S's to McKinsey 7S's makes up a new grouping called 10S's. These are subdivided into hard drivers and soft drivers. Hard drivers are easy to define and the organization can directly influence them. The hard drivers are as follows:

- Strategy
- Structure
- Systems
- Specialized technology

The soft drivers are less tangible and more influenced by culture. Both the soft and hard drivers have a major impact on an organization's performance. The soft drivers are as follows:

- Shared vision
- Styles
- Staff
- Systematic change management
- Strategic knowledge management
- Skills

Knowledge Management as a System

As you will notice, the 10S's foundation is a very holistic view of the total organization and the habit patterns of management and employees. To accommodate this and take advantage of the synergy between each of the 10S's, their output flows into an information hub. This combination of the

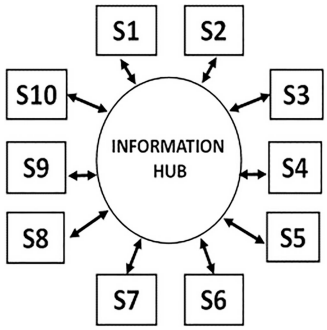


Figure 1.7 Key parts of the knowledge management system.

10 organizational drivers and the information hub makes up a key part of the organization's Knowledge Management System (KMS) (see Figure 1.7).

As we have previously stated, all organizations already have an IMS of some kind in place, but today many individuals and/or organizations are considering or in the process of upgrading it. Obviously, this book is designed to help the individual projects/programs/processes through an already-established IMS.

Unfortunately, the bouquets of flowers are given to the individuals who designed and implemented a new or upgraded system and not to the legion of employees who make the system perform in spite of many problems and bottlenecks. If we were to liken it to a horse race, the system design and implementation were like providing a racetrack with all its hurdles and challenges left in place. The winners are not the individuals who designed and installed the racetrack, it is the jockeys and horses that use the racetrack and compete to win the race. Likewise, you do not win the race by providing the system, you win the race based on how the system is used.

Firms contend with increasingly knowledge-driven competition. Many attempt to meet the challenge by investing in expensive knowledge management systems. However, these are useless for making strategic decisions because they don't distinguish between what's strategically relevant and what isn't. This book focuses on identifying and managing the specific, critical knowledge assets that your firm needs to disrupt your competitors, including the tacit experience of key employees, a deep understanding of customers' needs, valuable patents and copyrights, shared industry practices, and customer- and supplier-generated innovations.

If you are reading this book, you probably are an individual who has been assigned to manage an important project that will have a significant impact on today's survival and tomorrow's bright future. Now the value of the system designed is put to the ultimate evaluation of the designers' and implementers' skill and imagination or the lack thereof. Today's good is not good enough; only our best will stand up and meet the challenges brought about by our international competition.

Introduction to Value-Added or Useful Versus Harmful

There are many approaches to bringing about improvement within the organization. Some work better than others. Some do not work at all. Others are unproven theoretical concepts of the ideal situation. Some of the more popular ones are Six Sigma, Activity-Based Costing, Lean, Automation and Mechanization, Human Resource Management, Suggestion Programs, Design for Manufacturability, Process Redesign, Process Reengineering, Strategic Planning, Knowledge Management, Organizational Change Management ISO 9000, Reverse Engineering, etc.

We have seen examples where each of these has been very effective at adding value to parts of an organization and the same ones that have had a negative impact on the organization's total performance. What are the right ones for you? That all depends on the situation the organization is involved in. Some of the key conditions that drive the selection of improvement methodologies are as follows:

- Type of output you are producing
- The organization's financial conditions
- The type of defects that the organization is experiencing.
- Where the process errors occurred and the frequency of occurrence.
- The skill level that the employees need to produce the output efficiently and effectively.
- The skill level that the producers of the output need to have.
- Changes in the technology that you're using.
- Past history of implementing changes.
- Pressure from interested parties.
- Pressure from the labor union.
- What the competition is doing.
- What the consumer/customer needs are
- What the consumer/customer would like to have.
- What's happening to the stock price
- The type of equipment that the organization has.
- Where the organization's product is on the S-curve.
- Government regulations and changes to regulations.

This list could go on and on as many different conditions impact the type of improvement approach/methodology that will produce the best results for the organization.

The Balance Between Useful and Harmful

In BB1- Providing Value to our Stakeholders, our efforts will be focused on defining the stakeholders for your organization and providing a means to

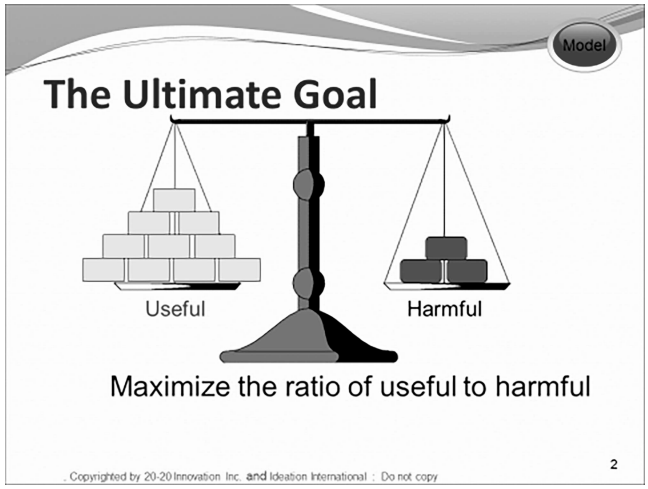


Figure 1.8 The balance between useful and harmful changes.

weigh the importance of each of the stakeholders. We have seen time after time where the side effects of this seemingly excellent solution have a negative impact on value to other stakeholders. The problem that the organization is facing is how to tip the scales in favor of the positive impact (Value-Added or useful changes) compared to the negative impact (Negative Value-Added or harmful changes) (see Figure 1.8).

In Figure 1.8 the useful and harmful changes are of equal weight. In this case, there is no advantage in refining the proposed change unless the useful changes far outweigh the harmful changes. Useful changes that far outweigh the harmful changes are unmined gold. The benefits that the organization gets are only equal to the difference between the useful changes minus the harmful changes.

Unfortunately, the majority of the change initiatives have focused on the useful changes (value added) and spent little time understanding the harmful changes that result from the improvement of an organization's changes.

Newton's third law states that all forces between two objects exist in equal magnitude and opposite direction: if one object A exerts a force F_A on a second object B, then B simultaneously exerts a force F_B on A, and the two forces are equal in magnitude and opposite in direction: $F_A = -F_B$. Simply put – for every positive impact, there is an offsetting negative impact that may be of greater or lesser magnitude.

Theoretically, that sounds like a very fine approach. Unfortunately, there is a big difference between theory and practice. Most organizations talk about providing value-added to the stakeholders. For years it is been all talk and no steak and potatoes put on the table. Most decisions that are made by the Board of Directors and by the executive committee are based upon optimizing return on investment or losing market share. For example: if the organization can outsource a number of machining operations at $2 million less than

when it's done in-house but it would mean laying off 10 workers. In your organization, would the project be dropped or approved to outsource the activity?

In most of the organizations we have worked with it would have been approved without looking at the negative aspects of approving the projects. To put it another way, you care more about making a profit than about your employees and customers? Jim worked 40 years for IBM and at one point in his career "I tried to get the ideas of installing a poor quality cost systems that consider the customer incurred cost when the computer broke down."

At that point in time much of our equipment was rented instead of owned by the customer. To me, it was obvious that we should consider the cost to the customer whenever the computer was not functioning as a result of an IBM problem.

In our analysis, we suggested that the rental rate per hour became part of the equation. The best I could get our executive team to agree on was one dollar for customer inconvenience for each time the computer broke down.

Another example is my son and I worked six hours to get a defective alternator out of his car and put in a new one that didn't work (12 hours of lost work time). We had already spent an hour and ½ going down to the Ford garage and picking up a new alternator (three hours of work time lost). A second trip to the Ford garage to return the defective alternator took an additional three hours. It took an additional 3 hours working together to install the new alternator. That's a total of over 20 hours due to the first alternator being defective. That's half a week's work at $1500 per week, and that consumer incurred an additional cost of $750. That does not include the cost of traveling to the Ford garage to take back the defective alternator. In addition, the car was out of service for an extra two days. It makes a big difference when you include customer-incurred costs into your model.

Likewise, when the individual is laid off, the value added to the stakeholders is negative in almost every case. It isn't just the one-off cost to the individual, it includes things like mortgage payments, car payments, schooling for children, taxes, time and expenses related to finding a new job, etc. You can be sure it is much more than the loss of salary as it can lead to losing her home, canceling of her children's education, interest paid in credit card debt, using up all the family savings, etc. The only way it could be value-added is if you rated the savings to their investors 500% to 1000% more than your other stakeholders. The average value-added from the customer's standpoint increases if are able to reduce their purchase costs without impacting performance.

Orientation of Innovation Management to Future Consumers

The focus and results of the problem-solving change process in companies are diverse. These are products and services improved thanks to the initiative and

creativity of the staff, introduced technological and technical innovation changes, and implemented organizational changes in the form of existing or changed procedures and standards, etc. The activities of initiative creative groups do not always end optimally, and this was also seen during the examination. But in general, there is always a tangible presence of the results of their activities.

For the successful activity of creative groups, the company must have innovative management, which can be based on the principle of orientation towards "non-consumer," the principle of orientation towards future consumers in addition to the fundamental principle of orientation towards the consumer, adopted in regular management. Innovation control, built on the principles of focusing on future consumers, should offer them (future consumers) something fundamentally new rather than just the list of products and services available in the company.

There are many examples of products that at one time became innovative while offering the automation of some kind of manual operation. Many of these products have a very narrow scope, but at the same time, they confidently take their share of the budget of interested buyers. For example, not everyone needs such devices as a paper shredder or bill counter. And before they appeared, the same problem was solved differently. But for a true target audience, their value is beyond doubt – and they willingly pay for it.

This approach can be used as the basis for the formation of innovative management, which does not conflict with the regular and strategic management of the company but complements them in a fundamental way. Thus, the solution to the problem of creating an environment for permanent existence and development of initiative creative groups is transferred to the plane of creating an environment for innovative management focused on the future consumer. The border "consumer – non-consumer" or "consumer – future consumer" should be used in this case as a transparent border of the areas of application of regular and innovative management of the company.

The authors focus special attention on the customers they lose because they get the best information from these losses. And if they finally win back two out of five lost customers along with three to five new customers those lost customers they shared the experience with, it was well worth the special effort.

The Rebirth of the Citizen-Scientist

In the recent decade, the term "citizen science" has emerged to define public involvement in genuine research projects. Synonym labels such as "crowd-sourced science," or "networked science" actually represent a new make-up for an old idea: back in 1982, science theoretician Feyerabend advocated the "democratization of science." Going some more decades backward in time, Thomas Jefferson used to envision weather stations operated by volunteers as a means for people to be informed and educated, thus engaging in self-

governance, a dynamic that is currently happening for real. This Jeffersonian idea illustrates one of the basic and most crucial issues with science as it is currently performed (i.e., through research within official institutions): its isolation. Contrastingly, citizen science operates – by design – free of the constraints inherent to such strongly formalized places.[7]

Citizen science thus not only relocates science but also fosters its growth in the mainstream of society. Non-professionals join professionals, thus co-creating knowledge that makes science an integral part of our daily lives and shared human culture. Citizen science is in its infancy, yet its popularity grows exponentially as the concept is modular enough to reach the humanities and social sciences (HSS), generally overlooked by both professionals from the so-called "hard" sciences, and citizens.[8]

EXERCISE ACTIVITY 1.1: STARTING AN INNOVATION CHANGE INITIATIVE WITH THE "FISHBOWL DISCUSSION"

This is the first of four innovation-based change management exercises which is designed as an ice-breaking activity that encourages employees to understand and embrace an organization's change. It provides an opportunity to communicate about the problem, opportunity, or change, gauge the underlying objectives, and understand the organizational benefits of getting on board early on. These exercises and activities will boost your employees' morale and help them see eye-to-eye on the company's vision. Change management exercises will allow you to anticipate future concerns, thereby reducing nervous energy and the organization's resistance to change.

No one likes decisions to be made for them. It's only human to want to be involved in the decision-making process. Similarly, when you allow a select few to make decisions that impact a larger group of stakeholders, you will often face resistance. A fishbowl discussion is perfect for situations such as these.

Objective of Fishbowl Discussions:

A fishbowl discussion aims to include a wide range of stakeholders to create inclusive decision-making processes by opening up a transparent communication channel. It is a roundtable discussion of prime stakeholders with a larger group of stakeholders witnessing it. This discussion format allows everyone to provide their individual input and experiences and allows them to question the key project owners.

Process:

- Set up the discussion by creating a roundtable with eight chairs – keep two chairs vacant at all times, allowing six participants to discuss. The remaining participants should be observers standing behind the roundtable.

- The moderator should initiate this change management exercise by giving a brief presentation about the topic and rules. Any two participants should take notes to compile later for review.
- Request any six participants to discuss the change at hand.
- In case of any interruptions or questions, request the observer to take a vacant chair and present their view.
- If there are no breaks or questions, the moderator should then ask the observers for their feedback.
- With 10 minutes left, stop the discussion and use the remaining time for reflections and final thoughts from participants and observers.
- You can use variations of this exercise by introducing role-play scenarios or swapping the initial participants with observers.

End of exercise

The Eight Fundamental Principles of Innovation Management

The ISO 56000 series provides a set of innovative management principles that the IMS is based upon. We look at principles as being things you cannot compromise. If you do, you will be immediately separated from the company. We like the word "beliefs," which indicates it's the things that we think are important, but can be compromised based on the situation. We believe you should be honest, yet you don't tell the new mother that her baby is ugly. You should select the word that best fits the culture of your organization and how it is used in your operating procedures for other concepts.

The application of the first principle focuses on conducting the organization's operations today and in the future. If a statement only applies to the future it is not a principle, it's a goal or objective because it is a requirement for future activities. It requires changes in the present operating conditions and relationships in order to make a targeted transformation schedule. They become a major driver of all strategic planning objectives and activities.

Obviously, the already mentioned principle of **focusing on future consumers can become the first principle** of innovation change management. This principle means that the future revenues of the organization depend on the trend of distribution of disposable income of future consumers and the company's efforts to include products and services in the sphere of interest of future consumers. Applying the principle of focusing on future consumers will allow the organization to actively shape the future needs of consumers, to become an active company that forms new markets and consumer products.

Don't get so excited about getting something for the future customer that generates many applications that are never transformed into revenue. If you

do, you can quickly use up all your financial resources, which could easily drive your organization into bankruptcy. We have seen examples of new startups of small and midsize organizations that did exactly that with the aid of citizen science.[9]

I know one man who resigned from Ernst & Young because he had a software product developed to the point that it was an important improvement tool directly related to the process redesign methodology. That was 18 years ago, he is still working on it, adding new features to the product. He has never quite gotten everything he would like in operating so that he can offer it for sale. The major driving priority in an organization has to be on the present, because if you don't have a present, then you won't have a future.

"You can't pay today's bills with money that's going to come from future customers." And you can quote HJ Harrington on that. I learned that lesson the hard way. "For the next three months, there was a lot of money coming in that was contracted for, but no money to pay the people that were going to do the work."

The second principle of innovation change management can be the principle of **leadership**. This principle means that the leaders of an innovative company must be able to determine the future purpose of the company, develop an innovation strategy, and achieve the implementation of innovative change management plans for the company's development.

The third principle of innovative management can be the principle of **involving employees in innovative processes**. It can be argued that innovative employees have their own means of production, which are their knowledge, experience, and skills to realize their abilities, and therefore they are much more independent from the company than their colleagues who do not take part in innovative activities. Accordingly, it is necessary to transform the principle of employee involvement into a change management principle of partnership with employees. This means that all employees of the company are given the right to think outside the box and take non-standard actions, so that employees become equal partners of the company, and maximize and realize their own abilities.

The fourth principle of innovation change management can be the principle of **approach as a project**. Future consumers are not yet the company's customers, so they cannot be interested in existing processes aimed at customer satisfaction, but they can count on the completion of innovative projects, which, if successful, give them (future consumers) the opportunity to become existing consumers of the company's products and services. Project management is the most acceptable type of management to achieve the end result of innovative activities, to ensure the concentration of the necessary resources for this, and to ensure the effective achievement of the set end results.

The fifth principle of innovation change management remains the principle of a **systems approach to management**, which, in accordance with the analogous principle of quality management, means that the definition,

understanding, and management of a system of interrelated processes and projects in accordance with the established goal contributes to the continuous development of the organization. A systematic approach to management creates the foundations for the formation of trust of future consumers and their involvement in the circle of real consumers.

The sixth principle of innovation change management can be the principle of **continuous innovation**, in addition to the corresponding principle of continuous improvement applied in quality management. Future consumers are not yet a client of the company, so they are not interested in continuous product, service, and process improvements that are not currently targeted at them. At the same time, they cannot remain indifferent to continuous innovations, since successfully implemented projects can make them loyal customers of the company.

The seventh principle of innovation change management can be the principle of **searching for unrealized opportunities**, in addition to the principle of decision-making based on facts. The conquest of future consumers cannot be based on facts alone. In innovative activities, it is necessary to rely on forecasts, assumptions, hypotheses, and other sometimes unreliable data. Innovative companies are more likely to create a new reality and corresponding new facts of the emergence of fundamentally new products and services that were previously not in demand by anyone, rather than using only existing reliable verified data and facts. Innovative companies are active "hunters" for unrealized opportunities. At the same time, it should be noted that the reliability of forecasts, assumptions, and other data should not be overridden; the more reliable the assumptions, the more accurately the product or service is formed for future consumers.

Finally, **the eighth principle** of innovation change management can be the principle of **strategic partnerships**, in expanding the principle of mutually beneficial relationships with suppliers used in quality management. Strategic partnership broadly interprets relationships, not only with suppliers but also with counterparties, other partners, and other companies and non-profit organizations interested in the final results of innovation. Capturing future consumers is a very ambitious task for one, even a very developed innovative company. This type of activity requires alliances, strategic alliances, associations, partners in standardization and certification, etc. New products and services can take their rightful place among the existing variety of goods only on the basis of joint activities of companies from various industries and sectors service.

Application of the proposed principles of innovation management will allow the creation of a management system focused on future consumers. In turn, this will lead to significantly better business results since the involvement of future consumers ensures the growth of the company's income, the rise of its potential, the development of the approaches used, a change for the better in the resource allocation system, the growth of personnel motivation and other strengths.

EXERCISE ACTIVITY 1.2: SWITCH PLACES TO GAIN NEW PERSPECTIVES

Gaining a new perspective often reduces resistance. The switch places exercise is the simplest change management exercise; you can try this with your team members to provide a different perspective and gain more understanding of other team members' viewpoints.

Objectives of the Switch Places Exercise:

This change management exercise encourages your team members to leave their comfort zones and explore a new perspective. By continuously changing places, people realize that change is a continuous process. Every time they gain a new perspective, they learn something new, which will boost their performance in the long run. Here is the process:

- Have your team members sit in a circle
- Place an object in the center of the circle
- At regular intervals – every few minutes or so – ask them to switch places and observe the object again for a minute. Note that some people might resist changing seats.
- Start a discussion amongst the participants as to what changed and how they will describe the object now that they have multiple perspectives.

End of exercise

Seek Understanding through Exploration stresses the importance of fully comprehending a problem before committing to any aspects of a solution. Problems have a structure that needs to be discovered and explored. We cannot know in advance where the hard parts of a problem are hiding or where we might find the opportunities for great solutions. Problem-solving itself has a structure that likewise must be mapped out before early steps commit us to the wrong path.

To explore a problem, we must be able to hold it up to the light and view it from different angles to form multiple representations, much as an architect looks at a building design in plan, elevation, and perspective. Our mental models can impede this kind of multifaceted exploration.

As rapidly as we frame a new situation, it is hard work to put that frame aside in favor of another, and then another.

Once a frame takes hold, it rapidly grows roots as it becomes our reality. Problem exploration requires the discipline and the imagination to move from one aspect of a problem or opportunity to another, from one perspective to another, to discover the pitfalls and possibilities.

Ensuring a Balance of Routine and Innovative Management

The company cannot apply only innovative approaches and innovative principles to its activities. For a sustainable existence, a company must serve its existing customers using a regular management approach to its problem-solving efforts.[10] Accordingly, a balance must be struck between innovative and regular management. Earlier it was shown how the priority development of regular management leads to a halt or slowdown of innovative projects in companies. At the same time, it is possible to demonstrate the opposite effect, when an excessive enthusiasm for innovations leads to dissatisfaction with existing consumers, which can end up for the company with their loss and all the resulting problems.

Strategic management can ensure the necessary balance of regular processes and innovative projects in a company, which allows the development of strategies and corresponding goals and objectives, both to ensure the growth of satisfaction of real consumers and to attract future consumers. For this, it is useful to divide the company's development strategy into two parts. The first part is an improvement strategy aimed at increasing the satisfaction of existing customers.

Growing customer satisfaction allows you to attract future customers by increasing the loyalty of existing customers, which contributes to the formation of their desire to recommend the company's products and services to other customers. The second part of the strategy is an innovation strategy aimed at identifying innovative projects and determining ways to implement them, which ultimately leads to attracting future consumers by offering them fundamentally new products and services (innovation should be pulled by strategy from the lowest levels of the organization, and not cut through the asphalt).

Improvement strategies and innovation strategies allow you to find answers to various questions about the future of the company and the future of its products and services, and their examples are given in Table 1.2. An improvement strategy is a strategy to improve what exists at the moment. At the same time, there may be an executable innovation strategy to better engage future consumers – a strategy to create something that does not yet exist.

A balanced change management strategy and an innovation strategy will allow the company to properly allocate resources to build upon the loyalty of existing customers and attract future customers. In addition, the strategies should be related to each other, they should provide for serving future customers by means of evolving regular management after their involvement in the circle of customers. Thus, the innovation strategy should also include organizational changes regarding the development of regular management. Then the involved future consumers will remain loyal customers of the innovative company for a long time or forever.

A company that has chosen the path of innovation development always thinks about the direction in which it should develop, which future consumers should be attracted, where and how to look for new directions of development that will change and expand the business, making it more attractive for all stakeholders.

Here it is impossible to offer unambiguous solutions since the strategy and tactics of innovation provide for movement towards something that does not yet exist. However, this does not mean that it is impossible to determine possible directions using well-known methods of invention and methods of intuitive thinking, scenario planning technologies, and other similar methods. The key is that people who plan and implement innovations have an unwavering commitment to making a difference in people's lives. An innovative company should have a project management mechanism. An innovative company should be able to form strategic alliances with partners, including using mechanisms such as standardization, membership in associations, and other voluntary associations, as well as using voluntary certification mechanisms. In any case, an innovative company should not adhere to the practice of isolationism. Finally, an innovative company should learn to boldly face the future, which is perhaps the most difficult step in the proposed scheme for developing and implementing an innovation ecosystem that is guided by change management principles.

EXERCISE ACTIVITY 1.3: USING THE RACI MATRIX FOR ALIGNING THE INNOVATION CHANGE MANAGEMENT ACTORS

There is a strong chance of your change initiatives failing if your team isn't clear on their roles in the change management process. You can lean towards the RACI matrix to provide the clarity you want.

Objectives:

A RACI Matrix represents a set of activities mapped against the *responsible, accountable, consulted, and informed* framework for stakeholders. This activity prevents any conflict or confusion that can arise in the team. This is the process:

- Identify all the tasks involved in the project and list them vertically.
- Identify all the project stakeholders and list them horizontally on the top.
- Fill in all the cells by assigning each with responsible, accountable, consulted, and informed.
- Ensure that all tasks have only one person accountable and there isn't any conflict.

Refer to the RACI matrix below for a better understanding of the exercise.

Table 1.2 Raci Matrix

Step	Project Initiation	Project Executive	Project Manager	Business Analyst	Technical Architect	Application Developers
1	Task 1	C	A/R	C	I	I
2	Task 2	A	I	R	C	I
3	Task 3	A	I	R	C	I
4	Task 4	C	A	I	R	I

CIO/IDG

End of exercise

Barriers to Innovation Change Management

To keep pace with a changing world, businesses are continuously going through multiple organizational changes to outperform their competitors and innovate, with the goal of improving productivity and driving revenue. While there is an increase in change volumes and complexities, it is estimated that only one in three innovation change management initiatives are a success.

Why are these change initiatives failing? Organizations often tend to fail to account for the people side of change management.[11] It's important to humanize change. Organizations tend to underestimate the power dynamics within their org, contextual considerations, and downplay their employees' resistance to change. They simply address change management with a top-to-bottom approach, forgetting that change imposition is often met with pushback.

To decrease this pushback, leaders should conduct a baseline assessment to identify the barriers to change and address them for a successful change initiative. Although the barriers to change might be different for every organization, we have identified the top 7 barriers to change leading to the failure of the change initiative.

1. **Lack of Clarity**
   Change is often difficult if you lack a clear vision. If you are unaware of the current state of your organization, you will not be able to bring it to a desired future state. If you are unclear of the vision, the drivers of change and the implementers will lack clarity as well. It will derail the entire initiative.

If you come prepared with a clear project scope and a compelling narrative, it will lead to a smoother transition. You must address the preliminary questions such as:

- Why is the change needed?
- How will it affect our current state?
- How do you expect to get there?

2. Ineffective Change Communication

Change management communication dwindles down the ladder. Statistically, only 68% of managers know the actual reason for organizational change. This number further declines from 53% to 40% for mid-level managers and frontline supervisors. Gartner suggests that due to poor change communication, 73% of employees experience moderate to high levels of stress, and the affected employees perform 5% less than an average employee.

Instead of announcing the changes and expecting employees to adjust, try working on an effective communication strategy.

3. Strategic Shortcomings

As a leader consider this: Is your strategy detailed enough to serve as a helpful guide throughout the transition? Effective change management strategy decides the outcome of any change initiative. A holistic change management approach should address the following key aspects:

- the need for change
- resources for change management
- risks associated with the change
- realistic timelines
- training & support
- measurable KPIs
- feedback

4. Change Resistant Culture

The longer a current process has been in the organization, the more invested employees are in it. The status quo always feels comfortable creating a lot of inertia in the organization. During change implementation, other cultural issues like internal politics, poor behavior control, and personal agendas start surfacing, which contribute to a change-resistant culture.

To overcome this barrier, change leaders should clearly map the stakeholders impacted by the change. They should focus on individual transition as well as on making the environment conducive for effective problem-solving change. Innovative problem-solving is grounded in our ability to predict the behavior of the world around us and the consequences of the actions we contemplate. The human mind is designed to make continuous predictions of future events.

5. **Lack of Organizational Buy-In**
   It is rightly said, *"Change starts at the top but happens at the bottom."* For a successful change initiative, you need to earn buy-in from both top management and entry-level employees. The top management buy-in is essential to add legitimacy to the change initiative. Their job is more than just sponsoring the initiative, but to actually take the onus of the change and lead by example. However, the mid-level and entry-level employees need to be on board to implement the change at the ground level.

6. **Change Fatigue**
   More often than not, organizations have multiple change projects in the implementation stage at one time. When change occurs in an organization simultaneously, it overwhelms the employees. This results in change fatigue.[12]

   Change fatigue manifests in burnout, apathy, and frustration – all of which result in lower employee engagement and productivity. Prioritization of change management is the key to dealing with this barrier to change.

7. **Lack of Governance**
   Investment in change is expensive, and this barrier to change can be costly to your organization. For any transformational change; you need to have a clear line of sight governance to manage the change from both a micro and macro level.

Innovative Change Management Introduction (ICM)

Table 1.3 is a list of the Emergent ICM Tools. These are tools and exercises that are designed to aid the interviewed individual or team in solving problems and being more creative related to their work assignment. They are also designed to stimulate sleeping brain cells so that they are more creative.

Now we will admit that the list in Table 1.3 is a little overwhelming. But don't worry about being able to use all of these. We don't know anyone who is using the total list of tools in their ICM activities. The authors have personally used approximately 25 of the tools listed when working with clients. The typical change agent within an organization can get by knowing only 15 of the tools. Of course, the more ICM tools that your change agent is familiar with, the better he/she can customize an ICM project to meet the specific needs of the organization's specific project.

There is a list of mind-expanding tools and exercises that are designed to stimulate sleeping brain cells so that they are more creative in Appendix C. The brain is a muscle and needs to be exercised on a regular schedule very much like you exercise the other muscles in your body. These mind expanders are designed to provide you with an exercise program for your mind designed to make you more creative and innovative.

Table 1.3 ICM Toolkit

- 4S Realignment
- 7S Analysis
- Action Plan
- Align Systems & Structures: Phase Diagnostic
- Behavior Targeting
- Case for Change
- Change Assessment
- Change Impact Mapping
- Change Leader Assessment
- Change Management Overview Presentation
- Communication Action Plan
- Communication Strategy
- Communications Campaign Planner
- Control-Influence Analysis
- Create Urgency: Phase Diagnostic
- Current-Future State Analysis
- Elevator Pitch
- Engage the Stakeholders: Phase Diagnostic
- Event Planning Template
- Executive Sponsorship Assessment
- Focus Group Process
- Force Field Analysis
- In Frame/Out of Frame
- Influencing Strategies
- Is/Is Not
- Keeping Up the Pressure
- Key Stakeholders Map
- Lead the Change: Phase Diagnostic
- Manager Enrollment Plan
- Measurement Audit
- Measurement-Reward Cycle
- Need-Vulnerability Assessment
- Past Experience Profile
- Phases of Transition Model
- Plan the Change: Phase Diagnostic
- Progress Review
- Project-Change Leadership Matrix
- RACI
- Resistance Profiler
- Reverse Imaging
- Scoping Questions
- Self-Assessment of Personal Change Agility
- SIPOC

Different Approaches to ICM

Different organizations have restructured and organized these tools and their activities in unique ways to create their own special methodologies. The following is a list of 12 organizations that specialize in the Innovative Change Management (ICM) methodology along with the name of the methodology the individual organizations use. Don't be fooled, just because the change in their methodology is different does not mean that the content within the methodology is different.

1. The Universal Change Activation Toolkit
2. ADKAR Model for Change Management
3. AIM (Accelerating Implementation Methodology)
4. Beckhard and Harris Change Management Process
5. Boston Consulting Group (BCG) Change Delta
6. Bridges Leading Transition Model for Change
7. Harrington Voehl Sustainable Change Model
8. GE's Change Acceleration Process (CAP)
9. John Kotter Eight Step Model for Change
10. McKinsey 7S Change Model
11. Kurt Lewin's Three-Stage Change Model
12. People-Centered Implementation (PCI) Mode

Five Types of Change Assessment

We suggest using five types of change assessments to measure performance levels. They are as follows:

1. Innovation Maturity Analysis
2. Change History Analysis
3. Employee Opinion Survey
4. Customer Focus Groups
5. Is/Should Be Analysis

Assessment 1. Innovation Maturity Analysis

This is an analysis of the five Major Innovation Areas in a typical organization. They are as follows:

A. Management.
B. Product
C. Processes
D. Sales and marketing
E. Support

For each of these five Major Innovation Areas, enough items need to be evaluated so that a minimum of 7 of the 10 Innovation Drivers (10S) are used to measure the performance level (see Table 1.4).

Management is responsible for determining how the resources within the organization will be utilized. Getting a proper picture of the AS/IS situation is absolutely critical to make meaningful decisions. Management should be sure that the open-data information used to make a decision reflects the reality as seen by the executive team, Board of Directors, middle management, line management, employees, and current and potential customers. It must be sure

Table 1.4 Ten Innovation Drivers (10S)

1. Shared vision
2. Strategy
3. Systems
4. Structure
5. Skills
6. Styles/Personality
7. Staffing
8. Systematic Change Management
9. Specialized Technology/Information Technology Systems
10. Situated Knowledge Management

that the assessment covers the proper considerations and that the open data that the assessment team presents is accurate as reported.[13]

EXERCISE ACTIVITY 1.4: USING THE 4 PS OF INNOVATION CHANGE MANAGEMENT

This is a short warmup exercise to help determine how to visualize successful change implementation and how it depends on whether or not your team can see the bigger picture. Set proper expectations at the inception of the project by highlighting the four P's – Project, Purpose, Particulars, and People.

Objectives of the Four P's:

This activity makes your team ready to adopt change by allowing them to explore the new procedure; the why and how of the change management process. This exercise encourages you to overcome potential barriers to innovation change management previously outlined by working in anticipation of future concerns.

Process:

- Create four columns on a whiteboard – one for each of the four P's.
- Divide participants into teams and ask them to provide inputs for the following:
  - **Project:** State the change you have in mind.
  - **Purpose:** What do you aim to achieve via this change?
  - **Particulars:** What are the change enablers for this process? Discuss the tools, training, and strategy for this change implementation.
  - **People:** Identify the impacted stakeholders and how their roles will change.
- Help them see the importance of your change initiative and how it will help them achieve their set goals.

Why Businesses Should Care About ISO 56000

So how did ISO 56000 come about? Potentially, in the next 10 years, there may be more innovation than in the last 100. So, there is a great world ahead of us. This is encapsulated in the ISO 56000 series of standards. ISO 56000 makes businesses think harder about innovation management – how they manage intellectual property, how they curate knowledge and insights, and how they manage ideas. This isn't just good for their business, but the whole innovation management space.

With ISO 56000, startups, scale-ups, and multinational corporations will rethink how they manage innovation partnerships. They will also manage the methods they use for achieving success in innovation, and learn how to provide training on innovation management while discovering why they need to carry out assessments.

These standards might be complex, but they are not unnecessary. Over 80% percent of executives say their future success is very or extremely dependent on open innovation, while 95% of all product innovations fail.[14] Now, after decades, there's an internationally recognized set of innovation management standards for organizations in various verticals. As mentioned before, this ties into ISO 9000, the international standard that defines the frameworks for a quality management system (QMS). Ludwig points out that more than 1 million organizations worldwide have an IS0 9000 certification, which makes it one of the most widely used management tools in the world today.

ISO 9001 and ISO 56000 are really similar in the sense that both aim to realize value for the interested parties and, as such, are vital to the success of an organization. They are interdependent and connected in the sense that an organization may need to innovate to improve quality and, at the same time, ensure the quality of its innovation processes. In other words, ISO 56000 complements ISO 9001 by creating a complete framework for achieving sustained and long-term success for all organizations.

The ISO 56000 series of standards is continuously evolving but, as of now, it looks like this:

- ISO 56000 covers innovation management fundamentals and vocabulary.
- ISO 56002 covers innovation management systems and incorporates material from previous methodologies.
- ISO 56003:2019 and ISO 56004:2019 are guidance documents on innovation management (tools and methods for innovation partnerships) and innovation management assessment, respectively.
- ISO 56003 covers various topics, such as how startups collaborate with large organizations, innovation partnerships, and considerations for charities and public organizations.
- ISO 56004 also covers various topics, such as innovation management assessment and methods for innovation success.

- ISO 56005 covers intellectual property management (IPM).
- ISO 56006:2021 covers strategic Intelligence management and will be published by September 2011.
- ISO 56007:2023 covers idea management and will be published by the middle of 2022.
- ISO/DIS 56008 under development covers the tools and methods for innovation operation measurements (Est 12/22).
- ISO ISO/TS:2023 will cover a basic Layman's Guide to IMS, with case studies and examples, and is presently under development and estimated for a 2022 release.

How Does ISO 56000 Help Businesses?

ISO 56000 is like the Bill of Rights & Constitution for innovation management, with all the needed information business leaders desire to create a system of record for innovation in their organizations. According to many innovation experts, in order to achieve their innovation management goals, businesses need to analyze their core capabilities in the following core areas:

- Vision & Strategies: How do tasks align with a company's innovation objectives? Will projects support and nurture creative ideas? Some organizations may need to have a clear and concise strategy for new and fresh ideas for innovation management.
- Innovation Culture: How does innovation play a role in the day-to-day running of a business? Is it part of an organization's culture? Or just an afterthought?
- Innovation Processes: Companies need to repeatedly evaluate their success in order to grow their innovation management strategies. Innovation shouldn't just be nurtured at the brainstorming stage but throughout design, development, creation, delivery, and benefits realization. Most projects are not innovative unless they result in a net value to stakeholders.
- Innovation Portfolios: Companies need to repeatedly evaluate their success in terms of innovation portfolios in order to grow their innovation management strategies.
- Tools and Techniques: Companies also need to use the right innovation science tools and techniques (and best practices) when managing innovation.
- Metrics: How will organizations measure and track their innovation management strategies? Which KPIs will they use? What insights will they generate?

The Taylor and Francis "Managing for Results" Innovation Library and ISO 56000 create a single source of information for innovation management and help organizations realize their innovation goals. However, as with other methodologies, libraries and standards organizations need to take a proactive approach and find solutions that execute and automate their innovation strategies, whether that's administration, tracking, management, or reporting forever. If it is a day old, today is old. There could be something new out there. In today's fast-moving environment, creative ideas are coming out every hour. Your best survival tool is a great knowledge management system. Current knowledge is a gateway to future success.

> Definition of work breakdown structure: A work breakdown structure (WBS) is a visual, hierarchical and deliverable-oriented deconstruction of a project. It is a helpful diagram for project managers because it allows them to break down their project scope and visualize all the tasks required to complete their projects.

All the steps of project work are outlined in the work breakdown structure chart, which makes it an essential project planning tool. The final project deliverable, as well as the tasks and work packages associated with it rest on top of the WBS diagram, and the WBS levels below subdivide the project scope to indicate the tasks, deliverables, and work packages that are needed to complete the project from start to finish.

Looking at your innovation breakdown structure will ultimately help you understand the types of innovation areas you want to pursue, and having a balanced portfolio of innovation makes sure you get a good return on your investment. Also, note that the following innovation management principles were developed to capture the essence of effective management of innovation activities. They can be used as an introduction to understanding the innovation management system or as a tool for assessing the innovation management capabilities of an organization.

EXERCISE ACTIVITY 1.5: LET'S FORM A NEW ENTERPRISE

The innovation management activity begins with the identification and communication of the root need for the change. This change management exercise helps us with just that.

More often than not, employees fail to understand the perspective of top-level management and the reason behind introducing a change. As an innovation change management practitioner, you can provide exposure to the same reasons by allowing them to think like their manager. This allows them to see the importance of being flexible and agile throughout the innovation change management process.

Process:

- Ask your participants to form teams and come up with a unique business idea to form a new company.
- Ask them to imitate all the core departments of their company and come up with strategies for each of these departments. Have them prepare a quick presentation for each of these core business areas.
- Shuffle the team members and ask them to prepare a new presentation by incorporating the feedback of their new members.
- Repeat this process a few times and then vote for the best presentation.
- Open a discussion on how teams were able to adapt to change (See Figure 1.9).

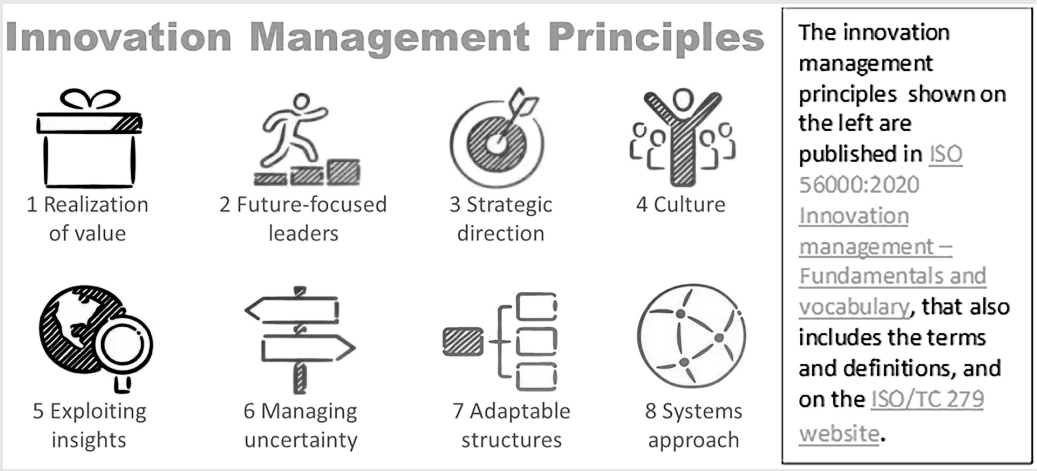


Figure 1.9 The innovation management principles.

End of the exercise

The eight principles shown above are part of the high-level structure contained in the ISO 56000 standards.

1. Realization of value
   Value (financial or non-financial) is realized from the deployment, adoption, and impact of new or changed solutions for interested parties.

2. Future-focused leaders
   Leaders at all levels, driven by curiosity and courage, challenge the status quo by building an inspiring vision and purpose and by continuously engaging people to achieve those aims.

3. Strategic direction
   The direction for innovation activities is based on aligned and shared objectives and a relevant ambition level, supported by the necessary people and other resources.

4. Culture
   Shared values, beliefs, and behaviors, supporting openness to change, risk-taking and collaboration enable the coexistence of creativity and effective execution.

5. Exploiting insights
   A diverse range of internal and external sources are used to systematically build insightful knowledge, to exploit stated and unstated needs.

6. Managing uncertainty
   Uncertainties and risks are evaluated, leveraged, and then managed, by learning from systematic experimentation and iterative processes, within a portfolio of opportunities.

7. Adaptability
   Changes in the context of the organization are addressed by timely adaptation of structures, processes, competencies, and value realization models to maximize innovation capabilities.

8. Systems approach
   Innovation management is based on a systems approach with interrelated and interacting elements and regular performance evaluation and improvements of the system.

The Opportunity Center

We first proposed the development of an opportunity center in the United Arab Emirates in 2013 at their Chamber of Commerce conference. At the time we called it, "The Innovation Works" (see Figure 1.10).

Figure 1.10 Presentation to Chamber of Commerce Abi Dhabi.

In order to stimulate the creativity and innovation movement within their organizations, many of the more advanced US organizations are now establishing or replacing their Suggestion Departments with a new organization called "Opportunity Centers" using the open data feedback loops.[15] These Opportunity Centers play a key role in stimulating creativity and innovation in all areas of the organization. However, in most cases the Opportunity Center was the outcome of the evolutionary growth of the suggestion system; in some organizations, the Innovation Center and the Knowledge Management System responsibilities have also been delegated to the Opportunity Center. Often the Opportunity Center will be the champion for an idea that has been presented to them. Individuals who believe they have a good idea will often go to the Opportunity Centers where professionals help them clarify and document their ideas. For some ideas, the Opportunity Center will schedule meetings with key executives and assess the employees in presenting their concept, including the projected value added.

A typical mission statement for an Opportunity Center could be read as follows.

> *The Opportunity Center is responsible for stimulating and activating the creative and innovative activities for all the organization's employees. This is accomplished by providing training on problem solving, creativity, and innovation. The Opportunity Center personnel provide one-on-one and group mentoring with the objective of helping employees clarify and develop their ideas. They then provide guidance and help the individuals and the organization to transform these concepts into tangible results.*

Typical services that are provided by an Opportunity Center are as follows:

- Review suggestions to identify the ones that have a high potential payback and put them on a fast track to get them implemented.
- Review suggestions to identify the ones that need additional clarification. Then sit down with the individual that made the suggestion to help the individual document his or her ideas.
- Serve as a resource that will work with an individual who is having difficulties in expressing and documenting his/her ideas.
- Help individuals prepare value propositions that are used to evaluate conceptual ideas.
- Provide training on various problem-solving tools, innovation approaches, and knowledge management methodologies.
- Serve as the ombudsman for individuals or teams that are presenting ideas and concepts to the management.
- Help individuals or groups to find executive sponsors for ideas that have significant merit.

- Help individuals develop their high-potential ideas into documented value propositions that are presented to management.
- Provide mentors for teams or groups that are holding brainstorming or problem-solving meetings.

Typically, an individual, who is having problems in clarifying and documenting a concept he or she has developed, will schedule a meeting with a member from the Opportunity Center. Often these meetings are focused on getting a better understanding of the difficulties in implementing his or her concept and calculating potential benefits, costs, and risks related to the implementation of the concept.

The Opportunity Center personnel are responsible for helping the individual clarify and refine his/her concept. The outcome of this activity can result in the concept being discarded or the preparation of a value proposition that will be presented to the management team. On occasion, what results from this meeting is a decision that the concept is not in line with the mission of the organization.

When this is the case, in the more advanced organizations, the Opportunity Center personnel will help the individual determine if it is a marketable idea. Some organizations even encourage employees, who have marketable ideas not related to the organization's mission, to become entrepreneurs. In these cases, the personnel in the Opportunity Center will acquaint the employee with the risks, benefits, and activities required to form his or her own corporation or to market the idea to an organization outside of the one that presently employs them.

These are organizations that are concerned about their employees and realize that small business is the heartbeat of the American economy. These are organizations that look beyond their own bottom line, thereby encouraging innovation and entrepreneurship throughout the organization.

Typical Objectives of the Opportunity Center

The following is a list of typical objectives that could be set when an Opportunity Center is established.

- Obtain 100% of all employees submitting ways to improve how they perform their assigned tasks each year. This includes everyone from the CEO down through the organization chain.
- Obtain an average of two implemented suggestions per month per employee related to how he or she performs his or her assigned tasks.
- Obtain from each major function in the organization at least one major improvement concept every year that will generate revenue or define operating savings equal to the operating cost of that function over the following two years.

- Obtain from each function creative concepts that will improve their productivity by a minimum of 5% per year. This will be measured by the function being able to increase its output by a minimum of 5% using the same resources or by producing the same quantity of output using 5% or fewer resources.
- Help the organization generate 35% of its revenue each year from products and/or services that were not offered three years earlier.
- Provide training to 100% of the employees that will help improve their problem-solving ability and their creativity.
- Conduct the closing postmortem related to successful and unsuccessful projects. The results of these postmortems are entered into the knowledge database.
- Establish and maintain an online database of best practices and proven applied approaches that have been used by the organization and may be used to create new solutions and products.

You may wonder why an organization would include its knowledge management system as part of the Opportunity Center. More and more, today's improvements are based upon an evolution, rather than a revolution, of concepts. A good knowledge management system collects information related to how problems have been solved in the past and groups them in a format that past experience can readily be applied to existing problems. Reapplying proven concepts, slightly modified to correct a current problem, often is the less risky path to take in your continuous improvement.

Techniques like TRIZ, with good examples of how each of the 40 principles has been applied in other innovative applications, provide an excellent idea-generating platform that can lead to breakthroughs in creativity and innovation (see Figure 1.11). One very effective approach we have used is each time a new concept is defined or a problem is solved, the approach used is classified into one of the 40 TRIZ principles. This soon results in a large database of the organization's related examples that are grouped in line with the 40 TRIZ principles. This database is then used to help define future solutions.

Capturing and maintaining data related to best practices and problem-solving approaches previously used by the organization and having it readily available in a database provides a competitive advantage that is often a necessity in today's fast-moving and very competitive environment. An effective knowledge management database is an essential part of any organization's creativity and innovation processes.

Reinforcing the Opportunity Environment

To help create and reinforce an environment where everyone has the opportunity to be creative and innovative, the Opportunity Center often conducts the following activities[16]:

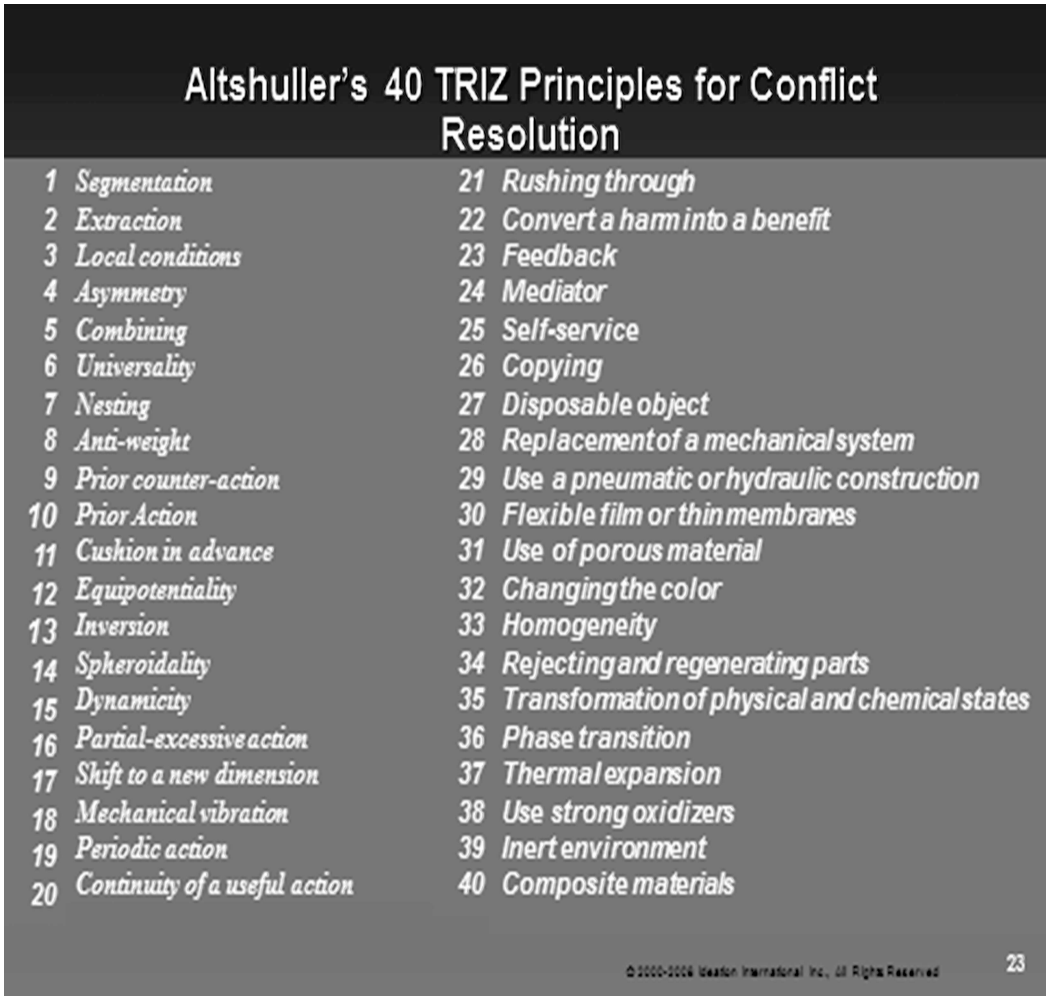


Figure 1.11 Altshuller's 40 TRIZ principles for conflict resolution.

- Coordinates the monthly functional opportunity-recognition luncheons – Each month the individual who submits the most creative implemented idea in each function (Product Engineering, Finance, Production Control, Sales and Marketing, Quality Assurance, Procurement, Human Resources, etc.) is invited to have lunch with the CEO and the COO of the organization.
- It is important to note that the winning ideas are selected based on their originality and/or how creative the ideas are, not on how much money they save the organization. Focusing the selection on creativity allows everyone within the functions to compete on an equal playing field. During these luncheons, the winning ideas are discussed and a small gift is given to each individual.
- Initiates the Opportunity Coin Program – The Opportunity Coin Program is designed to recognize people who are coming up with creative ideas. Each month the head of each function will personally distribute tokens of

recognition to the three individuals in his or her function that were runners-up to the individual that was recognized at the monthly functional opportunity-recognition luncheon.

- Typically these tokens can be exchanged for a free lunch at the organization's cafeteria or at a local restaurant. Our past experience indicates that these tokens are infrequently cashed in, but they are cherished by the individuals as tokens of personal recognition. The head of each function is required to personally visit the winners in his or her work area and present the tokens to them in their personal work environment.
- Yearly Opportunity Awards Dinner – The Opportunity Center will coordinate the Yearly Opportunity Award Dinner. At this dinner, typical awards that would be given out are as follows:
  1. Most creative idea by function.
  2. Most creative idea from the clerical support staff.
  3. Most creative idea related to the new products.
  4. Most creative marketing idea.
  5. Most creative sales idea.
  6. Most creative production operations related idea.
  7. Person submitting the most implemented ideas.
  8. Person submitting the idea that saved the most money.
  9. Team that created the most creative idea
  10. Recognition of individuals who received patent approval during the year.

This is a dinner that the award winners, their spouses or significant others, and their children are invited to attend. One of the best ways to develop employee loyalty and personal satisfaction related to their job is to make the employees look good in front of the people that are most important to them – their family. They may not have a very responsible job at work, but at home, they are king or queen. When one of our family is recognized for being the best at something, it is a golden day for the whole family. The award dinner is hosted by the CEO of the company.

Opportunity Center Summary

The Opportunity Center provides most organizations for the first time resources that have been set aside to help individuals refine, document, and sell their ideas. Combined together with knowledge management, efforts on innovation, and a new expanded suggestion program the new operating unit, called Opportunity Center, provides a stronghold for knowledge, creative, and innovative activities that go on throughout the organization. It also provides a treasure chest of data related to experiences that make a project successful or unsuccessful.[17] This new concept, when implemented correctly, provides a very important competitive advantage to the organization that implements it.

"We've all had a number of good ideas that could have made a real difference in our life but we lacked one or more of the following:

- Experience,
- Time,
- Knowledge, and
- Encouragement to convert these ideas into part of our life experience."

H J. Harrington

EXERCISE ACTIVITY 1.6: HOW YOUR ORGANIZATION CAN EASILY INCORPORATE IMS CONCEPTS

Business organizations need to optimize their innovation management systems in order to create and inspire more innovation. People come up with brilliant ideas all the time. Apple, Disney, Netflix, you name it – all of these brands started from a single idea someone had at some point in history. Now, businesses need to incorporate IMS concepts so they can better facilitate innovation in their organizations as follows.

When you think about building standards for innovation management, a key part of that will really be around building a center of excellence for innovation. The idea here is to have a single community that is able to very clearly define and share all of the information about innovation. What is the calendar of events around innovation? How do people propose new ones? What is the success that is being created around innovation? How do people learn and share this success?

These issues and your answers should be on every innovation manager's mind so he or she can create connections between all the people who contribute to an innovation program. On a scale of 1 to 10 (low to high) rate your organization's performance in the following areas:

1. **Rate yourself on seeing as opposed to doing.** Most companies see and talk regularly about the changes affecting their industry – like fast-moving competitors or changing customer behaviors. However, they lack the ability to connect those observations to fast action. IAOIP calls it the "seeing-doing gap" (1 = low/ 10 = high).
2. **Rewarding innovation and innovators will always be a challenge.** Said another way, trophies are OK; time and money are better. The most commonly used incentive to get employees to participate in innovation programs is some sort of award or recognition ("You get an Apple Watch! And you get an Apple Watch!"). However, among the role model set of companies, surveyors found a higher percentage of companies supplementing recognition with dedicated time to continue

developing an idea (30%) or seed funding (22%). Google's "20% time" for pet projects may be a bit of a myth, but some companies are trying to help employees get the time and funding they need to keep moving their projects forward (1 = low/ 10 = high).

