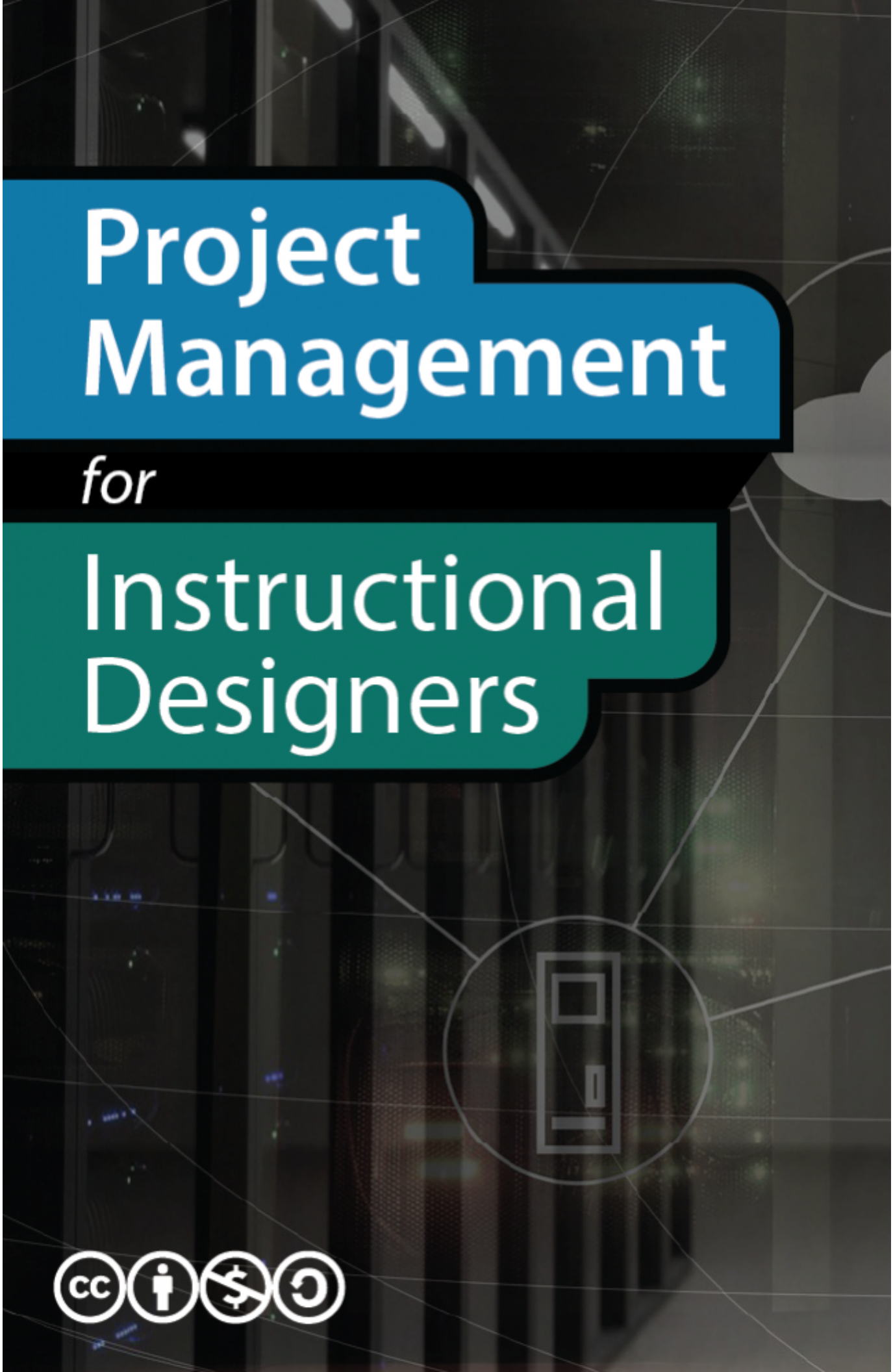
Project Management *for* Instructional Designers



Project Management for Instructional Designers

David Wiley

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David Wiley

Lumen Learning

Dr. David Wiley is the chief academic officer of Lumen Learning, an organization offering open educational resources designed to increase student access and success. Dr. Wiley has founded or co-founded numerous entities, including Lumen Learning, Mountain Heights Academy (an open high school), and Degreed. He was named one of the 100 Most Creative People in Business by Fast Company, currently serves as Education Fellow at Creative Commons, and leads the Open Education Group in Brigham Young University's instructional psychology and technology graduate program. He has been a Shuttleworth Fellow, served as a Fellow of Internet and Society at Stanford Law School, and was a Fellow of Social Entrepreneurship at BYU's Marriott School of Management.

About This Book

Project Management for Instructional Designers (PM4ID) is – as the name suggests – a book about project management tailored specifically for instructional designers. This book is a revise / remix of a pre-existing, openly licensed project management textbook which was donated to the commons by a benefactor that desires to be attributed as Anonymous.

PM4ID includes many new features and improvements to the original book, including:

- Alignment of book chapters with the PMBOK, which supports readers in preparing for the Project Management Professional certification,
- A series of video cases of project managers working in the instructional design area, integrated into every chapter,
- Multiple versions of the book, including HTML, PDF, and a text-to-speech mp3 audio version of the book,
- New examples written specifically for readers coming from the instructional design perspective,
- and more.

The third edition of Project Management for Instructional Designers was adapted to EdTech Books as part of Royce Kimmons' IPT 531: Introduction to Open Education class at Brigham Young University during Fall term 2022. Contributors included:

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The second edition of Project Management for Instructional Designers was created by students in David Wiley's IPT 682: Introduction to Project Management class at Brigham Young University during Fall term 2012. The team included:

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If you or your class would like to help improve Project Management for Instructional Designers, contact David Wiley at david.wiley@gmail.com.

License and Rights

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Introduction to Project Management

Overview

Welcome to Project Management for Instructional Designers. The book you are now reading is a work in progress. If you are interested in contributing to the book, please contact David Wiley at Brigham Young University. As many of those reading this book may be pursuing a career or further expertise in project management, it is important to outline how this book fits with other texts or certification requirements of the field. This book is designed to provide an overview of project management principles in instructional design, not as preparation for certification exams. However, in an effort to bridge the practical application principles with the knowledge needed for certification, each chapter of this text will begin with a reference to the foundational text from the Project Management Institute (PMI) entitled A Guide to the Project Management Body of Knowledge (PMBOK),[1] as well as two of the main certification exams – the Project Manager Professional Certification (PMP) and the Certified Associate in Project Management (CAPM). These references are meant to aide any reader who may be using this text to supplement their pursuit of other professional goals. The PMI, PMBOK, PMP, and CAPM are explained below.

Project Management Institute (PMI)

"PMI is one of the world's largest not-for-profit membership associations for the project management profession, with more than 650,000 members and credential holders in more than 185 countries." They advocate project management as a profession and have created "globally-recognized standards and credentials, [an] extensive research program, and . . . professional development opportunities. These products and services are the basis of greater recognition and acceptance of project management's successful role in governments, organizations, academia and industries." [2]

A Guide to the Project Management Body of Knowledge (PMBOK)

The PMBOK is the recognized standard from PMI that shares established norms, methods, and processes that constitute good practices of project managers. It is a document that has evolved through contributions of high-quality practitioners. This text defines project management as well as other important concepts, and describes the relevant processes for managing a project. It is this text that defines the content for which project managers will be held accountable in certification exams.

Project Manager Professional Certification (PMP)

The Project Manager Professional (PMP) certification is one of the most well-recognized certifications for project management. Companies increasingly require project manager applicants to have a PMP certification, thus making this

certification important in applying for jobs and setting yourself apart. Those who certify as a PMP show they are educated, competent and experienced project managers. Certifying as a PMP can be done in two different ways.

Method 1

1. A bachelor's degree
2. 3 years of project management experience
3. 4500 hours of leading projects
4. 35 hours of project management education
5. Pass the Test

Method 2

1. High school degree
2. 5 years of project management experience
3. 7500 hours of leading projects
4. 35 hours of project management education
5. Pass the Test

The PMP test has 200 multiple-choice questions, 25 of the questions are experimental questions for future exams and will not count toward your final score. A passing rate is usually around 106/175 (about 61%). The PMP test is very specific and will require more effort than just reading the PMBOK book to pass the exam.[3] Questions on the exam assume that the project is being managed using the principles in the PMBOK. The test further assumes that projects would operate perfectly within the parameters the book describes. Many questions will have good answers but you must be able to select the best answer. The test is focused around the Project Management Process, as described in the PMBOK. The following table breaks up the Project Management Process and shows the number of questions that are generally affiliated with that topic on the exam.

Test Topic	Percentage of Questions
Initiating a Project	13%
Planning a Project	24%
Executing a Project	30%
Monitoring and Controlling a Project	25%
Closing a Project	8%

Certified Associate in Project Management (CAPM)

The PMI provides an introductory certification for project managers called the Certified Associate in Project Management or CAPM. The requirements for the CAPM are much less stringent than those for the PMP. The prerequisites can be met in two different ways: (1) obtain 1,500 hours of project management experience, or (2) complete 23 hours of project management instruction. Many post-secondary project management courses include more than 23 instructional hours.[4] In fact, if you are reading this book for a project management course, you will probably meet the prerequisites for the exam through your class experience. The questions for the CAPM are organized differently than those for the PMP. The exam blueprint provided by PMI is based on percentages of test questions coming from each chapter of the PMBOK.

Test Topic and PMBOK Chapter	Percentage of Questions
Ch. 1: Introduction	4%
Ch. 2: Project Life Cycle and Organization	4%
Ch. 3: Project Management Processes	11%
Ch. 4: Integration Management	11%
Ch. 5: Scope Management	11%
Ch. 6: Time Management	11%
Ch. 7: Cost Management	9%
Ch. 8: Quality Management	7%
Ch. 9: Human Resource Management	7%
Ch. 10: Communications Management	7%
Ch. 11: Risk Management	11%
Ch. 12: Procurement Management	7%

Because the examination blueprint comes directly from the PMBOK, effective exam preparation will include a detailed study of the PMBOK and possibly another exam-preparation book.[5]

The format of this book is as follows:

- The content is organized in a roughly chronological pattern, corresponding to the order in which you will likely be called on to use the principles in this book. However, all of the information can be applied in any stage of a project.
- Each chapter has an Overview section which introduces the chapter topic and references the PMP and CAPM exam areas that correlate.
  - This chapter aligns with Chapter 1 of the PMBOK and 4% of the CAPM questions come from this knowledge area. The content connects to the Initiating and Planning category of the PMP questions.
- The Overview sections also contain videos of three instructional design project managers who relate how the chapter's principles applied to their individual projects.
- The chapter sections will each contain:
  - Learning Objectives – to help guide your reading in identifying key points.
  - Glossary words – the first instance of key terms will be in bold and give their definition within the text. There is also a glossary section on the side for easy reference.
  - Example scenarios – will be highlighted in tan boxes.
  - Key Takeaways – will summarize the learning objective information.

We hope you find the book useful and informative.

Designers Share Their Experiences

Dr. Andy Gibbons – Instructional Psychology and Technology – BYU

Watch on YouTube

My name is Andy Gibbons. I'm an instructional designer. I have been since about 1974. I worked eighteen years in industry, and the project that I'd like to talk about was for the U.S Navy, teaching helicopter pilots how to fly a particular anti-submarine warfare helicopter. And teaching operators called center operators who sit in the back of the aircraft looking for squiggles on a piece of paper that would indicate that they have found a submarine. The project was actually just about a year long, and it was full of interesting experiences.

Heather Bryce – Independent Studies – BYU

Watch on YouTube

My name is Heather Bryce, and I am the project manager for Brigham Young University Independent Study and I have been working here for three years. The project I will be discussing today is Art 45.

Dr. Larry Seawright – Center for Teaching and Learning – BYU

Watch on YouTube

I'm Doctor Larry Seawright. I'm Associate Director at the BYU Center for Teaching and Learning. I'm also project manager for a project we call the BYU Learning Suite, which is what I'm going to be talking about today.

[1] Project Management Institute (2008). A guide to the project management body of knowledge (PMBOK guide, fourth edition). United States of America: Project Management Institute.

[2] http://www.pmi.org/About-Us.aspx

[3] Mulchay, R. (2011). PMP Exam Prep. United States of America: RMC Publications.

[4] Project Management Institute (2012). CAPM certification handbook. Available from http://www.pmi.org/certification/~/media/pdf/certifications/pdc_capmhandbook.ashx

[5] Mulcahy, R. (2009). CAPM Exam Prep. United States of America: RMC Publications.

- Project Management Defined
- Project Definition and Context
- Key Skills of the Project Manager
- Introduction to the Project Management Knowledge Areas

1.1

Project Management Defined

Project Management | Project Scope

LEARNING OBJECTIVES

1. Identify the Project Management Institute's definition of project management.
2. Analyze and evaluate the role of client expectations in a project.
3. Define project scope.

One of the priorities of the Project Management Institute (PMI) during the 1980s was to define project management and develop it as a profession. Debate continues on whether project management is a profession with an enforceable code of conduct and other traditional criteria for recognition as a profession. However, PMI's development of A Guide to the Project Management Body of Knowledge (PMBOK), and the project management certifications that derived from these efforts, helped promote the understanding and development of the project management field. Defining project management, and substantiating it as a profession, brought about the question of its purpose. Intense discussions resulted in a compromise to define ***project management*** as "the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements."[1]

Be aware that PMI's definition is not the only view of what project management entails. Jack Meredith and Samuel Mantel[2] discussed project management in terms of producing project outcomes within the three objectives of cost, schedule, and specifications. According to this view, project management is the application of everything a project manager does to meet these parameters. This approach to defining project management shares PMI's focus on the project outcomes in terms of requirements, but Meredith and Mantel also added a fourth aspect of project management—the expectations of the client.

Image by petecocoon

If it is assumed that the client is the one who defines project requirements, then maybe project management is the application of knowledge, skills, tools, and techniques to meet client requirements. This definition focuses on expectations rather than project specifications. It is possible to meet all project specifications and not meet client expectations. It is also possible to only accomplish one or more of the specifications, yet still meet or exceed a client's expectations.[3]

PMI's definition of project management provides a good understanding of project management, but it does not help us understand project success. For that, we must include the client.

District Curriculum Alignment Project

A school district in Colorado invested a substantial portion of the budget toward switching to a professional learning community (PLC) model for faculty development. The district requested a project that would align the curriculum with each subject and grade level and be used as benchmarks for to evaluate the PLC's work with students. The project brought together teachers from across the district to design essential learning objectives, which would be taken back to schools and PLCs. The project team created the essential learning objectives within the budget and time constraints that were approved by the district, but teachers at the individual schools were unhappy that the learning objectives were decided at the district level rather than at the school level. Even though this project met all of the original goals, the district was still disappointed.
Meredith and Mantel discussed a tendency noted by Russ Darnall[4] that expectations often increase during the life of a project. Meredith and Mantel suggest that this is a form of scope increase. ***Project scope*** is reflected in a carefully crafted document that reflects the performance specifications of the project deliverables. Defining the project scope and managing scope change is a very different process from developing an understanding of a client's expectations and managing those expectations. Darnall focused on defining and managing client expectations as a critical project management skill that is distinct from scope development and management.

Client expectations encompass an emotional component that includes many client desires that are not easily captured within a specification document. Although closely correlated with project specifications, client expectations are driven by different needs. It is possible for a project team to exceed every project specification and end up with an unsatisfied client.

The reverse is also true. A project can be late and over budget and the client can be satisfied. Although this may be counterintuitive, the response of a client to the events of a project is complex and goes beyond the data related in project specifications.

Volunteer Training Program

A museum planned to use volunteers as gallery interpreters to facilitate a more engaging guest experience. The museum hired instructional designers to manage a project to plan, develop, and implement training for prospective volunteers. The original project specifications called for the training to last four hours. Throughout the project, it became clear to the project manager that the complexity of the learning objectives required more than four hours of training. The change in scope was approved by the museum, resulting in a significant increase in the total cost of the project. The museum, however, was satisfied with the project because it produced an effective training for volunteers. Client satisfaction is often tied to expectations about project performance. Identifying and managing those expectations is a primary responsibility of the project manager.

KEY TAKEAWAYS

- According to PMI, project management is the application of knowledge, skills, tools, and techniques to meet project requirements.
- The role of the client is crucial. Some experts include meeting or exceeding client expectations as a definitive element of project management.
- Project scope is a document that defines the work required to complete the project successfully.

[1] Project Management Institute, Inc., A Guide to the Project Management Body of Knowledge (PMBOK Guide), 4th ed. (Newtown Square, PA: Project Management Institute, Inc., 2008), 6.

[2] Jack R. Meredith and Samuel J. Mantel, Jr., Project Management: A Managerial Approach(Hoboken, NJ: Wiley, 2006), 8.

[3] Russell W. Darnall, The World's Greatest Project (Newtown Square, PA: Project Management Institute, Inc., 1996), 48–54.

[4] Russell W. Darnall, The World's Greatest Project (Newtown Square, PA: Project Management Institute, Inc., 1996), 48–54.

1.2

Project Definition and Context

Organizational Priorities | Stakeholders

LEARNING OBJECTIVES

1. Describe two defining characteristics of a project.
2. Understand project levels and organization priorities.
3. Describe the organizational options for managing projects.

Before elaborating further on project management, let's first identify what a project is and how projects come about. PMI defines a project by its two key characteristics: it is temporary and undertaken to create a product, service, or result that is unique.[1] Projects are undertaken by various organizations to better fulfill their purposes.

Organizational Priorities

Organizations fulfill societal functions (e.g. economic, religious, community support, government, etc.) Local factories, churches, and hospitals are all organizations that provide some social or community need. Factories create wealth and jobs, churches provide spiritual and common social needs for communities, and government organizations provide regulations and services that allow for an orderly society. These organizations have different views of time and each organization develops an operational approach to accomplishing the purpose of the organization over that time horizon. For example, a religious group might begin construction of a cathedral that would take several lifetimes to complete, government performance is reviewed at election time, and a publicly owned company must justify its use of money each year in the annual report.

Organizations operate to effectively and efficiently produce the product or service that achieves the organization's purpose and goals as defined by the key ***stakeholders***—those who have a share or interest in the organization. An organization seeks to develop stable and predictable work processes and then improve those work processes over time through increased quality, reduced costs, and shorter delivery times. Total quality management, lean manufacturing, and several other management philosophies and methodologies have focused on providing the tools and processes for increasing the effectiveness and efficiency of the organization. Historically, these methodologies focused on creating incremental and continuous improvement in work processes. More recently, organizations are increasingly focused on *step changes* that take advantage of new technologies to create a significant improvement in the effectiveness or efficiency of the organization.

Often, these initiatives to increase organizational effectiveness or efficiency are identified as projects. Economic organizations might initiate a project to produce a new product, to introduce or revamp work processes to significantly reduce product costs, or to merge with other organizations to reduce competition or lower costs and generate additional profits. A social organization, such as a hospital, may build a new wing, introduce a new service, or design new work processes to reduce costs. A government organization may introduce a new software program that handles public records more efficiently, build a new road to reduce congestion, or combine departments to reduce costs.

Each of the initiatives meets our definition of a project. Each is a temporary endeavor and produces a unique product or service. Projects are also defined within the context of larger projects as the following example illustrates.

National Energy Saving Education Plan

The National Energy Technology Laboratory laid out a plan for a national energy saving education plan that had a clear and identifiable outcome—helping consumers efficiently find and use reliable, affordable, and environmentally sound energy.[2] The details of this plan will be revised and updated, but the general goals are likely to remain unchanged. To accomplish these goals, the project requires the development of educational materials related to new technologies, coordination of a large number of instructional designers, and skillful stakeholder management. Development of each of the major components became a project for the instructional design teams within the larger project of providing educational materials to consumers related to finding and using reliable, affordable, and environmentally sound energy. Each project has to develop materials related to new technologies, and manage the stakeholders at the Department of Energy.Each instructional design team becomes a project for that organization. The project is defined by the scope of work. In the energy materials area, the scope of work included all activities associated with educating consumers on ways to reduce use of fossil fuels and reliance on imported energy. Using our definition that a project is a temporary endeavor that creates a unique product or service, implementation of the energy education materials would be a project that consisted of other projects. These projects could develop into creating education materials related to wind power, solar power, electricity transmission, biofuels, environmental protection, etc.

Organizing to Manage Projects

Because project management is different from operations (organizational) management, projects are handled best by people who are trained in project management. This expertise can be obtained by hiring an outside consulting firm that specializes in project management or by developing an in-house group.

Some organizations are designed to execute specific projects. Often entities contract with engineering and construction companies to design and build their facilities, or hire software companies to develop a software solution. The major work processes within these organizations are designed to support the acquisition and execution of those projects. Similarly, there are instructional design firms who have the specialized skills to effectively and efficiently design valuable instruction for their clients. The ability of these types of organizations to successfully manage projects in house becomes a competitive advantage for them in the marketplace.

Organizations designed to produce products or services also use projects. Major activities outside the normal work of the organization's department or functional units or major activities that cross functional boundaries become a project. As economic pressures increase the speed in which organizations must change and adapt to new environmental conditions, leaders are increasingly chartering projects to enable the organization to adapt more quickly. The application of a project management approach increases the likelihood of success as organizations charter a project to facilitate organizational change, to increase the development and introduction of new products or support the merger or divesture of organizational units.

Image by antgirl

Project management offices (PMOs) have emerged within organizations to facilitate development of organizational knowledge, skills, and tools to internally charter and manage projects. The PMO varies in structure and responsibility depending on the project management approach of the parent organization. On one end of the spectrum, the PMO has complete responsibility for projects within an organization from the criteria and selection of appropriate projects to accountability for project performance. In organizations that make a large investment in the PMO, a large number of new product or process improvement projects are submitted, and the project office develops a portfolio of projects to manage over a given period that maximizes the use of organizational resources and provides the greatest return to the organization.

PMOs can provide various functions for an organization. Some possible functions include the following:

- Project management. Some organizations maintain the project manager within the PMO, assign project managers from other departments, procure contract project managers, or practice a combination of all three.
- Center of excellence. The project office can maintain the organization's project management policies and procedures, maintain a historical database, maintain best practices, and provide training and specialized expertise when needed.
- Portfolio management. The project office actually supervises the project managers and monitors project performance. Portfolio management also includes prioritizing projects on the basis of value to the organization and maintains an inventory of projects. Portfolio management balances the number and type of projects to create the greatest return from the entire portfolio of projects.
- Functional support. The project office maintains project management expertise to support the project. Estimating, project scheduling, and project cost analysis are examples of functional support.

KEY TAKEAWAYS

- All projects are temporary and undertaken to create a product, service, or result that is unique.
- In an organization, project management can be used to make step changes to take advantage of new technologies or make significant improvements in effectiveness or efficiency.
- Projects can be handled by outside contractors or by an internal group in a PMO.

[1] Project Management Institute, Inc., A Guide to the Project Management Body of Knowledge (PMBOK Guide), 4th ed. (Newtown Square, PA: Project Management Institute, Inc., 2008), 5.

[2] National Energy Technology Laboratory, "Reliable, Affordable, and Environmentally Sound Energy for America's Future," The Energy Lab, 2001,https://edtechbooks.org/-NTPw(accessed June 18, 2009).

1.3

Key Skills of the Project Manager

Operations Managers | Project Managers

LEARNING OBJECTIVES

1. Compare project management and operations management.
2. Identify necessary leadership skills required of a project manager.

Often the difference between the project that succeeds and the project that fails is the leadership of the project manager. Each project team is a group of individuals who needs motivation and coordination. Planning is vital, but the ability to adapt to changes and work with people to overcome challenges is just as necessary. A project manager must master the skills that are necessary to be successful in this environment. The unique and temporary nature of projects creates a work environment that mandates a different management approach from that used by an operations manager.

Operations Managers

One way to improve understanding of project management is to contrast project management with operations management. All ***operations managers*** are charged with efficiently and effectively achieving the purpose of the organization. Typically, managers of economic organizations focus on maximizing profits and stockholder value; leaders of socio-religious organizations focus on effective and efficient delivery of a service to a community or constituency; and governmental managers are focused on meeting goals established by government leaders. For our purposes, each of these managers would be deemed the “operations manager”.

More effective work processes will produce a better product or service, and a more efficient work process will reduce costs. Operations managers analyze work processes and explore opportunities to make improvements. Operations managers are process focused, oriented toward capturing and standardizing improvement to work processes and creating an organizational culture focused on the long-term goals of the organization. Often, specific projects are undertaken to improve their overall operational processes.

Operations managers create a culture which focuses on the long-term health of the organization and build teams over time to standardize and improve work processes. They search for and nurture team members who will “fit in” and that contribute to both the effectiveness of the team and the team culture. Operations managers are long-term focused and oriented toward continuous improvement of existing processes over longer periods of time.

An operations manager may invest $10,000 to improve a work process that saves $3,000 a year. Over a five-year period, the operations manager improved the profitability of the operations by $5,000 and will continue to save $3,000 every year. The project manager of a one-year project could not generate the savings to justify this kind of process improvement and would not invest resources to explore this type of savings. However, the project manager might head the $10,000 project that the operations manager solicited to improve the work process of the organization.

Project Managers

Project managers focus on the goals of the project. Project success is connected to achieving the project goals within the project timeline. Project managers apply project management tools and techniques to clearly define the project goals, develop an execution plan to meet those goals, and meet the milestones and end date of the project. A project manager needs a different set of skills to both define and successfully execute projects. Because projects are temporary, they have a defined beginning and end. Project managers must manage start-up activities and project closeout activities. The processes for developing teams, organizing work, and establishing priorities require a different set of knowledge and skills because members of the project management team recognize that it is temporary.

Project managers create a team that is goal focused and energized around the success of the project. Project team members know that the project assignment is temporary because the project, by definition, is temporary. Project team members are often members of organizational teams that have a larger potential to affect long-term advancement potential. They seldom report directly to the project manager and the effect of success or failure of the project might not affect their reputations or careers the same way that the success or failure of one of their other job responsibilities would. Therefore, project managers create clear goals and clear expectations for team members and tie project success to the overall success of the organization. Project managers are goal directed and milestone oriented.

Image by geekstinkbreath

While there are many skills needed by a project manager that are the same as an operations manager, because project managers generally operate in an environment that is more time sensitive and goal driven, the successful project manager requires additional knowledge, skills, and abilities.

Albert Einsiedel[1] discussed leader-sensitive projects and defined five characteristics of an effective project leader. These characteristics were chosen based on some assumptions about projects. These characteristics include the project environment, which is often a matrix organization that results in role ambiguity, role conflict, and role erosion. The project environment is often a fluid environment where decisions are made with little information. In this environment, the five characteristics of an effective project leader include the following:

- Credibility – the project manager is coming into an established organization and must have a reputation or presence of credibility to receive the respect and support of the client and team.
- Creativity as a problem solver – projects are never "business as usual".
- Tolerance for ambiguity – a project manager can often be unfamiliar with the kind of work the client does and needs to be able to adapt and move the project forward, even if all aspects of the company aren't understood perfectly.
- Flexible management style – a project manager is constantly dealing with new people and environments and must adjust accordingly. They do not have the luxury of an established rapport with their project associates.
- Effective communicating – because of the ambiguous nature of projects, good communication skills are crucial in understanding what is expected by the client and being able to convey that vision to the project team.

Hans Thamhain[2] researched the training of project managers and, based on the finding, created a taxonomy wherein the qualities of a project manager are categorized into the following three areas:

- Interpersonal skills. These skills include providing direction, communicating, assisting with problem solving, and dealing effectively with people without having authority.
- Technical expertise. Technical knowledge gives the project manager the creditability to provide leadership on a technically based project, the ability to understand important aspects of the project, and the ability to communicate in the language of the technicians.
- Administrative skills. These skills include planning, organizing, and /managing/ overseeing/coordinating the work.

Traditionally, the project manager has been trained in skills such as developing and managing the project scope, estimating, scheduling, decision making, and team building. Although the level of skills needed by the project manager depends largely on the complexity of the project, the people skills of the project manager are increasingly more important. The skills to build a high-performing team, manage client expectations, and develop a clear vision of project success are the type of skills needed by project managers on more complex projects. "To say Joe is a good project manager except he lacks good people skills is like saying he's a good electrical engineer but doesn't really understand electricity."[3]

KEY TAKEAWAYS

- Operations managers are long-term focused and process oriented. Project managers are goal directed and milestone oriented.
- Project managers need the same skills as an operations manager, such as good communication, team building, planning, expediting, and political sensitivity.
- Project managers need additional skills in establishing credibility, creative problem solving, tolerance for ambiguity, flexible management, and very good people skills.

[1] Albert A. Einsiedel, "Profile of Effective Project Managers," Project Management Journal 18 (1987): 5.

[2] Hans J. Thamhain, "Developing Project Management Skills," Project Management Journal 22 (1991): 3.

[3] Russell W. Darnall, "The Emerging Role of the Project Manager," PMI Journal (1997): 64.

1.4

Introduction to the Project Management Knowledge Areas

Quality | Risk | Project Scope | Costs | Procurement

LEARNING OBJECTIVES

1. Identify the tasks performed in a project start-up.
2. Describe the areas of project management knowledge as defined by the Project Management Institute.

Project Start-up and Integration

During project start-up, the project management team refines the scope of work and develops a preliminary schedule and conceptual budget. The project team builds a plan for executing the project based on the project profile (project profiles are defined more fully in chapter 2). The plan for developing and tracking the detailed schedule, the procurement plan, and the plan for building the budget and estimating and tracking costs are developed during the start-up. The plans for information technology, communication, and tracking client satisfaction are all developed during the start-up phase of the project.

Flowcharts, diagrams, and responsibility matrices are tools to capture the work processes associated with executing the project plan. The first draft of the project procedures manual captures the historic and intuitional knowledge that team members bring to the project. The development and review of these procedures and work processes contribute to the development of the organizational structure of the project.

This is typically an exciting time on a project where all things are possible. The project management team is working many hours developing the initial plan, staffing the project, and building relationships with the client. The project manager sets the tone of the project and sets expectations for each of the project team members. The project start-up phase on complex projects can be chaotic, and until plans are developed, the project manager becomes the source of information and direction. The project manager creates an environment that encourages team members to fully engage in the project and encourages innovative approaches to developing the project plan.

Project Scope

The project scope is expressed in a document that defines the ***parameters***—factors that define the project and determine its behavior—what work is done within the boundaries of the project, and the work that is outside the project boundaries. The ***scope of work (SOW)*** is typically a written document that defines what work will be accomplished by

the end of the project—the deliverables of the project. The project scope defines what will be done, and the ***project execution plan*** defines how the work will be accomplished.

No template works for all projects. Some projects have a very detailed scope of work, and some have a short summary document. The quality of the scope is measured by the ability of the project manager and project stakeholders to develop and maintain a common understanding of what products or services the project will deliver. The size and detail of the project scope is related to the complexity profile of the project. A more complex project often requires a more detailed and comprehensive scope document.

According to the Project Management Institute, a complete statement of the scope should include the following: [1]

- Description of the scope
- Product acceptance criteria
- Project deliverables
- Project exclusions
- Project constraints
- Project assumptions

The scope of work is the basis for agreement by all parties. A clear project scope document is also critical to managing change on a project. Since the project scope reflects what work will be accomplished on the project, any change in expectations that is not captured and documented creates the opportunity for confusion. One of the most common trends in projects is the incremental expansion in the project scope, which is called ***scope creep***. Scope creep threatens the success of a project because the small increases in scope require additional resources that were not in the plan. Increasing the scope of the project is a common occurrence, and adjustments are made to the project budget and schedule to account for these changes. Scope creep occurs when these changes are not recognized or not managed. The ability of a project manager to identify potential changes is often related to the quality of the scope documents.

