PMP® Certification
PROJECT MANAGEMENT BASICS

4.9/5.0 rating from ProCert Labs
PMP Certification: Project Management Basics

Student Manual
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Index I-1
After reading this introduction, you will know how to:

A Use Course Technology ILT manuals in general.

B Use prerequisites, a target student description, course objectives, and a skills inventory to properly set your expectations for the course.

C Review this course after class.
Topic A: About the manual

Course Technology ILT philosophy
Course Technology ILT manuals facilitate your learning by providing structured interaction with the subject matter itself. While we provide text to explain difficult concepts, the activities are the focus of our courses. By paying close attention as your instructor leads you through these activities, you will learn the skills and concepts effectively.

We believe strongly in the instructor-led class. During class, focus on your instructor. Our manuals are designed and written to facilitate your interaction with your instructor, and not to call attention to manuals themselves.

We believe in the basic approach of setting expectations, delivering instruction, and providing summary and review afterwards. For this reason, lessons begin with objectives and end with summaries. We also provide overall course objectives and a course summary to provide both an introduction to and closure on the entire course.

Manual components
The manuals contain these major components:

- Table of contents
- Introduction
- Units
- Course summary
- Glossary
- Index

Each element is described below.

Table of contents
The table of contents acts as a learning roadmap.

Introduction
The introduction contains information about our training philosophy and our manual components, features, and conventions. It contains target student, prerequisite, objective, and review information for the specific course.

Units
Units are the largest structural component of the course content. A unit begins with a title page that lists objectives for each major subdivision, or topic, within the unit. Within each topic, conceptual and explanatory information alternates with hands-on activities. Units conclude with a summary comprising one paragraph for each topic, and an independent practice activity that gives you an opportunity to practice the skills you’ve learned.

The conceptual information takes the form of text paragraphs, exhibits, lists, and tables. The activities are structured in two columns, one telling you what to do, the other providing explanations, descriptions, and graphics.
Course summary

This section provides a text summary of the entire course. It is useful for providing closure at the end of the course. The course summary also indicates the next course in this series, if there is one, and lists additional resources you might find useful as you continue to learn about the subject matter.

Glossary

The glossary provides definitions for all of the key terms used in this course.

Index

The index at the end of this manual makes it easy for you and your students to find information about a particular subject matter component, feature, or concept.

Manual conventions

We’ve tried to keep the number of elements and the types of formatting to a minimum in the manuals. This aids in clarity and makes the manuals more classically elegant looking. But there are some conventions and icons you should know about.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Italic text</em></td>
<td>In conceptual text, indicates a new term or feature.</td>
</tr>
<tr>
<td><strong>Bold text</strong></td>
<td>In unit summaries, indicates a key term or concept. In an independent practice activity, indicates an explicit item that you select, choose, or type.</td>
</tr>
</tbody>
</table>

Activities

The activities are the most important parts of our manuals. They are composed of questions and answers designed to review concepts and invite discussion of ideas. Here’s a sample:

**Do it!**

**A-1: Discussing the importance of PMP certification**

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Which organization has accredited PMI as a Standards Development Organization?</td>
</tr>
<tr>
<td>2 What are the benefits of earning the PMP credential?</td>
</tr>
</tbody>
</table>
Topic B: Setting your expectations

Properly setting your expectations is essential to your success. This topic will help you do that by providing:

- Prerequisites for this course
- A description of the target student
- A list of the objectives for the course
- A skills assessment for the course

Course prerequisites

Before taking this course, you should have at least 36 months of professional project management experience.

Target student

This course is designed for project managers who want to take the PMP Certification exam. This course reviews the requirements and procedures for taking the PMP exam and helps reinforce your understanding of basic project management concepts.

Course objectives

These overall course objectives will give you an idea about what to expect from the course. It is also possible that they will help you see that this course is not the right one for you. If you think you either lack the prerequisite knowledge or already know most of the subject matter to be covered, you should let your instructor know that you think you are misplaced in the class.

Note: In addition to the general objectives listed below, more detailed objectives are listed at the beginning of many topics, along with references to corresponding material in the PMBOK. Because PMI does not publish a numbered list of PMP exam objectives, our numbering scheme is intended only as an organizational guide to topic coverage in this manual.

After completing this course, you will know how to:

- Identify the requirements for the PMP exam and discuss the PMP exam content.
- Describe the project management context.
- Explain the project management framework.
- Identify the knowledge areas and process groups of project management.
**Skills inventory**

Use the following form to gauge your skill level entering the class. For each skill listed, rate your familiarity from 1 to 5, with five being the most familiar. *This is not a test.* Rather, it is intended to provide you with an idea of where you’re starting from at the beginning of class. If you’re wholly unfamiliar with all the skills, you might not be ready for the class. If you think you already understand all of the skills, you might need to move on to the next course in the series. In either case, you should let your instructor know as soon as possible.

<table>
<thead>
<tr>
<th>Skill</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describing a project and its characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defining key terms, such as project management, program, subproject, portfolio, and project management office</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifying the stakeholders in a project and managing their expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifying the role of the project manager in different organizational structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using effective project management skills, such as communication, negotiation, management, influencing, and conflict management skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using effective general management skills, such as organizing and planning, budgeting, leadership, and team building skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifying the characteristics of a project phase, project life cycle, and product life cycle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifying the five process groups of project management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifying the nine knowledge areas of project management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
There are no special requirements for reviewing this course after class. However, you can download the PowerPoint presentations and CertBlaster software.

**Downloading the PowerPoint presentations**

If you would like to review the PowerPoint presentations for this course, you can download them as follows:

2. Enter the course title or search by part to locate this course.
3. Click the course title to display a list of available downloads.  
   **Note:** Data Files are located under the Instructor Edition of the course.
4. Click the link(s) for downloading the PowerPoint presentations.
5. Create a folder named Instructor Data on the desktop of your computer.
6. Double-click the downloaded zip file(s) and drag the contents into the Instructor Data folder.
Unit 1

Getting started

Unit time: 45 minutes

Complete this unit, and you’ll know how to:

A  Identify the requirements for appearing for the PMP exam and for maintaining your certification.

B  Discuss the PMP exam content.
Topic A: About PMP certification

Explanation
The Project Management Institute (PMI) is a globally recognized institution that promotes excellence in project management standards and practices. It is accredited as the Standards Development Organization by the American National Standards Institute (ANSI). PMI provides a platform for project managers across the world to enhance their knowledge base through seminars, training, discussions, and certifications. PMP certification is one of PMI’s many initiatives. The certification is an ISO 9001–certified program that is endorsed by organizations throughout the world.

Importance of PMP certification
As a PMP certified professional, you derive many benefits. A few of them are:

- Increased recognition from your organization
- Increased customer confidence
- Potential salary increase
- Better career prospects

Employers across the world use the PMP credential to sort through résumés. For employers, the credential is a guarantee that you incorporate new tools and techniques to manage projects, employ industry best practices, and follow an ethical code of conduct. The credential also proves that you are committed to constantly updating your knowledge and to contributing to the project management profession in general. In fact, the PMP credential is associated with one of the highest average base salaries and is ranked fourth in CertCities.com’s 10 Hottest Certifications for 2006.

Do it!

A-1: Discussing the importance of PMP certification

Questions and answers

1. Which organization has accredited PMI as a Standards Development Organization?

2. What are the benefits of earning the PMP credential?
PMP exam eligibility requirements

It’s strongly recommended that potential applicants for the PMP exam read the Credential Handbook. You can download this document from www.pmi.org. The following table describes the two groups of applicants who are eligible to take the PMP exam.

<table>
<thead>
<tr>
<th>Completed education</th>
<th>Project management experience</th>
<th>Project management education</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school diploma or equivalent</td>
<td>Minimum five years of project management experience and 7500 non-overlapping hours of managing projects</td>
<td>Completed 35 professional development units (PDUs) in project management. (Each PDU is equivalent to an hour of formal education in project management.)</td>
</tr>
<tr>
<td>Bachelor’s degree or equivalent</td>
<td>Minimum three years of project management experience and 4500 non-overlapping hours of managing projects</td>
<td>Completed 35 PDUs in project management.</td>
</tr>
</tbody>
</table>

As part of taking the exam, you agree to abide by a code of ethics. PMI’s PMP code of ethics specifies that you should constantly improve your professional capabilities and maintain high standards of personal and professional integrity. More information about the PMP code of professional conduct is available at http://www.pmi.org/info/PDC_CertificationsOverview.asp?nav=0401.

If you meet the eligibility criteria, you can apply for the PMP exam. The application form is available on the PMI Web site at https://www.pmi.org/certapp/. You can submit the form by postal mail or complete it online at the PMI Web site. If your form is approved, you will receive an eligibility letter that will authorize you to take the exam. This letter contains detailed scheduling information and the date on which your eligibility year begins. Within this eligibility period, you can take the PMP exam a maximum of three times.

Examination venue

After receiving the eligibility letter, you can schedule your exam at any Prometric Testing Center from Monday through Saturday. Visit http://prometric.com/pmi to get a complete list of test sites.
Exam site requirements

To be admitted into the exam center, you must carry your eligibility letter and a primary, government-issued form of identification. The ID should include English characters or an English translation and should have both a photograph and a signature. If your primary ID doesn’t contain both a photo and signature, you can use a secondary form of ID. The list of acceptable identification is shown in the following table.

<table>
<thead>
<tr>
<th>Acceptable government-issued ID</th>
<th>Acceptable secondary ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid driver’s license</td>
<td>Valid employee ID</td>
</tr>
<tr>
<td>Valid military ID</td>
<td>Valid credit card with signature</td>
</tr>
<tr>
<td>Valid passport</td>
<td>Valid bank (ATM) card</td>
</tr>
<tr>
<td>Valid national identity card</td>
<td></td>
</tr>
</tbody>
</table>

In addition, your name on the identification must match your name on the eligibility letter. If there is any identification mismatch, PMI has the right to deny permission to test you. Note that library cards and Social Security cards are not acceptable forms of identification.

Do’s and Don’ts

You’re not permitted to bring food, beverages, coats, book bags, luggage, or dictionaries into the exam site. PMI also prohibits laptops, mobile phones, PDAs, and other digital devices. However, handicapped candidates may carry devices that they cannot do without. If you require an electronic device for medical reasons, an exception can be made.

Notification of exam results

After you submit your test online, the computer will print a copy of your results. If you pass the exam, you will receive an official certificate declaring that you have passed. If you fail the exam, you will receive information about the result and a notification to retake the exam. You can get more information about exam results and reports by sending an e-mail message to customercare@pmi.org.

If you don’t agree with the exam results, you can request that your exam be scored by hand. However, you will need to pay an additional fee for this service.

Re-examination procedures

If you fail the exam the first time, you can attempt it two more times within the same eligibility year. However, if you fail the exam on all three attempts, you must wait one year before applying to take it again. Each time you retake the exam, you need to pay an additional fee and fill out a re-examination form. The re-examination fee structure is available at this Web page:
Continuing PMP certification

PMI provides support for keeping your certification status active through its Continuing Certification Requirements (CCR) program. As part of this program, every three years, you must:

- Attend a minimum of 60 PDUs.
- Complete an Application for Certification Renewal form.
- Pay a renewal fee.
- Continue to adhere to the PMP Code of Professional Conduct.

Do it!

A-2: Discussing the PMP exam eligibility criteria

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 How will the eligibility requirements differ between candidates holding an Associates degree and those holding a Baccalaureate degree?</td>
</tr>
<tr>
<td>2 Which of the following is (are) acceptable proof of identification?</td>
</tr>
<tr>
<td>A Valid credit card</td>
</tr>
<tr>
<td>B Eligibility letter</td>
</tr>
<tr>
<td>C Passport</td>
</tr>
<tr>
<td>D Social Security card</td>
</tr>
<tr>
<td>3 Which of these statements about retaking the PMP examination is false?</td>
</tr>
<tr>
<td>A If you fail the exam the first time, you can attempt the exam two more times within the same eligibility year.</td>
</tr>
<tr>
<td>B If you exhaust the maximum number of attempts allowed within an eligibility year, you must wait a year to reapply.</td>
</tr>
<tr>
<td>C If you passed the exam with a low score, you can retake it to improve the score.</td>
</tr>
<tr>
<td>D You need to pay an additional fee to retake the exam within the eligibility year.</td>
</tr>
<tr>
<td>4 What are the PMI CCR program requirements for keeping the status of your certification current?</td>
</tr>
</tbody>
</table>
Topic B: PMP exam content

Explanation

The PMP exam is conducted both as a computer-based and a paper-based test. You can choose either medium. If you are taking the exam on the computer, then before the exam begins, you will be required to complete a 15-minute tutorial on how to take the exam by computer. In the actual exam, you will see one question at a time on the screen.

The exam has 200 questions, which you’re given four hours to complete. Of the 200 questions, 25 are pretest questions. These questions appear randomly throughout the exam. The score of the pretest questions is not included in the total score.

PMI computes the final score for the remaining 175 questions. The scoring pattern of the exam is as follows:

- Each question carries one point.
- A passing score is 141 points out of 175 (approximately 81%).
- No points are deducted for wrong answers.

PMP exam structure

The 200 questions are distributed across different categories, as shown in the following table. The Professional and Social Responsibility group, which focuses on the PMP code of conduct and ethical behavior, has been allotted 9% of the questions. The rest of the questions address the five process groups, which focus on project management theory and principles.

<table>
<thead>
<tr>
<th>Question categories</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Initiating process group</td>
<td>11</td>
</tr>
<tr>
<td>Project Planning process group</td>
<td>23</td>
</tr>
<tr>
<td>Project Executing process group</td>
<td>27</td>
</tr>
<tr>
<td>Project Monitoring and Control process group</td>
<td>21</td>
</tr>
<tr>
<td>Project Closing process group</td>
<td>9</td>
</tr>
<tr>
<td>Professional and Social Responsibility group</td>
<td>9</td>
</tr>
</tbody>
</table>

Exam question format

Questions are not based on any single source of material. However, the Project Management Body of Knowledge (PMBOK) Guide can be considered the base document. Because the exam tests your application of project management concepts, it’s essential that you understand these guidelines and concepts in the context of real life.
All of the questions in the PMP exam are multiple-choice questions. Each question has four choices, and only one of them is correct. The questions are either situational or direct. The situational questions require you to evaluate a situation and choose the best solution based on project management standards and best practices. The direct questions might require comprehension and recall of information. For example, you might need to identify inputs, tools and techniques, or outputs of a process.

The following are sample questions provided by PMI to help you understand the question format.

**B-1: Reviewing sample questions**

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 You are assigned a project that requires the manufacturing of medical equipment for one of your company’s current clients. Your company has executed similar projects successfully in the past. During which phase of the project would you consider referring to previous project documents for the similar projects?</td>
</tr>
<tr>
<td>A Scope Planning</td>
</tr>
<tr>
<td>B Scope Verification</td>
</tr>
<tr>
<td>C Scope Definition</td>
</tr>
<tr>
<td>D Initiation</td>
</tr>
<tr>
<td>2 Assurance that activities throughout time have conformed to the organization’s requirements can be accomplished through the use of:</td>
</tr>
<tr>
<td>A Status reports</td>
</tr>
<tr>
<td>B Project stage gates</td>
</tr>
<tr>
<td>C Benchmarking</td>
</tr>
<tr>
<td>D Control charts</td>
</tr>
</tbody>
</table>
**Tips for taking the PMP exam**

*Explanation*

Following are a few tips that may help you avoid common mistakes:

- As soon as you get into the examination center, note the formulas for various mathematical calculations that you will perform during the exam. This will save you time spent in remembering them and prevent any confusion that might arise during the exam.