3. **Revenue generation is the mother of all metrics.** Among the "role model" set, revenue generated by new products or services was being measured by two-thirds of respondents. And 41% said they were also tracking cost reductions or efficiencies. It's not enough just to collect metrics, though – they need to be communicated and disseminated to relevant colleagues up and down the org chart (1 = low/ 10 = high).
4. **Recession worries haven't yet rattled your corporate innovators.** Despite stock market tremors, trade disputes, and slowing growth in many parts of the world, more than half (56%) of the corporate innovators in the Innovation Leader survey expected their company's overall investment in innovation to increase from 2019 to 2020; just 7% expected a decrease. The rest expected it to remain stable (1 = low/ 10 = high).
5. **Leadership support and the right strategy are more important to us than the ability to accept failure.** There's been a lot of rhetoric in recent years around "celebrating failure" and becoming more tolerant of failure as a necessary shift, to create more space for experiments that may not pay off. But in many organizations, explaining that it's OK to "fail fast" is not something the broad employee base is ever going to understand or embrace. The organization's ability to "accept failure well" was not seen as a key enabler of success by the survey's "role model" respondents. What was? Support from leadership; crafting the right strategy and vision for the innovation initiative; and assembling a team with the necessary skill sets to deliver on that strategy (1 = low/ 10 = high).
6. **Attracting and retaining innovation talent matters to us very much.** When respondents are asked to name their biggest challenges, they start with the usual suspects: things like politics, turf wars, lack of alignment, and unidentified "cultural issues." For most companies, building trust, enabling the right relationships, and providing support are necessary prerequisites to turning ideas into action. But when surveyors focused on the priorities of the "role model" set of respondents, their top challenge was different: it's recruiting top talent with in-demand skillsets, from data analytics to complex partnering arrangements with innovation ecosystems (1 = low/ 10 = high).
7. **Our Innovators have learned to just say no.** Previous annual surveys have found program leaders tasked with doing incremental and transformational innovation at the same time. "We run 17 programs in our company and we're also a skunkworks and we're supposed to be

scouting interesting startups and running hackathons," said one innovation leader. "We're being run ragged." Attempting to do too much can result in nothing having a significant impact. The researchers recommend putting a stop to projects that are not blossoming and learning to say no to requests that expand the mandate (1 = low/ 10 = high).

End of exercise

EXERCISE ACTIVITY 1.7: TWO-MINUTE ELEVATOR SPEECH ON UPGRADING YOUR INNOVATION MANAGEMENT SYSTEM TO A MEMBER OF THE EXECUTIVE COMMITTEE

At the end of the class, each of you will present a short two-minute maximum elevator speech that you could give to a member of your executive committee to convince them that they should, at a minimum, schedule a separate meeting to consider your suggestion. You should prepare each day so that at the end of the class, you are ready to make your two-minute presentation.

End of exercise

Summary

An innovation management system based upon our TIME Model facilitates all the processes needed to comply with ISO 56002 and 56004 and takes into consideration the number of additional factors that were not included in the ISO standards, which excludes key factors like tollgates and any emphasis on optimizing performance when considering all operations. A good IMS expedites the way businesses manage their innovation strategies so they can connect the dots, crunch the numbers, and plan product launches that won't fall at the first hurdle. Not every IMS is created the same. Business leaders need a flexible, reliable system that lets them scale their business, whether it's a start-up or a multinational. It needs to provide value, and it needs to engage its users.

Along the way, there's the engagement of the program, and whether the return on investment of your program will continue to increase. Ultimately, that comes with the maturity that your program exhibits. There are a lot of benefits to implementing an innovation management system. Statistics out there prove that organizations that are highly innovative, have the right approach, and focus on systems built in to measure their innovation programs and successes are going to achieve far better results with much greater efficiency

There are formally recognized standards bodies, both on national, European, and international levels. These formally recognized standards bodies develop standards (norms) in so-called full-consensus processes, i.e., with broad and systematic stakeholder consultation in a public inquiry, and are in a position to provide standards/norms that are used in support of regulation. The binding rules for formal international standardization are laid down in an Annex to the WTO TBT Agreement. In Europe, the standardization system is defined in a new Regulation that came into place on January 1, 2013 (1025/2012).

ISO IMS systems might contain a lot of dos and don'ts, but at its core, it helps businesses set the baseline for innovation in their organization. A good IMS is critical, though, not just for compliance, but also for ensuring that the best ideas are properly nurtured and executed.

We must emphasize that it is important for you to understand that the ISO innovation management system documents we are talking about are 56002 and 56004 only. They are both guideline documents; nothing in them is mandatory. This allows you to evaluate each individual suggestion to determine if it is true value-added or of no value-added to your organization and its stakeholders/interested parties. We know of cases where some of the suggestions presented in the standard would create a negative impact on the organization's overall performance. There are few free meals.

A very visual example was a company that installed Six Sigma throughout its organization to save a lot of money. But doing this caused the customer satisfaction index to drop down three points. For everything you decide to change be sure you understand the positive and negative impacts that the change can have on all of your stakeholders. *At the end of each Section of this Workbook, we will include five or more Innovation Riddles and Brainteasers that we call The Innovators Dilemma. The answers can be found in the Technical Supplement at the end of this Workbook. These teasers are designed to expand your mind as innovators and are loosely based upon the work of Zack Guido, and authors Dr Jim Harrington and Frank Voehl.*

The Innovator's Dilemma 1.1: Crossing the River and Back Again

You have left home and have just purchased three things at the local marketplace: a wolf, a duck, and a bag of seeds.

To get back home, you must travel across a river in a small boat. You are only allowed to have one item with you on your boat at any given point in time. You cannot leave the wolf alone with the duck because the wolf will eat the duck, and you cannot leave the duck alone with the bag of seeds because the duck will eat the seeds.

How many trips on the boat must you take to be able to get the wolf, duck, and bag of seeds across to the other side of the river safely?

The Innovator's Dilemma 1.2: Is the Glass Half Full or Half Empty?

You are in an empty room with a glass of water. The glass is a right cylinder that looks like it is about half full, but you are not quite sure.

What is the most accurate way, without spilling any water, to determine whether the glass is half full, more than half full, or less than half full?

The Innovator's Dilemma 1.3: Nuts & Bolts Will Drive You Nuts

In front of you are three closed metal boxes. One is labeled "Nuts," one is labeled "Bolts," and one is labeled "Nuts & Bolts." You know that every box is incorrectly labeled and you would like to rearrange the labels so that each box is correct.

By making only one selection from one box, how can you be sure to properly re-label each box?

The Innovator's Dilemma 1.4: Cutting the Cake

You have a delicious round circular birthday cake. How many equal-sized pieces can you cut the cake into by making only three straight slices with a knife and without moving any of the pieces around?

The Innovator's Dilemma 1.5: Heads or Tails

Your fellow worker at the Innovation Lab flips two coins behind your back and tells you: "At least one of the coins came up tails." What is the probability that both coins came up tails?

The Innovator's Dilemma 1.6: The Prisoner's Dilemma

You are a prisoner in a foreign and unfriendly country. You have been sentenced to death but are being given one chance to live. The king of the land has decided to let you play a simple game to determine your fate:

You are presented with two clay jars, one containing 100 white stones and one containing 100 black stones. You are allowed to redistribute these stones any way that you like, but when you are finished all stones must be in the jars.

After you have finished, both jars will be shaken up, you will be blindfolded, and you will be presented with one of the two jars at random. You will pick one stone out of the jar given to you. If the stone is white, your life will be spared, if the stone is black, you will be executed immediately.

How should you redistribute the stones to give yourself the best chance of survival?

Notes

1 On March 6, 2008, Apple's Steve Jobs announced his own, more limited and controlled effort at attracting ISVs to the iPhone platform. Under the Apple plan, ISVs can gain access to the necessary technical information to create applications to run on the iPhone, which Apple will then market through a new "App Store" that it will host.

2 The Creative Commons Web site can be found at: http:// creativecommons.org/ and Excerpted from "Legal Concepts," Creative Commons, accessed May 18, 2008, at http://wiki.creativecommons.org/ Legal_Concepts.

3 The adoption of Open Innovation by so many parties is not based on potential alone, but rather is informed by a series of social, economic, and creative imperatives. In this context, the discourse naturally transfers away from innovation per se, and instead towards the observable evolution of markets facing increased complexity, competition, and commodification. In such a situation, the value added by each individual company and each individual product is inherently smaller and less exclusive than in simpler economic times, but simultaneously the pooling of knowledge and the development of common platforms allows for sophisticated solutions to be introduced faster than before.

4 See Appendix A for a Workshop treatment of how the Doblin Periodic Table of Innovation can be used in conjunction with the Innovation Systems Cycle (ISC) that is used with the TIME methodology.

5 See the *Handbook: Ten types of innovation: The discipline of building breakthroughs:* Keeley, Larry, Walters, Helen, Pikkel, Ryan, Quinn, Brian: 9781118504246: Amazon.com: Books. Author Larry Keeley is a world-renowned speaker, innovation consultant, and president and co-founder of Doblin, the innovation practice of Monitor Group; BusinessWeek named Keeley one of seven Innovation Gurus who are changing the field.

6 Sources: Curley, M., & Salmelin, B. (2018). *The evolution of innovation*. In Open Innovation 2.0 (pp. 39–45). Springer, Cham; Georghiou, L., Sachwald, F., Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström, J., & Walters, H. (2010). *Business model generation: A handbook for visionaries, game changers, and challengers*. Hoboken; Keeley, L., Walters, H., Pikkel, R., & Quinn, B. (2013). *Ten types of innovation: The discipline of building breakthroughs*. John Wiley & Sons; Varis, M., & Littunen, H. (2010). Types of innovation, sources of information and performance in entrepreneurial SMEs. *European Journal of Innovation Management*, 13(2), 128–154.

7 Source: http://blogs.scientificamerican.com/guest-blog/2012/07/03/life-liberty-andthe-pursuit-of-data

8 The recent surge of citizen science, greatly assisted by information and communication technologies, thus allows reconsideration of the somewhat artificial categorizations of science domains and naturally involves trans- and interdisciplinary in scientific practice.

9 These considerations indicate that one does not need a ten-person lab, multimillion-dollar grants, and caffeine-intoxicated PhDs in order to perform brilliant science. Citizen systems of participation aimed at collective problem-solving bring, however, two crucial questions: Is citizen science capable of producing reliable data? What guarantees do we have that it is ethical science.

10 A central concept is the *frame as we* adopt the central thesis of Marvin Minsky's frame theory. Minskey argues that the building blocks of cognition are not minute and unstructured elements, but rather more elaborate clara structures that model the systems we are thinking about these structures *frames*. We have a lightning-fast ability to match situations we encounter with one of the thousands of frames we have in our mental filing system. With each new problem we encounter the frame we call up guides us in collecting information to build a situation-specific mental model. These models provide an explanation – the dynamics of a situation and allow us to predict the outcomes of alternative courses of action.

11 Engaging huge numbers of citizens in a research project means that massive input is generated. Indeed, volunteers already collect data for scientific projects: How reliable is this? Two decades ago, the USA introduced an amendment prohibiting volunteer-collected data from being used in the US National Biological Survey. In the case of a community-based bird species diversity survey, the estimated number of birds correlated with the changes in numbers of observers. Such examples contribute to a stigma associated with citizen science data, which is sometimes labeled 'incompetent' or 'biased.' In a recent piece, John Gollan argues the opposite: "a growing body of literature shows that data collected by citizens are comparable to those of professional scientists" although data-integrity issues can occur. For details see: Citizen Science Can Produce Reliable Data – Open Knowledge Foundation blog (okfn.org)

12 Coleman McCormick writes that with the growth of the open data movement, governments, and data publishers are looking to enhance citizen participation. OpenStreetMap, the wiki of world maps, is an exemplary model for how to build community and engagement around map data. Lessons can be learned from the OSM model, but there are many places where OpenStreetMap might be the place for geodata to take on a life of its own. See Bringing Geographic Data Into the Open with OpenStreetMap.

13 The open data movement has grown in leaps and bounds over the last decade. With the expansion of the Internet, and spurred on by things like Wikipedia, SourceForge, and Creative Commons licenses, there's an ever-growing expectation that information be free. Some governments are rushing to meet this demand, and have become accustomed to making data open to citizens: policy documents, tax records, parcel databases, and the like. Granted, the prevalence of open information policies is far from universal, but the rate of growth of government open data is only increasing.

14 In many ways, the roadblocks to the adoption of open models for creating and distributing data aren't ones of policy, but of technology and implementation. Even with ostensibly "open data" available through a government website, data portals are historically bad at giving citizens the tools to get their hands around that data. In the geodata publishing space, the variety of themes, file sizes, and different data formats combine to complicate the process of making the data conveniently available to users. What good is a database I'm theoretically allowed to have a copy of when it's in hundreds of pieces scattered over a dozen servers? "Permission" and "accessibility" are different things, and both are critical aspects of successful open initiatives. A logical extension of opening data is opening access to that data. If transparency, accountability, and usability are primary drivers for opening up maps and data, lowering the bar for access is critical to make those a reality.

15 A great example of the power of the engagement feedback loop with OpenStreetMap is the work of the Humanitarian OpenStreetMap Team's (HOT) work over the past few years. HOT kicked off in 2009 to coordinate the resources resident in the OpenStreetMap community and apply them to assist with humanitarian aid projects. Working both remotely and on the ground, the first large-scale effort undertaken by HOT was mapping in response to the Haiti earthquake in early 2010. Since then, HOT has grown its contributor base into the hundreds, and has connected with dozens of governments and NGOs worldwide – such as UNOCHA, UNOSAT, and the World Bank – to promote open data, sharing, transparency, and collaboration to assist in the response to humanitarian crises. To see the value of their work, you need to look no further than the many examples showing OpenStreetMap data for the city of Port-au-Prince, Haiti before and after the earthquake.60 In recent months, HOT has been activated to help with open mapping initiatives in Indonesia, Senegal, Congo, Somalia, Pakistan, Mali, Syria, and others.

16 Global innovation management standardization takes place in a diverse IMS standards ecosystem. Different organizations cover different technology areas. This includes a diversity of IPR policies – tailored by the members of the respective standards bodies so that the market is served best and innovation is promoted in an optimal way. Governments reflect this in their policy-making when including a reference or requirements to standards and specifications. They differentiate between policy areas and the needs that evolve for standards supporting the respective actions. This level of differentiation leads to a nuanced approach that best serves the markets and unleashes the potential for innovation which can be achieved with the support of standardization.

17 Standards are the backbone of open IMS ecosystems. Standards facilitate market access by complying with basic regulatory requirements in the areas of health, safety, and the environment. Standards are a key instrument for the broad adoption of new technologies. Standards enable and ensure inter-operability and thus allow all market players to provide innovative technologies and compete on fair grounds. This is particularly critical for the combination of technologies in order to build new, innovative solutions.

Chapter 2

The Innovation Systems Cycle

In a Nutshell

Currently, the prime focus for US business plans should not be on the manufacturing process design and delivery processes, but on greatly improving innovation leadership, design engineering capability, and sales and marketing innovation. These three areas have sadly been lacking significant performance improvement during the past 20 years.

The magic word for US business is "simplification." Most of the books written to date focus on the solution development aspect of the Innovation System Cycle, which is less than 15% of the total innovative system. Focusing on solution development is only the start – the rest of the innovation system cycle is what turns an idea into a profitable business. The techniques in this chapter are directed at key tasks across the innovative process, such as maximizing quality, productivity, maintainability, usability, and reliability, while focusing on reducing the product cycle time and costs within the innovative process.

This Chapter and supporting book use more than 50 different approaches/concepts, which leads the reader to a very simple method for understanding, establishing, and effectively using an innovative system to provide a significant marketing advantage. Previous works have focused on what to do; however, this Cycle focuses on how to do it. ISC transforms a complicated and complex system into an easy-to-use and understandable methodology.

Introduction

The innovative activities going on within an organization are often subcategorized into the following five innovation types.

- Product Innovation primarily leads to producing a competitive advantage through differentiation

DOI: 10.4324/9781003413509-2

- Process Innovation primarily leads to producing a competitive advantage through lower prices
- Sale & Marketing Innovation primarily leads to producing a competitive advantage through a marketing mix (target market, distribution, product, price, and promotion).
- Management Innovation primarily leads to producing a competitive advantage through better organizational ways of achieving the organization's goal.
- Service Innovation applies to servicing the customer after they have purchased the item and services to internal organizations

Levels of Innovation Complexity

We divide innovation complexity into five different levels, each of which can be associated with each of the types of innovation making a 5 x 5 matrix. They are the Five Levels of Innovation Complexity

Level 1	–	Apparent Solution	=	68.3%
Level 2	–	Minor Improvement	=	27.1%
Level 3	–	Major Improvement	=	4.3%
Level 4	–	New Paradigm	=	0.24
Level 5	–	Discovery	=	0.06%

There are five different types of innovation and five different levels of innovation that can be associated with each type of innovation. ISO uses four levels of innovation. They are as follows:

- Basic research
- Disruptive innovation
- Sustaining innovation
- Breakthrough innovation

We use five levels of innovation because they are based upon the analysis of hundreds of thousands of patents, thus getting a much richer accuracy level.

The percentage assigned to each of the five levels was based on an analysis of hundreds of thousands of patent applications. They were originally classified into these five categories in Russia, based upon analysis of thousands of patents. We recommend using five levels of classification because it has a much sounder database backing it up.

You will note that over 95% of the innovative activities result in apparent or minor improvements that the continuous improvement methodologies are capable of handling and usually do not require the sophisticated innovative approaches that are so often sold by training and consulting organizations.

The Innovation Systems Cycle (ISC) Explained

This chapter also covers our interpretation of the Innovation Management Systems (IMS) cycle which we divided into three phases. They are as follows:

- Phase I – Creation,
- Phase II – Setup and Producing
- Phase III – Delivery

We recognize that most innovative organizations already have an established innovative management system in place and operating, and we strongly recommend that these organizations use their present innovation management system as the foundation for the redesign and restructure of their current innovative management system. Changes to the current IMS should be directed at improving its harmony with the rest of the organization's activities and is designed to support its required function as part of meeting the organization's performance goals and objectives.

An organization will greatly minimize its resistance and maximize its resiliency if it uses the ISO Innovation Standards 56000 series and the TIME methodology to identify improvement opportunities rather than imposing a new IMS on the organization. Major mistakes can be made when an organization decides to throw away the old IMS and replace it with a new cultural innovation management strategy.

We have encouraged the reader throughout this chapter to keep things as simple as possible so that everyone in the organization can easily understand the benefits of upgraded systems implementation. This starts when an opportunity is identified and ends when the innovation is proven to be value-added to the relevant stakeholders. This thought pattern can be better expressed in the following list of three phases that include 12 process groupings (see Figure 2.1). This cycle can vary from a matter of days to years to complete depending upon the complexity of the change and the difficulties in measuring value-added.

Due to the experimental nature of many of the potentially innovative ideas, there is a high risk that these projects will not be successful. Failure rates as high as 80% have been recorded. Often the results from these types of initiatives are an understanding that the approach will not yield the desired results. To minimize the wasted effort and resources related to these

Phase I. Creation

- Process Grouping 1. Opportunity Identification
- Process Grouping 2. Creation Activity
- Process Grouping 3. Value Proposition
- Process Grouping 4. Concept Validation

Phase II. Preparation and Production

- Process Grouping 5. Business Case Analysis
- Process Grouping 6. Resource Management
- Process Grouping 7. Documentation
- Process Grouping 8. Production

Phase III. Delivery

- Process Grouping 9. Marketing, Sales, and Delivery
- Process Grouping 10. After-Sales Services
- Process Grouping 11. Performance Analysis
- Process Grouping 12. Transformation

Figure 2.1 Innovation systems cycle (ISC).

unsuccessful projects, a group of five tollgates is used to provide early identification of the unacceptable high potential of project, program, or activity failure. Often, funding is only approved for the project to reach the next tollgates.

The following is a list of the 12 Innovation Process Groupings with the 5 Tollgates integrated into the cycle (see Figure 2.2).

As much as we need a process for individual innovative project work products, we also need an innovation system that will sustain the innovative progress the organization is making because our innovation system has to cover and support the following innovation areas:

Phase I. Creation

- Process Grouping 1. Opportunity identification

***Tollgate I -Opportunity Analysis**

- Process Grouping 2. Opportunity Development
- Process Grouping 3. Value proposition

***Tollgate II -Concept Approval**

- Process Grouping 4. Concept Validation

Phase II. Preparation and Producing

*Tollgate III -Project Approval

- Process Grouping 5. Business Case Analysis
- Process Grouping 6. Resource Management
- Process Grouping 7. Documentation

***Tollgate IV -Customer Ship Approval**

- Process Grouping 8. Production

Phase III. Delivery

- Process Grouping 9. Marketing, Sales and Delivery
- Process Grouping 10. After-Sales Services
- Process Grouping 11. Performance Analysis

***Tollgate V -Project Evaluation**

- Process Grouping 12. Transformation

Figure 2.2 Innovation process groupings and tollgates.

- Product Innovation
- Process Innovation
- Management Innovation
- Sales and Marketing Innovation
- After Sales Service Innovation
- Supplier Innovation

Phase I – Creation Phase

There are three main phases to the ISC Cycle. There are as follows:

- Phase I – Creation Phase
- Phase II – Preparation and Production/Producing Phase
- Phase III – Delivery Phase

Phase I – creation phase: This represents the activities that most of the innovation will begin with. In the Creation Phase chapter, we are going to assume that you are just starting the cycle at the beginning of Phase I, the Creation Phase. The creation phase consists of the following three process groups and two tollgates. They are as follows:

- Process Grouping 1. Opportunity Identification
- Process Grouping 2. Opportunity development
- **Tollgate I** opportunity analysis
- Process Grouping 3. Opportunity Value Proposition
- **Tollgate II** Concept Approval

Phase I – Creation has the highest risk of the three phases. No matter what anyone says, we all know that every individual has a real sense of accomplishment when he or she comes up with a new and original concept that has the potential to add value to some, if not all, of the stakeholders. An example could be an operator running a drill press, a clerk hoping a customer would decide which shirt he wants to buy, or could be in the middle of the night when all of a sudden that great idea rolls around in your brain. It is an endless list.

The point of it is, you should be continuously and systematically looking for improvement opportunities that would have a positive impact on your employer, your family, your neighbors, and/or the world's population.

Identifying an opportunity that can bring about improvement within the organization and added value outside of the organization is a very positive experience. At this point, the individual thinks that this is an opportunity for them to do something that no one else has taken advantage of. "It's my chance to be a white knight fighting to improve my performance."

Innovation Rule Number one – "If it isn't broken, it's time to improve it."

H. James Harrington

This Process Grouping is responsible for identifying improvements and/or replacement opportunities. Most people have had the concept of strictly following procedures and processes without deviation implanted into their personality and habits, resulting in becoming blinded to the potential of challenging the current status and breaking out from today's restrictions, rules, and regulations. They put blinders on, forcing them to look straight ahead down the process map without the ability to look left or right for improvement opportunities. Adhering to this habit of strict compliance with established processes and procedures has greatly reduced the ability of today's generation to break away from accepted behaviors and be creative and innovative.

The directives to strictly follow established documented procedures as suggested by ISO 9000 have built a halo around our employees' heads, protecting them from any negative criticism and eliminating their responsibility for failure. The first step in instilling an innovative culture within an organization is training everyone on how to recognize improvement opportunities, and why it is not only acceptable but desirable to challenge the way things are being done in order to find a way to do it better.

It's time to train all levels of management to welcome being challenged by their subordinates. Management needs to truly believe that being challenged is not a negative act but a positive one that they will thrive on. It's time for management to accept that having a bad idea is not wrong; what is wrong is not having an idea at all. It is a good practice to hold a four- to eight-hour class on creative thinking. This should be a basic requirement for all employees and double that for management.

It's really not difficult to identify improvement opportunities. All you have to do is open your eyes and look around. Everything you look at, say to yourself, "Is it absolutely perfect? How can it be improved? If it was improved, who would benefit from it being improved? How difficult would it be to improve it? Should I take action to get it improved?" During this process, improvement opportunities are identified and evaluated to determine how the organization or its stakeholders could benefit from Phase I – Creation. It will also include doing a preliminary rough analysis of what impact successfully completing the project would have on the value-added content received for your stakeholders. Should it be related to a new or current process, a project, or a product? These potential opportunities are like puffs of smoke that float around us all the time and can disappear from our thoughts as quickly as a strong wind blows a puff of smoke away.

Every place we look, we see opportunities that we could jump on but are quickly pushed aside by other opportunities. The real problem we have is not identifying the opportunities; it is being able to hold onto them and determine if this is the right opportunity for you to champion. We believe that none of us

1. Work product-related opportunities
2. Work process-related opportunities
3. Service-related opportunities
4. Self-related opportunities
5. Family-related opportunities
6. Personal-growth opportunities
7. No value-add opportunities
8. Self-implementation opportunities
9. Opportunities that are not within my personal or organizational principles
10. Opportunities that are forced upon me
11. Opportunities where someone else should take the lead
12. Not practical opportunities (extremely difficult and time-consuming)
13. Opportunities where the return on investment is not adequate
14. Not part of the organization's mission (Note: You may want to add additional headings or remove some of the 14 headings that we presented.)

Figure 2.3 Typical opportunity categories.

has the ability to take on all the improvement opportunities we identify every day. One of the longest lists I have on my computer is my list of improvement opportunities that are available to me and I would like to take advantage of them, but I do not have the time or resources to do it right now.

A truly observant person would soon become overwhelmed with the number of new or improvement opportunities that are available to each of us each day. Sometimes these opportunities are personal, like a pretty girl who sits in the second seat in the front row. Sometimes it is family-related, like building a mother-in-law's house out back and moving grandma into it so she would have her own place. Other times it is a new product related, like we could use this sticky mess we are cleaning up as a good water-resistant epoxy. It could be as small as moving the bin of screws to the left-hand side of the workbench, making it much easier and faster to put an assembly together (see Figure 2.3). We categorize these opportunities as follows:

> Over 90 of all the people I know has had an idea that would have made them millionaires if they had taken advantage of it.
>
> **H. James Harrington**

EXERCISE ACTIVITY 2.1: WHAT ARE THE TEN MOST INNOVATIVE ORGANIZATIONS?

Steps to follow:

1. Make a list of ten organizations that you consider to be innovative.
2. Honestly define why you placed each organization on the list.
3. Identify which of the ten organizations is the most innovative and which is the least innovative.

4. Why did you rate the best organization at a higher level than the lowest organization?
5. On a scale of 1 to 10 rate your organization's output to its customer/consumer innovation reputation using the ten organizations you listed as putting out the most innovative products/services.
6. Make a list of the top three things your organization will have to do to the IMS to reduce the gap between the best innovative outputs and your organization's outputs' innovative reputation.

End of exercise

Innovative Improvement Opportunities

In this Playbook, we are going to be focused on business-related projects directed at IMS improvement opportunities. The very first decision you need to make is, "Do you want to improve the organization's IMS or do we want to improve the organization's performance by modifying the organization's IMS?" One of the biggest mistakes we consistently see organizations make is they focus on developing a world-class IMS rather than focusing on improving bottom-line results by changing the organization's innovative culture. As a result, well-intentioned individuals waste a great deal of the organization's resources making changes that may or may not be in the organization's best interest. We strongly suggest that when you look at your IMS you consider modifications to it based on the change's impact on the organization's bottom-line performance rather than the sophistication and excellence of the IMS.

> Innovation rule number two – "Make changes to your IMS based upon how it improves the organization's performance, not on how it improves the IMS."
>
> **H. James Harrington**

The functions that generate the biggest innovative value-added activities usually are research and development, product engineering, marketing, and sales. At a very minimum, you need to identify the roles, responsibilities, and accountability for these four main functions. An organization's reputation as an innovative organization is largely based upon how creative and unique its interface is with the customer or potential customers. We asked random customers who they consider innovative organizations. Then we asked the question, "Why do you consider these organizations as being innovative?" Over 95% of the time their opinion was based upon the innovation or uniqueness of the organization's output.

When we asked what they used to come up with their conclusions, we were surprised to learn that the vast majority of their conclusions were based upon what someone else had told them (friends, TV, magazines, etc.) about the organization's output. It is not the IMS that Apple has developed that has earned it the reputation as one of the most innovative companies in the world; it is what is said about its products that make its innovative reputation. If you hear something several times, you begin to believe, even if you cannot experience it. For example, I have only one Apple product and I was never able to get it to work. I kept it for two years playing with it now and then trying to use it. I eventually gave it to Goodwill, but I truly believe Apple produces innovative products, most of which are continuous improvement type innovation products.

EXERCISE ACTIVITY 2.2: WHAT WOULD MAKE US MORE INNOVATIVE?

In this exercise, we ask you to survey the general public and a group of people who use products similar to yours, addressing the following question: What would your output have to be for the general public to consider it innovative compared to other similar outputs? Some typical answers could be:

- There is no similar product/output.
- It does everything that the competition does and has several more valued-added functions.
- Its purchase price would need to be 40% lower than the competition with no reduction in functionality.
- Its 100% warranty would need to last twice as long as the competitions
- It maintenance costs would need to be 50% less than the competition
- It would need to be noticeably more reliable
- It would need to have some unique, value-added functions
- It would need to be much easier to operate.

FALSE REPUTATIONS

Some organizations obtain a reputation for being innovative not based on the product they deliver but on their promotions (television, radio, Internet, magazines, conferences, etc.). They repeatedly announce that they are innovative until you begin to believe it. Keeping this in mind, we are going to focus this part of the book on how you process innovative ideas that are designed to be used by the general public or a specific party. We also will focus on the part of the organization that is most involved in the task related to how you should use your IMS. Remember your product

design is only one part of delivering an innovative output to your internal and external customers.

End of exercise

Process Grouping 1 – Opportunity Identification

Inputs to Process Grouping 1

One of the major challenges for the team is to get everyone singing on the same page of the hymn book and in the correct key. As the team comes together for its first meeting, each member has his/her own set of hopes, fears, beliefs, and strategies about what the project will accomplish for the organization and for himself/herself personally. To help make the transformation from a group to a team, a set of documents has been developed. They are as follows:

- Team Charter and Contract
- Team objective
- Team goals
- Team Stakeholders and Customers
- Team project plan
- Team Roles and Sponsors as outlined below.

Team Roles and Responsibilities

There are four key roles that help create a successful innovation team: the team sponsor, the team leader, the team facilitator, and the team member. Each role carries specific responsibilities. Let's take a brief look at each team role.

The Innovation Team Sponsor

The sponsor is an individual who initiates and guides your team throughout its lifespan. The sponsor will not be a member of the team but will be responsible for appointing the team leader. Together they will develop the team charter and select the team members. Your sponsor will be the team leader's primary point of communication outside the team.

Some of the duties of the team sponsor are as follows:

- Selects the team leader
- Assists in developing the team charter
- Helps the team leader select team members
- Meets regularly with the team leader
- Helps to remove obstacles

- Provides additional resources
- Champions the implementation of team solutions
- Provides ongoing feedback

The Innovation Team Leader

The individual selected to lead the team may be elected by the team, or more often, appointed by the team sponsor. The character's movement team leader is always appointed. The team leader is usually someone with a deeper knowledge of the problem area, someone having more experience in the problem-solving process, or someone who has an excellent understanding of the team process.

Two of the most important traits of an effective team leader are as follows:

- Being able to guide the team without dominating
- Acting as an effective role model to the team

Some of the duties of the team leader are as follows:

- Coordinates team meetings and activities
- Teaches members
- Promotes and sustains the team synergy
- Encourages individual member participation without coercing
- Follows up on meeting action items
- Assists the team in monitoring and measuring its progress
- Ensures the team process is being followed
- Training the team members

The Innovation Team Facilitator

The team facilitator is a group process specialist. A facilitator is assigned to a team, at the leader's request, to provide expertise with the team process. The chief distinctions between the facilitator and the team leader are as follows:

- The facilitator is adept at using a wide range of tools and techniques for decision-making, problem-solving, and process improvement.
- The facilitator focuses on the team process only and is considered the process expert, while the team leader is primarily concerned with the project content.

Some of the duties of the team facilitator are as follows:

- Coaching the team leader
- Helping the team stay on track

- Helping the team manage conflict effectively
- Coaching the team on how to use tools effectively

The Innovation Team Member

The team members are the lifeblood of the team. The idea of "Participative Management" is based on allowing employees to help management make better decisions. The whole concept of "synergy" is based on two heads being better than one. If the innovation team leader is there to guide, the team members should assume responsibility for successfully completing the task.

Some specific team member responsibilities are as follows:

- Willingness to express opinions or feelings
- Identify improvement opportunities
- Active participation
- Listening attentively
- Thinking creatively
- Avoiding disruptive communication
- Willingness to call a time-out when necessary
- Being protective of the rights of other members
- Being responsible for meeting the goals and objectives of the team

Ways to Identify Improvement Opportunities

(See Appendix A for TIME Workshop)

There are many ways to identify potential improvement opportunities. Please note that throughout this book, we are using innovation opportunities and improvement opportunities interchangeably. When you look for opportunities, you find both innovation and improvement opportunities. We probably should refer to it as identifying innovation and improvement opportunities. The following are 12 typical popular ways to identify improvement opportunities (see Figure 2.4).

You can probably add an additional 12 easily. Each of these ways to identify innovation opportunities is supported by its own process. Within the same organization, it is frequently the case that different functions have design

1. Customer suggestions
2. Technology advancements
3. Employee Suggestions
4. Competition's New Products
5. R&D Experiments
6. Technical Journals
7. Professional Societies
8. Focus Groups with Customers
9. Supplier Suggestions
10. Personal Observations
11. Social Media
12. Webinar

Figure 2.4 Typical ways to identify improvement opportunities.

processes that are unique to their specific needs and preferences. With hundreds of opportunities that are available to most organizations, it is important that they select the right opportunities to invest the organization's resources in. This normally requires an excellent understanding of the type of business the organization is in, what is happening to this technology, and how its competitors are progressing.

The two main ways to obtain this type of information are through information documented in the public domain i.e. retrieving published data (completed research) that is in the public domain (books, magazine articles, conferences, technical reports, etc.) and conducting original research (observing, interviews, testing/disassembling competitive products, and services). All of these methods provide excellent input related to identifying an improvement opportunity and the development of solutions. The following are some of the most popular inputs to defining potentially innovative projects/programs (see Figure 2.5).

Other ways of Identification to help identify innovation opportunities.

My personal favorite way of identifying improvement opportunities is simply by sitting down with a pencil and sheet of paper and writing down the things that I'm unhappy with or I would like to see changed or I think should change. I find that closing my eyes in this process helps. But of course, I open my eyes to make my list. I then select the ones that I would like to be involved in changing and cross out the ones that I feel it is not worth my time to get changed. I then check off the ones that could produce large value-added returns and results.

Next, I check off the ones that would be value-added to the organization where I work. During my last review of the list, I check off the ones I would like to do. The items that have three checks behind them are very good candidates for my personal improvement opportunities list.

Sometimes I just look around where I am sitting and make a list of the items that could be improved. For example, the hooks on the drapes are difficult to keep on the drapery rod. There must be a better design for them. I process this list in the same manner I do my personal improvement opportunities list. For the next two days, I'm looking for things in the environment that could be improved or should be changed. They will be added to my already long list and I will repeat

1. Opening your eyes and senses
2. Opening your mind
3. Customer suggestion
4. Surveys
5. Focus groups
6. Marketing opinions
7. Sales opinions
8. Technology improvements
9. Customer complaints
10. Performance problems
11. Negative return on investment
12. Improve competitor product features and performance
13. Benchmarking studies

Figure 2.5 Popular inputs to defining potentially innovative projects/programs.

1. Management recognizes ways they can be more innovative
2. Motivating individuals to recognize opportunities
3. Defining process alternatives for a specific project/program
4. Preparing to use the process
5. Using the process
6. Identifying potential opportunities
7. Evaluating potential opportunities
8. Doing a rough value-analysis for high value-added opportunities
9. Management approval for further refinement of opportunities
10. Obtaining management approval of mission statements for significant approved opportunity

Figure 2.6 Process Grouping 1: Opportunity Identification activities.

the rating process again. Without exception, every time I do this I end up with far more things I want to do, and many more things than I will ever have time to do.

Now the hard part is looking at the list and selecting the one or two things I'm going to start working on today. There are hundreds and hundreds of improvement opportunities just waiting for you to identify; some of them are personal in nature and others are directly related to the organization you work for. Some of them you think you can come up with a better item and others you think you cannot improve. If you think you cannot do it, you will be right. I'm always surprised at what I can do if I try to do it. Just because you've never done it before is a very good reason why you should try to do it now.

Of course, the old tried and proven ways of identifying improvement opportunities are very beneficial – like listening to customer complaints, asking customers what they want and what they think they want in the future, staying abreast of technology changes that could impact your product design, analyzing costly activities, benchmarking, and reengineering. Some of the processes/activities that make up Process Grouping 1 (see Figure 2.6). Opportunity Identification activities are illustrated in the figure.

A good class focused on how to identify improvement opportunities will quickly make a major change in the way you look at things. Every place you look, everything you read, everyone you talk to, almost anything you do, is going to all of a sudden present an opportunity that you've never realized before. We recommend that you make a list of improvement opportunities that you identify. You will be surprised at how quickly the shortlist becomes a very long list and you start to get your red pencil out to cross out the ones that you don't have the resources to consider.

EXERCISE ACTIVITY 2.3: WHY OUR CUSTOMERS THINK THE ORGANIZATION IS INNOVATIVE

1. Make a list of the products/services that account for more than 10% of your revenue.
2. Make a list of the things your suppliers need to change for your customer to say the output is innovative.

3. Three of the listed outputs indicate what has to change in order for your customer/consumer to realize he's getting a more innovative improved product/service.
4. Make a list of why you consider them innovative.
5. For each of the five top consumer products that your organization makes, what needs to be changed in order to improve it? Make a qualifying estimate of changes that impact the organization's KPIs and the organization's innovative reputation.

After making this list, honestly define why you placed each organization on the list. I'll give 5 to 1 odds that your conclusion will be based on your view of the organization's outputs (In defining "output," we include advertising and sales). It's not how good your product is; it's how you make people think it is either through actual use or from advertisements. I drive a Buick with over 200,000 miles on and the only problem I've had is that every 60,000 miles I have to buy a new set of tires. I had to fix the automatic window on the driver's side because it would go up and down. But Consumer's Report articles in magazines and advertisements on television and radio me that Toyota is a better car with fewer breakdowns and is more reliable so we tend to believe that Toyota is a more innovative company.

End of exercise

Application to Your Organization

A typical list contains any personal items, family items, your organization's business items, other organization's improvement opportunities, and ideas to build your new business around and make changes in supplier inputs, etc. These improvement ideas can vary all the way from buying a helicopter to flying to work so you can eliminate all the traffic on the freeway. Or combining the state government with the federal government to eliminate the state government to save money, make faster decisions, and provide additional services. It could also include something like the ridiculous idea of going to Hollywood to marry a movie star, so she/he could support you.

Or how about rearranging your office so you can get another file cabinet in, relocating the coffee machine so that is closer to your desk, allowing everyone to have their own coffee maker on their desk, developing a substitute for salt that has no sodium in it, buying the Dragon software package for everyone in the company so no one would need to be efficient typists, opening a steakhouse where the center of attraction would be a campfire with a group of cowboys sitting around singing Western songs, developing an ink that is

erasable, relocating the handle on your newest product so that it would be easier to move and not skin your knuckles, moving the drilling operations to before the grinding operations so that the drilling burs would be removed during the grinding operation, developing an unbreakable screen for the cell phone, developing a machine light enough to sit on an individual's head that will help old people keep their balance, eliminating the need for canes, holding executive training sessions in Alaska at a fishing camp, fishing for four hours a day and doing organizational work for 10 hours per day.

Or developing a company that organizations could outsource their entire quality program to, developing a standard home toaster that would toast the bread equally across the slice, developing a simple way that could be used to edit webinar recordings, reorganizing the organization; breaking it up into small business units that are self-funding and totally accountable, providing real people contact for customers when customers call in for help or to complain, eliminating the four hours on hold when you're trying to reach the company's complaint department, or combining departments 3, 6, and 8 together, starting to take dance lessons so you get into better physical shape, etc.

Enough of the random improvement opportunities examples. The point is that improvement opportunities can vary all the way from the ridiculous to the sublime. Many of the improvement opportunities will not be related to the business that the organization is involved in. For this reason, one of the very first things we need to do when we are using the organization's organizational innovative management system is to separate the improvement opportunities that are not going to drive future improvement opportunities from the organization and its stakeholders' standpoint.

Furthermore, there is a second important consideration that must be looked at early in the organizational innovative management cycle. It is the improvement opportunities that are already budgeted for and included in the day-to-day operations within the organization. These are day-to-day activities that are covered in the individual's job description and budgeted for in the normal budgeting cycle. Typically, these are problems that need to be addressed without requiring additional budgetary resources and improvements or refinements to the present operating systems that are usually minor in nature. Example: Developing repair routings, updating procedures, developing new commercials, training new employees, updating the operating manual, using a newly developed faster computer chip in the present product and treating it as a new product, selecting new suppliers, rearranging the department, preparing annual reports, etc.

The combination of separating improvement opportunities that will not result in direct value added to the organization's overall performance and removing improvement opportunities that are covered in the normal budgeting cycle will typically eliminate between 60% and 90% of all the improvement opportunities generated by first-level managers and employees. Typically, it will account for 40% to 70% of the improvement opportunities identified by middle management

and the executive team. It is absolutely essential that we coordinate these improvement activities with the work that's being done to redesign the organization's IMS very early in the cycle. We have been surprised at how many times an organization has realized that they didn't need to redesign the present IMS. What they needed to do was to correctly use their current IMS.

The Potential IMS Improvement Identification

Because this workbook was written to help its reader evaluate if their organization's IMS could be modified in order to improve organizational performance, we have greatly simplified the amount of effort required to complete Process Grouping 1 – Opportunity identification. We will make the basic assumption that Shaun O'Reilly, a project manager for Aid4u Products, identified upgrading the Aid4u Products IMS as a potential improvement opportunity and has taken on the responsibility of being the champion of this project after reading an article in the June *Quality Progress Magazine* entitled, "Now is the TIME (Total Innovation Management Excellence)" by H. James Harrington. This stimulated his curiosity and interest so he listened to a half-hour webinar entitled "Using the ISO56002."

After just a very short search on the Internet, Shaun was surprised at the amount of activity going on to upgrade the new product development cycle and the IMS. Previously he was unaware that there was a professional organization called "International Association for Innovative Professionals" organized by Brett Trusko, and that the International Standards Association ISO had formed a technical committee, TC 279, set to writing international standards 56000 Innovation Management Systems Set. Mr. Frank Voehl and Rick R. Rick Fernandez are in charge of the US delegation to this international technical committee.

Tollgate I

Tollgate I is a high-risk Tollgate. All that management has available to make a decision to go forward is a potential improvement/innovation opportunity that an employee and a minimum of one manager are interested in investing their discretionary resources to determine if it can be developed to take advantage of this opportunity.

Decisions at this Tollgate I level are often highly based upon employee commitment, management judgment, and past experience. Basically, Tollgate I approval provides resources for a group of one or more individuals to investigate the improvement opportunity and determine if the organization should take advantage of it and if it would result in adding value to the organization and/or its stakeholders.

The sponsors of the improvement opportunity need to provide the following information in order for a decision to be made related to continuing work on taking advantage of the improvement opportunity (see Figure 2.7).

1. A description of why/how the proposed activity is an improvement opportunity.
2. What would need to change to take advantage of the improvement opportunity?
3. What would be the impact on each of the stakeholders if the opportunity is taken advantage of?
4. Does the sponsoring team have reasonable ideas on how to take advantage of the opportunity?
5. How much resources are required to advance the project to Tollgate II? Who will need to supply these resources and are these resources available at present time within the organization?
6. What is a general timeline of how long it will take to advance the program through the value proposition approval activity?
7. What is the potential value added from the opportunity if it is implemented?
8. What are the estimates of what the implementation costs could be?
9. Who would be responsible for managing the activities and held accountable for the results?
10. What parts of the organization would be impacted if the project is implemented?

Figure 2.7 The sponsor's role.

In conducting Tollgate 1 – Opportunity Analysis, a very rough draft of the return-on-investment analysis is prepared. The first part of that analysis is determining what should be changed. The next part is to analyze what the one-year added-value content that will be generated if it is changed.

We like to develop the maximum value-added that the change could result in and then estimate conservatively how effective the change would be. For this, we assume the change will be between 50% and 75% effective. Very few changes are 100% effective with no negative impacts. Now make an evaluation if it is worthwhile pursuing the opportunity any further.

If the decision is made to continue, make an estimate of the dollar amount of resources (employee time, materials, equipment, etc.) required to investigate and develop a way to take advantage of the opportunity. The employee time should include the individual, team members, management reviews, support service personnel, assembly personnel, etc. Once you have estimated the total dollar amount of resources required to develop a recommended action, double that value because we find these estimates usually are off by 80% to 200%.

You are now in a position to make a very rough estimate of the percentage return on investment even though you haven't estimated how much it will cost to implement the change because the change has not been identified at this point in time. As a result, we question going forward with any evaluated opportunity that doesn't calculate out at a minimum of 400% return on investment based upon the costs of investigating the opportunity, preparing an action plan, installing the change, providing training, maintaining the change, and the impact of any negative conditions as the change may occur.

The exception to this is improvement opportunities that are related to safety, in these cases the risk analysis needs to be used to determine if the opportunity will be dropped or continued. You may note that we are using the term improvement opportunity, rather than innovation opportunity. We like

the term improvement opportunity because unless a change is positive it cannot be an improvement but you can have innovative opportunities that present negative or no value-added.

Between 70% and 80% of all the initiatives will require only the immediate manager's approval to progress through to Tollgate II in the cycle. These are usually situations where the individual recognizing the opportunity or re-arranging assignments within the department can develop an approach for taking advantage of the opportunity and prepare a value proposition that will be presented at Tollgate II using resources that have already been included in the budget to support that type of improvement. Remember that 95% of all patents are obvious evolutionary changes or very minor changes.

Usually, when resources outside of the department are required to develop a way to take advantage of the opportunity and prepare a legitimate value proposition, the decision would be made by a group of affected managers.

Opportunities where a major investment will be made, which is not part of the normal job assignment of already-budgeted activities, should have been approved by upper management and reflected in the departmental budgets. It is estimated that this would be less than 5% of the opportunities identified.

Before you can consider making any changes to the present innovative management portfolio you need some sound reasoning as to why you put this critical organizational process at risk by making a change that may or may not have a positive impact on the organization's key performance indicators (see Figure 2.8). Some of the key information that will need to be collected is shown in the figure.

1. You need to understand what processes and parts of the organization that areinvolved in the current IMS. A flow-diagram of the current IMS process is a good starting point for this activity.
2. A comprehensive list of all of the organization's key performance indicators and their projected actual performance to goals and objectives for the next three years. If there is just the current level of change occurring in the innovative management system?
3. One of the outside factors that could impact the ability of the organization to meet its goals and objectives?
4. Which of the goals and objectives are impacted by innovation and how are they impacted?
5. What programsare underway and approved to address these issues? Are they adequate to eliminate the exposure?
6. Would the changes to the innovative management system impact the total organization or just certain functions within the organization? For example, if new, innovative principles are defined for the organization. It applies to all parts of the organization from finance to research and development to maintenance to sales and post-sales services.
7. What percentage of resources in each of the natural workings is devoted to creativity/innovation activities today?
8. Is it more effective to not be a developer of a new concept, but to wait so the concept is proven as the customer desired and then come out with a new output that eliminates the problems that the originator had in its initial design?
9. Define what type of innovation and the complexity (levels) of the innovative solutions will be needed to close the gap between predicted organizational performance and targeted goals and objectives.

Figure 2.8 Tollgate 1 requirements.

Process Grouping 2 – Opportunity Development

Surprise, surprise, surprise! In over 60% of the activities that go on in the innovative management cycle, the opportunity development activities are not the most creative activity that takes place during the cycle. It in the level I and level II complexity innovation programs that need to be changed is obvious. The creativity that takes place is how you make the change or how you sell it to your customers. That requires creativity and innovation. In many organizations, the most innovative department is your sales and marketing group, not your product engineering group. That is the reason sales and marketing are often paid better than your engineering team in many cases.

At this point, you have tried to define ways to take advantage of the opportunity. It will point where an opportunity is transformed into an entity. Typically, an individual or team is assigned to look at the many different ways the potential opportunity can be addressed. It calls upon individuals to step away from their daily activities and use their mental capabilities to come up with new and unique solutions. There is a great deal of self-satisfaction and pride generated when the individual or team defines one or more ways to take advantage of a potential improvement opportunity that no one else was able to take advantage of before.

Due to the high degree of creativity/innovation, the complexity of opportunity development, and the scope of the type of outputs that will need to be involved, we have divided this section into three Activity Block Diagrams that are to be presented.

1. Outputs that would be classified as an apparent solution or minor innovations. Based upon reviews and classifications of tens of thousands of patents, this accounts for over 95% of the patents issued.
2. Outputs that would be classified as major innovations. This accounts for just over 4.7% of the patents.
3. Outputs that would be classified as new paradigms or discoveries. This accounts for 0.3% of the patents issued.

As we begin Process Grouping 2 – Opportunity Development, we have a mission statement and approval to form a team that will be responsible for collecting sufficient data so that they can develop one to four potential ways to take advantage of the assigned opportunity. Also, a group leader and a project sponsor have been assigned to be responsible for coordinating the team's activity and keeping the project on schedule. Included in the mission statement was the minimum value-added return on investment that was required and the maximum cycle time that would be devoted to coming up with the answers and preparing a value proposition.

It is during Process Grouping – Opportunity Development that the magic occurs, and creativity is the most valued trait that the team members could have. The data collected in Process Grouping – Opportunity Identification is also made available but it is usually not sufficient to define the root cause that created the opportunity. The objective of this process is to develop a minimum of two, and preferably three or four, options that could be implemented to take advantage of the defined opportunity.

An Innovation Project Team (IPT) is often formed with the responsibility of collecting the information and knowledge that will allow them to creatively meet the assigned objectives. Although this team has a very narrow objective, the participants usually continue with the project through Phase I – Creation and Phase II -Preparation and Producing if the project is approved to be added to the organization's portfolio of active projects.

EXERCISE ACTIVITY 2.4: CONDUCT A MATURITY GRID INNOVATION SYSTEM DRIVERS ANALYSIS

Steps to follow:
After an IPT has been formed, it is trained to use the necessary innovation tools and methodologies. Some of their activities include the following:

1. Define how success could be measured, how to measure it, measure its current status, and set goals for value-added content. These goals should be in line with the goals defined in the approved objectives.
2. Develop a team mission statement and team charter that is approved by the appropriate personnel.
3. Brainstorm to develop a list of what needs to be done in order for the team to meet their objectives.
4. Define and understand the knowledge areas that could influence the suggested changes.
5. Evaluate to determine if organizational change management concepts need to be formally applied and if so how and when.
6. Develop their data collection plan and implement it after they have the approval of the managers whose employees will be affected. They must be sure to collect a large enough sample to convince themselves and management that they feel comfortable making decisions based on the data presented. Be sure that the team has one-on-one discussions with the individuals who will be affected.
7. While the data is being collected, we find it is a good time to do a strengths/weaknesses analysis of the opportunity. Remember for every positive thing that is done, there is a negative thing that will occur that can offset the positive action.

8. Don't wait until all the data is collected before you start analyzing it. Too often you will be surprised that the data being collected was not what you thought it would be. By analyzing the data as it comes in, you can recognize the problem early in the cycle and it will allow you time to collect a different set of data without delaying the project. As the data comes in, it should be validated and entered into the IPT Knowledge Bank.
9. Using the information in the knowledge bank, brainstorming the team's own experience, and creative ideas that come up during the team meeting, should provide the IPT enough knowledge to identify the factors that are restricting the opportunity from performing better (identify root causes).
10. Once the restricting factors are identified, tools and methodologies similar to the 76 tools listed in Appendix D will enable the team to develop creative and innovative ways to take advantage of the opportunity.
11. The IPT typically uses a lawyer to review the proposed action plans and determines what needs to be done to not infringe on another organization's patents/copyrights and to protect the knowledge assets that the organization has. The earlier you can do this in the cycle, the better.
12. Once IPT defines one potential action plan, they should immediately turn around and use a different set of assumptions to create second and third alternative solutions (Example: What do we have to change to keep the same profit margin if the sale price drops 8%? Or what would change if the first customer ship was next to Easter in place of the next Fourth of July?). This often drives to a fourth alternative that takes advantage of the best innovative ideas in the three previous ones.
13. Using the Opportunity Selection Box to select potential innovation opportunities, an opportunity that is located in the upper left-hand quadrant indicates value added is high and the resources required to take advantage of the opportunity are low. An opportunity classified as having this combination is usually a very good innovation opportunity. An opportunity located in the lower right-hand quadrant indicates low value-added and will require a large resource investment in order to take advantage of the opportunity. This is normally a bad situation. The last two quadrants are classified as "Maybe" and require more discussion before a decision is made to continue or table the proposed opportunity. Extra consideration is often given to opportunities that have a direct positive impact on the organization's customers/consumers (see Figure 2.9).

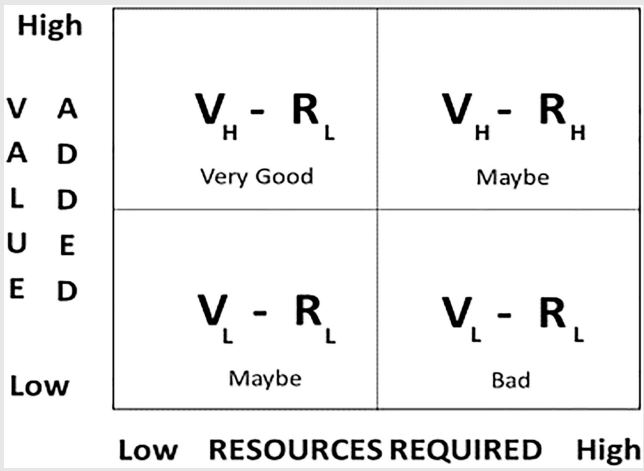


Figure 2.9 Opportunity selection box.

End of exercise

This may look like a very simple way of classifying innovation opportunities and it is if you keep the estimate considerations very simple and straightforward. Using the same system at the business case analysis process grouping level requires a great deal of thought and consideration related to what value-added is. In most estimates that we have seen, they only talk about upfront tangible savings, ignoring the negative impacts that the opportunity may create and often not considering its impact upon all of the stakeholders. For example, what is the value-added of the change in design that eliminates the need for two employees at a salary level plus variable overhead of $25,000 per year?

Most estimates would say the value-added content would be a savings of $50,000. Even that's wrong because there are two types of overhead; fixed overhead and variable overhead. When you let the individual go is savings on the variable overhead, but the fixed overhead is just distributed to the workers that are still engaged in the company. So, taking just fixed overhead into consideration, the actual savings would be $38000 per year. Now, consider what would be the acquisition cost later when you needed to hire a new employee. That could actually be somewhere between $10 and $20,000. Trapping your real value added to approximately $25,000.

Now let's consider what the negative impact is on the employee who is now without a job. That employee's negative impact on the economy? Some of the very advanced companies are now considering total impact on all stakeholders in their decision-making processes but we are estimating that is less than 0.1% of the organizations in the United States.

Process Grouping 2: Opportunity Development Activities for Apparent or Minor Opportunities

Typical activities that are included in Opportunity Development for Apparent or Minor Opportunities are defined in the Activity Block Diagram list in Figure 2.10 and the Activity Block Diagram in Figure 2.11.

During this activity, a number of potential problem solutions or improvement opportunities will be identified, analyzed, and prioritized. Also, during this activity, steps are actually taken to protect intellectual capital (patent new and unique concepts or check to see that there are no patent infringements).

