HAROLD KERZNER, PH.D.

INNOVATION PROJECT MANAGEMENT

SECOND EDITION

METHODS, CASE STUDIES, AND TOOLS FOR MANAGING **INNOVATION PROJECTS**

INTERNATIONAL Institute for Learning, Inc.

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To
my wife, Jo Ellyn,
for years of ongoing love,
support, and understanding

Contents

Preface

All companies desire growth. But without some innovations, the opportunities may be limited. And even if the firm does have a few successful innovations, failure can still occur if the company focuses on past successes without developing a culture for continuous and sustainable innovations. Today's industry leaders can become tomorrow's failures without constantly challenging results.

If continuous and sustainable innovation is to occur, then innovation leadership and project management must be married together and with a clear understanding of each other's roles. Innovation defines what we would like to do, and project management determines if it can be done. The marriage also may require that both parties learn new skills and create a corporate culture that supports idea management practices. As discussed in several of the chapters in the book, companies are developing organizational units dedicated to innovation activities and idea management.

Understanding each other's roles is the first step in making a company more innovative. This requires that the project managers and other innovation personnel understand what they do not do now but must do for long-term successful innovation. This also includes understanding the interfacing with marketing personnel and customers.

The book is broken down as follows:

- **Chapter 1:** Discusses why innovation and project management are often not discussed together and some of the links that are needed to bridge innovation, project management, and business strategy.
- **Chapter 2:** Discusses the different types of innovation. This is essential because each type of innovation may require a different form of project management.
- **Chapter 3:** Discusses how business strategy may determine the type of innovation required and links together project management with the different types of innovation.
- **Chapter 4:** Discusses the tools that traditional project managers need to learn in order to manage innovation projects. Many of these tools are not discussed in traditional project management programs.
- **Chapter 5:** Discusses why some of the processes used in traditional project management activities may not work within innovation projects without some degree of modification.

- **Chapter 6:** Discusses the growth in innovation management software that project managers are now using in the front end of projects for idea management, alternative analyses, and decision making.
- **Chapter 7:** Discusses the new metrics that project managers and innovation personnel are using for the monitoring and controlling of innovation projects.
- **Chapter 8:** Discusses innovations related to business models rather than products and services.
- **Chapter 9:** Discusses how disruptive innovation requirements may need a completely new form of project management and the need to interface closely with the consumer marketplace.
- **Chapter 10:** Discusses the roadblocks affecting the working relationship between project management and innovation.
- **Chapter 11:** Discusses how some projects, including innovation activities, have degrees of success and failure rather than complete success and failure as defined by the triple constraints.
- **Chapter 12:** Discusses the innovation culture that several companies have developed as well as the functional units they created to support innovation creation.
- **Chapter 13:** Case studies that discuss issues with innovation.

Companies mentioned in this book include:

- 3 M
- Advanced Micro Devices
- Airbus
- Amazon
- Apple
- Blockbuster
- Boeing
- Booz, Allen and Hamilton
- Boston Consulting Group
- Comau
- Daimler-Chrysler
- Dell Computer
- Deloitte
- Dubai Customs
- eBay
- Eli Lilly
- Facebook
- GEA
- General Electric
- Google
- Hewlett-Packard
- Hitachi
- Home Depot
- HYPE Innovation
- IBM
- IdeaScale
- Implement Consulting Group
- Industriens Fond
- InnovationLabs
- Integrated Computer Solutions
- Intel
- Iridium
- KAUST
- Kodak
- Lego
- Lenovo
- Logitech
- Medtronic
- Merck KGaA, Darmstadt, Germany
- Microsoft
- Motorola
- Naviair
- NEC
- Netflix
- Nike
- PayPal
- Philips
- Repsol
- Samsung
- Southwest Airlines
- Starbucks
- Texas Instruments

- Tokio Marine & Nichido Co, Ltd.
- Toyota
- Toys R Us
- Transmeta
- UNICEF
- Walt Disney
- Wärtsilä

The author is indebted to all the companies that were willing to share information on innovation to help better prepare the next generation of innovation project managers. Special thanks to Dr. Luigi Morsa for his input and constructive criticism throughout the preparation of this book.

