

Book Review

# Basic Concepts of Project Management

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## Abstract

This paper presents the specificities of project, project management. Project management is the discipline of initiating, planning, executing, controlling and closing the work of a team to achieve specific goals and meet specific success criteria. A project is temporary in that it has a defined beginning and end in time, and therefore defined scope and resources.

And a project is unique in that it is not a routine operation, but a specific set of operations designed to accomplish a singular goal. So a project team often includes people who don't usually work together – sometimes from different organizations and across multiple geographies. The development of software for an improved business process, the construction of a building or bridge, the relief effort after a natural disaster, the expansion of sales into a new geographic market — all are projects.

And all must be expertly managed to deliver the on-time, on-budget results, learning and integration that organizations need. Project management, then, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.

Theoretical development and practical experience are continually producing new insights. This paper is therefore incomplete, and it will grow along with new developments in the area of project management.

**Keywords:** Project; Management; Project management

## Introduction

Project Management is a problem-based, interdisciplinary course in project management skills and techniques that are needed to successfully manage projects in a modern business environment. In this course, you will work through the challenges of solving problems, tracking projects, and practicing leadership. You will learn how to effectively use computer-based scheduling and tracking software to keep timetables and schedules. You will also see why it is important for project managers to be able to respond to a wide variety of demands and to understand people and behavioural skills.

In addition, we will discuss the definition of project, give some examples of projects of different types and discuss the place of project management in overall corporate strategy in this topic. We will cover project life cycles and different models of project success. Finally, we will discuss project management in the context of organizational structure.

## Objectives

Think about the following topic objectives. After completing this topic, you should be able to:

1. Understand why project management is becoming such a powerful and popular practice in business today.
2. Recognize the basic properties of projects, including their definition.
3. Understand why effective project management is such a challenge; that is, the reasons why project management is becoming

increasingly popular and the constraints that make it such an important but difficult undertaking.

4. Differentiate between project management practices and more traditional, process-oriented business functions.
5. Recognize the key motivators that are pushing companies to adopt project management practices.
6. Understand and explain the project life cycle, its stages, and the activities that typically occur at each stage in the project.
7. Understand the concept of project success, including various definitions of success (e.g., the triple constraint), as well as the alternative models of success.
8. Understand the various forms of organisation structure and their potential impact on project success.

## What are projects?

Key features of modern business are the tremendous opportunities and threats posed by external events. As never before, companies must face international competition, rapid time to market and the need to constantly modify and introduce products, respond to customers as quickly as possible, and maintain competitive cost and operating levels. Sound impossible? It used to be. Common organizational beliefs often suggested that a company could compete by using a low-cost strategy, as a product innovator, or by placing its focus on customer service. In short, we had to pick our competitive niche and concede to others their claim to fame. In the decade of the 1990s, however, everything turned upside down. Companies were becoming increasingly good at realizing all of the above goals, rather



Figure 1: Examples of projects.

than finding just one that worked. General Electric, Nokia, Ericksson, Boeing, Oracle...the list goes on and on. These were companies that seemed to be successful in all aspects of the competitive model; they were fast to market and efficient, cost conscious and customer-focused. How was this happening?

Obviously, there is no one answer that covers every aspect of this question, but there is no doubt that one characteristic these firms shared was their development of and devotion to project management as a competitive tool. In a 1995 article, Fortune magazine labeled project management the number one career choice for the coming decade and had the following to say about project managers.

If the old middle managers are dinosaurs, a new class of manager mammal is evolving to fill the niche they once ruled project management. Unlike his biological counterpart, the project manager is more agile and adaptable than the beast he's displacing, more likely to live by his wits than throwing his weight around [1].

Tom Peters, the noted management consultant and business visionary, has likewise identified project managers as an indispensable commodity for successful organizations in the coming years. An increasing number of companies are coming to the same conclusion and are adopting project management processes as a way of life. Indeed, companies as diverse as construction, heavy manufacturing, insurance, health care, financial institutions, public utilities, and software are all becoming project savvy and are expecting their employees to do the same.

### Project definition

Projects are defined as organizational activities that are complex, one-time processes, limited by a defined budget, schedule to completion and resources, and aimed at achieving a set of technical or operating specifications designed to meet customer needs. Let's take a moment to examine the various elements of this definition.