Events occur that require the scope of the project to change. Changes in the marketplace may require change in a product design or the timing of the product delivery. Changes in the client's management team or the financial health of the client may also result in changes in the project scope. Changes in the project schedule, budget, or product quality will have an effect on the project plan. Generally, the later in the project the change occurs, the greater the increase to the project costs. Establishing a system for managing change during the project that captures changes to the project scope and assures that these changes are authorized by the appropriate level of management in the client's organization is the responsibility of the project manager. The project manager also analyzes the cost and schedule impacts of these changes and adjusts the project plan to reflect the changes authorized by the client. Changes to the scope can cause costs to increase or decrease.

Project Schedule and Time Management

The definition of project success often includes completing the project on time. The development and management of a project schedule that will complete the project on time is a primary responsibility of the project manager, and completing the project on time requires the development of a realistic plan and the effective management of the plan. On smaller projects, project managers may lead the development of the project plan and build a schedule to meet that plan. On larger and more complex projects, a project controls team that focuses on both costs and schedule planning and controlling functions will assist the project management team in developing the plan and tracking progress against the plan.

To develop the project schedule, the project team does an analysis of the project scope, which is incorporated into the contract, and other information that helps the team define the project deliverables. Based on this information, the project team develops a ***milestone schedule***. The milestone schedule establishes key dates throughout the life of a project that must be met for the project to finish on time. The key dates are often established to meet contractual obligations or established intervals that will reflect appropriate progress for the project. For less complex projects, a

milestone schedule may be sufficient for tracking the progress of the project. For more complex projects, a more detailed schedule is required.

To develop a more detailed schedule, the project team first develops a ***work breakdown structure (WBS)***—a description of tasks arranged in layers of detail. Although the project scope is the primary document for developing the WBS, the WBS incorporates all project deliverables and reflects any documents or information that clarifies the project deliverables. From the WBS, a project plan is developed. The project plan lists the activities that are needed to accomplish the work identified in the WBS. The more detailed the WBS, the more activities that are identified to accomplish the work.

After the project team identifies the activities, the team then sequences the activities according to the order in which the activities are to be accomplished. An outcome from the work process is the ***project logic diagram***. The logic diagram represents the logical sequence of the activities needed to complete the project. The next step in the planning process is to develop an estimation of the time it will take to accomplish each activity or the activity duration. Some activities must be done sequentially, and some activities can be done concurrently. The planning process creates a project schedule by scheduling activities in a way that effectively and efficiently uses project resources and completes the project in the shortest time.

On larger projects, several paths are created that represent a sequence of activities from the beginning to the end of the project. The longest path to the completion of the project is the ***critical path***. If the critical path takes less time than is allowed by the client to complete the project, the project has a positive total ***float*** or project ***slack***. If the client's project completion date precedes the calculated critical path end date, the project has negative float. Understanding and managing activities on the critical path is an important project management skill.

To successfully manage a project, the project manager must also know how to accelerate a schedule to compensate for unanticipated events that delay critical activities. Compressing – ***crashing*** – the schedule is a term used to describe the techniques used to shorten the project schedule. During the life of the project, scheduling conflicts often occur, and the project manager is responsible for reducing these conflicts while maintaining project quality and meeting cost goals.

Project Costs

The definition of project success often includes completing the project within budget. Developing and controlling a project budget that will accomplish the project objectives is a critical project management skill. Although clients expect the project to be executed efficiently, cost pressures vary on projects. On some projects, the project completion or end date is the largest contributor to the project complexity. The development of a new drug to address a critical health issue, the production of a new product that will generate critical cash flow for a company, and the competitive advantage for a company to be first in the marketplace with a new technology are examples of projects with schedule pressures that override project costs.

The accuracy of the project budget is related to the amount of information known by the project team. In the early stages of the project, the amount of information needed to develop a detailed budget is often missing. To address the lack of information, the project team develops different levels of project budget estimates. The ***conceptual estimate*** (or "ballpark estimate") is developed with the least amount of knowledge. The major input into the conceptual estimate is expert knowledge or past experience. A project manager who has executed a similar project in the past can use those costs to estimate the costs of the current project.

When more information is known, the project team can develop a ***rough order of magnitude (ROM)*** estimate. Additional information such as the approximate square feet of a building, the production capacity of a plant, and the approximate number of hours needed to develop a software program can provide a basis for providing an ROM estimate. After a project design is more complete, a project ***detailed estimate*** can be developed. When the project team knows the number of rooms, the type of materials, and the building location of a home, the project team can provide a detailed estimate. A detailed estimate is not a bid.

The cost of the project is tracked relative to the progress of the work and the estimate for accomplishing that work. Based on the cost estimates, the cost of the work performed is compared against the cost budgeted for that work. If the cost is significantly higher or lower, the project team explores reasons for the difference between expected costs and actual costs.

Project costs may deviate from the budget because the prices in the marketplace were different from what was expected. For example, the estimated costs for lumber on a housing project may be higher than budgeted or the hourly cost for labor may be lower than budgeted. Project costs may also deviate based on project performance. For example, the project team estimated that the steel design for a bridge over the Hudson River would take 800 labor hours, but 846 hours were actually expended. The project team captures the deviation between costs budgeted for work and the actual cost for work, revises the estimate as needed, and takes corrective action if the deviation appears to reflect a trend.

The project manager is responsible for assuring that the project team develops cost estimates based on the best information available and revises those estimates as new or better information becomes available. The project manager is also responsible for tracking costs against the budget and conducting an analysis when project costs deviate significantly from the project estimate. The project manager then takes appropriate corrective action to assure that project performance matches the revised project plan.

Procurement

The procurement effort on projects varies widely and depends on the type of project. It can range from less complex projects where the project team identifies the materials, product specifications and a detailed delivery schedule to the client; to the parent company providing procurement services via a liaison; to a procurement team being hired.

At the end of the project, equipment bought or rented for the execution of the work of the project are sold, returned to rental organizations, or disposed of some other way.

The procurement process may involve commodities, vendors, suppliers, and partners. The awarding of a contract can include price, ability to meet the project schedule, the fit for purpose of the product, and other considerations important to the project.

Project Quality

Project quality focuses on the end product or service deliverables that reflect the purpose of the project. The project manager is responsible for developing a project execution approach that provides for a clear understanding of the expected project deliverables and the quality specifications. The project manager of a housing construction project not only needs to understand which rooms in the house will be carpeted but also what grade of carpet is needed. A room with a high volume of traffic will need a high-grade carpet.

The project manager is responsible for developing a project quality plan that defines the quality expectations and assures that the specifications and expectations are met. Developing a good understanding of the project deliverables through documenting specifications and expectations is critical to a good quality plan. The processes for assuring that the specifications and expectations are met are integrated into the project execution plan. Just as the project budget and completion dates may change over the life of a project, the project specifications may also change. Changes in quality specifications are typically managed in the same process as cost or schedule changes. The impact of the changes is analyzed for impact on cost and schedule, and with appropriate approvals, changes are made to the project execution plan.

The PMBOK has an extensive chapter on project quality management. The material found in this chapter would be similar to material found in a good operational management text. Although any of the quality management techniques designed to make incremental improvement to work processes can be applied to a project work process, the character of a project (unique and relatively short in duration) makes small improvements less attractive on projects.

Rework on projects, as with manufacturing operations, increases the cost of the product or service and often increases the time needed to complete the reworked activities. Because of the duration constraints of a project, the development of the appropriate skills, materials, and work process early in the project is critical to project success. On more complex projects, time is allocated to developing a plan to understand and develop the appropriate levels of skills and work processes.

Project management organizations that execute several similar types of projects may find the process improvement tools useful in identifying and improving the baseline processes used on their projects. Process improvement tools may also be helpful in identifying cost and schedule improvement opportunities. Opportunities for improvement must be found quickly to influence project performance. The investment in time and resources to find improvements is greatest during the early planning stages of the project. During later project stages, as pressures to meet project schedule goals increase, the culture of the project is less conducive to making changes in work processes.

Another opportunity for applying process improvement tools is on projects that have repetitive processes. A housing contractor that is building several identical houses may benefit from evaluating work processes in the first few houses to explore the opportunities available to improve the work processes. The investment of $1,000 in a work process that saves $200 per house is a good investment as long as the contractor is building more than five houses.

Project Team

Staffing the project with the right skills, at the right place, and at the right time is an important responsibility of the project management team. The project usually has two types of team members: functional managers and process managers. The ***functional managers*** and team focus on the technology of the project. On a training project, the functional manager would include the professional trainers; on an information technology project, the software development managers would be functional managers. The project management team also includes project ***process managers***. The project controls team would include process managers who have expertise in estimating, cost tracking, planning, and scheduling. The project manager needs functional and process expertise to plan and execute a successful project.

Because projects are temporary, the staffing plan for a project typically reflects both the long-term goals of skilled team members needed for the project and short-term commitment that reflects the nature of the project. Exact start and end dates for team members are often negotiated to best meet the needs of individuals and the project. The staffing plan is also determined by the different phases of the project. Team members needed in the early or conceptual phases of the project are often not needed during the later phases or project closeout phases. Team members needed during the execution phase are often not needed during the conceptual or closeout phases. Each phase has staffing requirements, and the staffing of a complex project requires detailed planning.

Typically a core project management team is dedicated to the project from start-up to closeout. This core team would include the following members: project manager, project controls, project procurement, and key members of the function management or experts in the technology of the project. Although longer projects may experience more team turnover than shorter projects, it is important on all projects to have team members who can provide continuity through the project phases.

Project team members can be assigned to the project from a number of different sources. The organization that charters the project can use any number of staffing options, such as assigning managers and staff from functional units within the organization, contracting with individuals or agencies to staff positions, temporarily hiring staff for the project, or a combination of these. This staffing approach allows the project manager to create the project organizational culture. Some project cultures are more structured and detail oriented, and some are less structured with less formal roles and communication requirements. The type of culture the project manager creates depends greatly on the type of project.

Communications

Completing a complex project successfully requires teamwork, and teamwork requires good communication among team members. If those team members work in the same building, they can arrange regular meetings, simply stop by each other's office space to get a quick answer, or even discuss a project informally at other office functions. Many complex projects in today's global economy involve team members from widely separated locations, and the types of meetings that work within the same building are not possible. Teams that use electronic methods of communicating without face-to-face meetings are called ***virtual teams***.

Communications technologies require a variety of compatible devices, software, and service providers, and communication with a global virtual team can involve many different time zones. Establishing effective communications requires a communications plan.

Project Risk

Risk exists on all projects. The role of the project management team is to understand the kinds and levels of risks on the project and then to develop and implement plans to mitigate these risks. Risk represents the likelihood that an event will happen during the life of the project that will negatively affect the achievement of project goals. The type and amount of risk varies by industry type, complexity, and phase of the project. The project risk plan will also reflect the risk profile of the project manager and key stakeholders. People have different comfort levels with risk, and some members of the project team will be more risk adverse than others.

The first step in developing a risk management plan involves identifying potential project risks. Some risks are easy to identify, while others are less obvious. Many industries or companies have risk checklists developed from past experience. However, no risk checklist will include all potential risks. The value of a checklist is the stimulation of discussion and thought about the potential risks on a project.

The project team then analyzes the identified risks and estimates the likelihood of the risks occurring. The team then estimates the potential impact of project goals if the event does occur. The outcome from this process is a prioritized list of estimated project risks with a value that represents the likelihood of occurrence and the potential impact on the project.

The project team then develops a risk mitigation plan that reduces the likelihood of an event occurring or reduces the impact on the project if the event does occur. The risk management plan is integrated into the project execution plan, and mitigation activities are assigned to the appropriate project team member. The likelihood that all the potential events identified in the risk analysis would occur is extremely rare. The likelihood that one or more events will happen is high.

The project risk plan reflects the risk profile of the project and balances the investment of the mitigation against the benefit for the project. The plan includes periodic risk plan reviews during the life of the project. The risk review evaluates the effectiveness of the current plan and explores for possible risks not identified in earlier sessions.

KEY TAKEAWAYS

- During the start-up phase, the project leader develops the project infrastructure used to design and execute the project. A team is formed to create agreement among project stakeholders on the goals, cost, and completion date. Plans for executing the project by managing the schedule, quality, and budget are created.
- The SOW establishes project parameters that define what will be done.
- The project schedule begins with a milestone schedule followed by a WBS and a project diagram. The longest path through the project diagram is the critical path, and the difference between the completion of the critical path and the project finish date is the float. Shortening the critical path is called crashing the project.
- Cost estimating begins with a conceptual or ballpark estimate that is followed by a ROM estimate. A project budget is determined from the cost of the tasks in the WBS. Costs are monitored during the project and estimates updated if the costs vary from expectations.
- The provider of procurement management depends on the size of the project and the organization. Commodities are purchased through vendors, suppliers or partners.
- Project quality begins with the specifications of materials and labor. A quality plan creates a process for assuring the requirements and specifications of the project are met. Quality improvement tools can be applied to projects if the company has several similar projects.
- Team members are selected to manage functions and processes. The staffing plan assigns people as needed. Sources of team members are company employees, contractors, new hires, and partners.
- The risk on a project reflects the number of things that can possibly happen that will have a negative effect on the project and the probability of those events happening.

[1] Project Management Institute, Inc., A Guide to the Project Management Body of Knowledge (PMBOK Guide), 4th ed. (Newtown Square, PA: Project Management Institute, Inc., 2008), 115–16.

2

Project Profiling

Overview

This chapter aligns with beginning sections of most of the chapters in the PMBOK, where attributes are identified in specific ways. It is therefore difficult to quantify a proportion of the CAPM questions that come from this knowledge area. The content connects to the Initiation and Planning category of the PMP questions.

A project profile attempts to provide a snapshot look at the project scope and requirements before work actually begins. A well-crafted project profile can help when designing the project execution plan at a later stage, as well as in determining the assignment of resources to the project.

A project profile usually contains some or all of the following:

- Projections on project size and cost
- Analysis of project complexity
- Analysis of required technology and resources

By the end of this chapter you should be equipped with the skills necessary to successfully gauge the difficulty of a potential project as well as to forecast the required resources and time necessary through project completion.

Designers Share Their Experiences

Dr. Andy Gibbons – Instructional Psychology and Technology – BYU

Watch on YouTube

This project was to train helicopter pilots and sensor operators. The contract came to us as a signed contract with the Navy. It came with a certain number of resources promised to us. We had a lot of subject matter expert support on the project. On other projects that wasn't the case, but on this one we really had plenty. The thing that was interesting is as we looked at the constraints on the project there was a constraint we didn't notice that later turned out to be a big factor. Turns out that there…in the…we didn't have a lot of access to people who were actually using it on a day-to-day basis…the training….would be using the training in daily operations. And so we….our subject matter experts were off in the west coast, and it turns out that the water is different on the west coast from on the east coast. And of course quality of the water, when you're flying a helicopter and looking for submarines is a very important factor. We developed the course as if it was for the West coast. When the training was shipped to the East Coast, it was different. They couldn't use it in the same way. Actually it took some revisions of the training to adjust for that problem. We didn't know at the beginning that that was a resource problem. And so it came up and bit us later.

Heather Bryce – Independent Studies – BYU

Watch on YouTube

At the beginning of Art 45, we met to discuss the major requirements which would be editing, how long the course is, how well written the course was–that will determine our editing time, video requirements, flash requirements and art requirements. Obviously, Art 45 is an art class, drawing actually.

Dr. Larry Seawright – Center for Teaching and Learning – BYU

Watch on YouTube

The BYU Learning Suite is a learning management system that's going to replace the current system at the University. As such we have lots of stakeholders, so we had to do a lot of profiling. We had to check with all of the stake holders, faculty members, students, the University administration, and find out what all the various constituents needs were, and factor those in as we decided the scope of the project. How much could we do? How little could we do? We took a look at the existing product and the primary utilization of it. And decided that their mostly using this much, so this is how much we are going to start with. And then we verified that with all of the different stake holders.

- Using a Project Profile
- Project Profiling Models
- Complex Systems and the Darnall-Preston Complexity Index
- Darnall-Preston Complexity Index Structure
- Using the Darnall-Preston Complexity Index to Measure Organizational Complexity

2.1

Using a Project Profile

Budget | Project Manager | Project Profile

LEARNING OBJECTIVES

1. Identify project attributes that can be used for project profiling.
2. Define project profiling.

A project manager with a long history of successful projects oftentimes fails on others. What causes this to happen? Even though all projects are by definition unique, there are ***attributes*** (such as size, cost, subject matter, etc.) that are common among projects that allow the characterization or profiling of a project. Different skills and approaches are needed by the project manager for different projects. You can imagine that the ideal project manager for a large construction project may not be a good fit for a software development project. The technical knowledge needed to manage these projects is not the same and having the wrong technical knowledge may make the difference between a successful project and project failure.

A large project that will be executed in at least three locations will have a very different profile from a small project that will be executed in one location. These two attributes—size and location—provide information about the project that will enable a manager in the parent organization to assign a project manager with the appropriate knowledge and skills. We can then develop an execution approach to increase the likelihood of success.

Image by robnguyen01

Organizations need good tools for understanding and matching the needs of a project with the project manager who has the right skills and experience. Developing a project profile is one method for gaining an understanding of the project and providing a systematic approach to developing an execution plan to select a project manager who has the right kind of experience and skills.

Project profiling is the process of extracting a characterization from the known attributes of a project. The characterization will provide a more comprehensive understanding of the project that should result in developing an appropriate execution approach and the assignment of organizational resources. In different terms, project profiling is a process that summarizes what is known about the attributes of a project and places the project into a category with other projects that have similar characteristics. For example, you can characterize a project as a large project or a small project; the size of the project becomes the profiling attribute. You can characterize a project as domestic or global, making the location of the project the profiling characteristic.

A company that has twenty projects may determine that four of these projects are estimated to cost more than $1 million dollars and the remaining sixteen projects are estimated to cost much less. The company then communicates that all projects over $1 million be considered a large project. The company now establishes a rule that large projects will require a project manager with at least five years of management experience, it will have a vice president as executive sponsor, and it will require formal quarterly reports. In this example, one characteristic is used to develop the organization's project management approach to their twenty projects.

KEY TAKEAWAYS

- Project profiles can be created based on attributes such as budget and size to determine a systematic approach to developing an execution plan and selecting a project manager.
- Project profiling is the process of extracting a characterization from the known attributes of a project.

2.2

Project Profiling Models

Planning | Project Tools | Management Tools

LEARNING OBJECTIVE

1. Understand different methods of typing projects.

Image by PehMed2020

Shenhar and Dvir observed that the project execution approach was connected to the project type. The study identified different management patterns associated with project type as well as different management tools and practices. As

the project system scope became more complex and the system scope of the project became larger, more sophisticated management tools were put in place to reduce project uncertainty. As project technology increased, project managers became more invested in processes to manage technical issues such as redesign and testing. As projects increased in system scope, project managers became more invested in formal planning and control issues. In later research, Shenhar[2] developed recommendations for adjusting the project management approach based on the project typology. For example, project managers will use more risk management techniques (see Chapter 11) when the technological uncertainty is high.

Robert Youker[3] identified basic differences in project types. Among the attributes he used were the uncertainty and risk, level of sophistication of the workers, the level of detail in the planning, the newness of the technology, and the time pressure. Youker also looked at project size, duration, geographic location, number of workers, cost, complexity, urgency, and organizational design as attributes that help determine a project profile.

KEY TAKEAWAYS

- There are many different typology methods to consider when characterizing a project in order to meet its specific needs and scope. Some things to consider might be technological uncertainty and complexity of scope, risk, worker sophistication, location, urgency, and organizational design.

[1] Aaron J. Shenhar and Dov Dvir, “Toward a Typological Theory of Project Management,”Research Policy 25 (1996): 607–32.

[2] Aaron J. Shenhar, Adapting Your Project Management Style: The Key to Project Success (Hoboken, NJ: Stevens Institute of Technology, 1999).

[3] Robert Youker, “Defining the Hierarchy of Project Objectives,” IPMA Conference (Slovenia: American Society for Advancement of Project Management, 1998).

2.3

Complex Systems and the Darnall-Preston Complexity Index

Complexity | Complex Systems

LEARNING OBJECTIVES

1. Describe the characteristics of complex systems.
2. Explain the benefits of using the Darnall-Preston Complexity Index.

COMPLEX SYSTEMS

When is a project complex? The complexity of a system is usually determined by the number of parts or activities, the degree of differentiation between the parts, and the structure of their connections. Heterogeneous and irregularly configured systems are complex, such as organisms, airplanes, and junkyards. Order is the opposite of complex. Ordered systems are homogenous and redundant, like an interstate toll booth or a production line in a factory. Complex systems have multiple interacting components whose collective behavior cannot be simply inferred from the behavior of the individual components.[1]

In addition to the number of parts, the degree of differentiation between parts and the number, type, and strength of relationships between parts also influences the degree of complexity. For example, the transistors in a computer have three connections to other parts of the computer, but each nerve cell in the human brain can be connected to thousands of other cells in the brain, which is why the human brain is more complex than a computer. Complexity is context dependent. A project is more or less complex in relation to the number of activities, the type and strength of relationships to other project activities, and the degree and type of relationships to the project environment.

Projects are complex ***adaptive systems***, which consist of a large number of parts or activities that interact with each other in numerous and various ways. A complex adaptive system is adaptive if the activities adjust or react to the events of the environment. Successful adaptive systems adjust in a way that facilitates or allows the system or project to achieve its purpose.

The dependence of the project on the activities, the interdependence of the activities, and the specialization of the activities underscore the relationship dependence of project activities. This ***relationship dependence*** is a key aspect of complex adaptive systems. The nature of complex adaptive systems can be probed by investigating the impact of change in one activity and the effect on other activities and the behavior of the whole. Activities must be studied and

understood as interrelated, connected parts of the whole. If you remove a computer chip from a computer and the computer powers down, do not assume the purpose of the chip was to provide power to the computer. If you remove or shorten a project kickoff activity, do not assume the project will finish earlier because of the dependence of later project activities on project kickoff activities. Any change to the kickoff activities will impact other activities and the project as a whole.

Common Core Curriculum

In 2009, the Council of Chief State and School Officers and the National Governors Association undertook the project of developing K-12 curricular standards that would be common across the adopting states. The project proved to have a level of complexity not traditionally seen in state curriculum development. The project catered to diverse stakeholders, including state legislatures, state departments of education, teachers, administrators, parents, colleges/universities, and businesses. The project included the creation of different committees who advised on steps in the process, requiring consensus across multiple states in different time zones with different educational values. The project complexity profile reflected the relationship dependence of project activities as well as the large number of interacting parts and stakeholders in the project.

Complex adaptive systems have three characteristics that are also reflected in complex projects.

Complex Adaptive Systems Tend to Self-Organize

Formal organizational charts indicate reporting relationships but are not very effective at displaying project relationships. Projects organize around the work, phases, or activities. The organization of the project reacts to the nature of the work at any given phase. During the start-up meeting of a large complex project, the project manager facilitated the development of the project organization chart that included all the major partners, client leaders and key team members. After the chart was complete, the project manager ripped the chart up in front of the entire project team to demonstrate his key message, which was that there are formal reporting relationships, but the real leadership and communication will change during the life of the project. In other words, the system will adapt to meet the needs of the project at each phase.

Informally, the project team reorganizes information flows and priorities to support the current work of the project and a good project manager facilitates this adaptive behavior of the project organization by minimizing the impact of formal authority and processes.

Complex Systems Adapt to Changing Environments

A ***deterministic system*** is a system that will produce the same results if you start with the same conditions. The outcome can be reliably predicted if you know the starting conditions. For example, if you fire a rifle several times at a target, the hits on the target will be closely grouped if all the initial conditions are almost identical. A ***nonlinear system***, or ***chaotic system***, can produce wildly different results even if the starting conditions are almost exactly the same. If today's weather pattern is almost exactly the same as it was on a previous date, the weather a week later could be entirely different. Projects are usually nonlinear systems. If we execute an identical complex project three different times, we would deliver three different outcomes. We start with the assumption that the project is deterministic and use scenarios and simulations to develop the most likely outcome, yet a small change such as the timing of someone's vacation or a small change in the delivery date of equipment can change the entire trajectory of a project.

Changing Environments

A design company was hired to create training for employees of the client's new enterprise. The company managers felt that the outcome would be fairly predictable and assigned the management of the project to one of their lead designers. Two weeks into the project start-up, the company president realized the project needed a manager with more expertise and assigned a new person to manage the project. Then the client informed the company that they had changed the location for their new offices from Seattle to Houston. Since they had initially wanted the training to have location-specific nuances, the project needed to be reworked. During the second month of the project, the client encountered a legal suit which necessitated that the project be placed on hold. This project environment was unstable and the project plan and organization adjusted and evolved to respond to each of these changes.

All projects experience some forms of environment shift during the life of the project. This is one of the reasons project managers develop an aggressive ***change management process***. The purpose of the change management process is not to stop change but to incorporate the change into the project planning and execution processes. Projects, like all other complex adaptive systems, must respond to the evolving environment to succeed. Plan as if the project is deterministic but be prepared for unpredictable changes.

Complex Systems Coevolve with Internal and External Changes

In addition to responding to changes in the project environment, the internal project organization and environment is in a constant state of change. New people become members of the team, people quit, retire, and get sick. The office roof starts leaking, headquarters rolls out a new computer program required for all workers, or the project's lead designer cannot get her immigration visa extended. These are real examples of events that occurred on one project, and the project team adjusted to each event. The adaptation to changes in the project's internal situation while also adapting to the external environment reflects the coevolving nature of a complex adaptive system. An increase in the number of events within the project and the project environment that are likely to change during the life of the project is reflected in an increase in the complexity of a project.

DARNALL-PRESTON COMPLEXITY INDEX

Projects are more likely to fail in the beginning, not in the end. This generalized statement reflects the importance of understanding the environment in which a project will be executed and the importance of developing an execution plan that can be successfully implemented within this environment. Profiling a project correctly requires a system that is relatively easy to use but that includes enough attributes to capture all the most important characteristics of a complex project. ***The Darnall-Preston Complexity Index (DPCI™)*** is one model for understanding and profiling projects (and will be explained further through the rest of this chapter). This index assesses the complexity level of key components of a project and produces a unique project profile. The profile indicates the project complexity level, which provides a benchmark for comparing projects and provides information about the characteristics of a project that can then be addressed in the project execution plan. It achieves this objective by grouping eleven attributes into four broad categories: internal, external, technological complexity, and environmental.

The DPCI provides project stakeholders with information about the project to define the experience, knowledge, skills, and abilities needed by the project manager. The DPCI also has implications for the composition, organization, and skills needed by the project leadership team. The DPCI provides information and a context for developing the project execution plan and for assessing the probability of success.

Recovery costs can be extremely high for projects where the environment is misread or the execution plan does not address critical issues of the project environment. In addition to cost overruns and delays in the project, execution plans

that are not aligned with the project environment can create barriers that make recovery difficult, and in some cases, the business purpose of the project cannot be met. The DPCI is a tool to assist project stakeholders in developing a comprehensive analysis of the project environment and a project execution plan more aligned with that environment, both of which increase the likelihood of project success.

The foundation of a sound project execution plan is an assessment of the project environment. This assessment provides the information on which the execution plan is built. In the absence of an accurate assessment of the project environment, the project leadership makes assumptions and develops the execution plan around those assumptions. The quantity and quality of those assumptions will significantly influence the effectiveness of the project execution plan. The amount of information available to the project manager will increase over time and assumptions will be replaced with better information and better estimates. As better tools are developed for evaluating the project environment, better information will become available to the project manager.

The project environment includes all the conditions that can influence the outcome or success of the project, such as the project size, technological complexity, cultural and language barriers, the political landscape, and resource constraints. Understanding these influences and developing a project profile creates a foundation for building an effective project execution plan.

KEY TAKEAWAYS

- Complex systems have many different parts that interact with each other in different and often unpredictable ways. They adapt to changes in their external and internal environments.
- The Darnall-Preston Complexity Index (DPCI) assesses project attributes, enabling better-informed decisions in creating the project profile.

[1] Stephen Jay Gould, Full House: The Spread of Excellence from Plato to Darwin (New York: Three Rivers Press, 1996).

2.4

Darnall-Preston Complexity Index Structure

Complexity | Internal | External | Environmental | Project Attributes | Technological

LEARNING OBJECTIVES

1. Describe each of the external attributes that contribute to project complexity.
2. Describe each of the internal attributes that contribute to project complexity.
3. Describe each of the technological attributes that contribute to project complexity.
4. Describe each of the environmental attributes that contribute to project complexity.

The Darnall-Preston Complexity Index (DPCI™) is designed to develop a project profile that reflects different aspects of the project that will influence the approach to leading and executing the project.

The DPCI is built on four categories of attributes:

1. External. Environmental attributes that are in existence at the beginning of the project, such as size, duration, and available resources
2. Internal. Clarity of project objectives, the clarity of scope, the organizational complexity, and stakeholder agreement
3. Technological. Newness of the technology and familiarity of team members with the technology
4. Environmental. Legal, cultural, political, and ecological

The DPCI was developed around four assumptions:

1. All projects are unique.
2. Projects have common characteristics.
3. These characteristics can be grouped together to create a project profile.
4. There is an optimum execution approach for each project profile and therefore an optimum set of skills and experience for the project manager and execution team.

EXTERNAL ATTRIBUTES

The ***external attributes*** include those issues that are typically established early in the project definition phase and are usually outside the direct control of the project management team. The project size can be a product of the dollars needed to execute the project or project cost. The cost of the project is estimated during the conceptual phase of the

project, and is established at the time the project is authorized. The duration or time allocated to complete the project and the resources available are also attributes that are established when the project is authorized.

Size

Project size is a relative concept. How do we decide if something is large or small? A 150-pound person is big if the person is ten years old. A 150-pound person is small if the person is a professional football lineman. The frame of reference provides the context in which size is determined.

The size of a project is also relative. A $250 million oil refinery expansion is a relatively small project in an industry where billion dollar projects are common. A $250 million pharmaceutical development project or software development project would be considered a large project. The size of a project is determined by the context of the industry and the experience of the team executing the project.

Design firms usually specialize in projects that fall within a defined range. Small firms usually execute small projects and large firms usually execute larger projects. There is a size range for which the company experience, management skills, tools, and work processes are primarily designed. This size range or comfort zone exists for both the company and the members of the project team executing the project.

When a project team executes a project outside their comfort zone, stress is placed on both the tools and project team. When a project is larger than the comfort zone of a company, stresses are placed on the ability to provide experience and appropriate work processes, and the results are typically cost overruns and schedule delays. To mitigate this stress, some companies will divide large projects into smaller projects and execute the smaller projects with separate dedicated staff and resources. The key to success then becomes the coordination of the small projects to behave as if they are one large project.

When a company is executing a project that is much smaller than the company norm, resources are often misused and inappropriate work processes are utilized. The result often increases the project costs. Some companies with a history of executing large projects have set up a small project group to execute smaller projects. These groups establish a different culture, develop appropriate work processes, and use tools designed to execute smaller projects.

The more the project size is outside the comfort zone of the project, the more stress is created for the project. This is true on both ends of the spectrum. Both smaller and larger projects that fall outside the comfort zone of the project management team will create stress for the project. New skills, tools, and processes will need to be developed to manage the project, and this activity will absorb management time and energy. The higher the stress level created by executing a project outside the comfort zone of the organization, the greater the impact on the complexity level of the project.