- Organize your time efficiently and do not waste much time answering a question. If you find a question tough, the best thing to do is to mark it for review and attempt it later.

- Be optimistic while taking the exam. Even if a few questions are difficult to answer, you should go ahead with other questions.

- Read all four answer choices carefully to avoid choosing the wrong answer. You should first understand the question thoroughly and then identify its answer.

- Often, it will seem like more than one option is correct. Remember, you need to select the best option among the answers. Therefore, it’s important to read all four options. In other words, do not stop reading the remaining options after you think you found the correct one.

- At times, you might not agree with any of the options because they don’t match what you would do in your organization. Remember that these questions are based on a set of standards and guidelines that are recommended by PMI and recorded as best practices across industries. Try to answer the questions from PMI’s perspective or, in other words, according to what PMBOK prescribes. Only if you are unable to determine what PMBOK prescribes should you rely on your practical experience.

- It is advisable to become a PMI member. You’ll gain exposure to documents, journals, and articles on exam-relevant content. In addition, as a PMI member, you’ll pay a discounted exam fee.
## B-2: Understanding the PMP exam environment

### Questions and answers

1. What is the duration of the PMP exam?

2. What is the total number of questions in the exam?

3. What type of questions does the PMP exam contain?

4. What is the passing score for the PMP exam?

5. From which process groups should you expect the most questions?
Unit summary: Getting started

**Topic A**
In this topic, you learned about the importance of the PMP exam. You also learned about the eligibility criteria for appearing for the PMP exam.

**Topic B**
In this topic, you became familiar with the PMP exam structure and content. You reviewed the question distribution across process areas and the PMP question format. You also reviewed tips for successfully taking the PMP exam.

**Review questions**

1. True or false? No points are deducted for wrong answers on the PMP exam.

2. If you have a Baccalaureate degree, how many hours of PDUs do you need to be eligible?
   - A 25 hours
   - B 35 hours
   - C 40 hours
   - D 45 hours

3. When does your eligibility year for taking the PMP exam end?
   - A It ends one year from the date you file the PMP exam application.
   - B It ends one year from a date assigned to you by PMI.
   - C It ends one year from the date that your PMP application is approved.
   - D It ends one year from the time you formally complete all eligibility requirements.

4. If you fail the PMP exam, how long should you wait to attempt it again within the same eligibility year?
   - A One day.
   - B One week.
   - C One month.
   - D You do not have to wait to re-attempt the exam.
5 Which process area should you give maximum attention to for passing the exam?
   A   Planning
   B   Executing
   C   Monitoring and Controlling
   D   You should give equal attention to all process areas.
Unit 2
Project management context

Unit time: 120 minutes

Complete this unit, and you’ll know how to:

A  Describe a project and its characteristics.

B  Define the following terms: project management, program, subproject, portfolio, and project management office.
Topic A: Projects

Explanation

This topic covers the following course objectives:

<table>
<thead>
<tr>
<th>#</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.A.1</td>
<td>Identify the characteristics of a project (1.2.1 PMBOK)</td>
</tr>
<tr>
<td>2.A.2</td>
<td>Differentiate between projects and operational work (1.2.2 PMBOK)</td>
</tr>
</tbody>
</table>

Characteristics of a project

Different organizations define projects in different ways. Some organizations consider every task to be a project, and others consider only specific tasks to be projects.

According to the Project Management Body of Knowledge (PMBOK), a project is a multitask, temporary job with definite start and end dates. It has a clearly defined scope of work, budget, and unique output. Although this standard definition might not be applicable to all real-time projects, all projects must be temporary endeavors to create unique products, services, or results. Projects must also help organizations to meet strategic goals.

The following table lists examples of endeavors that do and do not qualify as projects.

<table>
<thead>
<tr>
<th>Examples of projects</th>
<th>Not projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of custom software</td>
<td>Using software for daily operations</td>
</tr>
<tr>
<td>Construction of a new building</td>
<td>An ongoing marketing campaign</td>
</tr>
<tr>
<td>Reconstruction of buildings and infrastructure after a natural disaster</td>
<td>Maintenance of an organization’s network</td>
</tr>
<tr>
<td>Assessment of the processes in a manufacturing plant to determine methods for improving productivity</td>
<td>Assembly of different parts of a product</td>
</tr>
<tr>
<td>Implementation of a mobile warfare system</td>
<td>After-sales support for a product</td>
</tr>
</tbody>
</table>

A project has three main characteristics: it is a temporary endeavor; it produces unique output or results; and there is progressive elaboration.

Temporary endeavor

A project is a temporary endeavor, meaning that it has definite start and end dates. An ongoing activity without a definite end date cannot be considered a project. For example, the development of a new car model will have a target end date. However, the manufacturing of this car will be an ongoing activity. In this case, the development of the new model is a project, and the manufacturing of the car is not. In a project management context, the word “temporary” does not mean lasting for a short period; rather, it means having a finite duration. For example, defense projects usually run for months or years.
A project ends in any of the following situations:
- Project objectives are met.
- It’s clear that the project scope or objectives cannot be met.
- The need for the project does not exist anymore.

**Unique output**

The output of a project should be a unique and can take several forms:
- **Product** — A quantifiable end product or a component item. For example, the development of a new aircraft model or new components for aircrafts.
- **Service** — The capability to perform business functions. For example, setting up a marketing team for an organization.
- **Result** — An outcome or documents. For example, an assessment report of a manufacturing plant, along with the methods to improve productivity.

**Progressive elaboration**

*Progressive elaboration* is the development of final output through incremental design and refinement of the initial concept. A project starts with a broad-level concept. The specifications of the project are gradually refined over stages (are progressively elaborated). The concept of progressive elaboration is closely tied with the scope of the project. As the project moves from a concept toward completion, the project and product specifications become clearer and more specific. Examples of progressive elaboration in a project include the development of a project plan and detailed work breakdown structure from the initial broad-level project scope. For a product, it could be the progression from a conceptual design to the detailed functional specifications.

To understand the concept of progressive elaboration, consider a project to create new accounting software. The project team would start by identifying the tasks that users will be able to complete by using this software. Based on this list of tasks, the team would develop a list of software features that will help accomplish those tasks. Next, the team would develop a detailed description of each feature, describing how the features would behave in response to different user actions. This would result in a detailed specifications document. When the project proceeded, the team would refine the features from performance and stability points of view. Then, during the testing phase, final adjustments might be done for operational purposes.
## A-1: Discussing the characteristics of projects

### Questions and answers

1. What is a project?

2. A company’s Vice President of Sales asks her team members to generate the sales report for the previous month. Is it a project?

3. Which of the following is (are) likely to be a project and why?
   - A. Providing after-sales service for a product
   - B. Producing a movie
   - C. Manufacturing shoes
   - D. Conducting an election

4. Which of the following is an example of progressive elaboration?
   - A. Creating a micro-level schedule for a project
   - B. Starting a project from scratch and taking it to successful completion
   - C. Executing a project based on a project plan
   - D. Developing a project management plan from an initial scope statement

5. Identify examples of progressive elaboration in projects that you have managed.
Project vs. operational work

Whereas projects are unique and temporary, operations are ongoing and repetitive activities in an organization. Operations might use the same processes repeatedly to produce expected results. For example, the implementation of a network is a project, but the day-to-day management and maintenance of that network is an operation. The project team must complete the implementation of the network within a specific time frame. However, the maintenance of that network does not have any definite end date; it’s an ongoing and repetitive activity.

Projects and operations also differ in their objectives. Projects help achieve strategic goals and then end. Operations enable the continuity of an organization’s business.

Projects and operations have certain similar characteristics. Both are performed by people and use a limited number of resources. Both are planned, executed, and controlled. They might also be related. As you can see in the network example, the output of a project can result in the beginning of operations.
### A-2: Differentiating between projects and operations

#### Questions and answers

1. What are the differences between projects and operations?

2. What are the similarities between projects and operations?

3. A shoe manufacturing company decides to launch a new model of sports shoe before the end of the year. Which of the following statements is true about this activity?
   - A. This is a project because the company is manufacturing this type of shoe for the first time.
   - B. This is an operation because the company is already in the shoe manufacturing business.

4. Which of the following are operations?
   - A. Providing raw materials for the manufacturing of a product
   - B. Designing a new quality management process for a product
   - C. Implementing a process to improve the productivity of a manufacturing unit
   - D. Performing quality tests on products

5. Which of the following is not a characteristic of an operation?
   - A. Ongoing activity
   - B. Planned, executed, and controlled
   - C. Unique output
   - D. Performed by people
The role of triple constraints

Any factor that limits the options for managing competing project requirements is known as a constraint. The term triple constraints refers to three key project constraints: scope, time, and cost. The quality of the output or the result of a project depends upon triple constraints. Triple constraints are interrelated, as shown in Exhibit 2-1.

A balance among these factors is important for the success of a project. A change in any of these factors will have an impact on one or both of the other factors. For example, if the scope of a project increases when you are only midway through it, you might need to spend more money and more time to complete the project.

Project tradeoffs

You might often receive sudden requirements from stakeholders, or experience risks or problems when they’re most unexpected. All of this is bound to affect one or more of the three constraints. In such situations, you need to analyze the impact of changes on each of the triple constraints and make appropriate tradeoffs so that you can still meet the project goals successfully.

Consider a situation in which the management of your organization wants to complete a project in a shorter duration than the usual time required to launch a new product. They want to be in the market before their competitor. In this situation, you are required to complete the project in a time less than optimal, without compromising the quality of the output. You need more skilled resources immediately to complete the project. In addition, you can start in parallel any activities that are not affected by each other’s schedules. All of this might well increase the project’s cost. However, if the product is launched on time, there is a high possibility of getting more market share and higher profits because the competitor’s product will not have been launched at that time.
**A-3: Identifying the role of triple constraints**

**Questions and answers**

1. You have begun production of a new product when you receive an additional request from the project sponsor. Your project is on schedule and set to finish on time. However, this new request will increase the scope of the project. What is the best way to proceed?
   - A Evaluate the impact of the scope change on the other components of the triple constraints, and evaluate the tradeoffs.
   - B Consult other stakeholders for a possible solution.
   - C Ask management to immediately deploy more resources.
   - D Inform the customer that the new request is a scope change and therefore cannot be done.

2. The customer requests that you complete the project two weeks earlier than initially planned. Evaluate the impact of this change on the other two constraints.

3. During the execution of a project, you determine that the effort was underestimated for some activities. To deliver the project with the defined scope, what is the best course of action now?
   - A Reduce the scope of the product.
   - B Cut down some activities, but complete the task on time.
   - C Ask the customer to pay the actual cost to complete the project.
   - D Ask the project sponsor to approve additional costs to accommodate the complete scope of the project.
Topic B: Project management concepts

Explanation

This topic covers the following course objectives:

<table>
<thead>
<tr>
<th>#</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.B.1</td>
<td>Define what is involved in managing a project (1.3 PMBOK)</td>
</tr>
<tr>
<td>2.B.2</td>
<td>Describe the project management context (1.6 PMBOK)</td>
</tr>
</tbody>
</table>

Definition of project management

PMBOK defines project management as the application of knowledge, skills, tools, and techniques in project activities to meet project requirements. Project management includes the following tasks:

- Identifying project requirements
- Determining clear and achievable objectives
- Balancing the competing demands of quality, cost, time, and scope
- Adapting the specifications, plans, and approach to the different concerns and expectations of stakeholders

All projects consist of processes. The success of a project depends on the effective selection and use of processes, tools, and techniques by its project manager. In addition, a project manager should be able to balance the constraints and make appropriate tradeoffs. You can say that a project is successful when it delivers the product, service, or result as defined by the scope, on time, within budget, and with acceptable quality. In other words, a project is successful when it meets or exceeds all of the stakeholder expectations.

Management by projects

Today, the term “project management” is sometimes used to describe an organizational or managerial approach to managing projects and some operations. This approach is known as management by projects, whereby activities are treated as projects, and project management principles are used to manage them. This requires the organization to execute, monitor, and control all activities and check them against their set targets of scope, time, and cost.

The key features of this approach include:

1. Setting goals, capturing detailed requirements, and ensuring stakeholder buy-in on the scope, time and cost.
2. Breaking down bigger tasks into subtasks and aligning tasks with deliverables.
3. Planning and deploying resources toward completion of tasks.

To understand the concept of management by projects, consider an example of a customer care center that adopts this approach. The organization continues all its operational processes for day-to-day activities. However, the adoption of a management-by-projects approach helps the organization measure, analyze, monitor, and control the implementation of various processes. Based on the results of these activities, the organization can take steps to improve its processes and practices.
Management by objectives

Management by objectives (MBO) is an approach that directs an organization to be guided by project goals. To do this, the organization uses three steps:

1. Establishing SMART (Specific, Measurable, Achievable, Realistic, and Timed) goals
2. Evaluating the accomplishment of the objectives periodically
3. Implementing corrective actions

The key weakness of this approach is that it gives less importance to the organizational context in which the goals are set and greater importance to the organization and its people’s commitment to the goals. As a result, neglected factors—such as the resources’ skills, planning, or stakeholders’ buy-in of the goals—could negatively affect the success of the project.

In the context of project management in an MBO organization, projects that are aligned with corporate objectives get priority for resources and all other aspects of the project. For example, consider an IT organization that follows the MBO approach. The corporate objective is to focus on healthcare solutions. In this organization, the management will assign the best resources to healthcare projects. For a project manager who manages non-healthcare projects, it will be difficult to get good resources, get any additional budget sanctioned, or direct management’s attention to project risks. In time, such a project might have to be phased out until the management changes its strategic goals.

**Do it!**

**Questions and answers**

1. What are the key factors for the success of a project?

2. What would be the most important reason for poor project management?
3 During a software development project, the customer asked the project team to change the functionality of two features. These features had already been developed. The project manager found that additional effort would be needed to change the features, but also realized that if the changes weren’t made, the customer would be dissatisfied. The project manager asked the development team to make the changes immediately. Do you agree with this decision? Why or why not?

4 Discuss the concept that management by projects is an evolution of management by objectives.
**Programs, portfolios, and subprojects**

*Explanation*

Often a project might be part of a group of projects that are designed to achieve common goals. Or, a project might have subprojects that will help meet its goals. The following are a few terms used to describe the hierarchy:

- Programs
- Portfolios
- Subprojects

**Programs**

A *program* is a set of related projects that are coordinated so that they gain benefits and control that would be unattainable if the projects were managed individually. These related projects might share common resources. Each project within a program is usually managed by a separate project manager, and all the project managers report to a program manager. The program manager manages the budget, schedule, and scope of the program, in addition to ensuring that all projects are consistently progressing to deliver the program goals.

Consider the construction of a new housing development. This can be seen as a program because it can comprise multiple projects, such as landscaping, constructing roads, and constructing houses. These different projects are linked together, and the final output will be a new housing development. Different project managers would oversee each project, and a program manager would supervise and manage the entire program.

A program can be continuous and repetitive, unlike the projects within it. For example, consider a movie production company. The company has been producing movies over the years, but each movie has a unique budget, scope, and team. Although the movie production program is repetitive, the production of each movie is unique.

**Portfolios**

A *portfolio* is a collection of programs or projects that are grouped together to meet strategic business objectives. The programs and projects within a portfolio contribute to an organization’s strategic and business goals, but might not necessarily be directly related or interdependent. For example, an IT company might focus on projects from various sectors, such as healthcare, insurance, and banking. The company would set different business goals and strategies for the projects in these different sectors. In such a situation, the company could create portfolios for these sectors and align projects with the appropriate portfolio. This would not only align similar projects under one head but also help optimize the utilization of skilled resources.