**Projects are complex, one-time processes:** Projects arise for a specific purpose or to fulfill a stated goal. They are complex in that they typically require the coordinated input of a number of members of the organization, either members from different departments, or multiple members of one functional area working together. Project organizations are intended to fulfill a stated goal and hence, are temporary; they exist only until the goals they are seeking have been attained, at which point they disband or are dissolved.

**Projects are limited by budget, schedule, and resources:** Project work requires members of a company to work with limited financial and human resources for a specified time period. Projects do not continue to run indefinitely. Once the assignment is completed, the project team disbands. Until that point, all activities are bounded by

the limits placed on them by budget and personnel availability. In this way, we often think of projects as resource-constrained activities.

**Projects are developed to achieve a clear goal or set of goals:** There is no such thing as a project team with an ongoing, nonspecific purpose. A project's goals define the nature of the project and the team that staffs it. Whether the goal is to build a new bridge, implement a new accounts receivable system, or win a presidential election, the goal must be specific and the project must be organized around achieving that stated goal.

**Projects are customer-focused:** Whether the customer is an internal organizational unit (e.g., accounting) or a broader external market, the underlying purpose of projects is to satisfy customer needs. In the past, this characteristic was sometimes overlooked; projects were considered successful if they attained their other technical, budget, and schedule goals. Now we have become increasingly aware that this attitude reflects only half the picture. Unless we acknowledge that the primary goal of a project is customer satisfaction, we run the risk of "doing the wrong things well;" that is, creating projects that do not serve the purposes for which they were intended.

### Examples of projects

Examples of projects are all around us. Some of the most obvious and best known include NASA's success with the Apollo moon launches; Boeing's 707, which revolutionized air travel; Sydney's Opera House; the pyramids of Giza, Egypt; London Bridge; the Channel Tunnel; Microsoft's Windows 95; IBM's System 360 computers...the list is endless. Successful projects can have a long-term impact on their developers, business and society at large. They truly represent the ability of people to achieve maximum performance in the face of innumerable challenges.

This course offers an opportunity for you to begin to master a new craft: project management, a skill that is becoming increasingly valued in corporations around the world. Project managers do represent the new corporate elite, a cadre of skilled individuals who routinely make order out of chaos, improving their firm's bottom line and burnishing their own value in the process. You are probably familiar with the following famous projects in (Figure 1).

### Projects and corporate strategy

Projects have been referred to as the "stepping stones" of corporate strategy. This idea implies that projects are developed in support of an organization's overall strategic vision. For example, 3M's desire to be known as a leading innovator in business gives rise to the literally hundreds of new product-development projects that are created and managed within that organization every year. In a very real sense, projects are the building blocks of strategies; they put an action-oriented face on the strategic edifice.

There are a number of reasons why projects and project management are so fundamental to helping an organization achieve its strategic goals. Many of these reasons arise from the very pressures that organizations find themselves facing in the new decade, including:

**Shortened product life cycles:** The good old days when a company could offer a new product and depend upon years of competitive domination are gone. Increasingly, the life cycle of new products is measured in terms of months or even weeks, rather than years. One has only to look at new products in electronics or computer hardware and software to easily understand this trend. Interestingly, we are seeing similar signs in traditional service sector firms that have also recognized the need for agility in offering and upgrading new services at an increasingly rapid pace.

**Narrow product launch windows:** In addition to shortened product life cycles, a related issue concerns the nature of opportunity. Organizations are very aware of the dangers of missing the optimum point during which to launch a new product, and must take a proactive view toward the timing of product introductions. Put another way: while reaping the profits from the successful sale of Product A, canny firms are already plotting the best point at which to produce and launch Product B, either as a product upgrade or new offering. Because of fierce competition, these optimal launch opportunities are measured in terms of months. Miss one, even by a matter of weeks, and many products become also-rans.

**Increasingly complex and technical products:** “The world today is a lot more complicated than it was in my day.” We hear this phrase all the time. And yet, there is a large element of truth in it. The world is more complex. Products are more complicated, technically sophisticated, and difficult to create efficiently. The public’s appetite for “the next big thing” continues unabated and substantially insatiable. We want bigger and better, more bells and whistles, larger (or smaller), faster, and more complex than the old model. Firms constantly upgrade their product and service lines to feed this hunger. This also causes nightmares in design and production as we continually seek to push the edges of the technical envelope. Unless companies find a way to maintain control of the process, this “engineering for engineering’s sake” mentality can quickly run out of control.