Seminars, webinars, e-learning courses, and workshops in innovation project management that use this book are available by contacting:

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International Institute for Learning

1 Introduction to Innovation Project Management

Learning Objectives for Project Managers and Innovation Personnel

To understand the differences between traditional and innovation project management
To understand that there are new skills, responsibilities, and expectations for managing innovation activities
To understand the strategic/business importance of innovation
To understand the importance of measuring innovation business value

INTRODUCTION

"The future is a direction, not a destination."

— Edwin Catmull

Over the past three decades, there has been a great deal of literature published on innovation and innovation management. Converting a creative idea into reality requires projects and some form of project management. Unfortunately, innovation projects may not be able to be managed effectively using the traditional project management philosophy we teach in our project management courses. Innovation varies from industry to industry, and even companies within the same industry cannot come to an agreement on how innovation project management should work. Part of the disagreement

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comes from the fact that there are several forms of innovation, each one with different characteristics and possibly requiring different tools.

It is inevitable that, over the next several years, professional organizations such as the Project Management Institute (PMI) will recognize the need to begin setting some standards for innovation project management and possibly partner with organizations, such as the Product Development and Management Association (PDMA), which offers a certification program related to innovation. There may also appear an Innovation Project Management Manifesto like the Agile Manifesto. The greatest innovation in the next decade may be the recognition and advancement of innovation project management as a specialized project management career path position.

There are differences between traditional and innovation project management. People have avoided using the words "innovation" and "project management" in the same sentence because of these differences. Even some organizations that offer certification in innovation practices do not use the words "project management." There is limited research on examining the link between innovation and project management.

Innovation is often unstructured and requires people to utilize those portions of the brain that focus on free thinking, creativity, brainstorming, and alternative analyses. Project management, on the other hand, is very structured, with a well-defined scope, and often with a very low tolerance for any creativity or brainstorming that is believed to be out of scope.

There are several types of innovation, ranging from small, incremental changes to a product to totally new products and processes that are the result of a breakthrough in technology that disrupts the market. Incremental innovation may follow some of the standard project management processes. Radical or disruptive innovation may require playing by a different set of rules. All assumptions must be challenged, even if they appear in a business case. Innovation requires the identification of the right problems and thinking about elegant solutions. All of these factors may require that the organizational culture change.

DEFINITIONS FOR INNOVATION

"If you want something new, you have to stop doing something old."

— Peter Drucker

"Innovation = Ideas + Execution + Adoption"

— Jag Randhawa, *The Bright Idea Box: A Proven System to Drive Employee Engagement and Innovation*

There are conflicting views on what innovation means. Some people argue that innovation is standing in the future (rather than the present) and helping others see it. Another view of innovation (to paraphrase Martha Graham) states that innovation teams, and innovators, are not ahead of their time in what they see. They are in real time, and the rest of the world hasn't caught up to them yet because they are still focusing on the past.

There is no universally agreed-on definition for innovation, but two common definitions are:

1. Innovation is the transformation of knowledge or intellectual property into commercialization.
2. Innovation is not necessarily invention; it can be the creation of something new, as in a new application. Innovation is finding a new or better solution to market needs in a manner that creates long-term shareholder value. Externally, it is seen by customers as improved quality, durability, service,

and/or price. Internally, it appears as positive changes in efficiency, productivity, quality, competitiveness, and market share.

To understand the difficulty in defining innovation, we will look first at the reasons for performing innovation:

- To produce new products or services with long-term profitable growth potential
- To produce long-term profitable improvements to existing products and services
- To produce scientific knowledge that can lead to new opportunities, better ways to conduct business (i.e., process improvements and new business models), or improved problem solving

There are many forms of process or operational innovation. Process innovation is needed to run the business. Capturing and implementing best practices, whether project management or business related, is a form of process innovation. Process innovation can also include changing some of the key operations such as in manufacturing to reduce cost, add business value, or speed up time-to-market. Process innovation overcomes the misbelief that innovation occurs only with technical solutions for designing a new product.