Duration

The duration of a project is often set by the parent organization that charters the project with a deadline that reflects the business purpose of the project. The following are examples of projects with end dates that are established to meet the organization’s business purpose:

- A new software program for a university to be implemented in time for registering students in the fall
- A new product to be introduced to the marketplace at the industry’s major conference
- A new high school to be constructed and open next fall

The project team also estimates the duration of the project and establishes a project end date based on normal work (e.g., forty hours per week) and the availability of resources.

Sometimes the normal time needed to complete a project is longer than the time available.

College Accreditation

A university's college of nursing is working to develop an assessment system to measure learning outcomes as part of its efforts to meet accreditation requirements. The deadline is six weeks earlier than the time estimated to pilot, revise, and finalize the assessment system. New employees will have to be hired to complete the additional work needed and professors will be asked to use small chunks of instructional time to expedite the piloting of items. A new schedule is developed based on these changes to the execution approach, and now the project schedule has zero float.

The result of this six-week compression to the project schedule is additional stress on the project. Significant management time and energy will be invested in tracking and managing schedule issues. Every issue that arises will need to be resolved quickly and involve the project's senior manager to assure the project schedule does not slip. This additional stress increases the overall project complexity.

Resource Availability

Projects require both human and tangible resources. The project requires people with the right experience, knowledge, and skills to accomplish the assigned tasks. Some projects require specialized subcontractors with skills not found within the project team. Each of these resources required by the project will be needed at the point in the project schedule when the materials or skills are required. When these resources are scarce or not available, additional management time and energy is needed.

Criterion Referenced Tests

When congress authorized the No Child Left Behind Act, states were required to develop large-scale assessments to measure how well students were performing according to the new standards. With many states trying to hire measurement experts to help develop these tests, a project manager for one state's implementation found that experts in testing and measurement were in short supply. The project manager dedicated significant time and resources to train people from within the project in educational assessment and measurement principles, so that the project of test development could continue.

When resources needed to execute the project are not readily available, the project leadership dedicates more management time and energy to acquiring the resources or finding innovative solutions to accomplish the project goals without the needed resources or with creative alternative solutions. The more time and energy the management team must dedicate to searching for resources or alternatives, the more stress on the project. The more scarce and more important the resources, the more stress is placed on the project.

INTERNAL ATTRIBUTES

The ***internal attributes*** are within the control or influence of the project manager, such as the clarity of objectives, clarity of scope, the organizational complexity, and stakeholder agreement. Although the clarity of objectives, as with the other attributes, can be improved during the life of the project, the project profile reflects the project at a given time. If the project objectives are not clear during the evaluation of the project, this lack of clarity impacts the complexity of the project.

Clarity of the Project Objectives

Project decisions are made based on how these decision help the project meet its objectives. If the objectives are unclear, the team will not make the best decisions. The greater the confusion for the project team on the goals and objectives of the project, the greater the impact on the complexity of the project.

Confusion Over Objectives in Philadelphia

A consultant was asked to evaluate the likelihood of success of a large project in Philadelphia. The consultant interviewed the project leadership and asked if the goals of the projects were clear. Each member of the leadership team responded that the goals and objectives were clear; however, when asked what the goals were, the answers varied greatly.

Protected

An educational evaluation project involved collecting outcome data from a large number of college students. The Institutional Review Board (IRB) application stated very clearly that individual students would not be identified with the data collected, that every effort would be made to make data generation and collection non-intrusive for students, and that students would not lose instructional time. Every major data decision passed through an evaluation of the impact on student instructional time and the protection of student confidentiality. Although these steps increased the complexity of the project, the clear goals warranted the extra efforts.

Clarity of Scope

The ***project scope*** defines what is inside the project and what is outside. Does the project to train five hundred technicians for the Boeing 787 include recruiting and assessing potential employees? The project scope did include recruitment and assessment, but hiring processes and drug testing belonged to Boeing. This scope was clear about which responsibilities belonged to the contractor doing the training and which responsibilities belonged to the parent organization.

Not all project scopes are this clear. The development of a clear project scope depends on information available about what products and services will be required. A project to develop a vaccine for a new strain of flu may not include sufficient information to develop the processes the team will utilize to understand the flu virus and develop a vaccine. As the team develops more information, the scope can be further developed.

Leadership time and energy will be focused on developing scope clarity. The lack of clarity and the amount of time needed by the leadership team to develop a clear scope will add to the project complexity.

Organizational Complexity

The structure of the project's client organization and the organizational decision-making processes influence the project complexity. A project with one client as the central point for making decisions and providing client approvals and technical information has only one relationship to manage and a streamlined communication process. Projects with a team representing the client require more of the project manager's time and energy managing the client relationships and communication process. The client team approach brings more expertise and often more comprehensive project oversight, but it adds to the project complexity.

Stakeholder Agreement

Often there is more than one major stakeholder in the project. An increase in the number of stakeholders adds stress to the project and influences the project's complexity level. The business or emotional investment of the stakeholder in the project and the ability of the stakeholder to influence the project outcomes or execution approach will also influence the stakeholder complexity of the project. In addition to the number of stakeholders and their level of investment, the degree in which the project stakeholders agree or disagree also influences the complexity of the project.

A small educational project will typically have several stakeholders in addition to the client. School administrators, teachers, students, parents, and even community and business leaders may have an interest in the project and can influence the execution plan of the project. The number of stakeholders on the project, multiplied by their passion for the subject and the potential for disagreement, increases the complexity of the project. Significant time and resources of the project will be dedicated to identifying, understanding, and managing expectations.

TECHNOLOGICAL COMPLEXITY

The ***technology*** of a project refers to the product of the project and not the technology used to manage the project. This technology is typically unique to the industry. A pharmaceutical project technology is the drug-making technology or pharmacology. The technology for a project to build a new automobile plant is the car production process. The key stress on the project is the newness of the technology. What aspects of the technology are known, and what aspects are unknown? Does the project combine technologies on the project that have never been combined? Newer and more complex technology requires greater expertise on the project team and increases the stress and complexity of the project.

Open Assessment Project

A non-profit organization hired a project manager to oversee the development of a website to distribute openly-licensed assessment items for teachers. The project required building an interface that would allow teachers to access materials and receive training on how to write good items, have a mechanism for teachers to submit new items, and a way for teachers to give tests online so student data could be used to evaluate the strength of individual items. Most of the technology was tested and the project team brought in experts to help design and implement an interface to meet the requirements of the project. The technology of the project necessitated the project team to develop a new understanding of this technology and adapt work processes to the technology requirements.

PROJECT ENVIRONMENT

The project environment includes all the issues related to the environment that will influence the development and execution of the project plan. An instructional design project in Pittsburgh, Pennsylvania will have very different legal, cultural, and political issues to address from one in São Paolo, Brazil. The environment attributes in Brazil require more planning, resources, and leadership attention to successfully execute the project.

Legal

The legal issues on a project can be broad and include many different levels of government. Most local governments have various permits, such as business licenses and building permits, required to do work. Some projects will have security issues and will work with local law enforcement.

Workforce laws vary significantly in country, regional, and local jurisdictions. The hiring and management of workers can be a complex and time-consuming issue for some projects. Companies not used to working in a union environment will invest project resources in learning and adapting to the new environment. Scheduling holidays, supporting maternity leave, and dealing with workforce reduction issues surrounding project closeout will vary in each environment, industry, and project. Understanding and managing workforce issues on a project can be simple or very complex.

National, regional, and local taxes require a project tax approach or policy on most international projects and some domestic projects. Duties for equipment and material brought into a country add complexity to the procurement plan. Equipment used temporarily to execute the project, such as a crane, is treated differently than permanently installed equipment, such as a pump. In some countries, a third party is hired to expedite the flow of materials through complex custom processes.

Not every project will have significant legal issues. When legal issues are involved, they are typically significant and will add to the complexity of the project. Understanding the legal issues that can affect the project and developing a plan to address these issues will reduce the complexity of the project.

Cultural

Culture is a term that reflects the community's assumptions, norms, values, and artifacts. Community includes the parent organization charting the project, the local community or communities where the project is executed, and the region and country where the project is located. The project team must understand the community's culture and its potential impact on the project. Culture also defines the meaning of work, truth, relationships, and how to communicate. Projects executed in various cultures will often experience cultural conflict.

Gender Difficulties in Argentina

A project team from the United States was responsible for executing a project in Argentina. The U.S. leadership team included women in key leadership positions, and the Argentines refused to take direction from females. The U.S. team believed strongly in their leadership capability and refused to make changes. This conflict was settled by senior managers of both organizations, and rules were established that respected all team members in leadership roles. The conflict did not go away, but the team was able to successfully execute the project with the original team. Delays were experienced on the project that could be traced to this cultural conflict.

Many organizations have rule-based cultures. Institutions of higher learning, organizations related to judicial organizations, and most government organizations are examples of rule-based organizations. The organizational structure and culture inhibits risk taking through established rules and policies. Projects are goal based and focus on plans and processes to achieve goals. Goal-based cultures promote assuming risk to achieve goals. Projects that are closely tied to a rule-based parent organization will often find conflict with the parent organization's need to follow rules and the project's need to accomplish goals. This conflict creates additional stress that adds to the project complexity.

On global projects, language, cultural conflict with the role of women, the religious role in daily activities, and even the concept of time can becomes issues on the project. These issues require project leadership to resolve and they add to the project complexity. In some countries and even different companies in the same country, meetings start on time, and a person arriving five minutes late will cause major disruption. In other situations, meetings can start within thirty minutes of the starting time without anyone objecting.

Communication Problem in India

A team of project experts was sent to India to evaluate a large instructional design project. The team arrived and reviewed the project documents which reported that the project was on time and meeting all project goals. After spending three days with various designers and team managers, the team discovered the project was significantly behind schedule. A culture existed on the project where workers told the project management what they expected to hear, and the difference between the progress of the project team and the progress reports became so large that the difference could not be reconciled during the original schedule of the project.

An increase in the number of cultures represented on the project team raises the cultural complexity and the complexity of a project. Although this cultural diversity creates leadership challenges, it also presents opportunities. The diversity of cultures presents various approaches to solving problems, and the project manager may find innovative solutions easier to develop with a diverse project team.

Political

Every project operates within one or more communities that reflect organizational dynamics and power struggles. The more important the project is to the organizational leadership, the more invested various organizational leaders will be in the project. The more people that become invested in the project and the more influence these people exhibit on the resources and activities of the project, the more time and energy will be expended by the project team in managing these outside influences. This additional stress on project leadership time and resources adds complexity to the project.

Ecological

Projects have the potential to impact the living conditions or the health of people, plants, and animals. In addition to the potential impact to land, water, and air, the ecology includes the sights and sounds that can impact the quality of life. An increasing number of clients expect the project team to minimize the impact of the project on the ecology. An ecology that is more sensitive to disruption and a more disruptive technology will place greater stress on the project and increase the project complexity. The addition of twenty-five people in existing office space or one that requires a substantial increase in electrical use will all impact the ecology. The project team develops means and methods to minimize the impact of the disruption in a manner consistent with the requirements as communicated by the client. The effort that is needed to minimize the ecological impact will influence the complexity of the project.

KEY TAKEAWAYS

- The external attributes are the relative size of the project, duration of the project, and the available resources.
- The internal attributes are the clarity of its scope, the complexity of the organization, and the agreement among stakeholders.
- The technological attributes are the technology of the product (not the technology used to manage the project), the newness of the technology, and the familiarity of the team with the technology.
- The environmental attributes are the legal issues, cultural conflicts, political interests, the impact of the project on the ecology, and the impact of the ecology on the project.

2.5

Using the Darnall-Preston Complexity Index to Measure Organizational Complexity

Complexity | Technological | Organizational

LEARNING OBJECTIVES

1. Analyze a project function for size, organizational complexity, technological newness, and technological familiarity and assign a complexity score.

Recall that the Darnall-Preston Complexity Index (DPCI™) ranks complexity in four categories: external, internal, technological, and environmental. The information provided in this chapter can be used to rate a project's complexity in the areas of size, organizational complexity, technological newness, and technology familiarity. Scores range from 1 (least complex) to 5 (most complex).

Image by Doblin/Monitor

Size

Recall that size is relative to the organization's comfort zone for projects. Refer to the following descriptions for tips on arriving at a DPCI score for size:

1. The project size is the most common size the organization does. The project manager and team members have done many similarly sized projects, and the tools they use to manage this size project are well tested and reliable.
2. The project size is at the high or low end of the range of project sizes that the organization or team members have done before.
3. The project size is about 20% higher or lower than projects the organization or some of the team members have done before. The project leader and a few key team leaders are familiar with this size project from work they have done elsewhere. Project management tools and processes will have to be adjusted but will probably work.
4. The project size is about 50% higher or lower than projects the organization or most of the team members have done before. Project management tools and processes will have to be adjusted, and it is not certain that they will work well. New tools and procedures may be needed.
5. Neither the organization nor the team members are experienced working on a project this size. It is several times larger or smaller than previous projects. It is too small or too large for the tools and techniques with which the team is familiar.

Organizational Complexity

Recall that system complexity is determined by the variety of types of elements and the number of connections there are between elements. Review a chart of the organizational structure that depicts the reporting relationships, the number of people involved, their familiarity with each other, and the amount of cross connections between reporting relationships and functions. Refer to the following descriptions for tips on arriving at a DPCI score for size:

1. The organizational structure is simple and involves few people. No new relationships need to be formed, and the people have worked together in these relationships before.
2. The team includes people who report to operations managers instead of the project manager, and more people are involved.
3. The organization chart has numerous segments, but most people are familiar with their roles and have worked in this type of role before.
4. The number of people involved is large, and the functions are handled by many different people. There are several levels of reporting in the organization chart.
5. The number of people is very large, and many of them do not know each other or have never met. Each major function requires a full-time person, and coordinating between functions requires frequent meetings among mid- and top-level managers.

Technology Newness

Recall that this category refers to the technology that is part of the project. It might be new technology that is being implemented to make a step change in the efficiency of an operation. Refer to the following descriptions for tips on arriving at a DPCI score for size:

1. The technology is not new. It has been around for years and is reliable.
2. The technology is only a few years old. Most of the initial bugs are out of it, but the fixes have not been thoroughly tested.
3. The technology is recent, and only a few other organizations have experience with it. The providers promise that the next release or version will have the problems resolved.
4. The technology is new and has just been released for general use. Problems are likely.
5. The technology is in an early testing phase, and your organization is one of the test sites. Problems are expected.

Technology Familiarity

Recall that this category refers to the familiarity of the project team with the technology that is part of the project. Refer to the following descriptions for tips on arriving at a DPCI score for size:

1. The team members have all used the technology or have been involved with projects that used this technology. They are confident that they understand it and can handle problems related to it.
2. The technology is new to some of the team members who are not in key positions. Standardized training is available, if necessary, to teach them what they need to know about it to do their jobs.
3. Several team members have not worked with this technology, including some of the key team members. Standardized training is not available, and consultants might be needed.
4. The technology is new but is similar to previous technologies with which the team leaders are familiar. An advisor from the product's development team may serve as a technology advisor.
5. The technology is new, and no one has worked with it before. A specialist might be needed to avoid serious errors.

Assigning a Score

Assigning a score is not an absolutely accurate process. Your objective is to be approximately correct, and some people are not comfortable with this type of estimate. Recall that one of the attributes of a successful project manager is the ability to live with ambiguity. One method that will help when assigning a score is to consider the two extremes. For each factor in the DPCI, consider what the simplest—least complex—scenario would look like, to which you would assign a 1 on the DPCI scale. Next consider what the most complex scenario would be, which would describe a 5. Then, compare actual projects to those two extremes. Accordingly, if it is about in the middle it rates a 3, and a 2 and a 4 are moderately simple and moderately complex, respectively.

KEY TAKEAWAYS

- Scores range from 1 to 5, where 1 is the lowest level of complexity and 5 is the highest. In each situation, consider what the two extremes would look like and then judge where the current situation lies between those extremes.

3

Project Phases and Organization

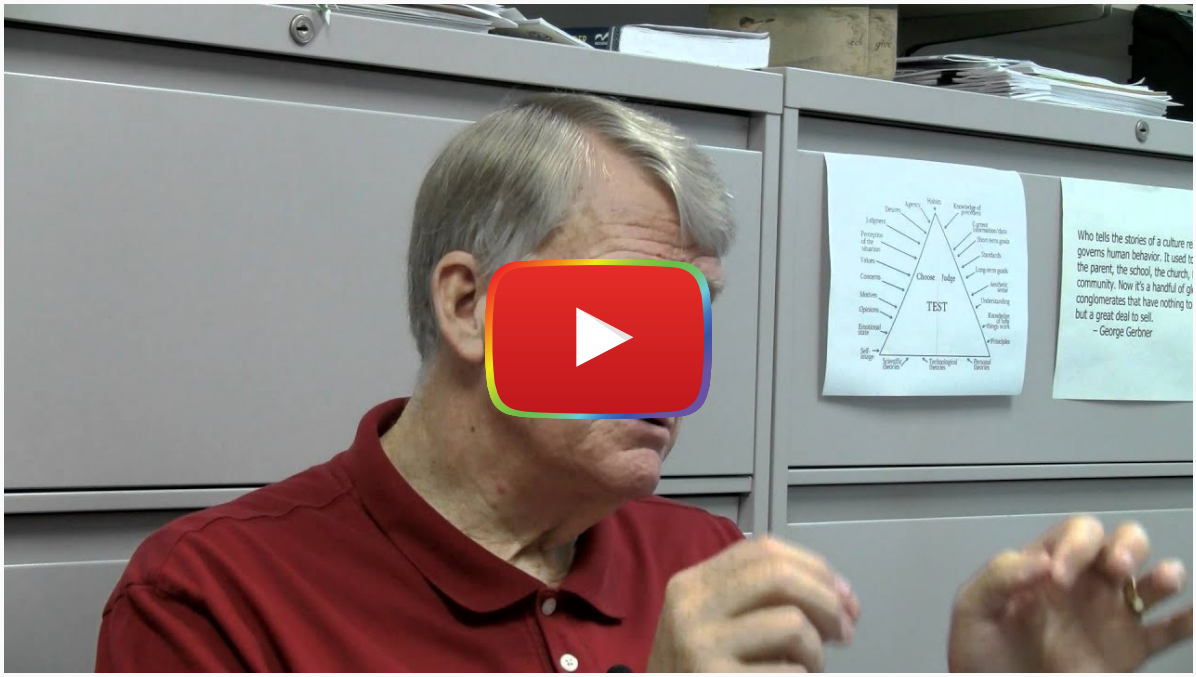
Overview

This chapter provides an overview of the entire project management process and applies to all the questions in the CAPM and PMP. However, it aligns well with Chapter 2 of the PMBOK and 4% of the CAPM is specifically dedicated to project life cycle and organization.

This chapter outlines the possible project organizational structures (both in terms of staff roles and communication channels) as the project progresses through its phases, from initiation to closeout.

Designers Share Their Experiences

Dr. Andy Gibbons – Instructional Psychology and Technology – BYU



Watch on YouTube

Well this turned out to be an interesting team. I was–this was my second project–training helicopter pilots and sensor operators and working with a very large client. This was my second project after graduate school. I had only been in the field for a year as a designer. The team ended up being about twenty, twenty-five people by the time we were through. The kinds of people that I worked with were first of all, subject matter experts who were given to us by the customer, which was the Navy. We also had–on our team we had–I had an assistant designer who was not trained, but was experienced. And was a former member of the Navy, and that really helped a lot because he understood the context that we were working with, and he understood the personalities. He frequently had to save us from peril. I mean, here is this fresh out-of-the-can instructional designer out of college, inexperienced in the ways of the world, and this guy–guy named Bob Hoffman saved my bacon a lot of times. We had other people. I had an assistant instructional designer who was a good writer, served writing functions. We had a video producer, because we had to produce twenty video segments while we were doing this. I had a host of artists. We had a very large art shop it turns out. There were different varieties of artists. We had a cartoonist, a guy named Johnny Hawk, who was very good. We had a serious technical–straight lines–you know with straight edge and everything. We had one of those. We had, one of the categories that we had that was very interesting to work with was what were called paste-up artists. In those days we didn't have desktop publishing at all. I mean, a word processor was still a Wang machine that came as a thing that sat beside your desk, it was huge. We didn't have, we couldn't create, design the layouts. And so they would have to use a special processor called a compositor to print out on glossy certain kind of paper, the text that was going to be placed on a page. And these paste-up artists would have to come with their X-ACTO knives and their straight edges, and cut out a piece of text and glue it to the piece of paper. It was a really interesting process. Nothing in my training in college told me that there was this kind of a person. And yet I end up, or any of these kinds of categories of artists, and yet within a year after college I was managing a host of these people. It was a very interesting experience.

Heather Bryce – Independent Studies – BYU

Watch on YouTube

Okay, well, we have editors. So we have fulltime employees and student employees. Our full-time employees kind of oversee the different functions. We have an editing function. The editing supervisor supervises student editors who take a first take and a second take on the courses. We also have a video supervisor who supervises our videographers. We have a flash supervisor, who supervises the flash programmers. So, and then, obviously an art director who supervises the artists. What I do as a project manager–I meet with the instructional designer and the different supervisors of those departments. And we meet at the beginning of a course and discuss what all the requirements will be for the course and collaborate. If there is an idea where originally the instructional designer thought that it would be good as a video piece, as we talk and meet perhaps the flash supervisor would have a better idea of how to best present it instructionally for the student. Something more interactive than just watching a video. So that's how the roles are divided.

Dr. Larry Seawright – Center for Teaching and Learning – BYU

Watch on YouTube

In a project like the BYU Learning Suite project, which is a learning content management system, there are quite a few roles that are encompassed in that–in the development process alone, not to mention everything else. In the needs gathering phase of that we have consultants who contribute to, along with the instructional designers, the building of the design of what we're going to produce. We have programmers who have to weigh in and say whether or not that is feasible. We have graphic designers who say "Gee if we have this kind of a format, then we're going to have to do this with the layout", and that kind of constricts us. Going back again to the stake holders we have faculty and students weighing in all along the way. And then of course we have the University administration giving us mandates. You have to do this and you have to do that. So the various roles as a project manager, you have to balance all those competing interests, and try to weigh, you know, when you get a mandate you have to weigh it against the realities of what you can do with the time, the scope, the money that you have. And then you take the resources, the people, the expertise that they have, and try to match it against all of those different competing agenda items. And you come up with a plan, and you try to execute against the plan.

Project Phases and Organization

Project Phases and Organization

3.1

Project Phases and Organization

Initiation | Planning | Execution | Closeout | Project Phases

LEARNING OBJECTIVES

1. Identify the phases of a project.
2. Describe the types of activities in each phase of a project.

The Project Management Institute (PMI) identifies four major phases of a project as characteristics of the project life cycle.[1] These four life-cycle phases are initiation, planning, execution, and project closeout. The knowledge, skills, and experience needed on the project can vary in each phase. During the early phases of a project, the project leadership needs good conceptual skills, the ability to build a team, and the experience to build a project roadmap. During project closeout, the project leadership provides a high degree of motivation and attention to details. On a large project, lasting two or more years, it is common to see the project management team change leadership to provide skills that are appropriate to the final phases of the project.

Initiation

The ***initiation phase***, which PMI labels "starting the project," includes all the activities necessary to begin planning the project. The initiation phase typically begins with the assignment of the project manager and ends when the project team has sufficient information to begin developing a detailed schedule and budget. Activities during the initiation phase include project kickoff meetings, identifying the project team, developing the resources needed to develop the project plan, and identifying and acquiring the project management infrastructure (space, computers). On projects where the scope of work for the project is not well defined, the project team will invest time and resources in developing a clearer scope of work. On projects where the major project stakeholders are not aligned, the project team will expend resources and time creating stakeholder alignment.

Unlike project milestones, some activities associated with project initiation may be delayed without delaying the end of the project. For example, it is advantageous for the project to have the major project stakeholders aligned from the beginning, but sometimes it is difficult to get the commitment from stakeholders to invest the time and resources to engage in an alignment process. Sometimes it is only after stakeholders begin observing progress on a project that the project manager can facilitate the stakeholder alignment processes.

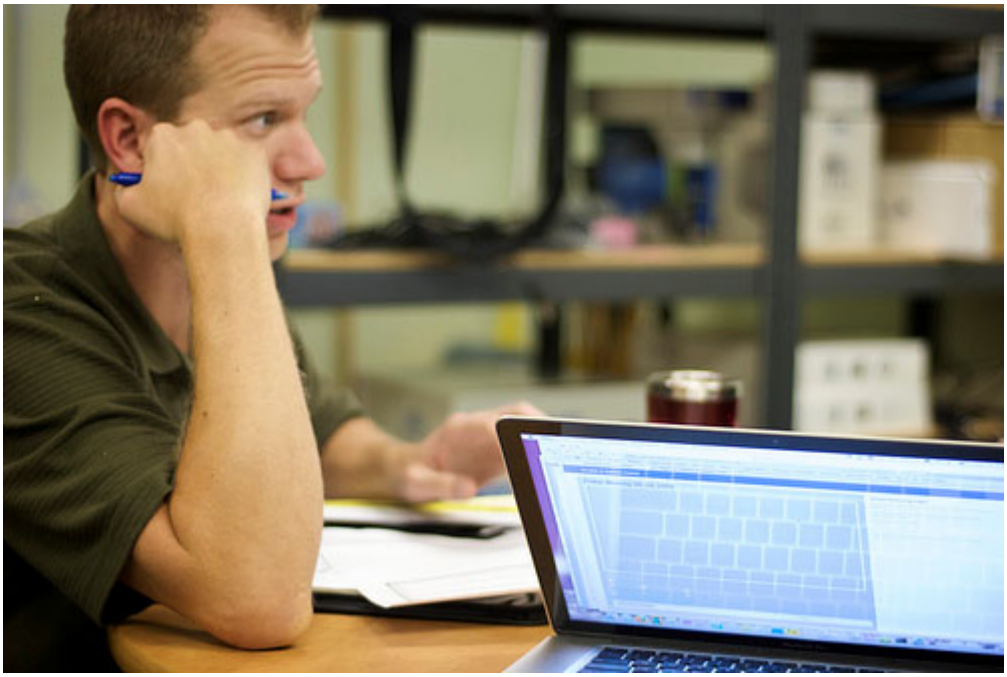


Image by iChris

Planning

The ***planning phase***, which PMI labels "organizing and preparing," includes the development of more detailed schedules and a budget. The planning also includes developing detailed staffing, procurement, and project controls plans. The emphasis of the planning phase is to develop an understanding of how the project will be executed and a plan for acquiring the resources needed to execute it. Although much of the planning activity takes place during the planning phase, the project plan will continue to be adjusted to respond to new challenges and opportunities. Planning activities occur during the entire life of the project.

Execution

The ***execution phase***, labeled by PMI as "carrying out the work," includes the major activities needed to accomplish the work of the project. On a construction project, this would include the design and construction activities. On an information technology (IT) project, this would include the development of the software code. On a training project, this would include the development and delivery of the training.

Closeout

The ***closeout phase***—or using PMI's nomenclature, "closing of the project"—represents the final stage of a project. Project staff is transferred off the project, project documents are archived, and the final few items or punch list is completed. The project client takes control of the product of the project, and the project office is closed down.

The amount of resources and the skills needed to implement each phase of the project depends on the project profile. Typically, a project with a higher-complexity profile requires more skills and resources during the initiation phase. Projects with a profile that indicates problems with alignment among key stakeholders or political and legal issues will require specialized resources to develop plans that address these issues early in the project. A project with a lower complexity level will invest more resources in the execution phase to complete the project as effectively and efficiently as possible.

Project Phases on a Large Multinational Project

A United States instructional design company won a contract to design and build the first distance-learning-based college campus in northern Argentina. There was no existing infrastructure for either the educational or large internet-based projects in this part of South America. During the initiation phase of the project, the project manager focused on defining and finding a project leadership team with the knowledge, skills, and experience to manage a large complex project in a remote area of the globe. The project team set up three offices. One was in Chile, where large distance education project infrastructure existed. The other two were in Argentina. One was in Buenos Aries to establish relationships and Argentinean expertise, and the second was in Catamarca—the largest town close to the campus site. With offices in place, the project start-up team began developing procedures for getting work done, acquiring the appropriate permits, and developing relationships with Chilean and Argentine partners.

During the planning phase, the project team developed an integrated project schedule that coordinated the activities of the design, procurement, and design teams. The project controls team also developed a detailed budget that enabled the project team to track project expenditures against the expected expenses. The project design team built on the conceptual design and developed detailed drawings for use by the procurement team. The procurement team used the drawings to begin ordering equipment and materials for the implementation team; to develop labor projections; to refine the construction schedule; and to set up the campus site. Although planning is a never-ending process on a project, the planning phase focused on developing sufficient details to allow various parts of the project team to coordinate their work and to allow the project management team to make priority decisions.

The execution phase represents the work done to meet the requirements of the scope of work and fulfill the charter. During the execution phase, the project team accomplished the work defined in the plan and made adjustments when the project factors changed. Equipment and materials were delivered to the work site, labor was hired and trained, a learning center site was built, and all the development activities, from the arrival of the first computer to the installation of the final light switch, were accomplished.

The closeout phase included turning over the newly constructed campus to the operations team of the client. A punch list of a few remaining items was developed and those items completed. The office in Catamarca was closed, the office in Buenos Aries archived all the project documents, and the Chilean office was already working on the next project. The accounting books were reconciled and closed, final reports written and distributed, and the project manager started on a new project.

KEY TAKEAWAYS

- The phases of a project are initiation, planning, execution, and closeout.
- The initiation phase, which PMI calls “starting the project,” includes activities such as holding alignment and kickoff meetings, identifying the project team, developing the resources needed to develop the project plan, and identifying and acquiring the project management infrastructure.
- The planning phase, which PMI calls “organizing and preparing,” includes developing detailed staffing, procurement, and project controls plans.
- The execution phase, which PMI calls “carrying out the work,” includes the major activities needed to accomplish the work of the project.
- The closeout phase, which PMI calls “closing of the project,” includes transferring staff, archiving documents, closing offices, completing punch list tasks, and turning over the results of the project to the client.

[1] Project Management Institute, Inc., A Guide to the Project Management Body of Knowledge (PMBOK Guide), 4th ed. (Newtown Square, PA: Project Management Institute, Inc., 2008), 11–16.

3.2

Project Phases and Organization

Organizational Chart | Organizational Structure | Project Complexity

LEARNING OBJECTIVES

1. Identify the various functions represented on a project.
2. Analyze and evaluate the influence of organizational structure on project functions.
3. Design a project organizational chart for various project complexity profiles.

There is no single organizational approach to projects. Each project is organized to accomplish the work effectively and efficiently. Several factors influence the organizational approach to execute a project. The complexity profile of a project, the culture of the parent organization, the preferences of the project manager, the knowledge and skills of the team, and whether the project management office is in-house or outsourced are some factors that influence the project's organization.