2.1 Form Opportunity Development Team.
2.2.Develop team charter, project objectives, innovation goals and operating ground rules.
2.3 Develop data collection plan.
2.4 Implement data collection plan.
2.5 Analyze data to define root cause and/or improvement opportunities.
2.6 Develop an action plan to meet the teams and innovation goals.
2.7 Define other approaches that could be used.
2.8 Select the best two approach.
2.9 Input into Knowledge Warehouse.
2.10 Develop action/implementation plan.
2.11 Update knowledge warehouse.

Figure 2.10 Activity block diagram list for apparent or minor opportunities.

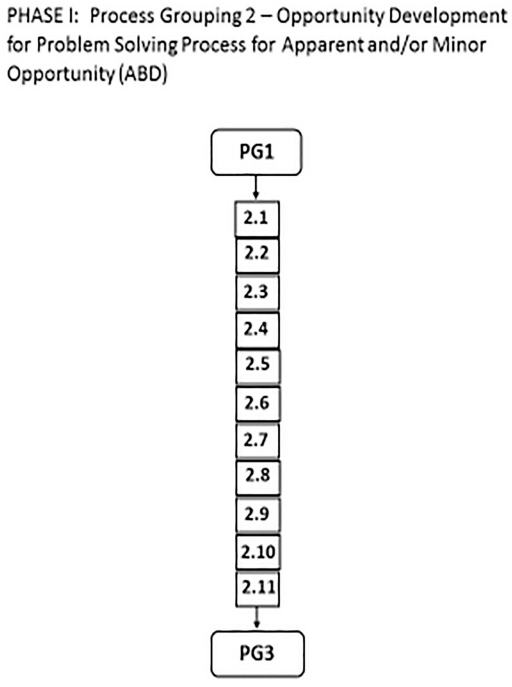


Figure 2.11 Process Grouping 2 – Opportunity development activity block diagram for apparent/minor opportunities.

Process Grouping 2: Opportunity Development Activity Block Diagram for Major Opportunities

See Figure 2.12 for detailed information related to each activity in Process Grouping 2 – Opportunity Development for Major Opportunities Activity Block Activity List.

Note: From this Activity Block Diagram for Process Grouping 2, we have not included the details related to each block on the Activity Block Diagram due to the book page-size limitations and to make it easier for you to read

Process Grouping 2: Opportunity Development Activity Block Diagram for New Paradigms and Discovery Opportunities

Less than 0.06% of items classified as innovative can be classified as unique new discoveries and 0.24% in new paradigms. The majority of the organizations using an IMS will never produce an output that can truly be classified as a discovery. Most innovative outputs or processes are developed based on previously known and understood concepts that are improved upon or slightly adapted to a new situation. Discovery-classified innovations often occur as a surprise or as the result of something else that is being developed. In other cases, a concept is accepted by a research group to

2.30. New design is the desired opportunity.
2.31. Form an Innovative Opportunity Development Team.
2.32. Define performance/physical desired changes.
2.33. Set magnitude of desired changes.
2.34. Define technology changes from present design.
2.35. Develop theoretical design concepts and evaluate.
2.36. If the evaluation is positive, continue the process.
2.37. Design concept failed, repeat 2.34.
2.38. Build laboratory models to evaluate theoretical concepts.
2.39. Will this design meet product requirements?
2.40. No – Go back to 2.34.
2.41. Yes – Set aside as a potential approach.
2.42. Update knowledge management warehouse.
2.43. Do you have a minimum of one additional alternative approach?
2.44. Yes – Are there any patent infringements?
2.43. Do you have a minimum of one additional alternative approach?
2.44. No – do you have a minimum?
2.45 Are there any patent infringements?
2.46. Yes – Can we design around the infringement
2.47. Can we negotiate using other organization's patent?
2.48. No – Infringement patent problem
2.49. No – Update knowledge warehouse and terminate project/program.
2.50. Does our productivity patentable ideas?
2.51. Yes – Apply for patents for unique ideas.
2.52. Yes – Patent requests granted.
2.53. Update knowledge management warehouse.

Figure 2.12 Process Grouping 2 – Opportunity Development for Major Opportunities Activity Block Activity List.

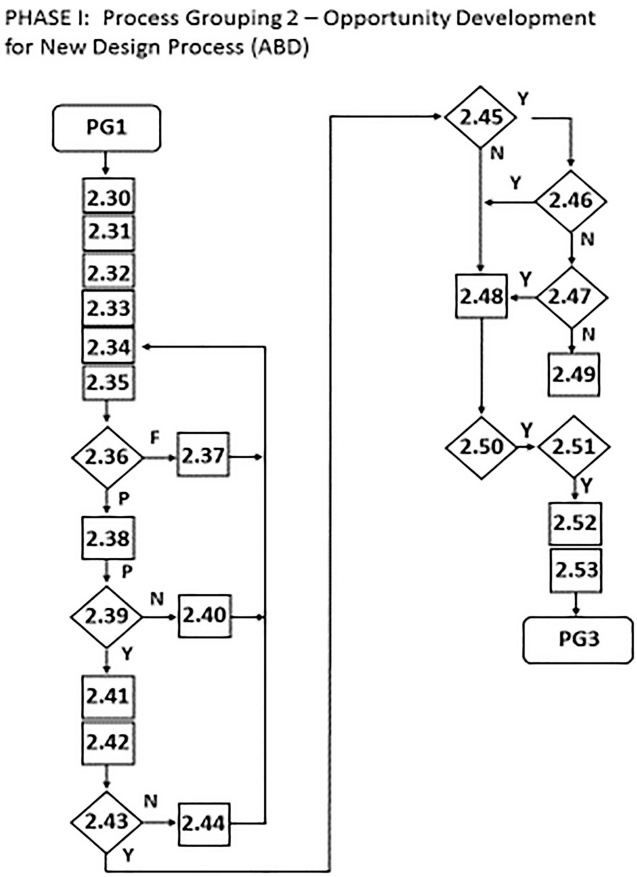


Figure 2.13 Process Grouping 2 – Opportunity development for new design process.

evaluate and determine if it will lead to something new and different from what we have today. These discovery innovations are the result of things like (Figure 2.13):

- I forgot to put it in the refrigerator last night and it tasted so good this morning.
- I mixed the wrong chemicals together and saw how sticky it was.
- I forgot to turn off the electricity and look how bright it glows.
- The odor in the room got so strong I couldn't stand it and all of a sudden, my migraine headache went away.
- I ran over it with the truck and it didn't even dent the can.

All of these examples could be classified as unexpected or error-related results. Some of these discoveries are related to targeted opportunities. Targeted opportunities are opportunities that have been identified but will require the creation of a new and unique method or approach in order to take advantage of the opportunity. Often, these are related to healthcare situations. For example, some of the targeted opportunities that we have today:

- Develop a cure for Alzheimer's disease.
- Develop a cure for old people losing their balance.
- Define a worldwide management system that will eliminate wars.
- Develop a system that will eliminate the need for electrical wiring within the house.
- Develop a system that will transfer information directly into the brain without using any of the senses.

Because this level of innovation is successful. Less than 1% of the time we did not include the details in this workbook. For those of you that need details related to breakthrough innovation. Typical activities included in Opportunity Development for New Paradigms and Discovery Opportunities are defined in the Activity Block Diagram and identified in the book *Managing Innovative Projects and Programs* by H. James Harrington and Sid Ahmed Benraouane, published by Taylor & Francis Group. 2023

Summary of Opportunity Development

It is important to point out that the tools we are discussing in this book are approaches that can be used in clarifying an innovative problem. They are not tools that will generate innovative solutions. They are tools that help you ask the right questions, but it isn't the question that produces the innovation. It is the answers to the questions that generate an innovative solution to an innovative opportunity.

Process Grouping 3 – Value Proposition

Once you have developed a potential solution, the next question you have to ask yourself is, "Is this potential solution value added to the stakeholders?" If you come up with a number of potential solutions, you need to evaluate which solution creates the most value-added per investment. Again, this Process Grouping requires a great deal of imagination, estimation, and research. It relies heavily on the judgment of the individual defining the potential solution. This process evaluates the creativity of the individuals developing the potential solution. Failure at this point in the system often results in reevaluation of the opportunity to see if it should be terminated or at a minimum sending it back to develop a new and more comprehensive potential solution.

The primary outputs from Process Grouping 2 – Opportunity Development are as follows:

a. Mission statement
b. Successful completion of Tollgate 1
c. Resources approved up to Tollgate II
d. Normal functional improvement opportunities are classified and scheduled

e. High-value opportunities identified with management agreement
f. Knowledge management system updated
g. Potential innovation opportunities identified and roughly qualified
h. Start of a database related to the project

A value proposition is a document that defines the benefits that will result from the implementation of a change or the use of an output as viewed by one or more of the organization's stakeholders. A value proposition can apply to an entire organization, parts thereof, customers, products, services, or internal processes. It usually does not consider other ways that the resources could be used to get a higher value-added.

Inputs to Process Grouping 3: Value Proposition

Some of the inputs to Process Grouping – Value Proposition include an updated knowledge management system, a project mission statement, organization values and principles, the opportunity development team's records and engineering notebooks, and knowledge protection results.

Although the term "value proposition" is used freely in the modern business lexicon, the truths about value propositions are (1) that they are generally not well thought out and executed, and (2) the process one follows to prepare a quality value proposition is generally misunderstood. The value proposition is the specific, quantified, and identified opportunity to improve business results. In the discipline of innovation, they are the justification for action or inaction. They are an opportunity for the innovator who may be intimidated by the "organization" to be able to prepare a document outlining the value of an idea, process modification, or hunch. The creation of an opportunity center (innovation center, creativity center, etc.) is an effective mechanism to move the idea from the rank and file to the organization. The value proposition is the mechanism for identifying the true potential of the opportunity. The opportunity center is responsible for stimulating and activating the innovation activities for all the organization's employees. This is accomplished by providing training on problem-solving, creativity, and innovation methodologies to the organization. The opportunity center personnel provides one-on-one and group mentoring with the objective of helping employees clarify and develop their ideas. They provide guidance and help the individual and organization to transform these concepts into tangible results.

In developing a traditional value proposition, one generally understands that performance issues have been identified and are driving the development of the proposition. Most organizations have some limited ability to develop a value proposition, even if they do not call it such. Without this ability, many businesses would not be able to remain in business, since the nature of business requires it to be able to adapt to a changing marketplace.

Some are better than others. The difference between an ordinary organization and an excellent organization isn't necessarily a question of the individual organization's ability to adapt, but to do so at a faster pace than the competition.

Creative ideas/items that provide value-added products, services, and processes to the stakeholders can originate from any part of the organization, not just from a few functions like research and development, marketing, and industrial engineering. Among today's most popular approaches used to identify creative ideas and items is a methodology called "benchmarking," which includes reverse engineering. Due to its popularity and proven usefulness over the last 20 years, we will highlight it as a source of creative ideas/items throughout parts of this book. However, it is important to note that benchmarking results in less than 20% of the value propositions developed in a typical organization. For this reason, it is extremely important that today's organizations' value proposition process takes advantage of all potential sources that can generate creative ideas/items.

Tollgate II: Concepts Approval

At this point in the cycle, a number of action plans have been developed and the team's best option has been selected. Estimations are now based on hard data and prepared by knowledgeable individuals related to the proposed change activities. Improvement opportunities that will require a considerable investment and/or high risk and or critical to the future success of the organization should be presented to the executive team. The other initiatives will be presented to the impacted managers. Those that recommended budget changes should also be presented to and approved by the chief financial officer.

This review focuses on the detail contained in the value proposition. Particularly, attention will be given to leading-edge innovative stations and technology advancements. Key factors to be considered are as follows:

- Customer satisfaction
- Safety requirements
- Return on investment
- Projected technology advancements
- Improvements in output per employee
- Reduced cycle time
- Projected market share
- Improved functional performance
- Improved quality

- Potential new patent and patent infringement
- Competitive advantage
- Levels of risk
- Marketing and sales strategies
- Estimated accuracy of data presented

It's important to note that at this point in the PIC, the projected improvements are primary judgment calls and there is little information related to the cost of change implementation. Although a number of theoretical approaches have been defined related to taking advantage of the opportunity, none of them have had their concepts validated. As a result, there still is a high risk of the recommended change failing to meet expectations and or requirements. Projects that successfully pass this Tollgate are usually ones that the executive team would like to add to the organization's portfolio of active projects.

Frequently at the end of Tollgate II – Concept Approval a project manager is assigned to follow the program through business case analysis. At this point in time, the project is usually not part of the organization's portfolio of active projects but it is a strong candidate to be included in the portfolio in the near future.

As high as 35% of projects that enter Tollgate II are rejected and terminated.

Process Grouping 4 – Concept Validation

By now, you have identified an improvement opportunity, defined ways to take advantage of this opportunity, and evaluated the potential solution to determine if it is value added to the stakeholders. Now two big questions – "Will it work? Will the solution bring about the potential savings as defined in the value proposition?" Failure at this point in the PIC results in a considerable loss of money, time, and human resources. It usually means that the potential project is dropped or at a minimum redirected back to Process Grouping 2 – Opportunity Development. This phase covers all the activities required to recognize potential improvement opportunities/problems, create a potential solution, and validate that the potential solution will address the opportunities/problems.

Process Grouping 4 – Concept Validation – Activity Block Diagram

Typical activities that are included in concept evaluation are defined in the following activity block flowchart (see Figure 2.14).

4.1 – Review team charter and operating guidelines
4.2 – Review the requirements for Tollgate III and for business case analysis procedures.
4.3 – Determine if additional functions need to be represented to the team to complete Tollgate III.
4.4 – Add resources as required with management approval
4.5 – Make a list of data that is required for the business case analysis and for Tollgate III.
4.6 – Analyze all the engineering knowledge base related to the mission
4.7 – Develop and initiate your organizational change management activities
4.8 – Define model configuration for each desired improvement measurement or potential impact to other areas
4.9 – Prepare test plan and prepare software testing programs.
4.10 – Define the number of test samples that need to be evaluated in order to have sufficient confidence in the performance, safety, and reliability of the components when used in the specific application.
4.11 – Order samples of all new technology components and tests key components for performance, function and reliability.
4.12 – Purchasing to order parts and equipment
4.13 – Construct models and laboratory test setups
4.14 – Have an independent observer validate the findings in the test method used to do the evaluation. (Typically, this verification would be done by quality assurance, or product engineering, manufacturing engineering, field maintenance, etc.)
4.15 – Determine if the product will be subjected to any unusual conditions and measure performance. Example: Bombarded by radio frequency, subjected to high or low temperature, subjected to unusual vibration or high humidity environment.
4.16 – Prepare a minimum of one pilot model where all of the interrelated performance parameters can be measured in relationship to each other.
4.17 – Conduct experiments and test runs
4.18 – Each time an evaluation/test is conducted, there are three possible outputs
4.19 – If the concept failed, go back to PG 2.6

Figure 2.14 Activity block flowchart.

During this activity, the proposed change is modeled, allowing new performance data to be collected. Modeling can be accomplished by building an engineering model of the change and subjecting it to a number of conditions (for example, temperature, humidity, vibration, electronic external interference, etc.) The results can be used to project performance, failure rates and/or reliability, and customer satisfaction. Simulation models, both real and virtual, are also frequently used to validate engineering and financial estimates (Figure 2.15).

Summary of Phase I – Creation

We have now completed discussing Phase I – Creation. By now the project team should have two or three potential solutions that need to be separated and evaluated to determine which has the best value added for the organization's stakeholders. It is important for you to understand that this is not the close out of the processes included in Process Grouping 1–4, as there often is a need to go back to collect additional information, to repeat evaluations, or to understand previous evaluations as the IPT goes forward into Phase II and III.

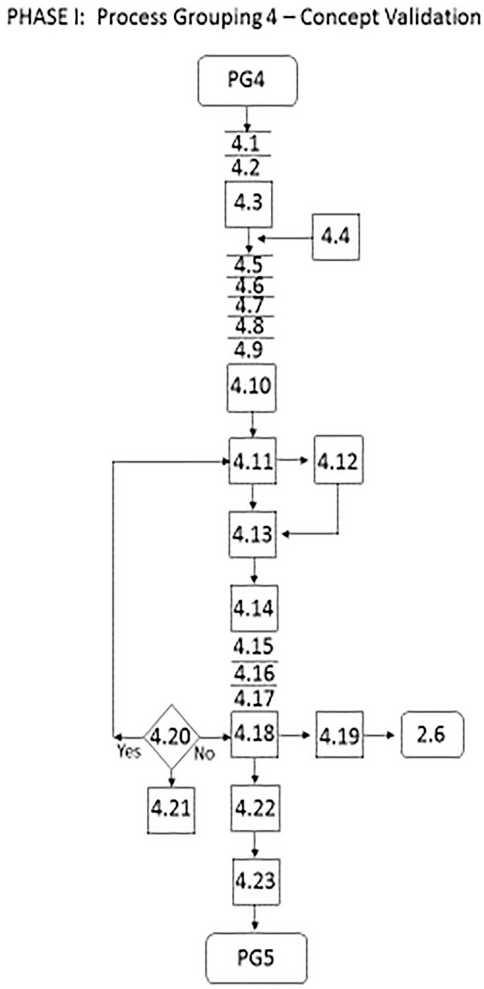


Figure 2.15 Process Grouping 4 – Concept validation – Activity block diagram.

Phase II: Preparation and Producing

With Phase 1 – Creation successfully completed, Phase II – Preparation and Producing begins. At this stage, the initiative becomes an approved project for the organization. Large complex and mission-critical projects are assigned to a project manager and become part of the organization's active project portfolio. The hundreds of minor improvement activities usually referred to as "continuous improvement" projects usually do not have the luxury of being managed by a professionally trained and experienced project manager.

Phase II – Preparation and Producing consists of the following four Process Groupings and tollgate III:

- Process Grouping 5 – Business Case Analysis.
- Tollgate III – Project Approval
- Process Grouping 6 – Resource Management
- Process Grouping 7 – Documentation
- Process Grouping 8 – Production

As the names imply, these four Process Groupings are very much standard activities. Only a few of them require a great deal of imagination and/or creativity. Most of them are type 1 – Obvious Improvements or type 2 – Minor Improvements. This doesn't mean that there isn't a continuous flow of improvement concepts being developed and implemented in these four Process Groupings. Usually, these changes are far less visible than the activities that take place during the four Process Groupings in Phase 1 – Creation. Typically, the projects that are considered major in nature and receive high levels of attention are Process Reengineering projects and/or new software packages that are being applied to one or more of the four Process Groupings.

Many people feel that the creative/innovative cycle is over when they complete Phase I – Creation. This is far from the truth as less than 6% of the total PIC cost is normally expended during all of Phase I. All of Phase I and II is an investment in the future that may or may not pay off. Phase I should have put us in a position where we have a high degree of confidence that continuing the project into Phase II will result in real value-added to the organization, its customers and/or their stakeholders.

The activities that typically occur in the four Process Groupings in Phase II – Preparation and Producing are as follows:

- Process Grouping – Business Case Analysis.

This is where you get approval, financing, budget, performance specifications, human resources, schedules, and executive support for an individual project/concept. It is usually a go or no-go decision activity.

- Process Grouping – Resource Management

This is where you transform a budget into money, people, facilities, and materials required to develop the concept so that it can be produced in the required quantities. This is typically the point where an official Project Manager is assigned and additional staff is added to the IPT.

- Process Grouping – Documentation

This is where the rough notes from the engineering notebook are transformed into engineering specifications that are released as product specifications and requirements. These product specs are then used to document the processes and procedures that will be used to produce the output and control its efficiency and effectiveness.

- Process Grouping – Production

This is where the manufacturing documentation (routings, training procedures, operating instructions, test procedures, build or subcontract decisions are made, equipment is installed, data collecting systems are installed and facilities are set up. It includes the training of the people who will produce the output and the suppliers who provide input to the process so that the process cost is minimized and the external consumer receives output that meets, and preferably exceeds, their requirements and at a price they consider reasonable. The objective is to maximize the value added for all of the stakeholders.

During this phase, the proposed changes are analyzed to determine if they should be included as part of the organization's portfolio of active projects. Once the change becomes part of the organization's portfolio of projects, resources are set aside to support the change process, create the necessary engineering and manufacturing documentation, validate the acceptability of the production outputs through a series of manufacturing process model evaluations, and start shipping to an external customer/consumers.

Tollgate III: Project Approval Supports the Business Case Analysis

Tollgate III and Business Case Analysis are two separate and very different activities.

- Tollgate III – Project Approval focuses on evaluating if the project meets the requirements defined in its mission statement and project plan. It is a very detailed focus on how the project/program will benefit the stakeholders and the probability of it being successful. This should be a detailed focus review on the potentially innovative project/program including an analysis of how the project will impact value-added for all the stakeholders. Successfully completing Tollgate III makes the project eligible to be included in the Business Case Analysis review of all the proposed potentially innovative projects/programs and current activities. Business Case Analysis usually takes place during a different meeting than the one held for Tollgate III.
- Business Case Analysis meetings discuss the merits of investing resources in current and proposed entities. This is usually a high-level executive meeting as it covers a broad range of presently active or approved entities and all of the projects /programs that have successively completed Tollgate III. It is the activity where resource allocation current is assigned to proposed potentially innovative projects. Based on past experience, there are often a number of proposed projects that could produce real value-added results but are not approved due to resource limitations and/or resource assignment to other projects that have a bigger impact on the organization's present and future status.

A comparison will be made between the proposed change and the resources that would be expended on current products and previously approved projects. Even currently approved entities that are being shipped to customers may be drastically cut back if the resources plan for the current entity is better utilized by applying it to the potential innovative project. This is a no-holds-barred meeting because those projects that successfully complete the Business Case Analysis will drive the future of the organization as well as maintain the current revenue stream. Great care needs to be taken related to the product selection and the announcement timing to keep ahead of the competition or in many cases just to maintain the status quo.

Process Grouping 5 – Business Case Analysis

This is where you get approval for financing, budget, equipment, performance specifications, human resources, schedules, and executive support for an individual project/concept. It is the point where the project becomes an official part of the organization's portfolio. It is usually a go or no-go decision activity.

Usually, there are a series of meetings held where the Business Case Analysis is reviewed for each proposed project/program. There also is a review of the status and value-added content for each of the major active projects/programs. Then a meeting of the executive team reviews proposed new and present active projects/programs to determine the best use of the organization's resources. This meeting can result in the present projects proposed being terminated or being funded and added to the list of active projects/programs in the organization's portfolio.

Inputs, Activities, and Outputs of Process Grouping 5 – Business Case Analysis

- Input(s) Process Group 5:
  - Portfolio Development Leader
  - Portfolio Development Team Members (if appropriate)
  - The Business Cases (Proposed Projects) To Be Analyzed
  - Related information from the Knowledge Warehouse
  - Project/program charter, goals, and objectives
  - Results from concept validation and Tollgate III
- Activities in Process Group 5
  - Business Case Validation
  - Validate the accuracy of projections
  - Document Performance and Project Resource Requirements for Each Project/Program
  - Analysis of Business Cases that do not Require Additional Resources
  - Select and Use a Set of Criteria Aligned to the Organization's Mission,

strategic plan, and long-range objectives to Classify and Rank the Business Cases
- Defined high and major-risk areas and associated mitigation plans
- Determine which Classification Model to Use – Qualitative, Quantitative, or Blended
- Review of present portfolio projects and programs

■ Output(s) from Process Group 5:
- An Executive Committee reviews and approves a Ranked-Ordered List of Projects and Programs based on their Potential Added Value /impact.
- The organization's portfolio is adjusted
- Budgets are adjusted to reflect changes in portfolio and current activities

As part of a typical Business Case Analysis cycle, each function should have submitted a set of business cases that they would like to start during the next business cycle (Note: For details, see the two books – *Value Proposition Development* and *Business Case Development,* published by CRC Press). On some occasions, the functional units submit projects/program business cases for inclusion in the active approved activities within the organization between budget cycles. In these cases, the Portfolio Development Team handles them as a special case.

These situations are discouraged but in today's organization with a very fast-changing environment, it is practically impossible to eliminate these special evaluation cases and still have the organization function effectively. We try to avoid as many of these cases as possible as they can become very time-consuming and costly. Typical ones that are considered are reactions to the competition's unsuspected release of the new advanced innovative product that obsoletes the organization's outputs.

Based on our personal experiences during a budget cycle, a number of improvement opportunities are identified that have not gone through the Value Proposition Development stage or the Business Case Development stage either. Often it is not practical to ignore these improvement opportunities and as a result, the Portfolio Development Leader will need to work with the individual functional area that is recommending or "nominating" these improvement opportunities to, at a minimum, prepare the data that is required for a business case so that the improvement opportunity can be fairly considered along with the other business cases. Often these last-minute improvement opportunities actually turn out to be "pet projects" sponsored by key executives within the organization and ignoring these key inputs could be politically "sensitive" and detract from the organization's potential performance.

Unfortunately, these improvement opportunities have a tendency to increase the length of the budgeting cycle and, as a result, should be discouraged whenever possible. In any case, no project/program that impacts the budgeting cycle should be considered unless it has an executive

sponsor, a projects/program leader (champion), a sound resource requirement, and an estimated value-added analysis complete and submitted with the request.

The Portfolio Development Leader and his/her Portfolio Development Team will focus their attention on classifying and ranking the proposed projects /programs business cases to develop the prioritized list of potential projects that will be considered to make up the approved portfolio.

Business Case Validation

During Tollgate III, the IPT should review each proposed project/program to ensure its business case is well-developed and includes practical and realistic estimates related to its goals, performance objectives, timing, and resource requirements. At a very minimum, realistic goals, performance objectives, timing, and resource requirements must be documented or the project/program should not be considered by the Executive Team for being included as an active project within the organization.

Document Performance and Project Resource Requirements for Each Project/Program

We find that while the Portfolio Development Team is reviewing the Tollgate III, individual project and program business cases are an excellent time to prepare a list of all the projects being evaluated and record the projected impact on the organization's performance and the resource consumption that is projected to happen. We also suggest you record the estimated implementation time and any risks that the group that prepared the business case defined as impacting the project/program. This provides an effective bird's eye view of all of the proposed projects/programs being evaluated.

Business case analysis is an evaluation of the potential impact a problem or opportunity has on the organization to determine if it is worthwhile investing the resources to correct the problem or take advantage of the opportunity. An example of the results of the business case analysis of a software upgrade could be that it would improve the software performance as stated in the value proposition, but (A) requires 5% more test processing time, (B) it would decrease overall customer satisfaction by an estimated two percentage points, and (C) reduces system maintenance cost only $800 per year. As a result, the business case analysis did not recommend including the project in the portfolio of active programs. Often the business case is prepared by an independent group, thereby giving a fresh unbiased analysis of the benefits and costs related to completing the project or program.

Summary of Process Grouping 5 – Business Case Analysis and Tollgate III

During these two activities, you should now have proposed opportunities to determine how the organization's resources should best be utilized. Approved projects should have detailed project management packages prepared for them. Projects that successfully complete this analysis are usually funded through the first customership and become part of the organization's portfolio of active projects. To get a better understanding of the business plan analysis activity, we recommend reading *Effective Portfolio Management Systems* published by CRC Press, 2015.

Process Grouping 6 – Resource Management

As we start Process Grouping 6 – Resource Management the executive team and the Board of Directors have agreed that a specific set of resources have been committed for the development and implementation of each of the approved projects/programs listed in the organization's portfolio of active projects. Typically, these resources are as follows:

- Human resources,
- Financial resources,
- Floor space resources,
- Equipment Resources,

These allocations do not mean that the resources and skills are now available to be assigned to these approved projects. It's like parents telling their daughter that she can go to the dance but no one has agreed to take her yet. It is now her responsibility to go out and scavenge an invitation from a boy who has a driver's license. This is where you transform a budget into the money, people, facilities, and materials required to develop the concept so that it can be produced in the required quantities.

Due to the unique processes needed to fill the requirements, we will present unique Activity Block diagrams for each of the following types of resources (see Figure 2.16).

- Human Resources (Staffing)
- Facilities Resources
- Financial Resources
- Equipment Resources
- Floor Space Resources
- Facilities Setup Resources

Figure 2.16 Types of resources evaluated for assignment.

This is typically the point where an official Project Manager is assigned and additional staff are added to the Innovative Project Team (IPT). During this activity, the resources that are required for the approved project are put in place.

In small and startup companies financing usually becomes a major problem. Initially, personal funding is used, then family funding, angel funding, and borrowing from banks are all legitimate sources.

People resources also present a problem for both the small and large companies. Although there are sufficient people out of work today to fill all the available jobs, there's a big shortage in fields like product engineering, programming, and manufacturing engineering. Finding the right suppliers at the right price that can produce the correct item, and do it on schedule in small lots is another problem that an organization faces during this activity. The last major item addressed in this activity is facilities. Not having the right equipment and/or the floor space required to support the output is a problem that must be addressed early in the product cycle.

Inputs to Process Grouping 6 – Resource Management

The following is a list of typical inputs that are used during Process Grouping 6 – Resource Management Process Grouping 6.

- Output from Tollgate III,
- Present budget,
- Entity objectives
- Key measurements.
- Personnel status
- Facility utilization analysis
- Financial reports
- Equipment utilization
- Certified supplier list
- Relevant information in the knowledge warehouse

Process Grouping 6 – Human Resource Staffing Activity Block Diagram

Of all the problems facing a new innovative project, the availability of qualified human resources is often the number one problem followed very closely by financing, particularly in smaller organizations that do not have deep pockets. Let's look at the situation related to human resources. This can be a twofold problem:

1. You could have too much work that needs to be completed for the number of employees you have available to do the work.

2. You can have enough employees to do the work but they do not have the skills required to do the work.

Now, at the completion of Tollgate III the organization has authorized the project team to use the resources they require to complete their assignments successfully. But, and that's a big "but"! Although the human resources have been approved, most of them are not presently assigned to complete the project. Experienced project managers will have developed their schedule taking into consideration the amount of time required to bring the required staff on board and get them trained. We've seen projects where the delay in requiring approved staff has caused a three-month project to slip six months.

For this reason, it is imperative that your staffing process flows need to be well-documented, evaluated, and streamlined. Minimum and maximum staffing times need to be well understood by any individual who is managing an innovative entity during this development and implementation cycle.

> Until you are fully staffed for the point you are in the project development and implementation plan, you are driving a 6-cylinder car that only has 4 cylinders working and the executive team cannot understand why you're not keeping up with the rest of the pack.
>
> **H. James Harrington**

Process Grouping 6 – Facilities Resource Management Activity Block Diagram

Facilities Resource Management includes providing the correct amount of space, utilities, layout, and equipment that the project requires, and making maximum effective use of the resources that the organization has already acquired. It has to include the space for both support and production facilities including warehousing and storage. Facilities are often a very important consideration when it comes to determining what will be produced within the organization versus subcontracted or procured. This is a resource that expands as the approach is being developed and produced and then shrinks down as production falls off and new entities are phased in.

We have subdivided Facilities Resource Management into:

- Floor Space Resource Management
- Equipment Resource Management.

Equipment Resource Management Activity Block Diagram

- Equipment resource management includes the selection, installation, utilization, and disposal of all office furnishings and equipment, mobile

equipment used by the organization, tools, machinery, computer equipment, and communications equipment. It does not include basic utilities like electricity, heating, and cooling.

Process Grouping 6 – Financial Resources Management Activity Block Diagram

The availability of human resources is equally as important to the success of a potentially innovative project/program as the availability of the required financing. In startups and small organizations, the lack of sufficient financial resources turns out to be a major roadblock to the project's success. Even in large successful organizations, financial resources must be addressed and efficiently managed. Basically, when we're talking about implementing a potentially innovative project/program, the organization is determining how they will invest their discretionary financial resources.

- Definition of Discretionary Financial Resources: Discretionary financial resources are all of the financial resources that are available when the cost to maintain the present activities is subtracted from the total available financial resources. Discretionary financial resources are typically used to develop new products, pay bonuses, expand facilities, research and development, improvements made to the present organization, and acquire typical items that would be included in maintaining the present activities. It could also include finances required to support presently approved projects and products, pay interest on outstanding debts, maintain current facilities, materials costs, supplier costs, current production/manufacturing costs, maintenance and repair costs, employee salaries, pay dividends, etc

Process Grouping 7 – Documentation

Everybody feels there's too much documentation that they have to do. We are all provided with far more information than we can possibly ever use and much more than we often would want. Still, we are dependent on it to make our decisions. Our paperless office has been replaced with computers that end up providing us with much more data and information than we could possibly read, let alone comprehend. Unfortunately, the project cycle required to transform an innovative opportunity into a value-added reality requires a great deal of communication throughout the entire organization. The bigger the organization, the more documentation that is required. The more and more we learn, the more people we want to share our knowledge with. The more complex the things we are doing, the more need to have more documentation in order to adequately manage the knowledge and information.

Fortunately, today documentation does not necessarily mean mounds and mounds of paper. Most of our documentation is now stored way out there someplace in the Cloud and is delivered to us at the touch of a key. Certainly, in industry our focus on optimizing our business processes requires everyone to perform a similar activity in the same standard way. Unfortunately, transforming a fuzzy opportunity into a value-added reality requires a great deal of standardization.

In many cases, documenting the systems required to make the transformation from a caterpillar (improvement opportunity) into a butterfly (value-added innovative item) is one of the most difficult and resource-consuming activities in the Innovative New Entity Cycle. Typical documents that are developed can be found in your organization's business procedures manual, engineering specifications, production routings and instructions, security manual, safety manual, and sales and marketing instructions.

Document control and document management are key problems that face the world today. Documentation does not necessarily mean mounds and mounds of paper. Most of our documentation is now stored way out there someplace in the Cloud and is delivered to us at the touch of a key. Certainly, in industry our focus on optimizing our business processes requires everyone to perform a similar activity in the same standard way. Unfortunately, transforming a fuzzy opportunity into a value-added reality requires a great deal of standardization.

To get detailed information about the activity block diagrams for the six parts of the document management system go to the book entitled *Managing Innovative Projects and Programs* by H. James Harrington and Sid Ahmed Benraouane, published by Taylor and Francis.

Summary Process Grouping 7 – Documentation

During this activity, the engineering documentation, maintenance manuals, production routings, and job instructions are prepared and operators are trained on how to use them. Packaging and shipping containers are evaluated to ensure that they provide adequate protection for the product. The information collection system is defined and put in place. The project management data system generates frequent status reports to keep the management team aware of the status and point out activities where they need to be involved.

Tollgate IV: Customer Ship Approval

At this point in the process, the entity design should be complete, utilities equipment and space should be set up and operational, and employees should be trained and functioning in the process in accordance with their long-term assignment. The entity being produced should meet all of the engineering, sales, maintenance, legal, and consumer requirements. The last activity in this

sequence is an evaluation to determine that all the conditions required to produce the entity in the projected quantities have been complied with and that the final entity represents the reputation that the organization wants to achieve. This very thorough evaluation needs to be conducted using the normal operating equipment and processes that will be used to produce the entities that go to the external customer/consumer. This evaluation is called Tollgate IV – Customer Ship Approval.

Important note – Customer-centric organizations are very careful to ensure that this Tollgate assessment confirms that the products the organization is shipping are representative of the organization's values, beliefs, and commitments.

Process Grouping 8 – Production

This is where the manufacturing documentation, routings, training procedures, operating instructions, test procedures, build or subcontract decisions are made, equipment is installed, data collecting systems are installed and facilities are set up. It includes the training of the people who will produce the output and the suppliers who provide input to the process so that the process cost is minimized and the external consumer receives output that meets and preferably exceeds their requirements and at a price they consider reasonable. The object is to maximize the value added for all of the stakeholders.

As soon as the product is approved for shipment to the customer/consumer, the manufacturing floodgate is opened. The documentation and estimates are put under stress to meet the initial output demands that occur at the start. The information collection system is initialized and status reports are generated.

At this point in the project, we are deeply committed to our customers and our investors to continue and make the project a success. Typically, with manufactured products, services, and software we have already committed orders from external customers. From an investor standpoint, a great deal of the organization's resources have already been expended with no return on investment. Money that resulted in bigger dividends was redirected to funding the development of this opportunity. To stop shipment at this point in time would require the output to not perform at the level committed to the external customer or a safety problem. As a result, this Tollgate is primarily directed at ensuring that all the "i's" are dotted and all the "t's" are crossed.

During this phase, the output from the process is transformed from items into dollars and cents. It also includes a performance analysis to compare actual results to project value-added to stakeholders. In Phase III there are four Process Groupings and one Tollgate.

- Process Grouping 9 – Marketing, Sales and Delivery
- Process Grouping 10 – After-Sales Service

- Process Grouping 11 – Performance Analysis
- Tollgate V – Project Evaluation
- Process Grouping 12 – Transformation

Process Grouping 9 – Marketing, Sales, and Delivery

Here we have entered a different world. Somehow the sales and marketing activities and culture are uniquely different from the culture in other parts of the organization. During this activity, promotional and advertising campaigns are developed and implemented. Sales strategy and quote approaches are prepared and the motivational compensation packages are designed. Since key systems that are frequently overlooked until a problem occurs are accounts receivable and order fulfillment systems, it's important to understand that the sales cycle is not completed until the item has been received by the customer and the customer pays the organization for the product or service that they received.

During the documentation activities, the marketing and sales plans and strategies were developed. It is during this Process Grouping that the adequacy of the plans and strategies are evaluated, measured, and updated.

Your marketing plan should be directed at including the needs and expectations of the five C's of marketing. They are as follows:

1. Company
2. Customer
3. Competitors
4. Collaborators
5. Climate

The marketing plan should consist of the following ten sections as listed next.

Typical Marketing Plan Table of Contents

1. Markets
   Research, study and understand their current and future markets. Understand your customers' current needs, desires, and direction. Define products and services that will attract new customers while maintaining your present customer base.

2. Competition
   Use competitive intelligence to maintain and expand your market share. Understand the strengths and weaknesses of the competition's offerings through techniques like competitive disassembly analysis and functional

testing. Use techniques like competitive shopping to understand competitive service advantages.

3. Distribution
   Work on developing and expanding distribution. Look for ways to collaborate with other businesses to decrease distribution costs and increase item demands. Focus on reducing cycle time between order entry and delivery.

4. Supply Chain
   Make sure that you are not at the mercy of the wholesaler so that you markup the price without real justification. Certified backup suppliers that provide a degree of risk reduction are critical and can long-cycle time procured items. Continuously assess economics related to internal or external value-added content and costs.

5. Positioning
   Understand how you fit in the market, which provides the means of determining where your potential customers are, what the right approach is, and if you should be using social media more extensively. Analysis of all sales is even more important than analysis of sales made.

6. Promotion
   Promotions help you define and zero in on specific demographics, thereby allowing you to reach more targeted customers. You need to understand the specific characteristics of the individuals using the various platforms.

7. Pricing
   Be sure the price you charge for an item is based on the market, not based on the costs to produce the item. There are some limitation guidelines that are valuable considerations. First, you don't want to exceed the upper side of the item price range in the market. You may want to vary prices based upon individual considerations (for example, if you're selling books, you may want to give a lower percentage decrease in price in November and December, when buying is higher for Christmas, than you use for the rest of the year).

8. Customer Service
   You lose more customers based on poor customer service than you do on inferior products. Customer service, in this case, includes sales engagement, organization-provided installations, call centers, and order processing. Here is a good example, suppose you call the customer support Call Center for software packages, and you are told the wait time

is two hours because there is a heavy backlog. This might make you believe that there are a lot of problems with that product that is causing the backlog so you decide not to purchase it.

It's also important to seek feedback. Make sure you provide ways for customers to review your business. If you have a customer loyalty program, regularly contact customers who have not made purchases in a while to offer discounts or inquire about why they have not visited your business recently

9. Financing
   I personally feel that the first obligation an organization has is to the individuals who finance the organization, with a secondary responsibility to the customer. For innovative products, the biggest concern an organization will have is funding an item for a period of time when there is no return on investment. Continuously reviewing your capital structure is mandatory to maintain an operational organization. It's only when you become financially stable that are you viewed as a successful business in your community and able to build a solid reputation.

10. Consistent Strategies
    Don't treat your strategies and plans as cast in concrete. It's better to think of them as a ball of clay that you are continuously reshaping to stay aware of the business environment and the changing customer needs. Building customer loyalty and increasing sales is the way to a successful business that is rewarding to your stakeholders. This requires a continuing collection of knowledge that is reshaping your strategy and plans. In many organizations, a two-year-old plan is more of a handicap than an advantage.

Sales strategy should be based upon the five S's of sales (see Figure 2.17).

Your marketing plan should include at a minimum the following seven sales items (see Figure 2.18).

- 1) Sell – gross sales. Sales are directly related to revenue.
- 2) Speak – get close to customers. Communicate! Communicate! Communicate with your customers and potential customers. Know them as individuals as well as organizations
- 3) Serve – add the value. Focus on how your item adds value to their organization.
- 4) Save – save costs. Be innovative to reduce your costs so you can reduce your item's costs to your customer. Find the most effective way to use your product at minimum cost and maximum value added.
- 5) Sizzle – extend your brand positive recognition. Focus on maintaining present customers; it is less expensive than finding new ones

Figure 2.17 The five S's of sales.

- 1) Sales messaging
- 2) Sales processes
- 3) Sales managing
- 4) Sales competency and behaviors
- 5) Sales adaption and execution plans
- 6) Sales enablement
- 7) Sales management development

Figure 2.18 The seven S's of marketing.

Last, we have come to the part of the innovation product cycle where the organization has made a major investment in developing and producing the new entity. By now the organization should have positioned itself to the point that the output should be viewed as value added to the potential customers. Basically, we have reached the point where the salesperson has the entity in hand that he can trade with the customer in return for something the customer has that the organization values more than the output they created.

We like to think that innovation occurs when one party has something that is unique and different that they are willing to transfer to a second party for something that the first party precedes as being of more value to them than the entity they are transferring to the second party. Unfortunately, that does not agree with the definition of innovation documented in ISO standard 56000:2019. ISO Standard 56000 in clause 4.1.1 defined innovation as "a new or exchanged entity, realizing or redistributing value."*

Summary of Process Grouping 9 – Marketing, Sales, and Delivery

Most people relate innovation and creativity primarily to activities that take place in Product Engineering and R&D. I will agree that it is a hotbed of creativity. I felt exactly the same way until I took over as CEO of a midsize company and was forced to understand the entire innovative cycle. I personally believe there is more creativity and innovation required in the sales and marketing group than there is in the Product Engineering group.

Promotional campaigns, dealing with individual clients, and the ability to readjust a sales campaign to make it more specific to a client, etc. require a great deal of creativity and ingenuity from the marketer and salesperson. I guess that's the reason that in successful companies the sales and marketing personnel are paid much more than the development engineer.

Years ago we took our production employees off from the piecework-type pay but we were still paying our salespeople based on meeting their quotas. Certainly, working in sales and marketing is challenging, exciting, and rewarding as each sale is a win and winning is the name of the game today. Today's marketers and salespersons live in a very fluid world where they have to be faster than the markets they are servicing or else they will lose ground rapidly. Commission-

based salespeople are highly motivated individuals because their success or failure is primarily based upon their creativity and ingenuity in dealing with their customers. I guess according to the definition of innovative, a new and different item that is produced meets the requirements to be called innovative.

Personally, I feel that a new product that does not have a positive return on investment is not innovative in a for-profit company. If it doesn't have a positive return on investment, it may be a creative product but I question if it is really innovative. I guess if we go with the ISO standard 56002, it would be considered innovative.

During this activity, promotional and advertising campaigns are developed and implemented. Sales strategy and quote approaches are prepared and the motivational compensation packages are designed.

Process Grouping 10 – After-Sales Service Activities

After-sales service includes individuals who man the control center, handle customer complaints, answer customer questions, and provide a line interface between the organization and its clientele. Another key part of after-sales service is a repair center. These two areas have to have the "patience of Job" since they are continuously faced with unhappy customers who just need someone to be mad at. Empowerment is the most useful weapon you can give these people.

After-sales service starts immediately after the customer and supplier have agreed to the terms related to the entity being acquired. The very first step in after-sales service is for the salesperson to explain the experience and the process that the customer will be subjected to in order for the entity to be put to use by the customer/consumer. This process needs to be well documented and the people involved in the process need to be well trained and highly empowered to take whatever action is necessary to satisfy the customer. Studies have proven that customer satisfaction decreases by the square of the number of individuals they have to discuss the problem with before a satisfactory win-win solution is developed.

Sales, marketing, and after-sales services are where the major part of an organization's creativity, innovation, and originality exist. The complexity of dealing with people overshadows the complexity of the most difficult engineering challenge. Each person an after-sales service employee comes in contact with has developed a set of emotions that is unique to his or her circumstances. To make it even more complex, these emotions change almost instantaneously, creating a whole new set of challenges and opportunities.

It's like trying to catch a cloud on a windy day. It is for these very reasons that the sales/service personnel must be much better trained. To relate a personal example, I have just completed writing a book made up of 19 short stories. This is the first fictional book I have written and the publishers I have been using do not handle fictional-type books. So after a number of

discussions, I decided to hire a firm that helps individuals self-publish a manuscript. I finally selected one that was highly recommended by a number of different organizational assessment firms on the Internet.

Over a period of eight days we made four different phone calls to the publisher and each time we went through the same process:

- Step 1 – press 1, if you've got a problem with accounting.
- Step 2 – press 2, if you want to find out the status of your book.
- Step 3 – press 3, if you want to talk with someone in our creative Commerce Department.
- Step 4 – press 4, if you would like to talk to someone about our products.
- Step 5 – press 5, if you would like to listen to a recording describing our services.
- Step 6 – press 6, if you want to order some more of a book we have published.
- Step 7 – press zero, if you want to talk to a specific individual and don't have the extension number.

I chose to press 4 and after it rang 8 to 10 times, I heard a very soft voice saying "I am Mary Jones and I am the lead author's representative at company ABC. I am presently talking with another very important author but your call is important to me so please leave your phone number and I'll call you right back." She never did.

Eventually, I gave up on trying to contact a representative from the organization and was able to find Mary Jones' email address. One day after I sent my email to her, I received a phone call explaining that she was very sorry she had not reacted to my previous contacts but she had been very busy and hadn't had time to listen to any of the messages that were left on her telephone.

Well, that should've been enough to convince me not to do business with this organization but she had a sweet voice and took time to explain in detail the services they provided. She convinced me that I did not know enough about self-publishing to do it myself and that their promotional staff had contacts that would get my book reviewed in many key publications, almost guaranteed that it would be in the top 20 books. To make up for some of the inconvenience, she agreed to reduce the processing costs by approximately 25%.

We agreed and I immediately sent them a copy of my manuscript. About two days later I received a bill from them, but they forgot to deduct the 25% that Mary Jones had agreed to. I got a hold of Mary Jones again and she assured me she'd take care of it, within another two days I received a corrected bill indicating that they had already deducted the full amount from my credit card account and they would be forwarding to an organization the 25% reduction.

This left me wondering how they could do this because I had never given them my credit card number and/or authorization to take money out of the credit account. On closer study, I realized that the credit card number that they used was not one that I recognized. After a discussion with their accounting

department, we realized that they had used someone else's credit card number. They wanted me to give them information related to one of my credit cards so they could process the billing correctly. Needless to say, it was time for me to look for another publisher. I believe this publisher is a good publisher but they just had bad after-sales service.

Process Grouping 11 – Performance Analysis

During this activity data is collected to determine if the actual results meet or exceed the commitments in the business plan analysis stage. A post post-mortem should be conducted before the project is closed out. This will provide input, both positive and negative, into the Knowledge Management System to help optimize future projects. Usually, based on this analysis, individuals doing outstanding work are rewarded and/or recognized.

- It should not be difficult for the team to determine how they are going to measure the success of the project. Specific commitments were well documented in Tollgates II, III, and IV. These commitments often are based on the entity's performance parameters, the cost to make the changes, the amount of resources consumed by the project, and the impact the new entity has on the market. The ideal situation is to evaluate these key parameters when you can run the new and previous entity at the same time without the impacted individuals knowing which entity they were working with.
- The medical field provides us with a very good example of this type of analysis when they bring together a group of individuals half of whom take the old cure and the other half take the new cure. It is well understood that the psychological impact of the additional attention that the process is given when it is considered for change can result in a major improvement in efficiency, effectiveness, and adaptability that would have the same impact on both the new and old entities.
- Another problem that the team faces is the learning curve for the new entity. The information gathered during opportunity identification and opportunity development was from the established line that is down on the flat of the learning curve while the new item may just be on the improvement slope of the learning curve. As a result, the timing and experience level of the production and sales can have a major impact on the final results and conclusions.

Tollgate V: Project Evaluation

Typically, the project management team has completed their major activities when they successfully pass Tollgate IV and both the team members and

management are anxious to reapply their skills to another assignment. This often results in the performance analysis being completed before sufficient data is available. This is particularly true of customer-related and reliability-related measurements. Typical project goals would read like this, "The relation of zzk2 processor will increase our share of the market by 30%."

The question is, "How do you possibly measure this when you want to complete Tollgate V within three months of the first customer product being delivered to a customer?" In truth, we are continuously pressured by management to eliminate the project management team right after first-customer ship and the Knowledge Management System has been updated to reflect things learned during the PIC.

Tollgate V is a comparison of the actual performance of the project and its assigned entity that is frequently used as the closeout of the project management activity when the responsibility for continuing smooth operation is transferred to production and sales.

Top Five Positive/Negative Innovation Change Impact Measurements

In order to understand the complexity of trying to satisfy all stakeholders, we need to understand each stakeholder's priorities. The following tables list the six stakeholders, their top five improvement priorities and their top five negative change impacts (Tables 2.1–2.12).

Table 2.1 Investors Measure of the Improvement in Priority Order

Return on investment
Stock prices
Return on assets
Market share
Successful new products

Table 2.2 Investors Measure of Negative Change Impacts in Priority Order

Reduce stock prices
Reduce dividends
Lower profit levels
Reduce market share
Failure of new products

Table 2.3 Management Measure of the Improvement in Priority Order

Return on assets
Value-added per employee
Stock prices
Market share
Reduced operating expenses

Table 2.4 Management Measure of Negative Change Impacts in Priority Order

Increased operating costs
Reduce market share
Lower customer satisfaction levels
Failure of new products
Longer cycle times

Table 2.5 External Customer Measure of the Improvement in Priority Order

Reduce costs
New or expanded capabilities
Improved performance/reliability
Ease to use
Improved responsiveness

Table 2.6 External Customer Measure of Negative Change Impacts in Priority Order

Increase purchase costs
Decreased reliability
Fewer capabilities than competition
Poor customer service
Increased difficulty to use

Table 2.7 Their Employees Measure of the Improvement in Priority Order

Increase job security
Increased compensation
Improved personal growth potential
Improve job satisfaction
Improve management

Table 2.8 Employee Measure of Negative Change Impacts in Priority Order

Layoffs
Decreased benefits
Salaries not keeping pace with cost-of-living
Poor management
Decreased skills required to do the job (boarding work)

Table 2.9 Suppliers Measure of the Improvement in Priority Order

Increased return on investment (supplier)
Improved communications/fewer interfaces
Simplified requirements/fewer changes
Long-term contracts
Longer cycle times

Table 2.10 Suppliers Measure of Negative Change Impacts in Priority Order

Loss of contract
Shorter order cycles
Increased competition
Imposing new standards
Longer Accounts Payable cycle times

Increase pollution of the environment (Increase in toxic gases and materials).

In evaluating the positive and negative impacts that a change initiative can generate on the organization's stakeholders, we use the following approach.

Table 2.11 Community Measure of the Improvement in Priority Order

Increasing employment of people
Increased tax base
Reduce pollution
Support of community activities
Safety for employees

Table 2.12 Community Measure of Negative Change Impacts in Priority Order

Moving work overseas
Decreasing the number of employees
Decreased facility resulting in lower taxes
Unsafe working conditions

For each of the six stakeholders, we evaluate the five negative and five positive impact ratings based on a scale of 1 to 5. A rating of 1 indicates that you are in strong disagreement with the statement and a rating of 5 indicates you are strongly in agreement that the statement applies to your organization. We then sum up all of the positive measurements and all of the negative measurements, keeping them separate from each other. Next, we subtract the negative change measurements from the positive change measurements.

The higher this number is, the better. A score of 25 is the best possible score and anything under 15 indicates a major change is required in order to service your stakeholders properly. The ideal improvement process would improve the organization's performance in all the stakeholders' priorities issues with lesser impact upon the negative change impacts. In these tables, the most frequent impact was noted, but sometimes one methodology can have more than one impact, depending upon the circumstances.

For example, total quality management (TQM) can have a positive or negative impact on job security. If improving the product increases the organization's market share resulting in an increased workload, job security is improved. But if TQM results in waste reduction, thereby improving productivity, but does not increase market share to the point that it offsets the productivity gain, employees can be laid off. This results in a negative impact on job security. It's easy to see that if an organization is a nuclear power plant, safety would be the number 1 priority for the management, community, and employees.

As we begin to review many techniques we can use to turn on our creative powers, here are some affirmations about you and others like you that serve as a foundation for our ideas:

1. We are confident that you are or can be creative.
2. We are confident that you can improve your creativity. It has been estimated that Leonardo Da Vinci and Thomas Edison used less than 50% of their potential creativity capabilities.
3. We are confident that the regular use of the mind expanders defined in this book will improve your creativity.
4. We are confident that risks, creativity, and rewards go hand-in-hand.
5. We are confident that creativity will become even more critical to real success in the 21st century than ever before.
6. We are confident that creative people get more joy from life.
7. We are confident that if you do not use your creative powers, you will become less capable of using them.
8. We are confident that real success goes to creative people who can implement their ideas and concepts.

Process Grouping 12 – Transformation

Usually, the project team is disbanded after Process Grouping 11 is completed, but that's only the beginning of the project story. The real test of the project occurs over the next year or two when the approaches are often reset to the original habit patterns. For successful innovative projects, changes have to become part of the organization's culture and habit patterns. This is where the real impact of the project is evaluated.

The team will also verify that at that point in time, the actual savings were in keeping with the projected estimates. It is very important that the team also validate that the savings went directly to the bottom line of the key performance measurements rather than being redeployed to do something that wasn't being done before because it wasn't justified. All too often, savings that save an individual 30 minutes a day amount to longer coffee breaks and as a result cannot be counted as value-added activities. The savings can only be realized when the individuals who were performing the eliminated activities have been reassigned and are performing a job that generates more real value-added than the old assignment did. Dismissing the assignment of people who counted as value-added results is one of the primary reasons why much of the improvement savings never reach the bottom line.

The cycle time reductions that don't result in increased sales have little or no impact on the bottom line. The only value as a result of the cycle time reduction is the rental space savings reduction and the interest rate on the value of the entity related to the decreased cycle time. Often, reduced cycle time that results in lower inventories has a negative rather than a positive impact. This results in waste like sending entities by overnight mail that could've been sent by regular mail.

This evaluation focuses on the sustainability and acceptance level of the innovative entity or change resulting from the project being assessed. The first task is to define, acquire, and understand the documents that define the improvement opportunity, its analysis, and the action that was taken to take advantage of the opportunity. The following is a list of some of the information sources that may be required as input into the analysis.