A portfolio manager:

- Analyzes the profitability and feasibility of each project in the portfolio and compares them with the objectives of the organization.
- Monitors the projects in the portfolio for adherence to organizational objectives.
- Manages the resources optimally.

A portfolio manager can decide not to start a project that does not contribute toward portfolio objectives, even if the project idea is very good. Typically, senior managers or senior management teams assume the responsibility of portfolio management.
Subprojects

Sometimes large projects can be divided into smaller independent units of work, called subprojects. Often, subprojects are outsourced to vendors or delegated to other teams in the same organization. Projects can be broken into subprojects based on the following:

- **Technological specialization** — For example, a software development project might have a subproject focused on automated quality testing of the program being developed.

- **Resource skill requirements** — A construction project might have one subproject focused on carpentry and another focused on plumbing installation.

- **Project processes** — Analysis and design might be performed by one team, and development and testing of the product might be performed by another.

Although subprojects are part of a parent project, they usually have separate schedules, budgets, and resource requirements. This means that they can be treated as separate projects and sometimes might even be called so. Very large subprojects might be broken down even further to a series of smaller subprojects.
### B-2: Discussing programs, portfolios, and subprojects

#### Questions and answers

1. What is the difference between a program and portfolio?

2. Which of the following is true about subprojects?
   - A. Programs are divided into manageable chunks of work called subprojects.
   - B. Subprojects directly contribute to the organizational objectives.
   - C. Each subproject has its own schedule and budget.
   - D. The output of a subproject is always the input for the next subproject of the parent project.

3. Which of the following can be considered an example of a portfolio?
   - A. A large road construction project broken down into multiple smaller projects
   - B. A defense program to build a long-range air-to-air missile
   - C. Training employees to use a new program
   - D. A set of software development projects that cater to the human resources (HR) industry
Role of the project management office

PMI defines a *project management office* (PMO) as an organizational unit that centralizes and coordinates the management of projects under its domain. The projects managed by a PMO might or might not be related to each other. A PMO is sometimes also called a *program management office*, a *project office*, or a *program office*.

A PMO has the following key tasks:

- Coordinate the planning, prioritizing, and execution of projects and subprojects that meet a customer’s or organization’s business objectives.
- Implement project management support functions, such as standardizing policies, procedures, and templates for managing projects.
- Provide training and guidance on project management and project management software.
- Act as a key stakeholder or decision maker during a project’s initiation, evaluate project performance, provide recommendations, and terminate the project if necessary to maintain the business objectives.
- Maintain and archive project documentation for future reference.
- Select and manage project personnel.

PMOs have different roles in different organizations. For example, an organization can set up a PMO to define, monitor, and improve project management processes in the organization. In this case, the PMO will define the project management methodology, processes, procedures, and templates to manage internal projects. Project managers will manage projects by using these methodology, processes, and procedures. The PMO will also audit the projects for compliance with defined processes and procedures. Other tasks of a PMO are to collect data from various projects, analyze the data, modify processes and procedures for better performance, and then train project managers on the enhancements.

A PMO is not a person, it’s a structure; therefore, a PMO is different from a project manager. The following table describes the key differences between project managers and PMOs.

<table>
<thead>
<tr>
<th>Item</th>
<th>Project manager</th>
<th>PMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td>Focuses to meet specific project objectives</td>
<td>Focuses on program or organizational objectives.</td>
</tr>
<tr>
<td>Resources</td>
<td>Monitors and controls the resources assigned to a project.</td>
<td>Optimizes the use of shared resources across projects.</td>
</tr>
<tr>
<td>Management</td>
<td>Manages the scope, cost, schedule, and quality of a project.</td>
<td>Manages opportunities, interdependencies, and risks across projects.</td>
</tr>
<tr>
<td>Monitoring and reporting</td>
<td>Reports project progress and project-specific information.</td>
<td>Reports consolidated information on projects from an enterprise point of view.</td>
</tr>
</tbody>
</table>

Poorly managed PMOs can generate negative impressions about the project management practices of your company, and these impressions can in turn have a negative impact on business. Therefore, it is important to clearly define the roles and responsibilities of the PMO. It’s also important that a PMO complies with its defined role and avoids taking up core project management tasks.
**B-3: Discussing the role of a PMO**

### Questions and answers

1. Is there a PMO or an equivalent entity in your organization? If so, what are its responsibilities?

2. Which of the following is a responsibility of a PMO?
   - A. Provide standardized policies for managing projects.
   - B. Perform quality tests as defined by the quality plan.
   - C. Manage the schedule and cost of a project.
   - D. Monitor and control the resources assigned to a project.

3. Categorize each of the following responsibilities as belonging to either a project manager or a PMO.
   - A. Revise the project management methodology.
   - B. Report the progress of a project to all stakeholders.
   - C. Audit project processes to check compliance with organizational standards.
   - D. Apply appropriate methods to optimize resource utilization across several projects.

4. Discuss how the activities of the PMO provide support to project managers.
Unit summary: Project management context

**Topic A**
In this topic, you defined what a *project* is and identified its *characteristics*. You also learned about the differences between projects and *operations*, and you examined the relationship among the triple constraints.

**Topic B**
In this topic, you defined the term *project management*. You also identified the differences between *programs*, *portfolios*, and *subprojects*. Finally, you learned about the role of a *project management office (PMO)* in an organization.

**Review questions**

1. True or false? Projects and operations can be related because there might be situations where the output of a project can be the beginning of an operation.

2. Which of the following is *not* a triple constraint?
   - A  Cost
   - B  Time
   - C  Risk
   - D  Scope

3. All of the following are the characteristics of projects, *except* for:
   - A  Unique output
   - B  Temporary
   - C  Repetitive
   - D  Progressively elaborated

4. Which of the following activities would be considered a project?
   - A  Writing a daily column in a newspaper
   - B  Setting up a food processing unit
   - C  Manufacturing automobile parts
   - D  Updating the details of new employees in the payroll register
5 Of the following, which is the best example of progressive elaboration?

A After development, the quality team reviews the product to ensure that it meets the scope specifications. After the review, the development team incorporates the review changes, and the quality team verifies the changes.

B A project manager prepares a project plan and then sends it to senior management for review. After the review, the project manager incorporates the suggested changes, baselines the plan, and publishes it for the project team. Then the team starts development according to the plan.

C Based on the initial requirements, a project team prepares a blueprint of the product. Next, the team creates a detailed design. Then, the team performs further analysis to create detailed specifications of each component of the product.

D Based on the requirement specifications, a project manager identifies the different tasks in a project. Then, the project manager creates a workflow diagram and a detailed schedule to complete each task.

6 A car manufacturing company is planning to develop a new car model by the end of the year. After the successful development of the new model, the company is planning to manufacture 10,000 cars of this model within the next year. Which of the following statements describes the situation most appropriately?

A Both activities can be considered projects because both have definite start and end dates.

B Both activities are operations because the company is already in car manufacturing and the activities are part of their day-to-day business.

C The first activity is a project because it has a definite time duration and it produces a unique output. The second activity is an ongoing, repetitive activity.

D Both activities are part of a single project and represent two phases of it.

7 Which of the following is the best example of an operation?

A Preparing a report on the stock market trend of the previous day.

B Preparing a report on the top 10 stocks of the previous year.

C Preparing a report on the reasons for a high stock market index for the past two quarters.

D Preparing a report on the trend of IT companies in the stock market for the coming year.

8 Which of the following is not a characteristic of operations?

A Continuously use the same set of processes

B Are performed within a finite time duration

C Produce the same results continuously

D Face constraints for resources
9 You are in the execution phase of a project, when the customer requests some modifications in the project’s scope. As a project manager, what should be the first step when you receive this request?

A Analyze the impact of the scope change on other constraints.

B Ask the customer to sanction the extra cost of accommodating the changed scope.

C Ask the team to modify the product as defined by the new scope.

D Inform the customer that the changes cannot be made within the current schedule, and revise the schedule to accommodate the changes.

10 Your company decides to organize its projects into three divisions based on these geographical regions: U.S., Europe, and Asia-Pacific. The company assigns a senior manager as the head of each division and sets specific goals for each division. The senior manager should focus on the business development in a specific business area and help the teams aligned with that business area meet their goals. Which of the following best defines this situation?

A Management by projects

B Management by objectives

C Program management

D Portfolio management

11 The management-by-objectives approach works when:

A The organization has a PMO.

B The projects are categorized into portfolios aligned with the objectives.

C Management supports the approach.

D The objectives are broken down into the most fundamental levels.

12 Which of the following situations can best be described as a program?

A A project that will run for multiple years.

B The construction of a house, a department store, and a business center all in the same city.

C All projects for the same customer.

D The reconstruction of houses, roads, department stores, and parks in a flood-affected city.
13 The following statements about programs are true, except for:
   A  The projects in a program are related to each other and work toward a common cause.
   B  Various projects under a program have separate budgets, scopes, and timelines.
   C  The projects in a program work together to achieve the budget and schedule of that program.
   D  All projects in a program must be managed by a single project manager.

14 The following can be the tasks of a PMO, except for:
   A  Providing standardized policies for project managers.
   B  Providing training on project management methodologies.
   C  Monitoring and controlling the resources associated with each project.
   D  Managing risks and opportunities across the projects in an organization.
Unit 3

Project management framework

Unit time: 120 minutes

Complete this unit, and you’ll know how to:

A  Identify project stakeholders and manage their expectations.

B  Identify the various organizational structures and the project manager’s role within each structure.

C  Discuss key project management skills.
**Topic A: Project stakeholders**

*Explanation*
This topic covers the following course objective:

<table>
<thead>
<tr>
<th>#</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.A.1</td>
<td>Identify project stakeholders (2.2 PMBOK)</td>
</tr>
</tbody>
</table>

**Key stakeholders**

An individual, a group, or an organization that affects and is affected by a project’s success or failure is called a *stakeholder*. Stakeholders can be within the organization or outside it. For example, in a software project, the project sponsor, project manager, project team, and functional managers might be the internal stakeholders, whereas end users and customers might be external stakeholders.

The following table lists the key stakeholders of a project.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project manager</td>
<td>Creates the project plan and leads and controls the project, ensuring that it’s completed on time and within budget.</td>
</tr>
<tr>
<td>Project sponsor</td>
<td>Authorizes financial resources for the project.</td>
</tr>
<tr>
<td>Performing organization</td>
<td>The enterprise that employs people most directly involved with the project.</td>
</tr>
<tr>
<td>Project team</td>
<td>A group of individuals who perform the work of the project.</td>
</tr>
<tr>
<td>Customer</td>
<td>Buys the product. The customer is the key stakeholder in any project and defines the project objectives.</td>
</tr>
<tr>
<td>User</td>
<td>Uses the product. The customer and the user might be the same or different entities. This depends on whether or not the customer will ultimately use the product.</td>
</tr>
<tr>
<td>PMO (project management office)</td>
<td>A centralized unit that coordinates and manages the entire project. The PMO is considered a stakeholder if it’s directly or indirectly responsible for a project’s outcome.</td>
</tr>
</tbody>
</table>

It’s important to identify all the stakeholders in the beginning of a project. Finding a new stakeholder when the team has already started development could mean a delay, scope change, or extra cost for the project.

Stakeholders affect a project in several ways. Depending on the role they play, stakeholders can have a negative or positive impact. Positive stakeholders generally benefit from the project, and negative stakeholders stand to lose from a project’s success.

Consider the example of a project to construct a dam. This project sponsors are confident that the dam will help solve the water and electricity crisis in the region and control flood-related problems in the future. These sponsors might include the company contracted to build the dam, the electric company, and some government officials.
Conversely, residents living near the projected construction site are against the project because it will require them to relocate, and environmentalists believe that the dam will disturb the ecosystem in the region.

In this scenario, the project sponsors are the positive stakeholders. They will benefit from the successful implementation of this plan. The local community and environmentalists are the negative stakeholders because their interests will be negatively affected.

**Do it!**

**A-1: Identifying the key stakeholders in a project**

**Questions and answers**

1. Which of the following stakeholders authorizes the budget for the project?
   - A. Project management team
   - B. Project sponsor
   - C. Customer
   - D. Performing organization

2. Which of the following stakeholders is responsible for the completion of the project on time and within budget?
   - A. Project sponsor
   - B. Project manager
   - C. Project team
   - D. Project management office

3. Your company is developing a vendor management system. This system will help manage vendors’ work allocation and generate reports on vendor performance. As a result, project implementation will become tighter, and vendor selection will become systematic. Who is not a stakeholder in this project?
   - A. Vendors
   - B. Project managers
   - C. Project sponsor
   - D. System administrators

4. An automobile design company is creating a new car model. After the successful development of the model, the company will manufacture cars of this model. Who would be the customer in the car model developing project: the car manufacturing unit or the end users of the car?
Managing stakeholder expectations

Explanation
The success of a project depends on how well you identify, address, and manage the expectations of stakeholders. Each stakeholder might have different interests, goals, and priorities for a project. For example, in a project to develop an intranet site for a company, the IT head might want collaborative and knowledge management features, such as e-mail, discussions, and chat. For the system administrator, the priority might be a solution with minimum changes in the existing IT infrastructure and network usage. For the employees, the priority could be the application’s ease of use. As a project manager, you need to determine the expectations of all of the stakeholders and work out the most feasible solution.

Three key components of managing stakeholder expectations are:
- Determining the stakeholder requirements
- Managing stakeholder influence
- Communicating with stakeholders

Determining the stakeholder expectations
Different stakeholders have different expectations for a project. These expectations can be defined requirements or undefined, general expectations. For example, suppose that you’re managing a project to analyze ways to improve the productivity of a manufacturing system. The stakeholder expectation can be as specific as “the new method must double the productivity” or as generic as “the new method should improve the productivity.”

You can determine stakeholder expectations by using such tools such as meetings, questionnaires, and requirements reviews. After you gather requirements, do the following:
- Analyze them to see which of the requirements can be met without compromising the scope of the project.
- For the requirements that cannot be met, talk to the stakeholders and explain why you cannot accommodate them.
- Collate the final set of requirements, document them, and seek a sign-off from all of the stakeholders. Remember that the requirements you agree to meet will be used to measure the success of your project later.

Managing stakeholder influence
In a project involving several stakeholders, it becomes challenging to manage their influence and still develop realistic and measurable plans that accommodate all stakeholders’ expectations. Sometimes you might be able to address one stakeholder’s concerns but find it difficult to accommodate others.

A key to managing stakeholder influence is reminding yourself that the customer’s requirements come first. Therefore, before making any decisions, you must weigh all requirements against the scope, budget, quality, and time limitations set by your customer.

Stakeholder influence is at the maximum in the beginning of a project and decreases as the project moves on. Exhibit 3-1 illustrates the influence of stakeholders on a project across phases.
Communicating with stakeholders

A key to managing stakeholders is keeping them involved in the project right through its completion. To ensure effective involvement of all the stakeholders:

- Ensure that they are informed about all the issues, risks, and constraints in the project.
- Hold brainstorming sessions and meetings at regular intervals. This will help you understand stakeholders’ expectations, issues, priorities, goals, and strategies. In addition, it gives you an opportunity to identify issues, problems, and conflicts, if any, and to avoid last-minute surprises.
- Provide written documents that clearly identify the purpose, risks, constraints, budget, timeframe, and requirements of the project. You should also provide project information such as project status, reports, and changes that are implemented.

During the project’s execution, you must communicate all the latest updates to all stakeholders. You must also involve stakeholders in change management and in debriefing about lessons learned from the project.