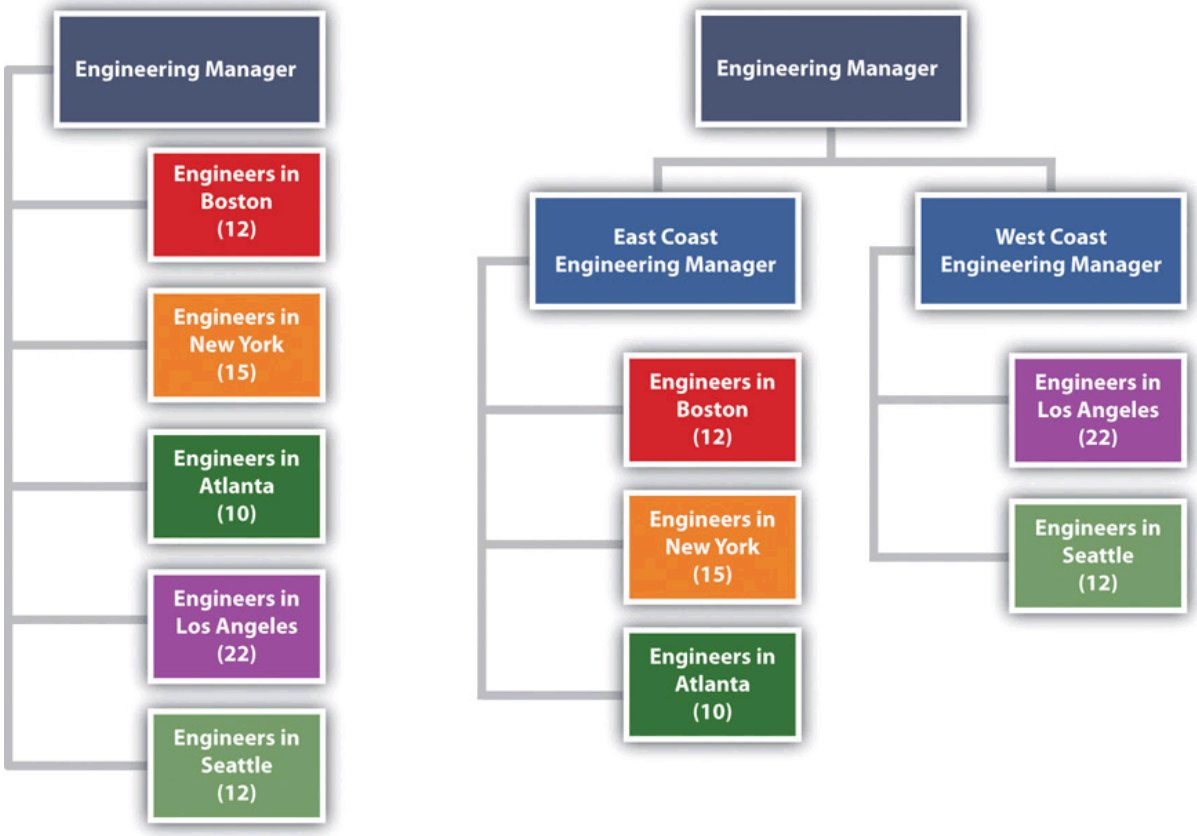
Image by nicholasjon

In developing the project organizational structure, the project manager considers the span of control for each manager. The span of control represents the number of people reporting to a manager. For example, the project manager does not want all of the artists on a project reporting to the art director and assigns lead artists to report to the art director with groups of artists who work on particular aspects of the design reporting to their group's lead artists.

The art director can organize the art department reporting structure so that the various lead artists would report to him or her. For example, the lead artists for various aspects of an instructional design project would report to the art director. On a larger, more complex project, the art director may establish area team leaders and have the art leads for each area report to an area art lead. If the project is geographically dispersed, with areas of the art department in different cities working on the project, then structuring the art function by area provides better coordination and control (see Figure 3.1).

Figure 3.1

Decreasing Span of Control by Increasing Levels of Reporting



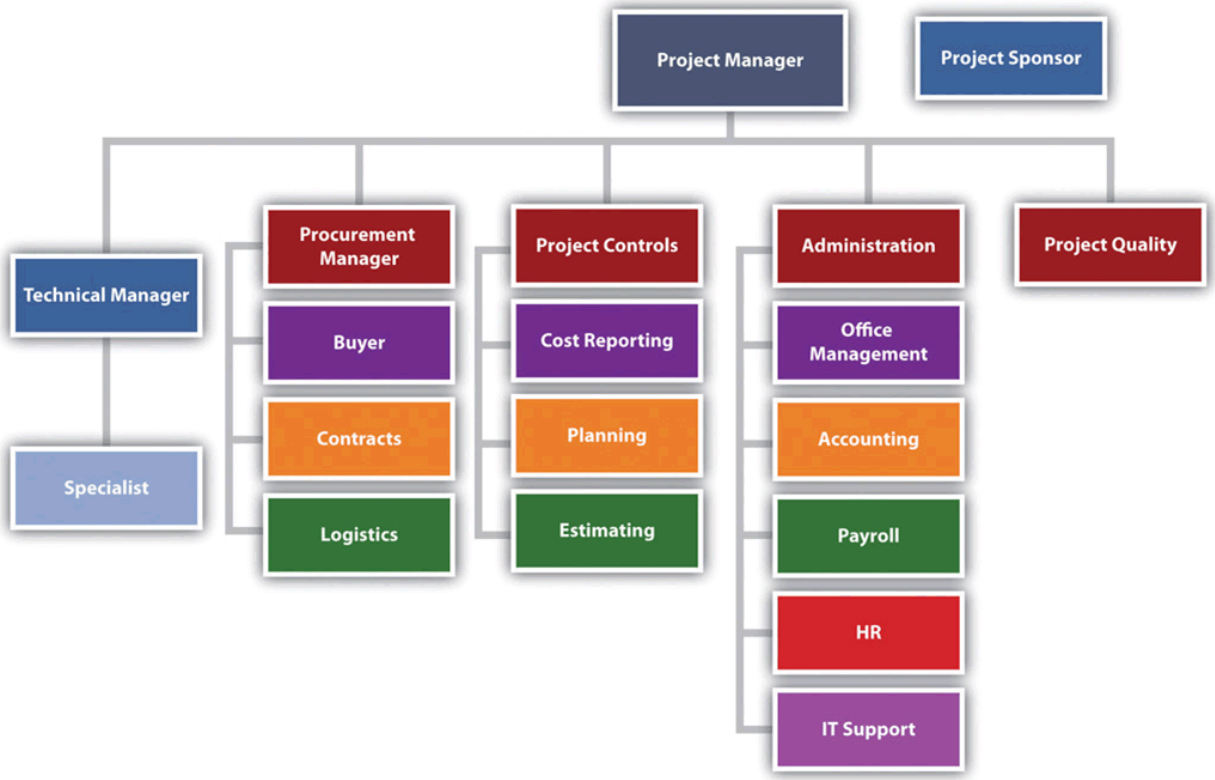
The organization on the left has seventy-one artists reporting to the same person. The organization on the right creates two additional positions and reduces the span of control to thirty-seven and thirty-four, respectively.

Most projects have similar functions that are important to successfully managing the project. Included among these are the following:

- Sponsor
- Project manager
- Controls
- Procurement
- Technical management
- Quality
- Administration

Figure 3.2

Typical Project Organization



On smaller projects, more than one function can be managed by one person. On larger projects, large teams may be needed to accomplish the work within the function.

Project Sponsor

The project sponsor is outside the day-to-day operations of the project and has the organizational authority to provide resources and overcome barriers for the project. The project sponsor is typically a leader in the parent organization with an interest in the outcome of the project. As a leader in the parent organization, the project sponsor can provide input into the project scope and other documents that define project success. The guidance and support from the project sponsor enhances the ability of the project to successfully meet the parent organization's objectives.

Southern Training Center Organization

A training organization in South Carolina assigned a project sponsor to every project. For smaller projects, the regional manager fulfilled the role of project sponsor. On larger, more complex projects, the operations manager was the project sponsor. The vice president was the project sponsor of the three or four most complex projects, and the president was the project sponsor only on projects with a high degree of political risk. This approach to assigning project sponsors assured that each project had an organizational advocate that could address barriers and provide direction and resources. The project sponsor, in this organization, developed a relationship with a senior representative of the client organization, reviewed monthly reports, and conducted thorough quarterly reviews.

Project Manager

Project managers often have the breadth of responsibility associated with corporate chief executive officers (CEOs). The project manager facilitates the start-up of a project and develops the staff, resources, and work processes to accomplish the work of the project. He or she manages the project effectively and efficiently and oversees the closeout phase. Some projects are larger than major divisions of some organizations, with the project manager responsible for a larger budget and managing more risk than most of the organizational leaders. A mining company that builds a new

mine in South Africa, an automobile manufacturer that creates a new truck design, and a pharmaceutical company that moves a new drug from testing to production are examples of projects that may consume more resources in a given year than any of the organization's operating divisions.

The function of the project manager can vary depending on the complexity profile and the organizational structure. Defining and managing client expectations and start-up activities, developing the scope, and managing change are functions of the project manager. On some projects, the project manager may provide direction to the technical team on the project. On other projects, the technical leadership might come from the technical division of the parent organization.

Although the functional responsibilities of the project manager may vary, the primary role is consistent on every project. The primary role of the project manager is to lead, to provide a vision of success, to connect everyone involved in the project to that vision, and to provide the means and methods to achieve success. The project manager creates a goal-directed and time-focused project culture. The project manager provides leadership.

Project Control

In general, project controls is both the planning function and the function that tracks progress against the plan. Project control provides critical information to all the other functions of the project and works closely with the project manager to evaluate the cost and scheduling impact of various options during the life of a project.

Sometimes accounting functions such as payroll, budgeting, and cash management are included within project controls. On larger projects, accounting functions are typically separate because the accounting culture tracks expenses to the nearest penny, and cost estimating and tracking by project controls can often be off by hundreds and sometimes thousands of dollars. The lack of definitive information necessitates the development of cost estimates within ranges that are often inconsistent with accounting practices. Separating these two functions allows each to operate within their own accuracy comfort zone. The following are typical activities included within the project controls function:

- Estimating
- Tracking costs
- Analyzing trends and making projections
- Planning and scheduling
- Managing change
- Tracking progress against schedule

The project controls team gathers this information from all the functions on the project and develops reports that enable each functional manager to understand the project plan and progress against the plan at both the project level and the functional level. On large complex projects, some project managers will assign project controls professionals to work within the major functions as well as the project management office. This approach allows each function to plan and track the function's work in more detail. The project controls manager then coordinates activities across functions.

Project Procurement

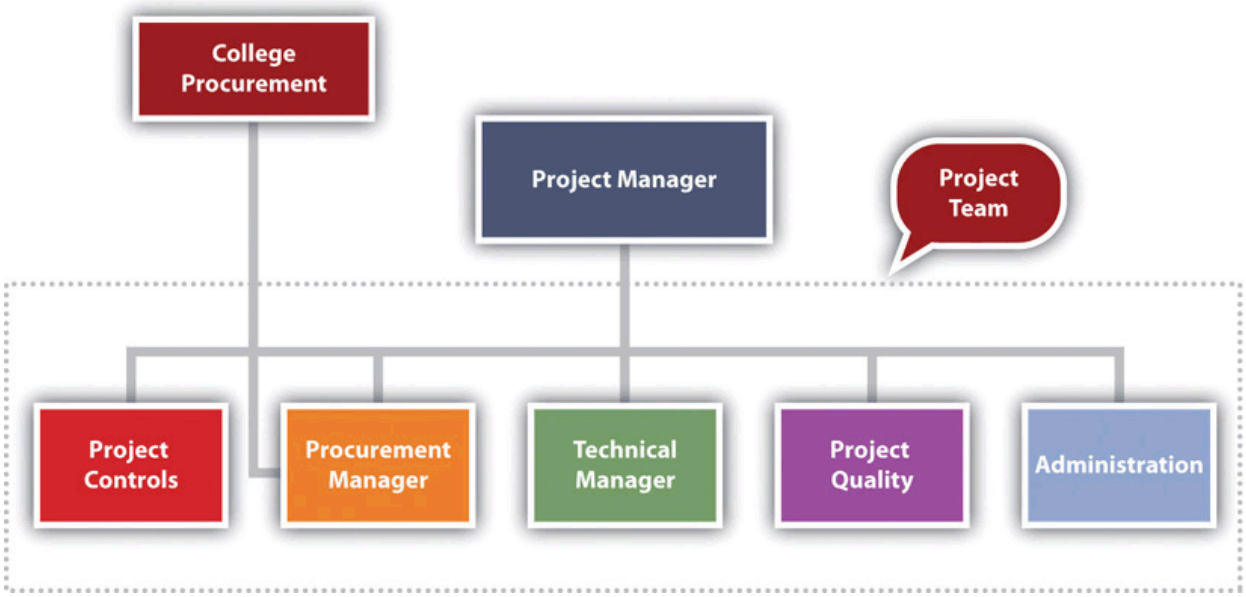
The approach to purchasing the supplies and equipment needed by the project is related to the complexity profile of the project and is, therefore, elaborated on in this chapter; however, the procurement process is discussed in more detail in Chapter 9. A small project with a low complexity level may be able to use the procurement services of the parent organization. In an organization where project resources reside in various departments, the departments may provide the supplies and equipment each team member of the project may need.

Southern College Procurement Organization

A college in South Carolina chartered a number of projects to increase the energy efficiency of the college. The project team included members from various college departments. Each department paid for the time, travel expenses, and supplies needed by the team member from their department. Each team member continued to use the computers and administrative support in their department for project work. The costs for this support was not included in the project budget nor tracked as a project expense. Equipment purchased by the project that was installed to reduce the energy consumption of the college was purchased through the college procurement department and charged to the project. More complex projects with greater procurement activity may have a procurement person assigned to the project. This same South Carolina college retrofitted a warehouse to create a new training center for industry. A procurement person was assigned to the project to manage the contract with the construction firm remodeling the space, the purchase and installation of the new training equipment, and the purchase of the supplies needed by the project team. All the procurement activity was charged to the project. The procurement person reported to the project manager for better communication on what the project needed and participated as a member of the project team to understand and provide input into the costs and scheduling decisions. She also reported to the college procurement manager for developing and implementing project procurement processes that met college procurement policies and procedures.

Figure 3.3

Figure 3.3 The Procurement Manager is Part of the Project Team



On larger, more complex projects, the procurement team has several responsibilities. The team is responsible for procuring the supplies and equipment (such as office supplies and computers) needed for the project team and the supplies and equipment (such as the training equipment) needed to execute the project. On an instructional filming project, the procurement team would rent set fixtures, office supplies, and computers for the project team to outfit a film crew on location. The procurement team would also purchase or acquire costumes, make-up artists, catering services, camera operators, and other materials needed for filming.

Procurement for Distance Learning Project in South America

On the large distance learning project in South America, during the initiation phase of the project, the procurement department arranged for office space and supplies for the design teams in Canada, Chile, and Argentina and offices at the site in Argentina. As the design progressed, the procurement team managed bids for the computer equipment and bids for the preparation of the campus site. The procurement team managed the logistics associated with transporting

equipment from Europe, North America, and Asia to the job site in rural Argentina. After the completion of the project, the procurement team managed the deposal of project property.

On large, complex projects, the procurement team manages at least three types of relationships with companies doing business with the project.

Commodity Procurement

The largest number of purchased items for most projects is commodity items. Commodities are items that can be bought off the shelf with no special modification for the project. These items are typically bid and the lowest prices that can meet the schedule of the project will win the contract. The procurement team assures the company that wins the bid can perform to the contact specifications and then monitors the progress of the company in meeting the projects requirements. Software for the project and the computers or other technology leased to the project are examples of commodities. The key to success in managing commodity suppliers is the process for developing the bids and evaluating and awarding the contracts.

Procurement from Vendors

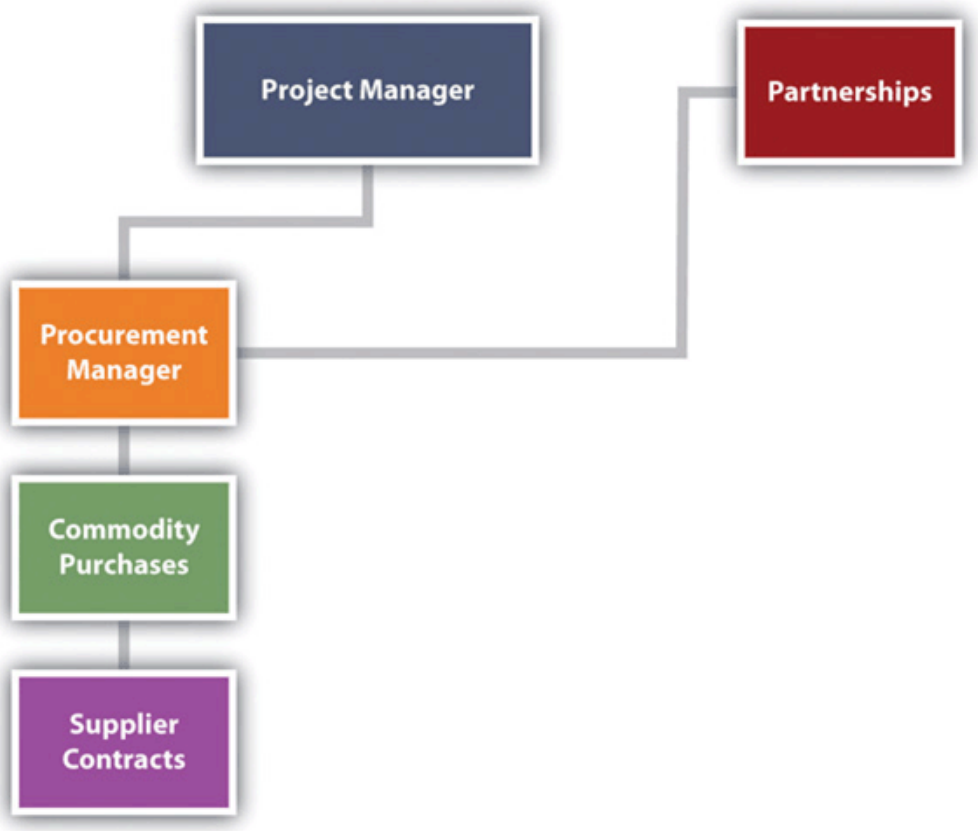
The second type of relationship is the vendor relationship. The terms supplier and vendor are often used interchangeably. In this text, suppliers provide commodities, and vendors provide custom services or goods. Suppliers bid on specialized equipment for the project. Programmers will specify the performance requirements of the equipment, and suppliers that have equipment that meets the requirements will bid on the project. The programming team will assist in the evaluation of the bids to assure compliance with specifications. The lowest bid may not win the contract. Sometimes the long-term maintenance costs and reliability of the equipment may indicate a high price for the equipment. The key to success is the development of clear performance specifications, good communication with potential bidders to allow bidders to develop innovative concepts for meeting the performance requirements, and a bidding process that focuses on the goals of the project.

Partnerships

The third type of project procurement relationship is the partnership. Sometimes the partnership is legally defined as a partnership, and sometimes the success of each partner is so closely tied together that the relationship operates as a partnership. On the South American project, the project team partnered with an Argentinean instructional design company to access the local education practices and relationship with local software vendors. This was a legal partnership with shared profits. The partner also designed and procured some programmed instructional materials on which the success of the project and the company designing the overall project depended. With this type of relationship, a senior manager on the project is assigned to coordinate activities with the partner, and processes are put in place to develop shared goals, align work processes, and manage change.

Figure 3.4

Procurement Manager Relationships



Technical Management

The technical management on the project is the management of the technology inherent in the project—not the technology used by the team to manage the project. The technical complexity on a project can vary significantly. The technological challenges required to build a submarine navigation training system are significantly different from those required to build an instructional unit for first grade math. The technological complexity of the project will influence the organizational approach to the project. The technological complexity for a project reflects two aspects: the newness of the technology and the team's familiarity with the technology. The newness refers to the degree to which the technology has been accepted in the industry. The more accepted the technology is in the industry usually means that more knowledge and experience will be available to the team. Familiarity refers to the experience the project team has with the technology. The less familiarity the team has with the technology, the more energy and resources the team will expend on managing the technological aspect of the project. For projects with high levels of project technology, a specialist may be hired to advise the technology manager.

Project Quality

Project quality is often part of the technical manager's responsibility. On large projects or projects with a high degree of technical complexity, the quality is sometimes a separate function. The project quality manager focuses on the quality of the project work processes and not the quality of the client's product. For example, if the project is to design and construct training for insurance agents, the quality manager focuses on the project work processes and meeting the technical specification of the instructional materials created by the project team. The project quality manager is not responsible for the quality of the instructional materials that the team produces. If the design team's computers, and other support equipment and materials function to the defined project specifications, the quality of the instructional

designer team's output is the responsibility of the company's quality department, and it may take several months for the company to refine the work processes to meet the design specifications of the instructional materials.

On an instructional design project, the quality manager may test the programmers to assure the programmers have the skills and that the code meets project specifications. On a training project, the quality manager may review the training curriculum and the qualification of the instructors to assure the training provides the knowledge and skills specified by the client. On a drug development project, the quality manager may develop processes to assure the water and other raw material meet specifications and every process in the development process is properly documented.

Project Administration

The administrative function provides project specific support such as the following:

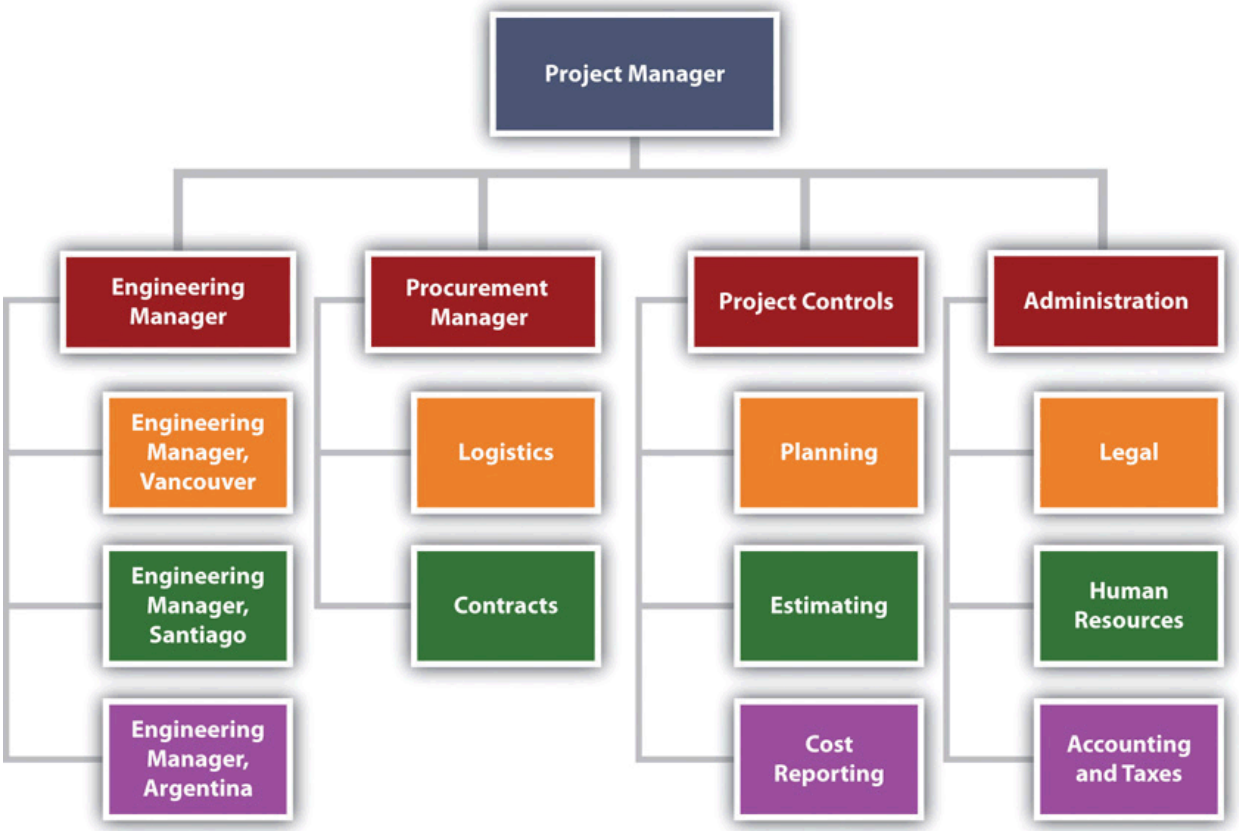
- Accounting services
- Legal services
- Property management
- Human resources (HR) management
- Other support functions found in most organizations

In most organizations, support for these functions is provided by the parent organization. For example, people assigned to the project will get human resources (HR) support from the HR department of the parent organization. Salary, benefits, and HR policies for employees assigned to the project will be supported out of the HR department. The parent organization will provide accounting functions such as determining the cost of cash, taxes, year-end project reports, and property disposal at the end of the project.

The project manager on smaller, less complex projects will have sufficient knowledge about these issues to coordinate with the parent organization's functional leaders. On more complex projects, the project may have an administrative manager responsible for coordinating the administrative functions of the projects. On larger, more complex projects, an administrative function may be established as part of the project team, with many of the functions assigning a resource to the project. In all cases, the administrative function on a project is closely related to the legal and organizational responsibilities of the parent organization and close coordination is important.

Figure 3.5

Organization for Major International Project



KEY TAKEAWAYS

- Key job functions on a project include the sponsor, project manager, controls, procurement, technical, quality, and administration.
- The project sponsor has the organizational authority to provide guidance and resources and can overcome barriers for the project.
- The project manager is the project leader with broad responsibilities for all phases of the project and for meeting project goals and client expectations.
- The project controls manager is responsible for controlling the project processes, including cost estimating and tracking, developing schedules, tracking progress against schedules, managing changes to the schedule or budget, and analyzing trends.
- The procurement manager is responsible for obtaining the services and materials needed to complete the project. This is accomplished by purchasing commodities, managing contractors who provide services and products, and working with partners.
- The technical manager deals with the issues related to the technology of the project.
- The quality manager monitors the project's processes—not the quality of the product of the project—and takes steps to assure they are done correctly and meet specifications.
- Project administration manages accounting, legal, property, and human resources.

4

Understanding and Meeting Client Expectations

Overview

This chapter aligns with the beginning of Chapter 3 of the PMBOK where stakeholders are addressed and 11% of the CAPM questions come from this knowledge area. The content connects to the Initiation and Planning category of the PMP questions.

Project management, especially within instructional design, revolves around understanding and meeting client expectations. Even the most efficiently completed project will not count as a success if the client and other important stakeholders are unhappy with the results. Accordingly, every successful project will necessarily have a plan or strategy of some sort in place for making the client happy. Depending on the complexity level of the project, this strategy to meet the client's expectations can range from having a general discussion with the project leadership team to developing a formal plan that is tracked during the life of the project. Since project stakeholders can often exert considerable influence over the success of the project with expertise, political influence, and additional resources, an essential element of such a plan will be on how to motivate the client to contribute to the team's success throughout the life of the project.

Designers Share Their Experiences

Dr. Andy Gibbons – Instructional Psychology and Technology – BYU

Watch on YouTube

Miscommunication did happen on this project. We were working with people who were trained in how to operate helicopters, how to fly them and how to operate the electronic equipment in the back of the helicopter. We found that, well first of all, the first communication challenge that we came up against was the communication of the content itself. I wasn't trained in helicopter piloting. I had no idea what a sensor operator was until I shook hands with one. I had no idea how the technical worked. I had no idea how the strategic part of this, how you actually play the chess game of finding a submarine that is under the water. And yet at the surface that's what these people were trained to do. So the first communication problem that we had was the subject matter. The second was the simple day-to-day communications with people who, in some cases, were highly motivated towards our project, and in some cases weren't. Learning to manage people's motivations became a very important challenge for us. There were people who just wouldn't show up for work when they were scheduled to work. Not on my staff but on the Navy's staff. Because they would have a check-ride in a simulator or they'd be doing something else, and we were low priority for them. Probably the biggest miscommunication problem that we had—had to do with an entire section of the subject matter. We mistook that what we were trying, what we were supposed to do was train people how to fly this helicopter and how to operate the sensors in the back of the helicopter. It turns out that, and we did our task analysis, a very thorough task analysis, reams of paper, showing all the things that needed to be trained and these resulted in instructional goals, however there was kind of a meta-performance that these people were engaged in. It was not just flying the helicopter, and not just operating the sensor equipment in the back. It was using the combination of pilot and sensor operator skills as a team to fly across the top of the water, looking for, first of all to detect a submarine and once you had detected it finding a way to keep track of it and to keep tracking. Of course the submarine is trying to escape. So there is this whole strategic, or what they call the tactical section of the training, and we found out about two-thirds of the way through the project that the subject matter expert team had not told us about this part of it, and we had not noticed it, it was kind of a stupid mistake on our part. So I looked at the subject matter, the head subject matter expert and said, we need to do a little bit more task analysis and add some things to the curriculum. Of course, by then, the budget had been set on a certain number of things to be created. And so,

when I said to him that means we're probably going to have to create some more instructional pieces. He said, well no, and he started finding excuses not to do that part of the course. Well once again the people on the East coast, because they had clear water, were much more expert it turns out. And when the training hit the East coast training site, the first thing they did was they opened up the box, and they took out the training. And they looked for this part on these tactical exercises. And it wasn't in the course. And so they immediately packed up the box and sent it back and said this course is useless for us. We need the tactical part. And what happened, the long and the short of it was, the U.S. Navy had to make another contract, and design more training. And the subject matter expert turned out to be wrong. He should have said, yeah we're going to develop more training. And so, that's how that worked out.

Heather Bryce – Independent Studies – BYU

Watch on YouTube

Well, we did have some miscommunication. The instructional designer was brand new, and so, wasn't as familiar with our processes as other instructional designers. So when we originally meet, we have all the supervisors meet together for collaborative meetings. Which, these types of meetings can be very expensive when you have a lot of full-time people meeting together. The instructional designer continued to have meetings, but normally what we would do is, we would have meetings with perhaps the student employee who is actually doing the work and not everybody who is involved at the supervisor level. So we had a lot of meetings with people that didn't necessarily need to be there that were probably extra meetings, and that of course made the project become quite expensive in meeting time. So that was a miscommunication on my part in communicating with the instructional designer that all those meetings weren't necessary. So the cost on this course grew quite quickly, but at the same time it was also good because there was a lot of collaboration, more than we would have on a normal course within the department. So, it was not a good thing as far as the course expense, but the course ended up being a really amazing project. The final product was amazing and actually won an award.

Dr. Larry Seawright – Center for Teaching and Learning – BYU

Watch on YouTube

Oh gee, where do I start. In the Learning Suite project, where we are building such a large and complex system that interacts with faculty and students, it accesses University databases that are password protected, that are roll protected. One of the key issues is communication of those requirements to our IT organization. Early on, one of the miscommunications that we had concerned some of the services we needed built, and it just never got done. So here we are progressing right along with the development, and so then we call up this person and say, “Is the service ready?” “What service?” Well, we actually never told them which service it was. So you know, it was a miscommunication on our part, but it was, you know, we didn’t tell them exactly what to build, and they have a completely different process. We’re not a professional in IT organization that normally builds gigantic applications like this. We’re the Center for Teaching and Learning, so we’re a bunch of PhDs who specialize in design and development of instruction materials and we just kind of happen to fall into building this Learning Suite because we made something called the Syllabus. That is the biggest part of the problem, is we’re not IT folks. So I am the associate director and the project director. Kind of, well it’s not two hats, its multiple hats that I’m wearing because I do other things. I’m also the Center’s evaluator. Etc. Etc. So you see, you know, with a smaller organization we do a lot of things. In big centralized IT organizations where they have not just one, but multiple project managers, that greatly facilitates project management on a scale where you could develop Microsoft Project plans and enterprise wide project plans in lots of detail, spreadsheets, etc. etc. We have a whiteboard where we track things. So the miscommunication happened because of our limited resources. You know, we do what we can, we try to be as professional as we can, but sometimes we fail to communicate in the way that the other party expects. So that was the primary difficulty. So you always want to try to verify that what you ask for got communicated. It got through the request process in a way that they could hear it.