**Huge influx of global markets:** In our undergraduate economics courses, we learned the nature of choices. These choices, often called “guns or butter” decisions, were based on a zero-sum assumption of a fixed pie. The fixed pie said that there was only so much to go around. Choosing more guns meant less butter was available. As we enter the new millennium, we see a “pie” that continues to expand. The global economic climate is not one of shrinkage or even zero-sum stability; it represents incredible opportunity on a scale never before imagined. During the 90s stock market boom times, it was routine for firms to be valued at 70, 80, even 90 times projected future earnings. Analysts are taking a look at the potential for future development and drawing the obvious conclusions: there is a gold mine out there for the companies that can exploit it. Project management firms, aiming at market agility while keeping a disciplined hand on costs and development times, are ideally poised to reap the benefits of the global marketplace.

**An economic period marked by low inflation:** The economic mood in developing countries remains highly favorable. One of the

key indicators of economic health is the fact that inflation has been kept under control. In the United States in particular, low inflation has been one of the triggers for the continued economic expansion and stock market boom of the last decade. Unfortunately, low inflation has a challenging side effect for business: it limits business’ ability to pass along cost increases in order to maintain profitability. Jack Welch, former CEO of General Electric, took a hard look at this problem recently and suggested that when wages are added in, we are actually in a period of deflation, in which price structures are declining. The implication is that successful companies of the future will be those that find their profits through streamlining internal processes, saving money by “doing it better” than their competition. Project management is a tool to realize these goals of internal efficiency and profit in a low inflation time.

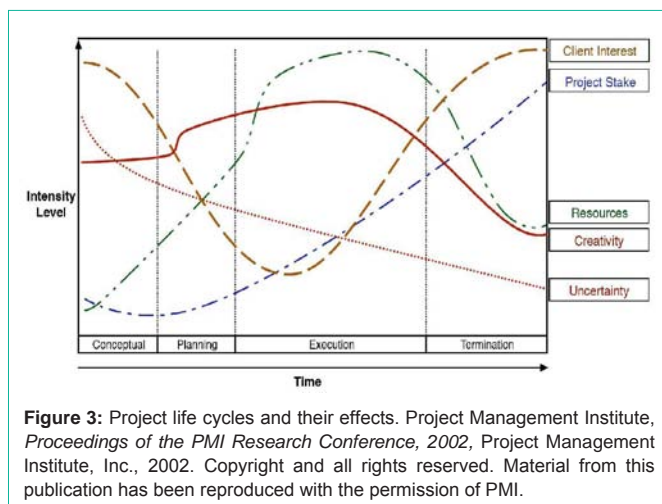
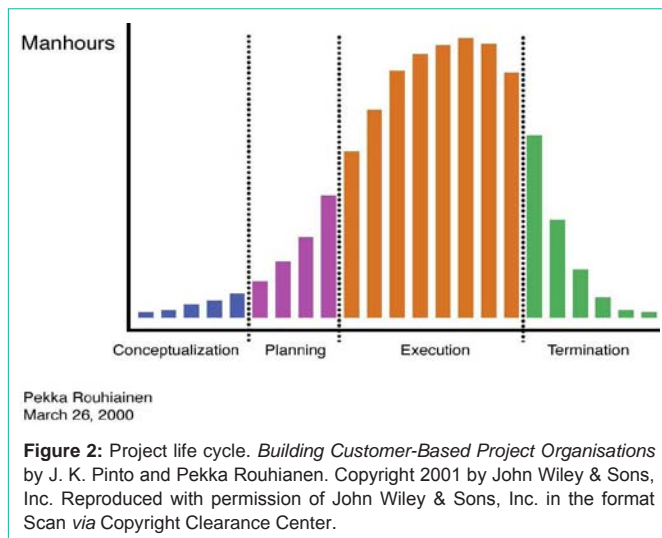
**General requirement for better Net Present Value (NPV) of investments:** In the highly technical world of Internet companies, investors are looking for a better and faster return on their investment. For industry, this means that there is no time for staying idle; firms have to act fast when they see an opportunity. From the project firm’s point of view, this means a greater need for flexibility in developing projects faster under greater uncertainty, often learning more about the opportunity while doing it. In general, project implementation has to take place in a shorter time frame than it used to, which means using a larger number of suppliers and subcontractors. Maintaining high standards for safety and quality while at the same time employing methods such as multiple working hypotheses and concurrent engineering; result in great and often conflicting requirements for the project management.