Exhibit 3-1: Stakeholders influence over the project
A-2: Managing stakeholder expectations

Questions and answers

1. In a project to renovate a house, the main contractor decides to subcontract the interior design work to an interior design company. Although the main contractor is happy with the interior design work, when the customer checks the renovated house, he doesn’t like the design at all and asks the contractor to change it completely. How might this have been prevented?
   A. The customer could’ve been involved when the main contractor explained the interior design requirements to the subcontractor.
   B. The contractor could’ve communicated the requirements more clearly to the subcontractor.
   C. The customer could’ve supervised the work more closely.
   D. There’s no way to prevent such scenarios.

2. Which of the following is not a part of managing customer expectations?
   A. Documenting customer requirements
   B. Involving the customer in the change management and approval process
   C. Identifying the customer’s underlined requirements
   D. Providing extra functionality to impress the customer

3. Your company recently completed a project in which five departments were involved. Because it was a critical project, management assigned the most experienced project manager to it. The project manager used appropriate project management processes. She captured all requirements and ensured that the product met all of them. However, when the product was made available for stakeholders to review, the heads of two departments expressed their dissatisfaction with the output. Which of the following could have been the most likely reason for this?
   A. The project manager was not trained to manage such critical projects.
   B. The expectations of dissatisfied stakeholders had been given less importance.
   C. The project manager failed to convince the stakeholders.
   D. The project manager did not have the requirements reviewed and signed off on.

4. Consider a project to set up the IT infrastructure for the Sales department of a company. In the project kickoff meeting, the IT supervisor suggests that they install computers with the latest configuration. However, the VP of Sales is against this idea because the sales team members do not need high-end systems to perform their tasks. He suggests that the IT team implement systems with a basic configuration. In such a situation, which stakeholder’s interest must be given priority?
5 When will stakeholders have maximum influence in a project?
**Topic B: Organizational and socio-economic influences**

*Explanation*
This topic covers the following course objective:

<table>
<thead>
<tr>
<th>#</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.B.1</td>
<td>Identify the organizational influences on a project (2.3 PMBOK)</td>
</tr>
</tbody>
</table>

**Components of the project environment**

Projects do not operate in isolation. First, they are part of an organization that expects to achieve its business objectives through the project. Then, there are various stakeholders who bring in disparate values and belief systems and expect to be accommodated. Finally, there are the social, cultural, international, political, technological, and physical influences that have either a direct or indirect impact on the project. All of these together constitute the *project environment*.

Here are some of the factors that shape a project environment.

**Organizational culture**

Organizations develop their own culture over time. These cultures and beliefs are reflected in the way the organizations conduct their business and in their work ethics, work hours, workplace relationships, and general policies. Organizational cultures are also reflected in the struggle for power and authority, in conflicts about goals, priorities, and interests, and in how these issues are resolved.

The organizational culture has a direct effect on projects and on a project manager’s decision-making process. For example, a project manager’s attitude toward experimentation and risk-taking, training and development, and problem-solving depends on the approach endorsed by the organization in general. In addition, projects that fail to fit into the culture might either be rejected at the onset or suffer because of lack of attention.

**Social and economic environment**

A project’s social environment comprises the people within an organization and outside it. These people are affected by the project even though they might or might not be directly involved in it. For example, consider a project to construct a nuclear power plant that will generate electricity. On the one hand, thousands of people will benefit from electricity generated by the project. On the other hand, people who need to relocate because of the construction of the plant might resist the project. Projects can affect society, and society can affect the progress and subsequent completion of projects. For example, the reluctance of the people to move from their current location can jeopardize the schedule to build the power plant.

The economic conditions of an organization will have a direct impact on a project. Every organization must compare the cost of a project to the benefits it will provide. Based on this comparison, an organization might decide to cut the budget, change the priority for completion, or even terminate the project.
International and political environment

In the era of internationalization, a project might be worked on in multiple locations simultaneously. These locations are often cross-country or even cross-continent. The various cultures and languages, the time zone differences, the different laws and regulations in each country, and the political situations in all these places become key factors in determining the success of a project. Understanding the differences and evaluating their impact can help you control the negative effects and enhance the positive effects. For example, if you are working on a project being implemented in a Southeast Asian country, language barriers and time zone differences might affect communication in the project. However, many project managers have been able to effectively use the time zone difference to shorten the cycle time of projects. Other considerations include cultural biases, travel requirements, and local and international holidays.

A project’s political environment refers to situations both within and outside of an organization. A project might be exposed to risks if a country’s political conditions are not conducive to it or if certain rules and regulations work against project requirements. Big corporations and multinational companies often establish separate departments that work with the political machinery of a country to leverage maximum support for the project.

A project is also affected by organizational politics. Power clashes within an organization or even within a project team cannot be ignored. Differences between functional managers and project managers about resource utilization are common. In addition, functional teams often clash on issues such as schedules, work allocation, and output quality. You need to use your negotiation and problem-solving skills to find suitable solutions.

Standards and regulations

*Standards* are generally accepted practices that are not mandatory, but are adopted voluntarily. They are established through agreement within a team and are used to bring consistency to any work result. For example, PMBOK is a standards document for project-management best practices.

*Regulations* are rules that must be implemented without fail. For example, all construction projects must comply with rules set by the Occupational Safety and Health Administration (OSHA) to ensure worker and workplace safety. The project manager should ensure that the place of employment is free from recognized hazards, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions.

Physical environment

A project’s physical surroundings include the local geographical and ecological conditions in which a project operates. The physical environment includes the following:

- The elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites, and biological diversity
- Factors such as energy, noise, and radiation
- Cultural sites and built structures
When the physical environment can affect your project, you should evaluate the impact and plan for any possible risks and hazards. For example, if you’re working on a project to create a railroad in a hilly area with excessive rainfall throughout the year, your work plan should accommodate the constraints caused by the weather and terrain.

**B-1: Identifying the components of a project environment**

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  What are the key components of a project environment?</td>
</tr>
<tr>
<td>2  What is the difference between a standard and a regulation?</td>
</tr>
<tr>
<td>3  A road construction project is being stopped following public protest against turning over land for the project. This is an example of:</td>
</tr>
<tr>
<td>A  Ineffective project planning</td>
</tr>
<tr>
<td>B  Social or political influence</td>
</tr>
<tr>
<td>C  Expectation conflicts</td>
</tr>
<tr>
<td>D  Violation of standards and regulations</td>
</tr>
<tr>
<td>4  A chemical plant implements measures to ensure that the workplace is safe for people working with hazardous chemicals. This is an example of:</td>
</tr>
<tr>
<td>A  Complying with workplace safety standards</td>
</tr>
<tr>
<td>B  Complying with workplace safety regulations</td>
</tr>
<tr>
<td>C  Implementing human resource policies</td>
</tr>
<tr>
<td>D  Preparing for audit by government agencies</td>
</tr>
</tbody>
</table>
Types of organizational structures

An important influence on projects is the structure of an organization. Organizational structures provide consistency and direction for team interactions, thereby allowing standardization and improvement. Organizational structures also determine the role you play in a project and the type of interaction you have with your team.

There are three types of organizational structures:

- Functional
- Projectized
- Matrix

Functional structure

This is recognized as the most common organizational structure. The entire hierarchy is broken up into several defined departments based on skills or specialization areas, such as human resources, finance, and marketing. The team members of a functional team report to a functional manager. Individuals belonging to each unit have a greater degree of specialization and standardization and are aware of rules, constraints, and job responsibilities. Following are the key features of this structure:

- The projects in a functional organization are mostly completed within a functional group. For example, if an engineering project arises, it’ll be managed solely by the engineering department. The project scope is generally limited to the boundaries of a function.
- The project manager has little or no authority. He or she is part of the functional team and reports to the functional manager.
- The project manager works part-time along with a part-time team.
- The team might work on multiple projects and do departmental work as well.
- The communication between departments flows through functional managers or department heads.
- In most cases, there will be no administrative staff to help the project manager perform the project management activities.

Exhibit 3-2 depicts a typical functional structure.
The following table lists the advantages and disadvantages of a functional structure.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is a stable form of organizational structure.</td>
<td>Authority lies with the functional manager, and the project manager merely coordinates the project activities.</td>
</tr>
<tr>
<td>There are clearly defined professional growth and career paths for all team members.</td>
<td>Individual projects sometimes fail to get proper attention and resources because several projects are dealt with at the same time.</td>
</tr>
<tr>
<td>All the team members report to one authority.</td>
<td>Priorities of the functional group might get emphasized at the cost of the organization.</td>
</tr>
<tr>
<td>Resources are centralized and can therefore be readily shared between functional units.</td>
<td></td>
</tr>
</tbody>
</table>

**Projectized structure**

In this type of organizational structure, individuals or team members with different skill sets are brought together to complete a project. The project manager has complete authority over the utilization of the project team and has a high level of responsibility for the project’s success. There is also a full-time administrative team to help the project manager with project management activities.

Following are the key features of this structure:

- All the team members report directly to the project manager.
- Project managers and team members are fully allocated to the project.
- At the end of the project, the project manager and team members move on to another project or are relieved of their duties.

Exhibit 3-3 depicts a projectized structure.

![Projectized structure diagram](Image)
Consider the example of a company that provides e-learning solutions. If this company follows a projectized structure, the content developers, multimedia professionals, and programmers will be allocated to the project, and the project manager will control the resource utilization and task allocation completely. This will help the project manager control the project more effectively. However, because the team is fully allocated to the project, team members might be underutilized during a lag period. In addition, team members might not be confident about their future roles because they depend on future projects that require their skills.

The following table lists the advantages and disadvantages of a projectized structure.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>The organizational structure is simple.</td>
<td>The structure is expensive because of duplication of skills and effort.</td>
</tr>
<tr>
<td>Lines of authority are clear and defined.</td>
<td>It doesn’t provide clarity on post-project functions and roles of team members. Team members might be reassigned to other projects or be relieved of their duties when a project ends.</td>
</tr>
<tr>
<td>A projectized structure has more effective coordination between the units as compared to a functional structure.</td>
<td>It doesn’t encourage development of people’s skills and capabilities beyond project requirements, so the organization’s skill pool fails to develop.</td>
</tr>
<tr>
<td>Project circumstances are highly dependent on the project manager’s skills and expertise.</td>
<td>It doesn’t provide enough opportunities for people to grow.</td>
</tr>
</tbody>
</table>
Matrix structure

The matrix organizational structure is a blend of the functional and projectized structures. The main advantage of the matrix structure is the presence of effective project management techniques, along with a defined organizational hierarchy that helps in maintaining an ideal structure. However, the team members might need to report to multiple functional heads as well as to project managers. Exhibit 3-4 depicts a matrix structure.

Exhibit 3-4: Matrix structure

The following table lists the advantages and disadvantages of a matrix structure.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focused on measured project objectives</td>
<td>More than one authority involved</td>
</tr>
<tr>
<td>Flexible form of organizational structure</td>
<td>Complexities arising from balancing resources</td>
</tr>
<tr>
<td></td>
<td>between different projects</td>
</tr>
<tr>
<td>Effective coordination among the team members</td>
<td>Complex monitoring and controlling processes</td>
</tr>
<tr>
<td>Efficient resource management among projects</td>
<td>Conflicts arising from differences in priorities</td>
</tr>
<tr>
<td>Team members confident about post-project</td>
<td>between the various levels</td>
</tr>
<tr>
<td>functions and roles</td>
<td></td>
</tr>
</tbody>
</table>

There are three types of matrix structures: weak, balanced, and strong.
Weak matrix

This type of matrix structure is similar to the functional structure. In a weak matrix structure, the project manager has minimum authority and usually works as a project coordinator. The project team members are from different departments, and both the project manager and the project team report directly to the functional manager. The project manager might be managing a part-time project team and working part-time on the project. Exhibit 3-5 depicts a weak matrix.

Exhibit 3-5: Weak matrix

Balanced matrix

In this structure, the project manager has more power and a full-time assignment on the project, but does not have full authority over the project or its funding. In this structure, the project manager reports to a functional manager but shares equal power with the functional manager in making project decisions. In this structure, too, the project team is allocated part-time to the project. Exhibit 3-6 depicts a balanced matrix.

Exhibit 3-6: Balanced matrix
Strong matrix

In this structure, the project manager has a high level of authority. The project team members might be from different departments but will have more time available for the project. The project manager makes all project decisions. Exhibit 3-7 depicts a strong matrix.

Exhibit 3-7: Strong matrix

Do it!

B-2: Identifying organizational structures

Questions and answers

1. You are managing a project in which your team members are assigned to the project part-time and are from different departments. The team members report to their respective department heads. In addition to managing project work, you also coordinate between different functional heads. You are working in a:

   A. Functional organization  
   B. Balanced matrix organization  
   C. Strong matrix organization  
   D. Projectized organization

2. You are managing a project in which all the team members are reporting to you. The team members are allocated full-time to your project. You are responsible for their work allocation and time utilization. You are in a:

   A. Functional organization  
   B. Balance matrix organization  
   C. Strong matrix organization  
   D. Projectized organization
3 A project manager with very little project management experience has been assigned to manage a project in a matrix organization. Which of the following is a problem he could face in the project?

A Complex monitoring and controlling processes  
B No flexibility in the organizational structure  
C Lack of coordination among team members  
D Difficulty in managing resources across projects

4 The team members of a project are concerned about the prospect of future assignments in the company. They work in a:

A Functional organization  
B Projectized organization  
C Weak matrix organization  
D Balanced matrix organization

5 The project manager recruits a .NET programmer for a software development project. The programmer reports directly to the project manager. The programmer’s employment with the company is temporary, lasting until the completion of the project. The company is a:

A Functional organization  
B Projectized organization  
C Weak matrix organization  
D Balanced matrix organization

6 A new team member in an organization is confused because she gets work requests from multiple people. If she is working in a weak matrix organization, whom should she contact to get proper direction about her work assignments and priorities?

A Functional manager  
B Project manager  
C Project sponsor  
D Project management office
Role of a project manager in different organizational structures

Explanation

A project manager’s role depends on the type of organizational structure and the project requirements. Sometimes, a project scope might be limited to one department. In other cases, a project could involve several departments during its course.

The following table highlights the role of a project manager in different organizational structures.