Strategic innovation is needed to grow the business. The output from strategic innovation can create sustainable business value in the form of:

- New products
- Enhancements in brand value
- Additional services
- Efficiencies and/or improved productivities
- Improvements in quality
- Reduction in time-to-market
- An increase in competitiveness
- An increase in market share
- New processes
- New technologies
- Reduction in labor or material costs
- Reduction in energy consumption
- Conformance to regulations
- New platforms
- New strategic partnerships or acquisitions

The long-term benefits of innovations include an increase in market share, greater competitiveness, greater shareholder satisfaction, and so on. Many of these outputs are not the traditional, tangible deliverables or outcomes that most project managers are accustomed to seeing. These outputs can be more business related and intangible. Therefore, deliverables may take on a new meaning during innovation.

There are several types of innovation that can be used for these products, services, and processes, each with unique requirements and different life-cycle phases. Therefore, there is no single path to innovation, making it impossible to establish a uniform approach for all types of innovation projects.

Today, academia is differentiating between R&D and innovation. R&D departments are usually needed for breakthrough innovations that generally involve new technologies. If the R&D group develops a new technology or a new way of doing something that is substantially different from the way it was done before, then it could be turned over to the innovation team to find applications.

THE BUSINESS NEED

"Vulnerability is the birthplace of innovation, creativity, and change."

— Brene Brown

"Normal is where innovation goes to die."

— Richie Norton, *The Power of Starting Something Stupid: How to Crush Fear, Make Dreams Happen, and Live without Regret*

Global business is susceptible to changes in technology, demographics, a turbulent political climate, industrial maturity, unexpected events, and other factors that can affect competitiveness. Taking advantage of these changes will be challenging. Companies need growth for long-term survival. Companies cannot grow simply through cost reduction and reengineering efforts that are more aligned to a short-term solution. Also, companies are recognizing that brand loyalty accompanied by a higher level of quality does not always equate to customer retention unless supported by some innovations.

According to management guru Peter Drucker, there are only two sources for growth: marketing and innovation (Drucker 2008). Innovation is often viewed as the Holy Grail of business and the primary driver for growth. Innovation forces companies to adapt to an ever-changing environment and to be able to take advantage of opportunities as they arise. Companies are also aware that their competitors will eventually come to market with new products and services that will make some existing products and services obsolete, causing the competitive environment to change. Continuous innovation is needed, regardless of current economic conditions, to provide firms with a sustainable competitive advantage and to differentiate themselves from their competitors.

The more competitive the business environment, the greater the investment needed for successful innovation. Companies with limited resources can take on strategic business partners and focus on co-creation. Co-creation innovation project management can result in faster time-to-market, less risk exposure, greater customer satisfaction, a greater focus on value creation, and better technical solutions (DeFillippi and Roser 2014). With co-creation, the project manager must learn how to manage group diversity not just of race, religion, ethnic background, or sex, but also the diverse personal interests in prestige, benefits they might gain, and the degree of importance attached to the project.

Investors and stockholders seek information on the innovation projects in the firm's pipeline. This gives them an indication of possible success in the future. Influential stockholders and stakeholders can put pressure on innovation activities by asking for:

- Shorter product development life cycles
- An increase in product competitiveness
- Faster time to market
- Execution with fewer resources
- Higher performance requirements than the competitors
- Better product quality

Stockholder pressure to shorten development time must not be at the expense of product liability.

For years, project management and innovation management were treated as separate disciplines. Innovation requires an acceptance of possibly significant risk, fostering of a creative mindset, and collaboration across organizational boundaries. Innovation management, in its purest form, is a combination

of the management of innovation processes and change management. It refers to products, services, business processes, and accompanying transformational needs whereby the organization must change the way they conduct their business. It includes a set of tools that allow line managers, project managers, workers, stakeholders, and clients to cooperate with a common understanding of the innovation processes and goals. Innovation management allows the organization to respond to external or internal opportunities, and use its creativity to introduce new ideas, processes, or products (Kelly and Kranzburg 1978). It requires a different mindset than the linear thinking model that has been used consistently in traditional project management practices. Innovation management tools allow companies to grow by utilizing the creative capabilities of its workforce (Clark 1980). However, there are still industries and types of projects that require linear thinking.

