



# Reinventing Project Management

The Diamond Approach to Successful Growth and Innovation

by Aaron J. Shenhar and Dov Dvir

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## Take-Aways

- The “Diamond Framework” can help you map your project’s “novelty, technology, complexity and pace,” and to identify and manage risk.
- Fulfilling customers’ needs is a more important project requirement than meeting the deadline or budget.
- If you can imagine how the project will look to someone in the future, you will see more clearly which aspects matter most.
- Prototypes can help you study customer reaction to possible breakthrough products.
- Risk of product failure rises directly with the technical complexity of the project.
- The formality of project management must rise with the complexity of the project.
- The urgency of a crisis requires you to act immediately. You should have contingency plans in place so you will have a framework for action if an emergency arises.
- Use a matrix to find and approve projects with high benefit and low risk.
- Customer requests can help you improve platform products.
- Constantly identify and develop future project managers.

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## Relevance

### What You Will Learn

In this Abstract, you will learn: 1) How the “Diamond Framework” will increase your project’s success; 2) Why customer satisfaction is a project’s most important goal; and 3) How to determine which project components to outsource and which to leave in-house.

### Overview

Most projects fail because conventional project management concepts cannot adapt to a dynamic business environment. Based on many case studies, this book provides a new, highly adaptive model for planning and managing projects. Aaron J. Shenhar and Dov Dvir explain how to use their “Diamond Framework” to understand the nature of your projects, and diagnose the gaps between your current capabilities and what is needed to make the project a success. They suggest using four bases to evaluate projects, to help employees understand the priorities and to take charge of projects in a more systematic and compelling way: “novelty, technology, complexity and pace.”

## Abstract

### Follow the Diamond

Businesses engage in two general categories of activities to make money. The first is making and selling products on a repetitive basis as part of normal operations. The second is handling new, perhaps one-off, projects. The number of new projects has greatly increased in most companies because products have a much shorter life cycle due to intense competition and the market pressure for novelty.

Project management has become a robust discipline with many competent practitioners. But despite the professionalism of project managers and the best efforts of project team members, many projects still fail. Even when managers deliver projects on time and on budget, they may still not meet the needs of their customers. So much about projects is uncertain, a problem compounded by today’s need for more adaptability than traditional models allow.

Managers also sometimes misunderstand the common elements in their projects and try to reinvent the wheel. This takes too long, is too costly and requires an impossible amount of expertise. The “Diamond Framework” (also called the NTCP model) uses four bases to analyze projects, so that everyone involved can gain a better understanding of what needs to be done:

1. “Novelty” – How intensely new are crucial aspects of the project?
2. “Technology” – Where does the project exist on the scale from low-tech to superhigh-tech?
3. “Complexity” – How complicated are the product, the process and the project?
4. “Pace” – How urgent is the work? Is the timing “normal, fast, time-critical or blitz”?

Place these four bases on a four-axis graph. If each factor is in the moderate range, the graph will be shaped like a perfect diamond. However, no project has this ideal pattern, and that is not a goal you should pursue. The purpose of the graph is to figure out the

“Assess project success by using five dimensions: efficiency, impact on the customer, impact on the team, business success and preparation for the future.”

“Success dimensions may change during the project’s life cycle, as new information is gathered and as the environment changes.”

“Building a business based on an innovation, as Apple did with the iPod, can be one of the reasons to initiate projects. But not every project is about creating a new business or innovation.”

“Each project is unique, but not in every respect. In a wide range of projects, we may find considerable variability – but also quite a number of common features.”

“You can no longer assume that your initial plan will hold until the project ends. Changes will take place and plans will have to be adjusted.”

“The ability of a firm to establish its design of a breakthrough product as an industry standard is a critical determinant of its long-term competitive position.”

actual structure of the project compared with the present capabilities you have on hand to execute the project. The differences between the two will show the gaps that have to be filled to make the project a true success.