Including the Client

Understanding Values and Expectations
Dealing with Problems

4.1

Including the Client

client | Project Phases | Project Teams

LEARNING OBJECTIVES

1. Describe what the client needs to know about the management style during different phases of a project.
2. Identify advantages and disadvantages of including the client on project teams.

To appreciate the skill and effort expended by the project team in achieving the objectives of the project, the client needs to know more about what the team does.

Educate the Client from the Beginning

Often the client does not have project management experience and, therefore, does not understand project phases and the requirements of the different phases. A less-experienced client may become frustrated at the changes in the management approach required for the different phases of the project. For example, during the early phases, the project leadership is encouraging creative approaches to accomplishing the project goals. As the project proceeds and the project plan becomes more firm, the project leadership focuses on accomplishing the project goals. The types of meetings, the agenda of the meetings, and the general project atmosphere change as the project moves from the planning phase to the production mode of the execution phase of the project.

Image by PehMed2020

During the last phases on a project, project team members are often tired and beginning to anticipate the transition that will take place at the end of the project. The motivational approach that worked during the early phases of the project is less effective during the final phases, and the project manager applies different approaches to motivating the project team. These changes can be disconcerting on a person's first project. By explaining what to expect and planning with the client a process to minimize the impact of these changes, the project manager prepares the client for these events and reduces the frustration.

Include the Client on Selected Project Teams

The client translates the needs of the organization through chartering the project and defining the project scope to the project manager and the project team. The client also has a supervision role. This supervision is often accomplished through regular project reviews and reports from the project team. Depending on the complexity level of the project, the reviews can vary significantly. On less complex projects, the review might be conducted in a one-hour meeting with a one-page summary document serving as the project progress report. On more complex projects, a full-day meeting might be necessary for the project progress to be fully understood, and the project report may be one hundred pages or more.

In addition to providing the formal overview of the project, most clients would like to actively participate in the success of the project. This is a delicate balance. The participation of the client can have undue influence on project decisions. The advantage of including the client in project activities is to gain the client's personal investment in the project plan, to create a better understanding for the client of the problems the project encounters during the life of the project, and to gain the insights and contributions of the client in problem solving.

Involving the client in teams where the client's special knowledge can add value to the team discussions and activities contributes both to the success of the team and the satisfaction of the client. During the development of a chemical-plant employee training in Tennessee, the project team struggled with a very tight project schedule. A team was established to explore ways to reduce the approval process for the drawings of the instructional design. It was taking two weeks for the design review, and even though this was within the normal time frame for design reviews, the project management team believed there were opportunities to reduce this time and shorten the length of the project.

The client's engineering manager participated in the brainstorming sessions that explored ways to reduce the design review time. Several good ideas were developed and put into place. The client's engineering manager took these ideas

back to the client's team and instituted many of the same ideas. There were two positive results: (1) a shortened schedule that saved two weeks by the end of the design, (2) a client that was emotionally engaged in the positive outcomes and contributed to the project success.

KEY TAKEAWAYS

- The project manager's style changes with each phase of the project. The client might not have experience with project phases and needs to be guided through the different phases, the purposes of each phase, and the different management styles those entail.
- Client participation in project teams can have undue influence on decisions, but this is offset by the buy-in of the client and the insights the client can offer when special knowledge is needed or schedules need to be changed.

4.2

Understanding Values and Expectations

client expectations | differing values | fair dealings

Learning Objectives

1. Identify methods for determining client expectations.
2. Identify methods for clarifying values and determining differences.
3. Describe the importance of dealing fairly with the client.

Two of the sources of dissatisfaction in personal and business interactions are unmet expectations and a misunderstanding or ignorance of the values held by the other party. The project manager needs to avoid having an unsatisfied client due to a clash of values or a failure to meet expectations.

Clarify Expectations

Client expectations are expressed in chartering documents such as the scope of work, the project purpose statement, and the list of project deliverables. Other expectations exist that are more difficult to express in written documents.

Managing Expectations

One project client had such a difficult time with the billing processes on her previous project that significant project management time and resources were expended on reconciling billing issues. This client has an expectation in the next project that project accounting and billing processes operate effectively and efficiently.Another client had been constantly surprised by changes and unplanned events happening on the project. This client wanted to participate early in the discussion of problems that arise during the life of the project and contribute to finding solutions and minimizing the negative impact on project performance.

Understanding and capturing these expectations in a written document is an important step in effectively meeting client expectations. Often it is the next question that enables a project manager to discover the less obvious expectations. The next question is the one the project manager asks after the initial response to inquiries about expectations. In our example, the client may express that he or she wants project billings to be accurate and timely. This is an easily understandable expectation, but when the project manager asked the next question—“Can you tell me more about what you mean?”—the client revealed the problems on her previous project, and the project team developed a better understanding of the client’s concern. The project team developed measures for tracking project billings that measured both timeliness and accuracy. This process enabled the project team to understand the client’s concern, develop work

processes that demonstrated a response, and provide data to the client on the timeliness and the accuracy of the billing processes.

For the client that expected to hear about problems early and participate in the problem-solving discussions, the project team shared the project action item register and highlighted issues the team felt may be important to the client. The project manager also discussed potential concerns with the client during their weekly project update.

After the project team captures the client expectations, the team then develops a method for tracking performance against expectations. In our example, the project team defined accuracy and timeliness in measurable terms and tracked the team performance. The project team developed a survey to track the client's perception of inclusion in the problem-solving process and tracked the client's response. These measures were then presented in the project review meetings with other measures of project performance such as cost and schedule.

As the project team meets and exceeds the client expectations, these expectations tend to change. If the goal is 85% accuracy on all project billings, and the project team begins to perform with an average of 95% accuracy or higher and never falls below 90%, then the client begins to expect 95% accuracy. This is a realistic expectation of the client; it also changes the expectation so that meeting the client's expectation becomes harder. Even if expectations change, it is important to maintain the original goal. This reminds the client at the end of the project that the project team not only met expectations but also raised them during the life of the project.

Clarify Values

Values are desirable principles or qualities.[1] Disagreements based on differences in values are extremely difficult to resolve because compromising means compromising your values. Organizations often have developed a list of corporate values. Sometimes these are real and sometimes they are more important to the corporate brand. The project manager needs to understand the real organizational and personal values of the team members related to the project.

Image by Ministerio Secretaria General de Gobierno

Communication Values

A large project in Washington had a client that valued prompt communication. All the members of the client's team had the latest phone technology and took calls during project meetings. The project team saw this behavior as rude and interfering with the effectiveness of the project. The client was very comfortable in this chaotic environment and valued constant communication because it provided them with a competitive advantage in their marketplace by enabling quick identification and response to opportunities. The same behavior was preventing the project team from developing a common understanding and agreeing on a project plan because they could not focus on the needs of the project long enough to develop this common understanding. The project manager and the lead client recognized the potential conflict for the project and developed a list of project meetings that would be "cell-less," which meant that the team members would turn cell phones off for that meeting. Other meetings would follow the cultural standards of the client.

Developing a mutual understanding of the personal and organizational values and dealing with differences during the early phases of the project will significantly reduce the potential for insolvable conflicts. This becomes more important on a large, complex project where the likelihood of a diverse project team is high, and the team may have to deal with different laws, customs, and cultural values. Developing an understanding of these differences and developing an appreciation for the value of this diversity for project team members can prevent conflict later in the project.

Deal Fairly with the Client

During the life of the project, the project manager will often have the opportunity to take advantage of the client, either because a clause in the contract is not written accurately or because the project manager has access to more detailed information. For example, a client finds a mistake in the original documents provided to the project team. The project team analyzes the new information to access the potential impact on the project cost and schedule. A skilled project manager can demonstrate a negative impact and increase project profits by requesting a change order. A skilled project

manager can also usually find an innovative approach to finding a solution without increasing the cost or schedule. In most cases, the client wants to be treated fairly. ***Fairness*** is characterized by impartiality and honesty that is free from self-interest, prejudice, or favoritism.[2] If the client interprets the change order as fair, then the project manager has the opportunity to create a satisfied client. If the client believes the behavior of the project manager is unfair, then it is difficult to create a satisfied client.

Key Takeaways

- To identify client expectations, review written documents, but have a dialogue with the client to uncover unwritten expectations by asking questions and listening. Manage increasing expectations by reminding the client of the original objectives.
- Understand the stated corporate values by reviewing written documents and client actions related to those stated values.. Attempt to avoid conflicts of values by identifying the differences before they become problems.
- Do not take advantage of clients' mistakes, but help them meet their objectives in spite of their errors. Live your own values of fairness.

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4.3

Dealing with Problems

Decisions | Procedures | Responsibilities | Standards

LEARNING OBJECTIVES

1. Describe standards and procedures for dealing with problems.
2. Describe the advantages of dealing with difficult issues as soon as they arise.
3. Describe the importance of establishing methods for revising major decisions.

Projects always experience unexpected problems that produce stress. Dealing with problems with competence is vital to maintaining a good relationship with clients.

Establish Standards and Procedures for Decisions

There are competing interests on projects, and the larger and more complex the project, the greater the number of issues and concerns that need to be addressed.

Competing Interests

It's 7:30 in the morning and the client called and wants you to have coffee in an hour with the new CEO, who flew in last night, to give him an update on the project. The instructional designers were supposed to be on site at 7:00, but they have still not arrived. A news reporter called and said she has an unnamed source who claims that there are sexual-harassment policy violations in your team.You decide to postpone a team meeting about project scheduling and cancel lunch plans with your daughter. It's going to be a busy day.

On large, complex projects, hundreds of decisions are made every day. Most of the decisions focus on the day-to-day operation of the project. Early in the project, decisions focus on choosing between alternative options for accomplishing project goals and determining how the project will be executed. Later, the focus is typically on solving problems. The project team develops solutions to deal with the barriers that emerge and develops alternative plans to meet project goals. The authority to make decisions is typically established early in the project and identified in a responsibility matrix—a table of people and types of problems that might require decisions—as shown in Figure 4.1.

Figure 4.1

The Responsibility Matrix

Title	Scope Statement	Work Breakdown Structure	Budget	Quality	Change Management Procedures	Change Approvals
Project Chartering Committee	✓					
Client Representative	✓	✓	✓	✓	✓	✓
Project Manager	✓	✓	✓		✓	✓
Technology Team		✓		✓		
Finance Team			✓		✓	
Schedule Coordination Team		✓		✓	✓	

The responsibility matrix identifies roles and client involvement.

Decisions that influence the outcome of the project, such as a delay to the project completion date or an increase in the project costs, typically involve the client. Some clients prefer to make the final decision, with the project manager developing alternative solutions with a cost-benefit analysis of each of the alternatives. Others prefer to be involved in discussions to better understand the barriers, developing alternative solutions and making decisions in a team environment. Understanding the client's decision-making preference and developing procedures and processes that support that preference is important to meeting client expectations.

Develop processes and methods that encourage both the client and team members to identify issues and concerns early and develop processes for dealing with them effectively. Define how and when decisions are made.

Image by World Economic Forum

On projects with a low complexity level, the project manager and team leaders can make decisions informally, with short meetings or phone calls. Weekly or monthly staff meetings are appropriate for more important decisions. Even though the decision-making process may be simpler on less complex projects, it is still important to understand the client's expectation for inclusion in the decision-making process and recording decisions and changes in project plans.

On more complex projects, the use of action item registers, weekly staff meetings, responsibility matrices, and other tools foster the decision making on a timely basis. For project teams operating in diverse locations, Internet-based tools for recording and tracking action items are beneficial in capturing issues and concerns.

Inform Client of Difficult Issues Early

Project managers typically have a high degree of confidence in their ability to deal with issues and concerns as they arise. Let's say the delivery of some equipment is delayed a week, causing changes in the project schedule, or the beta test of a software program identified far more problems than expected. If the project manager knows the problems, the project has a plan for recovering, the team developed a solution and will be back on track soon, should the project

manager inform the client? The answer seems like an easy yes, yet many project managers often believe there is no reason to bother the client with a problem they have under control.

Then suppose a second delay occurs on the equipment delivery or the fixes for the beta test are more costly than expected. Now the problems have elevated to the point the client needs to be informed. The greater the distance between the time of the event and the time the client knows about the events, the greater the client's frustration and mistrust. Including the client in the processes for handling project issues or concerns, as well as recovery planning, enables the client to develop confidence that problems will be addressed successfully. Including the client early in the process for dealing with problems enables the client to contribute with solutions and builds confidence that there is open and clear communication.

New Estimates Increase Cost Projections

On a large, complex project in South America, the project team was re-estimating the project cost and schedule projections after the project design was complete. The team was also conducting a new risk analysis, and the results of the cost and schedule projections, together with the risk analysis, provided the client with better cash flow projections. Early in the process, the project team understood that the cost projections would greatly increase and the final project cost would be significantly above the contingency set aside for the project.The client looked for an early indication of the results of the analysis, and the project manager kept reporting it was too early to know. The project team debated how much contingency the project needed and how to inform the client. When the client was told the results of the cost projections, the response was a combination of frustration and anger. The project manager was removed from the project and a new project manager assigned.

In the example above, when first indications suggested that estimates were low and several items in the budget needed extra funds, the project manager should have had conversations with the client. Including one or more members of the client's team in the reevaluation effort would have kept the client informed of the progress regularly and built trust in the new numbers. The project team could have offered suggestions and contributed to possible solutions for addressing the concerns that were developing, as costs were higher than expected. Dealing openly and early with the client is critical to client satisfaction.

Clients are often involved in major decisions on the project. For example, if the project invested another million dollars, the project could be completed a month early. The client will conduct the cost-benefit analysis and decide if the extra expense is worth the gain in time. Once this decision is made, the necessary changes are made in the execution plan and new goals are established through the change management process. Later, for reasons outside the control of the project, the project will not experience the time savings from the additional investment of funds. It is important to revisit the decision. A culture that encourages project team members to bring up the need for revisiting decisions and a mechanism that makes it easy to surface issues and concerns will increase the likelihood that these issues will come to the attention of the management team.

Establishing a culture and a mechanism for revisiting project decisions is important for meeting client expectations.

Emergency Button

An experienced project manager came up with a clever idea to enable his clients to capture the attention of the project team. He gave the client's team a bright red index card and said, "This is your emergency button." The card was a symbol. It empowered the client with the ability to capture the complete attention of the project team. When the client presented the red button, the project manager instantly stopped current activities and focused on the client. The red button meant the project leadership focused on understanding the issue or concern presented by the client and developing project priorities to meet the client's concerns.Although the red button was rarely used, it gave a sense of power to the client and communicated that the client was important. One project manager used the "red button" on four projects, and on two of the projects the card was never used. On one project, the client used the card to get the project ready for a visit from the client's boss, and on the fourth project, the client used the card often. Although the project manager believed the card was overused to get the total attention of the project leadership team, he never regretted

providing the client with the card. The “red button” card provided them a method to distinguish the really important needs of the client.

Revisiting Major Decisions and Issues

The project environment moves fast, and decisions are made and implemented to keep pace. Decisions made in the conceptual phase of the project may not be effective during the design phase. It is not that the decisions made were necessarily wrong, based on the data at the time they were understandable. However, with new information, it is sometimes important to revisit and change decisions made earlier in the project. As obvious as this might sound, many project teams are reluctant to challenge earlier decisions. Without a mechanism in place to revisit decisions, the early decisions may be seen as final. This sense of finality may limit progress and prevent the project from completing on time, as well as potentially having a project that is irrelevant as soon as it is introduced.

Sometimes people ask that decisions be revisited just because they did not like the decision that was made.

Not Revisiting Decisions

On an educational training manual project, the visual design schedule was changed to support the completion of the activities on the critical path by a project milestone date. The change increased the number of hours needed to complete the work because of the change in work processes. The project manager accepted the costs of the change to achieve the milestone date, but the manager of the visual design team objected because the change would cause their part of the job to exceed the budgeted amount. The project manager decided not to revisit the decision because no new information was available that would cause the decision to change.
Mechanisms for revisiting decisions are similar to project change orders. With a change order, a request to revisit a decision must be initiated by someone on the team. The formality of methods used by the project to revisit a decision depends on the complexity profile of the project. On less complex projects, an informal discussion in project meetings can develop the awareness that a decision needs to be revisited. On more complex projects, the action item register and the weekly project meetings provide a venue for revisiting decisions.

Vendor Decision Revisited

On a major project creating a new marketing manual for a large university, the priority was completing the manual in time for recruiters to visit athletes and other high school students throughout the country. The client was involved in the process to select major policy wording, and after an expedited bidding process, an instructional design vendor was selected for a critical piece of the manual layout.Later, members of the project team learned that this vendor was overcommitted, and there was a high risk that the vendor would not be able to meet the schedule dates. Even though it was the client’s decision to hire the vendor, the project leadership had established that this kind of issue needed to be readdressed with the client and warned the client of the possible risk and suggested changing plans. The client decided to proceed. Weeks later, the vendor began missing critical dates just as the project team predicted.Since the issue had been revisited, the client took the blame. Changes were made that brought the project back on track and the project finished on time and within budget, making the client even more impressed with the project team.

KEY TAKEAWAYS

- Determine who should be included in decisions for each category using a decision matrix.
- Additional information that is developed during the design and planning phase can require that decisions made during the conceptual phase need to be reconsidered.
- Decide at what level of problem the client should be involved by discussing the threshold with the client. Involve the client early in the process and provide a mechanism to give them a chance to contribute to the solution before the problem gets worse.
- Decide what criteria to use to determine when a decision should be revisited.

5

Working with People on Projects

Overview

This chapter aligns with Chapters 3 and 9 of the PMBOK and 18% of the CAPM questions come from these chapters. The content connects to the Planning and Executing category of the PMP questions.

Few skills are more essential to the project manager than the ability to lead, inspire, and manage people effectively. By effectively managing relationship dynamics and enhancing communication among team members, a project manager can contribute enormously to the success of any given endeavor. Moreover, as project scope and complexity increase, these skills become increasingly important lest the project fall into a tangle of petty factions and unclear expectations.

Some of the key skills include:

1. The ability to work well with individuals. This includes skills such as responsiveness to the needs and motivations of team members and the ability to effectively negotiate and resolve disputes.
2. The ability to create effective team dynamics. The project manager must take the lead in ensuring that trust and accountability are engendered, developing goals, effectively managing meetings, and monitoring team progress.
3. The ability to create a project culture. Successful project cultures are characterized by a strong shared vision of success and a consistent set of values that guide members of the project team in their independent decision making.

The concepts discussed in this chapter are not meant to be an exhaustive description of the skills required to successfully work with people on a project, but instead are meant only as a starting point. Some students of social dynamics mistakenly think that they can learn people skills solely from what they read in a book. This notion would be tantamount to an aspiring violinist hoping to learn the instrument by reading about music theory without ever physically touching the instrument! The principles that follow are the groundwork as you begin to build your own mental map of what effective people management and leadership looks like.

Note for ID: Effective people management is perhaps more important within instructional design than it is within a more prototypical setting, such as within a software company or building construction business. Instructional design projects are often characterized by small teams, vaguely specified client deliverables, the requirement to work closely with many individuals who do not have a vested interest in the outcome of the project, such as the subject matter experts (SMEs), and oftentimes a limited budget. Although no specific domain of project management has a monopoly on difficulty, the instructional design project manager has his or her own unique set of challenges and needs – especially when it comes to working with people.

Designers Share Their Experiences

Dr. Andy Gibbons – Instructional Psychology and Technology – BYU

Watch on YouTube

Well on this project where we were—we were training our diverse group. We were training submarine, excuse me, we were training helicopter pilots and we were training sensor operators who sit in the back and are completely different. One group was officers. One group was not officers, they were enlisted people. So, there was a great diversity of people we had to communicate with. I was very fortunate in this project because of some staffing. You know, it was not skill on my part or good choices on my part. We had two people whose personalities really spelled the success of the project. One was an untrained instructional designer. He was a Harvard graduate, he had his Bachelors from Harvard, and yet he wasn't employed in a law firm, you know, he wasn't advancing in his career. He was kind of in-between trying to decide what he wanted to do, but he had this wonderful outgoing personality, people just loved being around him, they wanted to talk to him all the time. And so he was kind of the heartbeat of the project. He was the glue that made all this diverse group of people, he was a motivator, he was exciting to be around. The second person was a Navy, former Navy, was a retiree. He had been in the Navy for so long and we were working with Navy personnel, both officers and enlisted people. He had been a fairly high ranking enlisted person. And he knew how not to take "guff" from enlisted people. He knew how to address officers, and he was on the technical side of things. He was very skilled with people within the military world. Without those two guys this would have been the biggest disaster. This project would have not worked, so personalities were incredibly important.

Heather Bryce – Independent Studies – BYU

Watch on YouTube

Well on Art 45, it's unusual because the instructor is actually an artist. Then we have an art director. Our flash supervisor has an art background, and he also has his masters in Instructional Design. And then we have our videographer who is artistic. So we had a lot of artistic personalities on this project. I think most of our team is used to working together, so I think the synergy was really great there, they had great ideas supporting because they're aware of what each role can do. I think the only, probably one thing that made this course, this project a little more interesting was our art director and our flash supervisor are both artists, and then of course the author is an artist. So they sometimes differed on how things should be presented. So I was really, they did a fantastic job in finding compromise. Because at the end of the day with our courses we have the final say with what is in a course. The author will give us the material, but we have the final say in how to present it. I think we found a nice way. Some things we went with the way that the author wanted to present certain concepts. And other ways, we went with the ways that our team thought it should be presented and I thought it was a good compromise.

Dr. Larry Seawright – Center for Teaching and Learning – BYU

Watch on YouTube

Our Center, we have about 20 full-time employees, and we have a wide variety of personality types. We have some folks who spend a lot of years in industry and kind of got tired of doing that. That would be me. I worked for IBM, Intel, Xerox, companies like that. And then went back, got a Ph.D., and now I'm working at the University. So we have folks that have a lot of industry experience, and we have people who have just come up through the University. Ph.D., you know, maybe a few years working as high school teachers, get a Ph.D. and now they're working with us. And so their experience with real world kinds of applications is kind of limited. Sometimes you get clashes there because you have people who have been used to running in industry large teams, and they have lots of resources and they expect things to be done like this. When I worked at Intel for example, there were lots of meetings where, you know, folks were yelling at each other. Literally yelling at each other in the meeting, and then you walk out the door and you talk about, you know, see you at the tee at four o'clock. Like they're bitter enemies, but they're best of friends. But that's the corporate mentality, the corporate culture. Here, the culture is let's all get along, and so when we had these personalities that have different, very different backgrounds it takes a little massaging. So as project manager it's my job is to smooth some ruffled feathers here, and to keep the kind of egos from getting bruised and keep doing the great work that they're doing without taking offence at what appear to be slights. And that is all communication when it comes down to it. Folks say things and we don't understand it because of different contexts. So frequently you have to have separate meetings. This is what this person meant and this is what this person meant so we can all get along right? A large part of what the role of a project manager is, is to make sure that those kind of communication issues get smoothed over. Not covered up, but smoothed over and clarified so that the project can keep moving forward.

- Working with Individuals
- Working with Groups and Teams

Creating a Project Culture

5.1

Working with Individuals

Leadership | Personality Types | Emotional Intelligence | Negotiation

Learning Objectives

1. Describe emotional intelligence.
2. Describe personality types and tools used to describe them.
3. Describe the relationship between leadership style and personality types.
4. Describe people skills that are necessary for negotiation and conflict resolution.
5. Describe how work is delegated.
6. Describe individual goals that are related to personality types.

Working with other people involves dealing with them both logically and emotionally. A successful working relationship between individuals begins with appreciating the importance of emotions and how they relate to personality types, leadership styles, negotiations, and setting goals.

Emotional Intelligence

Emotions are both a mental and physiological response to environmental and internal stimuli. Leaders need to understand and value their emotions to appropriately respond to the client, project team, and project environment. Daniel Coleman[1] discussed emotional intelligence quotient (EQ) as a factor more important than IQ in predicting leadership success. According to Robert Cooper and Ayman Sawaf, "***Emotional intelligence*** is the ability to sense, understand, and effectively apply the power and acumens of emotions as a source of human energy, information, connection, and influence."[2]

Emotional intelligence includes the following:

- Self-awareness
- Self-regulation
- Empathy
- Relationship management

Image by Infusionsoft

Emotions are important to generating energy around a concept, to building commitment to goals, and to developing high-performing teams. Emotional intelligence is an important part of the project manager's ability to build trust among the team members and with the client. It is an important factor in establishing credibility and an open dialogue with project stakeholders. Emotional intelligence is critical for project managers, and the more complex the project profile, the more important the project manager's EQ becomes to project success.

Personality Types

Personality types refer to the differences among people in such matters as what motivates them, how they process information, how they handle conflict, etc. Understanding people's personality types is acknowledged as an asset in interacting and communicating with them more effectively. Understanding your personality type as a project manager will assist you in evaluating your tendencies and strengths in different situations. Understanding others' personality types can also help you coordinate the skills of your individual team members and address the various needs of your client.

The ***Myers-Briggs Type Indicator (MBTI)*** is one of most widely used tools for exploring personal preference, with more than two million people taking the MBTI each year. The MBTI is often referred to as simply the Myers-Briggs. It is a tool that can be used in project management training to develop awareness of preferences for processing information and relationships with other people.

Based on the theories of psychologist Carl Jung, the Myers-Briggs uses a questionnaire to gather information on the ways individuals prefer to use their perception and judgment. Perception represents the way people become aware of people and their environment. Judgment represents the evaluation of what is perceived. People perceive things differently and reach different conclusions based on the same environmental input. Understanding and accounting for these differences is critical to successful project leadership.

The Myers-Briggs identifies sixteen personality types based on four preferences derived from the questionnaire. The preferences are between pairs of opposite characteristics and include the following:

- Extroversion (E)-Introversion (I)
- Sensing (S)-Intuition (N)
- Thinking (T)-Feeling (F)
- Judging (J)-Perceiving (P)

Sixteen Myers-Briggs types can be derived from the four dichotomies. Each of the sixteen types describes a preference: for focusing on the inner or outer world (E-I), for approaching and internalizing information (S-I), for making decisions (T-F), and for planning (J-P). For example, an ISTJ is a Myers-Briggs type who prefers to focus on the inner world and basic information, prefers logic, and likes to decide quickly.

It is important to note that there is no best type and that effective interpretation of the Myers-Briggs requires training. The purpose of the Myers-Briggs is to understand and appreciate the differences among people. This understanding can be helpful in building the project team, in developing common goals, and communicating with project stakeholders. For example, different people process information differently. Extraverts prefer face-to-face meetings as the primary means of communicating, while introverts prefer written communication. Sensing types focus on facts, and intuitive types want the big picture.

On larger, more complex projects, some project managers will use the Myers-Briggs as a team-building tool during project start-up. This is typically a facilitated work session where team members take the Myers-Briggs and share with the team how they process information, what communication approaches they prefer, and what decision-making preferences they have. This allows the team to identify potential areas of conflict, develop communication strategies, and build an appreciation for the diversity of the team.

Another theory of personality typing is the DISC method, which rates people's personalities by testing a person's preferences in word associations in the following four areas:

- Dominance/Drive—relates to control, power, and assertiveness
- Inducement/Influence—relates to social situations and communication
- Submission/Steadiness—relates to patience, persistence, and thoughtfulness
- Compliance/Conscientiousness—relates to structure and organization

Personality Type Badges

One project team in South Carolina used color-coded badges for the first few weeks of the project to indicate Myers-Briggs type. For this team, this was a way to explore how different team members processed information, made decisions, and took action.

Understanding the differences among people is a critical leadership skill. This includes understanding how people process information, how different experiences will influence the way people perceive the environment, and how people develop filters that allow certain information to be incorporated while other information is excluded. The more complex the project, the more important the understanding of how people process information, make decisions, and deal with conflict. There are multiple personality-type tests that have been developed and explore different aspects of people's personalities. It might be prudent to explore the different tests available and utilize the one(s) that are most beneficial for your team.

Leadership Styles

Leadership style is a function of both the personal characteristics of the leader and the environment in which the leadership must occur, and a topic which several researchers have attempted to understand. Robert Tannenbaum and Warren Schmidt[3] described leaders as either autocratic or democratic. Harold Leavitt[4] described leaders as pathfinders (visionaries), problem solvers (analytical), or implementers (team oriented). James MacGregor Burns[5] conceived

leaders as either transactional (focused on actions and decisions) or transformational (focused on the long-term needs of the group and organization).

Fred Fiedler[6] introduced his contingency theory, which is the ability of leaders to adapt their leadership approach to the environment. Most leaders have a dominant leadership style that is most comfortable for them. For example, most engineers spend years training in analytical problem solving and often develop an analytical approach to leadership.

A leadership style reflects personal characteristics and life experiences. Although a project manager's leadership style may be predominantly a pathfinder (using Leavitt's taxonomy), most project managers become problem solvers or implementers when they perceive the need for these leadership approaches. The leadership approach incorporates the dominant leadership style and Fiedler's contingency focus on adapting to the project environment.

No particular leadership approach is specifically appropriate for managing a project. Due to the unique circumstances inherent in each project, the leadership approach and the management skills required to be successful vary depending on the complexity profile of the project. However, the Project Management Institute published research that studied project management leadership traits[7] and concluded that good communication skills and the ability to build harmonious relationships and motivate others are essential. Beyond this broad set of leadership skills, the successful leadership approach will depend on the profile of the project. For example, a transactional project manager with a strong command-and-control leadership approach may be very successful on a small software development project or a construction project, where tasks are clear, roles are well understood, and the project environment is cohesive. This same project manager is less likely to be successful on a larger, more complex project with a diverse project team and complicated work processes.

Matching the appropriate leadership style and approach to the complexity profile of the project is a critical element of project success. Even experienced project managers are less likely to be successful if their leadership approach does not match the complexity profile of the project.

Each project phase may also require a different leadership approach. During the start-up phase of a project, when new team members are first assigned to the project, the project may require a command-and-control leadership approach. Later, as the project moves into the conceptual phase, creativity becomes important, and the project management takes on a more transformational type leadership approach. Most experienced project managers are able to adjust their leadership approach to the needs of the project phase. Occasionally, on very large and complex projects some companies will bring in different project managers for various phases of a project. Changing project managers may bring the right level of experience and the appropriate leadership approach, but is also disruptive to a project. Senior management must balance the benefit of matching the right leadership approach with the cost of disrupting established relationships.

Multinational Textbook Publishing Project

On a project to publish a new textbook at a major publisher, a project manager led a team that included members from partners that were included in a joint venture. The editorial manager was Greek, the business manager was German, and other members of the team were from various locations in the United States and Europe. In addition to the traditional potential for conflict that arises from team members from different cultures, the editorial manager and business manager were responsible for protecting the interest of their company in the joint venture.

The project manager held two alignment or team-building meetings. The first was a two-day meeting held at a local resort and included only the members of the project leadership team. An outside facilitator was hired to facilitate discussion, and the topic of cultural conflict and organizational goal conflict quickly emerged. The team discussed several methods for developing understanding and addressing conflicts that would increase the likelihood of finding mutual agreement.