Project management practices generally follow the processes and domain areas identified in the Project Management Institute's *PMBOK® Guide*.* Strategic innovation follows other processes such as strategizing, entrepreneurship, changing, and investing (de Wit and Meyer 2014). But now, companies are realizing that innovation strategy is implemented through projects. Simply stated, we are managing our business as though it were a series of projects. Project management has become the delivery system for innovation, but only if the rigidity of some project management processes is removed. Without some degree of flexibility, creativity and brainstorming may suffer.

Today's project managers are seen more as managing part of a business rather than managing just a project. Project managers are now treated as market problem solvers and expected to be involved in business decisions as well as project decisions. End-to-end project management is now coming of age. In the past, project managers were actively involved mainly in project execution, with the responsibility of providing a deliverable or an outcome. Today, with end-to-end project management, the project manager is actively involved in all life-cycle phases including idea generation and product commercialization. The end of the project could be a decade or longer after the deliverables were created.

For decades, most project managers were trained in traditional project management practices and were ill-equipped to manage many types of innovation projects. Projects with a heavy focus on achieving strategic business objectives were managed by functional managers. Project managers handled the more operational or tactical projects and often had little knowledge about strategic plans and strategic objectives that required innovation activities. Project management and innovation management are now being integrated into a single profession, namely, innovation project management (IPM), whereby project managers are provided with strategic information. Project managers are now the new strategic leaders. IPMs now focus heavily on the long-term business or strategic aspects rather than the operational aspects that encourage a mindset of "getting the job done."

Several years ago, a Fortune 500 company hired consultants from a prestigious organization to analyze its business strategy and major product lines, and to make recommendations as to where the firm should be positioned in 5 and 10 years, and what it should be doing strategically. After the consultants left, the executives met to discuss what they had learned. The conclusion was that the consultants had told them "what" to do, but not "how" to do it. The executives realized quickly that the "how" would require superior project management capabilities, especially for innovation. The marriage between business strategy, innovation, and project management was now clear in their minds.

Figure 1-1 illustrates how strategic planning was often seen in the C-suite. All the boxes in Figure 1-1 were considered important, except often not the last box, namely the implementation of the strategy. Therefore, senior management did not see the link between project management and

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**PMBOK* is a registered mark of the Project Management Institute, Inc.

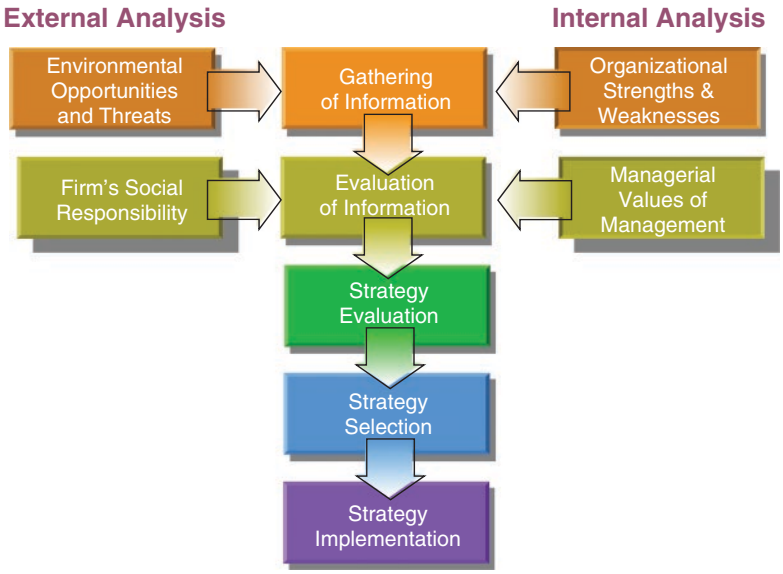

Figure 1–1. Traditional Strategic Planning Activities.

strategic planning activities because it was not recognized as part of their job description. Project management is now recognized as the delivery system by which an organization meets it strategic business objectives. If innovation activities are required, then project managers must undergo training in innovation project management.

Innovation project management is now being recognized as a career path discipline that may be more complex and challenging than traditional project management practices. Innovation projects have a high degree of risk because of the unpredictability of the markets, unstable economic conditions, and a high impact on human factors that may force an organization to change the way that it does business (Filippov and Mooi 2010). Innovation project managers may need a different skill set than traditional project managers.