- Appropriate engineering specifications
- The project plans
- Knowledge management, warehouse
- The Primary Performance Measurements
- Organizational change management plan
- Entity performance reports (quality, reliability, delivery, and customer complaint)
- Amendments to the project plan after initial approval
- Tollgate II final report
- Tollgate III final report
- Tollgate V final report
- Project financial final summary
- Implementation cost of Tollgate III recommendations
- Output production costs since the start of project
- Revenue generated as a result of project implementation
- Customer's opinion surveys related to project impact on them
- Budget expenditures and decreases related to the project
- Employee turnover rate
- Postmortem evaluation of the project by the project team
- Warranty summary report

The Innovator's Dilemma 2.1: The Case of the Mayor & the Farmer's Daughter

A dilemma has come up in your village between a farmer, his daughter, and the mayor. The farmer owes the mayor a sum of money that he cannot pay back and the mayor is in love with the farmer's daughter. This is upsetting to the daughter as she finds the mayor to be an evil, ugly, and cruel man. The mayor tells the farmer that he will settle the debt in front of the whole village by playing a simple game:

The mayor will take a black stone and a white stone and place them in a bag. The farmer's daughter will reach into the bag and draw one of the stones out in front of the whole village. If she draws the white stone, the farmer's debt would be forgiven and everything would return to normal. If she draws the black stone, she will be forced to marry the mayor and the debt will not be forgiven. Considering the situation, the farmer has no choice but to agree to

this settlement. The daughter knows the mayor too well and believes he will cheat and put two black stones into the bag.

What can she do to get out of marrying the mayor and have her father's debt forgiven?

The Innovator's Dilemma 2.2: Saving the Pills

You have been feeling very sick lately and have decided to visit your doctor. He gives you two medications to take, Medicine Y and Medicine X. You are instructed to take one pill of each every day and the pills must be taken together. If you take less than this amount, you will die from illness, and if you take more, you will die from an overdose.

When putting the pills away in your medicine cabinet, you accidentally drop the bottles and three pills fall out. You count the remaining pills in each bottle and determine that on the floor there is one X pill and two Y pills. Unfortunately, the pills look identical and you have no way of telling them apart.

How can you save the pills on the floor and still maintain the proper daily dosage and take all of the pills?

The Innovator's Dilemma 2.3: Switching on the Lights

You are standing in a room with three light switches. Each of these switches controls one of three light bulbs in the room next to you. All of the switches are initially down and in the off position, and you are told that all of the light bulbs in the other room are off.

Chapter 3

The ISO 56002 Innovation Management Systems Standard and KPIs

In a Nutshell

This section/chapter focuses on the leadership behavior and system that supports an IMS. The Section shows you how to create a vision for ISO 56002, how to craft an innovation strategy, how to communicate it to employees, and how to set an innovation policy that clarifies roles and responsibilities. We like to add to this one – accountability – that we believe goes along with the assigned responsibility. As we begin this Chapter, we want to reset our thinking. The reason the organization is considering changing its present innovative management activities is the basic need to meet the organization's bottom line, goals, objectives, and requirements. To accomplish this, there is a continuous need to improve and refine our current and innovative activities.

Key Performance Indicators (KPIs) and IPIs are a few selected performance measurements used at every level of both our current and innovative activities. Whether you are the CEO or an entry-level staff member, the only thing that changes is the scope of your assignment. For the purpose of this Workbook, innovation management is considered at the level of the organization, based on the notion that the organization can control its own destiny (i.e. can be managed as an autonomous entity).

Introduction to ISO 56002 Innovation Management Systems Standard and KPIs

- **Systems approach definition:** A systems approach uses interrelated and interacting elements, and regularly performs evaluations and improvements on the system.

DOI: 10.4324/9781003413509-3

- **System definition:** A system is defined as a set of interrelated or interacting elements.

The Systems approach can be applied to any organization, public or private, of any size and in any sector. It can also be used for a set of organizations if they can be managed as one entity to a certain degree. Also, a systems approach is crucial to connect the factors required to innovate. An innovation management system provides a framework in which to innovate and deliver value. The ISO 56000 innovation management system (IMS) standards series (especially 56002 and 56004) offers credible guidance, a common language, and a systematic approach to building innovation capabilities.

KPI measures are part of an activity that emerged thousands of years ago, fundamentally driven by the human curiosity to know more about the environment and to understand how the world works. In time, our world has evolved to become more and more complex, pressuring us to constantly refine our measurement tools and techniques.

Today, we see organizations as eco-systems and we act according to our desire to know more and to better understand this environment. Nowadays, challenges are not about accessing information, as most companies are managing large volumes of data. The challenge is to decide what data is the most important for decision-making.

In this context, key performance indicators (KPIs) are very useful innovation tools to provide four essential things: clarity, focus, engagement, and learning.

- Definition of Key Performance Indicators (KPIs): KPIs are a few selected performance indicators that should be achieved in order for the organization to fulfill its strategy and strategic plan. They particularly focus attention on controllable performance indicators.

Clarity: KPIs provide a detailed numerical view of the desired results. Based on their selected targets, they clearly reveal the state of performance. Furthermore, alignment is facilitated by mapping contributions to success across all organizational levels. Key performance indicators showcase what must be achieved, and at what levels, in order to achieve the organizational strategy.

Focus: In a business world flooded with data and information, knowing what to concentrate on is essential. KPIs, through their own nature, reflect what is relevant for the organization – what matters the most. This way, resources can be allocated more efficiently.

Engagement: KPIs drive engagement through a sense of ownership and responsibility for reaching targets. By assigning accountability for each KPI, employees become more committed and motivated to achieve the desired

performance levels. Engagement also contributes to building a performance culture which has a significant contribution to the success or failure of any performance management system.

Learning: By measuring and analyzing KPI results, managers gain a better understanding of how business works. KPIs enable the comparison of results in time, they reflect trends, identify patterns, and maximize the value of data through predictive analytics. Comparisons can also be made between competitors through benchmarking studies.

KPIs and ISO Systems

By monitoring KPI results, managers are able to focus on those areas that are underperforming and even develop a proactive approach by taking corrective actions to keep results close to targets. As such, high-level KPIs are the responsibility of the Executive Management team and the Board of Directors. They are used to measure the overall performance of the organization. For most profit-making organizations, the highest-level KPI is revenue. They quickly point out that the most important KPI is the customer satisfaction index, as the customer is the primary consideration. They get the best possible customer satisfaction, you would meet all their needs and do it for free.

Many people that we point this out to express shock and immediately come back to us saying, "you have to meet all stakeholders' needs." That's just not possible or true. All stakeholders are not equally important to the organization. If you have been classified as a profit-making organization then you have the responsibility of being profitable, resulting in you paying your taxes to the government so that you can continue to enjoy the quality of life you enjoy today. In most cases, your primary responsibility has to be to make a profit. That means that your organization needs to operate its innovative management system in a manner that optimizes revenue and profits.

In his 1997 book, *Innovator's Dilemma*, Clayton Christensen explains that new products are often inferior to existing products. This inferiority results not from inherent flaws, states Christensen, but because of the existing standards that customers and organizations use to evaluate quality. Consequently, the new products may appeal to fewer consumers and yield lower profits for the organization. Instead of considering total profits at the beginning, the organization might use innovation KPIs like growth potential and profit margins to more accurately measure the product's success. These metrics can help stakeholders understand the value of the new products in the existing market.

The ISO 56000 series of Innovation Management series provides you with the best concepts, methods, and approaches, which they believe should be

considered when designing or upgrading any management system. Some other common KPI examples include stock price, market share, net income, gross profit, total operating costs, and warranty costs. We like to limit our high-level KPIs to a maximum of 10. Some companies go as high as 20. We feel that that is more confusing than helpful.

Front-line KPIs

These are usually the responsibility of everyone, from the chairman of the Board of Directors to the employee mopping the floors. They measure how well they are meeting their responsibilities and accountabilities. Front-line KPIs are used to measure the various activities that support the high-level KPIs.

For example:

- One of the high-level KPIs for a national retail chain would have to be Revenue Growth
- One of the KPIs for the Vice President of sales and marketing could be to increase sales by 32% year–over–year (YoY),
- One of the Front-line KPIs for a store manager could be to increase my volume of sales by 35% year–over–year (YoY) and increase a sales conversion % by 10% year–over–year (YoY),
- One of the Front-line KPIs for a clerk in the store could be to increase their sales conversion % by 6% every six months (month–over–month, MoM).
- A second Front-line KPI for the sales clerk could be the number of customers serviced per hour

This example shows how the salesperson's front-line KPIs directly support the organization's high-level KPI of revenue growth. This demonstrates that any changes that we make to the innovative management system, its processes, its culture, its objectives, its goals, or the organizational structure have to be directly related to a measurable impact on the bottom line as defined by the high-level KPIs within your organization. With each change you make to any part or entity of the innovative management system, its impact should be reflected in a positive value-added change to one of the high-level KPIs.[1]

> *Don't build a castle on top of the mountain when all you need is a cottage by the river.*

It's extremely important that the front-line KPIs for our innovative management system relate directly to the high-level KPIs. Examples would be (Table 3.1):

Table 3.1 Typical innovation, high-level KPIs

■ revenue from innovation ■ profit from innovation ■ market share from innovation ■ employee months invested in innovation ■ resources delegated to innovation activities ■ innovation cost recovery time ■ share growth from innovation ■ percentage of innovation revenue generated by continuous improvement, apparent, and minor improvements.

Both high-level and front-line level KPIs can be broken down into two distinct categories. Current operations KPIs and Innovation operations KPIs.

If there's a high-level goal around sales, then the front lines will probably have sales targets. If there's a high-level target around manufacturing costs, then the production staff will have targets around waste reduction.

We feel the team that's looking at what should be done to change the organization's present premium/innovative management system must be thoroughly familiar with the high-level KPIs. Their goals and objectives and the relative impact the current activities and the innovative activities have on each of the high-level KPIs, goals, and objectives. Any changes to both increase or decrease in the organization's innovative management system should result in a positive impact on the organization's high-level KPIs or they shouldn't be changed.

The basic starting point for any innovation initiative is to develop a detailed understanding of the present innovative management system, how it is impacting the high-level KPIs, and then to determine if the present innovative management system should be changed to meet the organizations' goals and objectives for the key high-level KPIs, often referred to as the organization's bottom line performance requirements.

EXERCISE ACTIVITY 3.1: CREATING YOUR INNOVATION KPIS

Innovation KPIs are metrics that measure an organization's progression toward its innovation goals. This term is relatively broad, as the metrics useful to an organization depend on its industry and unique business model. You will need to choose which innovation management KPIs to measure based on your goals and available resources to collect data.

Steps to Consider: After gathering information over a specified 6-month period, and then analyzing the implications, and comparing the information to internal goals or industry standards, your organization can begin to make the appropriate adjustments. Here are some examples of innovation KPIs to consider measuring. From this list of 20, please select the top five or so that are a good fit for your TIME innovation management program (Figure 3.1).

- Percentage of ideas that lead to innovation experiments
- Dedicated time for experiments
- Percentage of new products that stay in production after the first year
- Research and development budget
- Client's satisfaction with the new product
- Employee willingness to consider new ideas
- Change in employee behavior
- Participation in training activities
- Adherence to resource allocation
- Adherence to the original timeline
- Timesheet metrics
- Evolution of organizational structures
- Number of acquired patents
- Number of new markets entered
- Number of new conversions
- Employee productivity
- Savings on raw materials
- Employee retention rates
- Percentage of capital invested in innovation activities
- Team adherence to the allocated budget

Figure 3.1 Typical innovation KPIs.

Note: Because the Innovation Analysis Team (IAT) would not want to make changes to the organization's IMS that didn't have a positive impact on some of the high-level and Front-line KPIs of the organization's performance measurements. It will necessitate the IAT to attain the high-level KPIs present and the three to five-year, year-to-year future performance level goals and objectives. On allocation, the executive team is reluctant to provide future goals and objectives projections.

Process to Follow:

1. Make a list of the 5–7 or more high-level IMS KPIs for your organization.
2. Review each of the high-level KPIs to determine if the Innovative Management System impacts the specific KPI.
3. For those high-level KPIs that are impacted by the IMS maker, graphs that show actual performance for the past three years and the goals/objectives for the next three years.
4. For each of the high-level KPIs that are innovative system impacts, estimate what its actual value would be if the trendline continues to show actual performance and other already approved programs and projects are continued.
5. For those high-level KPIs that are influenced by the IMS and are predicted to be KPI goals for the next three years, evaluate if it would be beneficial if the goal is set at higher levels. If it is, executive management should set new desired KPI goals and objectives and the IMS improvement team should use these new KPIs as they design or redesign IMS is modified.
6. For those KPIs where there is a negative variance between future goals and projected performance, review the mission statement for each of the organizations' major functions to determine which

functions would be the primary functions that would be responsible for changing their strategic plan so that they could take action to eliminate the negative gaps. They should also define the kind of changes in output that the modified IMS will be required to produce based on the following five categories.
   - Apparent solutions
   - Minor improvements
   - Major improvements
   - New Paradise
   - Discovery
7. In some cases where there are few high-level KPIs related to innovation, it may be necessary to include some of the midrange KPIs that are relevant to the IMS that you are targeting, optimizing their performance on the project may not be important enough to be reflected in the bottom line.

End of the exercise

Relationship of TIME and ISO 56000 Innovative Management Series

The TIME (Total Innovation Management Excellence) methodology is designed to develop the culture that will allow innovation to prosper and grow within an organization and this book is designed to maximize the value-added potential of the culture. It's like TIME technology in the car and the ISO 56002:2019 and ISO 56004:2019 standards are the gasoline that combines and works together, steering a project through the Project Innovation Cycle (PIC) that creates an innovative occurrence (results).

Surely you could push the car by hand or harness it to a horse, but that is very time-consuming and undesirable. By the time you get home, the ice cream would have melted. The good thing about the PIC is that its approach to applying proven advanced innovation methodologies to individual projects/programs is one of the best and fastest ways to create your desired result. This workbook is not intended to provide support in the effective understanding, and use of the implementation of the following documents:

- The ISO 56000 standard series on Innovation Management Systems
- The book entitled *Total Innovative Management Excellence (TIME) – The Future of Innovation*
- The book entitled *Using the ISO 56002. Innovation Management System*
- The book entitled *Managing Innovation Projects and Programs*

Table 3.2 ISO 56000 Standard

ISO 56000	Fundamentals and Vocabulary
ISO 56002	Innovation Management System
ISO 56003	Tools & Methods on Innovation Partnerships
ISO 56004	Innovation Management Assessment
ISO 56005	Tools and Methods on Intellectual Property Management
ISO 50506	Tools and Methods on Strategic Intelligence Management
ISO 50507	Tools and Methods on Idea Management
ISO 56008	Tools and Methods on Innovation Management

However, it does provide you with the methodology and techniques that will bring about significant improvement in the individual projects and programs that it is applied to ISO's Technical Committee 279. It is one of the most active catcher committees in the program and, as a result, has accomplished a great deal in the past two years. At present, they have five active working groups and at least one is being considered. Table 3.2 provides a view of the working groups and their assigned tasks.

Simply put, we suggest that you consider the information in all four of these sources if you have a state-of-the-art Innovation Management System. We find in many cases that the organization does not need a state-of-the-art system, but what they need is an innovative management system that will fill the negative voids when the protected performance is not going to meet the organization's goals and objectives.

In these cases, changes are made only to the parts of the system that will have a direct impact on meeting the goal or objective. This usually greatly reduces risk, as well as installation and maintenance costs. For example, only making the marketing culture more innovative is far less expensive than making the organizational culture more innovative.

Some IMS Definitions

ISO 56000:2020 Fundamentals and Vocabulary (For Innovation Management Systems) sets the foundation on which the IS0 56000 series is based. The standard defines innovation as follows.

- Definition of innovation: Innovation is defined as a new or changed entity, realizing or redistributing value.
  Note 1 to entity: novelty and value are related to, and determined by, the perception of the organization and related interested parties.
  Note 2 to entity: Innovation can be a product, service, process, model, method, etc.

Note 3 to entity: Innovation is the outcome. The word "innovation." sometimes refers to activities or processes resulting in, or aiming for innovation. When "innovation" is used in this sense, it should always be used with some form of qualifier, e.g., "Innovation activities."
Note 4 to entity: For the purpose of the statistical measurements, referred to in Oslo Manual 2018, fourth edition, by OBCD/ Eurostat.

- Definition of entity: Entity is anything receivable or conceivable.
  Example: products, services, processes, models, (e.g., a marketing or management method, or a combination thereof.
  Note 1 to entity: entities can be material (e.g. an engine), immaterial (e.g. a project plan) or imagined (e.g., the future state of the organization).

Using ISO definitions of innovation, it's difficult to identify any organization that is not innovative to some degree. Keeping this in mind, the wise thing to do is determine if the present system is adequate to meet your goals and objectives for the next 3 to 5 years. If you have a reasonable confidence level that you can meet your goals and objectives then you have a good mix between your innovation entities and your current operations. In this case, the challenge may be to see the goals and objectives increased by shifting resources between current processes/programs and innovative processes/programs.

This allows you to direct your discretionary resources to areas that will provide the maximum positive impact on your critical high-level KPIs (Critical Performance Measurements). One way to help make this decision is by understanding your strengths and weaknesses in your current processes and your innovative process as they relate to each of the entities listed in the 10S Model. You should then set your stretch goals and objectives based on taking advantage of your strong items in the 10S Model and steering away from the areas in which you are weak.

The 10S Model[2]

Successful growing companies have found that the answer to many of their problems is to become more creative and innovative. Of course, that's easier to say than to do. As a result, we have focused on defining the innovation drivers.

We started by focusing on the tried and proven McKinsey 7S model:

1. Shared vision
2. Strategy
3. Systems

4. Structure
5. Skills
6. Styles
7. Staffing

As we gained more experience in innovation transformation, we found that three other performance drivers needed attention to keep pace with the fast-changing technology environment/competition organizations face today. They are as follows:

8. Specialized technology – information technology systems
9. Systematic change management
10. Strategic knowledge management

Adding these 3Ss to McKinsey 7Ss makes up a new grouping called the 10S Model. These are subdivided into hard drivers and soft drivers. Hard drivers are easy to define and the organization can directly influence them.

The hard drivers are as follows:

- Strategy
- Structure
- Systematic change management
- Systems
- Specialized technology

The soft drivers are less tangible and more influenced by culture. Both the soft and hard drivers have a major impact on an organization's performance. The soft drivers are as follows:

- Shared vision
- Styles
- Staff
- Strategic knowledge management
- Skills

All ten are relevant and important performance drivers that must be considered and addressed in establishing an innovative organization. In reality, there are very few profit-making organizations that can exist without some form of innovation/creative activities incorporated into the operations. Few companies can exist without an active, efficient, and effective set of current processes and innovative processes, even Apple which has an excellent reputation for innovation relies heavily on continuously improving present models to sustain its performance.

EXERCISE ACTIVITY 3.2: USING THE 10S FRAMEWORK FOR INNOVATION MANAGEMENT – START WITH YOUR SHARED CORE VALUES[3]

By reinforcing each of the 10S factors, you can ensure an organization has the structural support required to be successful. It can also help you make sure your entire team shares the same goals. Here is the first step you can follow to implement the McKinsey Framework effectively – Start by examining your organization's shared values.

Steps to Consider:

1. Instead of focusing on the values highlighted on the company's website or on promotional materials, start by trying to identify the social norms and standards your team has adopted and uses regularly.
2. Consider what types of behaviors your coworkers deem acceptable and how these unwritten rules influence the way people interact with each other.
3. Then, assess whether your team's shared values are consistent with your organization's structure, systems, and strategy.
4. Some questions you might ask as you analyze your organization's shared values include:

What are the core values of the company?
What three words describe the company culture?
How strong are each of these values?
What are the original or founding values of the company?

If your organization's shared values are inconsistent with its structure, systems, and strategy, create a list of areas you can work on improving.

End of exercise

EXERCISE ACTIVITY 3.3: USING THE 10S FRAMEWORK FOR INNOVATION MANAGEMENT – REVIEW YOUR ORGANIZATION'S "HARD ELEMENTS"

This exercise is about reviewing how hard elements influence the company by analyzing your structure, systems, and strategy. As you assess each of these internal factors, consider how they influence and support each other (see Figure 3.2).

Some questions you might ask as you review the organization's hard elements are shown in the following figure.

- What type of hierarchy does the organization follow?
- How is the team divided?
- Does the organization use centralized or decentralized decision-making practices?
- How does each department organize important activities?
- How do team members choose partners, leaders and colleagues with whom they align?
- What rules or processes are in place to ensure team members complete their work?
- What are the core financial, communications, organization and human resources systems that support the business?
- What is the company's overall strategy to achieve its objectives?
- How does the organization remain competitive?

Figure 3.2 Typical review hard elements questions.

Review your answers to these questions carefully to identify areas where the organization's structure, systems, and strategy can support one another better.

EXERCISE ACTIVITY 3.4: USING THE 10S FRAMEWORK FOR INNOVATION MANAGEMENT – REVIEW YOUR ORGANIZATION'S "SOFT ELEMENTS"

After you've analyzed your team's shared values and hard elements, take the time to assess the remaining soft elements. These include the company's skills, management style, and staff. As you review each of these internal factors, consider whether they support the hard elements you previously identified[4] (see Figure 3.3).

Some questions you might ask as you assess an organization's soft elements are shown in the following figure.

- Which skills are the strongest in our innovation teams and which are the weakest?
- What specializations or strengths is the company most known for?
- Does our current innovation team have the capabilities to perform their research and development work effectively?
- Based upon the above, are there any important skills our team of innovators lacks?
- How effective is our innovation management system? Do we have one at all?
- Are IMS team members more collaborative or competitive?
- What specialized roles exist on our IMS team?
- Are there any innovation-based positions we plan to hire for immediately?

Figure 3.3 Typical review soft elements questions.

Revisit your answers to each of these questions and compare them with the notes you took while reviewing the organization's hard elements. If these elements seem like they're competing instead of supporting each other, consider what steps you can take to create a more cohesive work culture for the innovation teams to better perform and improve.

EXERCISE ACTIVITY 3.5: USING THE 10S FRAMEWORK FOR INNOVATION MANAGEMENT – CONDUCT AN INNOVATION "INTERNAL ANALYSIS"[5]

Creating an innovation-driven business strategy requires research into, and the assessment of, internal and external factors that impact the organization, as shown in the 10S Framework. Specifically, an internal analysis can help businesses establish areas for improving organizational functions, for growth, and ultimately for competitive advantage. Conducting an internal analysis requires extensive knowledge of the inner workings of the company.

Steps to consider:

1. Set your innovation strategy and objectives
2. Choose an innovation framework
3. Conduct research
4. Follow the framework
5. Set your priorities
6. Apply the findings

End of exercise

More about the ISO 56002 Innovation System Standard

ISO 56002 – Innovative Management Systems (and ISO 56004 – Innovation Management Assessment) are both guidance documents and are not requirement documents like ISO 9001 the Quality Management Systems requirement document. Both of these innovation standards have been written to cover all types of organizations from the Congress of the United States down to the lady that's making cookies in her kitchen to sell to the local bakery. It covers all governmental and private type organizations.

Both documents are packed full of state-of-the-art best practices as observed by leaders in the innovative movement around the world. To you, this means it is chock-full of golden nuggets that can give your organization a major competitive advantage if you select the right ones that match your

organization's product line, culture, skill levels, and customer set. This quick review of the standards provides you with the knowledge that will help you find your gold mine.

There are seven keywords whose meanings are used in the same manner in all International Standard Association documents. These words provide direction on how the associated clause and/or paragraph should be interpreted and used. There are as follows:

"Shall" indicates a requirement: "Shall" is used to indicate a requirement that is contractually binding, meaning it must be implemented, and its implementation verified. Period! Don't think of "shall" as a word, but rather as an icon that SCREAMS: "This is a requirement." If a statement does not contain the word "shall," it is not a requirement.
"Needs" indicates a requirement that is mandatory to be in compliance with. It is often used in a center that is classified as a recommendation standard when a specific requirement is necessary for the item to perform correctly or to eliminate a safety hazard. For example: the shifting lever and the car need to be in park before you can turn on the car or each person in the front seat needs to have their safety belt fastened when the car is being operated.
"Should" indicates a recommendation – "Should" is used to indicate a goal that must be addressed by the design team but is not formally verified. Goals, non-mandatory provisions.
"May" indicates permission while … "Can" indicates a possibility or a capability.
"Principles" is a statement that is important for the organization, some examples of benefits associated with the principle, a principle can be considered as an open set to be integrated and applied within the organization. We think of a principle as being a commandment, that is, an order that everyone should live up to, with no exceptions. We believe that ISO's definition is closer to a belief than a principle a human being should never compromise.

The clauses in ISO 56002 and 56004 are "should" type clauses, indicating that the clause is recommended to be complied with, but is not required. In these cases when you are using either or both ISO 56002 and 56004 you should review and understand what action the clause recommends the organization takes to implement the objectives defined in the clauses. For example, clause 5.2.1 Establishing the innovation policy – Management should establish, implement, and maintain an innovation policy, describing the commitment to innovation activities.

The Top Management considered the recommendation and decided it was a negative value-added because it would take time to prepare, disseminate, store, read, and update. They concluded that the organization is already creative and innovative with it is Pay for Ideas Suggestion Program and its Patent Rewards System. They decided that issuing an innovation policy statement would be viewed by the employees as, "So what's new." In this case, the

organization complied with the requirements of ISO 56002 clause 5.2.1 but may not have lived up to the intent of the clause.

Some innovation professionals preferred the "should – recommended clause compliance." type ISO documents, to the "shall – required clause compliance." type ISO documents because it allows them the opportunity to customize the system to the unique features of the output that's being produced, the size of the organization, and how innovative the output has to be to meet the customers' desires.

At the present time, efforts are underway to write a new requirement ISO tendered for innovation. ISO 56001 – Innovative Management Systems – required. This is a shall-type document that can be imposed on an organization as part of a contract. This will give your organization the ability to choose if it wants to be certified by an accreditation organization as being compliant with ISO 56001 or being compliant with ISO 56002.

Certification – the provision by an independent body of written assurance (a certificate) that the product, service, or system in question meets specific requirements. Note: the organization that issues the written assurance certification document of compliance to the ISO standard does not have legal exposure if they make false statements. I still like to go and see and talk with my suppliers as I consider them part of the family.

Accreditation – the formal recognition by an independent body, generally known as an accreditation body, that certifies and operates according to international standards

Compliance – is following the requirements of the ISO standards, focusing on decisions that create policies, processes, and procedures that adhere to the specifications set forth within the ISO. When companies are considered ISO compliant, that means all the standards of the International Organization for Standardization have been met.

Business Compliance from Cambridge Dictionary – the act of obeying an order, rule, or request: It is the job of the inspectors to enforce **compliance** with the regulations.

> "Innovation rule 3: LESS is BEST. SIMPLIFY! SIMPLIFY! As long as it does the job
>
> **H. James Harrington**

Construction of ISO 56002 – Innovation Management System

Note: (ISO 56004 details will be covered in Chapter 5)

We believe it's easy to understand the difficulties the technical committee faced in trying to prepare a guidance document for innovation whose scope covered the following.

a. 56002 provides guides for the establishment, implementation, maintenance, and continuous improvement of an innovative management system for use in all established organizations. It applies to **all types of organizations** regardless of their size, sector, or type.
b. I'm sure I would want Stanford Research Center which specializes in heart replacement to have a different innovative management system than the farmer that roasts garlic in Gilroy. I certainly would think that Lucky Missile and Space Division in Sunnyvale would be using a different innovative management system than the one Frank and Jim held views in writing this book, although Jim's and Frank's working agreement has been very successful over the last 20 years.
c. The focus is on established organizations with the understanding that both temporary organizations and startup organizations can also benefit by applying these guidelines (not rules) merged to all or in part of their activities, including organizations whose output is products, services, processes, models, and methods, ranging from incremental to radical and design-driven innovative activities.

It includes the painter who works by himself, the people who put chemicals in your pool, mom-and-pop grocery stores down the street, brand-new startup companies that are just developing a concept, the farmer in China that grows rice, all the way up to companies like Apple, Google, Stanford University and the US Army. With this extremely wide range of organizations and output types, there are often advantages in customizing the Innovative Management System to a specific organizational culture.

"Keep it simple – Don't build a 20-room castle on top of the mountain when all you need is a three-room cottage by the river. It will be less expensive to build, and less efficient as you spend your time cleaning the many rooms in the castle rather than producing results. In addition, it usually produces more effective output at a much lesser cost to maintain."

ISO 56002:2019 Organizational Structure is made up of ten clauses. They are as follows:

1. Scope
2. Normative references
3. Terms and definitions
4. Context of organization
5. Leadership
6. Planning
7. Support
8. Operation
9. Performance evaluation
10. Improvement*[6]

We have just completed a review of clauses 1.0 scope, 2.0 Normative references, and 3.0 terms and definitions. We are now ready to start discussing the body of the standard clause 4.0 to 10.0.

Clause 4.0 – Context of the Organization

ISO's definition of context: Context of the Organization is the "business environment," a "combination of internal and external factors and conditions that can have an effect on an organization's approach to its products, services and investments and interested Parties." For Innovative Management Systems, clause 4.0 recommends that before you design or redesign your Innovative Management System you develop a clearer view of the most relevant issues (either positive or negative) for information security, allowing it to properly define the Information Security Management System (ISMS) purpose, devise strategies, this will allow the organization's portfolio of active projects and programs allocate its resources where they will bring the best results.

You should consider all internal and external stakeholders when developing your IMS. In Clause 4, we discuss the following four major considerations:

1. Defining the organization's status and key issues
2. Identifying stakeholders' needs and expectations
3. Defining the requirements and limitations of the IMS (scope)
4. Defining the content of the IMS

Overview:

- Defining the extent to which internal and external issues impact the IMS
- Understanding the interests and needs of the organization's stakeholders (interested parties)
- Presenting cultural best practices
- Considering the previous three conditions to develop the scope of the IMS

Purpose:

In IMS, they use the word "context" extensively in this Clause.

- Definition of context: "ISO 56000:20020 defines context as the combination of internal and external issues that can have an effect on the organization's approach to developing and achieving its objectives. It is also sometimes called organizational environment."
- Definition of leadership: Leadership is a process of social influence, which maximizes the efforts of others, toward the achievement of a goal.

Note: Notice key elements of this definition. Leadership stems from social influence, not authority or power. Leadership requires others, and that implies they don't need to be "direct reports." Leadership is not defined in ISO 56000:2020.

Most of the items discussed in Clause 4 are basic items that apply to most of the systems that are embedded in most organizations. The exception to this is technology advancements that are applied only to a few parts of the organization even when they only apply to the continuous evolution-type improvements within an already-established product. For example, the cultural aspects that support the PIC are the same that support the personnel systems.

If you consider the PIC laid out in the following evolutionary order, starting with marketing, development engineering, product engineering, manufacturing engineering, quality engineering, manufacturing, procurement, and sales, it would be very undesirable and costly to have a separate innovative culture for these functions. Even though these individual functions exist in separate islands within the organization.

The only exception to this would be when management establishes an organization that is allowed to take on a different set of principles and operating procedures. For example, you may build typewriters in one plant and manufacture computer chips in another location. Or there may be a very different culture in research and development than there is in finance. We suggest that Subclauses 4.1, 4.3, and 4.4 be viewed from a total organization's viewpoint, not just the innovation cycle.

EXERCISE ACTIVITY 3.6: USING THE TIME FRAMEWORK FOR INNOVATION MANAGEMENT – CONDUCTING A COTO EXERCISE

The purpose of this exercise is to define how the company's Strategic Direction is developed by senior management through the identification of interested parties, issues of concerns, risks, and opportunities. It is important for Management to fully understand the needs of internal and external parties in order to ensure its Innovation Management System (IMS) is fully effective.

To this end, the Top Management conducts the following Context of the Organization Exercise, or "COTO Exercise," to identify the appropriate stakeholders, their issues of concern, and then the associated risks and opportunities derived from those issues. Finally, the outputs of this exercise inform Top Management so that the company's Strategic Direction may be updated, as necessary. The COTO Log is the primary record for this exercise.

ISO 9001 Clause 4.0 The 'context of the organization' (frequently referred to as COTO) establishes the context of the Quality Management System (QMS) and how the business strategy supports it.
ISO 9001 Clause 4.1: The organization will need to determine external and internal issues that are relevant to its purpose and would have an impact on what the organization does.
ISO 9001 Clause 4.2: The organization will need to identify the "interested parties" that are relevant to their QMS. Each organization will identify its own unique set of "interested parties"
ISO 9001 Clause 4.3: The scope of the QMS must be determined, which should consider any outsourced functions or processes if they are relevant.
ISO 9001 Clause 4.4: The final requirement of Part 4 is to establish, implement, maintain, and continually improve the QMS

"Interested parties" are those stakeholders who receive the company's services/products, who may be impacted by them, or those parties who may otherwise have a significant interest in the enterprise. The interested parties applicable to this exercise are listed in the COTO Log, along with the reason for their inclusion. This includes both internal and external parties.

Steps to consider:

1. For each interested party, the related issues of concern shall be identified in the COTO Log. These issues may reflect direct concerns of the party (for example, customers are concerned about the quality of products or services they purchase) or they may be indirect concerns.
2. Such concerns may impact the interested party or may be concerns derived from the party that impact the company.
3. Issues may be either internal or external, depending on whether the interested party is internal or external. In addition, a certain type of party may have both internal and external concerns.
4. When attempting to identify internal concerns, it may be useful to consider technological concerns, employee concerns, etc.
5. When attempting to identify external concerns, it may be useful to consider concerns arising from competition, society and culture, labor relations, statutory and regulatory issues, supply chain, economic issues, etc.
6. Each identified issue is assigned a "bias" (risk, opportunity, or mixed) which will help in determining how to manage the issues.
7. Each risk is assigned a likelihood of occurrence. Management will then determine a "treatment method" for each risk or opportunity. Risks are managed to reduce their likelihood and consequence, while opportunities are managed to increase their likelihood and

consequence. "Mixed" issues may require both – mitigation of their negative aspects (risks) and pursuit of their positive aspects (opportunities).

8. Each issue may have any manner of treatment indicated; it may be a complex plan defined in a separate document or may be a simple statement. The field for the treatment method must indicate the plan or reference a separate document.
9. Where a risk is determined to be treated via a Failure Mode Effects Analysis (FMEA) style treatment or Strength, Weakness, Opportunity, and Threat Analysis (SWOT), these must then be entered into the Risk Register tag within the COTO Log. There may not be a one-for-one alignment of each issue with a risk register entry; a single issue may result in multiple risks entered, for example.
10. Opportunities are managed via the Opportunity Register tab – COTO Log

From the information above, Top Management devises a strategic direction which is documented in the records of the Management Review.

End of the exercise

Clause 5.0 – Leadership

Purpose: The purpose of this clause is to provide a general framework for the role of leadership to enhance the IMS. It discusses the components of leadership behavior that inspire people to engage in innovation activities and programs and describes actions leaders should take to support the IMS. Examples of actions are the communication and awareness campaign leaders should engage in, executive presence, and the structure that top management should provide to create alignment and coherence in the functioning of the IMS.

Clause 5 consists of the following 3 subclauses:

5.1. Leadership and commitment
- General
- Focused on value realization
- Innovation vision
- Innovation strategy

5.2. Innovation policy
- Establishing the Innovation Policy
- Communicating the Innovation Policy

5.3. Organizational roles, responsibilities, and authority

EXERCISE ACTIVITY 3.7: USING THE TIME FRAMEWORK FOR INNOVATION MANAGEMENT – CONDUCTING A LEADERSHIP REALITY CHECK

Effectively, what this exercise is designed to do is to make you look at your leadership as it currently stands, and to determine what needs improvement and what is already working well for you. Look over the chart below and reflect on your leadership training and skills thus far. Ignore the third column for now. How much time do you spend on each of these behaviors? Is there anything that you're doing too much of that you think you should modify? Is there anything that you're doing too little of?

Now, look at the third column. How much time, under perfect circumstances, should you spend on these behaviors? This exercise is a great way to help you look back over your abilities and determine where you need to improve. It can easily be done individually or in a group, though the impact is greater when you are able to compare your calculations with those of other aspiring leaders.

Behavior	How much time do you spend on each behavior daily?	How much time should you be spending on each behavior?
Introspection or Reflection		
Collaboration		
Discipline		
Brainstorming		
Resolving Conflict		
Observing		
Directing		
Justifying		
Directing		
Encouraging		
Informing		

Figure 3.4 Conducting a leadership reality check.

You will be handed (or need to print, if you're doing this exercise independently) a chart to fill out. It will probably look something like the previous chart (see Figure 3.4).

End of the exercise

Overview Clause 5.0 Leadership

Clause 5.0 Leadership focuses on the leadership behavior that supports an IMS. This clause shows you how to create a vision, how to craft an innovation strategy, how to communicate to the employees, and how to develop an innovation policy that clarifies roles and responsibilities.

Clause 6.0 – Planning

Purpose:

The purpose of this clause is to guide organizations that are setting up an IMS. This clause is directed at accomplishing two objectives. First, it defines what is required to plan for installing or upgrading an IMS, and the second defines how individual projects/programs will be processed through the IMS. The major purpose of this clause is to determine if an initiative will become part of the organization's portfolio and thus have resources committed to it or to drop the initiative.

A final reminder: The ISO Standards 56002:2019 and this book were written to provide guidance for midsize and large organizations.

Applying some of the standards and tools, methodologies, and some of the culture-building recommended in this book to a small startup company could easily burn up (use up) resources that could be used much more effectively doing other activities. After all, it is not the IMS that is important; it is how it can be used to be of more value to you, your organization, and the other stakeholders. As you read and use each clause, keep in mind it is providing guidance, not requirements. Always look at each clause and consider standpoint, you're not to build unneeded bureaucracy and waste into the organization later has to be taken out using lean and process improvement methodologies.

Overview: This clause focuses on the process of developing a plan that will be used for assigning resources (for example: employees, money, space, and management resources). It addresses establishing a plan to develop, install, and evaluate an IMS. 90% of the people reading this book will be using it to enhance their present IMS. It also provides guidance on planning for the activities that could be used in processing an innovative improvement through the PIC. It consists of four subclauses. They are as follows:

6.1. Actions to address opportunities and risks
6.2. Innovation objectives and planning to achieve them
6.3. Organizational structures
6.4. Innovation portfolios

EXERCISE ACTIVITY 3.8: USING THE TIME FRAMEWORK – CONDUCTING AN IMS PLANNING EXERCISE: PLAN A COMPANY INNOVATION RETREAT

(For further details see: https://www.inc.com/guides/how-to-plan-a-company-retreat.html)

For this exercise, you need to plan your ideal company retreat focusing on Innovation Management. Choose a location, and determine the following:

- How many team members can attend the retreat at any given time?
- How much will the retreat cost per member?
- What will the schedule look like? How many events and team-building exercises will you be scheduling per day?
- How will meals be handled?
- Will there be a no-electronics or no-outside-contact policy?
- What are the ultimate innovation goal and objectives of this retreat?
- What are the expected outcomes?

End of exercise

Clause 7.0 – Support

This clause provides guidance on how to put together the resources needed to establish, implement, maintain, and improve a support system for your IMS. Here you will learn how to use resources and capabilities, understand the importance of managing and engaging people and teams, and how to secure funding for your innovation activities and programs. It also covers the four levels of documentation that are required by the IMS and/or associated QMS systems as shown (see Figure 3.5).

Overview Clause 7.0 – Support

This Clause covers some of the best practices on how to establish a support system for innovation programs and activities. It discusses the role of people, rewards, knowledge, and infrastructure, such as innovation labs, in enhancing the performance of a current IMS. It also describes how organizations should address collaboration and change management, as well as Innovative Processes (IP) issues. Finally, this clause discusses some known tools and

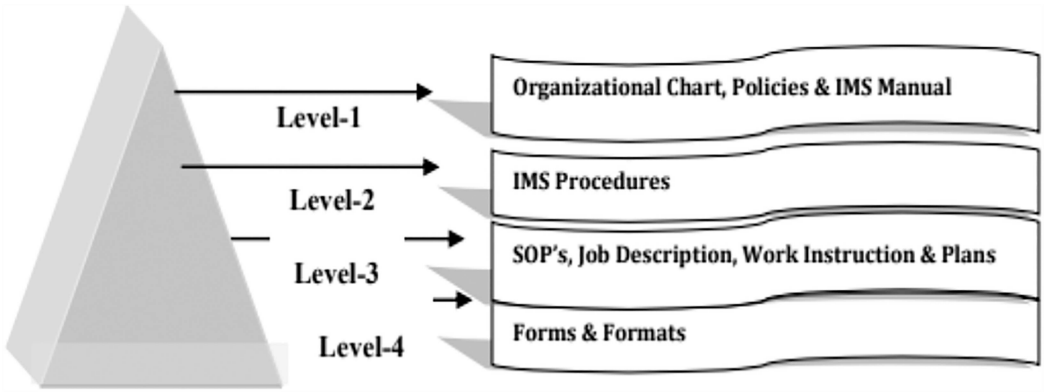


Figure 3.5 Four levels of documentation.

methods that are used in the industry to engage teams in creativity and innovative thinking. It consists of the following subjects:

- Resources (people, time, knowledge, finance, infrastructure)
- Competence
- Awareness
- Communication
- Documented information
- Tools and methods
- Strategic intelligence management
- Intellectual property management

Clause 8.0 – Operations

Purpose Clause 8.0 – Operations

To provide guidance on how to manage the innovation process and how to orchestrate different operations that are needed to support the innovation process. This clause describes the control mechanisms of collaboration, the criteria by which you define innovation, and the agile governance framework that you need to put in place to ensure a more fluid innovation process.

Agile governance is about understanding your organization's risk-taking appetite, your enterprise's tolerance level, and your challenges. Be it smaller, global, or local organizations, agile governance determines whether your organization's risk-based controls are working or not to help you manage risks.

The four guiding principles for Agile Governance.

- Effective Team Collaboration
- Mirror the Agile Manifesto: self-organized and empowered teams
- Monitor Performance Metrics
- Focus on the Team Behavior and Practices

Overview Clause 8.0 – Operations

This clause focuses on how to manage innovation initiatives, and how to prepare the innovation process, i.e. create a concept, identify opportunities, validate the concept, and develop and deploy solutions. It also provides tools and best practices on how to evaluate an idea, at the end of each step, and provides a risk assessment matrix at the end of each step. It also helps you understand what activities are needed to operate your PIC while identifying some best practices for using the ideation process. Note: The Ideation process is any and always coming up with ideas. This is a broad term that can be applied to any situation including strategy, problem-solving, decision-making, and design. The following are illustrative examples of ideation. Brainstorming is the process of spitting out ideas without validation.

This clause consists of the following subjects:

- Operational planning and control
- Innovation initiatives
- Innovation processes
  - General
  - Identify opportunities
  - Create Concepts
  - Validate concepts
  - Develop solutions
  - Deploy solutions

Clause 9.0 – Performance Evaluation

In ISO 56000 – 2020, Innovation Management – Fundamentals and Vocabulary Performance is defined as, "measurable results."

Note 1 to entry: performance can relate either to qualitative or quantitative findings.

Note 2 to entry: performance can relate to the management of activities, processes, products and services, systems, or organizations.

It relates to terms like indicators, efficiency, effectiveness, innovation capabilities, and values.

Evaluation is defined as, "The process of comparing results of analysis to establish criteria. Authors' Note: criteria should define an acceptable range of variation.

Purpose Clause 9.0 – Performance Evaluation

This clause describes the processes by which you evaluate the performance of the IMS. It provides a general framework to help you create and implement a

monitoring system that allows you to measure, analyze, and evaluate the performance of the organization's innovation activity or programs.

It describes the steps needed to establish the monitoring system and describes the tools and methods used to evaluate the IMS. It also provides a description of the different types of quantitative and qualitative methods to help you decide on the type of metrics you need to create, install, and phase into the total organization.

As you start to design or redesign the organization's IMS, a set of performance evaluations and documented criteria should be established in order to prove the design and implementation with adequate direction to produce the needed results needed to track and measure the continuous improvement of the IMS.

Authors note: "Outputs produced using processes, management systems, and/or equipment should not be considered deliverable to external customers until proper controls are put in place to ensure the output as delivered to the customer is performing to promoted minimally acceptable levels. Performance requirements are recommended for all key measurements of the IMS at each tollgate before the project is funded to continue. Exceptions to this rule are sometimes made when external customers are notified and are fully informed about the dangers and limitations related to outputs that have not been producing a qualifying process or do not meet its performance requirements, and agree to accept the output understanding these conditions.

It is important to point out that a performance management system consists of the following parts.

1. Defining desired performance results/requirements
2. Defining needed measurements
3. Defining measurement methodologies and equipment.
4. Defining measurement frequency
5. Collecting the measurement data
6. Performance Evaluation (Data analysis and reporting)
7. Continuous improvement

ISO 56002 relates to the requirements of the IMS, rather than the individual projects that go through the organization's IMS. When an organization decides to install an IMS or redesign its IMS, it should prepare a project charter that defines the desired performance results/requirements measurements and criteria for the entire IMS that the system design is based upon. These will serve as the primary KPIs for the IMS. They are sometimes referred to as design criteria. As the IMS design matures, additional secondary result/requirement measurements and criteria are often added.

Performance evaluation of individual innovative projects cycling through the IMS will be discussed further in ISO 56004. Later in this book.

Because ISO 56002 recommends that an innovative culture be developed within individual parts of the organization. It opens up the expensing of

performance evaluation requirements. Normal auditing is usually reserved for the product line, but when we prepare an innovation policy that states that everyone should be created and innovative, then we need to establish high-level and front-line level KPIs for every natural work team that is being measured and audited. A methodology called Area activity Analysis is used to accomplish this task.

The Two Types of Performance Evaluation

There are two very different types of performance evaluations that need to be conducted. They are as follows:

1. Function of the system or process as defined in the process specification or project charter. Often called systems certification. It validates the design of the system/process that is being changed to ensure it is meeting its performance goals and requirements. It often includes sustained performance runs to validate reliability and maintenance. In many cases, it requires certification of individual pieces of equipment related to performance, accuracy, and safety.
2. Certification is usually required prior to shipping output to external customers or consumers. Often, larger samples are required because there is no history database to build confidence in the risks and reliability related to the system/process/activities. It is during certification that you validate that continuous improvement has taken place between product cycles. Once the revised or new IMS is certified, regular schedule audits should be conducted on the IMS to be sure it is continuously improving.
3. Operational validation is the ongoing monitoring of individual jobs, products, or activities. It includes measurements like efficiency, effectiveness, cycle time, customer satisfaction, adaptability, variation, and conformance to output/product performance requirements. The performance measurement system frequently varies to meet the needs of the individual items being processed.

Area Activity Analysis Methodology

As previously discussed, it is relatively easy to set up midrange KPIs that focus on measuring the innovative management system like:

- Percent of employees working on innovative projects
- Percent of the market being serviced by innovative compared to objectives
- Percent of revenue generated by products released in the last three years
- Performance ratio (total invested into an innovative product divided by the total revenue from that product).
- Production months required to recover investment
- Return on investment

- New product market share.
- Cycle time from opportunity identified to delivery of product to ship schedule

It becomes much more difficult to measure how innovative a natural working unit or team is. These measurements also serve as a means to measure continuous improvement. We found it effective to use a technique called, "AAA; Area Activity Analysis." We will look at the individual work team and define activities that account for more than 20% of their workforce. Then flowchart them establishing result measurements/criteria as approved by the receiver of the output. The output performance measurements are called," Individual Performance Indicators – IPIs" (see Figure 3.6).

Using this approach, every natural working team, including the executive team, will have at least one innovative management measure that they will be responsible for continuously improving because conceptually every process has the potential to be improved. We like to have each natural working team devote at least one hour per six months to making a list of activities within the organization so that they can make improvement suggestions and discuss the value-added content their ideas have had on the organization in the last six months. It's a good opportunity to reward the individual who has made the biggest gains. A dinner for two might be a typical award. For more information about AAA see the book entitled *Total Innovation Management Excellence (TIME)* starting on page 237.

We know of some companies that have set up goals for their employees for the number of new suggestions or new innovations that they were expected to identify and document each month. Each natural working team, including the managers and employees, would have creativity as a line item in the individually scheduled appraisal and in their job description.

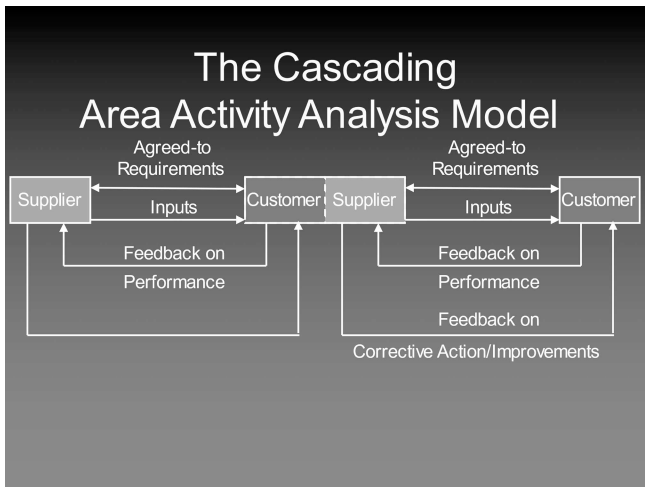


Figure 3.6 Area activity analysis.

ISO 9126 defines a general framework for the evaluation of software attributes. ISO 9126 focuses on six key performance measurement characteristics. They are as follows:

1. Functionality
2. Reliability
3. Usability
4. Efficiency
5. Maintainability
6. Probability

Because the measurement characteristics they use are common performance indicators, we believe they could be used with some innovative management systems. We believe that this is in fact one of the strengths as ISO 9126 is more adaptable and can be used across many systems, including some IMS.

The original model defined six product characteristics. They are as follows:

1. Functionality – These are the required functions available to the software.
2. Reliability – How reliable is the software?
3. Usability – How easy is it to use the software?
4. Efficiency – How efficient is the software?
5. Maintainability – How easy is it to modify the software?
6. Portability – How easy is it to transfer to another environment?

These six characteristics are further subdivided into a number of sub-characteristics.

Overview of AAA

This clause on the general framework that allows you to put together a coherent evaluation system, as shown in Figure 3.6 above, links the AAA performance measures to your internal audit, your corrective action system, and the annual management review process. It's important to point out that the standard does not require you to have an outside auditor assess your innovative management system. It is a decision that is completely left up to the management team. We frequently identify organizations that have third-party consultants/assessors to conduct two or three initial audits while they are training internal personnel to handle the follow-up audits. It also shows you how to align the following four actions to create coherence in the functioning of the IMS evaluation:

- Monitoring, measurement, analysis, and evaluation of the IMS
- Internal audit
- Measuring corrective action
- Management review

EXERCISE ACTIVITY 3.9: USING THE TIME FRAMEWORK FOR INNOVATION MANAGEMENT – EVALUATING THE IMS SYSTEM PERFORMANCE

Using the ISO 9126 systems model shown above as an evaluation framework, assess your organization's IMS in terms of the characteristics and sub-characteristics as shown (see Table 3.3). Please ignore any sub-characteristics that are not appropriate for your IMS.

Table 3.3 Characteristics and Sub-characteristics to Help Assess Your Organization's IMS

Characteristic	Sub-characteristic	Explanation
Functionality	Suitability	Can software perform the tasks required?
	Accurateness	Is the result as expected?
	Interoperability	Can the system interact with another system?
	Security	Does the software prevent unauthorised access?
Reliability	Maturity	Have most of the faults in the software been eliminated over time?
	Fault tolerance	Is the software capable of handling errors?
	Recoverability	Can the software resume working and restore lost data after failure?
Usability	Understandability	Does the user comprehend how to use the system easily?
	Learnability	Can the user learn to use the system easily?
	Operability	Can the user use the system without much effort?
	Attractiveness	Does the interface look good?
Efficiency	Time Behaviour	How quickly does the system respond?
	Resource Utilisation	Does the system utilise resources efficiently?
Maintainability	Analysability	Can faults be easily diagnosed?
	Changeability	Can the software be easily modified?
	Stability	Can the software continue functioning if changes are made?
	Testability	Can the software be tested easily?
Portability	Adaptability	Can the software be moved to other environments?
	Installability	Can the software be installed easily?
	Conformance	Does the software comply with portability standards?
	Replaceability	Can the software easily replace other software?
All characteristics	Compliance	Does the software comply with laws or regulations?

For scoring purposes, use a 1 to 5 scoring system, with 1 being low and 5 being high. Note that an overall score of 70 or greater indicates a very robust operational IMS. A score of 40 to 70 indicates an average-performing system, and a score below 40 suggests an IMS that needs much improvement (see Clause 10 for more improvement-related information).

End of exercise

Another approach frequently used is making a list of the ISO 56002 focuses on seven key performance measurement characteristics. They are as follows:

1. Efficiency
2. Indicators

3. Effectiveness
4. Timing
5. Innovation
6. Capabilities
7. Value-Added

Then adding behind each of the seven performance measurement characteristics 1 to 4 subcategories. For example, behind effectiveness you could add this subcategory return on investment, net favorable return for employee hour, impact on market share, Etc.

Another process used in a not-for-profit organization was making a list of all of the stakeholders and using it as a measurement of what each of the stakeholders would consider most important in innovative activity.

Summary Performance Evaluation

It is important to emphasize that performance evaluation will vary significantly from prototype to prototype and in the majority and financial strength of the organization performing the innovation.

Management Reviews

The focus of this clause is on the steps you need to take to install a learning system that helps you identify weaknesses and how to prevent them from happening in the future. At the end of the clause, you will learn how to conduct an improvement strategy based on the output from your evaluation system. You will also learn how to communicate with different parties and stakeholders internally to improve the IMS classification. There are two components to this clause:

- Deviation, nonconformity, and corrective actions
- Continual improvement

The purpose of this clause is to provide guidance on how to implement an improved system and manage the different steps that link it to the shortcomings and weaknesses identified by the IMS evaluation process. It helps you understand how you can install corrective actions to stop immediately the deviation and establish a preventive action plan to avoid future problems. The general status and reporting systems related to the innovative projects should keep the executive team current with its status.

Clause 10.0 – Improvement

A key ingredient in the IMS is the continuous involvement of top management attention and focus on the IMS operations. To accomplish this, top management should review the organization's IMS at scheduled intervals. This action is necessary to demonstrate that top management places high importance on the innovative activities that go on within the organization and even more important to keep top management familiar with the operations and requirements for the IMS.

One of Top management's three most important responsibilities is to provide creative/innovative thought/direction/example that results in the organization documenting continuous improvement results in the following areas.

- Sustainability
- Suitability
- Competitiveness
- Adequacy
- Effectiveness
- Efficiency
- Value-added to the employees, investors, customers, and consumers.
- Organizations net value

We recommend that at least once a year the Top Management team convene an innovative working management review session. One-third of the session is devoted to a status report that shows the improvements made since the previous session, discusses unforeseen issues that occurred, how the IMS is helping meet our three-year strategic goals and the review of outstanding risk. The second third of the session is devoted to each of the top managers reporting on what their organization has done to continuously improve their innovative activities. The last third of the meeting is devoted to Suggesting things that could be done to improve the present IMS and or take advantage of IMS-related opportunities identified during the session.

Unfortunately, ISO 56002 may leave the impression that a once or twice-a-year major review session with all of the top management team in attendance is adequate to maintain and improve the organization's innovation activities. The real need is for every one of the top management team to be able to address a question related to these 8 organizational conditions in a very knowledgeable and professional manner. He/she may not be responsible for having the information at his/her fingertips, but they should know the right individual to provide the answers to the inquiry. Maintaining an organization's IMS is not a yearly job; it is a daily job for every one of the top managers.