These are just some of the more obvious challenges facing business today. The key point is that the forces propelling these ideas are not likely to abate in the near term. Companies as large and successful as General Electric, 3M, Nokia, Sony and Microsoft have made project management a key aspect of their operating philosophies.

### Project life cycles

Project life cycle refers to the stages in a project’s development process. Life cycles are important because they demonstrate the logic for how a project proceeds. Further, they let us develop a process for “attacking” the project, including when we should devote resources to it, how we should evaluate its progress, and so forth. Take a look at a simplified model of the project life cycle as shown below in (Figure 2). In this life cycle, we identify four distinct phases of the project’s development, labeled conceptualization, planning, execution, and termination.

1. Conceptualization refers to the initial goal development and technical specifications for the project. The scope of the work is created, the necessary resources are identified, and the important organizational contributors or stakeholders are signed on to the process.
2. Planning is the stage in which all detailed specifications, schematics, schedules, and other plans are developed. The work packages are broken down, individual assignments are created, and the process is delineated.
3. Execution is when the actual “work” of the project is done, the system is developed, or the product is created and fabricated and



other project-based activities are performed.

4. Termination is when the completed project is transferred to its customer, the project resources (people, money, physical plant) are reassigned, and the project is formally closed out.

These stages are the waypoints at which the project team can evaluate both its performance and the project's overall status. Remember, however, that life cycle is relevant only after the project has actually begun. The life cycle is signaled by the actual kick-off of project development, the development of plans and schedules, the performance of necessary work, and the completion of the project and reassignment of personnel. When we evaluate projects in terms of this life cycle model, we are given some clues regarding their subsequent resource requirements; that is, we begin to ask the questions of whether we have sufficient personnel, materials, or equipment to support the project. For example, when beginning to work on our term paper project, we may discover that it is necessary to purchase a PC or hire someone to help with researching the topic. Thus as we plan the project's life cycle, we also acquire important information regarding the resources that we will need. The life cycle model, then, serves the twofold function of project timing (schedule) and project

requirements (resources), allowing team members to better focus on what and when resources are needed.

The project life cycle is also a useful means of visualizing the activities required and challenges to be faced during the life of a project. Figure 3 indicates some of these characteristics as they evolve during the course of completing a project [2]. As you can see, five components of a project may change over the course of its life cycle:

**Client Interest:** The level of enthusiasm or concern expressed by the project's intended customer. Clients can be either internal to the organisation or external.

**Project Stake:** The amount of corporate investment in the project. The longer the life of the project, the greater the investment.

**Resources:** The commitment of financial, human, and technical resources over the life of the project.

**Creativity:** The degree of innovation and creativity required by the project, especially during certain development phases.

**Uncertainty:** The degree of risk associated with the project. Risk is highest at the beginning because uncertainty is greatest.

Each of these factors has its own dynamic. Client interest, for example, follows a "U-shaped" curve, reflecting initial enthusiasm, lower levels of interest during development phases, and renewed interest as the project nears completion. Project stake increases dramatically as the project moves forward because an increasing commitment of resources is needed to support ongoing activities. Creativity often viewed as innovative thought or applying a unique perspective, is high at the beginning of a project, as the team and the project's client begin developing a shared vision of the project. As the project moves forward and uncertainty remains high, creativity also continues to be an important feature. In fact, it is not until the project is well into its execution phase, with defined goals, that creativity becomes less important. To return to our example of the term paper project, in many cases, the "creativity" needed to visualize a unique or valuable approach to developing the project is needed early, as we identify our goals and plan the process of achieving them. Once identified, the execution phase, or writing the term paper, places less emphasis on creativity per se and more on the concrete steps needed to complete the project assignment. The information simplified in (Figure 3) is useful for developing a sense of the competing issues and challenges that a project team is likely to face over the life cycle of a project. Over time, while certain characteristics (creativity, resources, and uncertainty) begin to decrease, other elements (client interest and project stake) gain in importance. Balancing the requirements of these elements across the project life cycle is just one of the many demands placed upon a project team.