What constitutes a successful project? The Sydney Opera House came in many years late and about 1,500% over budget, yet it is now a symbol of national pride and a global tourist destination. Certainly, the short-term view of schedule, budget and quality are important, but they are often less important than customer satisfaction in the long-term view of stakeholders. Project management must take all stakeholders’ short- and long-term considerations into account.

Project and team efficiency are important, but think of the long-range perspective. Does anything change about the project when you consider it from a future point of view? Does the project have sufficient flexibility to adapt to new requirements as fresh information becomes available? Are the project team’s incentives aligned with customer happiness and product performance, as well as with deadline and budget requirements?

The diamond framework allows managers to see the gaps between where the project is and where it needs to be. Understanding the gaps allows managers to select the right team members and resources. The framework also reveals areas of uncertainty and risk in ways that invite appropriate decisions in the planning stage, where they will do the most good. Now, consider each realm of the framework.

### **Novelty: New Creations**

Most projects create something, but their projects have varying degrees of newness or novelty. A “derivative product” is a revised offering of a successful product, such as new colors, sizes or convenience features. Creating product requirements and marketing programs for these products is fairly straightforward. They are often used to extend product life and milk the cash cow. These projects are fairly low-risk and pose few future concerns. Managers should freeze the new product’s requirements around the time that the project begins.

A new version of an existing product is a “platform novelty.” Such projects need a great deal of analysis and market research. Product requirements usually remain in flux until midproject, due to adjustments in the face of knowledge gained by studying the market. The new version has to please existing customers, ride current market trends and meet the challenge of competitive offerings. Marketing has to build the product’s image and emphasize its advantages.

“Breakthrough products” present more challenges because they do not yet have defined markets that the manufacturer can exploit. Market research is less reliable because potential customers have not experienced the product. The product design is really a best guess, based on the expertise of the designers. Trial-and-error is an important part of the design and development process, and the project team must collect feedback from generations of prototypes.

Highly creative marketing is necessary to grab attention. You can use samples and introductory pricing to persuade customers to try the product, but it must win them over by meeting needs the customers themselves may not be aware that they have. A truly breakthrough product should try to become the market standard in its space.

“Increasing technological uncertainty requires longer design, build and test periods.”

“Moving from assembly to system projects is a major change... Managers of system projects must have a system view and must manage the interfaces between disciplines.”

“To overcome project uncertainties and unexpected problems... develop alternative solutions in parallel.”

“Most companies with a well-established practice of listening to their customers are rarely able to build a case for investing in disruptive technologies until it is too late. That is the innovator’s dilemma.”

### Technology: Technical Difficulty

The uncertainty in a project is a measure of the mix of new and mature technology it requires, as well as the company’s existing knowledge. Newness to the market and newness to the company represent different kinds of uncertainty, but the way these issues merge in any given project determines its level of technological uncertainty. Low-tech projects have almost no technological risk, but they require maximum efficiency to gain returns. As the level of technical complexity increases, so does the risk of failure and the likelihood that efficiency will fall.

Superhigh-tech projects are subject to delays, cost overruns and risks of product failure. If a product is low-tech, technical requirements must be frozen early in the process to gain efficiency. With a high-tech project, requirements must stay open longer to take advantage of knowledge gained during the project. The mix of technologies will have an effect on which people you select for the project team.

### Complexity: Measuring the Complications

The complexity base measures the three different types of complexity within a project and assesses how they are organized. A higher degree of complexity means a greater interaction between the parts, which requires more formality in project management.