Our recommendations for the agenda at the Top Management Innovation Review:

- The meeting is called by and chaired by the highest-level manager in the organization. Example Pres., chairman of the board, CEO, Chief Executive Officer, Organization, Owner, etc.
- Open meeting with a review of the agenda – the person who scheduled the meeting – 10 minutes
- IMS report on how it is functioning, problems that occurred, present problems, and proposed future changes in the IMS. This is not a report on individual innovative projects/programs – 15 minutes
- Report progress, problems overcome, and outstanding problems. Each top manager should show at least one graph that indicates the part of the organization he or she is responsible for innovation/creativity in is continuously improving – Each key manager reports on the activities in his or her function – 10 minutes each max.
- Discussion led by the top manager in the organization on how to improve the present IMS strategic plan

Detailed records should be recorded of the individuals that attended the meetings. We recommend that the entire executive team stay for the entire meeting so there would be a free exchange of ideas on how additional improvements can be made. Each presenter should supply a copy of the information they presented that would be stored in the knowledge library or other appropriate document retention centers. The executive team should agree on the maximum time it should take to develop an action plan for any problem/improvement opportunity that was brought up during the meeting and agreed to as a legitimate value-added opportunity.

ISO 56002 Subclause 10.3 Continual Improvement

This subclause reads, "The organization should consistently improve the stability, accuracy, effectiveness, and efficiency of the innovation management system." This specific subclause is directed only at the Innovation Management System and not directed at the individual innovation projects/programs. Too often, this subclause is interpreted to apply to innovative projects, programs, management, and results.

ISO 56000:2020 (E) defines only three types of innovation, they are as follows:

1. **Disruptive innovation**. Disruptive innovation initially addresses less demanding needs, replacing established offerings.

   Note: Compared to establishing overseeing efforts, disruptive innovations are initially simpler, often with lower performance and they are generally more cost-effective, requiring fewer resources and offered at lower cost.

2. **Breakthrough innovation.** Their definition is innovation with a high degree of change, radical innovation is at the other end of the continuum to incremental innovation.
3. **Radical innovation** whose definition is the same as Note: Disruptive innovation, can create new markets and value networks by addressing new users and developing new business and value realization models.

Continual Improvement is defined as recurring activity to enhance performance,

Performance is defined as measurable results.

Note: Performance can relate either to quantitative or qualitative findings.

Note: Performance can relate to the management of activities, processes, public services, systems, or organizations.

Placing continuous improvement as a last subclause in ISO 56002 might have been because the originators of the document thought that continuous improvement and innovative programs were not an important part of the more complex innovative initiatives. This is not the case. It was left to the end because it was rated as being of lower importance than some of the earlier items. We believe this creates a very bad and false impression to leave on a person just learning about innovation. A person experienced with innovation projects recognizes the importance of continuous improvement as a major driving force in the innovation initiative.

It is undoubtedly not the kind of innovation that people brag about unless you are the individual who's benefiting from the revenue generated from the continuous improvement of innovative initiatives that far outperform the revenue generated from the radical and breakthrough innovative initiatives combined. It has been estimated that for every breakthrough innovative initiative that was successful, there have been more than 18 continuous improvement, innovative initiatives that were successful, generating hundreds of times more revenue than the initial breakthrough initiatives.

I also question the use of continuous improvement which literally requires a positive change between each point on the measurement being evaluated. It is not continuously improving if there is no change in value nor does it take into consideration the normal variation that we expect out of the process that is stable and under control. What we are really looking for is a positive trend line. For example, we should be looking for a positive trend line between any five consecutive measurement values.

THE INNOVATOR'S DILEMMA 3.1 MEXICAN LASER STANDOFF AT THE OK CORRAL

You are a cyborg in a duel with two other cyborgs. You have a laser beam attached to your arm that fires with 33% accuracy. One of the

other cyborgs shoots with 50% accuracy, and the other shoots with 100% accuracy. Each of you is allowed one shot per round and the shooting order starts from the worst shooter to the best shooter. You will shoot first, the 50% accurate cyborg will shoot second, and the 100% accurate cyborg will shoot third. If a cyborg is killed, their turn will be skipped. You, having the worst shot, are up first.

What should you shoot at to maximize your chance of winning?

Notes

1 The KPI Institute offers **Certified KPI Professional and Practitioner** training courses designed to help people understand KPI measurement challenges and ways to address them. To ensure a smooth learning experience the Institute offers toolkits, templates, case studies, good practice examples from some of the most successful organizations worldwide as well as thought-provoking exercises.

2 Our 10S Model is based upon the **McKinsey 7S model is a tool that analyzes a firm's organizational design** by looking at seven key internal elements: strategy, structure, systems, shared values, style, staff, and skills, in order to identify if they are effectively aligned and allow the organization to achieve its objectives.

3 Organizational values are the beliefs and principles that drive a business forward. These abstract ideas guide the way people within an organization think and act in everything they do and may even inspire the company's creation. Assessing the values of an organization can help you learn what matters to the company and working for companies whose values align with your own can help you feel fulfilled and motivated. When you become involved with a company with similar values, it can help you work toward the goals that you share.

4 Creating a business strategy requires research into and the assessment of internal and external factors that impact the company. Specifically, an internal analysis can help businesses establish areas for growth and competitive advantage. Conducting an internal analysis requires extensive knowledge of the interworkings of the company.

5 According to Indeed.com, an innovation-driven internal analysis is the thorough examination of a company's internal components, both tangible and intangible, such as resources, assets, and processes. An internal analysis helps the company decision-makers accurately identify areas for growth or revision to form a practical business strategy or business plan. Often, those creating the company's business strategy pair an internal analysis with an external analysis to create a full picture of how the company functions both as an individual entity and as a part of the larger competitive industry.

6

Chapter 4

What Is Total Innovation Management Excellence?

In a Nutshell

In this chapter, we have gathered together the thoughts and ideas of more than 20 of the most creative innovation thought leaders from business, professional practice, and academia in this compelling book. The thought leaders look at innovation from almost every angle – their statements offer an unparalleled view of innovation and provide a depth of insight that is extraordinary. This chapter is organized around Dr. Harrington's innovation pyramid, which consists of the 16 building blocks required to bring about significant improvements in an organization's ability to deliver creative products. It highlights the principles and recommendations in the ISO's new innovation standard 56002 and provides many new concepts that are not included in the standard. It includes a free, powerful, and valuable online customized innovation maturity analysis.

The following three unassailable facts will strike you as soon as you read this chapter: (1) Innovation is the new mantra; whether you're involved in a not-for-profit, for-profit, service sector, or governmental organization. (2) Understanding that innovation and creative activities penetrate into every part of an organization, requiring multiple perspectives that drive a new way of thinking and working that impacts the organization's culture, social operations, and commercial context that impacts the total organization, and not just new products or services. (3) Innovation is an exciting adventure and organizations need to draw on insights from around the globe in order to be competitive in fast-moving technologies.

Introduction: The Imperative for Innovation

In the book "Total Innovative Management Excellence (TIME) – The Future of Innovation," Langdon Morris, one of the leading thought leaders in innovation management, recorded:

DOI: 10.4324/9781003413509-4

"This new form of systematic innovation has a number of key elements.

1. As it is proactive rather than reactive, it is undertaken from the outset in alignment with and in support of an organization's overall strategy. Strategy thus defines the context in which innovation is pursued and provides the primary targets toward which the search for innovation is directed.
2. As it is pursued with great awareness of the rate at which new technologies are being discovered and developed, maturing, and impacting the market, it takes a broad view of the emerging technology landscape and seeks to understand future possibilities thoughtfully and comprehensively. The capacity to anticipate market shifts thus becomes a distinct competitive advantage for any organization.
3. And yet, paradoxically, this effort must not be guided by specific predictions about the medium and long-term futures. Instead, given the acceleration of the change, we take the view that all predictions are likely to be wrong. So what is our approach then? Instead of predicting the future, we model *alternative futures*, shifting from 'prediction thinking' to 'possibility thinking,' and thereby broadening our innovation horizon to encompass these possibilities. When we recognize what could happen, we are much better prepared to recognize the new things that are happening and to act quickly. We can also use this knowledge to be the drivers of change by harnessing trends and shaping market outcomes. This is of course the great advantage that innovation brings.
4. As it is clear that great ideas may emerge from anyone, anywhere, at any time, innovation leaders actively encourage broad participation in the innovation effort. Indeed, innovation is understood to be the product not of an organization, but of an entire ecosystem, which may consist of individuals, organizations, clients, partners, and researchers. Hence, the role of innovation managers is to bring the entire ecosystem into alignment as co-participants in the innovation process. Innovation casts a very wide net, and defining an inspiring and compelling process of inquiry seeks to engage people as co-explorers and co-creators.
5. The innovation process itself is carefully managed to balance the broad early-stage learning and investigation with the mid-stage definition of possibilities and with the end-stage execution and delivery of value.
6. Systematic innovation is also pursued with an acute awareness of risk. However, risk in innovation occurs simultaneously across multiple dimensions, so risk management is a multi-faceted effort. For example, there is a significant risk in pursuing only the sure bets, which drives us toward incremental thinking and sets us up to be blindsided by big changes. Conversely, there is also a risk in pursuing only the big bets and overlooking thereby the easy wins that could help sustain market share. So there is risk in being too broad, and also in being too narrow.

Innovation management is always focused on finding the balance, and cognizance of this is also how we manage the inherent risks through the critical technique of innovation portfolio management.

7. In contrast to common perception, innovation is not all about creative game-playing, toothpick towers, and legos. While creativity is of course essential, so are disciplined development of and selection between options, tracking of schedules and deadlines, mapping technologies and new competitors, careful governance, and rigorous investment management."

Introduction to TIME

Time is flying by fast as countries around the world use the United States as the benchmark as they attack America's number one feature that has made it the greatest nation in the world. It gets people and organizations to try to be more creative and innovative. It's a win-win situation for the foreign competition and the consumer as well. It is a call to arms for the United States just like Pearl Harbor was a call to arms in World War II.

TIME is designed to change the organization's culture whereas a methodology is designed to focus on individual parts or products of the organization. Some of the more innovative aggressive organizations are using both of these in parallel as the Innovation Systems Cycle methodology, which focuses on the immediate future, and TIME, which provides for a long-term, across-the-board improvement in innovation and creativity.

Well, it's about time for TIME, which is a methodology designed to take advantage of the most positive aspects of each of the best practices that the various functions within the organization are promoting. TIME blends together key parts of these methodologies in a manner that demonstrates to the individual stakeholders that the culture of the organization is primarily focused on improving performance and value-added to each of the stakeholders. The six tiers of the TIME pyramid are presented in Figure 4.1.

To accomplish this, TIME uses 16 key building blocks to construct an organizational profile designed to consider all of the individual stakeholder's desires. (Note: We use the term *stakeholder desires* rather than *stakeholders' needs or requirements*.) These building blocks are strategically aligned with each other to increase the organization's efficiency, effectiveness, and adaptability. This combination of building blocks makes up a pyramid that is commonly known as the TIME Pyramid (See Figure 4.2).

- Tier I – Value to the Stakeholders (the Foundation)
- Tier II – Setting the Direction
- Tier III – Basic Concepts
- Tier IV – Delivery Processes
- Tier V – Organizational Impact
- Tier VI – Rewards and Recognitions (Shared Value)

Figure 4.1 The six tiers of the TIME pyramid.

Figure 4.2 The TIME pyramid.

Tier I – Value to Stakeholders

Tier I – Value to Stakeholders is the foundation that is designed to support the pyramid whose objective is to provide added value to the Stakeholder (Stakeholder, Partnerships.) It is the bottom tier and contains only one Building Block – BB 1: The Foundation. The foundation needs to sit firmly on bedrock thereby establishing a platform for the other 15 building blocks.

This foundation is built on a bedrock to provide maximum stability to the pyramid. It provides assurance to the stakeholders that the organization's activities are stable and well-constructed. Without a good foundation, no matter how elaborate the construction is, the organization is doomed for failure. Too many of the present technologies are built on a "sand" base. As a result, as the sand shifts cracks start to appear in the foundation, and the walls (and the organization) come crumbling down under their own weight.

Tier II – Setting the Direction

The second tier in the pyramid is used to set the innovative direction of the organization's performance strategy. It consists of five building blocks (BBs), which are as follows:

- BB2 – Innovative Organizational Assessment.
- BB3 – Innovative Executive Leadership.
- BB4 – Performance & Cultural Change Management Plans.
- BB5 – Commitment to Stakeholders' Expectations.
- BB6 – Innovative Project Management Systems.

Many organizations fail because they develop their plans before they understand the opportunities, the competition, and the limitations.

Tier III – Basic Concepts

The third tier in the pyramid is directed at integrating the basic innovative concepts into the organization. It consists of four building blocks. They are as follows:

- BB7 – Innovative Management Participation.
- BB8 – Innovative Team Development.
- BB9 – Individual Creativity, Innovation and Excellence.
- BB10 – Innovative Supply Chain Management.

This is the blood and sweat level of the pyramid. It is often a lot of hard boring work whose rewards are hard to see. It's the blocking and tackling exercises that make the 80-yard run for a touchdown possible.

Tier IV – The Delivery Processes

The fourth tier is the Delivery Processes Level. This tier of the pyramid focuses on the organization's processes and the output that the customer/consumer receives. It consists of three building blocks. They are as follows:

- BB11 – Innovative Design.
- BB12 – Innovative Robotics/Artificial Intelligence.
- BB13 – Knowledge Assets Management.

This is your chance to shine, grow, learn, lead, and, most of all, contribute to everyone's well-being. This is your chance to be the very best you can possibly be. Your chance to stand up and call out "bingo." We've got room to make you a winner. This is where the magic happens!

Tier V – Organizational Impact

The fifth tier of the pyramid is the Organizational Impact Level. By now the innovative performance improvement process is well underway within the

organization and it will soon start to impact the organization's structure as well as its measurements. This tier consists of two building blocks. They are as follows:

- BB14 – Comprehensive Measurement Systems.
- BB15 – Innovative Organizational Structure.

You can't be a winner if you don't have a goal. A goal that cannot be measured eliminates the possibility of ever winning. A good goal that is measurable is your golden ticket to success if you are organized to aggressively attack the goal.

Tier VI – Rewards and Recognition (Shared Value)

Rewards and Recognition that involve shared values are at the very top of the pyramid as they provide the mortar that holds the individual building blocks together. Without enough innovative mortar, it can cause the pyramid to shift and decay. As the individual building blocks shift around causing large cracks and voids to weaken the pyramid until the pyramid is unstable. The TIME Pyramid was created to provide additional value to all the stakeholders. It is absolutely imperative that the added value content and results are shared with the relevant stakeholders.

You cannot expect an employee to suggest efficiency improvements if he or one of his friends is going to be laid off as a result of the suggestion. If you start a continuous improvement process and you have layoffs, what you will end up with is a continuous sabotage process. We like to see the organization release a no-layoff policy. For example:

> No employee will be laid off because of improvements made as a result of the TIME methodology. People whose jobs are eliminated will be retrained for an equivalent or more responsible job. This does not mean that it may not be necessary to lay off employees because of the business downturn.

The organization's dollars and cents savings should be shared in three ways:

1. with the customer/consumer.
2. with the employee.
3. with the investors.

Should everyone be recognized in the same way and with equivalent value rewards? No!! All rewards and recognition systems should be capable of adjusting their output based on the contribution the individual or team made to the organization's overall performance.

One very important word of warning, "Don't focus so hard on creating your most advanced innovative management system that its purpose is to maximize the value-added of the items that are processed through the system. Bureaucracy eliminated can play a key element in your system design."

The TIME Building Blocks

In a previous chapter, we defined that the innovative creation cycle (Innovation System Cycle – ISC) was composed of three phases – the **creation phase**, the **preparation and producing phase**, and the **delivery phase**. If we're to complete the lifecycle, we would add a fourth phase – the usage phase. Truly you do not have an innovative concept or program unless it has created added positive value when all the stakeholders have been considered. All too often, features are added to a current device with the claims that it is an innovative feature. In reality, the resources it consumes to be creative and use it was greater than the resources that were saved from using it.

So far in this chapter, we have developed a visual image of the pyramid. Now it's time to share some of the key materials that go into making each of the building blocks and how they are locked together to form smoothly running processes and systems.

Each building block has its own unique contribution to the strength and performance of the total organization and should provide inputs that are absolutely essential for the organization to perform as efficiently, effectively, and adaptable, as is needed to meet its responsibilities. Customers cherish and enjoy the strong building blocks of your organization, but they are most apt to talk about the weak building blocks and the surprisingly bad results rather than the surprisingly good results. Be twice as careful to not be bad then you take to be good. If you tell me your good stories, I may get bored. But if you tell me your bad stories, I'll tell you ones that are worse, even if I have to beef them up a little to sound bad enough.

There is a biblical story that the Jewish slaves told about when the Egyptian Pharaoh took away all the straw and forced them to make bricks that were of equal quality and reliability. The Egyptian Pharaoh responded by saying, "You think they had it bad, when they ran away and my legions went out to bring them back to do their jobs their Lord parted the sea to allow them to walk across on the dry seabed to safety while my men, who were chasing them, all drowned as their Lord flooded the area."

BB1: Building Block 1 – The Foundation

This foundation is built on bedrock to provide maximum stability to the pyramid (See Figure 4.3). It provides assurance to the stakeholders that the organization's activities are stable and well-constructed. Without a good

Figure 4.3 BB1 – The foundation.

foundation, no matter how elaborate the construction is, the organization is doomed for failure. Too many of the present technologies are built on a "sand" base. As such, they look beautiful for a period of time and then slowly decay taking the organization's culture, investors' money, and employees' jobs with it.

It is absolutely essential that you invest heavily in building a foundation that is capable of supporting the weight of the structure that will be placed upon it when it's subjected to time and the very worst of environmental conditions (hurricanes, tornadoes, earthquakes, sandstorms, floods, etc.).

The tallest skyscraper in San Francisco (The Millennium) is slowly tilting to one side because the foundation was not built on bedrock. It was the pride and joy of San Francisco residents until it turned into San Francisco's Leaning Tower of Pisa. Literally, millions of dollars will be required to correct the foundation that the building was built upon. As of this date, no one knows how to correct the situation other than tearing down the upper stories of the building to reduce the weight on the foundation.

I realize that investing money in the foundation looks like a waste of time and resources but let me assure you, the biggest wastes occur when you don't provide a stable foundation. The culture within your organization depends heavily on what it is supported by.

Who Are the Stakeholders – The Interested Parties?

From our standpoint, it means that we need to understand the positive or negative value-added to each of the organization's stakeholders before we can make a decision if the change is positive value added. This is far simpler to

state than it is to accomplish. To get started in this direction, the following is a list of potential stakeholders within an organization.

1. Customers.
2. Consumers.
3. Management.
4. Investor.
5. Suppliers.
6. Employees.
7. Employee's family.
8. Government.
9. Special interest groups.
10. Service providers.
11. The community/mankind.

The stakeholder is any individual or group of individuals impacted by an organization's products or processes. It is becoming more and more accepted that all organizations need to consider all of their stakeholders in every decision that is made. If you accept the premise, it is easy to see that your improvement process must consider more than just the end consumer. Certainly, it is easier and less complicated if you can direct your efforts at maximizing the potential impact on just one or two stakeholders (usually the investor and the external customer). But that is not possible for most organizations today, since most organizations have at least six different stakeholders with very different priorities.

Although all stakeholders are important, the ones who have the biggest impact on government and functioning organizations are as follows:

- Its investors.
- Its management.
- Its external customers.
- Its suppliers.
- Its employees
- Its community/mankind.

These six stakeholders have very different needs and expectations. Trying to satisfy six different stakeholders with such different needs is a very significant challenge to any management team. For what is good for one, maybe bad for another. For example, it would be good for the investor and management to reduce costs by having fewer benefits and lower salaries by moving the operations from the United States to Mexico. However, for obvious reasons, this change is not advantageous for the employees' and the community's standpoint. It could also increase the pollution in Mexico.

Management's Prioritization of Stakeholders

To live with this dilemma, management teams have prioritized the improvement's importance of individual stakeholders. Typically, the way management considers priorities for the six stakeholders is shown below.

- Priority 1 – Investors.
- Priority 2 – Management.
- Priority 3 – External customers.
- Priority 4 – Their employees.
- Priority 5 – Their suppliers.
- Priority 6 – The community/mankind.

In this case, investors are the top priority with the community at the lowest priority. This unwritten prioritization has resulted in our government passing laws to protect the general public, the environment, and employees.

Top Five Positive/Negative Innovation Change Impacts

In order to understand the complexity of trying to satisfy all stakeholders, we need to understand each stakeholder's priorities. The following tables list the six stakeholders, their top five priorities, and their top five negative change impacts.

List 1.1 Investors Measure of the Improvement in Priority Order.

1. Return on investment.
2. Stock prices.
3. Return on assets.
4. Market share.
5. Successful new products.

List 1.1.1 Investors Measure of Negative Change Impacts in Priority Order.

1. Reduced stock prices.
2. Reduced dividends.
3. Lower profit levels.
4. Reduced market share.
5. Failure of new products.

List 1.2 Management Measure of the Improvement in Priority Order.

1. Return on assets.
2. Value-added per employee.
3. Stock prices.
4. Market share.
5. Reduced operating expenses.

List 1.2.1 Management Measure of Negative Change Impacts in Priority Order.

1. Increased operating costs.
2. Reduced market share.
3. Lower customer satisfaction levels.
4. Failure of new products.
5. Longer cycle times.

List 3.1 External Customer Measure of the Improvement in Priority Order.

1. Reduced costs.
2. New or expanded capabilities.
3. Improved performance/reliability.
4. Ease to use.
5. Improved responsiveness.

List 1.3.1 External Customer Measure of Negative Change Impacts in Priority Order.

1. Increased purchase costs.
2. Decreased reliability.
3. Fewer capabilities than competition.
4. Poor customer service.
5. Increased difficulty to use.

List 1.4 Their Employees Measure of the Improvement in Priority Order.

1. Increased job security.
2. Increased compensation.
3. Improved personal growth potential.
4. Improved job satisfaction.
5. Improved management.

List 1.4.1 Employee Measure of Negative Change Impacts in Priority Order.

1. Layoffs.
2. Decreased benefits.
3. Salaries not keeping pace with cost-of-living.
4. Poor management.
5. Decreased skills required to do the job (boarding work).

List 1.5 Suppliers Measure of the Improvement in Priority Order.

1. Increased return on investment (supplier).
2. Improved communications/fewer interfaces.
3. Simplify requirements/fewer changes.
4. Long-term contracts.
5. Longer cycle times.

List 1.5.1 Suppliers Measure of Negative Change Impacts in Priority Order.

1. Loss of contract.
2. Shorter order cycles.
3. Increased competition.
4. Imposing new standards.
5. Longer Accounts Payable cycle times.

List 1.6 Community Measure of the Improvement in Priority Order.

1. Increasing employment of people.
2. Increased tax base.
3. Reduced pollution.
4. Support of community activities.
5. Safety for employees.

List 1.6.1 Community Measure of Negative Change Impacts in Priority Order.

1. Moving work overseas.
2. Decreasing the number of employees.
3. Decreased facility resulting in lower taxes.
4. Unsafe working conditions.
5. Increase pollution of the environment (Increase in toxic gases and materials).

We agree with you that improvement impacts and negative change impacts can be different and/or rearranged based on the type of products that are being provided, the culture of the organization, and where the organization is in its development cycle. They can be different for nonprofit organizations like the government and there is some variation depending on the country/state that they are located in. However, the way they are presented represents our research related to a variety of industries from the United States to China and other countries along the way.

The ideal improvement process would improve the organization's performance in all the stakeholders' priorities and issues with lesser negative change impacts. In these tables, the most frequent impact was noted, but sometimes one methodology can have more than one impact, depending on the circumstances. It's easy to see that if an organization is a nuclear power plant, safety would be the number one priority for the management, community, and employees.

The TIME Methodology Improvement Type

The TIME methodology, when implemented correctly, can have positive impacts on the organization as noted below:

- Increased market share.
- Increased return on investment.

- Increased value-added per employee.
- Increased stock prices.
- Improved morale.
- Improved customer satisfaction.
- Improved competitive position.
- Improved productivity.
- Improved adaptability.
- Improved reliability.
- Improved maintainability.
- Improved safety.
- Increased number of employees.
- Increased profits.
- Decreased waste.
- Decreased overhand.
- Decreased inventory.
- Decreased or eliminated layoffs.

Return on Investment

Every year millions of dollars are spent on training that is not put to good use. I estimate that 5 to 10% of organizations do a very poor job of implementing the innovative improvement process and receive little or no return on the huge investment. Additionally, I estimate that about 10 to 20% of organizations successfully implement their innovative improvement process very effectively and can document a return on their investment of as much as 40 to 1.

For example, Globe Methodological Inc. has documented a 40 to 1 return on improvement effort. And somewhere between 70% and 85% of organizations that implement an improvement initiative fall someplace in the middle. They improve about 5% per year, making it worthwhile, but these organizations do not obtain the results that they should be getting. Many of the same organizations are not seeing their market share grow even though they reduced waste, cut defect levels between 15 to 20%, and came out with new products and cut cycle time. Why? Because the savings are not passed on to the external customer but are absorbed in increased bonuses for the executive team.

As a result, there is no impact on the bottom line. Other times the savings are just absorbed into the process, resulting in no tangible savings. For example, all too often, improvement activities reduce the time to perform a specific task from eight hours to seven hours. If there are 20 people who are performing the specific job that's a savings of 20 employee hours per week or a savings of 1,000 employee hours per year. The employee's pay plus overhand is $52 per hour which is a total savings of US $52,000 per year.

However, if the employees are not assigned a different value-added job, they adjust their work pattern to accommodate an eight-hour day. The old saying "Work expands to meet the defined work hours." In these cases

employees' breaks are extended a little longer, actual work begins a little later and everyone can slow down to talk to their neighbor about last night's TV program.

When a change in a product or a process occurs, it reduces the time required to perform a specific task, and the individuals who are now surplus should be identified and placed on the surplus list. Before any new job can be filled, Human Relations and the requesting manager need to look at the surplus list to be sure that none of the employees can be trained to do the value-added job. All too often we hide surplus people by assigning them to jobs that didn't need to be done before because they were not cost-effectively justified. If it didn't need to be done before, it probably does not need to be done now.

One of the reasons for the lack of bottom-line results is that these organizations are improving exponentially, but the competition is also implementing the same innovative improvement processes at the same time, causing these organizations to stay on par with their competitors. As a result, their market share does not increase. In some cases, the competition that is utilizing the improvement activities is even losing market share. This usually occurs when organizations observe that their competition is implementing an improvement activity and they decide to copy it. These organizations usually start one or two years behind the competition.

Two innovation rules to follow:

- Innovation Rule number 1: You cannot copy your competition. For when you get to where you want to be, they will be far ahead of you. You must improve at a much higher rate than your competition in order to be competitive.
- Innovation Rule number 2: Do not go to your competition and give them all your Innovation strategies. They may listen to you.

Why Organization Innovation Failures Occur

Organizations that are unhappy with their progress have many things in common. The following are the primary reasons why an organization is disappointed with the progress of its improvement efforts:

1. Promote the adoption of new technologies in order to push innovation.
2. Change is top management (new top management).
3. Management thought the employees were the problem not themselves.
4. Management was unwilling to change but they want others to change.
5. Change to top management's priorities and/or direction.
6. Differences in priority between management and the employees.
7. The theory has been taught in class but not put into practice.
8. Use of theoretical concepts rather than proven methods.
9. Using consultants who were not skilled in the methodology.

10. Downturns of the economy caused them to discontinue their efforts.
11. Middle management did not buy into the change.
12. No results after the first six months.
13. Other higher priorities within the organization kept it from being affected.
14. The consultants they hired did not understand their business.
15. They are not improving fast enough to keep pace with the competition.
16. Lack of hands-on, measurable results. There is a need to show management needs return on investment.
17. The change is not solving meaningful problems.
18. The change activity is interfering with getting the job done.
19. Lack of focus strategy to integrate all efforts.
20. The innovative effort is not reflected in the bottom line.
21. Lack of organized labor support.
22. The methodology did not work.
23. Layoffs killed the activities.
24. High project failure rates.
25. Insufficient support for the initiative.
26. The innovative activity was poorly timed.
27. All the creative activities were assigned to product engineering and development.

These symptoms led to two real causes of these failures:

1. Upper management did not believe that they needed to change.
2. Lack of trust between management and the employees is the single biggest cause of innovation failures.
3. The organization's innovative champion can be the third major cause of failure. The champion or Czar is the person within the organization selected to lead the innovative initiative. And in many cases, he or she was not qualified. Attending one class does not qualify a person to teach and certainly not to lead innovation improvement activities.
4. Both the successful and unsuccessful organizations based their innovative initiative on a consultant's methodology. Often their implementation was based upon a book written by a consultant. The methodology that is used needs to be flexible enough to adjust to the individual circumstance.
5. Forgot Middle Management – Of all the people who have been impacted the most by improvement efforts is the middle management. Middle managers are the ones who have felt the pinch of all layoffs and flattening organizations more than anyone else.

Why Buy from You?

After World War II, our production capabilities were the only ones that were not out-of-date or bombed out, ensuring our immediate success. As a result,

we gained a false sense of confidence. We began to believe it was our management style that set us apart, not because the war was not fought on our soil. In Europe, an MBA degree began to stand for a Manager who had been to America. The rest of the world was quick to learn from the US. People around the world set a personal objective to exchange their rice and potatoes for the steak that was on our plates.

As a result, we slept through the 1960s and 1970s. The alarm clock rang in the 1980s but we rolled over and turned it off. In the 1990s we woke up, showered, shaved, dressed, and drove to work. It wasn't until the 2000s that we rolled up our shirt-sleeves and were committed to not losing more ground. This new, leaner America is transforming itself from a sleeping giant into a customer-related team that will do anything to satisfy its customers.

International customers are attracted to your organization for four reasons, in the following order:

- Customers Are Won Because of:
  1. Capabilities.
  2. Trust.
  3. Price.
  4. Quality

- Customers Are Lost Because of:
  1. Trusts.
  2. Quality.
  3. Capabilities.
  4. Price.

Product and service capability is driven by using the latest technology and/or using present technology in more creative ways. Trust is based on experience and reputation. It reflects the faith that the customer has in your ability to meet your cost, schedule, and performance commitments. Price today is directly tied to value. Customers are looking at getting the best performance at the least cost. Quality reflects more than just the internal view of the product and/or service purchase. It reflects the quality of the total organization, the reliability of the product, and the capability of its sales and service personnel. You lose customers for the same four reasons that you attract them, but in a different order.

For an organization to survive in today's competitive international environment, there must be innovative improvement efforts using both continuous and breakthrough improvement methodologies. Management needs to make the correct business decisions so that the correct products are available at the time they are needed, while making the most of everyone's efforts. There needs to be a high level of cooperation between government, business, labor, and academia. Each must improve the value of the product and/or service as viewed by its customers. This means that all functions in an organization must

use the most appropriate technology to improve their efficiency, effectiveness, and adaptability. In addition, all organizations need to have a well-communicated agreed-to plan that merges together the many improvement methodologies to provide the greatest value to all the stakeholders.

Providing Value to Stakeholders

The purpose of any progressive, long-lasting organization is to provide products and services to its customers that have more value, better quality, and are less costly than what other organizations offer. But it also has an obligation to all its stakeholders which include investors, management, employees, suppliers, and the community. Truly great organizations provide ongoing security and value to all of their stakeholders, not just their customers. TIME is based upon establishing strong stakeholder partnerships with the organization using innovative improvement approaches. The word "partnership" implies that all parties involved will mutually benefit from the innovative improvement activities.

Without building a strong stakeholder foundation your innovative improvement process cannot sustain itself. It is like building your house on sand close to the ocean. No matter how well you put the building blocks together on top of a bad foundation, sooner or later the sand will shift and your house will come tumbling down. One of the most difficult jobs all organizations face is to balance the needs of all its stakeholders so that the organization is perceived as value-added to all of the stakeholders.

Determining Value-Added for All Stakeholders

I suggest that you start the evaluation by making a checklist for your most important stakeholders. Typically these are the investors, the external customers, management, employees, the community/mankind, and suppliers. For each of these stakeholders, you should define the top positive value-added outcomes and a second list of the negative value-added outcomes that would result from implementing a project, program, or change.

Samples of these lists can be found in lists 1.1 through 1.6.1. Due to the variety of organizations, cultures, outputs, and operations conditions, you may find it necessary to modify the list to accommodate your specific organization's environment. The information in the above-mentioned list represents the information that we would include in a typical engineering and production-type organization.

For each of the 10 outcomes per stakeholder, you should determine if you agree or disagree with the statement. We use a "10" to indicate a strong agreement with the statement and a "0" to indicate a strong disagreement with the statement. This will provide you with an understanding of which major stakeholder change activities are positive value-added and which

have no value ("5" rating) or negative value-added for the change. Periodically the changes that have or are being implemented should have this checklist reviewed and combined to identify major stakeholders that are receiving no or negative value-added improvements in all 10 outcomes per each major stakeholder. When this occurs, your organization should consider some change activity that will result in positive value to that stakeholder.

Determining Value-Added for Individual Changed or New Activities

Determining what stakeholders are being served by the organization's change or new initiatives is much easier to define. The difficulty occurs when we start to justify a potentially innovative change initiative. Usually, organizations focus their analysis on the organizational key measurements like return on investment, value-added per employee, reduced cycle time, and increased customer satisfaction. Typical types of data that need to be assembled are:

- Cost to produce the output – Finance, Manufacturing Engineering, Sales and Marketing.
- Average employee costs including variable overhead – Finance.
- Sales forecast by month for the first year, by quarter year next two years – Sales and Marketing.
- Additional equipment requirements estimated price – Manufacturing Engineering and Information Technology.
- Supplier projected cost – Procurement.
- New employee acquisition costs – Human Relations.
- Projected cycle time – Product Engineering.

Some key tips to remember:

- Whenever your innovative change value-added results from eliminating or simplifying work activities, there are no savings unless individuals are assigned to do a different value-added activity. These cannot be activities that were not being done before because they could not be justified. For example, if you change the 8.0 hours per day operation that an individual is performing so that it can be done in 7.8 hours a day, the employee must adjust his work rhythm to fill up the rest of the 0.2 hours. This in reality is not value-added. Example 2: If an innovative improvement effort resulted in savings of 80 hours per week and no one is assigned to another activity, there is no work hour savings involved in the project. If the 80 hours are assigned to other or new activities, the savings from the initial project is equal to the additional value-added as a result of applying the 80 hours to a different assignment.

- You cannot claim work hours saved unless the savings are applied to a different assignment or employees are released from the organization as a result of the innovative performance improvement activity. If the change resulted in saving 80 hours per week and only one person was laid off, the savings would be equal to the savings as a result of an individual that was laid off plus the value-added for the other 40 hours. Value-added when a job is eliminated, there is a savings of the employee's salary plus the variable overhead costs. The fixed overhead cannot be considered.
- The cost of the person laid off is immediately reflected as a decrease in cost but you must consider the replacement cost to your organization. We like to use the replacement cost for an individual as a negative value-added to the innovative change. The average replacement cost runs between 50% and 150% of the employee's annual salary. That means that for an employee whose salary is $60,000, it will cost the company anywhere from $30,000 to $45,000 to hire and train a replacement.
- The first type of cost that results from separating an individual from the organization is direct costs. This category includes the following:
  - Separation costs such as exit interviews, severance pay, and higher unemployment taxes.
  - Replacement costs for advertising, search, agency fees, etc.
  - Temporary staffing.
  - Training costs.
  - Personal purchase items like uniforms, and informational literature.
  - Reduced productivity due to the learning curve.

Indirect costs. This includes the following:

- Lost productivity for the departing employee.
- Lost clients and lost organizational knowledge.
- Reduced morale.
- Hiring temporary employees.
- Additional work for other employees.
- New employee learning his or her job.

These costs vary greatly from country to country and type of output. The following is a typical replacement cost for a manufacturing-type organization in the United States in 2020.

- Heavy manufacturing plant employee – $760.
  - Registered nurse – $1,200.
  - Financial professional – $8,500 to $13,000.
  - Senior manager at a residential construction company – $80,000 to $90,000.

- Middle manager at a consumer products company (making $50–125k) – $98,000 to $117,000.
- Lower-level executive at a consumer products company (making $125k) – $185,000.
- Senior-level executive at a consumer products company (making $200k) – $300,000.

When you reduce inventory, you only save the interest on the value of the inventory that was reduced. Typically this is about 3% of its value. By reducing inventory, this frees up additional space that can be used for something other than inventory. In this case, additional space can be considered as positive value-added savings at a rate in keeping with renting a similar area.

The cumulative positive or negative value-added should be included in the Value Proposition and the Business Systems Analysis. It should be used as an initial projection that justifies making the project part of the organization's portfolio of activities.

The importance of having a solid foundation for your TIME initiative cannot be overstated. All too often organizations march blindly into new initiatives without establishing a firm base to build the new culture on. Obviously, BB1 needs to be established early in the transformation initiative. As a result, much of this activity has to be based on good judgment, acquired knowledge, and experience. When you design your foundation, there are two things that you need to consider. They are as follows:

1. The materials that will be used in the foundation, including the steel rods that hold it together and reinforce the foundation.
2. The materials that the foundation sits on. If the material that the foundation is sitting on shifts, it can weaken and/or destroy the best-designed foundation and everything that the foundation supports. Ideally, the foundation is constructed on a bedrock that is firmly based on the organization's mission and values. If this is not the case, support columns need to be designed to penetrate the sand until there can be no movement in the materials that the foundation is resting on.

You need to build your foundation in a manner that will support the present activities and continue to support your activities if the organization grows by 100%. Given a sound foundation, the organization can extend upward without jeopardizing any of its strengths and advantages.

> Building a temple on the foundation that was designed for a bungalow is a sure combination for failure.
>
> **H. James Harrington**

EXERCISE ACTIVITY #4.1: BUILDING A SOLID FOUNDATION FOR INNOVATION

An innovation framework sets the parameters, processes, and practices that foster innovation. Because innovation is a complex, cross-functional endeavor, the framework applies organization-wide. It provides a sustainable structure for innovating in line with corporate strategy and ultimately creating tangible business outcomes.

Steps to Follow:

Now that you are familiar with the TIME types of innovation, here are five steps to help develop an innovation framework exercise based on your organization's needs and goals.

1. Create an innovation:

Determine what your company is trying to achieve with innovation, aligned to business objectives. Your innovation and business strategies are not mutually exclusive but should be integrated as part of core business planning. Tied to individual and company performance, this sets the foundation for long-term innovation.

This step is crucial to building a solid innovation framework. A disjointed approach to innovation often results in misguided efforts, conflicting priorities, and turf wars over scarce resources. Senior leadership must set the innovation strategy and rally the organization around it.

2. Analyze and select your innovation types:

Based on your innovation strategy and the organization's goals, decide which innovation type or types are best. A mix often works best, according to Doblin: "… all great innovations, throughout history, comprise some combination of these ten basic types."

For example, your current innovation strategy could be to increase revenues by elevating existing products while improving the customer experience. You could build your innovation framework around some combination of service, customer engagement, brand, product system, and product performance innovation.

3. Establish or understand your means of innovation:

Many organizations focus on internal knowledge and talent for innovation (e.g., R&D departments, innovation labs, internal start-ups, crowdsourcing). External approaches include customer input, venture capital arms, partnerships, M&A activity, and other practices.

Use your innovation strategy to guide you here. Knowing what the business objectives are and the types of innovation required, you can determine if the organization is using the right vehicles or if it needs to introduce new ones. Your innovation framework should then guide and support these methods as well as the people using them.

4. Build your processes and systems:

Depending on the methods of choice, you'll need to set up consistent ways to spur and sustain innovation. For example, your company may prioritize internal innovation. Executives may aspire to "open innovation," where the entire company is involved in coming up with great ideas and solutions to internal issues.

You can support this by implementing the right systems and processes in your innovation framework. Crowdsourced innovation programs, for instance, solicit input from all employees regardless of which department poses a need or challenge. These systems can provide consistent processes to submit ideas and qualify them. For more on this topic, read the article "3 Ways to Cultivate Employee Engagement Through Crowdsourcing."

4. Develop the capacity for successful delivery:

Your innovation framework must also enable the fast execution of the best ideas. This includes prioritizing innovation initiatives based on risk, ROI potential, resource constraints, strategic fit, and other criteria. It also includes reducing bureaucracy and speeding up decision-making.

The framework must prompt enough governance to keep employees and teams innovating on strategy, but not so much that it stifles them. You can motivate and empower teams by linking the innovation strategy and initiatives to their daily work and facilitating their choice of work methodologies. This enables them to tackle innovation in their own ways and do their best work. Finally, celebrate successes.

End of exercise.

BB2: Building Block 2 – Innovative Organizational Assessment

It is not practical to start any type of innovative improvement effort without establishing what your present situation is. One of the major mistakes many organizations make is thinking that the executive team has an excellent understanding of what problems the workforce is facing. We often find out that the executive team frequently has a more positive view of the organization's operations and the employees have very different opinion (Figure 4.4).

Figure 4.4 Innovation works – UAE example.

Typical items that should be included in your current-state analysis are as follows:

- Map presents an innovation management system.
- Conduct innovation maturity grid analysis.
- Contact as is, should be, priority analysis.
- Map presents knowledge management system.
- Map presents market analysis process.
- Map future market analysis process.
- Review job descriptions for people who interface with customers.
- Review current active portfolio projects.
- Review project management procedures.
- Review employee opinion surveys.
- Hold private, confidential meetings with executives.
- Review operating manual.
- Review executive performance measurements/KPIs.
- Review organizational change management.
- Innovation rewards and recognition.
- Supply chain management procedures and results.
- Status of core capabilities and competencies.
- Internal technology status development.
- Analysis of strategic plan.

Any assessment of an organization collects information related to the needs, expectations, and desires of the executive team, middle management, and the employee. Once this is done, the organization is in a position to compare the organization's strengths and weaknesses as viewed from these three separate levels. (Note: It is a rare organization where a single survey and/or assessment is adequate to characterize the culture of the organization and identify opportunities for major improvement – Ernst and Young database.)

It is absolutely critical that you back up your final organizational assessment with hard facts, not just opinions. At a very minimum, you should have a good flow diagram of your current Innovation Management System and hard facts related to project management of innovative projects.

BB3: Building Block 3 – Innovative Executive Leadership

> If you're going to sweep the stairs, always start at the top.
>
> – My grandmother.

Top and executive management must do more than just support TIME. We like to start our innovation improvement initiative with the Board of Directors. The primary responsibility of the CEO of an organization is to meet the requirements set by the Board of Directors. The performance goals and objectives are not based on what the executive board says they should be. They are based on what the Board of Directors requires. Of course, the total executive team must be part of the process, participate in designing the process, assign resources, and give freely of their personal time. The start of any improvement process is the total executive team's belief and leadership to make it successful (Figure 4.5).

Figure 4.5 BB3.

EXERCISE ACTIVITY #4.2: RETURNING TO ONE'S ROOTS

Executives may have started in lower positions in the company, and many may have changed in the meantime. Due to this perspective, higher management may be out of touch with the current experience of entry-level workers. One of the more unconventional yet enlightening executive team-building ideas is for organizational leaders to spend time working in the trenches.

Executives can either visit the same or different departments. These leaders should spend at least half a day shadowing areas like customer service, warehouse, or administrative assistants, and then report findings to the rest of the higher management team. While you can go incognito *Undercover Boss* style, we recommend being open and honest about your position and intentions.

This approach shows more trust in and respect for employees and opens the door for honest communication and bonding between differing company levels.

This exercise helps executives gain valuable perspective on how the lower rungs of the organization operate. Leaders can come together afterward to bond over the experience and brainstorm new solutions.

BB4: Building Block 4 – Performance & Cultural Change Management Plan

All employees need to understand why the organization is in existence, what the behavioral rules are, and where the organization is going (See Figure 4.6).

Figure 4.6 BB4 – Performance and cultural change management.

This direction must be well-communicated to the stakeholders, and there needs to be an agreed-upon plan on how the organization wants to change. That is what a Business Plan does for an organization. It sets the direction of the business, what products are going to be provided, what markets are going to be serviced, and what goals need to be reached in the future. Without an agreed-to, well-understood business plan that is implemented effectively, the organization has no direction so it meets its goal of going nowhere.

> A business plan setting on someone's desk is no plan at all.
>
> **H James Harrington**

The future state operation is a vision of how the organization wants its culture to function in the reputation that the organization will have three to ten years in the future. It is possible to make a change in the way the organization is behaving in as little as six months. Sustaining the change for six months does not indicate that the culture has actually changed; it only indicates that the behavior patterns have changed and these may easily be changed back to their original behaviors once the stimulus has been removed. To get a cultural change, the behavioral patterns need to be sustained for at least four years to the point that it is no longer anything special; it's just the way we do it here.

We like to think about culture as a rubber band stretched around four posts. Inside the square made by the rubber band is the culture within the organization. It is very easy for a CEO or a new improvement methodology to come into the organization and distort the rubber band. As soon as the distributing pressure is removed, the rubber band snaps back to its old culture. We like to see the distortion held constant for two CEO cycles before it can be considered a legitimate cultural change.

Note: A typical future state vision statement could read, "Increase the value-added content per employee significantly using creative and innovative tools and techniques." (Examples of other vision statements are presented throughout this book.)

The challenge that faces the organization is how to prepare a vision statement that is challenging but doable while adding value to the stakeholders. There are a number of approaches used to accomplish this. Some of them are as follows:

1. Executive Task Team – This usually is a small group of three to five people assigned by the CFO. The CFO is usually a member of this task team executive officers and the manager of the strategic planning department. Each member of this team will explain what his/her ideal view of the organization would be five years in the future. Following this discussion, the

team will prepare a strawman's version of the vision statement that all of mankind agrees on. The strawman's version of the vision statement is then presented to the total executive team and middle management for their verbal or written comments. Based on these inputs, the vision statement is rewritten and presented to at least one focus group from each major function. Based on input from the focus groups, the vision statements are modified for the third time and released to the whole organization.

Four Options for This Exercise: A-B-C-D

- A – The 10S's Performance Drivers Approach – This approach develops proposed vision statements for each of the 10S that drive most of the performance in an organization (See Figure 4.7). They are as follows:

A ten-level progression model has been established for each of the 10S's. This is an online software package that allows anyone to do a self-evaluation or a group evaluation by answering a few very simple questions. Within five minutes they have a completed and analyzed innovation maturity level report covering seven of the ten categories. This is used to establish the maturity level of your innovation environment and systems. The individuals then evaluate each of the questions in the survey and select the level of performance they would like to be at three to five years in the future for each individual question.

The computer then analyzes the inputs and calculates the desired maturity level for three to five years in the future. This provides an excellent tool for generating customized cultural performance patterns to maximize the potential of success for the individual functions within the organization and the general overall cultural vision statement.

Our experience indicates that optimum performance results within an organization have a variable cultural pattern depending on the activities and customers that the individual functions are servicing. For example, you wouldn't want to have the same culture imposed upon the person laying bricks

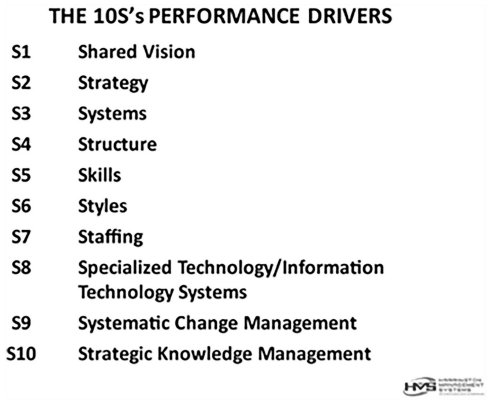


Figure 4.7 The 10S's performance drivers.

and the person selling a $3 million home. This is our preferred approach because it provides very customized results.

- B – The functional approach – Each functional VP will prepare a proposed vision statement for the whole organization. We advise that each vice president should take time to get input from the people who report to them related to the proposed vision statement. A meeting is held where the proposed vision statement is presented by the individual who submitted the proposed vision statement. Each member of the executive team will classify and identify the two proposed vision statements that they believe best serve the organization and its stakeholders. The proposed vision statement that receives the highest ratings will be used as a foundation for the organization's vision statement. The executive team will recommend changes to the selected preliminary vision statement and agree on how it will be changed. The vision statement is then communicated to the stakeholders of the organization as the organization's official vision statement.

- C – Reputation approach – The executive team will define the stakeholders that would be most effective in binding the organization's vision and its associated changes. Typically, the stakeholders that are selected are the customer consumer, employees, investors, and management. A meeting of the executive team and selected knowledgeable individuals is held to develop a vision statement. Usually, this team has a representative from the Board of Directors and one from a major company on it. The meeting is divided up into small working groups of three to five people.

Each working group will be assigned a major stakeholder. The working group will develop a list of attributes that the assignment stakeholder would want to see in an organization that has an excellent reputation. (Example: Lowest price, highest reliability, ease-of-use, attractive packaging, feminist response to purchase orders, return on investment, higher wages, etc.) A list of attributes is then prepared for each major stakeholder. These lists are compared to each other to identify common themes. The attributes with the most common attribute themes need to be considered when preparing the formal vision statement.

With this information in hand, the small working groups go back together and prepare a proposed vision statement. These vision statements are reviewed with the total executive team. The executive team will rate each of the proposed vision statements and the one with the highest rating is selected to be the framework for the vision statement. This preliminary vision statement is then modified based on important points brought up in the other proposed vision statement and specific knowledge that individual members of the team have.

This revised vision statement is referred to as the preliminary vision statement. Each of the vice presidents will then hold focus groups with small

groups of their employees to get their input related to the preliminary vision statement. Procurement will usually do something similar with key suppliers and sales will do the same thing with customers/consumers.

Finally, a second meeting of the executive team is then held to review the results of the focus groups. Based on these inputs, the preliminary vision statement will be updated and released as the formal vision statement for the organization. It is extremely important that the formal vision statement is effectively communicated to the stakeholders by knowledgeable, well-informed individuals.

- D – Another approach to preparing the formal vision statement is to assign someone and/or some group (the strategic planning department is often used) to organize the vision statement meeting. They make arrangements to have the following prepared for and presented at the vision statement meeting.
  1. Sales and marketing will present their view of what customers will be buying over the coming five-year period.
  2. The Information Technology department will present their projections of how the computer and software technologies will change over the next five years.
  3. Approaches to effective ways of developing an organization's vision statement. The one that you select should be based on the unique properties of your organization's culture.
  4. Someone from this COO's office will pull together a list of major problems and improvement opportunities the organization is facing today.
  5. Manufacturing engineering will present a view of how production technologies will be changing.
  6. Marketing will present their view of how the competition will be changing to make it more competitive
  7. The project management office will present a list of the presently active projects and the ones that are scheduled to start within the next two years.

Copies of these seven presentations should be distributed a minimum of five days prior to the vision planning meeting. This preliminary vision statement is then presented to the entire group for their comments and one of them is selected to be used as the working model.

The group then prepares a working model to the point that the final vision statement is ready for release.

Note: No matter what approach you use to prepare your vision statement, there are certain things that it must be in line with. Typical ones are as follows:

- The organization's mission statement – the future vision statement should not require the organization to produce products and/or supply services

that are not part of the organization's mission. If they are not in agreement with each other, one or two of them should be changed.

- The organization's principles – the future vision statement should not be designed in a way that would require or even allow managers to deviate from the organization's principles.
- The organization's core capabilities and competencies – these should be considered to determine if the vision should focus on strengthening core capabilities and competencies while subcontracting processes that do not complement the core capabilities and competencies.
- Technology advancements – the vision statement has to include provisions for changes in technology and/or competitors' products or services.
- Problems and/or improvement opportunities related to the present services and products.

BB5: Building Block 5 – Commitment to Stakeholders' Expectations

Every organization has an obligation to the individuals who are impacted by the organization's activities (See Figure 4.8). This includes investors, management, employees, suppliers, customers, consumers, the community, interested parties, the employee's family, etc. The investor wants decreased costs so that bigger

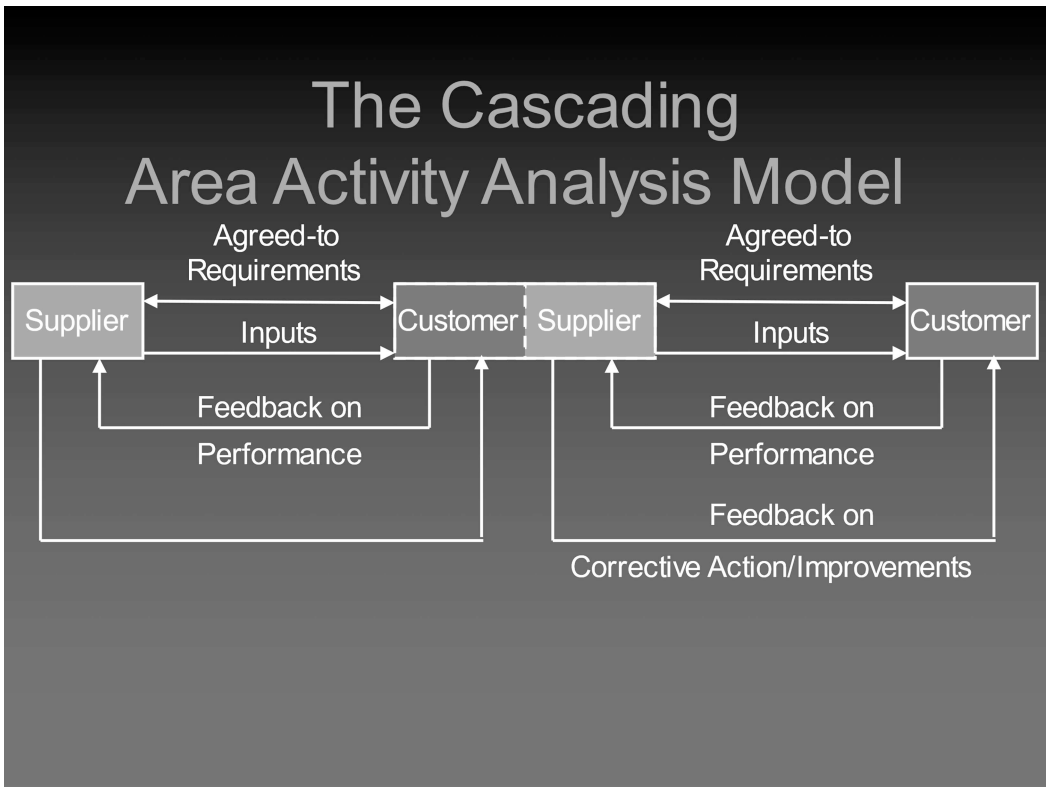


Figure 4.8 BB5 – Commitment to stakeholders' expectations.

dividends can be paid. One of the biggest problems top management faces is how to balance the activities within the organization so that all the stakeholders have a win-win impression of the way the organization is managed.

Unfortunately, all business stakeholders are not equally important to the organization's performance. As a profit-making organization, we have an obligation to be profitable and pay taxes. A not-for-profit organization has a different set of responsibilities and obligations to its stakeholders. As a government agency, they operate to a completely different rule set. Success in this endeavor is brought about by developing a set of shared values between the organization and its shareholders. Probably few organizations handle this situation as well as they should, or as they could, due to the complexity when an improvement initiative has a positive impact on one shareholder and a negative impact on another.

BB6: Building Block 6 – Innovative Project Management Systems

Project Management Institute has issued an updated version of their standard called "PIMBOK" (See Figure 4.9). It is a well-prepared comprehensive document that provides detailed guidance for large and small projects. The biggest innovation improvement opportunity in many companies is a high project failure rate. To decrease the number of project failures, we recommend reading "Effective Portfolio Management Systems" (CRC Press 2015).