The second team-building session was a one-day meeting that included the executive sponsors from the various partners in the joint venture. With the project team aligned, the project manager was able to develop support for the

publication project's strategy and commitment from the executives of the joint venture. In addition to building processes that would enable the team to address difficult cultural differences, the project manager focused on building trust with each of the team members. The project manager knew that building trust with the team was as critical to the success of the project as the technical project management skills and devoted significant management time to building and maintaining this trust.

Leadership Skills

Einsiedel[8] discussed qualities of successful project managers. The project manager must be perceived to be credible by the project team and key stakeholders. The project manager can solve problems. A successful project manager has a high degree of tolerance for ambiguity. On projects, the environment changes frequently, and the project manager must apply the appropriate leadership approach for each situation.

The successful project manager must have good communication skills. Barry Posner[9]connected project management skills to solving problems. All project problems were connected to skills needed by the project manager:

- Breakdown in communication represented the lack of communication skills.
- Uncommitted team members represented the lack of team-building skills.
- Role confusion represented the lack of organizational skills.

The research indicates that project managers need a large numbers of skills. These skills include administrative skills, organizational skills, and technical skills associated with the technology of the project. The types of skills and the depth of the skills needed are closely connected to the complexity profile of the project. Typically on smaller, less complex projects, project managers need a greater degree of technical skills. On larger, more complex projects, project managers need more organizational skills to deal with the complexity. On smaller projects, the project manager is intimately involved in developing the project schedule, cost estimates, and quality standards. On larger projects, functional managers are typically responsible for managing these aspects of the project, and the project manager provides the organizational framework for the work to be successful.

Listening

One of the most important communication skills of the project manager is the ability to actively listen. Active listening is placing oneself in the speaker's position as much as possible, understanding the communication from the point of view of the speaker, listening to the body language and other environmental cues, and striving not just to hear, but to understand. Active listening takes focus and practice to become effective. Active listening enables a project manager to go beyond the basic information that is being shared and to develop a more complete understanding of the information.

Client's Body Language Indicates Problems at a Board Meeting

A client just returned from a trip to Australia where he reviewed the progress of the project with his company's board of directors. The project manager listened and took notes on the five concerns expressed by the board of directors to the client.

The project manager observed that the client's body language showed more tension than usual. This was a cue to listen very carefully. The project manager nodded occasionally and clearly demonstrated he was listening through his posture, small agreeable sounds, and body language. The project manager then began to provide feedback on what was said using phrases like "What I hear you say is…" or "It sounds like…." The project manager was clarifying the message that was communicated by the client.

The project manager then asked more probing questions and reflected on what was said. "It sounds as if it was a very tough board meeting." "Is there something going on beyond the events of the project?" From these observations and questions, the project manager discovered that the board of directors meeting did not go well. The company had experienced losses on other projects, and budget cuts meant fewer resources for the project and an expectation that

the project would finish earlier than planned. The project manager also discovered that the client's future with the company would depend on the success of the project. The project manager asked, "Do you think we will need to do things differently?" They began to develop a plan to address the board of directors' concerns.

Through active listening, the project manager was able to develop an understanding of the issues that emerged from the board meeting and participate in developing solutions. Active listening and the trusting environment established by the project manager enabled the client to safely share information he had not planned on sharing and to participate in creating a workable plan that resulted in a successful project.
In the example above, the project manager used the following techniques:

1. Listening intently to the words of the client and observing the client's body language
2. Nodding and expressing interest in the client without forming rebuttals
3. Providing feedback and asking for clarity while repeating a summary of the information back to the client
4. Expressing understanding and empathy for the client.

Active listening was important in establishing a common understanding from which an effective project plan could be developed.

Negotiation

When multiple people are involved in an endeavor, differences in opinions and desired outcomes naturally occur. Negotiation is a process for developing a mutually acceptable outcome when the desired outcome for each party conflicts.. A project manager will often negotiate with a client, with team members, with vendors, and with other project stakeholders. Negotiation is an important skill in developing support for the project and preventing frustration among all parties involved, which could delay or cause project failure.

Vijay Verma[10] suggests that negotiations involve four principles:

1. Separate people from the problem. Framing the discussions in terms of desired outcomes enables the negotiations to focus on finding new outcomes.
2. Focus on common interests. By avoiding the focus on differences, both parties are more open to finding solutions that are acceptable.
3. Generate options that advance shared interests. Once the common interests are understood, solutions that do not match with either party's interests can be discarded, and solutions that may serve both parties' interests can be more deeply explored.
4. Develop results based on standard criteria. The standard criterion is the success of the project. This implies that the parties develop a common definition of project success.

For the project manager to successfully negotiate issues on the project, he or she should first seek to understand the position of the other party. If negotiating with a client, what is the concern or desired outcome of the client? What are the business drivers and personal drivers that are important to the client? Without this understanding, it is difficult to find a solution that will satisfy the client. The project manager should also seek to understand what outcomes are desirable to the project. Typically, more than one outcome is acceptable. Without knowing what outcomes are acceptable, it is difficult to find a solution that will produce that outcome.

One of the most common issues in formal negotiations is finding a mutually acceptable price for a service or product. Understanding the market value for a product or service will provide a range for developing a negotiations strategy. The price paid on the last project or similar projects provides information on the market value. Seeking expert opinions from sources who would know the market is another source of information. Based on this information, the project manager can then develop an expected range from the lowest price that would be expected within the current market to the highest price.

Additional factors will also affect the negotiated price. The project manager may be willing to pay a higher price to assure an expedited delivery or a lower price if delivery can be made at the convenience of the supplier or if payment is made before the product is delivered. Developing as many options as possible provides a broader range of choices and increases the possibility of developing a mutually beneficial outcome.

The goal of negotiations is not to achieve the lowest costs, although that is a major consideration, but to achieve the greatest value for the project. If the supplier believes that the negotiations process is fair and the price is fair, the project is more likely to receive higher value from the supplier. The relationship with the supplier can be greatly influenced by the negotiation process and a project manager that attempts to drive the price unreasonably low or below the market value will create an element of distrust in the relationship that may have negative consequences for the project. A positive negotiation experience may create a positive relationship that may be beneficial, especially if the project begins to fall behind schedule and the supplier is in a position to help keep the project on schedule.

Negotiation on a Textbook Adoption Project

After difficult negotiations on an open textbook adoption project in Indiana, the project management team met with the publisher and asked, "Now that the negotiations are complete, how can we help you get more adoptions?" Although this question surprised the publisher, the team had discussed how information would flow, and confusion in expectations and unexpected changes always cost the supplier more money. The team developed mechanisms for assuring good information and providing early information on possible changes and tracked the effect of these efforts during the life of the project.

These efforts and the increased trust enabled the publisher to increase adoptions on the project, and the publisher made special efforts to meet every project expectation. During the life of the project, the publisher shared several ideas about how to reduce total project costs and increase efficiencies. The positive outcome was the product of good partner management by the project team, but the relationship could not have been successful without good faith negotiations.

Conflict Resolution

Conflict on a project is to be expected because of the level of stress, lack of information during early phases of the project, personal differences, role conflicts, and limited resources. Although good planning, communication, and team building can reduce the amount of conflict, conflict will still emerge. How the project manager deals with the conflict results in the conflict being destructive or an opportunity to build energy, creativity, and innovation.

David Whetton and Kim Cameron[11] developed a response-to-conflict model that reflected the importance of the issue balanced against the importance of the relationship. The model presented five responses to conflict:

1. Avoiding
2. Forcing
3. Collaborating
4. Compromising
5. Accommodating

Each of these approaches can be effective and useful depending on the situation. Project managers will use each of these conflict resolution approaches depending on the project manager's personal approach and an assessment of the situation.

Most project managers have a default approach that has emerged over time and is comfortable. For example, some project managers find the use of the project manager's power the easiest and quickest way to resolve problems. "Do it because I said to" is the mantra for project managers who use forcing as the default approach to resolve conflict. Some project managers find accommodating with the client the most effective approach to dealing with client conflict.

The effectiveness of a conflict resolution approach will often depend on the situation. The forcing approach often succeeds in a situation where a quick resolution is needed, and the investment in the decision by the parties involved is low.

Resolving an Office Space Conflict

Two senior managers both want the office with the window. The project manager intercedes with little discussion and assigns the window office to the manager with the most seniority. The situation was a low-level conflict with no long-range consequences for the project and a solution all parties could accept.

Sometimes office size and location is culturally important, and this situation would take more investment to resolve.

Conflict Over a Change Order

In another example, the client rejected a request for a change order because she thought the change should have been foreseen by the project team and incorporated into the original scope of work. The project controls manager believed the client was using her power to avoid an expensive change order and suggested the project team refuse to do the work without a change order from the client.

This is a more complex situation, with personal commitments to each side of the conflict and consequences for the project. The project manager needs a conflict resolution approach that increases the likelihood of a mutually acceptable solution for the project.One conflict resolution approach involves evaluating the situation, developing a common understanding of the problem, developing alternative solutions, and mutually selecting a solution. Evaluating the situation typically includes gathering data. In our example of a change order conflict, gathering data would include a review of the original scope of work and possibly of people's understandings, which might go beyond the written scope.The second step in developing a resolution to the conflict is to restate, paraphrase, and reframe the problem behind the conflict to develop a common understanding of the problem. In our example, the common understanding may explore the change management process and determine that the current change management process may not achieve the client's goal of minimizing project changes. This phase is often the most difficult and may take an investment of time and energy to develop a common understanding of the problem.

After the problem has been restated and agreed on, alternative approaches are developed. This is a creative process that often means developing a new approach or changing the project plan. The result is a resolution to the conflict that is mutually agreeable to all team members. If all team members believe every effort was made to find a solution that achieved the project charter and met as many of the team member's goals as possible, there will be a greater commitment to the agreed-on solution.

Project Goals Accomplished

In our example, the project team found a new way to accomplish the project goals without a change to the project scope. On this project, the solution seemed obvious after some creative discussions, but in most conflict situations, even the most obvious solutions can be elusive.

Delegation

Delegating responsibility and work to others is a critical project management skill. The responsibility for executing the project belongs to the project manager. Often other team members on the project will have a functional responsibility on the project and report to a functional manager in the parent organization. For example, the procurement leader for a major project may also report to the organization's vice president for procurement. Although the procurement plan for the project must meet the organization's procurement policies, the procurement leader on the project will take day-to-

day direction from the project manager. The amount of direction given to the procurement leader, or others on the project, is the decision of the project manager.

If the project manager delegates too little authority to others to make decisions and take action, the lack of a timely decision or lack of action will cause delays on the project. Delegating too much authority to others who do not have the knowledge, skills, or information will typically cause problems that result in delay or increased cost to the project. Finding the right balance of delegation is a critical project management skill.

When developing the project team, the project manager selects team members with the knowledge, skills, and abilities to accomplish the work required for the project to be successful. Typically, the more knowledge, skills, abilities, and experience a project team member brings to the project, the more that team member will be paid. To keep the project personnel costs lower, the project manager will develop a project team with the level of experience and the knowledge, skills, and abilities to accomplish the work.

On smaller, less complex projects, the project manager can provide daily guidance to project team members and be consulted on all major decisions. On larger, more complex projects, there are too many important decisions made every day for the project manager to be involved at the same level, and project team leaders are delegated decision-making authority. Larger projects, with a more complex profile will typically pay more because of the need for the knowledge and experience. On larger, more complex projects, the project manager will develop a more experienced and knowledgeable team that will enable the project manager to delegate more responsibility to these team members.

Learning Project in Peru

An instructional design project in Peru was falling behind schedule, and a new manager was assigned over the design team that was the most behind schedule. He was an experienced project manager from the United States with a reputation for meeting aggressive schedules. However, he failed to see that as a culture, Peruvians do a great deal more socializing than teams in the U.S. The project manager's communication with the team was then limited because he did not go out and spend more time with them, and his team did not develop trust or respect for him. Due to these cultural differences, the project fell further behind, and another personnel change had to be made at a significant cost of time, trust and money.

The project manager must have the skills to evaluate the knowledge, skills, and abilities of project team members and evaluate the complexity and difficulty of the project assignment. Often project managers want project team members they have worked with in the past. Because the project manager knows the skill level of the team member, project assignments can be made quickly with less supervision than with a new team member with whom the project manager has little or no experience.

Delegation is the art of creating a project organizational structure with the work organized into units that can be managed. Delegation is the process of understanding the knowledge, skills, and abilities needed to manage that work and then matching the team members with the right skills to do that work. Good project managers are good delegators.

Adjusting Leadership Styles

In the realm of personality traits, remember that they reflect individual's preferences, not their limitations. It is important to understand that each individual can still function in situations for which they are not best suited. It is also important to realize that you can change your leadership style according to the needs of your team and the particular project's attributes and scope.

For example, a project leader who is more Thinking (T) than Feeling (F) (according to the Myers-Briggs model) would need to work harder to be considerate of how a team member who is more Feeling (F) might react if they were singled out in a meeting because they were behind schedule. If a person knows their preferences and which personality types are most successful in each type of project or project phase, they can set goals for improvement in their ability to perform in those areas that are not their natural preference.

Another individual goal is to examine which conflict resolution styles are least comfortable and work to improve those styles so that they can be used when they are more appropriate than your default style.

KEY TAKEAWAYS

- Emotional intelligence is the ability to sense, understand, and effectively apply emotions.
- Two common tools for describing personality types are DISC (Dominance, Influence, Steadiness, and Conscientiousness) and the Myers-Briggs Type Indicator (MBTI). The MBTI is the most common. It rates personalities on the position between extremes of four paired terms: Extroversion (E)-Introversion (I), Sensing (S)-Intuition (I), Thinking (T)-Feeling (F), and Judging (J)-Perceiving (P).
- Leadership styles are usually related to the personality of the leader. The type of leadership style that is most effective depends on the complexity and the phase of the project.
- Negotiation and conflict resolution require skill at listening and an understanding of emotional intelligence and personality types.
- Delegation is the art of creating a project organizational structure that can be managed and then matching the team members with the right skills to do that work.
- Individual goals can be set for improving abilities that are not natural personality strengths to deal with projects and project phases.

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5.2

Working with Groups and Teams

Trust | Team Meetings

Learning Objectives

1. Describe the value of trust and how it relates to contracts and complex projects.
2. Identify four types of trust.
3. Describe how a project manager can build trust.
4. Identify three common meeting types and then describe how they differ.
5. Identity types of teams.
6. Describe the HUMM method of measuring project performance.
7. Describe the importance of developing a project story.

A team is a collaboration of people with different personalities that is led by a person with a favored leadership style. Managing the interactions of these personalities and styles as a group is an important aspect of project management.

Trust

Trust is the foundation for all relationships within a project. Without a minimum level of trust, communication breaks down, and eventually the project suffers in the form of costs increasing and schedules slipping. Often, when reviewing a project where the performance problems have captured the attention of upper management, the evidence of problems is the increase in project costs and the slippage in the project schedule. The underlying cause is usually blamed on communication breakdown. With deeper investigation, the communication breakdown is associated with a breakdown in trust.

Image by Brunel University

On projects, trust is the filter through which we screen information that is shared and the filter we use to screen information we receive. The more trust that exists, the easier it is for information to flow through the filters. As trust diminishes, the filters become stronger and information has a harder time getting through, and projects that are highly dependent on an information-rich environment will suffer from information deprivation.

Contracts and Trust Relationships

The project typically begins with a charter or contract. A ***contract*** is a legal agreement that includes penalties for any behavior or results not achieved. Contracts are based on an adversarial paradigm and do not lend themselves to creating an environment of trust. Contracts and charters are necessary to clearly establish the scope of the project, among other things, but they are not conducive to establishing a trusting project culture.

A relationship of mutual trust is less formal but vitally important. When a person or team enters into a relationship of mutual trust, each person's reputation and self-respect are the drivers in meeting the intent of the relationship. A relationship of mutual trust within the context of a project is a commitment to an open and honest relationship. There is nothing that enforces the commitments in the relationship except the integrity of the people involved. Smaller, less complex projects can operate within the boundaries of a legal contract, but larger, more complex projects must develop a relationship of mutual trust to be successful.

Types of Trust

Svenn Lindskold (1978) describes four kinds of trust:

1. *Objective credibility.* A personal characteristic that reflects the truthfulness of an individual that can be checked against observable facts.
2. *Attribution of benevolence*. A form of trust that is built on the examination of the person's motives and the conclusion that they are not hostile.
3. *Nonmanipulative trust*. A form of trust that correlates to a person's self-interest and the predictability of a person's behavior in acting consistent in that self-interest.
4. *High cost of lying*. The type of trust that emerges when persons in authority raise the cost of lying so high that people will not lie because the penalty will be too high.

Creating Trust

Building trust on a project begins with the project manager. On complex projects, the assignment of a project manager with a high trust reputation can help establish the trust level needed. The project manager can also establish the cost of lying in a way that communicates an expectation and a value for trust on the project. Project managers can also assure that the official goals (stated goals) and operational goals (goals that are reinforced) are aligned. The project manager can create an atmosphere where informal communication is expected and reinforced.

The informal communication is important to establishing personal trust among team members and with the client. Allotting time during project start-up meetings to allow team members to develop a personal relationship is important to establishing the team trust. The informal discussion allows for a deeper understanding of the whole person and creates an atmosphere where trust can emerge.

High Cost of Lying in a Charleston Project

On a project in Charleston, South Carolina, the client was asking for more and more backup to information from the project. The project manager visited the client to better understand the reporting requirements and discovered the client did not trust the reports coming from the project and wanted validating material for each report. After some candid discussion, the project manager discovered that one of the project team members had provided information to the client that was inaccurate. The team member had made a mistake but had not corrected it with the client, hoping that the information would get lost in the stream of information from the project.The project manager removed the team member from the project for two main reasons. The project manager established that the cost of lying was high. The removal communicated to the project team an expectation of honesty. The project manager also reinforced a covenant with the client that reinforced the trust in the information the project provided. The requests for additional information declined, and the trust relationship between project personnel and the client remained high.

Small events that reduce trust often take place on a project without anyone remembering what happened to create the environment of distrust. Taking fast and decisive action to establish a high cost of lying, communicating the expectation of honesty, and creating an atmosphere of trust are critical steps a project manager can take to ensure the success of complex projects.

Project managers can also establish expectations of team members to respect individual differences and skills, look and react to the positives, recognize each other’s accomplishments, and value people’s self-esteem to increase a sense of the benevolent intent.

Managing Team Meetings

Team meetings are conducted differently depending on the purpose of the meeting, the leadership style that is appropriate for the meeting, and the personality types of the members of the team.

Action Item Meetings

Action item meetings are short meetings to develop a common understanding of what the short-term priorities are for the project, individual roles, and expectations for specific activities. This type of meeting is for sharing, not problem solving. Any problems that emerge from the discussion are assigned to a person, and another meeting is established to address the issue. Action item meetings focus on short-term activities, usually less than a week in duration.

The action item meeting is fact based and information oriented. It is a left-brain-type focus. The action item meeting has very little dialogue except to ask clarification questions. If discussion is needed or disagreement is not easily resolved, another problem-solving meeting is established to deal with that issue. On smaller topics, that meeting might take place immediately after the action item meeting and only include those people with an interest in the outcome of the discussion.

The project manager keeps the successful action item meeting short in duration and focused on only those items of information needed for the short-term project plan. The project manager will restate the common understandings of what activities are priorities and who will be responsible for the activities. Often these meetings can include a review of safety procedures or security procedures when these issues are important to the project. The leadership approach to action item meetings focuses on data, actions, and commitments. Although the project manager may observe stresses between project team members or other issues, they are not addressed in this meeting. These are fact-based meetings. If issues begin to arise between people, the project manager will develop other opportunities to address these issues in another forum. Using the Myers-Briggs descriptions, team members who favor thinking more than feeling and judging more than perceiving are more comfortable with this type of meeting.

Management Meetings

Management meetings are longer in duration and are focused on planning. They are oriented toward developing plans, tracking progress of existing plans, and making adjustments to plans in response to new information.

These meetings include focused discussion on generating a common understanding of the progress of the existing plan. This discussion is based on quantitative information provided on the progress of the schedule and other data, but the discussion is qualitative in evaluating the data to develop a more complete understanding of the data. The experience and opinions of the project leaders are solicited, and disagreement about meaning of the data is even encouraged to develop a deeper understanding of the data. Through this discussion, a common understanding of the status of the project should emerge, and the project manager invites discussion, includes people to offer their thoughts, and assures that disagreements are positive discussions about interpretation of the information and that disagreements do not become personal.

Management meetings also focus on developing midterm goals. For larger, more complex projects, the goals may be monthly or even quarterly. For smaller or less complex projects, weekly goals will provide the focus. The project manager focuses the discussion on the broad priorities for the next period and includes all the functional leaders in the discussion. The goals that emerge from the discussion should represent a common understanding of the priorities of the project for the next term.

For example, during the early phases of a project, the team is focused on developing a conceptual understanding of the project. A major milestone on complex projects is typically the completion of the conceptual plan. The project manager would lead a discussion on what needs to be accomplished to meet the project milestone and asks what potential barriers exist and what key resources are needed. From the discussion, the project team develops a few key goals that integrate the various functions of the project team and focus the team on priorities.

The following are some examples of goals during the conceptual phase:

- Developing a list of the procurement long lead items and defining critical dates
- Developing a human resources plan that identifies critical positions
- Developing and building agreement with the client on the project scope of work

Each of these goals is measurable and time framed. They can be developed as positive motivators and will take the project leaders and most of the project team to accomplish. They develop a general understanding of the priorities and are easy to remember.

Management meetings are a combination of left-brain thinking, which is fact based, and right-brain thinking, which is creative and innovative. Using the Myers-Briggs terminology, team members who prefer feeling over thinking and perceiving over judging can contribute ideas and perspectives on the project that the more fact-oriented members might miss.

The project manager allows and encourages conversation in developing and evaluating the goals but focuses the discussion on the goals and obstacles. Management meetings take on a different focus during the month. Meetings at

the beginning of the month spend time addressing the progress and potential barriers to the goals developed the previous month. During the middle of the month, the project manager leads the team to develop next month's goals as the team also works on the current month's goals. Toward the end of the month as the goals for the month are accomplished, the meeting focuses more on the next month, enabling the team to remain goal focused during the life of the project.

Management meetings are also an opportunity to discover obstacles to goal achievement. The project team reallocates resources or develops alternative methods for accomplishing the goals. As the project team discusses the progress of project goals, the project manager explores possible obstacles and encourages exposing potential problems in achieving goals. The project manager focuses the team on finding solutions and avoids searching for blame.

The project manager uses a facilitative leadership approach, encouraging the management team to contribute their ideas, and builds consensus on what goals will bring the appropriate focus. The project manager keeps the focus on developing the goals, tracking progress, identifying barriers, and making adjustments to accomplish the management goals. Although there are typically meetings for scheduling and procurement and other meetings where goals are established and problems solved, the management meeting and the goal development process create alignment among the project leadership on the items critical to the project's success.

Leadership Meetings

Leadership meetings are held less frequently and are longer in length. These meetings are used by the project manager to reflect on the project, to explore the larger issues of the project, and to back away from the day-to-day problem solving. The project manager will create a safe environment for sharing thoughts and evaluations of issues that are less data oriented. This is a right-brained, creative meeting that focuses on the people issues of the project: the relationship with the client, vendors, and project team. Team members who favor feeling, perceiving, and intuition often contribute valuable insights in this type of meeting. The team might also share perceptions by upper management and perceptions of the community in which the project is being executed. Where the time frame for action item meetings is in weeks and management meetings is in months, the time frame for leadership meetings is longer and takes in the entire length and impact of the project.

The project manager's meeting management skill includes creating the right meeting atmosphere for the team discussion that is needed. For discussions based on data and facts, the project manager creates the action item type meeting. The conversation is focused on sharing information and clarification. The conversation for leadership meetings is the opposite. Discussion is more open ended and focused on creativity and innovation. Because each type of meeting requires a different meeting atmosphere, mixing the purposes of a meeting will make it difficult for the project manager to develop and maintain the appropriate kind of conversation.

Skilled project managers know what type of meeting is needed and how to develop an atmosphere to support the meeting type. Meetings of the action item type are focused on information sharing with little discussion. They require efficient communication of plans, progress, and other information team members need to plan and execute daily work. Management type meetings are focused on developing and progressing goals. Leadership meetings are more reflective and focused on the project mission and culture.

These three types of meetings do not cover all the types of project meetings. Specific problem-solving, vendor evaluation, and scheduling meetings are examples of typical project meetings. Understanding what kinds of meetings are needed on the project and creating the right focus for each meeting type is a critical project management skill.

Types of Teams

Teams can outperform individual team members in several situations. The effort and time invested in developing a team and the work of the team are large investments of project resources, and the payback is critical to project

success. Determining when a team is needed and then chartering and supporting the development and work of the team are other critical project management abilities.

Teams are effective in several project situations:

- When no one person has the knowledge, skills, and abilities to either understand or solve the problem
- When a commitment to the solution is needed by large portions of the project team
- When the problem and solution cross project functions
- When innovation is required

Individuals can outperform teams on some occasions. An individual tackling a problem consumes fewer resources than a team and can operate more efficiently—as long as the solution meets the project's needs. A person is most appropriate in the following situations:

- When speed is important
- When one person has the knowledge, skills, and resources to solve the problem
- When the activities involved in solving the problem are very detailed
- When the actual document needs to be written (Teams can provide input, but writing is a solitary task.)

In addition to knowing when a team is appropriate, the project manager must also understand what type of team will function best.

Functional Teams

A functional team refers to the team approach related to the project functions. The engineering team, the procurement team, and the project controls team are examples of functional teams within the project. On a project with a low complexity profile that includes low technological challenges, good team member experience, and a clear scope of work, the project manager can utilize well-defined functional teams with clear expectations, direction, and strong vertical communication.

Cross-Functional Teams

Cross-functional teams address issues and work processes that include two or more of the functional teams. The team members are selected to bring their functional expertise to addressing project opportunities.

Cross-Functional Teamwork on Video Production Project

A cross-functional project team in Tennessee was assigned to develop a project approach to drafting, shooting, and editing educational videos without storing the videos on the school server. Although the complexity of this goal is primarily related to creating the videos and procuring editing equipment, the planning involved coordination of the script drafting, procurement of equipment and talent, and project controls. Team members from each of these functions developed and tracked a plan to meet the project goal. Because they communicated so frequently and clearly, the cross-functional team was successful in designing a process and executing the plan in a way that saved three weeks on the video schedule and several thousand dollars in cost by hosting off-site.

Problem-Solving Teams

Problem-solving teams are assigned to address specific issues that arise during the life of the project. The project leadership includes members that have the expertise to address the problem. The team is chartered to address that problem and then disband.

Qualitative Assessment of Project Performance

Project managers should provide an opportunity to ask such questions as "What is your gut feeling about how the project going?" and "How do you think our client perceives the project?" This creates the opportunity for reflection and

dialogue around larger issues on the project. The project manager creates an atmosphere for the team to go beyond the data and search for meaning. This type of discussion and reflection is very difficult in the stress of day-to-day problem solving.

The project manager has several tools for developing good quantitative information—based on numbers and measurements—such as the project schedules, budgets and budget reports, risk analysis, and goal tracking. This quantitative information is essential to understanding the current status and trends on the project. Just as important is the development of qualitative information—comparisons of qualities—such as judgments made by expert team members that go beyond the quantitative data provided in a report. Some would label this the "gut feeling" or intuition of experienced project managers.

The ***Humm Factor*** is a survey tool developed by Russ Darnall to capture the thoughts of project participants (Caudron, 1995). It derived its name from a project manager who always claimed he could tell you more by listening to the hum of the project than reading all the project reports. "Do you feel the project is doing the things it needs to do to stay on schedule?" and "Is the project team focused on project goals?" are the types of questions that can be included in the Humm Factor. It is distributed on a weekly or less frequent basis depending on the complexity profile of the project. A project with a high level of complexity due to team-based and cultural issues will be surveyed more frequently.

The qualitative responses are converted to a quantitative value as a score from 1 to 10. Responses are tracked by individuals and the total project, resulting in qualitative comparisons over time. The project team reviews the ratings regularly, looking for trends that indicate an issue may be emerging on the project that might need exploring.

Humm Survey Uncovers Concerns

On a project in South Carolina, the project surveyed the project leadership with a Humm Survey each week. The Humm Factor indicated an increasing worry about the schedule beginning to slip when the schedule reports indicated that everything was according to plan. When the project manager began trying to understand why the Humm Factor was showing concerns about the schedule, he discovered an apprehension about the performance of a critical project supplier. When he asked team members, they responded, "It was the way they answered the phone or the hesitation when providing information—something didn't feel right."

The procurement manager visited the supplier and discovered the company was experiencing financial problems and had serious cash flow problems. The project manager was able to develop a plan to help the supplier through the period, and the supplier eventually recovered. The project was able to meet performance goals. The Humm Factor Survey provided a tool for members of the project team to express concerns that were based on very soft data, and the project team was able to discover a potential problem.

Another project team used the Humm Factor to survey the client monthly. The completed surveys went to a person who was not on the project team to provide anonymity to the responses. The responses were discussed at the monthly project review meetings, and the project manager summarized the results and addressed all the concerns expressed in the report. "I don't feel my concerns are being heard" was one response that began increasing during the project, and the project manager spent a significant portion of the next project review meeting attempting to understand what this meant. The team discovered that as the project progressed toward major milestones, the project team became more focused on solving daily problems, spent more time in meetings, and their workday was becoming longer. The result was fewer contacts with the clients, slower responses in returning phone calls, and much fewer coffee breaks where team members could casually discuss the project with the client.

The result of the conversation led to better understanding by both the project team and client team of the change in behavior based on the current phase of the project and the commitment to developing more frequent informal discussion about the project.

Developing a Project Story

Every project develops a story. It is the short explanation that project team members give when asked about the project. This is also called the elevator speech, which is the explanation a person would give if he or she were in the elevator with the CEO and the CEO asked him or her to describe the project. Project stories often express important aspects of the project and can create a positive picture of the project or one that is less appealing.

A project story will develop, and creating a positive project story is a project management skill that helps the project. A positive project story is inviting to people and helps with the recruitment of talent to the project. A positive project story also helps when services are needed from functional departments within the company and in developing management support for the project. The project manager actively sets out to create the project story. Creating a positive story entails identifying the unique aspects of the project and building a positive outcome.

Building a Reputation for Project Completion Speed

A project manager in South Carolina always challenged people with speed. He identified the last project with similar characteristics and challenged the team to beat the time by weeks or months. The story became, "If you want a project done on time, this is the project team you need." The project manager created a spirit of competition and fun. The project manager was a high-energy person, and the idea of finding a way to finish a project early seemed a natural outcome.

Every project manager can find the unique aspect of the project and build a sense of specialness about the project. The project becomes a good place to work, provides the team with a sense of accomplishment, and becomes the story created by the project manager.

Key Takeaways

- Trust is important to reduce delays caused by excessive filtering and fact checking. Contracts are specific about the project scope, but personal relationships of mutual trust are necessary on complex projects.
- Four types of trust are objective credibility, attribution of benevolence, nonmanipulation, and a high cost of lying.
- To create trust, the project manager needs a reputation for trustworthiness and needs to align official goals with operational goals, establish a high cost of lying, and create an atmosphere of respect and benevolent intent.
- Meeting types are action item, management, and leadership. Action item meetings focus on specific short-term priorities. Management meetings focus on planning, and leadership meetings focus on larger issues.
- The types of teams are functional, cross-functional, and problem solving.
- The Humm Factor measures project performance and uses a questionnaire to identify qualitative information about project performance.
- A short statement of the purpose and character of the project is useful in recruiting and obtaining support for a project.