1. Assembly – The lowest degree of complexity is concerned with the materials, components, subsystems and actual process of assembly, and usually focuses on building a specific, relatively straightforward, self-contained product.
2. System – This measure provides information on how complicated manufacturing the product will be. For example, computers have a system level of complexity, as do ships, cars and buildings. Even intangible products, such as complex software and business reorganization, fit this category. External organizations often coordinate projects at this level of complexity. These projects have a medium to high risk.
3. Array – These projects consist of coordinating multiple systems and are usually hugely complex; for example, the Channel Tunnel between the U.K. and France. Usually a central firm will control the many subprojects, but coordination and negotiation between the largest stakeholders is crucial. These projects use signed legal contracts and formal project specifications managed by a tightly organized bureaucracy. Many external stakeholders often influence these high-risk projects.

### Pace: A Sense of Urgency

The ideal completion date for every project is yesterday. However, some projects are more time-sensitive than others. The pace measurement captures the urgency of time in the success of the project. Competitive pressures push good ideas to market as quickly as possible. A project with a normal pace has considerations more important than the schedule. People may complain about timing in these projects, but, in reality, meeting the schedule is a nice-to-have factor rather than a must-have. The risk is that late delivery will waste competitive advantage or market leadership.

Time-critical projects are those where failure to meet the project and milestone deadlines can result in project failure because a window of opportunity will close. Blitz projects are crisis projects with extremely urgent timing. Getting to these projects as soon as possible is too late. Project managers will need contingency plans to handle the emergency. These events include natural disasters, acts of war and business crises.

“The project’s technological uncertainty level...depends on the technological know-how that exists or is accessible to the company.”

“In crisis, plans are often useless...It would be helpful to think of possible scenarios ahead of time and build contingency plans. [But] when crisis strikes, it is often unimaginable, and you must be ready to act.”

## Diamonds at Work

Project managers can use the diamond framework to foster business innovation. Map proposals on a matrix to show low-to-high benefit opportunity and low-to-high risk difficulty. You can approve projects with high opportunity and low risk immediately, and drop those with high risk and low opportunity. The kind of innovation embodied in the project will change the shape of the diamond and indicate the style of management the project needs.

The audience for successful innovative items changes over the product’s lifecycle. Innovators are the first to buy a revolutionary product and early adopters are the next. An innovative product needs to bridge the gap between the early adopters and the early majority, buyers who accept the product as its technology becomes widely understood. The company that succeeds in selling at this point is not always the first to market.

Even a company that listens to its customers may still miss revolutionary opportunities. This is the “innovator’s dilemma.” Motorola’s reluctance to invest in new digital technology in the late 1990s allowed its Asian and European competitors to overtake the leader in the market. The diamond framework can help management distinguish between the platform products that customers will ask for, and the breakthrough products the company can pursue to disrupt the marketplace and capture great rewards.

Most established businesses have an existing project plan, most often based on the classic project model of define, plan, execute and termination. The problem is that almost no projects are so linear. Once project execution starts, reality will push some aspects back to the planning or definition stages. The diamond framework can predict the likelihood of these iterations by showing how far out on each axis the project is.

You can also use the model to decide which parts of a project to outsource. With any given increment, the closer each of the four bases is to the center, the more likely it is that you can outsource that element. The further out on an axis an element goes, the higher the risk and the greater the talent required to make it work. Handle these risky aspects in-house or manage them internally if you hire outside expertise.

Each industry has a different profile when mapped on the framework. Heavy equipment is different from pharmaceuticals, which is different from consumer goods and so on. Within each industry, any given customer has a different value proposition than any other customer. Customers’ requirements will differ, as will their demands for features, support and availability. Understanding your customers is the beginning of developing and running a successful project.

The adaptive project management approach embedded in the diamond framework is more suited to the demands of the modern competitive environment than the traditional linear project management model. Meeting schedules, budgets and performance requirements remains important, but the larger goal of a project is to serve customer needs and generate good business results. A project has a much higher chance of success if the best people go into project management, so be on the lookout for new talent.

## About the Authors

Aaron J. Shenhar is professor of management at the Stevens Institute of Technology, New Jersey. Dov Dvir is head of the management department at Ben-Gurion University of the Negev, Israel. He has 20 years of project management experience.