BB7: Building Block 7 – Innovative Management Participation

One of our biggest problems is the lack of innovation in the management methodology (See Figure 4.10). This building block is designed to get all levels

Figure 4.9 BB6 – Innovative project management systems.

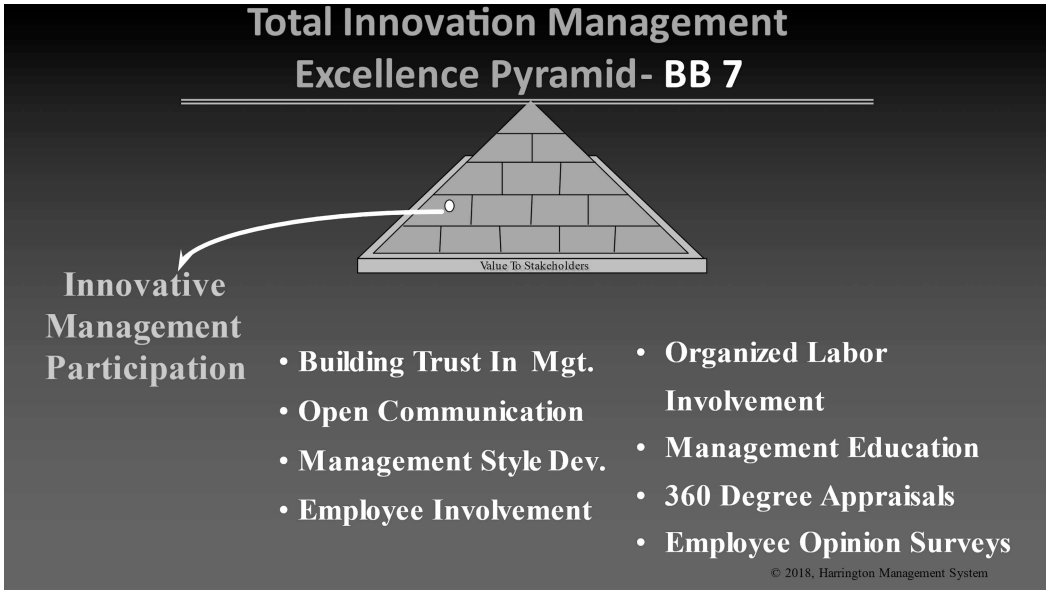


Figure 4.10 BB7 – Innovative management participation.

of management actively participating (out on the playing field) in the improvement effort. Having management feel comfortable in a leadership role is essential to the success of the total process. It is important that you bring about the proper change in top, middle, and first-line managers and supervisors before the concepts are introduced to the employees.

Most organizations have done a poor job of preparing management for their new leadership role. As a result, they are still managing using the same principles that were used in the 1980s. All too often the management rule is, "Do what I say – not what I do." You cannot expect your workers to be excited about being out in the field picking cotton while you're sitting on your Miranda drinking your myth. Lincoln freed the slaves.

There is a huge difference between leadership and participation. The coach of a football team provides leadership to the team. We are participating in the game if we are out on the field blocking, catching passes, being tackled, pushing, and shoving to get that extra inch. We have leaders in the football stands. They stand up and yell at the top of their lungs instructing the quarterback that he must throw a pass, complain when the coach calls a play they did not like, or when the guard misses a tackle. None of the players are working as hard as they could according to the coach in the stands. These are the fans who are out of breath just walking up the stairs to their seat. They are the type of person who seems to always sit beside me and spill mustard from his hot dog all over my pants.

This building block is designed to get all levels of management actively participating (out on the playing field) in the improvement effort. Having the management feel comfortable in a leadership role is essential to the success of the total process. It is important that you bring about the proper change in top,

middle, and first-line managers and supervisors before the concepts are introduced to the employees.

EXERCISE ACTIVITY #4.3: THE 10 ESSENTIAL LEADERSHIP SKILLS

Steps to Follow: Rate yourself on a scale of 0 to 10 for each of the 10 Leadership Skills shown above (See Figure 4.11).

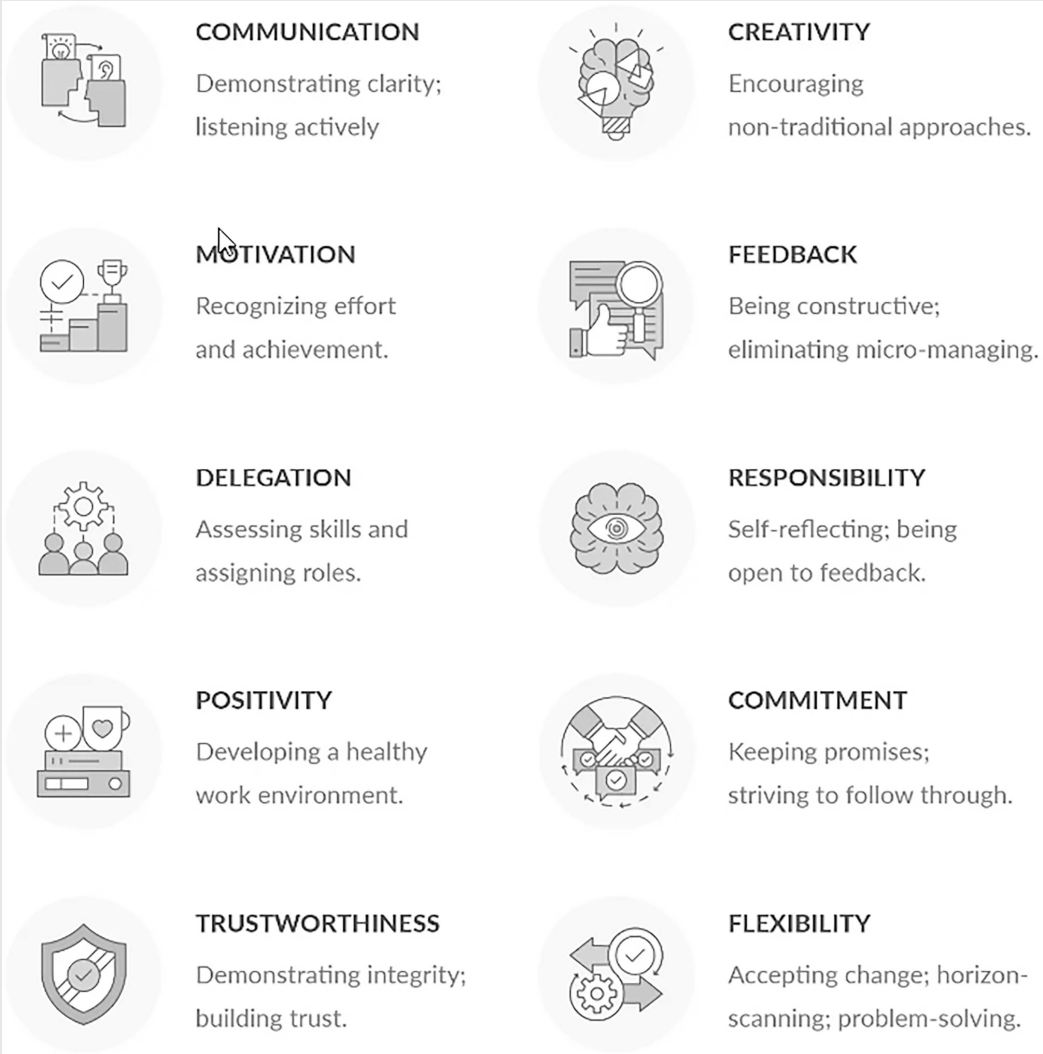


Figure 4.11 The 10 essential leadership skills.

A score of 1 to 30 shows low skill levels, from 31 to 70 shows moderate to solid skills, and from 71 to 100 shows excellent skill levels.

End of exercise.

BB8: Building Block 8 – Innovative Team Development

The organization needs to take advantage of manager and employee teams to take maximum advantage of the improvement opportunities (See Figure 4.12). Everyone involved in the organization's change process is a key ingredient in today's competitive business environment. This building block develops team concepts as part of the management process and prepares all employees for participating in a team environment. One of the prime outputs of the team environment is a sense of being a member of the organization and a feeling of cooperation among the individuals within the organization. Developing a team environment will have a big impact on employee morale, efficiency, and effectiveness.

I have often heard the theory that a team of two generates three times the output of one. I've seen many occasions when a team of two generates 0.7 times the output due to the compromises required to obtain a consensus decision.

Here are some good questions that management has to be prepared to answer based on their activities in BB 7.

- Why should I be on a team?
- Will someone else get credit for my good ideas?
- Do you have a charge number for the time I spend with the team?
- Can I decide which team I want to be on?
- What part of my job will I be relieved of so that I can participate on the team?
- At what bowling alley will a team meeting be held?
- No, this is not an athletic team; it's a performance improvement team so do not bother to bring your bowling ball.

Figure 4.12 BB8 – Innovative team development.

This building block develops team concepts as part of the management process and prepares all employees for participating in a team environment. The team usually uses a set of standard performance improvement tools selected to meet the specific requirements of the organization and serve as a standard idea-generating approach that everyone in the organization is trying to use.

One of the prime outputs of the team environment is a sense of being a member of the organization and a feeling of cooperation among the individuals within the organization. It will develop a team environment that will have a big impact on employee morale, efficiency, and effectiveness. It has a tendency to eliminate comments like, "I knew she was doing it wrong but it is not my job to train her."

I view teams as a group of people who come together because they are involved in a common objective. You become a member of the team anytime you are part of the cycle that produces a result. The members of the team are the people who participate in the cycle. This may include people you have never met and/or talked with. If you're in a group personally, socially, or professionally and you are not a member of the team concerned with the total outcome, then you shouldn't be part of the cycle.

Unfortunately, in businesses with associated teams that often are working on commonly associated improvement opportunities, there is a need for them to work in harmony with each other. The usually process-driven improvement opportunities need to get groups of people together to attack an individual subject. This certainly is sometimes used by teams to share ideas and often takes the team members out of the role of being responsible for the results. I believe that the real purpose of the team is to provide harmony between individuals so you can maximize the association, the feeling of contribution, personal satisfaction, and results when ideas are combined to come up with a better result.

All employees in the organization should be trained and capable of using the following approaches effectively.

- Basic Team effectiveness training.
- Brainstorming.
- Business Process Improvement.
- Cause-and-Effect Diagrams.
- Check sheets.
- Flow Charting.
- Force Field Analysis.
- Graphic.
- Histograms.
- Novel Group Techniques (NGT).
- Opportunity Identification.
- Pareto Diagram.
- Plan-Do-Check-Act (Shewhart's Cycle).
- 5Ws and 2Hs.

BB9: Building Block 9 – Individual Creativity, Innovation and Excellence

Management must provide the environment, as well as the tools, that will allow and encourage employees to excel, take pride in their work, and then reward them based on their accomplishments (See Figure 4.13). This is another key ingredient in every winning organization's strategy. You can have a **good** organization using teams, but you can have a **great** organization only when each employee excels in all the jobs he/she is performing. Care must be taken to have a good balance between team cooperation and individuals who strive for excellence in all their endeavors. The two concepts need to work in tandem, not compete with each other.

Typically the more advanced organizations will have empowered the people to take action, often eliminating the need for a team. For example, if a skid is sitting in the walkway, an empowered person will move it out of the way. A team will hold ten meetings to do the same thing.

Can you imagine calling Apple's help desk because your computer won't turn on and being told, "That's an interesting problem. I will bring it up at our weekly team meeting and get back to you when they come up with an answer."?

> I made a quick list of some of the things I think about when I talk about improving the individual's ability to be creative and to transform that creative spark into a final product. Probably the most important thing is their personal commitment to implementing their ideas … No innovator can wait for someone else to turn their ideas into value added.
>
> **H. J. Harrington**

Figure 4.13 BB9 individual creativity, innovation and excellence.

TOP 20 How-to Insights

1. Providing the environment for personal development – opening the door to individual excellence.
2. Improvement-related training and experience.
3. Job- and career-related training and experiences.
4. Career growth training to boost personal Creativity.
5. Rewrite all job descriptions including management – and understand the psychological foundations for making personal innovation a requirement in every job. No more hanging up your mind at the time clock.
6. Developing individual performance plans and performance evaluation (appraisal). Provide a way to track progress. We know of organizations that set quotas for the number of approved suggestions per employee per month.
7. Use helpful Suggestion systems. Good tracking system and even better response.
8. New employee training and Career-Building. If you promote, rotate.
9. Building a bond with your manager and your neighbor.
10. Reinforcing desired individual behaviors.
11. Cross-discipline training.
12. Turning employee complaints into profit.
13. Getting ideas flowing.
14. Empowering the individual closest to the customer.
15. Self-managed employees.
16. How to recognize improvement opportunities.
17. How to evaluate the value of your ideas.
18. How to perform Area Activity Analysis (AAA).
19. How to excel in selling your ideas.
20. Dealing with Empowerment: Setting personal excellence goals and award programs for individual excellence (quality, productivity).

How about setting up a department that helps your employees develop, document, and sell their ideas?

BB10: Building Block 10 – Innovative Supply Chain Management

Winning organizations have winning suppliers (See Figure 4.14). The destiny of both organizations is inevitably linked. Once the innovative improvement process has started to take hold within the organization, it is time to start to work with your suppliers. The objective of this partnership is to help them improve the performance of their output and increase their profits, while reducing the cost of their product and/or service to you. It's a search for that win-win situation that benefits both you and your suppliers. We personally prefer the term "operational partners" rather than suppliers or subcontractors.

Figure 4.14 BB10 innovative chain management.

The primary goal of Innovative Supply Chain Management is value creation by providing products and services to customers through optimally managed processes, resources, and capabilities. Innovative Supply Chain Management is a cradle-to-grave process that begins from the earliest recognition of customer needs through end-of-life and final disposal or retirement of products and services.

APICS, formerly founded as the American Production and Inventory Control Society (APICS) defines Supply Chain Management as "the design, planning, execution, control, and monitoring of supply-chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally."

There are five basic steps that provide an analytical and objective structure to formulate a strategic linkage between the supply chain and marketing. These are as follows:

1. Define organizational objectives.
2. Determine marketing strategies to meet these objectives.
3. Assess how different products qualify in their respective markets and win orders against competitors.
4. Establish the appropriate process to manufacture or outsource production of these products.
5. Provide the infrastructure to support the manufacturing or sourcing of these products and related supply chain infrastructure. Collaboration is at the heart of Supply Chain Management. The Supply Chain Management process should look at the needs of the entire enterprise and processes should be designed accordingly. While the Supply Chain Manager may not own the

individual process, it is important to understand and participate in decision-making at all levels from the inception of the product to its final discontinuance, retirement, disposal, and recycling. This will mean establishing a close working relationship with other departments. An important example is Sales and Marketing, which controls customer-facing processes such as Customer Relationship Management and Demand Forecasting.

SIPOC Diagram – Describes Suppliers, Inputs, Processes, Outputs, and Customers Diagram

A SIPOC diagram is a tool that summarizes the inputs and outputs processes in flow chart form. The acronym SIPOC stands for suppliers, inputs, processes, outputs, and customers. The SIPOC diagram is used by a team to identify all relevant elements of a supply chain process before work begins. It helps define a complex project that may not be properly scoped. A SIPOC diagram defines the inputs the process receives, the suppliers providing those inputs, and the outputs that a process delivers to the customers receiving the outputs. In traditional manufacturing processes, these represent the physical flow of all inputs to the product and, finally, the completed product to the customer.

Value Stream

The Value Stream encompasses all actual value-added and non-value-added activities and associated processes used to transform information and/or raw material into a final product/service for delivery to the customer.

Value Stream Mapping

Value Stream Mapping is a method used to define, measure, analyze, improve, and control the flow of the product or element being transformed, which could be inventory, a medical patient, paperwork, or anything in any segment of any value chain. The Value Stream Map provides a graphical representation of the information and physical flows of the value chain for a defined set of customers, suppliers, or product families from a systematic view (See Figure 4.15). The informational flows are communicated across the top of the map and flow from left to right from customer to seller and provide the signal that sets the supply chain in motion, resulting in communication of demand to suppliers and production facilities.

The physical flows of products are communicated along the lower portion of the map and are represented as flowing from right to left from the Supplier, through manufacturing and delivery processes, to the customer. Metrics such as cycle time or Overall Equipment Effectiveness may be represented. Finally, a timeline that compares Value-added time and Non-value-added time = Total Lead time is displayed at the bottom of the graphic. The maps are drawn as

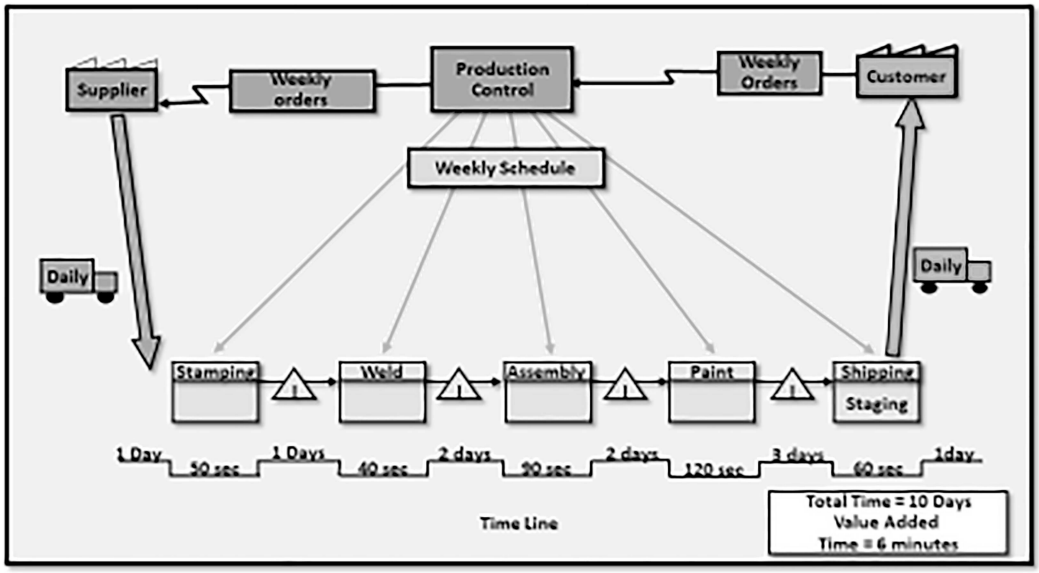


Figure 4.15 SIPOC diagram.

Current State reflecting "as-is" conditions and Future State with the desired improvements being shown.

BB11: Building Block 11 – Innovative Design

This building block uses cross-functional Process Improvement Teams (PITs) to make a quantum leap forward in the critical business processes (overhead-type activities) (See Figure 4.16). It focuses on making these important parts of the organization more efficient, effective, and adaptable. This building block

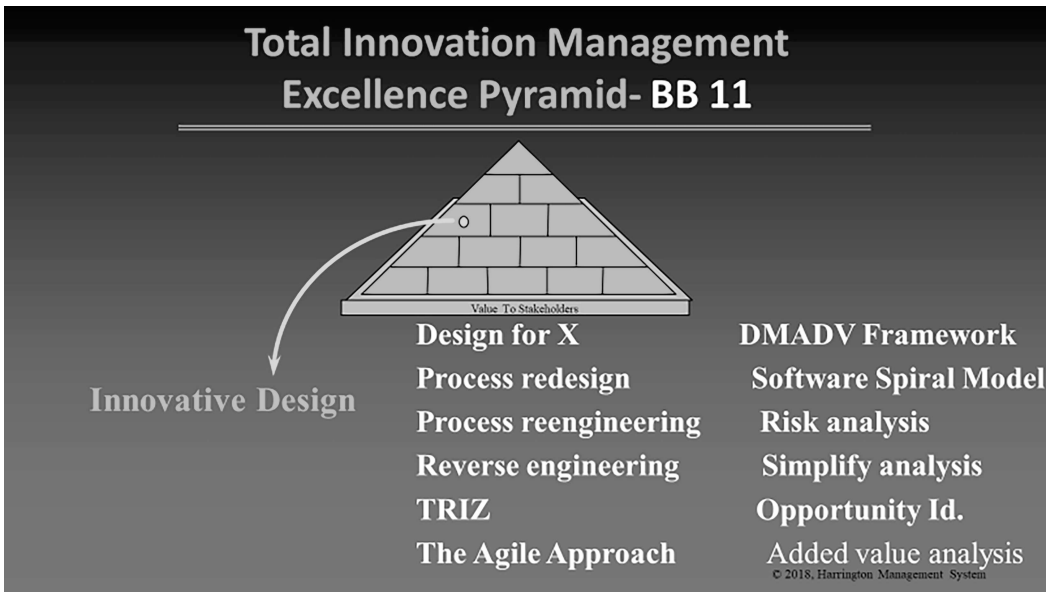


Figure 4.16 BB11 – Innovative design.

makes use of many different streamlining techniques, including bureaucracy elimination, value-added analysis, benchmarking, and information technology, carefully woven together.

This approach brings about drastic improvements in the processes to which it is applied. Improvements between 20% to 60% are being realized in a period as short as two months. Although this building block was specifically designed for performance improvement in business processes, it also works equally well in product processes. Figure 4.17 shows the five phases of the Streamlined Process Improvement Methodology (SPI).

It is designed to make a step function improvement often more than 60% reduction in cost and cycle time in a matter of three months. This is the start of improvement compared to the continuous improvement and relevant systems methodology to improve performance. Typical examples of continuous improvement methodologies are ISO 14,000, ISO 9000, quality circles, lean, Six Sigma, and TQM. The continuous improvement methodology should result in a continuous performance improvement of 5 to 10% per year compared to the 60% improvement in three months, using the business process improvement methodologies.

An innovative design is not one that gradually changes even though the change is in a positive direction. An innovative design is one that jumps forward in the march of progress, rather than a step forward. From the consumer standpoint, an innovative design has to be one that is significantly better than any other one that's available. From the organization's standpoint, it needs to bring

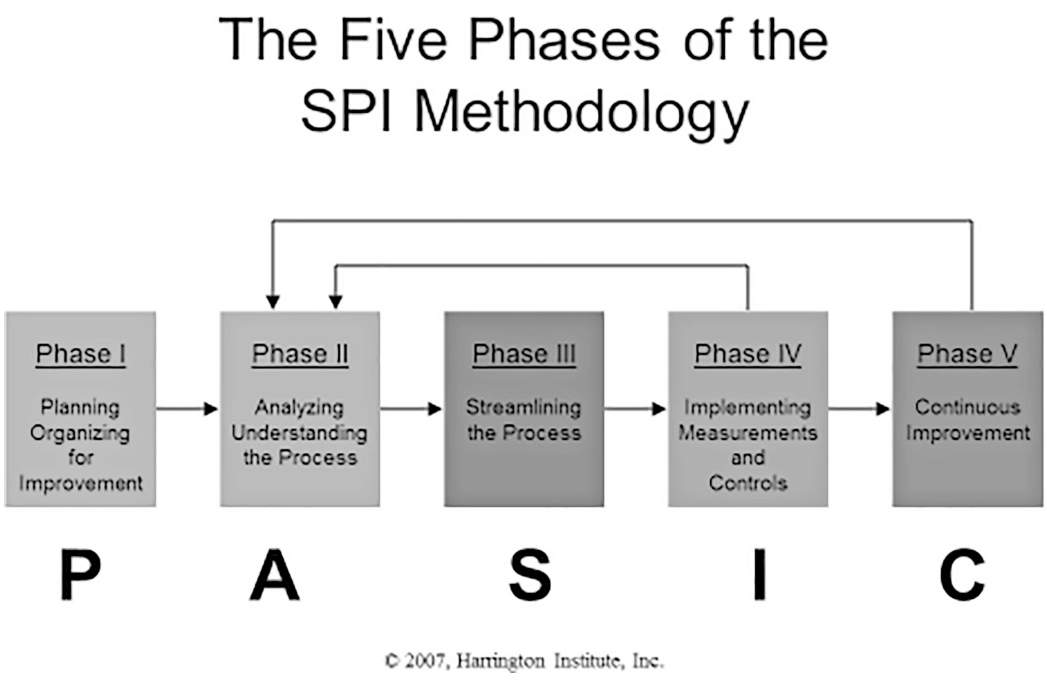


Figure 4.17 Five phases of the streamlined process improvement methodology.

in more value-added than the cost to develop, produce, sell, and maintain it through the warranty period. Over a short time period, an innovative design is no longer innovative as it is no longer significantly better than what is available from other sources. The first time a man cooked meat to eat over a fire, it was innovative; having a barbecue out in the backyard is not innovative.

After 70 years, where the biggest percentage of my time was spent doing problem-solving, I realized that in most cases poor design of products, processes, organizational structures, and methods were the real root causes of the problem and we were focusing on correcting symptoms, rather than preventing a repeat of the same problem in the next product cycle. An innovative designer delivers a design that is efficient, effective, and adaptable, in addition to meeting customer expectations. The current trend of focusing on minimizing risk needs to give way to preventing errors from occurring. To accomplish this, tools like Design for X need to be incorporated into a design methodology and design evaluation. Typical Design for X techniques are as follows:

- Design for manufacturability.
- Design for reliability.
- Design for repair ability.
- Design for safety.
- Design for costs.

Increased emphasis needs to be placed on knowledge management. Most designs are reviewed by a number of functions so that the individual function is not held accountable for finding errors. All errors that occur after a design review should be charged to the organizations being paid to do the design review, not to the design department.

Unfortunately, we have all become accustomed to using our customers as the final testers. It's fast, quick, and sloppy. To offset this trend, you need to improve the effectiveness of tools like Business Process Improvement, Total Quality Management (TQM), Activity-Based Costing, and Lean. With today's short product cycle times, it's too late to correct any problem in manufacturing processes. By the time you find and correct a problem in manufacturing the product cycle is over and the organization is just left with an extensive recall. It means that we need to develop innovative ways to evaluate potential and improvement opportunities during the development cycle and before the product is released to manufacturing.

BB12: Building Block 12 – Innovative Robotics/Artificial Intelligence

Watch out for Building Block 12. It has more potential than any other part of the pyramid. It's the diamond mine of the future (See Figure 4.18).

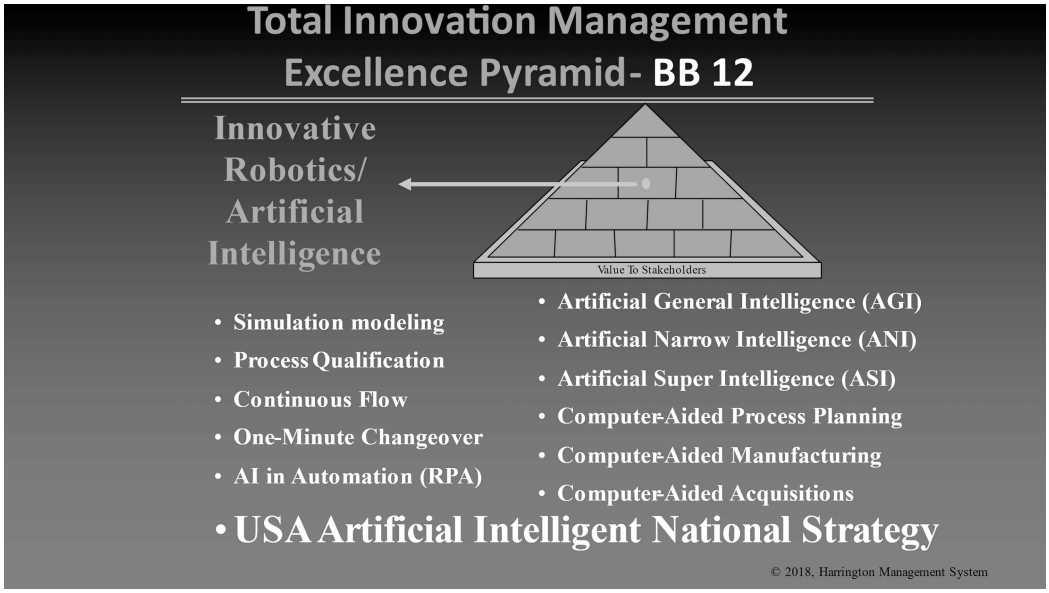


Figure 4.18 BB12 – Innovative robotics/artificial intelligence.

This building block focuses on how to design and maintain product and service delivery processes so that they consistently satisfy external and/or internal customers and the people who consume the end product. Innovative use of technology, automation, and artificial intelligence has drastically changed the way our processes are designed and function. Automation has made concepts like Six Sigma practical in our manufacturing processes. Technology provided us with new products almost on a monthly basis.

Artificial intelligence provides the capacity for a computer to perform operations analogous to learning and decision-making by humans, using an expert system, a program for CAD or CAM, or a program for the perception and recognition of shapes in computer vision systems. In many applications, it is impossible for humans to make decisions as fast or as correctly as artificial intelligence can. The combination of innovative personnel using technology, automation, and artificial intelligence is bringing us closer and closer every day to the ultimate factory of the future. Future accuracy, repeatability, dependability, and precision will not be in the hands of a human, but in the programming designed into the new computerized environment.

In this building block, we will show you how automation, technology, and artificial intelligence can be used to reduce costs, assist in creating new products, and reduce cycle time, while improving the quality of the delivered product. Who would've believed just a few years ago that computers would be taking our order in a restaurant rather than a waitress?

Different Types of AI

To better understand the definition of AI, we need to address the different types of AI. They are as follows:

1. Artificial Narrow Intelligence (ANI) or narrow AI,
2. Artificial General Intelligence (AGI) or general AI,
3. Artificial Super Intelligence (ASI) or super AI.

Because not all of the types of AI we talk about today have the same power and impact, it is important to remind the reader about the distinction that needs to be made between the three types of AI. In the field of AI, we make the distinction between Artificial Narrow Intelligence (ANI) or narrow AI, Artificial General Intelligence (AGI) or general AI, and Artificial Super Intelligence (ASI) or super AI. It is important to mention that at this junction of history, we have been able to discover only narrow AI. We are not yet able to use the general AI or super AI.

- Artificial Narrow Intelligence (ANI)
  This type of AI, also called weak AI, is designed to perform a very precise and well-defined task. It is narrow because it does not go beyond what it has been programmed for. It operates according to the rules and the predefined parameters. A good example of a narrow AI is the language processing programs we are all familiar with, such as Apple's Siri and Amazon's Alexa. Another example of narrow AI is the AI algorithm behind search engines, such as the RankBrain program Google uses to map queries, organize searches, and rank pages according to a specific parameter that is provided by the programmer.

  These applications, while they appear to be very intelligent in interacting with us, they perform in a very narrow fashion. They perform only actions for which they were programmed. Apple Siri, for instance, while it may seem that it knows everything, it interacts only from within what has been provided to it by the data sets. In other words, it cannot go beyond the parameters from which it reads. That is why Siri, or any other language processing application, is unable to understand language subtleties such as humor, jokes, sadness, or emotion in general.

- Artificial General Intelligence (AGI)

  It has been said that a computer can be no more intelligent than the individual who is supplying it with information. This is true. But when 100 people are providing it with information it soon becomes more intelligent and advanced to any 1 of the 100 people.

  H James Harrington

  The second type of AI is general AI. This type of AI, also known as full AI or strong AI, has the potential of mimicking human cognition, and the decision-making process that a human brain goes through. This is the type of AI that we see in Sci-Fi movies and makes us scared about the prospect of AI. While we are still too far from this kind of AI, the

exponential nature of technology will one day lead us to strong AI where computers will be sovereign to make decisions outside of human control. These decisions will not be narrow. They will involve abstract thinking, strategic thinking, and judgment calls about situations that are surrounded by ambiguity and uncertainty. There already has been one case in which computers generated their own language to talk to each other that humans could not understand.

- Artificial Super Intelligence (ASI)
  The third category of AI is called super AI. In this type of AI, we reach the singularity moment where machine intelligence surpasses human intelligence. In this type of AI, the machine acquires qualities that are so far exclusively part of the human experience: Consciousness, a term that characterizes humans and refers to our ability to know, feel, perceive, and be aware of our surroundings, including the meaning of time and space. While these two steps set a good framework for national AI strategy, most critics agree that the USA needs to do more to catch the AI global race. The current initiative seems to lack details and funding and is short on the ethical framework that will serve as a model for AI governance. China for example has set an objective of becoming the world leader in AI technology. (Watch out Silicon Valley.)

BB13: Building Block 13 – Knowledge Assets Management

Today more than ever before, knowledge is the key to organizational success. Instead of having one or two resources of information, the Internet provides us with hundreds of them, if not thousands, of inputs, all of which must be researched for the key nuggets of information (See Figure 4.19). We are so overwhelmed with so much information that we don't have time to absorb it so we depend on the computer to do it for us.

To make matters worse, most of the organization's knowledge is still undocumented and rests in the minds and experiences of its employees. This knowledge disappears from the organization's knowledge base whenever an individual leaves an assignment.

An organization's first challenge is how to collect the undocumented knowledge that rests in the minds of its employees. A second challenge is, "How do you prevent outside sources, including your competition, from hacking into your knowledge base?"

Knowledge Management Life Cycle

Installing a KMS is not easy; it requires that the entire organization undergo a transformation that includes its culture, structure, and management style, but

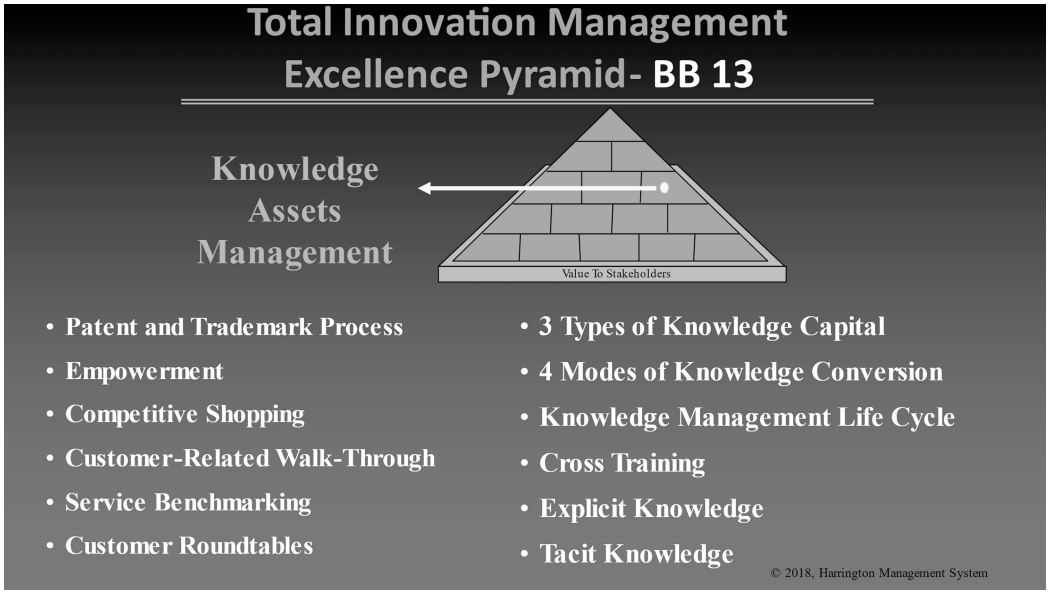


Figure 4.19 BB13 – Knowledge assets management.

the results are well worth the effort. However, before we talk about the KMS, let's look at the Knowledge Management Life Cycle. In its very simplest terms, it is made up of six phases (See Figure 4.20).

- Phase I – Creating Knowledge
  Information and knowledge creation can and does occur at any place, which includes all parts of the organization and the outside world. It is the result of an individual's creative thoughts and actions. All individuals must be encouraged to become involved in contributing and increasing the availability of information and knowledge.

- Phase II – Capturing Knowledge
  This is the act of preserving knowledge by identifying its value. This includes both hard (explicit) and soft (tacit) knowledge. This is so crucial that IBM hired outside journalists to interview their own people to capture how they made the decisions that led to successful outcomes.

- Phase III – Transferring Knowledge
  This is the act of transforming knowledge inputs into a standard format, which can be addressed by the stakeholders. It includes organizing the

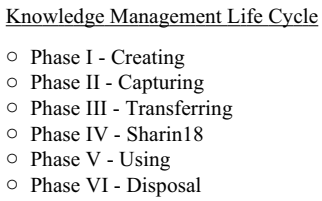


Figure 4.20 Knowledge management life cycle.

data into subject-matter groups to meet the needs of the users. Furthermore, enabling processes must be put in place that will prompt the system to update the most current knowledge.

- Phase IV – Sharing Knowledge
  The knowledge-sharing phase is the most important phase of the life cycle. People throughout the organization must be willing to share their knowledge and experiences if the KMS is going to succeed. However, there are many reasons why people do not want to share their knowledge. Here are some of them:
  - "I am valuable because I know something that no one else knows."
  - "I am not rewarded for sharing."
  - "Sharing is a waste of time."
  - "People should be able to think it out themselves."
  - "I am too busy to share information."
  - "It is not worth the time."
  - "The timing is not right."

The truth of the matter is that people are afraid of losing their personal competitive advantage if they share their knowledge.

Share your knowledge. It's one way to achieve immortality.

- Phase V – Using Knowledge
  This is where the KMS pays off. Its big advantage is that the sharing of past experiences and knowledge helps to prevent errors from occurring and to create new and better answers to the organization's opportunities. It is also during this phase that new knowledge is created and fed back to Phase I.

- Phase VI – Disposal of Knowledge
  As new ideas are created, better ways are developed, and best practices change, it is important to keep the knowledge warehouse purged of any obsolete information and past best practices. This must be done with care for sometimes historical data is very helpful as new approaches prove to be unsound.

The Six Phases to Install a KMS

Although in a learning organization everyone needs access to knowledge, most KMSs are designed around the core competencies of the organization. We recommend a six-phase approach to implement a KMS). The 6 phases are made up of 63 activities.

1. Phase I – Requirements Definition (8 activities).
2. Phase II – Infrastructure Evaluation (16 activities).
3. Phase III – KMS Design and Development (13 activities).
4. Phase IV – Pilot (15 activities).
5. Phase V – Deployment (10 activities).
6. Phase VI – Continuous Improvement (1 activity).

It would take a great deal of space to go into the details of each activity in each phase so we recommend reading "Knowledge Management Excellence" published by Paton Press.

The Enhance cloud service at EDGESoftware.cloud/managing – innovation offers "process-based knowledge management" for your knowledge assets. This approach allows you to attach your own knowledge assets through your custom process models so you can "Access the right knowledge at the right place at the right time."

BB14: Building Block 14 – Comprehensive Measurement Systems

This building block helps the organization develop a balanced measurement system that demonstrates how interactive measurements like quality, productivity, and profit can either detract from or complement each other (See Figure 4.21). Because organizations today have to consider all stakeholders, not just one of them, a change that has a positive impact on one stakeholder can have a very negative impact on another. For example: A drug that relieves back pain might also cause heart attacks. Only when the improvement process documents positive measurable results can we expect management to embrace the methodology as a way of life. A good measurement plan converts the skeptic into a disciple.

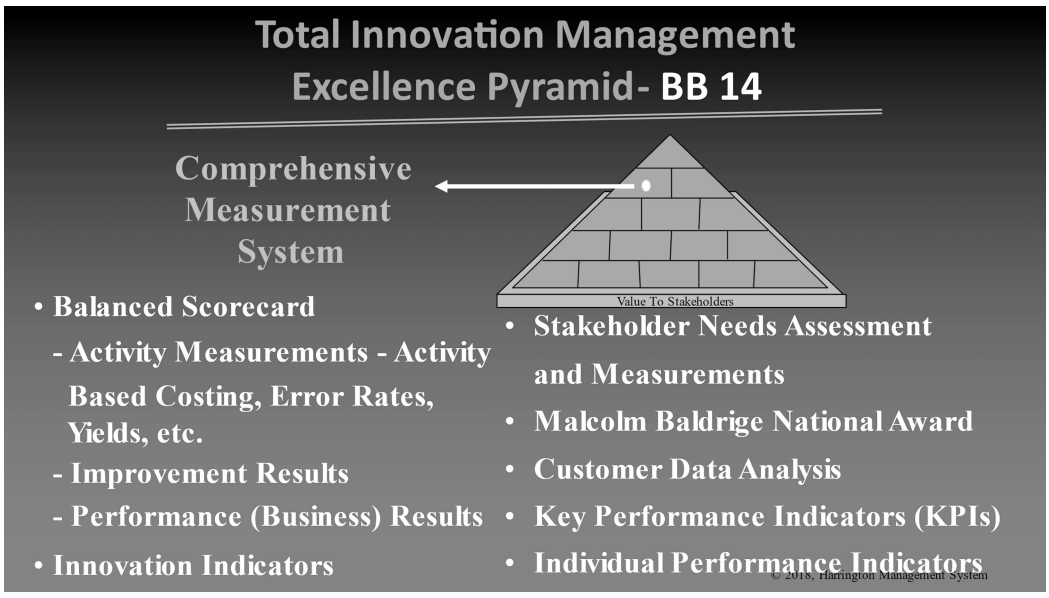


Figure 4.21 BB14 – Comprehensive measurement systems.

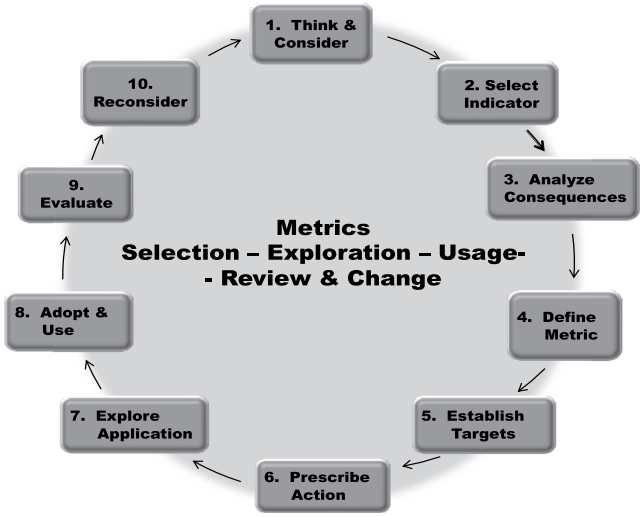


Figure 4.22 Process of identification, exploration, usage, review, and adjustment of metrics. Source: © 2015 c-IM&E Inc. with permission from S. Cohn.

As the process develops, the measurement system should change. When you start the improvement process, you measure activities. About 6 months into the process, you start to measure improvement results, and about 18 months into the process, the normal business measurement should start to be impacted. One cannot underestimate the importance of choosing suitable innovation indicators and the design of appropriate metrics for the positive competitive evolution of a company.

The selection of indicators should be achieved via "intelligent constructive debates" to sift through their advantages and disadvantages, followed by an analysis of potential consequences and trial application before being put into formal usage. As explained earlier, the value and impact of metrics should be evaluated and their applicability reconsidered in a process like the one illustrated in Figure 4.22.

1. Use the innovation management framework and the organization's competitive/relevant situation to consider the important indicator domains.

2. Select the appropriate SMART indicators that are of value for the management of the organization's innovation and deserve to be short-listed for further analysis toward adoption.

SMART Goals Definition: SMART goals are ones that set objectives and KPIs in a precise and easy-to-communicate way. First described in print in 1981 by author George T. Doran and later expanded by Professor Robert S. Ruben, SMART is an acronym that stands for:

- **S**pecific
- **M**easurable

- **A**chievable
- **R**ealistic
- **T**ime-bound.

SMART states that clear, attainable, strategic goals are the most effective way to create concrete milestones and metrics.

3. Analyze the potential consequences of using such an indicator, with extra attention paid to the negative ones.

4. Define the measurable aspects of the indicator and the process of measuring it with an understandable metric.

5. Establish clear, reasonable, and effective targets of performance vis-à-vis this metric.

6. Define potential corrective actions in cases when the targets are not being met such that the situation is speedily remedied. [(See Box B) on the impact of pre-defined targets and corrective actions.]

7. Explore the usage of such a metric for the organization and verify that there are no impediments to its acceptance and use.

8. If the exploration shows positive results, adopt and use the metric. Communicate its adoption to avoid any misunderstanding of the indicator objective, the way it is to be measured (who, how, when, where), and the significance of the level of performance expected. Once metrics are put into usage, they start impacting what the management "sees" and how the people in the company act.

9. Evaluate timely, in synch with market and company changes, the usefulness of this metric in achieving desired innovation objectives and the fact that it does not lead to any undesirable consequences or that people have become too "comfortable" with it.

10. Reconsider the wisdom of using such an indicator and its associated metric and, if advisable, start looking for different indicators, which takes one back to point #1 above.

It is better to select meaningful indicators with complex associated metrics than employ easy-to-measure indicators that obscure how priority innovation objectives and processes are being addressed by the company.

If selected judiciously, innovation indicators and metrics enable companies to:

- adopt effective innovation strategies and targets in alignment with business goals,
- monitor progress and undertake necessary corrective actions,
- optimize allocation and further development of resources, and
- reward true contributors.

BB15: Building Block 15 – Innovative Organizational Structure

In our new environment, employees are empowered to do their jobs and are held accountable for their actions (See Figure 4.23). With these changes, large organizations operating as a monolith need to give way to small business units that can react quickly and effectively to changing customer requirements and the changing business environment. This building block helps an organization develop an organizational structure that meets today's needs and tomorrow's challenges. For example, we worked with one organization where we were able to reduce 2 layers of management and eliminate 32 management positions. Establishing a dual ladder for management and technical people that was equivalent financially and stature was a key activity in positioning the 32 managers whose jobs were eliminated.

BB16: Building Block 16 – Rewards and Recognition

The Rewards and Recognition process should be designed to pull together the total pyramid. (See Figure 4.24.) It needs to reinforce and reward individuals who perform in keeping with the organization's desired behaviors. It also needs to be very comprehensive, for everyone hears "Thank You" in a different way. If you want everyone to take an active role in your improvement process, you must be

Figure 4.23 BB15 – Innovative organizational structure.

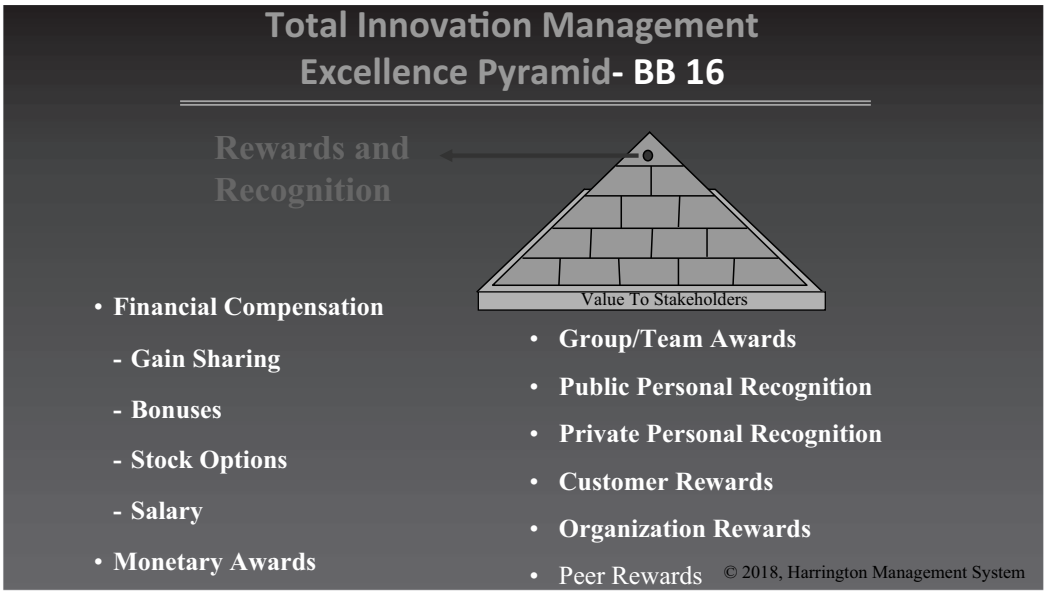


Figure 4.24 BB16 – Rewards and Recognition.

able to thank each individual in a way that is meaningful to him or her. There is a time for a "pat on the back" and a time for a "pat on the wallet." Your rewards and recognition process should include both.

Summary

Is the TIME methodology the only way to improve the quality of life in the United States? No, but it is one way that we believe progress can be made to make our products and services maintain or improve their position in the international market. It will require many different supporting activities to bring about the required changes that are facing us in an artificial intelligence and robotics world.

There is no better time than today for each of us to write on our forehead, "We need to be more creative." Managers need to lead the way with some staggering changes to our personnel systems. *Fortune Magazine* each year publishes a list of the 100 best companies to work for and a list of the most innovative companies. If your company wasn't in the top ten in both of these lists, there is an obvious opportunity for you to be more innovative.

The Advantages of a Good IMS

There are many advantages of having an effective IMS that meets and/or exceeds the relevant suggestions defined in the ISO 56000:2020 series. Some of these advantages are as follows:

- Management's expectations are clearly communicated to the employees.
- The organization performs much more predictably.

- There is international acceptance of the organization's innovation system.
- It provides a base for all the organization's improvement activities.
- It increases market share.
- It may be required by some organizations as part of their contract with their suppliers and/or subcontractors.
- It saves time because key procedures are documented, eliminating the need to reinvent the wheel over again each time.
- It provides a base that ensures that improvement gains are captured and internalized.
- It defines potential improvement opportunities.
- It focuses on expending resources on items that drive added value.
- It triggers the new product development release cycle.
- It establishes a knowledge-based design environment.

We like to think of a good IMS as a stable base that other improvement efforts should be built upon. Improvements that are made in a poorly defined system are a lot like pushing a big round boulder up a steep incline. The moment you relax and turn your back on the boulder, it rolls right back down the hill, often crushing the people that have worked so hard to push it up the incline. This is what has happened to many organizations when they tried to implement process reengineering, quality circles, total quality management, Six Sigma, Lean, or Activity-Based Costing. A good IMS provides the block under the boulder that keeps it from rolling back down the hill (See Figure 4.25).

Be careful about using projected performance improvement numbers because we know of no statistically sound, reasonably accurate data available that proves that installing the new IMS improved the organizations' performance. The studies we have seen did not include data related to the organizations' performance before ISO 56002:2019 was installed. In addition, the

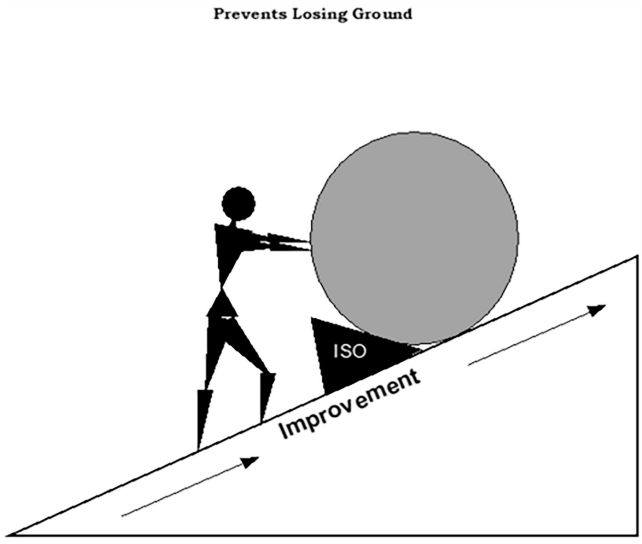


Figure 4.25 Maintaining advancements in IMS.

degrees of installation of the best practices listed in ISO 56002:2019 vary from organization to organization because ISO 56002:2019 is a guidance document, not a requirements document. To be absolutely truthful, we know of no organization that has implemented all the suggestions given in ISO 56002:2019 and we know of some organizations, rated in the top five innovative companies in the United States, that disagree with some of the suggestions. We personally believe that all of the suggestions given in the document are things that should be considered when designing your IMS, but not automatically or blindly built into your IMS.

A Word of Caution

Don't undertake the upgrading of IMS to meet the ISO 56000:2020 series requirements lightly. It will require a major commitment of the executive team's personal time and the organization's resources. In a freewheeling, entrepreneurial-type organization, defining, documenting, and implementing procedures that define how the processes operate often directly oppose the current culture and force the organization to change in ways that decrease creativity. Before you decide to upgrade your IMS, ask yourself the following questions:

- Why should the organization upgrade its innovation system?
- What benefits will the organization receive from a better innovation system?
- How will we measure these benefits?
- How much will it cost the organization?
- What will be the organization's return on investment?

There is no doubt about it. Innovation Management Systems are here to stay. Soon it will be a major consideration in the selection of new subcontractors. There are two prime reasons that are driving the ISO 56002:2019 landslide. The first and primary reason is that customers are demanding and expecting their suppliers and subcontractors to be innovative. The second reason for implementing formal IMS is that organizations around the world are using it to create a competitive advantage for their organization. You have two options, "You can be the bandleader out in front of the parade or the street sweeper behind the parade that's picking up the horse droppings. It's up to you."

The authors of this book, after carefully examining the pros and cons of a formal documented IMS, strongly support the concept and encourage all organizations to place a high priority on this activity within their organization's business plan. The truth of the matter is that we find it hard to understand how large to medium-sized modern organizations can operate without a formally documented IMS. Moreover, we are surprised that this issue was not highlighted and addressed back in the 2010s when innovative organizations were capturing the lion's share of the market, making it an executive issue.

Is the TIME methodology the only way to improve the quality of life in the United States? No, but it is one way that we believe progress can be made to make our products and services maintain or improve their position in the international market. It will require many different supporting activities to bring about the required changes that are facing us in an artificial intelligence and robotics world.

There is no better time than today for each of us to write on our forehead, "We need to be more creative." Managers need to lead the way with some staggering changes to our personnel systems. *Fortune Magazine* each year publishes a list of the 100 best companies to work for and a list of the most innovative companies. If your company wasn't in the top ten in both of these lists, there is an obvious opportunity for you to be more innovative.

The Future of Innovation

There is no doubt about it. The U.S. is the blue-ribbon country of the world – the best place to live, work, and raise a family. We are more productive and have the best standard of living than any place in the world. People are more satisfied with their jobs in the United States than in Canada, Europe, or Japan.

• U.S. Index	40
• Canadian Index	39
• European Index	29
• Japan Index	16

Money Magazine evaluated the standard of living in the sixteen wealthiest nations. It compared them in five areas: Health, solid job prospects, comfortable income, upward mobility, and adequate leisure time. The U.S. ranked #1; Japan, #7; Germany, #8; and the United Kingdom, #15. We are the envy of the rest of the world, and when you are #1, everyone is using you as a benchmark to beat. As a result, around the world, everyone has targeted the US as the gold standard. Let's face it; it is much easier and cheaper, faster and less risky to copy what someone else is successfully doing than to generate a new and unique idea yourself.

The challenging world of the future requires a different way of thinking, a different way of working, and a different way of managing. Someone once said, "The future environment is made up of:

- F = Faster
- U = Uncertainty
- T = Turbulent
- U = Universal
- R = Revolutionary
- E = Ethical."

We hate to complain about the United States of America as we are extremely fortunate to live in the best country in the world. But it is up to us and the next generation to creatively and innovatively improve the U.S. living standards to keep us as the benchmark country. It's up to you and me so let's make a commitment to be more creative and innovative related to our personal life and our work environment making the good old USA even better for our children.