Organizations need the ability to manage a multitude of innovation projects concurrently to be successful, and therefore innovation project management is being supported by corporate-level portfolio management practices. IPM cannot guarantee that all projects will be successful, but it can improve the chances of success and provide much-needed guidance on when to "pull the plug," reassign resources, and minimize losses.

INNOVATION LITERATURE

There exists an abundance of literature on innovation. One of the reasons for this is that competitiveness is increasing the number of business objectives, thus mandating more innovation (Crawford et al. 2006). Some of the literature focuses on empirical studies, whereas other publications address mainly traditional product innovation. However, some of the projects that may appear as sole product innovation may have significant complexity and include multiple innovations. Examples would be

the design of Boeing's 787 Dreamliner (Shenhar et al. 2016); the Opera House in Sydney, Australia (Kerzner 2014); the Iridium Project; the Construction of Denver International Airport; and Disney's theme parks (Kerzner 2017). Because of the divergent nature of innovation from industry to industry, there are publications that focus on industry-specific innovations such as the auto industry (Lenfle and Midler 2009), the pharmaceutical industry (Aagaard and Gertsen 2011), the manufacturing industry (Calik and Bardudeen 2016), and the construction industry (Brockmann et al. 2016; Ozohorn and Oral 2017). These publications also address academic studies toward finding solutions to innovation problems.

Some researchers try to add structure to innovation by identifying categories of innovation according to elements such as complexity, life-cycle phases, levels of risk, strategic business importance, and information available (Garcia and Calantone 2002; O'Connor and Rice 2013). There are also articles that question whether such classifications are realities or myths because to date there is no consistent definition for innovation (Frankelius 2009).

There is also a human behavior side to innovation that appears in the literature. Examples include the ability to motivate people involved in innovation project management (Pihlajamma 2017) and reducing the tension and stress created by innovation ambiguity (Stetler and Magnusson 2014).

PROJECT MANAGEMENT LITERATURE

There exists a plethora of literature on project management. Unfortunately, most of the literature focuses on linear project management models with the assumption that "one size fits all." While this may hold true in some industries and for some projects, the concept of "one size fits all" does not apply to projects involving innovation.

Today, more than ever before, companies are realizing that business strategy, including innovation needs, is being implemented using project and program management concepts (Lenfle 2008). Although project management has matured into a strategic competency for some firms, not all project managers possess innovation management skills. What is missing in the literature is articles that identify innovation competencies that project managers must possess as well as articles that bridge the gaps between innovation, project management, and business strategy. There is no simple model in existence that bridges these gaps. But what most articles seem to agree on is the need to manage innovation for sustained performance.

There are published articles now appearing that discuss the management of innovation considering the relationship between project management and innovation (Špaček and Vacík 2016; Kenny 2003; Marin 2011; Midler 2019). Most of the published literature provides helpful guidance on the new metrics that should be used for innovation project management.

Špaček, M. and Vacík, E. (2016). Management of innovation projects in SMEs in the Czech Republic. *Journal of Economics & Management* 24, 14–30.

Kenny, J. (2003 March). Effective project management for strategic innovation and change in an organizational context. *Project Management Journal* 34 (1), 43–53.

Marin, A. (2011 June). On innovation through access to technology in project management. Case study. *Managerial Challenges of the Contemporary Society* (2), 169–172.

Midler, C. (2019). Crossing the valley of death: Managing the when, what, and how of innovative development projects. *Project Management Journal* 50 (4), 447–459.

Traditional project management is often seen as standardized processes for planning, scheduling, controlling, and sometimes risk management. The standardized processes are based on rigid policies and procedures that everyone must follow regardless of the unique characteristics of the projects. Some people regard traditional project management as obedience to regulations, policies, and authority (Geraldi et al. 2008).

The discipline of traditional project management may not work well when innovation is required. Project managers need flexibility in their ability to select the appropriate tools for their projects and customize the processes to fit the needs of the projects. This holds true even for many projects that do not require innovation. The future for some types of innovation and for some industries will be flexible project management models such as those used in agile and Scrum projects.