<table>
<thead>
<tr>
<th>Project features</th>
<th>Organizational structures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Functional</td>
</tr>
<tr>
<td>Project manager’s role</td>
<td>Part-time</td>
</tr>
<tr>
<td>Project manager’s authority</td>
<td>Little</td>
</tr>
<tr>
<td>Project manager reports to</td>
<td>Functional manager</td>
</tr>
<tr>
<td>Availability of administrative staff</td>
<td>Part-time</td>
</tr>
</tbody>
</table>

B-3: Examining a project manager’s role in different organizational structures

Questions and answers

1. Jim manages a project. All the team members in this project are allocated full-time to the project. In addition, Jim has full authority to manage the resources allocated to his project. Jim works in a:
   A. Functional organization
   B. Projectized organization
   C. Weak matrix organization
   D. Balanced matrix organization

2. Mary, a project manager, is discussing her project with a friend. She explains that it’s very difficult to get tasks done in the project because she has no control to assign or change the project resources. Her project includes team members from different departments, and the department heads often set different priorities for their staff members without informing her. Mary works in a:
   A. Functional organization
   B. Projectized organization
   C. Balanced matrix organization
   D. Strong matrix organization
3 John, a project manager, is assigned full-time to a project. He makes all decisions after discussions with the functional managers of the different functional groups involved in the project. He can override their decisions if necessary. John is working in:

A Functional organization
B Weak matrix organization
C Strong matrix organization
D Projectized organization

4 In which of the following organizations does a project manager have a part-time role in a project?

A Functional
B Projectized
C Balanced matrix
D Strong matrix

5 Compare the role of a project manager in functional and projectized organizational structures.

6 Compare the role of project managers in weak matrix, balanced matrix, and strong matrix organizational structures.
**Topic C: Key project management skills**

*Explanation*

This topic covers the following course objectives:

<table>
<thead>
<tr>
<th>#</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.C.1</td>
<td>Identify the key project management skills (1.5.4 PMBOK)</td>
</tr>
<tr>
<td>3.C.2</td>
<td>Discuss the importance of key project management skills (1.5.5 PMBOK)</td>
</tr>
</tbody>
</table>

**Interpersonal skills**

Interpersonal skills are critical in any project management position. Maintaining healthy interpersonal relationships involves:

- Effective communication skills
- Negotiation and conflict management skills
- Ability to influence and encourage team members to get things done
- Leadership, providing vision and strategy
- Motivational skills to energize team members
- Ability to analyze and solve problems, find alternatives, and make decisions

**Communication skills**

It is believed that a project manager spends 90% of the project time communicating in different forms. Ambiguous and ineffective communication can create confusion within a team and divert the team members’ focus from project objectives. However, good communication skills can:

- Improve relationships and productivity
- Build teamwork and enhance performance
- Create an open communication channel
- Reduce conflicts
- Solve problems

**Different dimensions of communication**

Communication is a two-way process that involves three key elements: the sender, the receiver, and the message. The message is the information that the sender transmits to the receiver. The sender initiates the communication process by sending the message. The receiver decodes and understands the message and sends appropriate feedback. It’s the responsibility of the sender to ensure that the message is clear and understandable. It should also be in a format that the receivers can easily comprehend. Exhibit 3-8 depicts the communication process.
Project communication involves multiple dimensions:

- **Written communication** — This can take various forms, such as memos, reports, letters, official notices, and statements. For effective written communication, you should:
  - Write short, clear sentences in the active voice.
  - Avoid jargon and acronyms that are not commonly used.
  - Focus on the subject being discussed and don’t digress from the main idea.

- **Oral communication** — This method is the most uncomplicated and frequently used form of communication. However, it’s important to distinguish when oral communication is and isn’t the best choice. For example, solving issues between team members might be more effective with oral communication (talking to each other face to face or on the phone) than with e-mail discussion. However, seeking oral agreement on project requirements and not documenting them could cause problems. An important aspect of effective oral communication is active listening skills. Active listening requires you to remain focused on the conversation, understand and evaluate the message, and then respond.

- **Nonverbal communication** — This includes your posture, voice quality (pitch and tone), appearance, body posture and orientation, gestures, and facial expressions.

- **Formal and informal communication** — Communication during a project is not always formal and documented. Brainstorming ideas or resolving minor project issues might be done through informal meetings. However, communication that affects the course of a project and might have a major impact on multiple stakeholders should be discussed formally. Results of such discussions should be documented and communicated to all stakeholders.
The following table highlights the situations in which different methods of communication might be used.

<table>
<thead>
<tr>
<th>Method of communication</th>
<th>Use</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written, formal</td>
<td>Project charter, communicating over distant areas, reports, complex problems</td>
<td>Solving a problem</td>
</tr>
<tr>
<td>Written, informal</td>
<td>E-mail, notes and memos</td>
<td>Sending a note to a team member to implement certain changes</td>
</tr>
<tr>
<td>Oral, formal</td>
<td>Presentations, speeches, conferences</td>
<td>Making presentations to stakeholders to inform them of changes implemented in the project</td>
</tr>
<tr>
<td>Oral, informal</td>
<td>Meetings, conversations</td>
<td>Analyzing the main cause of a conflict</td>
</tr>
</tbody>
</table>

Communication can be between peers (horizontal) or between higher and lower levels in the team hierarchy (vertical). Communication can also occur within the project team (internal) or with entities outside the team (external), such as the functional group, organization, customer, or PMO.
C-1: **Discussing the importance of communication skills**

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 You want to communicate the project management plan with your project team. The <em>best</em> method for this would be:</td>
</tr>
<tr>
<td>A Written, formal</td>
</tr>
<tr>
<td>B Written, informal</td>
</tr>
<tr>
<td>C Oral, formal</td>
</tr>
<tr>
<td>D Oral, informal</td>
</tr>
<tr>
<td>2 Which of the following is an example of a formal written communication?</td>
</tr>
<tr>
<td>A Report</td>
</tr>
<tr>
<td>B Notes</td>
</tr>
<tr>
<td>C Memo</td>
</tr>
<tr>
<td>D E-mail</td>
</tr>
<tr>
<td>3 Communication in a presentation should tend toward:</td>
</tr>
<tr>
<td>A Written, formal</td>
</tr>
<tr>
<td>B Written, informal</td>
</tr>
<tr>
<td>C Oral, formal</td>
</tr>
<tr>
<td>D Oral, informal</td>
</tr>
<tr>
<td>4 Discuss the importance of communication in managing a project.</td>
</tr>
</tbody>
</table>
Conflict management, negotiation, and influencing skills

Explanation

Conflict management requires using efficient problem-solving approaches to find an acceptable solution to a conflict. As a project manager, you should always try to resolve a conflict, rather than suppress it, escalate it (unless it’s out of your control), or ignore it. Conflicts can arise during any phase of a project, and they are unavoidable.

The main causes of conflict are:

- Personality differences
- Differences in perceptions, values, goals, priorities, and requirements
- Cultural differences
- Past rivalries
- Cost
- Resources
- Administrative procedures

Conflict management strategies

The first step toward managing a conflict is to analyze the reasons for it. For example, a conflict could arise among the stakeholders of a project because of a difference in priorities. Conflicts could arise as a result of overlapping responsibilities of team members or because different functional groups differ in their opinions about the implementation of a product feature.

When you understand the reason for a conflict, use an appropriate conflict management strategy. Following are various conflict management strategies:

- Confronting — Involves finding the best solution to a problem. It recognizes the need to deal with a problem head on instead of ignoring it. The outcome of confrontation is a solution that is acceptable to all.
- Compromising — Adopted when both parties are satisfied with the outcome to a certain extent. In this case, the problem is not seen as really threatening or important. As a result, both parties agree upon a reasonably acceptable solution. This normally leads to lose–lose or win-some–lose-some situations.
- Smoothing — Concentrates on resolving the conflict more than the problem itself. The solution is usually reached through mutual agreement. Smoothing usually leads to short-term solutions because the solution might have been found by agreeing that the problem does not exist or is being exaggerated.
- Avoidance (withdrawal) — Used when either party wants to postpone the discussion to get additional clarification to resolve the problem or when a party is not interested in resolving the problem. This leads to a lose–lose situation and is, therefore, not a good choice for resolving conflicts.
- Forcing — Forces one viewpoint or concern onto another party. It is the most unacceptable strategy to use in any scenario.

It’s possible that conflict can lead to a positive outcome. Conflict is constructive when it results in the clarification of important, yet unaddressed issues. It can also help team members adopt a creative approach and look for alternative options. Finally, conflicts can sometimes be avoided altogether by ensuring that there is no ambiguity and overlap in roles and responsibilities of team members and that they know their roles.
Negotiation and influencing skills

As a project manager, you negotiate almost every day throughout the life of the project. You negotiate with your project sponsor for additional budget, with functional managers for resources, and with the customer for more time. Your ability to work with all stakeholders, internal and external, to agree on a mutually acceptable solution is extremely crucial to the success of a project.

In a project, you use your negotiation skills in areas such as:

- Scope
- Budget
- Schedule
- Cost
- Technical solution or approach
- Contract terms and conditions
- Priorities

Negotiation tactics

Different situations require different negotiation tactics. For example, when you realize during the negotiation process that you need some additional information or clarification to close the deal, you can adopt the Delay tactic. In other words, you can postpone the discussion to a later date or for the next meeting.

The following table highlights the different types of negotiation tactics and the situations in which they can be applied.

<table>
<thead>
<tr>
<th>Tactic</th>
<th>Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay</td>
<td>You are not interested in closing a deal, or you do not have enough</td>
</tr>
<tr>
<td></td>
<td>information to conclude the discussion.</td>
</tr>
<tr>
<td>Forcing</td>
<td>You must have the other party agree.</td>
</tr>
<tr>
<td>No authority</td>
<td>You do not want to negotiate the terms and you want to show that you</td>
</tr>
<tr>
<td></td>
<td>do not have the authority to negotiate.</td>
</tr>
<tr>
<td>Deadlines</td>
<td>You want to force the other person to make quick choices.</td>
</tr>
<tr>
<td>Better offer</td>
<td>You want the other person to promise a reward in return for what you're</td>
</tr>
<tr>
<td></td>
<td>offering.</td>
</tr>
<tr>
<td>Missing man</td>
<td>You do not have the information you’re required to provide, so you</td>
</tr>
<tr>
<td></td>
<td>must either conclude or postpone the discussion.</td>
</tr>
<tr>
<td>Fair and reasonable</td>
<td>You want to seek a mutually acceptable agreement, politely.</td>
</tr>
<tr>
<td>Overwhelm with information</td>
<td>You want to keep your point of view ambiguous or avoid a definitive</td>
</tr>
<tr>
<td></td>
<td>solution.</td>
</tr>
</tbody>
</table>
C-2: Discussing conflict management, negotiation, and influencing skills

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A project manager says “I do not want any discussion; please implement the functionality as agreed upon in the design phase.” What conflict management strategy is this?</td>
</tr>
</tbody>
</table>
| A Compromising  
B Forcing  
C Smoothing  
D Confronting |
| 2 Two team members do not get along and are having problems working together. As a result, there is a delay in their outputs. The project manager calls both parties together, and the three of them discuss the issues and arrive at a reasonable solution. This is an example of: |
| A Confrontation  
B Withdrawal  
C Compromising  
D Smoothing |
| 3 Discuss the situations in which you used negotiation skills in your projects. |
| 4 Jim and Mary are working as project managers in a construction company. The interior designer on Jim’s team had to take an unexpected three-week leave. Jim has no other interior designer available, and he will not be able to complete the project on time without one. Jim knows that the interior designer in Mary’s team is relatively free at this time. Which project management skill would Jim use to get the interior designer in Mary’s team to work on his project for three weeks? |
| A Compromising  
B Negotiation  
C Influencing  
D Smoothing |
Other general management skills

Other general management skills that a project manager needs include:

- Organizing and planning
- Budgeting
- Leadership and team building

Organizing and planning

Managing a project is about managing its various aspects, and this involves numerous tasks. In a day, you might schedule tasks, organize meetings and conferences, review resource utilization, perform appraisals, update plans and schedules, and attend to team members’ concerns. Often, the day ends but the tasks don’t. You might find it difficult to manage and complete each and every assigned task. Such situations require effective organization skills so that you can make the best use of your time and resources. In other words, you should be able to categorize tasks as urgent, important, and unimportant so that you know what needs immediate attention and what can wait. Wasting time on unimportant tasks that seem urgent can consume costly time and resources, and ignoring important tasks can pose risks.

Planning is another important managerial skill. It is the ability of a manager to anticipate problems and concerns and mitigate them well ahead. To prevent surprises when the deadlines are closing in, some managers set aside one hour before the end of each day to determine the progress of the tasks assigned to each team member and to ensure that each member is fulfilling the project requirements. Planning helps avoid last-minute surprises. In addition, when you can figure out problems in the initial stages, the cost of controlling them is much less and precious effort is saved.

Budgeting skills

You need to have budgeting skills and to know standard finance and accounting principles. You should also be familiar with budget-related activities, such as preparing and overseeing purchase orders and receipts, and you should understand how to evaluate vendor quotes.

Leading vs. managing

The terms “leader” and “manager” are often used synonymously; however, they are not necessarily the same. It is not necessarily true that a person who has good leadership skills will also have good managerial skills, or vice versa. Leaders motivate people to collectively work with them to achieve a common goal, whereas managers implement management processes for the development of an organization. Leaders know their strengths and weaknesses and constantly improve themselves, set new challenges and priorities for themselves and their team, give direction to the team, and above all, inspire and motivate.
The following table shows the key differences between leaders and managers.

<table>
<thead>
<tr>
<th>Leaders</th>
<th>Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspire change</td>
<td>Encourage stability</td>
</tr>
<tr>
<td>Lead people</td>
<td>Manage work</td>
</tr>
<tr>
<td>Work with a vision</td>
<td>Set and achieve objectives</td>
</tr>
<tr>
<td>Set direction</td>
<td>Plan detail</td>
</tr>
<tr>
<td>React proactively to change</td>
<td>React to change</td>
</tr>
<tr>
<td>Encourage excitement and passion for work</td>
<td>Justify with money</td>
</tr>
<tr>
<td>Take risks</td>
<td>Minimize risks</td>
</tr>
<tr>
<td>Use conflict constructively</td>
<td>Avoid conflict</td>
</tr>
</tbody>
</table>

**Team building and motivating**

Often, people from different teams are put together as one team to complete a project. These people might not have worked with each other before. This is when leadership and motivational skills become especially important. You need to help the team members see themselves as one unit and work to achieve common goals. This can be accomplished through team-building activities, training, and recognition and rewards programs. Compensating people fairly for their work and ensuring that problems are resolved in a timely and effective manner can encourage people to contribute wholeheartedly to a project.
### Do it!

**C-3: Discussing organizational, planning, and budgeting skills**

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Some managers believe that giving a salary increase is the best motivation strategy. Do you agree with this viewpoint? Discuss.</td>
</tr>
<tr>
<td>2. It is difficult to do team-building activities in a matrix or functional organization, compared to projectized organizations. True or false? Discuss.</td>
</tr>
<tr>
<td>3. Maria is a project manager. As part of managing a large project, she manages multiple vendors and internal teams. She sends and receives many reports, memos, invoices, and other important project-related documents on a daily basis. However, it is getting very difficult for her to keep track of these documents, and this task is becoming very time-consuming. What project management skill would Maria need to improve?</td>
</tr>
<tr>
<td>4. Jim is a busy project manager. He attends multiple meetings in a day and troubleshoots problems whenever they arise. As a result, he cannot complete other project management tasks on time. What project management skill would help Jim to improve the current situation?</td>
</tr>
</tbody>
</table>
Unit summary: Project management framework

**Topic A**

In this topic, you learned about *stakeholders*. You learned about their role and importance in each project. In addition, you also learned how to manage stakeholders’ expectations.

**Topic B**

In this topic, you identified the various components of the *project environment*. You also learned about various *organizational structures* and their advantages and disadvantages. In addition, you learned about the role and importance of a project manager in different organizational structures.

**Topic C**

In this topic, you learned about *key management skills*—such as communication, negotiation, leadership, and motivational skills—that a project manager should possess. You also learned about other important management skills, such as organizing, planning, and budgeting.

**Review questions**

1. Which of the following stakeholders must get top priority when there is a conflict of expectations?
   - A. Performing organization
   - B. Customer
   - C. Project sponsor
   - D. Project team

2. Which of the following stakeholders has the *most* important role in determining project requirements?
   - A. Project manager
   - B. Project sponsor
   - C. Project management office
   - D. Customer

3. Which of the following is *not* a responsibility of the project sponsor?
   - A. Resolving conflicts among stakeholders
   - B. Providing necessary resources to the project manager to execute the project
   - C. Participating in key project decisions
   - D. Authorizing an additional budget for the project
4. Which of the following organizational structures gives maximum power to project managers?
   A. Functional
   B. Balance matrix
   C. Projectized
   D. Weak matrix

5. Which of the following organizational structures gives minimum power to project managers?
   A. Functional
   B. Balance matrix
   C. Projectized
   D. Strong matrix

6. Which of the following statements is not true about the functional structure?
   A. It is a flexible organizational structure.
   B. It provides clearly defined professional growth and career paths.
   C. All the team members report to one authority.
   D. Resources are centralized and therefore readily shared between functional units.