References

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Shari Caudron, “Industry’s Unsung Heroes,” Industry Week, December 4, 1995, 12–16.

5.3

Creating a Project Culture

Innovation | Learning | Culture | Project

LEARNING OBJECTIVES

1. Describe how project culture is developed and enforced.
2. Describe how differences in culture between stakeholders can influence the project.
3. Describe the role of innovation on projects.

Project managers have a unique opportunity during the start-up of a project. They create a project culture, something organizational managers seldom have a chance to do. In most organizations, the corporate or organizational culture has developed over the life of the organization, and people associated with the organization understand what is valued, what has status, and what behaviors are expected. Edgar Schein defined culture as a pattern of basic assumptions formed by a group on how to perceive and address problems associated with both internal adaptation and external integration.[1] Schein also described organizational culture as an abstract concept that constrains, stabilizes, and provides structure to the organization. At the same time, culture is being constantly enacted, created, and shaped by leadership behavior.

Characteristics of Project Culture

A ***project culture*** represents the shared norms, beliefs, values, and assumptions of the project team. Understanding the unique aspects of a project culture and developing an appropriate culture to match the complexity profile of the project are important project management abilities.

Culture is developed through the communication of

- the priority
- the given status
- the alignment of official and operational rules

Official rules are the rules that are stated, and ***operational rules*** are the rules that are enforced. Project managers who align official and operational rules are more effective in developing a clear and strong project culture because the project rules are among the first aspects of the project culture to which team members are exposed when assigned to the project.

Operational Rules on a Multisite Project

During an instructional design project that required individuals to collaborate remotely, an official rule had been established that individuals would backup their work in a location other than the shared folders they were using every week. It did not take long, however, for everyone involved to see that one member was actively backing up all work. Believing that was sufficient, the operational rule became simply leaving the backing up to a single individual. They assumed that official rules could be ignored if they were difficult to obey.

When this individual fell ill, however, no one picked up the slack and followed the official rule. When some files were corrupted, the team found that their most recent backups were weeks old, resulting in redoing a lot of work. The difference between the official rules and the operational rules of the project created a culture that made communication of the priorities more difficult.

In addition to official and operational rules, the project leadership communicates what is important by the use of symbols, storytelling, rituals, rewards or punishments, and taboos.

Creating a Culture of Collaboration

A project manager met with his team prior to the beginning of an instructional design project. The team was excited about the prestigious project and the potential for career advancement involved. With this increased competitive aspect came the danger of selfishness and backstabbing. The project leadership team told stories of previous projects where people were fired for breaking down the team efforts and often shared inspirational examples of how teamwork created unprecedented successes—an example of storytelling. Every project meeting started with teambuilding exercises—a ritual—and any display of hostility or separatism was forbidden—taboo—and was quickly and strongly cut off by the project leadership if it occurred.
Culture guides behavior and communicates what is important and is useful for establishing priorities. On projects that have a strong culture of trust, team members feel free to challenge anyone who breaks a confidence, even managers. The culture of integrity is stronger than the cultural aspects of the power of management.

Culture of Stakeholders

When project stakeholders do not share a common culture, project management must adapt its organizations and work processes to cope with cultural differences. The following are three major aspects of cultural difference that can affect a project:

1. Communications
2. Negotiations
3. Decision making

Communication is perhaps the most visible manifestation of culture. Project managers encounter cultural differences in communication in language, context, and candor. Different languages are clearly the highest barrier to communication. When project stakeholders do not share the same language, communication slows down and is often filtered to share only information that is deemed critical. The barrier to communication can influence project execution where quick and accurate exchange of ideas and information is critical.

The interpretation of information reflects the extent that context and candor influence cultural expressions of ideas and understanding of information. In some cultures, an affirmative answer to a question does not always mean yes. The cultural influence can create confusion on a project where project stakeholders share more than one culture.

Culture Affects Communication in Mumbai

A project management consultant from the United States was asked to evaluate the effectiveness of a management team executing a project in Mumbai, India. The project team reported that the project was on schedule and within budget. After a project review meeting where each of the team leads reported that the design of the project was on schedule, the consultant began informal discussions with individuals. He began to discover that several critical aspects

of the project were behind schedule and lacked a mitigating strategy. The information on the project flowed through a cultural expectation to provide positive information. The project was eventually cancelled by the U.S.-based corporation when the market and political risks increased.

Not all cultural differences are related to international projects. Corporate cultures and even regional differences can create cultural confusion on a project.

Cultural Differences between American Regions

Be aware that cultural differences don't only occur if you have a multinational team. On a major project in South America that included project team leaders from seven different countries, the greatest cultural difference that affected the project communication was between two project leaders from the United States. Two team members—one from New Orleans and one from Brooklyn—had more difficulty communicating than team members from Lebanon and Australia.

Image by UK Department for Business, Innovation and Skills

Innovation on Projects

The requirement of innovation on projects is influenced by the nature of the project. Some projects are chartered to develop a solution to a problem, and innovation is a central ingredient of project success. The lack of availability of education to the world at large prompted the open education movement, a highly innovative endeavor, which resulted in the textbook you are now reading. Innovation is also important to developing methods of lowering costs or shortening the schedule. Traditional project management thinking provides a trade-off between cost, quality, and schedule. A project sponsor can typically shorten the project schedule with an investment of more money or a lowering of quality. Finding innovative solutions can sometimes lower costs while also saving time and maintaining the quality.

Innovation on a Textbook Project

A project manager brought together a team of professors, graduate students, and undergraduates to develop a mathematics textbook. One of the major goals of the team was to present the information in a compelling way. To encourage innovation the project manager was lenient with the dress code, noise levels, and even space (there were members of the team that liked to wander). This created a comfortable atmosphere where participants felt welcome to take risks and suggest a variety of ideas. This approach was not, however, in line with the expectations of the university in which they were housed. The project manager had to decide if he wanted to maintain the lenient atmosphere or ask

the team to abide by the expectations of the university. Feeling that the innovation of the project would suffer by changing the dynamic the group had established, the project manager chose to rent office space off-campus. Innovation is a creative process that requires both fun and focus. Stress is a biological reaction to perceived threats. Stress, at appropriate levels, can make the work environment interesting and even challenging. Many people working on projects enjoy a high-stress, exciting environment. When the stress level is too high, the biological reaction increases blood flow to the emotional parts of the brain and decreases the blood flow to the creative parts of the brain, making creative problem solving more difficult. Fun reduces the amount of stress on the project. Project managers recognize the benefits of balancing the stress level on the project with the need to create an atmosphere that enables creative thought.

Stress Managed on a Website Design Project

When a project manager visited the team tasked with designing the website for a project, she found that most of the members were feeling a great deal of stress. As she probed to find the reason behind the stress, she found that in addition to designing, the team was increasingly facing the need to build the website as well. As few of them had the necessary skills, they were wasting time that could be spent designing trying to learn building skills. Once the project manager was able to identify the stress as well as its cause, she was able to provide the team with the support it needed to be successful.

Exploring opportunities to create savings takes an investment of time and energy, and on a time-sensitive project, the project manager must create the motivation and the opportunity for creative thinking.

KEY TAKEAWAYS

- Project culture is developed by communicating priority, status, and the alignment of official and operational rules. It is enforced through use of symbols, storytelling, rituals, rewards or punishments, and taboos.
- Differences in culture between stakeholders can affect communications, negotiations, and decision making.
- Innovation can be the main focus of the project, or it can be used to achieve improvement in goals that are usually mutually exclusive, such as lowering costs and shortening schedule.

[1] Edgar Schein, "Organizational Culture," American Psychologist 45 (1990): 109–19.

6

Communication Technologies

Overview

This chapter aligns with Chapters 4 and 10 of the PMBOK and 18% of the CAPM questions come from this knowledge area. The content connects to the Planning, Executing and Monitoring & Controlling category of the PMP questions.

Almost by definition, projects require teamwork, and team members must communicate with each other for a variety of reasons and by a number of possible methods. For instance, team members frequently need to update each other on their progress and may employ such means of communication as email, project management software, or social media. Available technology can greatly facilitate such tasks and assure timely and accurate communication between team members.

Such technologies include:

- Communication technologies
  - Email
  - Short Message Services (SMS), commonly referred to as texting
  - Video conferencing and chat services, like Skype
  - Blogs and wikis, like WordPress and Mediawiki
  - Microblogging services like TwitterDocument and calendar sharing services like Google Docs
  - Postal and shipping services
- Desktop software tools
  - Microsoft Office or Open Office Suite
  - Visual design and mockup software like Balsamiq
  - Project management software like Microsoft Project or OpenProject

Choosing which communication resource(s) to use on any given project is a critical decision and should be driven by the needs of the project. Generally speaking, simple projects will require fewer communication resources, while larger, multifaceted projects may require more specialized or complex tools and software.

Software tools are constantly changing. Wikipedia maintains a relatively up-to-date listing of various project management programs and their features.

Designers Share Their Experiences

Dr. Andy Gibbons – Instructional Psychology and Technology – BYU

Watch on YouTube

Well, we were training fairly technical subject matter, it was how to fly a helicopter and how to operate the sensitive electronic equipment in the back, sensors. So that the technologies that we were working with, that we were training people to use were very sophisticated technologies. Unfortunately, we had almost zero technologies. As a designer this was the 1975–76 time frame. The word “processor” was just being invented. We didn’t have word processors. Everything was typed by hand, by secretaries. We had an overworked secretary who was constantly typing things. And a lot of hand written documents had to pass. Our design document was typed, and if you made a mistake on a page you would have to re-type the whole page if it was a major mistake, or an addition. So sometimes the documents ended up looking kind of funny. You’d have a document with just a small paragraph at the top. What I’m trying to depict here is we didn’t even have the word processor. We didn’t even have the desktop publishing that we have today. We had video technology, but we didn’t have some of the video editing technologies that we have. So it was almost a razor blade kind of an operation where stuff would end up literally on the cutting room floor, tape would end up that way. Although we did, one of the things, the Navy did give us use of their editing base. So once we had identified the takes that we wanted to edit into our video materials, they—we could do a re-roll kind of thing. But it was, compared to the tools that we have today, if we had had the tools today, then, that we have today the project would have been made much easier. And frankly, my staff would have been cut by half if I had had word processing and design.

Heather Bryce – Independent Studies – BYU

Watch on YouTube

My name is Heather Bryce, and I am the project manager for Brigham Young University Independent Study andWe used video and Flash, I don't know if you count video as a technology, but definitely Flash as a technology. And the Flash in this course is absolutely amazing. I can show you some examples. We did a virtual sketchbook as a way to introduce vocabulary. So instead of just memorizing what perspective is, they could actually see what an artist sketch would look like and how they would use perspective. Flash is particularly important in this course because it really allowed the student that interactive experience that you need in a drawing course. So that was probably the most important technology used on this project.

Dr. Larry Seawright – Center for Teaching and Learning – BYU

Watch on YouTube

Technology issues in the Learning Suite are probably the biggest concern that anyone has. Because the technologies we are using are off-the-shelf. We're looking at using essentially PHP and MySQL databases although we'll probably migrate to Oracle simply because that is kind of University standard. Because the product we're building, the BYU Learning Suite, is a University supported product. As we build that and hand it over to the University IT folks to operate, their saying "Hmm, our supported platform is Oracle." So we'll have to migrate that over time, over to Oracle. But right now, you know, we're doing simple things. PHP programming, MySQL. Just really, kind of straight forward web pages that we build little dialogue boxes, we get inputs and we store it somewhere. So, it's not a very complicated system. The key to it really is the decision that the University IT folks made several years ago to, in the past, University data systems were locked up very tightly. And they have to be. It is our paycheck information, it's all the FERPA data that needs to be protected for students, all that private stuff. But the University decided that they wouldn't be the only ones to build the applications that would then get access to the data. They decided to build a web service interface so that folks like us can write an application that goes through the web service and securely gets the data. And that's how we're able to build the Learning Suite. So we're able to access the University Gradebook, the University academic information systems, the personnel files so that we can know who's on campus and who is not, who is authorized to use this system, the library, the bookstore. All those things are enabled by a simply thing that we call web service. It's just an abstraction layer that separates the data from the program here. It's also a really great thing because it allows us down the road. Right now we're using a third party, grade book. In a year or so we will have our own grade book written. And because of this application interface layer that separates us from the actual data we'll be able to swap out that backend grade book, and the interface for the students and faculty, unchanged. Except you'll see "new features". Because it's our grade book and we have other stuff. So that's kind of the technologies that we're using. It is really enabled by some very forward thinking decisions on the part of the University IT folks who, you know, came to the conclusion that, you know, maybe we're not the best folks to write applications.

We're really good though at management and deployment of things. So you build the systems, turn them over to us and we'll run them for you. So that's kind of where we are right now.

Types of Communication
Selecting Software

6.1

Types of Communication

Learning | Synchronous | Communication | Objectives | Asynchronous

LEARNING OBJECTIVES

1. Identify characteristics and examples of synchronous communication.
2. Identify characteristics and examples of asynchronous communication.
3. Identify questions to answer when considering new communications technologies.

Completing a complex project successfully requires good communication among team members. If those team members work in the same building, they can arrange regular meetings, simply stop by each other's office space to get a quick answer, or even discuss a project informally at other office functions. Many projects are performed by teams that interact primarily through electronic communication and are, therefore, called virtual teams.[1] To avoid miscommunication that can harm trust and to include team members in a project culture, the project team needs a plan for communicating reliably and in a timely manner. This planning begins with understanding two major categories of communication.

Image by World Economic Forum

Synchronous Communications

If all the parties to the communication are taking part in the exchange at the same time, the communication is ***synchronous***. A telephone or Skype conference call is an example of synchronous communication. The following are examples of synchronous communications:

- *Live meeting*. Gathering of team members at the same location.
- *Conference call*. A telephone call between two or more individuals where several people participate.
- *Audio conference*. Like a conference call, but conducted online using software like Skype.
- *Computer-assisted conference*. Audio conference with a connection between computers that can display a document or spreadsheet that can be edited by both parties.
- *Video conference*. Similar to an audio conference but with live video of the participants. Some laptop computers have built-in cameras to facilitate video conferencing.
- *IM (instant messaging)*. Exchange of text or voice messages using pop-up windows on the participants' computer screens.
- *Texting*. Exchange of text messages between mobile phones, pagers, or personal digital assistants (PDAs)—devices that hold a calendar, a contact list, a task list, and other support programs

Modern communication technologies make it possible to assemble project teams from anywhere in the world. Most people work during daylight hours, which can make synchronous meetings difficult if the participants are in different time zones. However, it can be an advantage in some circumstances; for example, if something must be done by the start of business tomorrow, team members in Asia can work on the problem during their normal work hours while team members in North America get some sleep.

Remember Time Zones

It is important to remember time zones and calculate the difference between yours and your associates' correctly so as to not miss important meetings or deadlines. Cities and countries to the north or south of each other all observe the same local time. Be aware that many well-educated people in the United States think of South America as directly south of North America. As you can see in Figure 6.1, most of South America is one or two time zones east of the United States. A helpful site to convert local time to another time zone is http://www.timezoneconverter.com/cgi-bin/tzc.tzc

Figure 6.1 World Time Zones

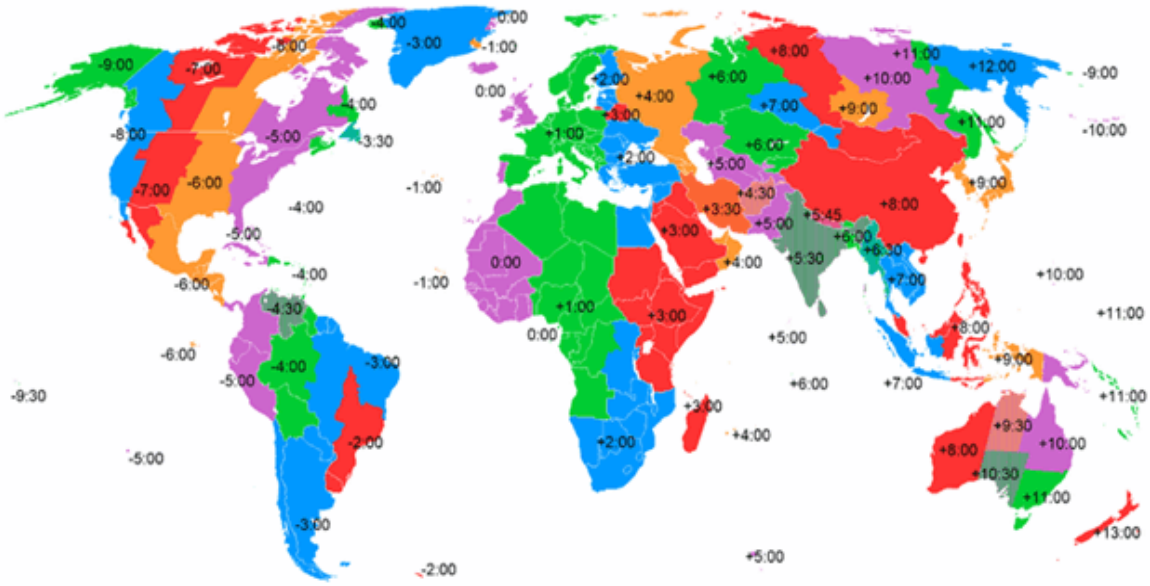

Image by TimeZonesBoy

Time zones are calculated in reference to the time zone of the Royal Observatory in Greenwich, England. The time at that location is Greenwich Mean Time (GMT). More recent references designate it as Coordinated Universal Time (UTC) instead of GMT. The time zones advance from Greenwich in an easterly direction. However, at the international dateline (about the midpoint around the world from Greenwich), you subtract the time zone from GMT. To prevent confusion between a.m. and p.m., times are often given using a twenty-four-hour clock. For example, midnight is indicated as 00:00, noon is 12:00 and 1 p.m. is 13:00.

Conference Call between New York and Paris

A project manager for an online course development project in New York is five time zones west of the reference zone, so the time is given as UTC–5 (or GMT–5). If it is noon in the reference zone, it is 7 a.m. (five hours earlier) in New York. The manager would like to contact a project team member in Paris, France. Paris is one time zone east of the reference zone (UTC+1 or GMT+1). If it is noon (12:00) in the reference zone, it is 1 p.m. (13:00) in Paris.This means that there is a six-hour difference between New York and Paris. If the project manager waits until after lunch to place the call (1 p.m. in New York), it will be too late in the day in Paris (7 p.m.) to reach someone.

Asynchronous Communications

Getting a team together at the same time can be a challenge—especially if they are spread out across time zones. Many types of communication do not require that the parties are present at the same time. This type of communication is asynchronous. There are several choices of asynchronous communications.

Mail and Package Delivery

Many companies prefer that final contracts are personally signed by an authorized representative of each party to the agreement. If several signatures are required, this can take weeks to get all the signatures if the contracts are transferred by a postal service. If this process is holding up the start of the project, you can use an overnight delivery service to minimize the time spent transferring the documents.

Fax

Fax machines have been around a long time and enjoy a high level of trust for transmitting documents accurately. Although it might seem archaic to still use fax transmissions, in many countries a fax of a signed contract is legal, but a computer-scanned image is not.

E-Mail

Electronic mail (e-mail) is widely used to coordinate projects and to communicate between team members. It has several valuable characteristics for project management:

- Information can be sent to a list of team members.
- Messages can be saved to document the process in case of a misunderstanding or miscommunication.
- Files can be attached and distributed.

Project Blog

A **blog** is an online journal that can be private, shared by invitation, or made available to the world. Some project managers keep a journal in which they summarize the day's challenges and triumphs and the decisions they made. They return to this journal at a later date to review their decision-making process after the results of those decisions are known to see if they can learn from their mistakes. Many decisions in project management are made with incomplete knowledge, and reflecting on previous decisions to develop this decision-making skill is important to growth as a project manager.

Really Simple Syndication (RSS)

Some projects are directly affected by external factors such as political elections, economic trends, corporate mergers, technological or scientific breakthroughs, or weather. To keep informed about these factors, you can subscribe to online news sources. A technology that facilitates this process is Really Simple Syndication (RSS). Web pages with RSS news feeds have labeled links.

If the user clicks on the RSS feed, news from the website is automatically sent to the user's news reader, such as Google Reader. The news reader can be set to filter the news for key words to limit the stories to those that are relevant to the project.

Assessing New Communication Technologies

New technologies for communicating electronically appear with increasing frequency. Using a new technology that is unfamiliar to the team increases the technology complexity, which can cause delays and increase costs. To decide if a new technology should be included in a communications plan, seek answers to the following questions:

- Does the new communication technology provide a competitive advantage for the project by reducing cost, saving time, or preventing mistakes?
- Does the project team have the expertise to learn the new technology quickly?
- Does the company offer support such as help desk and equipment service for new communication technology?
- What is the cost of training and implementation in terms of time as well as money?

KEY TAKEAWAYS

- Synchronous communications take place when all the parties are present at the same time. Examples are telephone calls and video conferencing.
- Asynchronous communications take place when the parties are not present at the same time. Examples are e-mail and blogs.
- Determine if a new technology can save time, reduce cost, or prevent mistakes and if the increased complexity can be handled by the team and support staff for an affordable cost in time and money.

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[1] Business Dictionary, s.v. "Virtual Team,"https://edtechbooks.org/-CMsx (accessed January 27, 2010).

6.2

Selecting Software

Complexity Software

Learning Objectives

1. Identify the types of software that are appropriate for projects of low complexity.
2. Identify the types of software that are appropriate for projects of medium complexity.
3. Identify the types of software that are appropriate for projects of high complexity.
4. Describe strategies for sharing documents that can be edited by a team.

Part of a communications plan is determining the type of computer software that will be used to create documents, spreadsheets, diagrams, and reports. The choice of software is related to the complexity of the project.

Image by Eastern Arizona College

Simple Projects

Basic projects can be managed using some of the features available in general-purpose software that is available in most offices.

Word Processing

Even the most basic project will generate numerous documents using word processing software. A communications plan can specify standards for these documents that make it easier to create, edit, combine, store, and retrieve the documents. Document standards include the following:

- Specifying the file format
- Using consistent styles
- Using templates for commonly used forms.

File Format

Word processing software programs display a document on a computer's screen and allow the user to enter and edit text. When the file is saved to a storage device, the text and all the various formatting such as font and font size are converted to a code for efficient storage. The code varies from one word processing program to another and even between releases of the same program.

The most common word processing program, by a wide margin, is Microsoft Word (MS Word). Several releases of MS Word run on the Windows operating system and on the Macintosh operating system. Versions of MS Word released prior to 2007 save files in a proprietary format. The format is indicated by a period and a three-letter extension—.doc—that is automatically attached to the file when it is saved. Beginning with MS Word 2007 for Windows and MS Word 2008 for Macintosh, files are saved using a different format that is indicated by a period and a four-letter extension —.docx—that identify the newer format.

Styles

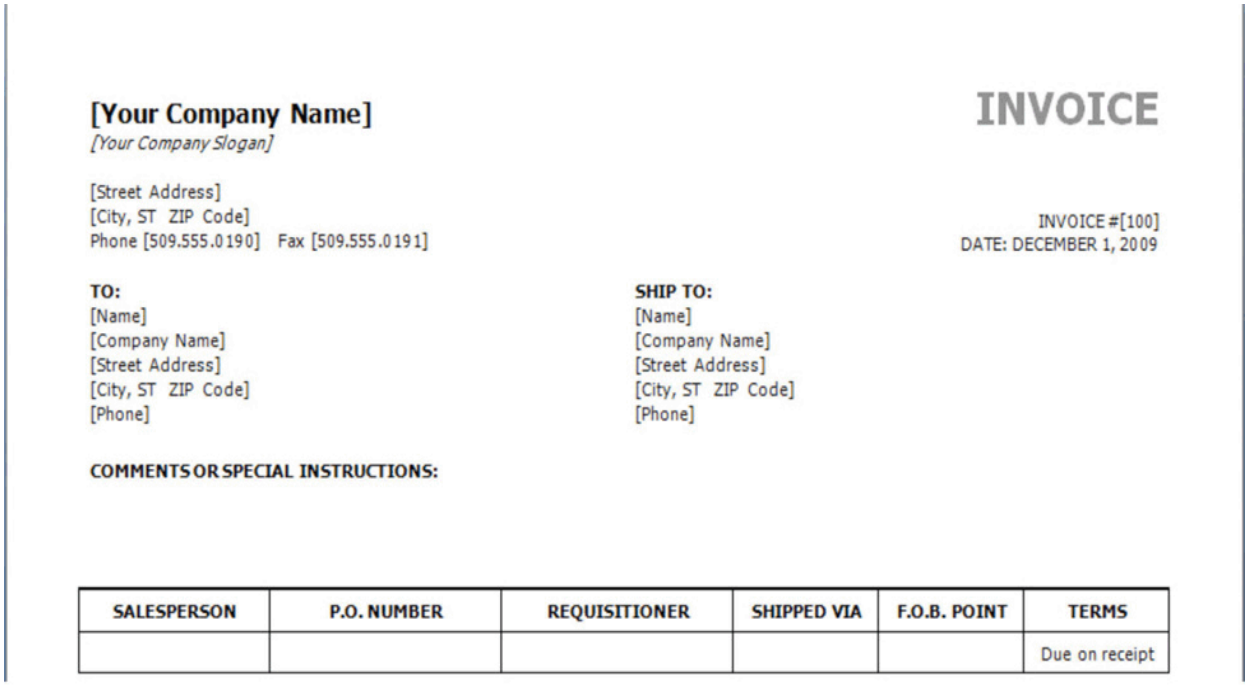
The combination of formatting, including font, font size, font color, shading, and other attributes used to display a segment of text and to identify its level of importance, is called a style. A style can be given a name and applied repeatedly to different portions of a document. Predefined styles are available in MS Word 2007 on the ribbon, on the Home tab, in the Styles group, as shown in Figure 6.10, "Style Choices". Users can define their own styles and give them names. Some organizations prefer that all of their documents have similar fonts and styles for headings, body text, and figure captions.

Templates

If a particular type of document will be used repeatedly, it might be worth the time to create an example document—a template—that is formatted using the appropriate styles with blanks or placeholder text where the user can insert the information that describes a particular situation. A variety of templates are already available for download at no additional cost. For example, when a new document is created in Microsoft Word 2007, there is an option to choose a template such as the invoice template shown in Figure 6.2.

Figure 6.2

Standardized Document Used as a Template



[Your Company Name]
[Your Company Slogan]

[Street Address]
[City, ST ZIP Code]
Phone [509.555.0190] Fax [509.555.0191]

INVOICE

INVOICE #[100]
DATE: DECEMBER 1, 2009

TO:
[Name]
[Company Name]
[Street Address]
[City, ST ZIP Code]
[Phone]

SHIP TO:
[Name]
[Company Name]
[Street Address]
[City, ST ZIP Code]
[Phone]

COMMENTS OR SPECIAL INSTRUCTIONS:

SALESPERSON	P.O. NUMBER	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
					Due on receipt

The template may be customized and used repeatedly for all the documents of that type, or the organization can design its own.

Spreadsheets

Spreadsheets are a display of data in row and column format—in which financial or numerical data can be manipulated. The intersection of the rows and columns are cells into which numbers, text, dates, and formulas can be entered. The formulas can utilize values found in other cells and display the results in the cell in place of the formula. If the value in a cell to which the formula refers is changed, all the formulas that use that cell's value are immediately recalculated. This feature makes it convenient to examine several options quickly. Spreadsheets are often used to manage data on simple projects instead of a dedicated database or project management software.

The most common spreadsheet program, by a wide margin, is Microsoft Excel (MS Excel). There have been several releases of MS Excel that run on the Windows operating system and on the Macintosh operating system. Versions of MS Excel released prior to 2007 save files in a proprietary format. The format is indicated by a period and a three-letter extension—.xls—that is automatically attached to the file when it is saved. Beginning with MS Excel 2007 for Windows and MS Excel 2008 for Macintosh, files are saved using a different format that is indicated by a period and a four-letter extension—.xlsx—that identifies the newer format.

If the data in the spreadsheet is arranged in simple rows of the same type of data, it can be manipulated to provide reports for basic projects. If one or more of the columns in a table contain labels, identification numbers, or other descriptions, those labels can be used to specify sorting and filtering options. For example, if the spreadsheet has a list of expenses, the rows of data can be sorted in decreasing or increasing value by one of the data types such as the due date or the amount of the expense. The display can be restricted—filtered—to display only those rows that meet criteria specified by the user. For example, the table could be filtered to display the expenses for a particular department that were incurred between two dates. This ability facilitates the preparation of monthly progress reports and budgets.

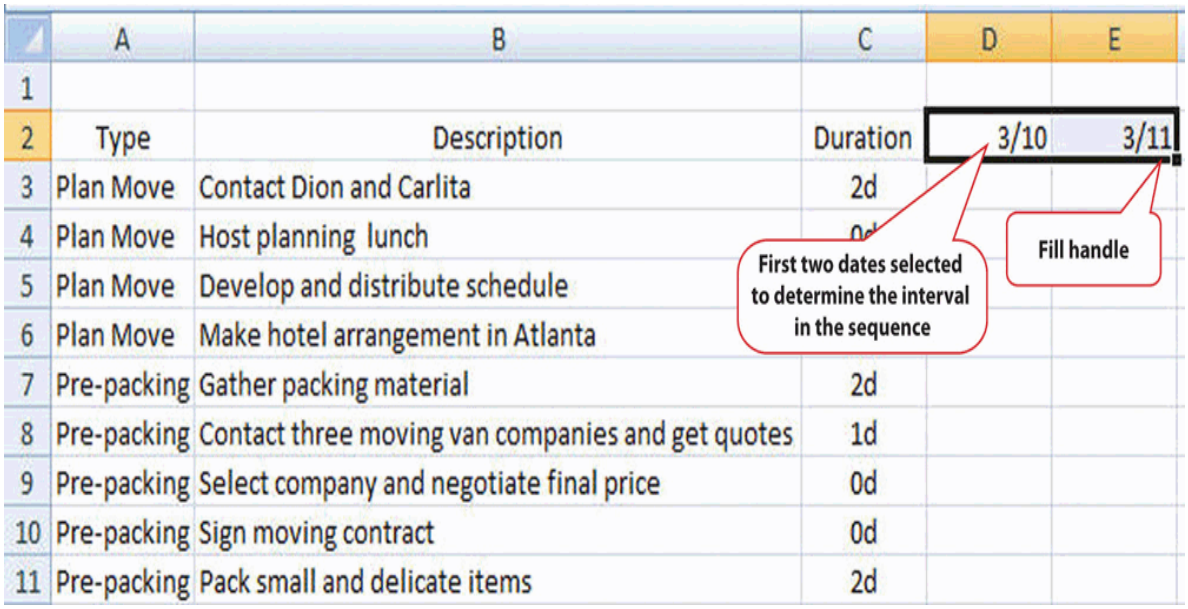
Graphics for Bar Charts and Milestones

Spreadsheets can be used for basic progress reports that show activities, dates, and horizontal bars that represent the duration of an activity. A sequence of dates can be created as column labels by entering the first two dates in the sequence, selecting both dates, and then dragging the fill handle—a small square in the lower right corner of the selected cell.

The duration of each activity and the relationships between activities can be illustrated using the drawing shapes. A long rectangle can represent a bar whose length represents the duration of the activity. Events or significant dates in the project are identified with a diamond. The diamond can be created by using a small square shape and rotating it. Arrows can be drawn between the shapes to indicate their relationships, as shown in Figure 6.3.