> There is a TIME for planning, a time for sleeping, but now is the TIME for innovative action.
>
> H James Harrington

Performance improvement initiatives come along, flourish, and then dissolve. We've all been through Zero Defects, Quality Circles, Continuous Improvement, TRIZ, Total Quality Management, ISO 9000, Business Process Improvement, Organizational Change Management, Six Sigma, Lean, – the list seems to go on and on. Now we are in the middle of Product and Process Innovation. Each of these methodologies has its good points and a few bad points. The problem many organizations have is that they are focused on part of the business rather than focusing on managing the total business. I don't care if you're a small, medium, or big organization. You need to function in harmony and unity throughout the organization.

I've always been proud of being a U.S. citizen, but our stature in the world is slipping fast. The baby boomer generation has not kept up with the rest of the world. In our investigation, we looked at the top ten countries considered to be the best place to live (See Table 4.1). Sadly the U.S. only ranked number 8 according to the following report by the U.N. Human Development.

Table 4.1 Best Place to Live

Country	*GDP per Cap*
1. Switzerland	– $62,125
2. Japan	– $22,974
3. Canada	– $48,390
4. Germany	– $50,840
5. UK	– $44,292
6. Sweden	– $51,285
7. Australia	– $50,391
8. United States	– $59,792
9. Norway	– $72,058
10. France	– $44,081

UN Human Development Report 2018

Table 4.2 Leading Countries in Quality of Life and GPD per Capital

Quality of Life by Country	*GPD per Capita*
Country	*Country*
1. Canada	Luxembourg
2. Sweden	Switzerland
3. Denmark	*Macau*
4. Norway	Iceland
5. Switzerland	Ireland
6. England	Qatar
7. Australia	United States
8. Netherlands	Singapore
9. New Zealand	Denmark
10. Germany	Australia

Source: Wharton School of the University of Pennsylvania GPD per Capita – source World Bank Annual Analysis

Furthermore, the U.S. is not even listed in the top ten countries when it comes to evaluating quality of life according to Wharton School of the University of Pennsylvania (See Table 4.2). Our life expectancy is 71.85 years compared to countries like Italy and South Korea where life expectancy is well over 82 years. In addition, we are number 7 in GPD per Capita.

The U.S. needs to greatly improve its capability to innovate if it's going to overcome the dark deep hole it has dug for itself. I know we can do it if we all work together to make the U.S. the number 1 place to live and do business in.

EXERCISE ACTIVITY #4.3: HOW DO EFFECTIVE BOSSES SPUR INNOVATION IN THEIR TEAMS? (THIS IS A USEFUL EXERCISE THAT IS USED TO CREATE AN "INNOVATION & CHANGE" NOTEBOOK)

Background: Unfortunately, many companies, even those with innovative histories, struggle to keep up with the torrid pace of change in their industries. This past year, for instance, Starbucks, an organization widely regarded as nimble and forward-looking, announced a restructuring, with CEO Kevin Johnson emphasizing the need to "increase the velocity of innovation." Established businesses have trouble innovating for many

reasons, including siloed structures, fuzzy strategies, inadequate talent, and not enough funding. "Softer" factors also come into play, for example, a team or corporate culture that fails to give employees the time and space they need to think creatively.

How do effective leaders overcome these hurdles? We've spent the past decade studying creative bosses, such as filmmaker George Lucas, hedge fund guru Julian Robertson, and fashion magnate Ralph Lauren, who not only innovate but also create work environments in which everyone else does too. When we advise leaders on how to bring some of the same behavior into their organizations, we emphasize that it's OK to start small. And one of the first tools recommended is a group exercise we call the "change notebook."

Here's how it works: At your next team meeting, pull out a pad of paper, turn to an empty page, and divide it into three columns. Each one corresponds to a question relevant to innovation:

1. "What is the existing practice/the recipe for success/the way we've always done it at our organization?" Jot your thoughts down in the left-hand column, including the key beliefs or assumptions underlying the practice. Then look critically at each of them and ask yourself if any are on the verge of becoming anachronistic or obsolete.
2. "What market shifts, external forces, or technologies might threaten the elements of our operational status quo?" List these in the middle column.
3. "What can we do about these impending disruptions you've uncovered?" For each one, use the right-hand column to note some preemptive action you could take. Sometimes you'll want to tweak an existing practice to render it "disruption-proof." Other times you'll need to toss it out and start from scratch.

End of exercise.

When a team at one of our client companies, a midsize insurer specializing in the automobile market, ran through this exercise, employees identified a number of operational "sacred cows" – practices like designing policy parameters based on past experience, selling to customers through independent agents, subcontracting with insurance adjusters to work with customers after an incident, and putting premiums into secure investment options.

Threats to the business noted by the team included self-driving cars, the growth of Uber-type services, the rise of larger insurance companies offering "one-stop shopping," the digital customization of policies for customers, a volatile investing climate, and the company's increased vulnerability to bad publicity on social media.

Brainstorming actions to take, executives came up with a range of options, including studying self-driving cars and their implications more closely, creating new products and services for gig-economy workers, seeking out ways to tighten relationships with existing customers, scouring their network of independent brokerages for digital innovations they might exploit, and reevaluating the company's investment portfolio for its resilience in the face of volatility. Whether or not all of these ongoing initiatives succeed, the exercise spurred team members to break out of entrenched mindsets, leading to far more innovative results than if they had remained passive.

As you experiment with the change notebook, you'll find that your team members become progressively more comfortable exploring new ideas, including those that conflict with the status quo, and taking action to deal with looming change before it catches them unawares. Don't just do the exercise once and forget it; make it a regular part of your team's workflow. Devote 15 minutes to it at a weekly team meeting, filling in a new page of the notebook each week. Remind yourselves of potential disruptions you've identified in the past, and then work on spotting new ones.

Over time your team will gain more facility in the exercise. Due to the structured nature of these conversations, change will come to seem less chaotic and scary, and team members will become accustomed to talking through disagreements and tough issues. If my experience consulting with teams is any indication, you'll also get group members in the habit of pulling themselves away from daily concerns to focus on the big picture. You'll help them internalize the notion that change, not stasis or stability, is a fundamental quality of business; eventually, this sensibility will color everything they do.

It's easy for teams and organizations to fall into a pattern of reacting to change. But why can't *you* be the aggressive, proactive ones? You can. Follow the example of the world's greatest bosses, and take an important step toward instilling a culture of creativity, growth, openness, and innovation that your team or organization so desperately needs.

EXERCISE ACTIVITY #4.2: THE INNOVATOR'S DILEMMA #4: BUCKETS, BUCKETS, WHO HAS THE BUCKETS?

You have a 12-gallon bucket, an 8-gallon bucket, and a 5-gallon bucket. The 12-gallon bucket is full of water and the other 2 are empty. Without using any additional water, how can you divide the 12 gallons of water equally so that 2 of the 3 buckets have exactly 6 gallons of water in them?

Chapter 5

ISO 56004 Innovative Management Assessment

In a Nutshell

ISO 56004 Innovation Management Assessment Standard points out that innovation is the key driving force for creating value from new products, services, processes, or business models for most organizations. It recognizes that many organizations already have established innovative management (IM) as part of their basic systems. This document was prepared to define how an Innovation Management System (IMS) contributes to the further development of an organization and its IM. This document provides guidance and patterns of thought to the reader on why it is beneficial to carry out an Innovation Management Assessment (IMA), focusing on what to assess, how to perform the assessment, how to report results, and get value-added returns on your investment.

Overview

There are internal and external driving forces and needs required to set the context for innovation and renewal. There are also questions and challenges related to *how to make it happen*. We are at a point where we know that innovation activities can be managed by providing the right conditions, mitigating barriers, and engaging people in the organization. A system's approach involving assessment is crucial in order to link and manage all the required interconnected factors needed for the ability to innovate, such as leadership, processes, culture, and supporting structures (Karlsson & Magnusson, 2019).

This approach, covering both systematic and systemic perspectives, has gained a growing interest in both academic research and industry practice. The importance of moving beyond a process-centric approach to a holistic, systems one has also been further reinforced with the publication of the ISO 56004 Innovation Management Assessment Guidance Standard.

DOI: 10.4324/9781003413509-5

ISO 56004 Innovation Management Assessment picks up the system where ISO 56002 left the IMS after it was certified and became part of the organization's normal operations. It provides a type of operating system that is designed to maintain the current IMS and continuously improve it by assessing and auditing the IMS's and the projects/programs' performance that are being processed through the innovative management cycle.

This is a standard that focuses on accessing the innovation systems through assessments, audits, and effective measurement systems. It makes effective use of the information collected as current processes go through the innovative cycle in order to identify improvement opportunities and take a vantage of these opportunities. It heavily focuses on the advantages related to the correct phasing in of new innovative concepts into established ongoing activities to maximize the value added to the organization.

Introduction to ISO 56004

- Innovative Management Assessment definition – An innovative management assessment (IMA) is an assessment with regards to innovative management. Note: Innovative management assessment can be done to determine the innovation capability or innovation performance of an organization.
- Requirement definition – A requirement is a need or expectation that is stated, generally implied, or obligatory. Note: "Generally implied" means that it is the customer or, practices for the organization and interested parties that the need or expectation under consideration is implied.

ISO 56004:2019 is a "should do" type book that places no requirement to implement clauses in this standard. The choices of the clauses and how they are implemented are left to the discretion of the organization that is using the IMS to manage their organization. We particularly like this approach as it leaves the decision-making to the individuals who best understand the organization's mission, goals, priorities, commitments, culture, and commitments.

An IMS is a set of interrelated and interacting elements aimed at the realization of value. It provides a common framework to develop and deploy innovation capabilities, evaluate performance, and achieve intended outcomes. Innovation isn't just about having a few bright ideas. It's about creating value and helping organizations continuously adapt and evolve.

Innovation is an increasingly important contributor to the success of an organization, enhancing its ability to adapt to a changing world. Novel and innovative ideas give rise to better ways of working, as well as new solutions for generating revenue and improving sustainability. It is closely linked to the resilience of an organization; in that it helps them to understand and respond to changing contexts and see the opportunity that might combine the creative

ability of both its people and those who deal with it. Also, a more systematic approach to innovation management creates new opportunities to measure and analyze efforts and effects related to innovation.

In order to be effective problem solvers, we must be able to predict the outcomes of our actions. The ability to predict is grounded in our ability to explain. When we see that flipping a certain switch turns on the lights in a room, we can form an explanatory link between the two events. Flipping the switch causes the light to go on. We understand the switch-light system sufficiently to predict what will cause the light to go on.

This also makes it easier to evaluate managerial levels, which in turn may lead to innovation from both academic research and industry practice perspectives, and to which this chapter aims to contribute by specifically referencing an IMS as the unit of analysis.

Seven Basic Principles That Guide Innovation Activities

There are seven basic principles that are used to guide an innovation activity. They are as follows:

1. Adding value to the organization and interested parties.
2. Challenging the organization's strategy and objectives.
3. Motivating and mobilizing for the organization's development.
4. Being timely and focused on the future.
5. Allowing for context and promoting the adoption of best practices.
6. Being flexible and holistic in looking at the "easy and hard" parts of an opportunity, idea, or problem.
7. Being an effective and reliable process.

Eight Basic Principles for an IMS Summarized

The basic principles for a total Innovation Management System (IMS) are as follows:

1. Realization of value: Realized from appointment, adoption, and impact of new or changed solutions for interested parties.
2. Future-focused leaders: Leaders whose curiosity encourages the challenge of the status quo by developing an inspired vision and purpose for the organizations while encouraging people to achieve their goals.
3. Strategic direction: Innovation activity is based upon alliances and shared objectives supported by relevant people and required resources.
4. Culture: Shared values, beliefs, and behaviors.
5. Exploiting insights: A wide range of background heritage and experience brought together to provide a wide view of potential alternatives.

6. Managing uncertainties: Adjusting to risk-taking in accordance with the strategic conditions.
7. Adaptability: The ability to systematically anticipate and understand the need for change and respond to change in an essential central innovation capability.
8. Systems approach: Communicating and measuring the interaction between elements develops the understanding of their interrelationships.

Note: In both cases, we would've added two additional beliefs (we prefer the use of the word *beliefs* in place of *principles* as it allows some variation from the state as a condition). They are as follows:

1. Knowledge management/assets management: Without visa, knowledge management library is directed at the organization's core capabilities and competencies.
2. Drive out fear of failure.

ISO 56004:2019 provides guidance for the establishment, implementation, maintenance, and continual improvement of an Innovation Management System for use in all established organizations. It consists of ten sections. There are as follows:

Clause 1.0 – Scope

ISO 56004 provides guidance for the establishment, implementation, maintenance, and continual improvement of an innovative management system for use in all established organizations. It meshes very nicely with organizations that have already installed a quality management system. In keeping with ISO 9001. This means that an integrated management system encompassing the requirements of both the quality standard ISO 9000 and the innovative standard ISO 56000 will be deeply entrenched in numerous organizations around the world.

The ISO 56004 Innovative Standard for Assessment defines its roles, responsibilities, and accountabilities related to maintaining and measuring a current Innovative Management Operation. However, the standard is not intended as a detailed, one-size-fits-all solution. Rather, it is intended to be a framework for providing a common language and approach.

ISO 56004 was specifically designed to provide guidance on, "Why it is beneficial to use an Innovative Management Assessment (IMA). How you would go about selecting the right approach for upgrading your IMA and what do you expect from a good functioning IMA?" It was not designed to be an audit checklist. A system description breaks a system down into a set of elements and their relationships. But the elements and the relationships that we choose to describe are

a function of our purpose. If our task is to operate the lights, we don't care about the internal components of a light switch, the color of the switch, or the wiring that connects the switch to the light. These facts are not relevant to turning the lights on and off. It provides guidance related to the fundamentals for designing and implementing an assessment system to provide input related to how the present innovative management system is performing, identify weaknesses that need to be improved, and opportunities that could improve its overall performance. It provides a knowledge base for the organization that:

1. Facilitates communication related to current performance, and highlights the areas where action needs to be taken or where opportunities for improvement exist to those individuals responsible for running the IMA.
2. Understands the value and benefit of carrying out an IMA.
3. Helps identify and qualify potential improvement opportunities.
4. Insights into the concepts, principles, and procedures of an IMA.
5. Supports the design choices of applications to improve the current IMA.
6. Supports uses other interested parties seeking confirmation of the organization's ability to innovate effectively.

Clause 2.0 – Normative References

Clause 2.0 provides a list of standard documents that are related to using the standard.

Clause 3.0 – Terms and Definitions

Note: For the purpose of this document, the terms and definitions that are given in ISO 56000 apply. It provides the standard definition of terms and technologies used throughout the standard as they are applied in the standard.

Clause 4.0 – Reasons for Carrying Out an Innovation Management Assessment

Its purpose is to get a better understanding of the IMS to determine the performance of the current IMS. It suggests that a combination of internal and external factors and conditions can affect an organization's clearer view of the most relevant issues (either positive or negative) for innovative knowledge, strategy, and process security. Its objective is to help provide justification for the use of the resources to conduct an Innovation Management Assessment.

Its primary purpose is to provide an assessment system that continuously evaluates the organization's total IMS, highlighting any time the system is not

working in keeping with the system's design and intent. In addition, it should focus management's attention on opportunities for improving the present IMS. It also highlights that each top manager plays a responsive role and has related accountability for continuous improvement of the innovative roles their organization should be engaged in.

Building Block 2 in the TIME pyramid structure presented assessment techniques designed to help quantify the organization's current culture. Chapter 2 already introduced you to a number of innovation measurement and assessment tools so we will not repeat that information here. Instead, we will just highlight some of the important points and provide some new additional information.

Major Omission

The ISO Working Group mission statement instructed its members to prepare a standard for assessing the IMS, not the items that are the process using the system or how the system was being used as a result. The assessment's recommendations in the Standard only apply to improvements in the IMS, not to the product flowing through the system or how to evaluate how the system is being used. It is possible to have an outstanding IMS that is not being used properly.

We strongly recommend that after your system has been upgraded, your primary measurement system should be directed at measuring how productive the system is at optimizing the total organization performance. The crucial part of the innovation cycle is the timing and when the product is available for delivery to potential customers.

The Standard, as written, defines the Information Security Management System (ISMS) purpose and devises strategies to improve it. It does not focus on the organization's portfolio of active projects and programs. You should allocate its resources where they will bring the best results. You should consider all internal and external stakeholders when developing your IMS as outlined in the following Culture/Shared Vision Exercises described. From our standpoint, the major KPI for the innovative activity is when customers' purchasing level reaches the sharp upward turn on the S-curve cycle.

Clause 5.0 Choosing the Innovation Management Assessment Approach

Every morning in Africa, a gazelle wakes up,

it knows it must outrun the fastest lion or it will be killed.

Every morning in Africa, a lion wakes up.

It knows it must run faster than the slowest gazelle, or it will starve.

It doesn't matter whether you're the lion or a gazelle-

when the sun comes up, you'd better be running.

~ Christopher McDougall, Author of Born to Run

Selecting Assessment Approaches

Many approaches have short-term and long-term considerations. Action on part of the approach selected is required now, while further action is required later. There are three factors to consider when choosing an approach with minimal consideration of longer-term issues. First is the pressure of time. We see traffic on the interstate slowing ahead. We are coming to an exit. We know the next exit is miles ahead. Should we take the exit or stay with the interstate hoping that the slowdown is short-lived? Of course, our knowledge of the alternative route offered by the exit is critical.

Building and maintaining peak innovation performance requires an understanding of your current innovation ecosystem and how best to leverage it. If you want to improve your innovation efforts to optimize speed and creative output, it helps to measure and understand the strengths and weaknesses of your organization's capabilities (people, processes, practices, etc.). With the right metrics and analysis, you can manage these capabilities and effectively align them around solving operational issues or generating market strategies that drive new value creation. Without a sense of your collective capabilities and a plan to get your organization innovating at startup speed, you run the risk of becoming an out-of-shape bureaucracy that is unfit to compete in the future.

Use the survey tools we highlighted or select one of your own that better meets your needs, but don't miss the chance to find out "How are we doing?" Organizational assessments, and the insights and momentum they create, are fundamental building blocks to the TIME Pyramid and for bringing an innovative direction to the organization's performance strategy.

Clause 5.0 provides a general understanding of the assessment approaches available and how to effectively use them so that there is a high degree of confidence that they are continuously improving. The clause is subdivided into five subclauses for a better understanding of the assessment approaches. These subclauses are as follows:

- Subclause 5.1. General.
- Subclause 5.2 Understanding Different Approaches to Innovation Management Assessment.
- Subclause 5.2.1 Performance Criteria for Innovation Management.
- Subclause 5.3 Type and Quality of Innovation Management Assessment Outputs (s).
- Subclause 5.4 Formats of Innovation Name Assessment Outputs.

To answer the question, "How are we doing?" we explore a variety of assessment tools and methods and offer tips to help you succeed. You can use off-the-shelf surveys, create one from scratch, conduct in-person assessments, or take advantage of online tools to survey people at scale. For example, you might gather the executive team for a two-hour meeting to get a quick snapshot of their perspective on innovation.

You could have them consider their enterprise's effectiveness in executing these foundational innovation tasks.

1. Strategizing: Setting direction and priorities for innovation.
2. Exploring: Uncovering unmet needs and significant opportunities.
3. Generating: Creating many high-potential ideas.
4. Optimizing: Iterating and improving the value of ideas.
5. Selecting: Making good choices among new ideas.
6. Developing: Designing, building, and testing operational improvements as well as new products and services.
7. Implementing: Delivering innovative solutions on time and within budget.
8. Commercializing: Launching and scaling up new businesses or offerings.
9. Competing: Beating the competition with new or enhanced offerings.
10. Profiting: Generating sufficient returns from operational improvements as well as new offerings.

Prepare with Purpose

For an organizational assessment to be successful, it must serve a specific purpose. Assessments designed without clarity regarding the who, what, where, when, how, and most importantly, why, typically produce poor results. It may seem obvious, but identifying the reason you are conducting an innovation assessment is critical: What do you want to know? What has prompted the need for the assessment? What areas of the organization need improvement or change? What information would help you to make better decisions? Identifying what you want to know makes it easier to determine the design, content, scope, and tone of your organizational assessment.

Some organizations are sufficiently complex that we cannot consider all aspects simultaneously. To work on complex organizations, we must separate them into parts, consider the parts separately, and then put the parts back together. How do we go about breaking complex organizations into parts? Christopher Alexander addressed this question in his ground-breaking handbook on design methodology, "Notes on the Synthesis of Form." As both a Ph.D. in mathematics and an architect, Alexander brought a uniquely analytical approach to understanding design. His principal insight was that organizations, like problems, have an inherent structure that should guide the way we break them into sub-sections of highly interrelated elements.

If innovation is falling below expectations, use the assessment to determine what is needed for employees to innovate and collaborate effectively, or what leadership support should be put in place. A sound "form follows function" guiding principle is to select an assessment methodology to fit your informational and organizational needs.

The following is a five-step assessment process.

1. Prepare – Determine goals, roles, timing, and plan.
2. Refine – Tailor questions to meet information requirements.
3. Conduct – Promote, deploy, and monitor surveys.
4. Feedback – Analyze data, provide results, and create strategy.
5. Results – Actualize problems and take advantage of opportunities.

In the design of complex assessment systems, the most difficult step is often evaluating the performance of a proposed solution. In extreme cases, such as the design of fighter aircraft, competing contractors produce fully functioning prototypes that are performance-tested in use. In contrast to design by natural selection, there is only one cycle of generating and evaluating alternatives.

In addition to figuring out who should be included in the assessment, what the timeline is, and when it should be distributed, you will need to determine two key roles. You must settle on who will be the project manager for the assessment and who will conduct the assessment.

Finding a good project manager is vital. Ideally, you select someone who is not only effective at developing and implementing a plan but also has the respect of organizational stakeholders. The second key role is often determined by whether or not you have the in-house expertise to conduct the assessment.

This standard approach allows for different choices (configurations) of assessments based on the individual situation that could be performed by an individual or a team. It could be by internal or external experts. It could be surveys, desktop research, one-on-one interviews, or combinations thereof.

Assessment Approaches

A standard-based framework for IMS can be seen as a vehicle for advancing both understanding and action within organizations and in collaboration with and learning from others. Since ISO 56004 aims to support innovation activities in any sector, it also serves as a mechanism to integrate learning across different sectors. Furthermore, a standard-based framework for innovation management systems can act as a catalyst for better integration of theory and practice. The work presented in this chapter is based on a set of empirical cases from a diversity of contexts and undertaken as a collaborative effort to better understand innovation management from a system, project, and program perspective.

The Standard 56004:2019 recommends that before starting an assessment of the IMS, you need to define the approach and the framework of the assessment. In other words, you need to clarify what you are assessing, for what purpose you are assessing, and how you will conduct the major assessment steps. This includes a clear definition of the criteria you will use to evaluate the performance of innovation as well as the format and style of the assessment report. In organizations that use a formal project management system, often, the assessments are coordinated and led by the project management office. A pre-requirement for most individuals that would be doing an Innovative Management Systems assessment would be an excellent background in project management, and preferably a certified project manager with a background in the creation of desired outputs.

The Standard 56004:2019 in its Section 5.2, Understanding Different Approaches to IMA, provides a detailed description of the framework of the Innovation Management Assessment (IMA). This framework is made of the following components:

- Assessment objectives.
- The breadth and extent of the assessment.
- Assessment focus.
- Expertise involved in assessment.
- Data collection and data collection tools.
- Data type.
- Reference and comparison.
- Data interpretation.
- Innovation management outputs, format, and reports.

Selecting the Most Suitable IMA Approach

There are four basic different Innovative Management Assessment (IMA) models that can be used. They are as follows:

1. In-house developed and conducted.
2. Out-house developed and conducted.
3. Out-house developed and internally conducted.
4. A combined team of in-house and out-house resources develop and conduct the assessment.

All of these models work satisfactorily. We personally like the fourth model because the combined team brings together the internal experience and problems to the assessment and the external participant provides a different view and experience base through the activities.

In the early 1970s, Newell and Simon developed a rule-based computer model, General Problem Solver (GPS). The underlying logic of the model grew

out of research on the way people solve actual problems. They asked subjects to record in detail the steps they took in solving sample problems. Their goal was to develop computer logic that would mimic human problem-solving. In order to do this, they had to describe problem-solving in a formal manner. However, behind the formality, there is a notion of problem-solving as finding a path through a terrain of connected ideas.

When considering starting an IMA, an awareness of the four different approaches used as the techniques employ novel and useful outside experience index in evaluating the IMS and also in creating action plans to improve the current system. This is useful in looking at identifying improvement before looking at selection criteria for either an external tool or the development of an in-house solution.

Assessment Objectives

There is a twofold reason to conduct periodic assessments of the IMS. They are as follows:

- Determine if the IMS is being used as it was designed to be used.
- Determine if the present IMS is keeping pace with the changing needs of its users, customers, and stakeholders.

Why Organization Innovation Failures Occur

Organizations that are unhappy with their progress have many things in common. The following are the primary reasons why an organization is disappointed with the progress of its improvement efforts:

1. Change in top management (new top management).
2. Management thought the employees were the problem not themselves.
3. Management was unwilling to change but they want others to change.
4. Change to top management's priorities and/or direction.
5. Differences in priority between management and the employees.
6. The theory has been taught in class but not put into practice.
7. Use of theoretical concepts rather than proven methods.
8. Using consultants that are not skilled in the methodology.
9. Downturns of the economy caused them to discontinue their efforts.
10. Middle management did not buy into the change.
11. No results after the first six months.
12. Other higher priorities within the organization kept it from being affected.
13. The consultants they hired did not understand their business.
14. They are not improving fast enough to keep pace with the competition.
15. Lack of hands-on, measurable results. There is a need to show management a return on investment.
16. The change is not selling meaningful problems.

17. The change activity is interfering with getting the job done.
18. Lack of focus strategy to integrate all efforts.
19. The innovative effort is not reflected in the bottom line.
20. Lack of organized labor support.
21. The methodology did not work.
22. Layoffs killed the activities.
23. High project failure rates.
24. Insufficient support for the initiative.
25. The innovative activity was poorly timed.
26. All the creative activities were assigned to product engineering and development.

These are all symptoms, not root causes. The real causes of these failures are as follows:

- Root Cause 1: Upper management did not believe that they needed to change.
- Root Cause 2: Lack of trust between management and the employees is the biggest single cause of innovation failures.
- Root Cause 3: The organization's innovative champion can be the third major cause of failure. The champion or Czar is the person within the organization selected to lead the innovative initiative. And in many cases, he or she was not qualified. Attending one class does not qualify a person to teach and certainly not to lead innovation improvement activities.
- Root Cause 4: Both the successful and unsuccessful organizations based their innovative initiative on a consultant's methodology. Often, their implementation was based on a book written by a consultant. The methodology that is used needs to be flexible enough to adjust to the individual circumstance.
- Root Cause 5: Forgot Middle Management – The people who have been impacted the most by improvement efforts are middle management. Middle managers are the ones who have felt the pinch of all layoffs and flattening organizations more than anyone else.

The Breath and the Extent of the Assessment

The second question you need to address in deciding about the IMA is the level or depth of the assessment. You can assess the entire organization, focus on one single unit of the organization, or assess a few units together. A critical dimension that you need to keep in mind is that when choosing to focus on a few units, choose units that are linked to each other so you can identify the interdependencies that ought to exist, as well as the iteration that needs to happen in typical innovation activities. For instance, you cannot choose to assess the unit in charge of managing innovation,

without assessing customer service or marketing as these two units are part of the innovation ecosystem of the organization. In my view, when designing an assessment strategy, you should invest time to assess the entire organization rather than segment the organization. A comprehensive approach always yields a better understanding and fits the nature of creativity and innovation.

Assessment Focus

The next question that you need to address is deciding about the objective of the assessment. In other words, what will be the focus or the objective of the assessment? Will the assessment focus on strategy? Will it address the process? Are you assessing the ideation? Or the supporting technology? Commonly assessed objects are the suggestion system, the tools and methods supporting the IMS, and customer feedback. You can also assess supporting events such as hackathons, design thinking workshops, and brainstorming sessions. Keep in mind that when focusing on a single element, while this may allow you to understand its strengths and weaknesses, it provides little understanding of how the system interacts with other parts of the IMS.

Expertise Involved in Assessment

The view of the expert involved in assessing your IMS is important. Beyond the report written by the expert, you also get a perspective and an interpretation of how your system functions overall. However, the expert's view could be also biased. If you choose to tap on your internal expertise to assess the innovation system, it is possible to do so using ISO innovation series documentation, guidance, and framework that are publicly available. However, keep in mind that an internal expert may overlook certain dimensions that are critical to the IMS. An internal assessor may also be biased in his or her judgment.

A common bias found in internal assessment is groupthink bias, in which the assessor thinks in a similar pattern as the team being assessed; the Abilene paradox, in which the assessor behaves in a way that pleases the unit being assessed most often because of the presence of someone with expert knowledge; or simply the confirmation bias, in which the assessor attempts to confirm things that he or she already knows about the unit being assessed.

An external assessor, on the other hand, while expensive, is more suited for innovation assessment. Removed from the internal politics of the organization, an external assessor may provide a fresh look at how the innovation management system functions, providing an objective view of the IMS's shortcomings and helping the organization learn new best practices. My suggestion is that you conduct an internal assessment once or twice a year, and conduct an external assessment every other year depending on the specifics of your organization, and the context in which you operate.

Clause 6.0 – The Innovation Management Assessment Process

Planning for the implementation of an IMS must include adequate planning that concerns not only the opportunity but also the risk involved. In addition, innovation, and objectives should be involved along with supporting plans to achieve these objectives.

The Innovation Management Assessment Cycle

Clause 6.0 defines the Innovation Management Assessment as being made up of four phases. We added an additional phase to get commitment to do it and use it. They are as follows:

- Phase 1 – Commitment.
- Phase 2 – Prepare.
- Phase 3 – Conduct.
- Phase 4 – Conclude.
- Phase 5 – Improve.

Clause 7.0 – Prepare the Innovation Management Assessment

This clause is then further divided into seven subcategories. They are as follows:

- Subclause 7.1 The Innovation Management Assessment Strategy, Intent, and Scope is usually a very comprehensive and detailed assessment that penetrates into every nook and backroom that contains any activity related to the IMS. The auditors will often ask very detailed, deep, and complex questions and require the answers to be backed up by sound evidence. They will be delving into, and asking questions about, things like innovation, scope, organizational design, strategic planning, culture, knowledge management, etc. Be prepared to validate any statement you make related to your customers' feelings, customer support, and product performance.
- Subclause 7.2 Innovation Management Assessments, Design Suitable for the organization – you have many different options available in selecting and designing your IMS. The assessor should be familiar with the various options you have and question why you selected the options you did. It's good to know not only why you did it, but why you didn't do it in a different way.
- Subclause 7.3 Expected Results of the Innovation Management Assessment. Your IMS should be providing clear financial and value-added results to

your stakeholders. You must be prepared to demonstrate these value-added factors when you consider the negative things, as well as the positive things, that occurred.

- Subclause 7.4 Performance Matrix for the Innovation Management Assessment. Your KPI should be well-identified and be available for review. Any negative trends should have action plans completed or well underway.
- Subclause 7.5 The resources required (internal and external). An organization will frequently want to review staffing plans for adequacy and may react negatively if employees complain about excessive overtime or stress.
- Subclause 7.6 Organization's ability and willingness to change. There needs to be documented, demonstrated willingness for key management to change and accept new processes, programs, and cultures, thereby setting an example for the employees. Affirmative action should be in place to improve resilience throughout the organization and to recognize stress before the employee goes into future shock.
- Subclause 7.7 Prepare for the set-up of the Innovation Management Assessment
  - Obtain commitment from the leadership.
  - A common understanding of the triggers and objectives of the IMA.
  - The mandate for and scope of the IMA.
  - Clarity on the specific IMA approaches.
  - Clarity on the timeline, milestones, and budget.
  - A communication approach to preparing and engaging the organization.
  - Appropriate risk management.
  - Strong commitment in the organization for the improvements necessary.
  - Preparation of the data collection and the necessary supporting materials.
  - Conduct the Innovation Management assessment.
  - The plan for dissemination of the results.

The organization should determine and provide in a timely manner the resources needed for the establishment, implementation, maintenance, and continuous improvement of the IMS. In discussing the value of standards within innovation, it is important to note that ISO 56004 refers to the standardization of innovation management systems, and not the standardization of innovation as an output.

Innovation, as defined in the "ISO 56004:2020 Innovation Management – Fundamentals and Vocabulary" (ISO, 2020) as a "new or changed entity, realizing or redistributing value," is referring to the output from innovation activities and hence is not what should be standardized. However, the system to manage and support innovation activities can arguably benefit from

standardization, based on insights from both scientific knowledge and proven experience.

Clause 8.0 – Conduct the Innovation Management Assessment

Subclause 8.1 Set Up the Tool(s)

Based on the selected tool(s) for the IMA, the organization can ensure that the team engaged in the IMA conduct has full command of, control over, and access to the tool(s) for the duration of the IMA.

Subclause 8.2 Data Collection (Qualitative and Quantitative) and Data Collection Tools

Standard 56004:2019 provides three different options for data collection. You can use them simultaneously, separately, or combine them. For instance, you may collect data using an online survey and desk research, while adding a face-to-face component like an interview or focus group. Interviews, in my view, provide more credibility and validity to the data at hand. In my experience, I always find interviews more revealing and insightful as they talk about the true strengths and weaknesses of the organization, while also getting an insider view of the human capital of the organization. So even when you are collecting data through desk research and online surveys using automated tools, it is a good practice to add a human dimension to data collection by conducting direct interviews or focus groups with people and employees engaged with the innovation system.

In research methods, we generally make a distinction between the qualitative approach and the quantitative approach. In the quantitative approach, we use hard data as a measurement tool to get an indication of the trends and where the organization stands in terms of objectives, targets, and benchmarks. In the qualitative approach, we tend to dive deeper to get insights into the true meaning of the data.

A good assessment philosophy combines both approaches to develop a holistic approach to assessment. This is why I suggest that a good assessment uses both types of data collection in order to help the team develop a better sense of the issues.

Subclause 8.3 Data Analysis

The data analysis will provide transparency of the strengths and weaknesses in the IMS, but also in the IMA. This creates the base for concrete improvement actions. The data analysis is performed in the following order

8.3.1. Data cleaning, and
8.3.2. Data interpretation and gap identification.

Reference and Comparison

When assessing an IMS, it is important that the assessment provides a reference and a comparative framework that points to the differences in performance between your system and the chosen benchmark. The standard provides three options you can use in order to create this comparative framework. The first one is the before/after option. The before/after option is a side-by-side comparison of the previous performance and the new performance in which issues are easily recognized. In this option, you show how the system used to perform and how it is performing now. The good thing about this option is that it is simple to understand and can have a visual impact on those involved in managing the system.

The second option is the comparison between actual performance versus target performance. This is also a good comparison as it shows the level of performance and the stretch that you have to engage in improving the system. The third option is to conduct a correlation analysis to show the connections between two or more variables. This is usually helpful when you introduce a new variable, such as a new capability or a new resource, and you want to show the level of impact of this new variable on the innovation system.

Finally, you can also use best practices or benchmarking. Best practices and benchmarking is a comparative framework that compares the performance of your IMS with outside systems. This is actually what we recommend. Benchmarking is helpful because it allows you to stack up the performance of your innovation system against that of your competitors. It also allows you to learn new best practices that you can deploy in your organization. Benchmarking is also important to the innovation system because it links your innovation activities to the overall innovation ecosystem of the economic cluster in which you operate.

Appendix A for the TIME Workshop presents strategies for seeking an understanding of innovation opportunities/problems through a disciplined search for challenges and opportunities. Many innovative ideas call for imagination, the use of metaphor, and thinking outside of the box – what Edward de Bono called lateral thinking. Any time we preface an idea with what if, the burden falls on evaluation.

Data Interpretation

Data interpretation is a critical component of the overall IMA. Without a good interpretation of the connections between different variables and how the system performs overall, there is no meaning to the assessment. More

importantly, data interpretation helps top leadership make decisions to adjust the system by diverting resources or changing the course of actions. Data interpretation also helps the innovation team develop a comprehensive view of how different parts of IMS are connected and how they affect each other. Finally, the data interpretation helps you formulate the recommendations needed to improve the system.

Clause 9.0 – Conclude the Innovation Management Assessment

> To measure is to understand, to understand is to gain knowledge, to have knowledge is to have power. Since the beginning of time, the thing that sets humans apart from other animals is our ability to observe, measure, analyze, and use this information to bring about change.
>
> **– H. J. Harrington**

Based on the results of conducting the IMA, the findings and the corresponding recommendations for improvement, including the estimated timeline and resources required for their implementation, are identified, developed, documented, and clearly communicated to the appropriate primary stakeholders.

All actions and changes to the IMS shall consider performance evaluation results and innovation goals and objectives before the changes are made.

Subclause 9.1 Document Findings

The IMA can be used as an opportunity to identify areas of improvement and to increase value creation. It can be performed periodically, allowing the organization to keep learning and developing over time, and to help anticipate future challenges. As part of the first assessment, alongside the timeline for future improvement activities, it is recommended that dates for the future assessment be set at the start of the process and, if necessary, any changes to the scope of the next IMA can be defined.

Innovation Management Outputs, Formats, and Reports

The output of the IMS is a report that helps top leadership understand the strengths and weaknesses of the system while identifying the gaps and the ways the organization needs to improve. This is where you can tell top

leadership about how you feel about the organization and what needs to be done to change or improve current performance. A good report is a report that is written in a positive tone, identifying the true strength of the team being assessed, but also allowing the organization to stretch. If the assessment is being done because of a competition, like assessing the organization for a national award, then paying careful attention to the writing style and the suggestions is critical to the credibility of the report.

In this type of report, showing the weakness with evidence and pointing to the improvement and the best practice you see fit can help the organization secure the buy-ins of top leadership and make your suggestions more acceptable to lower and middle management.

Another equally important dimension of the report is data visualization. Data visualization helps the reader of your recommendations understand the report. This is also very helpful to top leadership who may not have enough patience for narratives. The space between black and white is not gray but full of colors. It is important to be able to have access to all colors, to pick and choose the right ones for the right purpose, and to combine the right ones into harmonious paintings. A visualization that describes the connections, shows the cause and effect, and describes correlations is much easier to understand (See Table 5.1).

Innovation Management Assessment Check List Based on 56004:2019

Table 5.1 IMA Check List Based on 56004:2019

Questions to Ask	*Explanations*
Assessment objectives	Why do we need an assessment? Is it for measuring how well we achieved our goals? Is it to add a better value? Or Is it to improve an innovation capability?
The extent of assessment	What are we assessing? The entire organization, a single business unit, or the whole enterprise system?
Assessment objects	What component of the business are we assessing? Are we assessing only one dimension of the business such as strategy, execution, and ideation process? Or all the dimensions of the business?
Expertise involved	Are we conducting an internal assessment using our internal assessors? Or are we hiring an outside assessment organization?
Data collection	How is data collected? Is it through interviews, online surveys, or desk research?

(*continued*)

Table 5.1 *(Continued)* IMA Check List Based on 56004:2019

Questions to Ask	*Explanations*
Tools for data collection	How are we collecting the data? Are we collecting it manually or using an automated tool, or both?
Data Type	What type of data are we using to assess innovation? Is it only quantitative data, such as financial and accounting ratios and marketing returns? Or are we also capturing qualitative data such as people's ability to change, and employees' perception of innovation?
Reference type	What references and benchmarks are we using to assess innovation? Is it a before/after and pre/ post approach? Actual versus target? Or simply benchmarking best practices.
Comparison type	What comparative framework are we using? Are we assessing innovation based on previous innovation assessments conducted in the past, correlation analysis between different variables, or a simple benchmark of industry leaders' practices?
Data interpretation	How are we interpreting the data we are getting from the assessment? Are we using a normative data approach, like using a baseline measurement obtained from a large sample? Or simply interpreting the data independently from any score or measures obtained in the past?
Innovation Management Assessment output	What is the format of the report that we will generate? Is it an executive summary of the findings? A comprehensive report? Or a report that will be supported by other tools such as software and Excel sheets.
IMA recommendations	What is the purpose of IMA recommendations? Is it to enhance the innovation management system? To enhance the assessment process? Or to enhance the innovation capability of the entire organization?

Subclause 9.2 Innovation Management Assessment report structure and content, the documentation of the data analysis could be organized by either topic/theme, urgency, or complexity of the required improvement.

Subclause 9.2.1 Examples of the data analysis results organized by topics/ theme.

Subgroup 9.2.2 Examples of the data analysis results organized by urgency or complexity.

Subclause 9.3. Communications of the Innovation Management Assessment Results.

Subgroup 9.4 Recommendations for Intervention Management Improvement.

Clause 10.0 – Improvement of the Innovation Management Assessment

Subclause 10.1 Recommendations for Improving the Innovative Management Assessment Should Be Recorded after Each IMA

The principle of the best practices suggests that the organization reviews the stability of the innovative management assessment approach itself, and the developed process regarding their suitability for the organization's objectives to increase their value from innovation should be done at regular intervals. This will result in lessons learned for the next IMA. The organization might refine objectives for the current assessment or might choose a more in-depth assessment after a first high-level checklist approach.

Subclause 10.2 Determine the Roadmap to Enhance Future Innovation Management Assessments

The roadmap will take into account the timing of the next assessment to ensure that the most important improvement measurements are implemented in due time. The time and effort for the training of the assessment team in the enhanced assessment approach will be considered as well. In subclause 10.2, it is suggested that the team prepare a roadmap based on the opportunities that we identify/discuss as a result of the assessment.

In the case of an innovation management assessment, a roadmap is defined as a high-level plan that states an overarching objective and captures the major steps to achieve it. A valid roadmap makes a persuasive case for undertaking any specific action towards the main objective and paints a clear picture of how these underlying activities interconnect to bring the desired outcome.

For completeness, the roadmap will include the actions, timelines, and responsibilities, as well as the expected, clearly defined, and measurable deliverables and necessary budgets.

The following is a typical roadmap output prepared by Office Timeline, LLC. See Figure 5.1.

Subclause 10.3 Implement Roadmap Actions

This subclause suggests the use of the roadmap as a communication tool that conveys a product's/project's strategy and status. When using a concise and convincing rationale for taking a certain step/including a specific feature, a roadmap proves essential to the effective coordination of cross-functional teams around a common goal and for gaining approval from company leadership, partners, and customers (See Table 5.2).

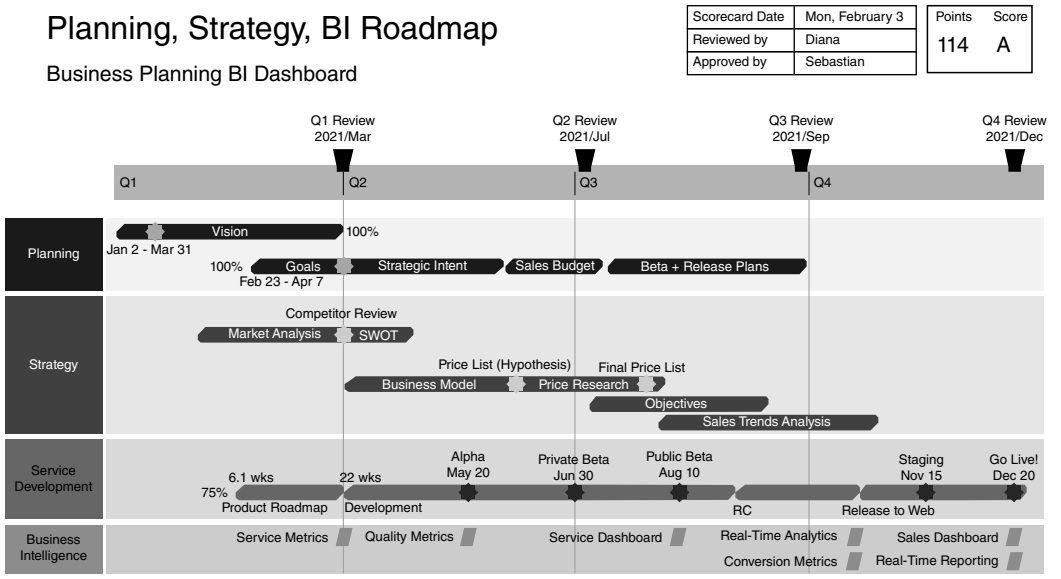


Figure 5.1 Typical roadmap.

Table 5.2 Why Measurements Are Critical

Measurements are critical to: ■ Understanding what is occurring ■ Evaluating the need for change ■ Evaluating the impact of change ■ Ensuring that gains made are not lost ■ Correcting out-of-control conditions ■ Setting priorities ■ Deciding when to increase responsibilities ■ Determining when to provide additional training ■ Planning to meet new customer expectations ■ Providing realistic schedules ■ Satisfying your stakeholders

Summary Conclusions

Innovation opportunity/problem situations trigger the recall of frames that have served us well in the past. When we are armed with a frame that has been successful, we tend to have a predisposition to that frame and minimize differences with the new situation. American psychologist Abraham Luchins dubbed this tendency the Einstellung Effect in the 1940s. The Einstellung Effect is more ubiquitous than its name suggests. We constantly experience it when trying to solve a problem by pursuing solutions that have worked for us in the past - instead of evaluating and addressing it on its own terms. Thus, while we may eventually solve the problem, we may also be wasting an opportunity to do so in a more rapid, effective, and resourceful manner.

The following are the normal activities of a regularly scheduled assessment of the organization's IMS:

- Assignment of an assessment team.
- Scheduling the event.
- Conducting the assessment validation data.
- Analyzing the findings.
- Establishing continuous improvement initiatives.
- Presenting the findings and recommendations to top management.
- Preparing a final report.
- Developing a roadmap, as appropriate.
- Implementing the activities approved in the roadmap.
- Closing out the assessment with the final report for the organization that conducted the assessment, which defines the organization's status in comparison to the ISO's standard and best practices.

Finally, in closing: Be Skeptical of Expert Opinions – Even Your Own: When we are confronted by a situation that is beyond our depth, we naturally seek the help of experts. We are desperate to get a handle on the innovation opportunity/problem and are eager to attach ourselves to the first plausible explanation. Be aware of this tendency. Although an expert may have a higher level of knowledge, he or she may also have a predisposition to see the problem from a perspective counter to your own objectives.

Lastly, be sure to consider Miller's Law. George Miller, the cognitive psychologist, proposed the following strategy for understanding people with an apparently contrary view to our own: To understand what another person is saying you must assume that it is true and try to imagine what it could be true of. Miller is saying that the statements that we make, our opinions, and our assertions as to what is true are actually about our own mental model of the world, not about the real world itself.

Miller's Law asks us to try to understand and explore how a person must frame the world such that their statements make sense. Awareness that mental models are not reality is the foundation for all of the innovation management principles discussed in this Playbook. We must train ourselves to think about thinking, to locate ourselves in the innovation management's problem-solving process, and to be aware of the fallibility inherent in the powerful mental tools that we so nimbly employ.

Opportunity exploration requires discipline, persistence, and imagination. The goal of innovation exploration is to discover a wide range of possible solutions. The innovation explorer does this by investigating potential solutions to each aspect of the problem, independent of the constraints presented by other aspects. Through this process, we will discover both the hard parts of the problem and the opportunities for innovative solutions. Discipline is required to move quickly from one part of the opportunity/problem to the next

without becoming bogged down in any one area. Imagination is required to consider the full range of possibilities, throwing off preconceptions or limitations that early intellectual commitments might impose.

THE INNOVATOR'S DILEMMA #8: THE SIX HATS THINKING MINUS ONE

There is a box in front of you with three black hats and two white hats inside. Three perfectly intelligent men, Alan, Bob, and Cal, who each know the contents of the box, are blindfolded and asked to reach into the box, take a hat, and place it on their heads. They do not know which color hat they have taken and cannot see the hats on their own heads.

You then place the three men in a single file line in such a way that after you remove their blindfolds Alan can see Bob and Cal's hats, Bob can see Cal's hat, and Cal cannot see anyone's hat. The men are required to face forward and are not allowed to turn around.

You ask Alan if he knows the color of the hat he is wearing and he replies "No." You then ask Bob if he knows the color of the hat he is wearing and he too replies "No." Finally, you ask Cal if he knows the color of the hat he is wearing and he answers "Actually I do!"

What color hat was Cal wearing and how did he figure this out?

EXERCISE 5.1: TWO-MINUTE ELEVATOR SPEECH FOR UPGRADING YOUR IMS TO THE EXECUTIVE COMMITTEE

At the end of the class, each of you will present a short two-minute maximum elevator speech that you will give to your executive committee. The purpose of this speech is to convince them that they should, at a minimum, schedule a separate meeting to consider your suggestion.

End of exercise

Closing Thoughts

Every organization should have one or more key capabilities and/or competencies. You can't be the very best at everything you're doing. Be good at everything you're doing, but be great in the things that set you apart from the rest. You may want to be known for your quality, uniqueness of design, efficient service, performance, reliability, and features. All those things could be your capabilities and competencies.

If you read this far into the Playbook, we would assume that there is some interest in being known for your creativity, order, and innovation. There are some real advantages in being the first to market with some new output that has no competition, the right answer is probably to have the right mixture between established output that has continuing customer demand and newly designed outputs that are opening up new and additional markets plus expanding your present market. It's that balance that we really want to work with.

The key to a sound business model is the correct balance between a portfolio of current deliverables, innovative new deliverables, and future-state active innovative programs. Having creative products and services, plus creative backup support and delivery systems, cannot be overestimated. The first person at the dinner table gets the biggest and juiciest steak whereas the last person only gets the bones.

The TIME methodology presents the best-performing concepts listed in the ISO-56000 series Standards on innovation and combines them together with creativity-expanding methods, total quality assurance, advanced engineering, and programming concepts to create a system that balances out the performance costs, schedule, performance, efficiency, and profitability to produce the optimal results.

It focuses on getting the best results rather than being the best in any specific entity. It realizes and recognizes that business is a flowing stream that changes drastically during drought and has to react quickly to a flood, which often means what was the best practices yesterday is detrimental today and will put you out of business tomorrow. Business is like riding a surfboard. You have a successful ride and the paddle out and wait patiently for the next big wave that makes your heart beat wildly. If it is exciting today and you are having an overflow of orders, begin preparing for the quiet that is going to come along as the wave moves past you. And if it's quiet today, let me assure you, there is a huge tsunami coming at you, just over the horizon. Now is the ***TIME*** to get ready for it.

Some Final Thoughts Worth Thinking by H. James Harrington & Frank Voehl

> "It's TIME for rebirth of the American creativity that showered us in the 1800s as our pioneers seized improvement opportunities in the West and in the 1940s as our country reacted to Pearl Harbor with an explosion of performance capabilities that no one has ever been able to create or equal again. If we could do it in the 1800s and again 1940s, we should be able to do it even better in the 2020s."

"Studies of innovative problem solving in many contexts have shown that we see what our frames expect us to see. Initial impressions bias the interpretations of later observations."

"Create. You just can't wait."

"Innovate – before so late."

"Innovate or Evaporate, perspire or expire."

"If you're going to innovate, buy a bigger wall."

"I hope that you enjoy reading the concepts in this Playbook but, more importantly, I hope that the book can contribute to an 'Open' debate about 'Open Innovation'"

"You can make more millions for many obvious innovations than you can from one breakthrough innovation that you may never find."

"Even a homeless person can be creative and often is."

"The creative person is usually richer in most ways than the intellectual."

"A knowledge base that contains specialized 'theories' rather than isolated facts preserves meaningfulness, but renders us liable to confirmation bias."

"You don't have to be the best. It's the one who hires the best who is the big winner."

"When we form a mental model of a problem, we are in the position of a jury; we are the finders of fact. We build an initial sketch of the problem situation that guides us as we fill in the details."

Appendix A: Course Exercises for a TIME Workshop

TIME Workshop Overview

The Exercises contained in this Workshop are organized into four modules that correspond to the Innovation Systems Cycle (ISC) and the Periodic Table of Innovation.[1] If you've followed our publications over the past ten years, you'll know that we are big fans of the Periodic Table of Ten Types of Innovation. Our research efforts have culminated with our T.I.M.E. Handbook and this Playbook – along with the Workshop/ Course contents which roughly follows after the innovation types, as shown in Figure A1.1.

Exhibit 1: The innovation systems cycle and types of innovation

#	Innovation Type	Description
1.	Profit Model	How you make money
2.	Network	Connections with others to create value
3.	Structure	Alignment of your talent and assets
4.	Process	Signature of superior methods for doing your work
5.	Product Performance	Distinguishing features and functionality
6.	Product System	Complementary products and services
7.	Service	Support and enhancements that surround your offerings
8.	Channel	How your offerings are delivered to customers and users
9.	Brand	Representation of your offerings and business
10.	Customer Engagement	Distinctive interactions you foster

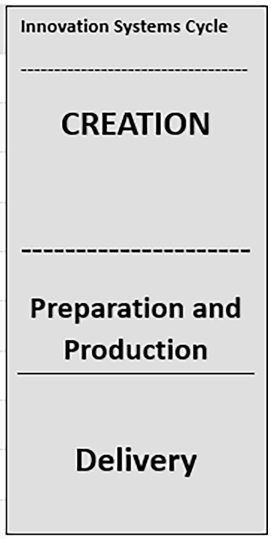


Figure A1.1 The innovation systems cycle and types of innovation.

We have used these frequently with clients to get them to think beyond innovating their product, which becomes harder, more expensive, and less differentiating over time. However, what we have found in recent workshops is that since it was originally published in 2020, some of the case studies and examples in the book already come across as somewhat out of date. That's how rapidly the world is changing. So for our training purposes, we organize the exercises around the Periodic Table of Innovation as a workshop experience, integrated with the TIME/ISC Model (as shown below). We integrate the selected workshop exercises with some mini-case studies, along with an outline of what module and what each of them represents.

Workshop/Training Details: Innovation workshopping is part of our Innovation Toolkit and begins with insights and ideas, but not just any ideas. They must be rooted in business issues and be relevant to a business problem. They must also stand up to scrutiny and analysis. For that reason, it's useful to derive ideas from insights that emerge from experiences with stakeholders or audits and projects, and from encounters with barriers to better performance. The latter may result from process, resource, technological, or other constraints, or from a desire to expand offerings and deliver more value. Exhibit 2 shows the five-step insights to ideas development model that is part of the process outlined in this TIME Playbook workshop (Figure A1.2.).

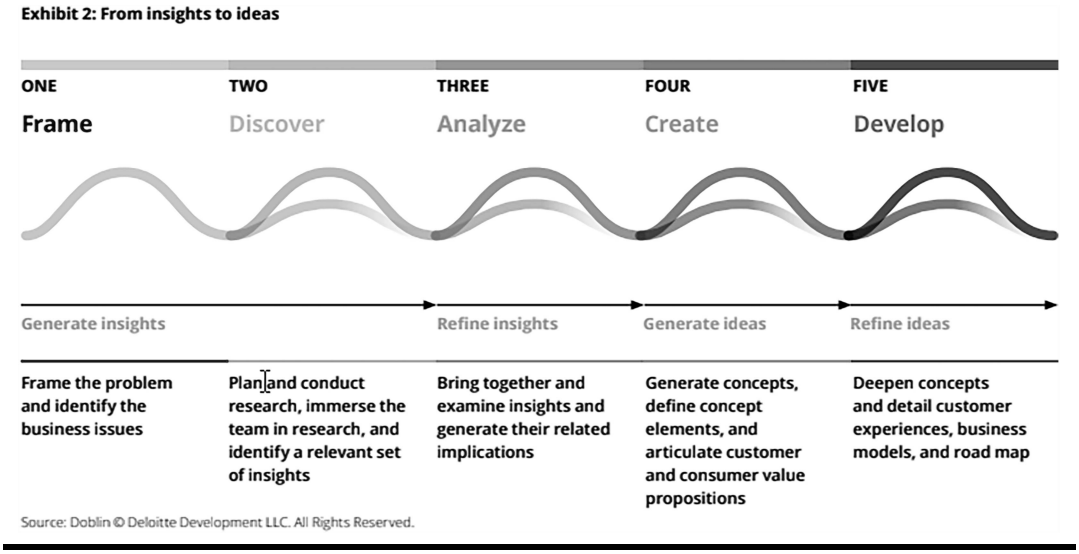


Figure A1.2 From insights to ideas.