7. Which of the following statements about projects in a strong matrix organization is true?
   A. Team members are not confident about their post-project functions and roles.
   B. All team members report to a single authority.
   C. The project manager makes all project decisions independently.
   D. The functional manager and the project manager are at the same level in the hierarchy.

8. Which of the following organizational structures is considered to be most expensive?
   A. Functional
   B. Projectized
   C. Balanced matrix
   D. Strong matrix
9 A project manager is managing a software development project. Quality assurance reviews have been delayed because the team doing the testing is away for unscheduled training. When the project manager asks the functional manager to resolve this issue, she agrees to allocate resources from the general pool to do the work and expedite the process. This project manager is working in a:

A Functional organization
B Projectized organization
C Balanced matrix organization
D Strong matrix organization

10 You are managing a software development project. You need an experienced Java programmer to create some Java-based components for this project. None of the programmers on your team has sufficient experience in Java. You know that there is an experienced Java programmer assigned part-time to another project in your company. Which of the following skills will be most helpful in acquiring the Java programmer for your project?

A Communication skills
B Negotiation and influencing skills
C Organizational skills
D Leadership and motivational skills

11 Your customer is delayed in providing certain specifications required to create a product. As a result, your subcontractor informs you that the final deliverable will then be delayed as well. In this conflict, you decide to wait until your customer sends the specifications. Which of the following reflects your strategy?

A Withdrawal
B Delay
C Smoothing
D Confrontation

12 After meeting with your customer, you want to share the detailed review feedback on the project design. The design feedback is complex and several subcontractors are working on the project. If the subcontractors are in different locations, which one of the following methods will be most effective for communicating the design feedback?

A Written, formal
B Written, informal
C Oral, formal
D Oral, informal
13 The team leader of Functional Group A complains that the team leader of Functional Group B does not respond to his queries within a reasonable time frame. The team leader of Functional Group B says that he ignores only unnecessary queries. The project manager listens to their problems carefully and expresses his confidence in the two team leaders’ ability to resolve the issues themselves. They are both great team players and such issues are common in all projects. This is an example of:

A. Withdrawal  
B. Compromising  
C. Smoothing  
D. Confronting

14 There is a conflict between two functional groups in a project. Team B is unhappy with the output it receives from Team A. Team B says the output is not meeting specifications and therefore is not fit to be processed. Team A is sure that it has implemented all quality checks and processes and nothing is wrong. The project manager talks to both teams, identifies their problems, and agrees for a quality audit on Team A’s work. This conflict management technique is known as:

A. Confronting  
B. Compromising  
C. Smoothing  
D. Forcing
Unit 4

Project management processes

Unit time: 120 minutes

Complete this unit, and you’ll know how to:

A Identify the characteristics of a project phase, a project life cycle, and a product life cycle.

B Identify the five process groups of project management and explain how they interact with one another.

C Identify the knowledge areas of project management and explain how the process groups map to knowledge areas.
Topic A: Project phases and life cycles

Explanation

This topic covers the following course objectives:

<table>
<thead>
<tr>
<th>#</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.A.1</td>
<td>Identify the characteristics of a project phase (2.1.2 PMBOK)</td>
</tr>
<tr>
<td>4.A.2</td>
<td>Define a project life cycle and a product life cycle (2.1.3 PMBOK)</td>
</tr>
<tr>
<td>4.A.3</td>
<td>Outline the differences between a project life cycle and a product life cycle (2.1.3 PMBOK)</td>
</tr>
</tbody>
</table>

Project phases

Organizations divide large projects into manageable chunks called phases. Creating phases helps people:

- Focus on completing one work unit at a time, while remaining aware of the big picture.
- Communicate the progress of a project to managers and other stakeholders.

A project usually has three phases: initial, intermediate, and final. There can be a number of intermediate phases, depending on the size of the project. In addition, each phase might be large enough to have distinct sub-phases. The output of each sub-phase contributes to the completion of a phase deliverable.

For example, consider a software development project. It can have phases such as needs analysis, feasibility study, requirements specification, product design, development, and testing. Further, the product design phase can have multiple sub-phases, such as functional specification and prototyping. A project phase concludes with deliverables and phase-end reviews.

Deliverables

Deliverables are specific and measurable outputs produced by the end of each phase. They might be concrete, such as design documents, storyboards, or functional software, or intangible, such as a decision on whether to terminate or continue a project as a result of a feasibility study.

The deliverable of each phase is measured against the requirements set for it in the beginning of the phase. If the deliverable meets the requirements, the stakeholders approve it or, in other words, provide a sign-off. A sign-off is also a formal authorization to close the project phase and initiate the next phase. The formal transfer of phases is known as a handoff.

If the deliverable falls short of expectations, the management might decide to terminate the project.
Phase-end reviews

The process of reviewing and approving a deliverable at the end of a phase is called a phase-end review. In this review, you:

- Verify that the deliverable meets the objectives set for it. You may decide to rework the deliverable and extend the duration of the phase.
- Determine if the deliverable is transferable to the next phase.
- Evaluate whether the project should continue or deserves closure.
- Decide if the next phase should start without closing the current phase. This method is called fast tracking and is used to compress a schedule. It is especially used in projects where the work is routine and the output from the previous phase is not the input for the following phase or is used in parts.

Because a phase-end review forms the basis for transition to the next phase, it is also called a phase gate, phase exit, kill point, or stage gate.

Do it!

A-1: Identifying the characteristics of a project phase

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 The following actions are part of a phase-end review, except for:</td>
</tr>
<tr>
<td>A Verify that the deliverable maps to the project scope.</td>
</tr>
<tr>
<td>B Decide the activities for the next phase.</td>
</tr>
<tr>
<td>C Determine if any additional work is required in the phase.</td>
</tr>
<tr>
<td>D Determine if the next phase can be started.</td>
</tr>
<tr>
<td>2 The measurable and verifiable output of work is known as a:</td>
</tr>
<tr>
<td>A Deliverable</td>
</tr>
<tr>
<td>B Phase gate</td>
</tr>
<tr>
<td>C Kill point</td>
</tr>
<tr>
<td>D Handoff</td>
</tr>
<tr>
<td>3 A handoff is:</td>
</tr>
<tr>
<td>A An authorization to close the current phase.</td>
</tr>
<tr>
<td>B An authorization to run multiple phases in parallel.</td>
</tr>
<tr>
<td>C The technical transfer to a new phase.</td>
</tr>
<tr>
<td>D The process of approving the phase deliverable.</td>
</tr>
<tr>
<td>4 Fast tracking is the technique of:</td>
</tr>
<tr>
<td>A Reviewing a phase deliverable to map it against the project scope.</td>
</tr>
<tr>
<td>B Starting a later phase in parallel with the current phase.</td>
</tr>
<tr>
<td>C Approving a phase deliverable and authorizing team members to begin the next phase.</td>
</tr>
<tr>
<td>D Closing a phase and starting a new phase.</td>
</tr>
</tbody>
</table>
The project life cycle

Explanation

A project life cycle represents the period in which a project starts, grows, matures, and ends. In other words, all the phases in a project together make a project life cycle. Exhibit 4-1 illustrates a project life cycle.

Exhibit 4-1: The project life cycle

A project life cycle defines the following:

- The technical work to be done in each phase
- The deliverable(s) to be produced in each phase and the review and acceptance criteria for each deliverable
- Resources to be included in each phase
- The process used to control and approve each phase

Characteristics of a project life cycle

Different projects use different life cycles, which means that each project has a different set of phases. For example, a software project can have analysis, design, development, implementation, and evaluation phases. A construction project can have feasibility study, pre-construction, construction, engineering commissioning, completion, and client occupation phases. Sometimes even when projects have the same phases, the activities in them and their inputs and outputs are different. In addition, the number of phases in projects in the same application area can vary based on the scope of the project.
Although project life cycles can differ, they share some common characteristics, such as the following:

- Phases in a project life cycle are usually sequential. The output of one phase is generally used in the following phase.
- Projects incur low costs and minimum resources in the beginning, huge costs and resources during the execution phase, and rapidly diminishing costs and resources as a project nears the completion phase.
- During project initiation, the degree of uncertainty and the risk of failing to meet objectives are highest. However, as a project moves along, the uncertainty and risk of failure decline and the project gains momentum.
- The influence of stakeholders on a project is greatest in the initial phases. The influence gradually decreases through the intermediate and closing phases. This is largely because the cost to accommodate change requests is minimal in the initial phase and increases as the project moves toward closure.

**Sample life cycles**

Life cycles for different projects are customized based on individual product requirements. The following are some typical project life cycles from different application areas.

**Software development**

The following phases form a typical software development life cycle:

- **Concept** — Involves identifying business needs, defining the project’s goals and objectives, and identifying acceptance criteria.
- **Definition** — Involves performing a feasibility study, designing and developing a prototype, evaluating the prototype, identifying the shortcomings, and suggesting improvements for the final version.
- **Execution** — Includes implementing improvements and suggestions, designing and constructing the final version, commissioning and installing the software, and testing and evaluating the final software.
- **Closeout** — Includes evaluating a project after launch and then deciding whether to continue production.
**Educational publishing**

The following phases describe a project life cycle that is commonly applied in the educational publishing industry.

- **Analysis** — Includes determining the audience requirements and training needs, analyzing the existing knowledge and skills of the audience, identifying timelines, and identifying priorities and constraints.
- **Design** — Includes documenting learning objectives, identifying resources, planning the mode of instruction, and creating assessment items.
- **Development and review** — Includes creating scripts and storyboards, producing materials, and reviewing the instructional material.
- **Implementation** — Includes delivering the instructional materials and conducting a pilot training session to analyze their effectiveness.
- **Evaluation** — Measures the effectiveness and efficiency of the instructional material. Suggestions to improve the efficiency of the instructional material are incorporated in this phase. This phase decides whether the product should be launched or discontinued.

**Construction**

The following phases describe a construction project life cycle and a few of the key activities within each phase.

- **Feasibility** — Includes initiating the project, performing a feasibility study, and preparing and seeking approval for the design.
- **Planning and controlling** — Includes preparing a schedule, performing cost and risk analysis, validating contract terms and procedures, and bidding or negotiating with manufacturers and stakeholders.
- **Designing** — Includes creating the base design and determining the manufacturing and engineering costs.
- **Execution** — Includes acquiring raw materials, identifying problems and addressing them to improve performance in the following phase, and implementing quality standards and processes.
- **Construction** — Includes manufacturing, installing, and evaluating the product.
- **Maintenance and handover** — Includes fixing problems after the evaluation process and handing over the premises to the customer.

**Chemical processing**

The following phases describe a typical project life cycle in the chemical processing industry.

- **Scoping** — Includes identifying a business need and preparing a project plan.
- **Approval** — Includes finalizing and approving the project plan and performing cost and risk analysis.
- **Design** — Includes approving the budget, preparing the preliminary design document, and comparing and analyzing different technologies to be used in the project.
- **Procurement** — Includes approving the final design and selecting and purchasing the equipment and instruments.
- **Construction** — Includes installing the equipment and instruments and manufacturing the product.
• **Commissioning** — Includes evaluating and analyzing the prepared product and measuring the effectiveness of the product in the market.

• **Startup** — Includes deciding whether to keep the product on the market or discontinue it.

**Do it!**

**A-2: Defining a project life cycle**

<table>
<thead>
<tr>
<th>Questions and answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 All the following statements about project life cycle are true, except:</td>
</tr>
<tr>
<td>A A project life cycle defines the technical work to be done in each phase.</td>
</tr>
<tr>
<td>B In a project life cycle, the degree of uncertainty is equal across phases.</td>
</tr>
<tr>
<td>C A project life cycle defines the resources to be included in each phase.</td>
</tr>
<tr>
<td>D In a project life cycle, the project cost is minimum in the initial phase.</td>
</tr>
</tbody>
</table>

| 2 In a project life cycle, the cost of changes to meet stakeholder expectations is: |
| A Minimum in the initial phase of the project. |
| B Minimum in the closing phase of the project. |
| C Minimum during the intermediate phases of the project. |
| D The same across all project phases. |

| 3 In a project life cycle, the influence of stakeholders will be: |
| A Maximum in the initial phase of the project. |
| B Maximum in the closing phase of the project. |
| C Maximum during the execution of the project. |
| D The same across all project phases. |

| 4 In a project life cycle, you need: |
| A The same number of resources across all phases. |
| B A low number of resources in the starting phase, maximum number of resources in the intermediate phases, and the least number of resources in the closing phase. |
| C The maximum number of resources in the starting phase, a gradually decreasing number of resources in the intermediate phases, and the least number of resources in the closing phase. |
| D The least number of resources in the initiation phase, the maximum number of resources in the intermediate phase, and a low number of resources in the last phase. |
The product life cycle

Explanation

A product life cycle defines the stages that a new product progresses through until it is withdrawn from the market. A typical product life cycle consists of the following phases: introduction, growth, maturity, decline, and phase out. Exhibit 4-2 shows the phases of a typical product life cycle. Often a product does not progress through all the phases. It can be withdrawn immediately after introduction or after minimal success to be replaced by an improved version.

Exhibit 4-2: Product life cycle

Product and project life cycles interact and overlap. If you’re creating a new product, you can’t know the full scope of that project without knowing the scope of the product itself. Similarly, the project life cycle might be but one part of the product life cycle. For example, the project of creating or enhancing a product might be part of a bigger product life cycle that includes several other projects, such as product selection, promotion, brochure creation, market analysis, and phase-out of the current product.

Consider the example of a company that is a global leader in the distribution of a wide range of electronic components. This company offers both buyers and sellers a complete online experience for buying and selling services for a growing range of electronic products, from headphones to computer peripherals. The company’s management plans to launch a new electronic product and include it in their ever-growing online marketplace. The company has been following a nine-step product life cycle to assess the effectiveness of the product.

The nine key processes involved in the product life cycle are:

1. Identifying the product(s) to be launched
2. Identifying the market need for the product by conducting surveys and inviting bids from selected vendors
3. Finalizing the product and vendor
4. Developing or sourcing the product manufacturing
5. Identifying and documenting the product launch plans
6. Promoting the product with the help of media
7. Formally launching the product in the marketplace
8. Analyzing the popularity of the product
9. Deciding whether to continue selling the product or discontinue it
### A-3: Defining a product life cycle

#### Questions and answers

1. What are the key phases in the product life cycle?

2. Some organizations consider the project life cycle to be a part of the product life cycle. Do you agree?
Topic B: Processes and process groups

Explanation

This topic covers the following course objectives:

<table>
<thead>
<tr>
<th>#</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.B.1</td>
<td>Define a process group and identify the five process groups of project management (3.2 PMBOK)</td>
</tr>
<tr>
<td>4.B.2</td>
<td>Discuss process group interaction (3.3 PMBOK)</td>
</tr>
</tbody>
</table>

Processes

A process is a series of interlinked individual activities that result in a specific deliverable or output. A project comprises several processes. Some contribute toward the development of a product, and others organize and manage the work and resources required to develop a product.

Project processes can be divided into two categories:

- **Project management processes** — Define the work you need to do to develop a product. These processes consist of activities that are common to all projects, regardless of the application areas (such as construction or software development). These processes:
  - Outline the specifications needed to define a product.
  - Help to describe and organize the work of the project.