Figure 6.3

Diagram of Activities



This type of diagram is useful for projects with low complexity where a simple chart of a few activities will suffice.

Software for Moderately Complex Projects

More complex projects involve more people who are often separated geographically and who contribute to the same documents. Complex projects have more tasks with more complex relationships. To manage those tasks and relationships, using dedicated project management software and more sophisticated diagramming software is justified.

Sharing Team Documents

If more than one person on a team will be contributing to a document, the document must be accessible to them. To manage documents that are created by a team, it is necessary to control the edits so that work is not lost or confused.

Version Control and File Storage

Previously, files such as word processing documents and spreadsheets may be stored on an individual's computer and copies sent to participants who then make changes and return the revised version to the person who is responsible for the final version of the document. Today, file sharing services like Dropbox are used to provide team members access to the canonical copy of a document in a single location. A user can still lose a lot of work if a newer version of a document is replaced with an older version. Fortunately, services like Dropbox provide access to every version of a file ever saved as a contingency against overwriting, accidental deleting, etc.

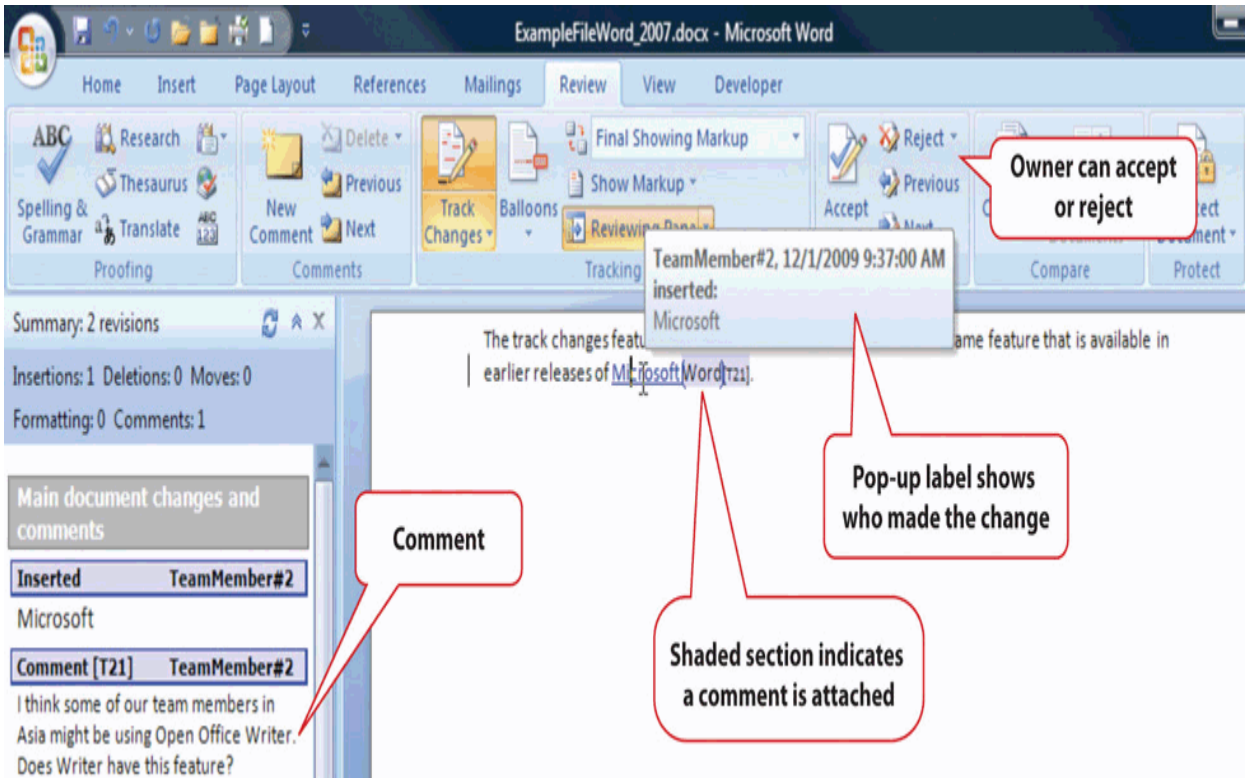
Tracking Changes and Adding Comments

One of the features that is particularly useful for keeping track of the changes made to a document by several users is called Track Changes. If a team member wishes to explain a change, it is very important that they do not insert their explanation as text into the document. Such explanations might not be deleted and would end up in the final version of

the document with potentially damaging results. Instead, team members can use a form of electronic sticky note to make comments. This feature is found in MS Word 2007 on the Review tab, in the Comments group. A change and a comment are shown in Figure 6.4. The document owner must go through the document and accept or reject each change and delete all the comments before the document is released as a finished product.

Figure 6.4

Tracking Changes and Adding Comments

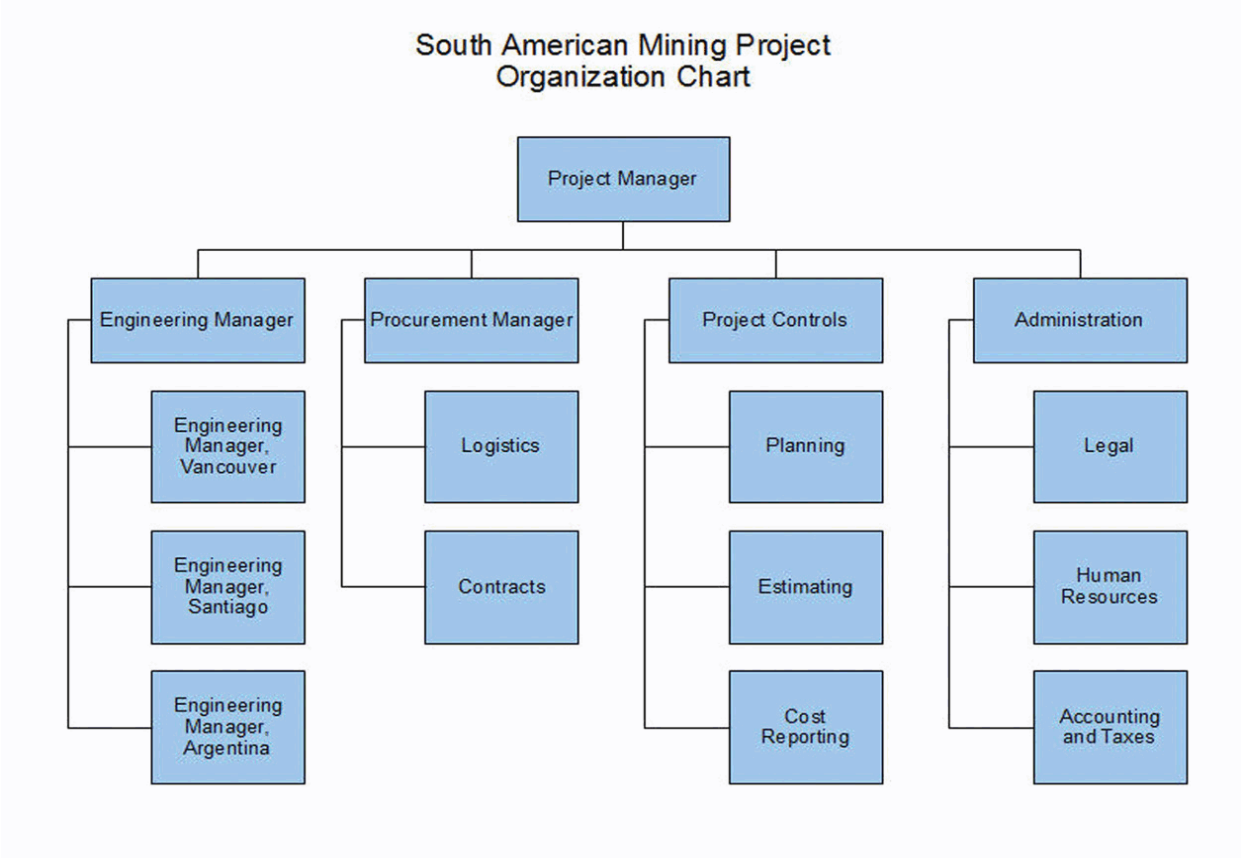


Diagramming Software

The processes and relationships in medium- and high-complexity projects usually require more sophisticated software tools for creating reporting diagrams and workflow charts. The market for diagramming software is more diverse than for word processing and spreadsheets, and it is not as likely that most team members will have the same programs that save files in the same formats. Microsoft Visio 2007 is available as a stand-alone program that sells for several hundred dollars. For medium-complexity projects, a free alternative to Visio is Open Office Draw. Open Office is a free software alternative that includes a word processing, spreadsheet, presentation, and drawing programs. The Open Office Draw program, and others like it, can create diagrams such as the one shown in Figure 6.5.

Figure 6.5

Diagram Created Using Open Office Draw



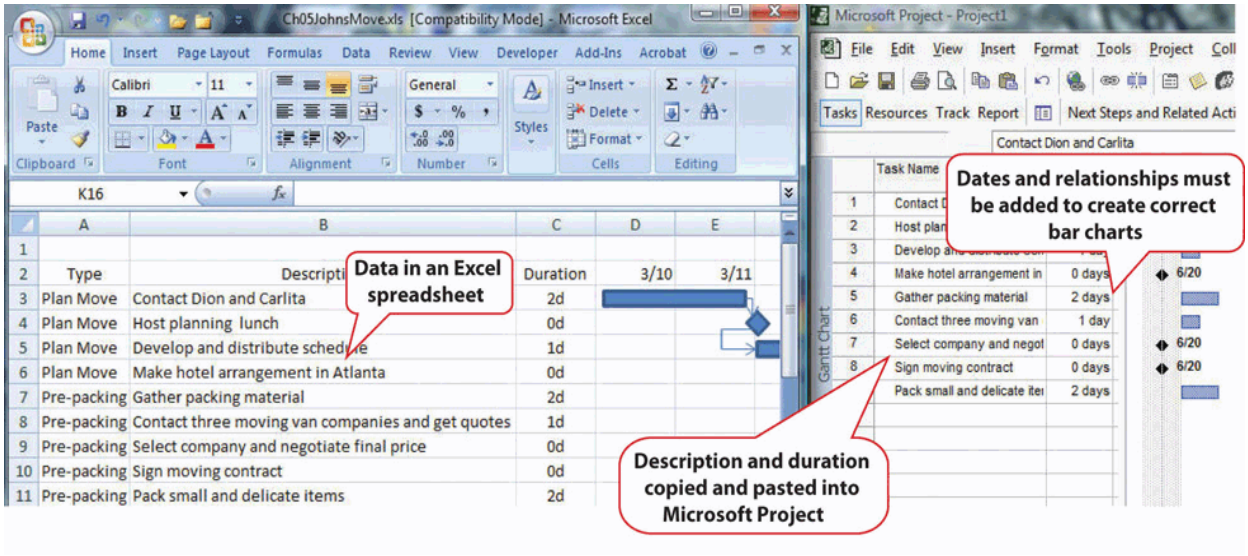
The files created by the various drawing programs might not be compatible with each other, but all the programs can create static image files that can be pasted into word processing documents.

Project Management Software

The relationships between project activities can become complicated in medium- and high-complexity projects. Dedicated project management software can compute the sum of activity durations along several different paths through complex relationships and recalculate them immediately if any of the durations or starting times are changed. Similarly, charts and reports are updated automatically based on the new data. The most popular software for medium-complexity projects is Microsoft Project. If a project manager begins work on the project in the belief that it can be managed using a list of activities in a word processing program or in a spreadsheet, the list of activities and their durations can be copied and pasted, or imported, into the project management software's table of activities, if the original document or spreadsheet was designed with that possibility in mind, as shown in Figure 6.6.

Figure 6.6

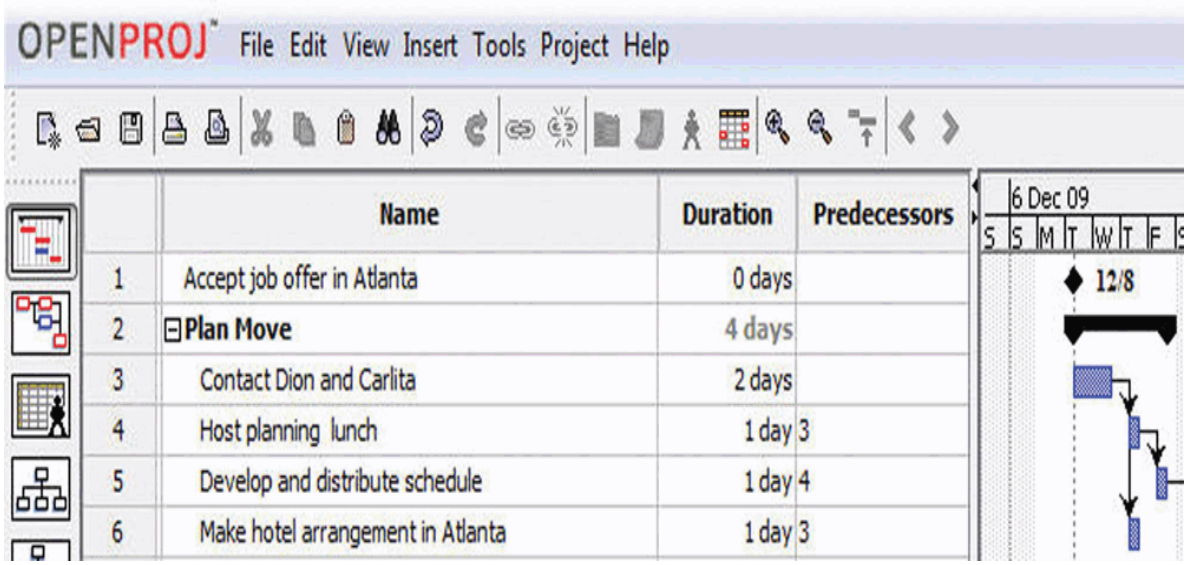
List of Activities Transferred to a Project Management Program



Once the data are placed in the project management software, the relationships can be defined and reports created. Organizations on a tight budget might consider using an open source program named OpenProject. Open source software is usually available at no cost for individual users and with fewer restrictions than proprietary software like Microsoft Project. OpenProject is similar to Microsoft Project, as shown in Figure 6.7, and could be used on low- and medium-complexity projects that do not need the more advanced features available in Microsoft Project.

Figure 6.7

Open Source Project Management Software



Software for Complex Projects

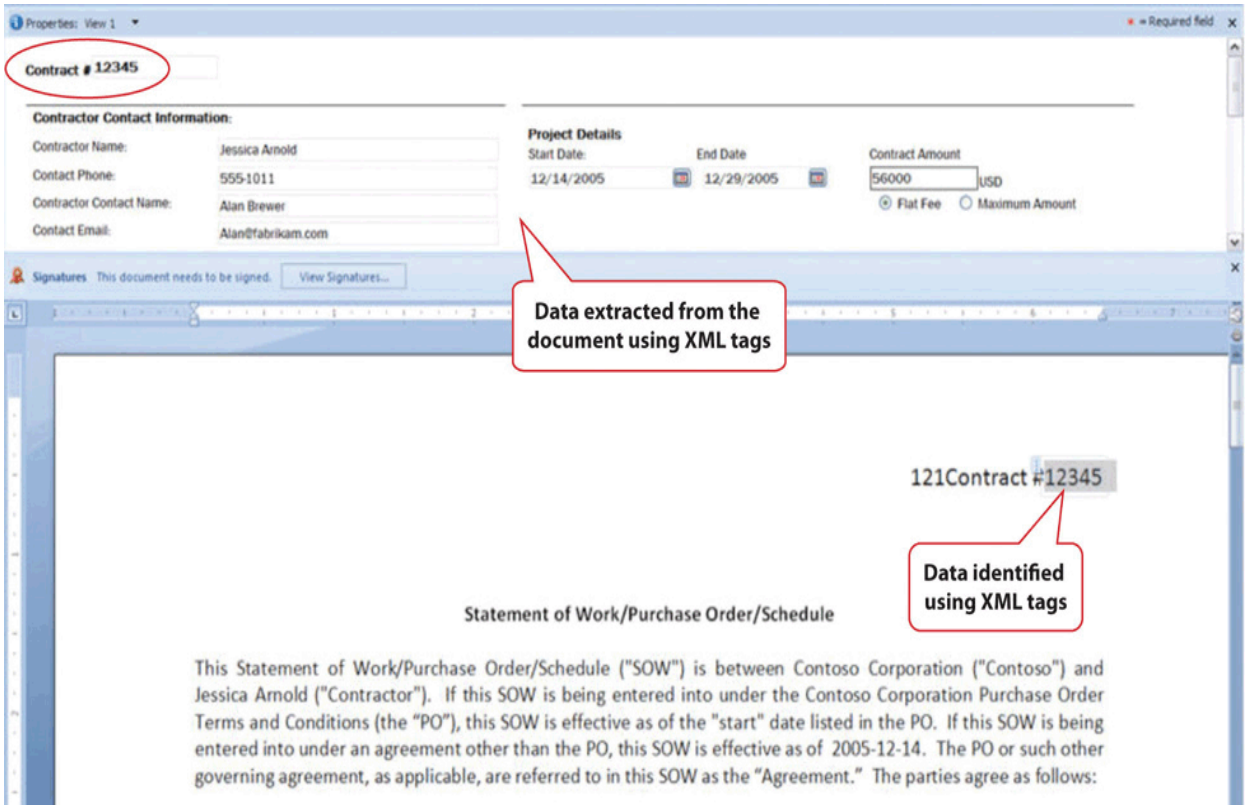
Complex projects can involve thousands of individual activities and a company might have several projects going at the same time. Large, complex projects are common in the construction industry. A software that is commonly used for complex projects in construction is P6 from Primavera. It has the ability to produce sophisticated reports that help project managers to anticipate problems and make projections.

Word processing documents often contain data that could be aggregated and analyzed. Beginning with Microsoft Word 2007 and the .docx file format, it is possible to insert characters called ***tags*** on either side of a particular section of a

form or document and assign a data label. For example, the name of the supplier on an invoice could be enclosed between two tags: Thompson Hardware. These tags resemble those used in the hypertext markup language (HTML) to identify how to display text on a Web page, but instead of telling a Web browser how to display the name of the supplier, it identifies Thompson Hardware as the supplier. These tags are can be created by following a set of rules called the ***extensible markup language*** (XML). Forms created using XML can be scanned for the content that is marked by tags. The data can be imported into a spreadsheet or database for analysis. Creating documents that use XML to identify data in the forms can be done using Microsoft InfoPath. An example that identifies key facts in a document that was prepared using InfoPath is shown in Figure 6.8. Because it takes extra effort to learn to use InfoPath, or a similar XML authoring program, and to create the forms, this approach is normally limited to complex and sophisticated organizations that have the need to manage large amounts of data.

Figure 6.8

InfoPath Form with XML Tags



Key Takeaways

- Low-complexity projects might be managed using general purpose word processing and spreadsheet software by using the special features for outlining, managing data, and inserting graphic objects
- Medium-complexity projects need special purpose software for managing project activities, such as Microsoft Project, and graphic software such as Visio. Open source software such as OpenProject and Open Office Draw may suffice.
- High-complexity projects need more sophisticated project management software like P6 from Primavera. Forms can be created using XML tags that allow data to be extracted from the documents.
- Files can be stored at a location that is accessible by all the team members. They can be granted different levels of access, including view only, edit only, and ownership. Features like track changes and compare documents can help manage edits.

7

Starting a Project

Overview

This chapter aligns with Chapters 3-5 of the PMBOK and 33% of the CAPM questions come from these chapters. The content connects to the Initiating, Planning and Monitoring & Controlling category of the PMP questions.

This chapter provides an overview of the selection and initiation of a project. Prior to the initiation of a project, the ***chartering organization***—the organization that determines the need for the project—develops a justification for the project. Often, several initiatives compete for the resources of the organization, and potential projects are evaluated to see which ones are best aligned with the mission and goals of the organization. This evaluation process can be very simple where the benefits to the organization are obvious and the economics of the project are very favorable. On larger, more complex initiatives, the process of gathering and evaluating the data to justify the project can take a year or more. The information gathered during this evaluation process provides the basis for the project charter, the initial scope of work, and other information required to initiate the project.

Designers Share Their Experiences

Dr. Andy Gibbons – Instructional Psychology and Technology – BYU

Watch on YouTube

The starting of a project is always an exciting time. There is so much happening and it has to happen so fast, you almost can't catch your breath. This project was on a technical subject matter, how to fly helicopters. I've never flown in a helicopter before, much less piloted one. Sensor operators operating sensitive electronic equipment. So one of the big challenges was getting up to speed on the technology. One of the things that they hadn't taught me in school that I wished they had taught me was about different types of content and how to do an analysis of the subject matter. Because there were different kinds of subject matter in this training. And we were getting up to speed as quickly as we could, but we were treating the subject matter as if it was procedures and rules and facts that had to be memorized. When in fact it was a very complex skill that had to be learned. And we didn't analyze it appropriately. So one of the challenges was how to learn the content fast. And how to see in the content structures that even the subject matter experts didn't see. There were other projects that I worked on where after I had learned to see into content the people had, it's a skill that you learn as a designer by the way, how to see the constructs that exist in their subject matter. There were times when I could actually anticipate and ask questions where the subject matter expert would say "Oh yeah that is a part of our, that is something that you have to learn in order to do this." As designers, one of a designer's biggest challenges at the beginning of a project is getting their minds around the subject matter and seeing invisible structures inside. When training is bad, and as a designer, you get called in to replace somebody else's bad job, or inadequate job. When training is bad very often it is because the subject matter was misconceived. So that was one big challenge. The other was just a matter of getting budgets completed, and getting staff organized, and getting them assigned to tasks, figuring out who is going to do what. Making sure that–one interesting process that we–that I had to undertake was a challenge. And that was, we created probably four or five hundred different pieces, instructional pieces, actually elements, media elements from videotapes down to individual handout lessons that had to be managed and configure managed–configuration managed. And we had to have a way as they were going through the development process. Each piece that was created had to go through seven or eight stages including, the reviews and the paste-up artists, and the Navy reviews, and the subject matter,

excuse me the designer reviews. Artwork had to be created, text had to be written. And so each piece had to go through a chain of events. Managing one piece of instruction through that chain of events, and because there were things that were this kind of event, there were this kind of workbook, or maybe there was this kind of a slide sound presentation, or a videotape, or there were all kinds of different events going through this process. We found that managing that was going to be a nightmare, and so one of things that really saved us on this particular project was we devised a little system of, you normally had some kind of a check off that would go around with each package of material at each stage of development. Well, we devised a little system where each person, as it would get sent to the artist, and it says create the art for this segment. When they had finished it they would check it off and they would put the date and the time and then they would clip that and put it into a box. Each day at the end of work we were able to tell where every segment was because it was going to be on somebody's desk. We were able to tell how much time they had worked on it and how fast things were moving through this pipeline. And which artists had free time, which artists had surplus–who didn't have surplus but were being overworked and were falling behind. It was a stroke of luck actually that we discovered early on that we had to have this kind of a tracking system for all these little tiny pieces and parts that had to go through this system. That was a really a stroke.

Heather Bryce – Independent Studies – BYU

Watch on YouTube

With Art 45, I think our greatest challenge was at the beginning there were so many ideas. Because we had so many artists working on the project, people with art backgrounds. So I think that the challenge was trying to figure out how do we best present this in a long distance atmosphere. Traditionally, with an art class, you're in the classroom, the teacher is looking at what you're doing, you're seeing examples. And so as much as possible we wanted to see how we could give that experience. So it was a combination of having everyone at the table talking about, well this would be a good example of when video would be appropriate for the actual instructor to draw or, you know, show what she is doing. We showed technology, you know, have them show the program and a little video snippet and then some Flash activities where the student can have some kind of virtual experience. So I think that was probably the beginning, the start-up. All these amazing ideas, how to bring them in together and be concrete in deciding okay what is the best way to proceed?

Dr. Larry Seawright – Center for Teaching and Learning – BYU

Watch on YouTube

Well, the project start-up for the BYU Learning Suite was a little bit kind of an interesting start-up. The way evolved is out of an existing product. We built something called the Syllabus Builder, which was an attempt to offer a systematic way for departments and faculty to build a uniform syllabus. We did a database at the backend of it at the request of a college who needed to output all of their syllabi for creditors. The University as they were going through and looking at the learning management system with the University currently purchases and renews on an annual basis. As they were looking at alternatives to that, one of the administrators took a look at the Syllabus Builder and said “Hey we could extend that and make it into a learning management system.” And so the start-up of the project really came from the University down to us. And they gave us a huge list of requirements. So the start-up was really difficult because we had to pair through all of those requirements and match those against our limited capabilities and see, you know, what could we do in the, with the resources that we had. The people, the money, which is essentially how much can we pay for students. And the time that we have to make all of this stuff. And so, you know, start-up was interesting. And then of course, because of who we are, we have lots of instructional designers, we have consultants who have Ph.D.’s in Instructional Design. So they went out and started talking to faculty and students, so our list of requirements, it got to be really big. And we had, you know, our biggest challenge at start-up was to figure out what we could do in the time frame that the University was going to give us.

Alignment Process
Communications Planning

7.1

Project Selection

Learning | Project Selection | Missions | BYU IPT | Organization | Goals | Objectives | Cash Flow | Interest | Simple Payback | IRR | Internal Rate of Return

LEARNING OBJECTIVES

1. Describe the difference between an organization's mission, goals, and objectives.
2. Describe how the missions are different depending on the type of organization.
3. Define economic terms used for choosing projects.
4. Describe the influences of funding, timing, and unofficial considerations on project selection.
5. Define a project champion and his or her role.

Projects are chosen for a variety of reasons and not all of them are apparent. The project manager must understand why a project was selected over other choices so that he or she can align the team toward justifying the choice that has been made by senior management.

Image by UK Department for Business, Innovation and Skills

Mission of the Organization

The mission of an organization is a statement of why it exists. For example, a police department might have its mission stated on the door of each patrol car—to protect and serve. A well-written mission statement is short and has the following sections:

- Purpose of the organization
- Primary stakeholders
- Responsibility of the organization toward the stakeholders
- Products or services offered

BYU IP&T Department Mission Statement

The objective of the Department of Instructional Psychology and Technology is to enhance learning by improving instruction and teaching. In partnership with others, the department will (1) search for knowledge that improves instruction, (2) apply knowledge and technology to solve instructional problems, and (3) empower students with knowledge and skills in instructional development, research, evaluation, and measurement.[1]

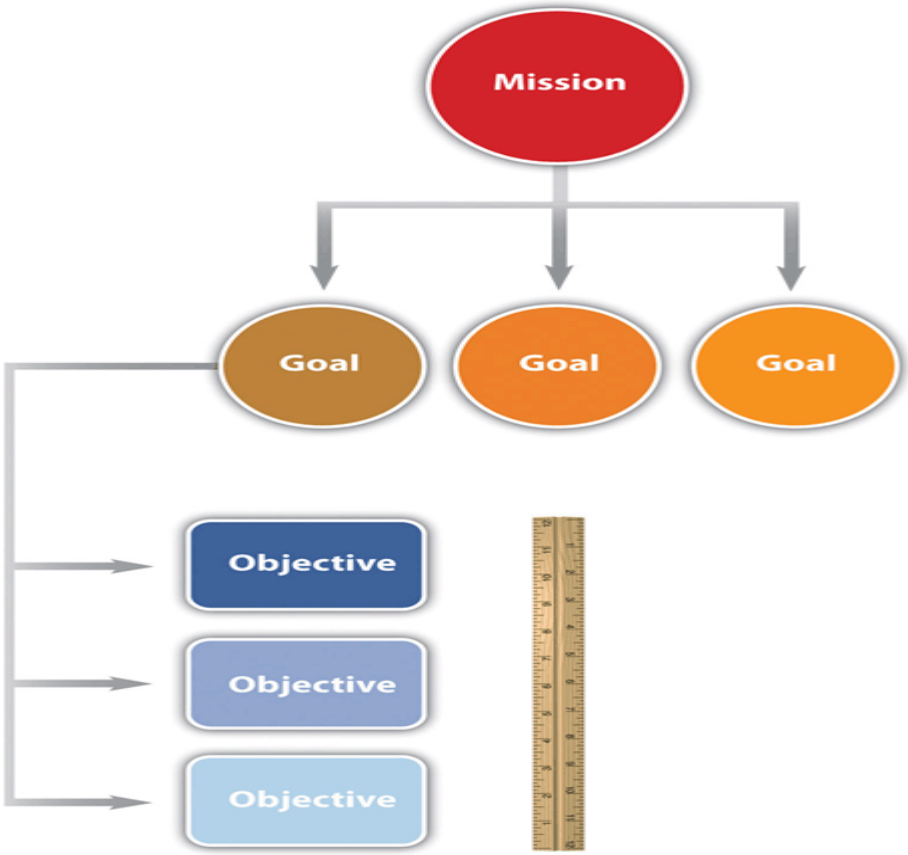
Organizations can be categorized as profit, not for profit, and government. A business that is created to make a profit for its owners and stock holders must consider the cost of each project and how much profit it is likely to generate. The mission statement of a not-for-profit organization, like a charity, would emphasize the service it provides. A not-for-profit organization must control its costs so that it does not exceed its funding, and it is always seeking funding and is in competition with other not-for-profit organizations for funding from the same sources. A government agency, like a police department, is similar to a not-for-profit organization but its sources of funding are usually taxes and fees. Its mission would include its responsibilities to the citizens it represents. Government organizations compete for funding from higher levels of government. Projects are more likely to be funded if the proposal for the project is closely aligned with the mission of the organization. The project manager must be aware of that mission while building a team and aligning it behind the purpose of the project.

Goals and Objectives

Senior administrators of the organization decide on how to achieve the mission of the organization by choosing goals. For example, the director of a not-for-profit preschool that provides low-cost education for children of poor, single parents might set a goal of improving its reputation for quality. A ***goal*** is an end toward which effort is directed. The director meets with her staff and they consider several ways of achieving that goal. They decide to seek certification by a nationally known group that evaluates the quality of preschool programs. Obtaining this certification is an objective.

In this text, we distinguish between the terms goals and objectives. An ***objective*** must have a measurable outcome. In this example, it is easy to measure whether or not the organization receives the certification, which is the distinguishing characteristic of an objective. The use of these terms is not standardized across the industry or in business, but we will be consistent within this text. To determine whether a statement is a goal or an objective, simply ask if there is a measurable outcome. Seeking the certification is an objective that can be met by treating it as a project that has a measurable outcome and a limited time frame.

Figure 7.1 Relationships between Mission, Goals, and Objectives



Economic Selection Criteria

If an organization's mission is to make money, it will try to maximize the profits of the company by increasing the money coming in or decreasing the money going out. The movement of the project's money is called ***cash flow***. Money coming in is positive cash flow, and money going out is negative. The company can maximize profits by improving its operational efficiency or by executing projects. The company must raise money to fund projects. Companies can raise money in three ways:

1. Borrow it (government organizations, such as cities and schools, can sell bonds, which is a form of borrowing).
2. Fund the project from existing earnings.
3. Sell additional stock or ownership shares in the company.

If a company borrows money, it must pay back the amount it borrowed plus additional interest. The ***interest*** is a percentage of the amount of the loan that has not been repaid. The repayment of the loan and interest is usually paid quarterly or annually. To qualify for selection, a project that is intended to make or save money must be able to do the following:

- Repay loans if money must be borrowed to fund the project
- Increase future earnings for shareholders
- Make the company stock more valuable

When senior managers at a for-profit company decide which projects to fund, they must consider these economic issues.