Some industries still have requirements and a valid need for traditional project management practices. But there is a change taking place. "Managers need to recognize the type of project at the start, resist institutional pressure to adapt traditional 'rational' approaches to all projects and apply an appropriate approach—one tailored for the type of project" (Lenfle and Loch 2010). Traditional project management does not distinguish between types of projects. Articles are appearing in the literature that propose a methodology to classify projects to guide the design of a suitable project management model (Geraldi et al. 2011). Even with flexible project management approaches, there may be issues such as those identified by Coombs et al. (1998):

> Thus we have seen that the literature suggests that there may be a need for different project management styles according to a number of distinguishing characteristics between innovations. The major distinctions are the level of technological uncertainty, the extent to which the technology is novel to the firm, the extent to which the technologies and products involved cause market disruption, and the size and complexity of the product or system involved. The implication here is that one generic model would lead to an over simplified view of project management. However, it is also clear that all these dimensions, if combined in all their possible permutations, could lead to the generation of a large and unwieldy number of different possibilities for project management styles. There is therefore a need for a compromise between the inflexibility dangers of "one-best-model," and the excessive costs of tailoring project management approaches for each project. (p. 177)

INNOVATION BENCHMARKING

Literature on innovation and project management does not always provide enough information for companies to improve their innovation practices. Many firms find benchmarking to be the best approach. Benchmarking is part of the continuous improvement process whereby we recognize that others, such as those considered as best in class, might be better at doing something and we wish to learn how to equal and/or surpass them. We measure the gap between us and the reference organization and decide how to compress it.

Benchmarking is more than just looking at products or services or the forms, guidelines, templates, and checklists that others are using. Benchmarking also promotes an understanding of the business processes, the business model under investigation, and the firm's strategy and strategic objectives. This knowledge is critical for continuous improvements for innovation activities.

There are several types of benchmarking activities. The two most common are process and strategic benchmarking:

- *Process benchmarking* focuses on critical steps such as the components of a project management methodology.
- *Strategic benchmarking* analyzes the strategies and core competencies used to create products and services.

In traditional organizations, project managers and the PMOs are usually active in performing process benchmarking. In highly innovative organizations, the focus is on strategic benchmarking.

Several years ago, a division of a Fortune 100 company decided to perform project management process benchmarking against their competitors in the same industry. At the end of the benchmarking process, management patted itself on the back, stating "Boy, are we good compared to our competitors."

After the gloating period was over, the PMO decided to benchmark against world-class project management organizations that were not in their industry. The results showed that the firm was quite poor in their project management capabilities. Recognizing the need for action, the company created the position of vice president for innovation. The VP's role was to perform strategic benchmarking against any company in the world that would share information and discover what best practices could be brought into the company as part of a continuous improvement effort. This included capturing best practices on innovation management.

The previous example makes it clear that innovation benchmarking must be properly targeted to extract the information needed that contributed to success. While companies may be willing to share the processes, forms, guidelines, templates, and checklists they use in managing innovation projects, they may be reluctant to provide strategic information on how they link innovation objectives to corporate business strategy, their culture, employee motivation practices, their commercialization practices, and how they determine the needs of their customers. The information they are reluctant to share may be critical for determining how to tailor their successes to your organization.

Knowing what questions to ask during strategic innovation benchmarking is important. There are published articles that can provide some guidance (Dembowski 2013; Pages and Toft 2009; Coombs et al. 1998; Berg et al. 2006).

Innovation benchmark targeting can also focus on innovation systems that nations use and support rather just individual companies (Ruu Lin et al. 2008; Manjón 2010; Burz and Marian (2016). How a country, geographical region, or business sector, views innovation practices could act as an attraction or deterrent for your company to open a plant, an innovation center, or seek out strategic partners in their area. Some national factors to consider include:

- What special policies and regulations might exist in the country related to patent protection and control of intellectual property?
- Are there special health and safety policies that can hinder innovation activities?
- Is there a national culture that supports innovation practices, perhaps by providing workforce assistance?
- Is there a technical infrastructure supported by technical courses and degrees taught at local universities and available to the workforce?

Dembowski, F. L. (2013 Winter). The role of benchmarking, best practices & innovation in organizational effectiveness. *International Journal of Organizational Innovation* 5 (3), 6–20.