- **Product-oriented processes** — Consist of activities that help develop the product for which the project is set up. For example, processes involved in creating a product manual will include collecting and analyzing user requirements, developing specifications and guidelines, creating the manual, and testing it. Product-oriented processes:
  - Progress with the evolution of the product.
  - Are defined based on the project life cycle. For example, the process of testing software might be part of the testing phase of the software development life cycle.
  - Are implemented by the entire development team and not just the project management team.

Product-oriented processes and project management processes are interconnected. You need to integrate and align them to produce a useful product. For example, there might be instances when you find that some of the project management processes in a project need to be done several times to achieve the required outcome.

Process groups

Project management processes are divided into five distinct, yet closely interrelated, groups called process groups. These process groups combine similar project management activities under the following five categories:

- **Initiating** — Defining and authorizing the project.
- **Planning** — Setting the project objectives and goals and planning how to achieve them.
• **Executing** — Managing and developing resources to work with the project management plan.

• **Monitoring and Controlling** — Regularly measuring the progress of the project and identifying and implementing corrective actions.

• **Closing** — Formalizing the project output, releasing the project resources, and declaring the end of the project or phase.

**Phases vs. process groups**

By now, it might seem that the terms *project phases* and *process groups* can be used interchangeably. However, they are not the same. There are some basic differences between project phases and process groups.

Project phases are intermediate steps that help to develop the product of a project. For instance, project phases such as feasibility studies and prototyping are methods used to complete the project. Process groups, on the other hand, are invariably used within all project phases. Therefore, for large projects, you might use all of the process groups in each phase. Exhibit 4-3 describes the relationship between a phase and the process groups.

*Exhibit 4-3: Phases vs. process groups*

For example, a construction project comprises several phases, such as a feasibility study, planning, designing, prototype development, building, and monitoring. Here, all the process groups can be repeated several times in each phase. Each phase is initiated, planned, executed, monitored and controlled, and closed.
B-1: Defining a process group

Questions and answers

1. Which of the following is not a project management process group?
   - A. Initiation
   - B. Planning
   - C. Analysis
   - D. Monitoring and Control

2. Which of the following is a product-oriented process in a house construction project?
   - A. Planning the construction from foundation to completion
   - B. Updating the work completion status at the end of every day
   - C. Conducting a meeting of all stakeholders to kick off the project
   - D. Installing electricity cables according to wiring standards and regulations

3. You are managing a project to develop customer-care management software. Categorize each of the following processes as either a product-oriented process or a project management process.
   - A. Preparing a functional specifications document
   - B. Preparing a work breakdown structure
   - C. Developing a prototype
   - D. Creating flowcharts to represent the working of different software functions
   - E. Preparing a project schedule
   - F. Tracking project activities


Project management processes within each process group

Each process group comprises a set of key processes. To perform these processes, you need specific inputs, to which you apply certain tools and techniques so that the required outputs are generated.

Initiation process group

The Initiation process group involves defining and authorizing a new project phase or project. Before beginning this process, an organization documents its business needs or requirements. Project objectives are developed, along with reasons that a particular project is best suited to satisfy requirements. Supporting documents include a basic description of the project scope, deliverables, duration, and suggested resources.

Finally, stakeholders and management authorize the project and assign a project manager. Including customers and other stakeholders during Initiation encourages shared ownership and increases the chances of acceptance of deliverables and overall satisfaction with results. This inclusion is critical to a project’s success.

Following are the two key project management processes in the Initiation process group.

<table>
<thead>
<tr>
<th>Process Description</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorize the project. In this process, the business needs and the proposed solution (such as a product or service) are documented. The project charter is approved by a higher management body outside the project, such as a portfolio manager or program manager. For large projects, this process is used to verify or redefine the decisions of the previous project charter.</td>
<td>Develop project charter</td>
</tr>
<tr>
<td>Create a high-level definition of the project scope. This process documents the broad-level requirements of a project, such as product requirements, deliverables, project boundaries, assumptions and constraints, and acceptance criteria.</td>
<td>Develop preliminary project scope statement</td>
</tr>
</tbody>
</table>

Planning process group

Planning processes ensure that you prepare a project management plan that defines how you intend to achieve the goals of a project. In this process group, you divide the project into multiple phases and define the objectives and desired outcome of each phase. Planning processes also refine the project’s cost, schedule, scope, and risks, which have been cursorily listed earlier in a preliminary scope statement. The performance measurement baselines set for the project and team are used to gauge the project’s progress from this point forward.

Project planning is an iterative process. Whenever new project information is identified or existing information is refined, it requires identifying or resolving various factors, such as risks, assumptions, constraints, and requirements. Similarly, when approved changes affect any of the project factors, you need to update the project plan. Updates to the project plan can be made for a specific phase or the entire project.
The Planning process group consists of multiple processes. The following table lists these key processes.

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop project management plan</td>
<td>Define, prepare, integrate, and coordinate all components of a project management plan.</td>
</tr>
<tr>
<td>Scope planning</td>
<td>Define, verify, and control project scope, and define and create the work breakdown structure.</td>
</tr>
<tr>
<td>Scope definition</td>
<td>Create a detailed project scope statement.</td>
</tr>
<tr>
<td>Create work breakdown structure</td>
<td>Divide the project deliverables and tasks into small manageable components.</td>
</tr>
<tr>
<td>Activity definition</td>
<td>Identify the specific activities that need to be performed to achieve different project deliverables.</td>
</tr>
<tr>
<td>Activity sequencing</td>
<td>Identify and document the dependencies between scheduled activities.</td>
</tr>
<tr>
<td>Activity resource estimating</td>
<td>Estimate the type and number of resources required to perform each activity.</td>
</tr>
<tr>
<td>Activity duration estimating</td>
<td>Estimate the time required to complete each scheduled activity.</td>
</tr>
<tr>
<td>Schedule development</td>
<td>Analyze the sequence, duration, resource requirements, and schedule constraints of activities to prepare a schedule.</td>
</tr>
<tr>
<td>Cost estimating</td>
<td>Estimate the cost of the resources needed to complete the project.</td>
</tr>
<tr>
<td>Cost budgeting</td>
<td>Sum up the estimated cost of individual activities or work packages to prepare the cost baseline.</td>
</tr>
<tr>
<td>Quality planning</td>
<td>Determine the quality standards that are relevant to the project, and the methods to satisfy these standards.</td>
</tr>
<tr>
<td>Human resource planning</td>
<td>Determine the roles, responsibilities, and reporting structure of team members to create a staffing management plan.</td>
</tr>
<tr>
<td>Communications planning</td>
<td>Determine the communication and information needs of all project stakeholders.</td>
</tr>
<tr>
<td>Risk management planning</td>
<td>Determine the risk management activities needed for the project.</td>
</tr>
<tr>
<td>Risk identification</td>
<td>Identify project risks and document their characteristics.</td>
</tr>
<tr>
<td>Qualitative risk analysis</td>
<td>Prioritize risks to assess and combine their probability and impact.</td>
</tr>
<tr>
<td>Quantitative risk analysis</td>
<td>Numerically analyze the impact of identified risks on project objectives.</td>
</tr>
</tbody>
</table>
Risk response planning

Develop options and actions to enhance opportunities and reduce threats to project objectives.

Plan purchases and acquisitions

Determine what needs to be bought or obtained, and then determine when and how to do this.

Plan contracting

Document the requirements of the output and identify potential sellers.

**Executing process group**

After creating the project management plan, you translate it into action in the Executing process group. In fact, executing the plan is the most crucial part of a project. It’s in this process group that you delegate the project or a project phase to the project team. The size and constituents of a team depend on the requirements of the phase. Next, project activities are integrated and performed.

The following table describes the key processes in the Executing process group.

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct and manage project execution</td>
<td>Instruct the various technical and organizational people in the project to execute it as defined in the project management plan. Deliverables, as defined in the project management plan, are the output of this process. In addition, the work completion status is collected for the performance monitoring process.</td>
</tr>
<tr>
<td>Perform quality assurance</td>
<td>Apply all the quality processes defined for the project to ensure that the project meets all requirements.</td>
</tr>
<tr>
<td>Acquire project team</td>
<td>Obtain the human resources required for the project work.</td>
</tr>
<tr>
<td>Develop project team</td>
<td>Improve the skills and interaction of team members for better project performance.</td>
</tr>
<tr>
<td>Information distribution</td>
<td>Provide project-related information to stakeholders at regular intervals.</td>
</tr>
<tr>
<td>Request seller responses</td>
<td>Obtain proposals, bids, quotes, information, or offers for completion of work outside the organization.</td>
</tr>
<tr>
<td>Select sellers</td>
<td>Review offers, select a seller, and negotiate a written contract with the seller.</td>
</tr>
</tbody>
</table>
Monitoring and Controlling process group

As the name implies, this group includes processes used to check the progress of a project against the set goals. If you see that a project is deviating from its project management plan, you need to take control measures to bring it back on track.

Variances might occur in the form of excessive budget, increased scope, or delays in activity completion dates, and so on. They affect the plan, which is an output of the Planning process group. You must identify these discrepancies and put the project back on track. You might need to modify the plan and execute the project based on new parameters; this makes the iteration of the Planning processes unavoidable.

The following table describes the key processes in the Monitoring and Controlling process group.

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor and control project work</td>
<td>Collect, monitor, and analyze project performance information, and evaluate the measurements and trends for process improvements. Monitoring includes risk monitoring, status reporting, progress measurement, and forecasting.</td>
</tr>
<tr>
<td>Integrated change control</td>
<td>Control the changes in a project. This process ensures that the changes are beneficial to the project and manages the approved changes.</td>
</tr>
<tr>
<td>Scope verification</td>
<td>Accept the completed project deliverables.</td>
</tr>
<tr>
<td>Scope control</td>
<td>Control changes in the project scope.</td>
</tr>
<tr>
<td>Schedule control</td>
<td>Control changes in the project schedule.</td>
</tr>
<tr>
<td>Cost control</td>
<td>Control the project budget.</td>
</tr>
<tr>
<td>Perform quality control</td>
<td>Monitor project outputs for conformance to the project quality standards and to identify methods to ensure product quality.</td>
</tr>
<tr>
<td>Manage project team</td>
<td>Track the performance of team members, provide feedback, resolve issues, and coordinate changes to enhance project performance.</td>
</tr>
<tr>
<td>Performance reporting</td>
<td>Collect and publish project performance information, such as status and progress reports, and forecasts.</td>
</tr>
<tr>
<td>Manage stakeholders</td>
<td>Manage communications to satisfy the requirements of stakeholders and to resolve issues.</td>
</tr>
<tr>
<td>Risk monitoring and control</td>
<td>Track and monitor identified risks, identify new risks, execute risk response plans, and assess the effectiveness of risk response plans throughout the project life cycle.</td>
</tr>
<tr>
<td>Contract administration</td>
<td>Manage the relationship and contract between the buyer and seller, and review and document seller performance.</td>
</tr>
</tbody>
</table>
Closing process group

Closing processes bring the project to a formal end. A key process in this group is documenting the lessons learned by the development team throughout the project; these include the problems faced, positive outcomes, and things that could be improved. This is referred to as historical information and you can use it as a reference for future projects. The activities in this process group end with archiving all project documentation and releasing project resources.

The Closing process group has two key processes, described in the following table:

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close project</td>
<td>Finalize all the project activities across all the project process groups.</td>
</tr>
<tr>
<td>Contract closure</td>
<td>Complete all terms of each contract in a project, including resolving any open issues.</td>
</tr>
</tbody>
</table>

Do it!

B-2: Discussing project management process groups

Questions and answers

1. The project manager of a project is identified in the ___________ process group.
   A. Initiation
   B. Planning
   C. Executing
   D. Monitoring and Controlling

2. Which of the following activities is part of the Initiation process group?
   A. Creating a detailed project plan
   B. Creating a work breakdown structure
   C. Preparing a preliminary project scope statement
   D. Determining the project team

3. Estimating resource requirements is part of the ___________ process group.
   A. Initiation
   B. Planning
   C. Executing
   D. Monitoring and Controlling

4. The preliminary schedule is created in which of the following process groups?
   A. Initiation
   B. Planning
   C. Executing
   D. Monitoring and Controlling
5 The project team is acquired in which of the following process groups?
   A Initiation
   B Planning
   C Executing
   D Monitoring and Controlling

6 The following statements about project management process groups are true, except for:
   A Process groups are iterated when a variance occurs.
   B Activities from different process groups might be performed in parallel.
   C Process groups are the intermediate steps that help to develop the final product of a project.
   D The output of one process group is the input for the next process group in the sequence.

7 A project manager is in the process of verifying a project’s progress against the project scope. Which process group would this activity belong to?
   A Planning
   B Executing
   C Monitoring and Controlling
   D Closing

8 In a project meeting, the project manager explains the key responsibility areas of the team members. Which process group would this activity belong to?
   A Initiation
   B Planning
   C Executing
   D Monitoring and Controlling

9 The project manager is reviewing project activities, comparing them with the project management plan, to verify that the project was executed as defined by the plan. Which process group would this activity belong to?
   A Planning
   B Executing
   C Monitoring and Controlling
   D Closing
10 The project manager identifies some variances in the budget allocated for a few activities in the project. The project manager analyzes these variances to decide which corrective measures are needed to put the project cost back on track. Which process group would this activity belong to?
   A Planning
   B Executing
   C Monitoring and Controlling
   D Cost Controlling

11 The Planning process group is completed by:
   A Holding a kickoff meeting to communicate the project plan.
   B Publishing the project plan and performance measurement baselines.
   C Seeking the approval of the project charter by all stakeholders.
   D Seeking the approval of the project management plan by all stakeholders.

12 The Closing process group is completed when:
   A The product is delivered.
   B The customer signs off on the product.
   C The lessons learned are compiled.
   D The resources are released.
**Interaction among process groups**

Process groups are not isolated steps. They are sets of activities tied together by their inputs and outputs. The output of one process group is the input for the next process group. For example, the output of the Planning group—the project management plan—becomes an input for the Executing process group. As a result, there is constant interaction among process groups.

To understand why process groups interact and overlap, consider the following situations:

- You are executing a project based on the requirements and objectives finalized during the Initiation and Planning process groups. However, during execution, you discover that there is a better way of accomplishing certain activities. Now, you must plan a new course of action and extend planning activities and perform them in parallel with the Execution processes. This progressive movement of the process groups within a project is called *iteration*. In other words, iteration (in a project management context) is a process of revisiting process groups whenever variations occur.

- You discover that the output of a phase conflicts with the project scope and plan. Under such circumstances, it’s essential to re-plan without compromising the project timeframe, cost, or scope. However, if the variance detected is far from the project management plan, you must undertake a complete overhaul of the plan. This will help you control risks that would otherwise adversely affect the project.

- While executing a project, you come across unexpected risks. You have to reconsider your project execution strategy and change the project management plan. In addition, you need to start a few of the processes all over again and perform control measures for the affected activities. As you can see, in such situations, you might be doing planning, execution, and control processes in parallel, even though, technically speaking, you might be in the Execution process group.

The level of overlap is highest among the Planning, Executing, and Monitoring and Controlling process groups. Exhibit 4-4 illustrates how the five process groups overlap and interconnect throughout the various phases of a project.
Exhibit 4-4: Interaction of project management process groups
The Plan-Do-Check-Act cycle

A simple outline framework called the Plan-Do-Check-Act (PDCA) cycle can be used to describe the interaction among the five process groups. The components of the PDCA cycle are linked by their inputs and outputs, as with the process groups. Output from one process becomes the input for another. Here is how the PDCA cycle works:

1. **Plan** — Plan a change.
2. **Do** — Execute the plan.
3. **Check** — Verify the impact of the change.
4. **Act** — Take wider action based on what you learned in the Check step. If the change did not bring about the desired results, repeat the cycle with a different plan. If the change was successful, incorporate the change into the process framework.