### Determinants of project success

Definitions of successful projects can be surprisingly elusive. How do we know when a project is successful? When is it profitable? If it comes in on budget? On time? When the technology we are developing works? When we achieve our long-term payback goals? It is ironic that project managers continue to have great difficulty in identifying a mutually acceptable and encompassing definition of success. Perhaps our difficulties in defining success are similar to Justice Potter Stewart's famous description of pornography ("I know

it when I see it"). Most of us naturally gravitate toward the historical definition of the "triple constraint" in project management, that is, the classic definition of a project's goals as comprising time, budget, and performance.

**Time:** Projects are constrained by a specified timeframe to completion. In other words, they are not supposed to continue indefinitely. As a result, the first constraint that governs project management work asks the fundamental question: Did the project come in, on, or before established schedules?

**Cost:** A second key constraint for all projects is a limited budget. Projects must meet their budgeted allowances in order to use resources as efficiently as possible. We do not write a blank check for a project and hope for the best. Consequently, the second limit on a project concerns the following question: Did the project get completed within the budget guidelines?

**Performance:** All projects are developed in order to adhere to some a priori technical specifications. We have an idea of what the project is supposed to do or how the final product is supposed to operate. The question then becomes trying to determine whether or not the finished project operated according to specifications.

These three historical criteria have more recently been joined by a fourth:

**Client acceptance:** Client acceptance argues that projects are developed with a customer in mind; that is, projects are not created just to be created. They have a client for whom the project is intended to serve a purpose. Consequently, if customer or client acceptance is a key variable, the project must also pass the test of whether, when completed, it is accepted and used by the customers for whom it was intended. The important point to remember here is that companies that evaluate project "success" strictly according to the triple constraint have a potential to miss the most important hurdle of all, the acceptance and use of the project once completed.

### Benefits of a quadruple constraint for project success

Another way to distinguish among these different criteria for success is to think about it in terms of "internal" vs. "external" notions of success. In the old days, when project management was primarily a technique used in construction and heavy industry, the overwhelming reason to use it was to maintain internal organizational discipline in expenditures of money and time. Under those assumptions, a triple constraint made perfect sense. It was focused internally on efficiency and productivity measures, it provided a clear metric for personnel evaluation, and it allowed the cost accountants to keep a clear handle on expenses. Unfortunately, in more recent years, the triple constraint has come under increasing pressure as an inadequate measure of project success.

Including client acceptance as a fourth criterion of success has some obvious benefits. First, it refocuses corporate views outside the organisation toward the customer. Who cares if we are efficient in producing a lemon? Second, it recognizes that the final arbiter of a successful project is not the cost accountant, but the marketplace. Projects are only as good as they are useful, either to improve the activities of other parties or to open new avenues of revenue for the company. Finally, client acceptance requires project managers and

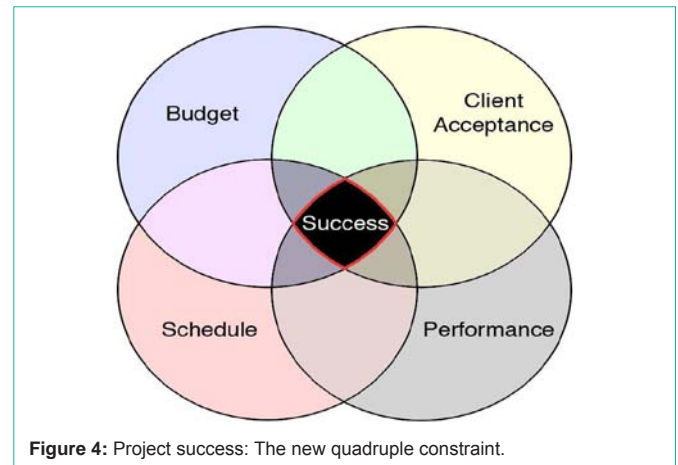


Figure 4: Project success: The new quadruple constraint.

their teams to create an atmosphere of openness and communication throughout the development of the project.