Insights lead to ideas, but not by themselves. These phases enable a team to iteratively develop concepts that will be relevant to stakeholders and other interested parties. They guide the research process and enable innovation teams to marshal insights and implications to generate offerings that produce value for the customer, and can be depicted as shown on the Insights to Ideas map below (Exhibit #2).

As the workshop cycle progresses, in the final "Develop" phase, the team refines its concept to generate an actual service offering. This process can and should also be applied to stakeholders' issues and problems. What information does management need to support better decision-making in specific areas? Which concerns are topping the agenda at audit committee and board meetings? How can risk oversight and governance be improved? How can strategic planning and risk management processes become more robust? An articulated process – moving from issues to insights to ideas – keeps all innovators focused on the business and on the people working to realize its goals. Let's assume that you know something about insight creation with data and analytics. But how is the insight framed in the first place? Good framing helps set up the entire process of generating and using insights. What problem needs to be solved? Is the decision being addressed amenable to being answered by data and analytics? Are enough alternatives being examined? The key is for the decision-maker and the analyst to be aligned on how the problem is framed and pursued in the first place.

Workshop Modules

The Workshop includes the 25–30 exercises outlined in this Playbook and "Brain-Busters" that are organized into four modules as follows: (a) Problem/Opportunity Framing, (b) Creation/Discovery, (c) Preparation/Analyze & Production/Create, and (d) Delivery/Develop; and within each of the four modules, we will focus on certain Types of Innovation using the Periodic Table of Innovation. Like any "Periodic Table of Elements," these exercises can be arranged or rearranged in numerous ways, but we suggest that for most participants, you will need to begin with the Problem/Opportunity Framing followed by the Profit Model.

We have found the tremendous usefulness of using the ten types of innovation in providing a practical model to enhance the rigor and improve the results of innovation efforts. This approach stemmed from the recognition that most innovations fail not due to lack of creativity, but due to lack of discipline.[2] Appealing to the consumer of the insights involves using analytical approaches that are less than fully rigorous. Certainly, some insights are sounder than others in terms of their analytics, but that doesn't mean they will result in a better decision. I once interviewed a wise market researcher about the techniques he used with his clients. He was well aware that focus groups, for example, are not typically known for generating high-quality insights about customers.

TIME Workshop Exercises – Outline by Workshop Phases

TIME Playbook Exercise and The Innovators Dilemma 'Brain-Busters'	Opportunity/ Problem Framing	ISC Creation Phase	ISC Prep & Production	ISC Delivery
1- 12 Steps in Opportunity/ Problem Framing (Exercise - #0)	XXXXX			
2- Starting an Innovation Change Initiative with the 'Fishbowl' Exercise	XXXXX			
The Innovators Dilemma #1: Crossing the River & Back Again	XXXXX			
The Innovators Dilemma #2: Is that Glass Half-empty or Half-full?	XXXXX			
3- Switch Places to Gain New Perspectives		XXXXX		
4- Using the 4-Ps of Innovation Change Management		XXXXX		
5- Let's Form a New Enterprise		XXXXX		
6- How Your Organization Can Incorporate Innovation IMS Concepts		XXXXX		
The Innovators Dilemma #3: Nuts and bolts will drive you nuts		XXXXX		
The Innovators Dilemma #4: Cut the Cake		XXXXX		
The Innovators Dilemma #5: Heads/Tails		XXXXX		
7- What are the 10 Most Innovation Organizations			XXXXX	
8- What Would Make Us More Innovative			XXXX	
9- Why Customers Think your Organization is Innovative			XXXXX	
10- Developing Your Business Case				
11- Conduct a Maturity Grid Innovation System Drivers Analysis			XXXXX	
12- Creating Your Innovation KPIs			XXXXX	
13- Creating the 10S Framework for IMS			XXXXX	
The Innovators Dilemma #6: The Prisoner's Dilemma			XXXXX	
The Innovators Dilemma #7: The Mayor & the Farmer's Daughter			XXXXX	
14- Using the 10S Framework – Reviewing the 'Hard' elements			XXXXX	
15- Using the 10S Framework – Reviewing the 'Soft' Elements			XXX	
16- Using the TIME Framework: Conducting a COTO Exercise			XXXX	XXXX
17- Using the TIME Framework: Conducting a Leader's Reality Check			XXXXX	XXXXX
18- Using the TIME Framework: Conducting an IMS Planning Session			XXXXX	XXX
19- Using the TIME Framework: Evaluating the IMS System Performance			XXX	XXXXX
The Innovators Dilemma #8: Saving Pills				XXXXX
The Innovators Dilemma #9: Switching on the Lights				XXXXX
The Innovators Dilemma #10: Mexican Lazer Standoff at the *OK Corral*				XXXXX

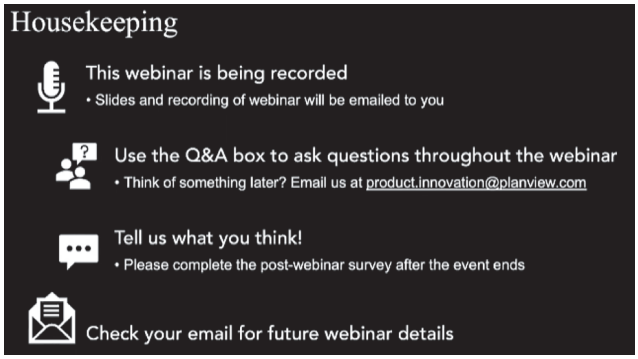
Figure A1.3 TIME workshop exercises.

Our TIME Workshop consists of four modules which are organized into the Insights to-Ideas areas of Opportunity Framing, Creation/Discovery, Preparation/Analyze & Production/Create and Delivery/Develop (See Figure A1.3.). The workshop follows and is supported by the TIME Handbook (Harrington & Voehl) and can be completed in as little as one week or extended over as much as a 3–6 month period if desired. The modules all follow the Insights-to-Ideas path and journey of innovation management progression, as outlined in this TIME Workshop™.

This means that we may have to devote a lot more effort to insight creation and marketing than we would otherwise. If an organization cares enough about insights to treat them as long-term assets, it might sooner throw away

money than throw away a useful insight. In short, becoming an insight-driven organization should mean not only being able to create and apply a lot of insights, but also being willing to hang on to and reuse them over time (See Figures A1.4 and A1.5).

Workshop Module #1: Opportunity/Problem Framing



Workshop/ Webinar Ground-Rules

!- Use the PDCA Cycle as a common ground

2- Use Webinar Ground rules where possible

3- Speak with Facts and encourage others

4- Give Credit where Credit Is Due

5- Promote Common Theory Base thinking

6- Be Flexible and Nimble of Thought.

Workshop Module #1: Opportunity/ Problem Framing

Problem/ Opportunity Framing. Start with Problem Framing, which is **a thinking method used to understand, define, and prioritize difficult business obstacles and issues.** It involves describing and interpreting a problem to arrive at a problem statement, which is an important step in problem solving. Problem framing helps get everyone on the same page and can act as a convincing argument when dealing with stakeholders.

Figure A1.4 Opportunity/problem framing.

TIME Workshop Module One. Opportunity/ Problem Framing...

Length of Module: 2–4 hours	Number of Exercises:

Opportunity/Problem Framing is used to understand, define, and prioritize difficult business obstacles and issues the Innovation Team is facing.

Figure A1.5 Data-driven decision making.

In 1910, Scottish writer and poet Andrew Lang said, "He uses statistics as a drunken man uses lampposts—for support rather than illumination." Decades later, many modern businesses still do just that, using data to support rather than drive their decisions. Why? After all, data really is valuable only if it helps a company make better decisions. Your organization might be sitting on the world's largest data pile, but it's useless unless you have the means to frame the problem/opportunity and translate it into insights that drive your business (See Figure A1.6).

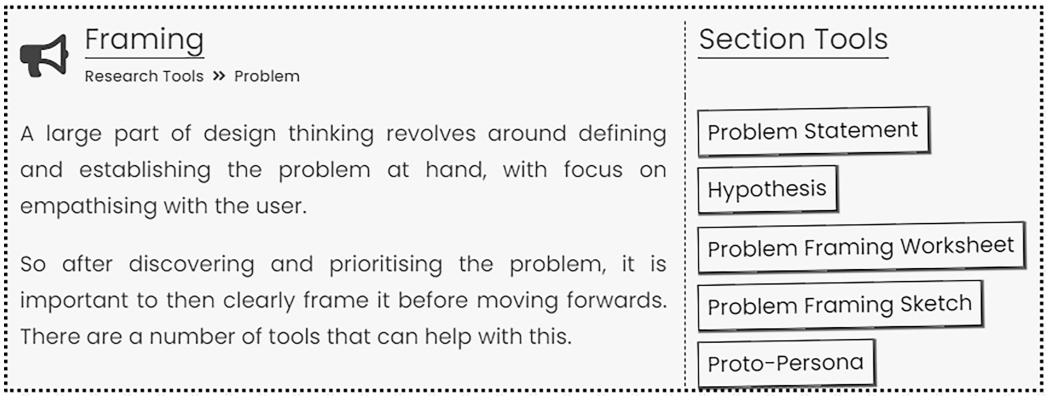


Figure A1.6 Problem/opportunity statement interview☺.

Problem/Opportunity Statement Interview: Many of the same tools that would be used during the User Interview stage can be used here, except for ensuring the questions themselves are skewed from a discovery perspective – the Problem Interview script (v2) created by Ash Maurya is particularly helpful when crafting the interview, as shown in Figure A1.7.

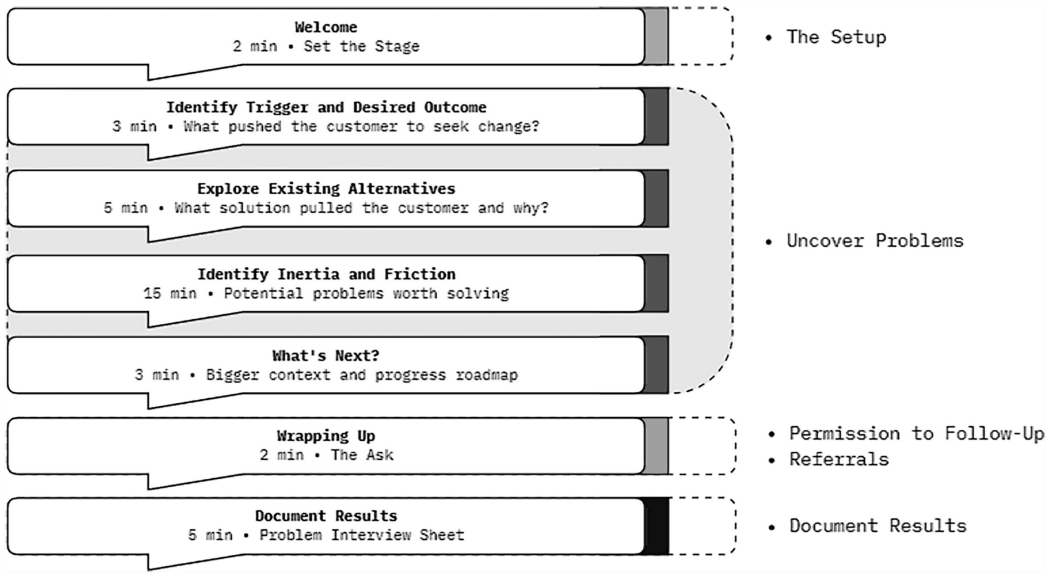


Figure A1.7 On hypothesis testing.

What is the key problem that is trying to be solved? Empathy with the prospective user and understanding what the problem might be is extremely important, and a problem statement helps accomplish this. A problem statement further helps avoid coming up with solutions too early on by focusing on the "why" part of the problem. It is also an excellent way of communicating the problem to stakeholders. There are a number of different ways of creating an Opportunity/Problem Framework but the examples in our Innovation Tools & Methods Handbooks are the more common approach.

Hypothesis Testing: Along with a Problem Statement, we can use a Hypothesis as an initial starting point to investigate further. This Hypothesis will help us to frame the problem in a way that aligns the product goal with the user goal without proposing exact solutions and testing our assumptions. The Hypothesis acts as a starting point for future experimentation, and throughout the research phase should be revisited and adjusted accordingly to ensure any proposed experience continues to align with the user goal (See Figure A1.8).

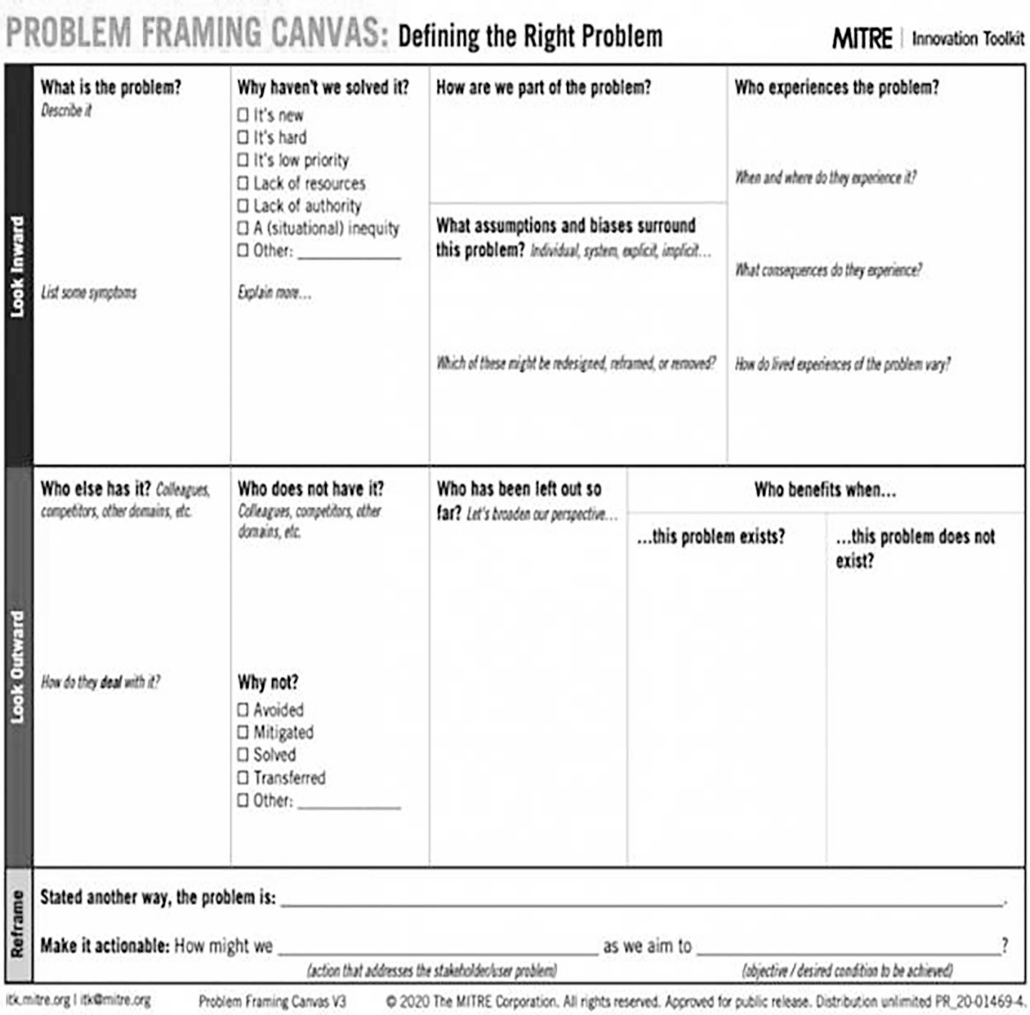


Figure A1.8 Problem framing worksheet.

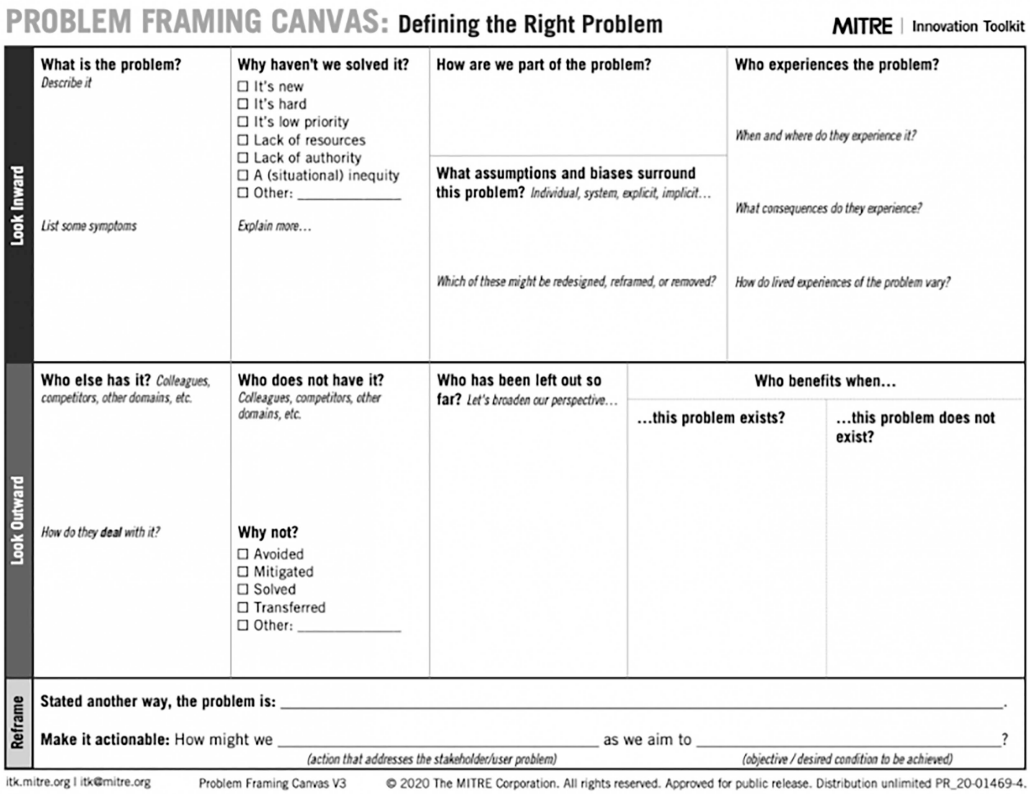
Problem Framing Worksheet: With a Problem Framing Worksheet we can begin to gain consensus and clarify the problem the team wants to solve. This includes having a sense of what "done" would look like, scoping out the activities and goals, and reducing confusion. A problem statement is how a problem is communicated to team members.

Exercise #1: Execute the 12 Steps in Problem Framing: (The Template (Exhibit 3 at the end of this exercise) provided by Mitre and is used with permission for this workshop.[3])

An effective problem statement is framed in a way that provides context and relevance so it's easy to comprehend. This is the initial step in the problem-framing process. The purpose is to introduce the issue to team members to begin ideating potential solutions. There aren't always easy solutions to complex business problems. In those cases, it can help to reframe how you look at the problem in order to come up with an innovative solution.

The following steps should be taken to complete this exercise:

For remote teams, create a collaboration document using one of the templates above if you'd like.
Share the document in advance with your team.
For in-person teams, book a room and prepare sticky notes and markers.
Divide the whiteboard into the Problem Framing Canvas quadrants: See Exhibit 3.
Send any relevant supporting data you have in advance to the team.
Let your team know that the day's goal is to understand and frame the opportunity/problem, not to solve it.
Ask the team to take a step back and think about the opportunity/problem as a whole from the perspective of the people affected by it.
Set a timer for 20 minutes for the team to add their ideas to the collaboration document or on sticky notes to the whiteboard.
Using the ideas generated by the team, craft one concise problem-framing canvas that sums up the issue from the customer's perspective.
The problem statement canvas should include who is affected, what is affecting them, why it needs to be solved, and where the problem is happening.
Make it visible = Post your problem statement somewhere highly visible to the team - in your online space or in your physical workspace. This will keep the problem at the top of everyone's mind.
Now that you've clearly framed the problem, assemble the appropriate team members together to create a plan for solving it using our remaining modules (See Figure A1.9).



PROBLEM FRAMING CANVAS: Defining the Right Problem MITRE | Innovation Toolkit

Look Inward

What is the problem? *Describe it*

List some symptoms

Why haven't we solved it?
- ☐ It's new
- ☐ It's hard
- ☐ It's low priority
- ☐ Lack of resources
- ☐ Lack of authority
- ☐ A (situational) inequity
- ☐ Other: _____

Explain more…

How are we part of the problem?

What assumptions and biases surround this problem? *Individual, system, explicit, implicit…*

Which of these might be redesigned, reframed, or removed?

Who experiences the problem?

When and where do they experience it?

What consequences do they experience?

How do lived experiences of the problem vary?

Look Outward

Who else has it? *Colleagues, competitors, other domains, etc.*

*How do they **deal** with it?*

Who does not have it? *Colleagues, competitors, other domains, etc.*

Why not?
- ☐ Avoided
- ☐ Mitigated
- ☐ Solved
- ☐ Transferred
- ☐ Other: _____

Who has been left out so far? *Let's broaden our perspective…*

Who benefits when…

…this problem exists?

…this problem does not exist?

Reframe

Stated another way, the problem is: _____.

Make it actionable: How might we _____ *(action that addresses the stakeholder/user problem)* as we aim to _____ *(objective / desired condition to be achieved)*?

itk.mitre.org | itk@mitre.org Problem Framing Canvas V3

Figure A1.9 Problem framing canvas.

Exercise #2 – Starting an Innovation Change Initiative with the "Fishbowl" Exercise

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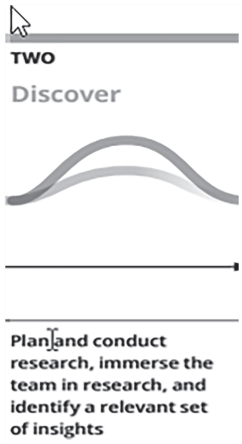


The ISC Creation Phase consists of Discovery. The cycle involves Opportunity Identification and Development, Value Propositions, and Concept Validation with a heavy emphasis on Research. Innovative Profit Models find a unique way to turn a firm's offerings and other sources of value into cash. Great ones reflect a deep understanding of what customers and users actually cherish and where new revenue or pricing opportunities might lie. Innovative profit models often challenge an industry's tired old assumptions about what to offer, what to charge, or how to collect revenues. This is a big part of their power: in most industries, the dominant profit model, if not for Research (see below) often goes unquestioned for decades. Refer to our Innovation Systems Cycle playbook discussions on pages #30-45.

Figure A1.10 ISC creation phase.

TIME Workshop Module: Creation/ Discover Phase (Figure A1.10).

Length of Module: 2–4 hours	Number of Exercises: 4

Figure A1.11 Creation/discover phase.

Once we have "discovered" your Opportunity/Problem Area, think about your research and where revenue comes from … Are there any bottlenecks that are limiting it or could you be doing other things to generate it (Figure A1.11)?

Innovation Partnership approaches such as advanced supplier relationship/co-makership management, procurement management, and the Kraljic Portfolio Model can help you build your network and manage your supplier relationships more strategically. Your organization should be focusing on its strengths and outsourcing its weaker areas to a network of suppliers and contractors. This can help to improve its primary focus, reduce its costs, and increase its efficiency.

In today's hyper-connected world, no company can or should do everything alone. Networking for innovations provides a way for organizations to take advantage of other companies' processes, technologies, offerings, channels, and brands – pretty much any and every component of a business. Structure innovations are focused on everything from superior talent management systems to ingenious configurations of heavy capital equipment. An enterprise's fixed costs and corporate functions can also be improved through Structure innovations, including departments such as Human Resources, R&D, and IT. Ideally, such innovations also help attract talent to the organization by creating supremely productive working environments or fostering a level of performance that competitors can't match.

These innovations mean a firm can capitalize on its own strengths while harnessing the capabilities and assets of others. Network innovations also help executives to share risk in developing new offers and ventures. These collaborations can be brief or enduring, and they can be formed between close allies or even staunch competitors. Also, think about whether you could create

strategic alliances with other organizations to make the most of your mutual opportunities.

Four Related Exercises:

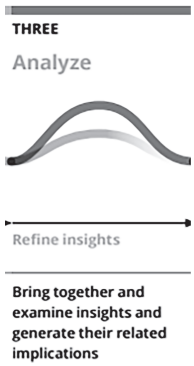
3. Switch Places to Gain New Perspectives

4. Using the 4 Ps of Innovation Change Management

5. Let's Form a New Enterprise

6. How Your Organization Can Incorporate Innovation IMS Concepts

(See Figure A1.12).



Once we have Framed the Opportunity/ Problem, conducted the research and immersed the Innovation Team in the 'pool of knowledge' then we are ready to bring together and examine our insights and generate meaningful implications. This involves the ISC cycles of Business Case Analysis, Resource Management, Documentation and Production.
A business case analysis report should answer three basic questions: Costs: **What are the costs of making this decision?**
Risks: What are the risks of making this decision?
Benefits: What are the expected benefits of making this decision?

Figure A1.12 Analyze.

TIME Workshop Module on Preparation & Production – How you connect and examine the insights and generate implications...

Length of Module: 2–4 hours	Number of Exercises: 2

Look at how your organization connects with its innovation ecosystem and its suppliers in particular (Figure A1.13).

For many businesses, conducting a business case analysis is an important step in being able to come up with a solution to a business problem. Even if the solution seems clear without conducting research, an analysis can help you identify problems you may not be aware of and propose solutions that will help an organization reach its goals. Any individual or department within a business can complete a case analysis for their own use.

The purpose of performing a case analysis is to assess insights and decisions before taking the steps to develop a final solution. Your case analysis can help

Figure A1.13 Examine the insights.

you figure out potential problems in the business, what the costs and risks of the problem may be, and the benefits of certain decisions so you're adequately prepared to take action.

Actions may include writing a report, appealing to stakeholders, speaking to customers, or performing another activity that elevates the business, increases sales, secures partnerships, or otherwise helps a business meet its goals. The advantage of the business case is that it helps you:

Justify why the investment will return the initial commitment.
Show where there will be cost savings.
Give examples of how this has worked before for other businesses.

What we are doing here is giving the decision-makers enough information to weigh up the pros and cons of the investment. Use the process of defining metrics to achieve the following:

Identify the primary business objectives, for example, reduce costs, increase sales, develop market share
How to accomplish this, for instance, by reducing labor and/or business costs associated with certain steps of a related process
How to measure the effectiveness of the initiative, such as reduction in cost per unit of output for the process
Process innovations involve the activities and operations that produce an enterprise's primary offerings. Innovating here requires a dramatic change from "business as usual" that enables the company to use unique capabilities, function efficiently, adapt quickly, and build market-leading margins. Process innovations often form the core competency of an enterprise, and may include patented or proprietary approaches that yield advantage

for years or even decades. Ideally, they are the "special sauce" you use that competitors simply can't replicate.

Related Exercises:

7. What are the 10 Most Innovation Organizations?

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8. What Would Make Us More Innovative?

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9. Why Customers Think your Organization is Innovative?

Exercise #10: Developing a Business Case (Optional). This Business Case Exercise provides you with the structure you need to describe four main areas:

Business Need – what is the specific need or gap in the market you are trying to target? Describe the business need that the project will address, for example, a new call center required to support customers requiring technical support.

Anticipated Outcomes – describe the anticipated outcomes of implementing the project that addresses the business issue. Examples of outcomes should include answers to questions like, "What are our aims?", "How to define success factors?" and "What are the expected benefits?"

Justification – describe why this project should be implemented and the rationale for why it was selected over other alternative solutions. Summarize key quantitative and qualitative information, including a description of the impact of not implementing the project.

Critical Success Factors – describe and list the project's critical success factors. Determine how success will be measured, for example, the percentage take-up of new services over [X] years.

Complete this Business Case Template … (See Figure A1.14).

Project Name	Project Manager
Client	Duration

Executive Summary	Write a short version of each of the following sections in your business case.
Mission Statement	Define the vision, goals and objectives of the project.
Product/ Service	Explain what the product or service and how it fits a niche or serves a need.
Project Definition	Provide general information about the project, such as a project plan outline.
Project Organization	What is the structure of the project, such as functional, matrix, projectized or composite
Financial Appraisal	Estimate the cost of executing the project plan over the schedule of the project.
Market Assessment	Research the market opportunities and threats, including competitors.
Marketing Strategy	Show how your product or service with be distributed, what its pricing will be, the target audience, etc.
Risk Assessment	Figure out risks to your project and work on how to identify and mitigate them.

Figure A1.14 Business case template.

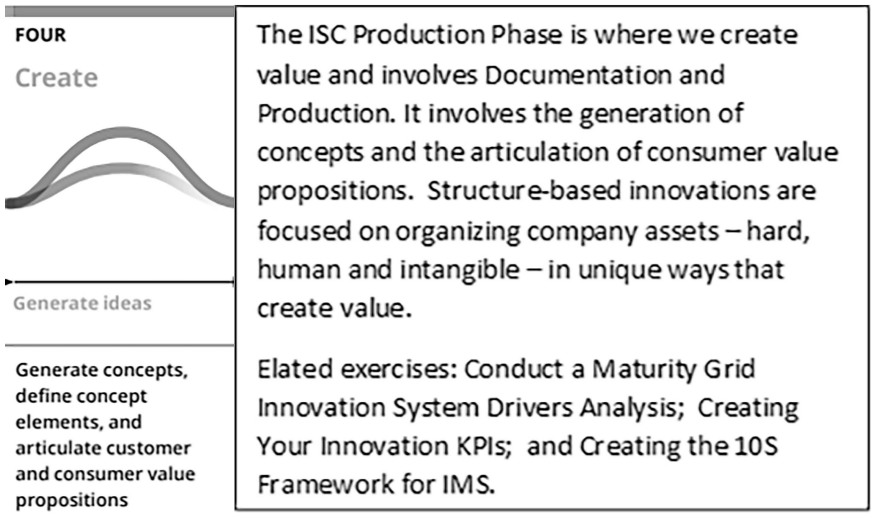

Figure A1.15 Created.

TIME Workshop Module on Production – How you generate concepts and articulate consumer value propositions... (Figure A1.15).

Length of Module: 2–4 hours	Number of Exercises: 2

Figure A1.16 Generate concepts.

Product Performance innovations address the value, features, and quality of a company's offering. This type of innovation involves both entirely new products as well as updates and line extensions that add substantial value. Too often,

people mistake Product Performance for the sum of innovation. It's certainly important, but it's always worth remembering that it is only one of the Ten Types of Innovation, and it's often the easiest for competitors to copy (Figure A1.16).

Think about any product or feature war you've witnessed – whether torque and toughness in trucks, toothbrushes that are easier to hold and use, even with baby strollers. Too quickly, it all devolves into an expensive mad dash to parity. Product Performance innovations that deliver long-term competitive advantage are the exception rather than the rule.

Product System innovations are rooted in how individual products and services connect or bundle together to create a robust and scalable system. This is fostered through interoperability, modularity, integration, and other ways of creating valuable connections between otherwise distinct and disparate offerings. Product System innovations help you build ecosystems that captivate and delight customers and defend against competitors.

Related Exercises:

11. Conduct a Maturity Grid Innovation System Drivers Analysis

12. Creating Your Innovation KPIs

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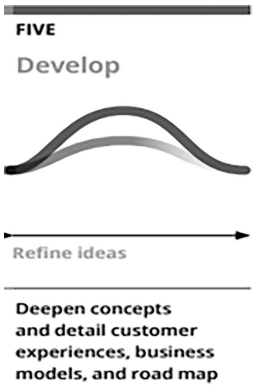
13. Creating the 10S Framework for IMS



The ISC Delivery/ Develop Phase is where we refine ideas, models and roadmaps. It involves the deepening of concepts and the detailing of customer experiences, business models and a Roadmap. It involves the last four Process Groupings of the Innovation Systems Cycle (ISC) of Marketing/ Sales/ Delivery, After-Sales Service, Performance Analysis, and Transformation. The four types of innovation involved from the Doblin Periodic Table are: (1) Service: How you support and amplify the value of your offerings; (2) Channels: How you deliver your offerings to customers and users; (3) Branding: How you represent your offerings and business; and (4) Customer Engagement: How you foster compelling interactions.

Figure A1.17 Develop.

TIME Workshop Module on Develop/Delivery – How you deepen concepts and detail customer experiences, business models, and roadmaps... (Figure A1.17).

Length of Module: 2–4 hours	Number of Exercises: 2

Figure A1.18 Delivery.

Delivery Phase innovations are focused on service, channels, branding, and customer engagements (Figure A1.18).

Service: How you support and amplify the value of your offerings.

Service innovations ensure and enhance the utility, performance, and apparent value of an offering. They make a product easier to try, use, and enjoy; they reveal features and functionality customers might otherwise overlook, and they fix problems and smooth rough patches in the customer journey. If done well, they elevate even bland and average products into compelling experiences that customers come back for again and again.

Channels: How you deliver your offerings to customers and users

Channel innovations encompass all the ways that you connect your company's offerings with your customers and users. While e-commerce has emerged as a dominant force in recent years, traditional channels such as physical stores are still important – particularly when it comes to creating immersive experiences.

Skilled innovators of this type often find multiple but complementary ways to bring their products and services to customers. Their goal is to ensure that users can buy what they want, when and how they want it, with minimal friction and cost, and maximum delight.

Branding: How you represent your offerings and business.

Brand innovations help to ensure that customers and users recognize, remember, and prefer your offerings to those of competitors or substitutes. Great ones distill a "promise" that attracts buyers and conveys a distinct identity.

They are typically the result of carefully crafted strategies that are implemented across many touchpoints between your company and your customers, including

communications, advertising, service interactions, channel environments, and employee and business partner conduct. Brand innovations can transform commodities into prized products, and confer meaning, intent, and value to your offerings and your enterprise.

Customer Engagement: How you foster compelling interactions.

Customer Engagement innovations are all about understanding the deep-seated aspirations of customers and users and using those insights to develop meaningful connections between them and your company. Great Customer Engagement innovations provide broad avenues for exploration and help people find ways to make parts of their lives more memorable, fulfilling, delightful – even magical.

Related Exercises:

16. Using the TIME Framework: Conducting a COTO Exercise

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17. Using the TIME Framework: Conducting a Leader's Reality Check

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18. Using the TIME Framework: Conducting an IMS Planning Session

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19. Using the TIME Framework: Evaluating the IMS System Performance

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Notes

1 The Doblin Periodic Table of Innovation was developed by Doblin Group, an innovation consulting firm, which developed the 10 Types of Innovation® after 27 years of research into organizations' creative processes. Doblin Group says that you'll more likely have a successful organization if you focus on innovating in at least four of the ten areas.

2 After examining over 2,000 business innovations throughout history, Doblin uncovered that most breakthroughs don't necessarily stem from engineering inventions or rare discoveries. Instead, they observed that innovations can be categorized within a range of ten distinct dimensions – and anyone can use the resulting strategic framework to analyze the competition, to stress test for product weaknesses, or to find new opportunities for their products.

3 The Problem Framing canvas is provided as a public service without charge by Mitre and helps create an inclusive environment, where all members of the team are able to contribute to building a shared understanding of the problem at hand. Facilitators should take care to build a high-trust environment and ensure each participant is encouraged to speak up. This tool helps foster an adaptable mindset among groups, and they often end up coming up with new ways to describe the problem they are working on. For details see – https://itk.mitre.org/toolkit-tools/problem-framing/.

Appendix B: Answers to the Innovator's Dilemma

Innovators' Dilemma Solutions

Figure Appendix B.1
Innovators Dilemma #1: Crossing the River and Back Again
(Chap ref #1.1)

Solution
To make it across the other side of the river without losing any of the items you just purchased at the market, you can make the following trips:

1. Bring the duck over.
2. Return alone.
3. Bring the wolf over.

4. Return the duck.
5. Bring the bag of seeds over.
6. Return alone.
7. Bring the duck over.

Now you'll be on the other side of the river with all three purchases and able to make it back home safely.

Figure Appendix B.1
Innovators Dilemma #2: Is the Glass half empty or half full … (Chap ref #1.2)

Solution
The most accurate way to determine whether the glass is half-full, more than half-full, or less than half-full is by tilting the glass sideways until the water touches the lip of the glass. Because the glass is a right cylinder, you can look at where the water towards the bottom of the glass is to determine how much water there is. If the water perfectly intersects the corner of the bottom of the glass, it is half-full. If the water level at the bottom of the glass is above the corner, the glass is more than half-full. And if the water level at the bottom of the glass is below the corner, the glass is less than half-full.

Figure Appendix B.1
Innovators Dilemma #3: Nuts & Bolts will drive you nuts (Chap ref #1.3)

Solution
The key to this riddle is to understand the fact that all of the boxes are labeled incorrectly.

The way to correctly label all of the boxes with only one selection is to reach into the box labeled "Nuts & Bolts" and pull something out. Suppose you pull out a bolt, which means that that box must be "Bolts," you now know that the remaining two boxes are "Nuts" and "Nuts & Bolts" but since the "Nuts" box is labeled incorrectly, it must be the "Nuts & Bolts" and the "Bolts" box then must actually be "Nuts."

Figure Appendix B.1
Innovators Dilemma #4: Cutting the Cake … (Chap ref #1.4)

Solution
This is a personal favorite of innovators and problem solvers because it is so easy to remember and tell people, and everyone is capable of solving it. You can make eight equal-sized slices in three cuts:

- First, cut the cake straight down the middle splitting it into two pieces.
- Then cut straight down the middle of those two pieces to make four equal pieces.
- Then make a horizontal cut across the center of the cake to split those four pieces into eight.

Figure Appendix B.1
Innovators Dilemma #5: Heads or Tails – The Loaded Coin (Chap ref #1.5)

Solution
This riddle has a few solutions. Technically there are infinite ways you can flip an unfair coin and determine a winner based solely on chance but it requires the rules to become more and more complex as you come up with new solutions. We will provide the three most elegant answers.

The most famous answer to this problem is using a strategy commonly attributed to the mathematician John Von Neumann. To construct a fair game of chance with an unbiased coin that flips heads more than tails. All you need to do is follow these rules: Flip the coin twice. If it comes up heads and then tails, you win. If it comes up tails and then heads, your best friend wins. If it comes up heads and then heads, or tails and then tails, you start over. The two instances of heads-then-tails and tails-then-heads are equally probable, regardless of how unbalanced the coin is. This provides a fair contest.

Another answer is for you and your best friend to each flip the coin ten times. Whoever flips more heads wins. If you tie, you start over. This answer demonstrates the ease with which you can come up with infinite solutions by slightly changing the rules for a contest like this.

One more answer is to say to your friend, "We will each flip the coin as many times as it takes to flip tails. Whoever can do this in the least amount of flips wins." This is also a fair contest.

Figure Appendix B.1
Innovators Dilemma #6: The Prisoners' Dilemma (Chap ref #1.6)

Solution
The best chance of survival comes with the following innovative solution: Put one (1) white stone in the first jar and all of the remaining in the other jar. This gives the prisoner better than a 74% (74.74%) chance of survival.

Figure Appendix B.1
Innovators Dilemma #7: The Mayor and the Farmer's Daughter … (Chap ref #2.1)

Solution
All the daughter needs to do is remove one stone from the bag, keep it concealed in her hand, and ask the mayor to show the remaining stone to the village. The village will then believe that the farmer's daughter has drawn the white stone.

Innovators Dilemma #8: Saving Pills & Mixing Medicine … (Chap ref #2.2)

Solution
The key to this riddle is to break the pills in half. Take all three pills from the floor and break them each in half. Split the halves up equally into two piles so that both piles contain one-half of each of the three pills. Now you take one pill of Medicine X out of the bottle, split it in half, and put one half in each pile. Now you have two piles that each contain two halves of Medicine X and two halves of Medicine Y, which is your appropriate daily dosage.

Figure Appendix B.1
Innovators Dilemma #9: Switching on the Lights … (Chap ref #2.3)

Solution
In order to determine which switches go with which light bulbs, this is what you must do:

- Turn the first light switch on.
- Turn the second light switch on.
- Leave the third light switch off.
- Wait 15 minutes and turn the second light switch off.

Now enter the room with the light bulbs. One light bulb will be on and controlled by the first switch, because it's the only switch that's currently turned on. Of the two light bulbs remaining, both of which are off, one will be hot to the touch because it had just been left on for 15 minutes. The second switch controls this light bulb and the final switch which had remained off the whole time controls the light bulb that is off and not hot.

Figure Appendix B.1
Innovators Dilemma #10: Mexican Laser Standoff at the OK Corral …

You are a cyborg in a duel with two other cyborgs. You have a laser beam attached to your arm that fires with 33% accuracy. One of the other cyborgs

shoots with 50% accuracy, and the other shoots with 000% accuracy. Each of you is allowed one shot per round and the shooting order starts from the worst shooter to the best shooter. You will shoot first, the 50% accurate cyborg will shoot second, and the 100% accurate cyborg will shoot third. If a cyborg is killed, their turn will be skipped. You, having the worst shot, are up first.

What should you shoot at to maximize your chance of winning?

Solution
To maximize your chance of survival you should shoot your laser at the ground in front of you. The turn would then pass to the cyborg with 50% accuracy who would aim at the 100% accurate cyborg, for if he shoots at you and kills you, the 100% cyborg would be up next to shoot and would surely kill him.

If the 50% cyborg hits his target and kills the 100% cyborg, it is once again your turn and you have a 25% chance to kill the 50% cyborg and win the duel. If the 50% cyborg misses the 100% cyborg, it will then be the 100% cyborg's turn to shoot, and he will surely aim at the 50% cyborg because he would rather eliminate him from the game than you because you have a worse chance to hit. Once this happens, it will again be your shot and you have a 25% chance to kill the 100% cyborg and win the duel. Thus, hitting the ground is your best option.

Had you aimed at either of the two cyborgs for your first shot and killed them, it would be the remaining cyborg's turn and they would have no other target to aim for but you and they are both much better shots so you are much more likely to survive if you are able to shoot first. Shooting at the ground guarantees this.

Figure Appendix B.1
The Innovator's Dilemma #11: The Six Hats Thinking minus One (Chap ref #5.1)

Solution
There is only one configuration that would allow for this situation – if Bob and Hal are both wearing Black Hats. Here's how Cal figured it out.

- If Alan were to see two White Hats in front of him, then he would know to deduce (know) that he is wearing a Black Hat = because there are only two White Hats in the box. In all other instances, he must respond with a "No."
- If Bob were to see a White Hat in front of him he would be able to deduce that he was wearing a Black Hat = because he would know that both himself and Cal couldn't be wearing White Hats, otherwise Alan would have known the color of his hat.
- The dilemma is solved = Both Alan and Bob do not know the color of their hats so Cal can be sure in his insight that the color of his own hat must be Black!

Appendix C: List of the Most Used and/or Most Effective Innovative Tools and Methodologies in Alphabetical Order

Book I. Organizational and/or Operational IT&M
Book II. Evolutionary and/or Improvement IT&M
Book III. Creative IT&M

Note: IT&M = Innovative Tools and/or Methodologies
P = Primary Usage S = Secondary Usage Blank = Not used or little used

	IT&M	*Book III*	*Book II*	*Book I*
1.	5 Why questions	S	P	S
2.	76 standard solutions	P	S	
3.	Absence thinking	P		
4.	Affinity diagram	S	P	S
5.	Agile Innovation	S		P
6.	Attribute listing	S	P	
7.	Benchmarking		S	P
8.	Biomimicry	P	S	
9.	Brain-writing 6-3-5-	S	P	S
10.	Business case development		S	P
11.	Business Plan	S	S	P

(*continued*)

	IT&M	*Book III*	*Book II*	*Book I*
12.	Cause and Effect Diagrams		P	S
13.	Combination methods	P	S	
14.	Comparative analysis	S	S	P
15.	Competitive analysis	S	S	P
16.	Competitive shopping		S	P
17.	Concept tree (concept map)	P	S	
18.	Consumer co-creation	P		
19.	Contingency planning		S	P
20.	Co-Star	S	S	P
21.	Costs analysis	S	S	P
22.	Creative problem-solving model	S	P	
23.	Creative thinking	P	S	
24.	Design for Tools		P	
	Subtotal number of points	7	7	10

Book I. Organizational and/or Operational IT&M
Book II. Evolutionary and/or Improvement IT&M
Book III. Creative IT&M

Note: IT&M = Innovative Tools and/or Methodologies
P = Primary Usage S = Secondary Usage Blank = Not used or little used

	IT&M	*Book III*	*Book II*	*Book I*
25.	Directed/Focused/Structure Innovation	P	S	
26.	Elevator Speech	P	S	S
27.	Ethnography	P		
28.	Financial reporting	S	S	P
29.	Flowcharting		P	S
30.	Focus groups	S	S	P
31.	Force field analysis	S	P	
32.	Generic creativity tools	P	S	
33.	HU Diagrams	P		
34.	I-TRIZ	P		

(*continued*)

	IT&M	*Book III*	*Book II*	*Book I*
35.	Identifying and Engaging Stakeholders	S	S	P
36.	Imaginary brainstorming	P	S	S
37.	Innovation Blueprint	P		S
38.	Innovation Master Plan	S	S	P
39.	Kano analysis	S	P	S
40.	Knowledge management systems	S	S	P
41.	Lead user analysis	P	S	
42.	Lotus Blossom	P	S	
43.	Market research and surveys	S		P
44.	Matrix diagram	P	S	
45.	Mind mapping	P	S	S
46.	Nominal group technique	S	P	
47.	Online innovation platforms	P	S	S
48.	Open innovation	P	S	S
49.	Organizational change mgt	S	S	P
50.	Outcome driven innovation	P		
	Subtotal number of points	15	4	7

Book I. Organizational and/or Operational IT&M
Book II. Evolutionary and/or Improvement IT&M
Book III. Creative IT&M

Note: IT&M = Innovative Tools and/or Methodologies
P = Primary Usage S = Secondary Usage Blank = Not used or little used

	IT&M	*Book III*	*Book II*	*Book I*
51.	Plan-Do-Check-Act	S	P	
52.	Potential investor present	S		P
53.	Pro-active Creativity	P	S	S
P	Project Management	S	S	P
54.	Proof of concepts	P	S	
55.	Quickscore creativity test –	P		
56.	Reengineering/Redesign		P	

(*continued*)

	IT&M	*Book Ill*	*Book II*	*Book I*
57.	Reverse Engineering	S	P	
58.	Robust design	S	P	
59.	S-Curve Model		S	P
60.	Safeguarding Intellectual Properties			P
61.	Scamper	S	P	
62.	Scenario Analysis	P	S	
63.	Simulations	S	P	S
64.	Six thinking hats	S	P	S
65.	Social Networks	S	P	
66.	Solution Analysis Diagrams	S	P	
67.	Statistical Analysis	S	P	S
68.	Storyboarding	P	S	
69.	Systems thinking	S	S	P
70.	Synetics	P		
71.	Tree diagram	S	P	S
72.	TRIZ	P	S	
73.	Value analysis	S	P	S
74.	Value propositions	S		P
75.	Visioning	S	S	P
	Subtotal – number of points	7	12	7

(P) priority rating	*Creative*	*Evolutionary*	*Organizational*
TOTAL	29	23	24

IT&M in Creativity Book 29

IT&M in Evolutionary Book 23

IT&M in Organizational Book 24

Appendix D: Glossary

- **Activities** are small parts of a process usually performed by a single department or individual.
- **Business Case** captures the reason for initializing a project or program. It is most often presented in a well-structured written document, but, in some cases, also may be in the form of a short verbal argument or presentation.
- **Business Case Analysis** is an evaluation of the potential impact of correcting a problem or taking advantage of an opportunity on the organization to determine if it is worthwhile investing resources to correct the problem or take advantage of the opportunity.
- **Concept validation** (Proof of Concept) is a realization of a certain method or idea in order to demonstrate its feasibility, or a demonstration in principle, with the aim of verifying that some concept or theory has practical potential. Concept validation is used to validate the performance of the activities defined in the value proposition. (Concept Validation and Proof of Concept are often used interchangeably.)
- **Create** is to make something: To bring something into existence.
- **Creative** is using the ability of people to make or think of new things, involving the process by which new ideas, stories, products, etc. are created.
- **Cycle** is any input that goes into a series of processes and/or systems and part of the output circles back to trigger a new input into the cycle.
- **Entrepreneu**r is a person who organizes and manages any enterprise, especially a business, usually with considerable initiative and risk. He/she does not have to create the idea or concept.
- **External Customer** is an individual or organization that is not within the supplier's organization that receives a product, a service, or information from the supplier.
- **Innovation** is a new/unique idea or concept that adds value to the organization and its customers. Innovation is the act of taking new unique

and creative ideas that are developed, funded, produced, and distributed to external customers that result in creating value for both the organization and the consumer/customer.

- **Innovation Systems Cycle** (ISC) is the way a typical project for products would progress through innovative activities from identifying opportunities to measuring the value added to the stakeholders.
- **Innovative idea** is one that adds greater value to the customer and the organization than it costs to produce it.
- **Innovator** is an individual who is capable of creating added value for the organization and its customers by being capable of taking new and unique ideas or concepts all the way through the ISC from recognizing an opportunity to evaluating the actual value added.
- **Internal Customer** is a person, process, or department within the organization that receives output from another person and/or process within the same organization.
- **Intrapreneur** is an employee of a large corporation who is given freedom and financial support to create new products, services, systems, etc. and does not have to follow the corporation's usual routines or protocols.
- **Manager** is an individual who accomplishes an assigned task through the use of other individuals to whom the work is delegated.
- **Marketing** is the action or business of promoting and selling products or services, including market research and advertising. Marketing is finding out what we don't have and sales is the task of selling what we do have. Marketing is the activity of finding out what the customer wants to buy.
- **Natural Work Team** is any group of individuals that report to the same individual. It could be employees who report to the first-line manager or first-line managers who report to a second-line manager, etc.
- **Organizations** are systematic arrangements of entities (people, departments, companies, divisions, teams, agencies, etc.) aimed at accomplishing a purpose, which may or may not involve undertaking projects. They are often documented in an organization chart that shows the relationships of the individual organization to the total organization.
- **Organization** is a company, corporation, firm, enterprise, or association of any part thereof, whether it is incorporated or not, public or private, that has its own function and administration. (Source: ISO 8402 – 1994) It can be as small as a first-line department and as large as the government in the United States.
- **Organizational** refers to those activities, projects, programs, processes, and systems that apply to the total organization, not just one or two departments or units.
- **Organizational culture** is the values and behaviors that contribute to the unique social and psychological environment of an organization. Organizational culture includes an organization's expectations, experiences, philosophy, and values that hold it together and are expressed in

its self-image, inner workings, interactions with the outside world, and future expectations. It is based on shared attitudes, beliefs, customs, and written and unwritten rules that have been developed over time and are considered valid. Also called corporate culture, it's shown in:

1. the ways the organization conducts its business, treats its employees, customers, and the wider community,
2. the extent to which freedom is allowed in decision-making, developing new ideas, and personal expression,
3. how power and information flow through its hierarchy down the rest of the organization, and
4. how committed employees are towards collective objectives. (Business Dictionary)

- **Organizational structure** is a system used to define a hierarchy within an organization. It identifies each job, its function, and where it reports to within the organization. This structure is developed to establish how an organization operates and assists an organization in obtaining its goals to allow for future growth. The structure is illustrated using an organizational chart.
- **Process** is a series of interrelated actions and/or tasks performed to create a pre-specified product, service, or result. Each process is comprised of inputs, activity, outputs, tools, and techniques, with constraints (environmental factors), guidance, and criteria (organizational process assets) taken into consideration.
- **Process Adaptability** is the flexibility of the process to handle future changing customer expectations and today's individual, special customer requests. It is managing the process to meet today's special needs and future requirements. Adaptability is an area largely ignored, but it is critical for gaining a competitive edge in the marketplace. Customers always remember how you handled, or didn't handle, their special needs.
- **Process Effectiveness** is the extent to which the outputs of the process or sub-process meet the needs and expectations of its customers. It is a lot like quality, but includes more things. Effectiveness is having the right output at the right place, at the right time, at the right price.
- **Process Efficiency** is the extent to which resources are minimized and waste is eliminated in the pursuit of effectiveness. Productivity is a measure of efficiency.
- **Process Grouping** is groups of processes and systems that are grouped together due to the way they interact with each other or in some cases are alternative processes. (For example, you can do something by hand or electronically. In either case, the task involved is very different.) In the case of the Innovation Systems Cycle, we have defined 12 process groupings.
- **Proof of Concept** is a realization of a certain method or idea to demonstrate its feasibility, or a demonstration of whose purpose is to verify

that some concept or theory has the potential of being used. A Proof of Concept is usually small and may or may not be complete. The Proof of Concept approach is often used for start-up companies or new products to show how the concept will perform in the real world.

- **Program** is a group of related projects, subprograms, and program activities managed in a coordinated way to obtain benefits not available from managing them individually. They may include work outside the scope of projects. A program will always have projects contained within its scope.
- **Program/Project Management** is the application of Tasks/Tools/Techniques, and Skills/Knowledge to meet program requirements, to obtain benefits and control not available from managing them individually. It is harmonizing projects and program components, and controlling interdependencies to achieve benefits outlined in the business case and value proposition.
- **Project** is a temporary endeavor undertaken to create a unique product or service. Projects should always have a time related to them.
- **Project Manager** is an organizational employee, representative, or consultant appointed to coordinate a project/program. This individual plans and organizes the resources required to complete a project/program, prior to, during, and upon closure of the project/program lifecycle. Note: Project Manager is also the term used for individuals who are managing programs.
- **Project Portfolio** is a centralized collection of independent projects or programs that are grouped together to facilitate their prioritization, effective management, and resource optimization in order to meet strategic organizational objectives.
- **Project Team Manager** is an individual who is truly accountable for the success or failure of a specific project/program. They usually will have many, if not all, of the people working on the project/program assigned directly to them. They will be responsible for getting people from other organizations to work on their project as they are needed.
- **S curve** is a mathematical model also known as the logistic curve, that describes the growth of one variable in terms of another variable over time. S curves are found in fields from biology and physics to business and technology. In business, the S curve is used to describe, and sometimes predict, the performance of a company or a product over a period of time.
- **Sales** is the activity of taking a lead and selling the item to the potential customer.
- **Selling** is first and foremost a transaction between the seller and the prospective buyer or buyers (the target market) where money (or something considered to have monetary value) is exchanged for goods or services. Selling is the art of closing the deal.
- **Structure** is the arrangement of and relations between the parts or elements of something complex.

- **Systems** are groups of related processes that may or may not be connected.
- **Tasks** are steps that are required to perform a specific activity.
- **Value proposition** is a document that defines the benefits and negative impacts that will result from the implementation of the change or the use of output as viewed by one or more of the organization's stakeholders. A value proposition can apply to an entire organization, parts of the organization, customer accounts, products, services, or internal processes.
- **Work breakdown structure (WBS)** is a deliverable-oriented breakdown of a project into smaller components. A work breakdown structure is a key project deliverable that organizes the team's work into manageable sections.

Index

Pages in *italics* refer to figures and pages in **bold** refer to tables.