Exhibit 4-5 illustrates the relationship between the PDCA cycle and the process groups.

*Exhibit 4-5: Relationship between the PDCA cycle and the process groups*
### Questions and answers

1. Describe the interaction between different process groups.

2. In which of the following process groups is the level of overlapping minimal?
   - **A** Planning
   - **B** Executing
   - **C** Monitoring and Controlling
   - **D** Closing

3. When performing the Executing processes, you identify some new risks, which will affect the planned execution of the project. In this situation, which of the following statements is true?
   - **A** You need to stop the Executing process group activities and restart the Planning process group activities.
   - **B** Because you are in the Executing process group, you cannot restart the Planning process group activities.
   - **C** You can perform Planning and Executing process group activities in parallel, but you need to stop the Monitoring activities.
   - **D** You need to run the activities of the Planning, Executing, and Monitoring and Controlling process groups in parallel.

4. Discuss situations in which you need to run the activities of the Planning, Executing, and Monitoring and Controlling process groups in parallel.
**Topic C: Project management knowledge areas**

**Explanation**
This topic covers the following course objectives:

<table>
<thead>
<tr>
<th>#</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.C.1</td>
<td>Define each knowledge area and list its objectives (3.1 PMBOK)</td>
</tr>
<tr>
<td>4.C.2</td>
<td>List the project management processes within each knowledge area (3.2 PMBOK)</td>
</tr>
<tr>
<td>4.C.3</td>
<td>Map the process groups to the knowledge areas (3.4 PMBOK)</td>
</tr>
</tbody>
</table>

**The nine categories of project management skills**

An alternative method can be used to classify the various processes in the process groups. This alternative method classifies processes as project management knowledge areas. Knowledge areas refer to processes that call for specific skills. For example, all processes that require defining and controlling the scope of a project—no matter what process group they’re in—fall under the knowledge area of Project Scope Management. The processes of each knowledge area fall across the five process groups.

The nine knowledge areas of project management are:

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management

**Project Integration Management**

The Project Integration Management knowledge area joins all the processes required to integrate the components of a project. It includes processes to authorize the project, plan project work, manage project work, control changes, and close the project. Using processes in this knowledge area, you can integrate project processes, maximize performance, and meet project goals.

Project Integration Management consists of the following seven processes:

- Develop project charter
- Develop preliminary project scope statement
- Develop project management plan
- Direct and manage project execution
- Monitor and control project work
- Integrated change control
- Close project
Project Scope Management

Project Scope Management refers to the processes that limit and control the work included in a project. Project Scope Management deals with two key concepts: project scope and product scope. *Project scope* is about managing projects based on the project management plan and creating work breakdown structures. *Product scope* defines or corresponds to the product requirements.

Project Scope Management includes five processes:

- Scope planning
- Scope definition
- Create WBS
- Scope verification
- Scope control

Project Time Management

Project Time Management includes the processes that are essential to complete a project within the specified period. This knowledge area is concerned with the schedule for completing each activity during the project life cycle. It also includes monitoring the project’s performance against the defined schedule and controlling any variance.

Project Time Management consists of six processes:

- Activity definition
- Activity sequencing
- Activity resource estimating
- Activity duration estimating
- Schedule development
- Schedule control

Project Cost Management

Project Cost Management ensures that a project is successfully completed within the estimated budget. This knowledge area focuses on estimating cost requirements to complete a project, preparing a budget, and completing the project within the approved budget.

Project Cost Management includes the following processes:

- Cost estimating
- Cost budgeting
- Cost control
Project Quality Management

This knowledge area includes activities that focus on an organization’s quality policies and the customer’s quality requirements. Project Quality Management uses measures and techniques to ensure that the product meets the requirements specified by the customer. According to the PMBOK, the following objectives need to be assigned the utmost importance:

- Customer satisfaction
- Management responsibility
- Prevention over inspection
- Continuous improvement

“Prevention over inspection” means taking steps to ensure quality up front. If errors can be prevented, then less time and effort will be required to check and repair the final product in a final inspection.

Project Quality Management consists of three processes:

- Quality planning
- Perform quality assurance
- Perform quality control

Project Human Resource Management

The Project Human Resource Management knowledge area includes processes that help to organize and manage the project team. These processes require you to implement various interpersonal skills—such as conflict management, leadership, negotiation, and training skills—to achieve project objectives and goals.

Project Human Resource Management contains the following processes:

- Human resource planning
- Acquire project team
- Develop project team
- Manage project team

Project Communications Management

The Project Communications Management knowledge area defines the communication processes used to facilitate timely and effective exchange of information. It also focuses on storing and disseminating information to everyone involved in a project. The processes also include working with all project-related communication, such as:

- Preparing project-related plans and notes
- Reporting performance
- Documenting information to be shared with team members, stakeholders, and management
- Identifying the media type, presentation techniques, and meeting management techniques to be used during a project.

The processes related to the Project Communications Management knowledge area are:

- Communications planning
- Information distribution
- Performance reporting
- Managing stakeholders
**Project Risk Management**

The Project Risk Management knowledge area covers the processes needed to identify and analyze potential threats during a project. It involves mitigating risks that might harm the project. It also ensures that positive events in the project are enhanced so that project performance can be improved.

The Project Risk Management knowledge area includes six processes:

- Risk management planning
- Risk identification
- Qualitative risk analysis
- Quantitative risk analysis
- Risk response planning
- Risk monitoring and control

**Project Procurement Management**

This knowledge area includes the processes that help define what to procure, when to do it, and how to do it. The key processes within this knowledge area are:

- Plan purchases and acquisitions
- Plan contracting
- Request seller responses
- Select sellers
- Contract administration
- Contract closure
C-1: Discussing project management knowledge areas

### Questions and answers

1. Match the following processes to the appropriate project management knowledge areas.

<table>
<thead>
<tr>
<th>Process</th>
<th>Project management knowledge area</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Cost budgeting</td>
<td>1 Project Integration Management</td>
</tr>
<tr>
<td>B Create WBS</td>
<td>2 Project Time Management</td>
</tr>
<tr>
<td>C Develop project charter</td>
<td>3 Project Scope Management</td>
</tr>
<tr>
<td>D Activity sequencing</td>
<td>4 Project Cost Management</td>
</tr>
</tbody>
</table>

2. The process of managing stakeholders is part of the __________ knowledge area.

   A Project Risk Management
   B Project Scope Management
   C Project Communication Management
   D Project Quality Management

3. Where quality management is concerned, what are the four objectives that are assigned utmost importance?

4. Match the following processes to the appropriate knowledge areas.

<table>
<thead>
<tr>
<th>Process</th>
<th>Project management knowledge area</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Perform quality control</td>
<td>1 Project Communication Management</td>
</tr>
<tr>
<td>B Manage project team</td>
<td>2 Project Quality Management</td>
</tr>
<tr>
<td>C Risk response planning</td>
<td>3 Project Human Resources Management</td>
</tr>
<tr>
<td>D Performance reporting</td>
<td>4 Project Risk Management</td>
</tr>
</tbody>
</table>
Mapping the project management process groups and knowledge areas

You can create a matrix by mapping the 44 project management processes discussed previously to the nine knowledge areas and the five process groups. The mapping in the following table shows the project management processes in their appropriate process groups and knowledge areas.

<table>
<thead>
<tr>
<th>Project management knowledge areas</th>
<th>Project management process groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initiating</td>
</tr>
<tr>
<td>Project Management Integration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop project charter</td>
</tr>
<tr>
<td></td>
<td>Develop preliminary project scope statement</td>
</tr>
<tr>
<td>Project Scope Management</td>
<td>Scope planning</td>
</tr>
<tr>
<td></td>
<td>Create WBS</td>
</tr>
<tr>
<td>Project Time Management</td>
<td>Activity definition</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Cost Management</td>
<td>Cost estimating</td>
</tr>
<tr>
<td>Project Quality Management</td>
<td>Quality planning</td>
</tr>
<tr>
<td>Project Human Resource Management</td>
<td>Human resource planning</td>
</tr>
<tr>
<td>Project management knowledge areas</td>
<td>Initiating</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Project Communications Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communications planning</td>
</tr>
<tr>
<td>Project Risk Management</td>
<td>Risk management planning</td>
</tr>
<tr>
<td></td>
<td>Risk identification</td>
</tr>
<tr>
<td></td>
<td>Qualitative risk analysis</td>
</tr>
<tr>
<td></td>
<td>Quantitative risk analysis</td>
</tr>
<tr>
<td></td>
<td>Risk response planning</td>
</tr>
<tr>
<td>Project Procurement Management</td>
<td>Plan purchases and acquisitions</td>
</tr>
<tr>
<td>Questions and answers</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td>1 Compare project management process groups with project management knowledge areas.</td>
<td></td>
</tr>
<tr>
<td>2 Map each project management process to its appropriate process group and knowledge area:</td>
<td></td>
</tr>
<tr>
<td>A Activity sequencing</td>
<td></td>
</tr>
<tr>
<td>B Develop preliminary project scope statement</td>
<td></td>
</tr>
<tr>
<td>C Perform quality assurance</td>
<td></td>
</tr>
<tr>
<td>D Manage project team</td>
<td></td>
</tr>
<tr>
<td>3 Categorize the following Project Procurement Management knowledge area processes into the appropriate process groups:</td>
<td></td>
</tr>
<tr>
<td>A Plan purchases and acquisitions</td>
<td></td>
</tr>
<tr>
<td>B Contract administration</td>
<td></td>
</tr>
<tr>
<td>C Select sellers</td>
<td></td>
</tr>
<tr>
<td>D Request seller responses</td>
<td></td>
</tr>
</tbody>
</table>
Unit summary: Project management processes

**Topic A**
In this topic, you learned about the characteristics of *project phases* and *project life cycles*. You also learned about various project life cycles from different application areas.

**Topic B**
In this topic, you learned about the differences between project management processes and product-oriented processes. You also learned about the *five process groups* of project management. In addition, you also learned about the level of interaction between the various process groups.

**Topic C**
In this topic, you learned about the nine *knowledge areas* of project management. You also learned about the relationship between the process groups and knowledge areas.

**Review questions**

1. Another term for “phase-end review” is:
   A. Fast tracking
   B. Handoff
   C. Phase gate
   D. Sign-off

2. In which of the following process groups will the project cost be the minimum?
   A. Initiation
   B. Planning
   C. Execution
   D. Closing

3. Which of the following statements about product-oriented processes is false?
   A. They consist of activities that help develop a product for which a project is set up.
   B. They’re implemented only by the project management group.
   C. They progress with the evolution of a product.
   D. They’re defined based on the project life cycle.

4. Which of the following is not a project management process group?
   A. Initiation
   B. Design
   C. Planning
   D. Executing
5 Which of the following processes is part of the Initiation process group?
   A Develop project charter
   B Scope definition
   C Create WBS
   D Activity definition

6 Which of the following processes is not part of the Planning process group?
   A Activity sequencing
   B Cost budgeting
   C Acquiring project team
   D Schedule development

7 Information distribution is part of the __________ process group.
   A Initiating
   B Planning
   C Executing
   D Monitoring and Controlling

8 Which of the following processes is part of the Monitoring and Controlling process group?
   A Acquiring project team
   B Scope verification
   C Perform quality assurance
   D Develop project team

9 A project phase is delegated to a project team in the ________ process group.
   A Initiating
   B Planning
   C Executing
   D Monitoring and Controlling

10 Which of the following is not a project management knowledge area?
    A Project Time Management
    B Project Monitoring and Controlling
    C Project Procurement Management
    D Project Scope Management
11 Which of the following processes is not part of the Project Integration Management knowledge area?
   A  Develop project management plan
   B  Manage project team
   C  Monitor and control project work
   D  Direct and manage project execution

12 Which of the following is not a process from the Project Quality Management knowledge area?
   A  Quality planning
   B  Perform quality assurance
   C  Perform quality control
   D  Customer satisfaction

13 Which of the following is not a part of the Project Time Management knowledge area?
   A  Activity sequencing
   B  Activity resource estimating
   C  Create WBS
   D  Schedule development
Course summary

This summary contains information to help you bring the course to a successful conclusion. Using this information, you will be able to:

A Use the summary text to reinforce what you’ve learned in class.

B Determine the next courses in this series (if any), as well as any other resources that might help you continue to learn about PMP certification.
Topic A: Course summary

Use the following summary text to reinforce what you’ve learned in class.

Unit summaries

Unit 1
In this unit, you learned about the importance of the PMP exam. You also learned about the exam’s eligibility criteria and structure. Finally, you learned tips for taking the PMP exam.

Unit 2
In this unit, you learned about the characteristics of a project. Then, you learned about the difference between projects and operations and about the role of triple constraints in projects. You also defined project management and learned about the differences between programs, portfolios, and subprojects. Finally, you learned about the role of the project management office.

Unit 3
In this unit, you identified the key stakeholders in a project and learned how to manage their expectations. Then, you learned about the components of the project environment. You also learned about the different types of organizational structures and the role of project manager in different structures. Finally, you learned about key project management skills.

Unit 4
In this unit, you identified the different phases of a project. You learned about the project life cycle and product life cycle. You also learned about the five process groups, the processes within each group, and the interaction between these groups. Finally, you learned about the nine knowledge areas of project management and about the relationship between the process groups and knowledge areas.
Topic B: Continued learning after class

Course Technology also offers resources for continued learning.

Next courses in this series

This is the first course in this series. The next course in this series is:

- *PMP Certification: Advanced PMBOK 2004 Topics*

Other resources

You might find the following resource useful as you continue to learn about PMP certification. For more information, visit www.course.com.

- *Information Technology Project Management, Fourth Edition*
  ISBN: 0-619-21526-7
Glossary

Deliverable
A specific and measurable output produced at the end of each process, phase, or project.

Fast tracking
A method used to compress a schedule by overlapping phases that might otherwise be done in sequence.

Handoff
The formal transfer of project phases from one phase to another.

Knowledge areas
A grouping of project management processes based on specific skills.

Operations
Activities in an organization that are ongoing and repetitive and that are used to produce the same product or provide the same service.

Phase-end review
The process of evaluating and approving a deliverable at the completion of a phase.

Plan-Do-Check-Act (PDCA) cycle
A simple outline framework to describe the interaction among the five process groups of project management.

Portfolio
A set of programs or projects that work toward a common strategic business objective.

Process
A series of interrelated individual activities that result in a specific product, result, or service.

Product
A quantifiable artifact created as either an end item or a component item. Also referred to as “material” or “goods.”

Product life cycle
A collection of generally sequential and non-overlapping stages in the development of an artifact. These stages are determined by the organization developing the product, but generally include introduction, growth, maturity, decline, and phase-out.

Program
A set of related projects that work toward a common goal.

Progressive elaboration
The development of final output through incremental design and refinement of an initial concept.

Project
A multitask, temporary job with definite start and end dates and used to create a product, service, or result.

Project management
The application of knowledge, skills, tools, and techniques in project activities to meet project requirements.

Project Management Body of Knowledge (PMBOK) Guide
A document that focuses on the fundamentals of project management concepts, including proven traditional practices and innovative practices that are emerging in the project management profession.

Project management office (PMO)
An organizational unit that centralizes and coordinates the management of projects under its domain.

Sign-off
A formal authorization to close one project phase and initiate the next phase.

Stakeholder
An individual, group, or organization that affects and is affected by the success or failure of a project.

Subproject
A smaller, more manageable portion of a larger project.

Triple constraints
The three key, interrelated constraints of a project: scope, time, and cost.
PMP Certification: Project Management Basics
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