**Consider one example:** by the late 1970s, most American automakers had hit the skids. We were losing market share in huge chunks to foreign competitors, we were making a shoddy product, and we were no longer appealing to modern standards of taste. In this system, a "successful" project (a new car) could be introduced, only to fall flat on its face in terms of sales. Ford Motor Company finally got the right idea by scrapping the old methods for design and car development. The company went back, literally, to the drawing board and re-engaged in a dialogue with its customer base, including surveying old customers who had switched to buying other brands. Through intensive interviews, focus groups, and a willingness to listen to what people were telling them, Ford created the Taurus, a radical departure in design from previous models. The Taurus has been a wildly popular car for Ford, spearheading its move in overtaking General Motors as the most profitable auto company in the world during the decades of the 80s and 90s.

What was the key to this success? Clearly, the company's willingness to reorient its focus toward the customer was the principle reason. In the same way, other project-management organisations have begun viewing client acceptance as more than just an addition to the triple constraint, but as ultimately, the necessary condition for project success (Figure 4).

### Another model of project success

Another model of project success traces its roots back to earlier work from the 1970s in the field of management. The proponents, Randy Schultz and Dennis Slevin, argued that successful implementation of a new system, project, or method within a firm required passing three equally important hurdles: technical validity, organizational validity, and organizational effectiveness.

1. Technical validity asks a simple question: Does the system or project work? Is it a good technical solution to the problem the company faces? If the answer is yes, the project is said to be technically valid.
2. The second measure, organizational validity, is concerned with ensuring a fit between the needs of the client and the project; that is, is the project appropriate for the client? A project may be an

**Table 1:** Differences between department and project management.

| Department   | Project   |
|--|---|
| Repeat process or product  | New process or product                            |
| Several objectives   | One objective                                     |
| Ongoing  | One shot - limited life                           |
| People are homogenous  | More heterogeneous                                |
| Well-established systems in place to integrate efforts   | Systems must be created to integrate efforts      |
| Higher certainty of performance, cost, schedule  | Higher uncertainty of performance, cost, schedule |
| Part of line organisation  | Outside of line organisation                      |
| Bastions of established practice   | Violates established practice                     |
| Supports status quo  | Upsets status quo                                 |
| <b>Source:</b> Project Management Institute, Proceedings of the Annual Project Management Institute Symposium – 1992, Project Management Institute Inc., 1992. Copyright and all rights reserved. Material from this publication has been reproduced with permission of PMI. |   |

excellent technical solution to a perceived problem, yet still not be useful because it is not right for the client. For example, proposing a highly technical solution to a communications problem where the client base has no technical training or aptitude may make technical sense, but simply may not fly in the face of workforce limitations.

3. Finally, organizational effectiveness asks the bottom line question, what positive impact has the project had, either on the organization's profitability (in the case of a new product) or the improvement of its operations? Organizational effectiveness is predicated on the natural assumption that the project is being pursued to show positive outcomes.

### Differences between department and project management

Rarely are there manuals written on how project teams are expected to operate. Rather, much of project management involves "violating" such sacred rules as the manner in which members of different functional departments are expected to communicate, the way additional resources are secured, close interaction with clients by all members of the project team, and so forth. It is in violating these standard operating procedures that project teams are most effective, operating in a flexible and responsive manner to a variety of both internal technical and external client demands (Table 1).

We have now reached the end of Topic 1. By now, you should have a clearer understanding of the foundations of project management, including some of the reasons project management is so prevalent and important in modern business.

In the following topics, we will continue to explore in depth the nature of the limits on project managers, the challenges these limits create, and the opportunities they offer. Successful project

managers accept these challenges and learn to manage well in spite of them. It is for the purpose of helping to create a new generation of effective project managers that this course was developed. We hope that through exploring the various roles of project managers and addressing the challenges and opportunities they constantly face, we will offer a new and refreshing approach to better understanding the task of project management.

### Conclusion

Anyone who has ever worked on a project will agree that making a project succeed is no simple task. The difficulties manifest themselves in (extreme) delays, (extreme) budget over-runs, inadequate results, dissatisfied customers, high stress among the project team and other undesirable outcomes.

Project and project management processes vary from industry to industry; however, these are more traditional elements of a project. The overarching goal is typically to offer a product, change a process or to solve a problem in order to benefit the organization. Projects are characterized by four features: a group of people, a goal, limited time and money and a certain level of uncertainty regarding whether the goals will be achieved. Project managers are involved with all of these aspects. Supervising and directing a project is thus anything but an easy task.

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