PROJECT MANAGEMENT PROFESSIONAL

PMP®

Based on PMBOK Guide Sixth Edition

SECOND EDITION

With practical case study

By: Ahmed Alsenosy

PMP, PRINCE2, PMI-PBA, PMI-RMP, PMOC

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+500 PMPs

Preface

PMP certification is one of the most worthy global certifications in project management profession; PMP holders demonstrate their knowledge and capability to manage projects effectively. The first edition of this book has assisted more than 500 professionals in passing the PMP exam based on PMBOK Guide Fifth Edition. This book, which is the second edition, has been developed based on the PMBOK Guide Sixth Edition considering:

Re-writing and structuring of the PMBOK Guide in order to facilitate and simplify understanding and studying as well.

Explaining the tools and techniques in more details and with illustrative examples and figures.

Performing a Mapping between the 49 project management processes to demonstrate their integration and interaction in one page.

Introduction and summary for each chapter which facilitates reading and comprehension

Concentrating on the exam by presenting a complete section of how to study and

pass PMP exam in addition to using exam tips in all chapter throughout the book.

Including practice tests based on knowledge areas to test and evaluate the quality of studying and understanding.

Drawing each chapter in mind mapping; to sharpen on key inputs,key tools and techniques, and key outputs. In addition to, highlighting the critical definitions for each section.

Extra chapter to summarize the Agile approach to facilitate the Agile book content easily.

Proposing a practical case study in a separate chapter which shows the implementation of project management processes on a construction project considering the project management process groups and their interaction.

Finally, I believe that this book will meet satisfaction and fulfill expectations of the global project management audience and will support in passing the PMP exam.

Ahmed Alsenosy
www.alsenosy.com
+ 500 PMPs

About the author

AHMED ALSENOSY, Ph.D. (cand), MSc, PMP®, PMI-PBA, PMI-RMP®, PRINCE2, PMOC

Ahmed Ibrahim Alsenosy holds a Bachelor of Civil Engineering.

Ph.D. (student) ..."Critical success factors for applying (OPM) Governance in Construction industry in MENA region"...Expected ISA 2018 - University of Cincinnati - USA

Member and Certified by the project management institute – Pennsylvania - USA as:

1 - Project manager professional (PMP ®) – 2011

2 - Risk Manager Professional (PMI-RMP ®) – 2013

3- Professional Business Analysis (PMI-PBA) - 2017

And certified from AXELOS – UK

4- PRINCE2(practitioner) Certified -2017

5- Project Management Office Certified (PMOC®) – USA- 2018

Holds academic degrees as per the following:

6- Master of projects management MSc- Denmark. – 2016

"BPCPM of applying PMI Module in construction projects management on KSA"

6 - International Trainer Professional (TOT®) Diploma - Cairo University - 2014

7- Arbitration in Construction Contracts Diploma – Arab Academy for Science – 2016

Other highlights:

- He has implemented more than +200 courses in project management,
- The author of Project Management PMP (Book) 1st Edition, 2015
- He has several dozens of articles in project management, more than 200 videos in project management.
- Speaker in Conferences and forums in Project management topics in (Big 5, SEC, DPMF, Cairo Construction Research Center).
- Chairman for RWAAD Magazine specialized in project management, www.rwaadpm.com
- Founder and the owner of PES Inc. www.professionalengineers.us

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Acknowledgments

First of all, I would like to thank everyone who contributed to the production of this book, which took about ten months to prepare, compile, arrange, design, produce and review the content, which we believe it will gain your satisfaction. Special thanks and appreciation to my wife and family, for Engineer Mohamed Hisham, Engineer Karim Ragab, Mr. Hamoud El Hadrami and Mr. Gamal. Al-Saeed, Mr. Mohammed Abdul Ghaffar, Eng. Ayman Al-Najjar and Eng. Heba Al-Najjar, all of whom have made significant contributions to the design, publication and scientific review of the book. I wish them full success, luminescence, and repayment in their lives.

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I

How to Study for PMP Exam?

This chapter presents essential tips for achieving the success in PMP exam from the first attempt.

I.1. Why is PMP Important?

Project managers do not need a PMP to do project management work, but having the certification will significantly improve opportunities for substantial increases in pay; why? The certification carries weight in organizations and companies because it codifies how a project manager works. Some companies may even require a certification, as most federal workplaces do since 2016.

Let's look at the benefits of a PMP certification, what's required to get it, and what kind of work and salary to expect afterward.

The PMP certification is global. Unlike many other certifications that focus on geography or domain, a PMP can work in virtually any industry and any location. PMPs are sought after by employers. Studies show that when more than one-third of their project managers are certified, more of their projects are completed on time and on a budget, as well as meeting the original goals.

A significant advantage when it comes to salary and earning potential may be the most robust incentive to get certified. Project managers with a PMP certification generate a salary 20 percent higher on average, compared to those without a PMP certification.

Smart sheet aggregated the salary information for project managers from companies including PMI, PayScale, Glassdoor, Indeed, Salary.com, Monster.com, Careerbuilder.com, the Robert Half Company and Angel List, to show the salary ranges that a PMP project manager can expect to make, by industry, in 2017; PMP salaries 2017 (10-22 percent higher than non-certified project managers):

- General: $55,000 up to $125,000.
- Financial & Insurance: $114,000 up to $144,000.
- Tech & IT: $64,000 up to $145,000.

- Healthcare: $80,000 up to $86,000.
- Staffing & Consulting: $111,000 up to $121,000.
- Travel Services: $83,000 up to $90,000.

Geographically, salary ranges are higher for project manager having PMP in big cities and along the West and Northeast coasts. In Washington, D.C. for example, project manager PMPs can make upwards of $130,000 a year. However, women still earn less than men.

More than one million people earn a postsecondary certificate every year; a specialized certification is a smart way to jumpstart a career without having to return to a full degree. Project management is a booming profession with work opportunities in all industries A PMP certification is often listed among the best certificates to future-proof job opportunities and careers.

A PMP certificate is a small investment with the potential to generate a high return. That makes the PMP Exam a recommended step on any project manager's career ladder.[1]

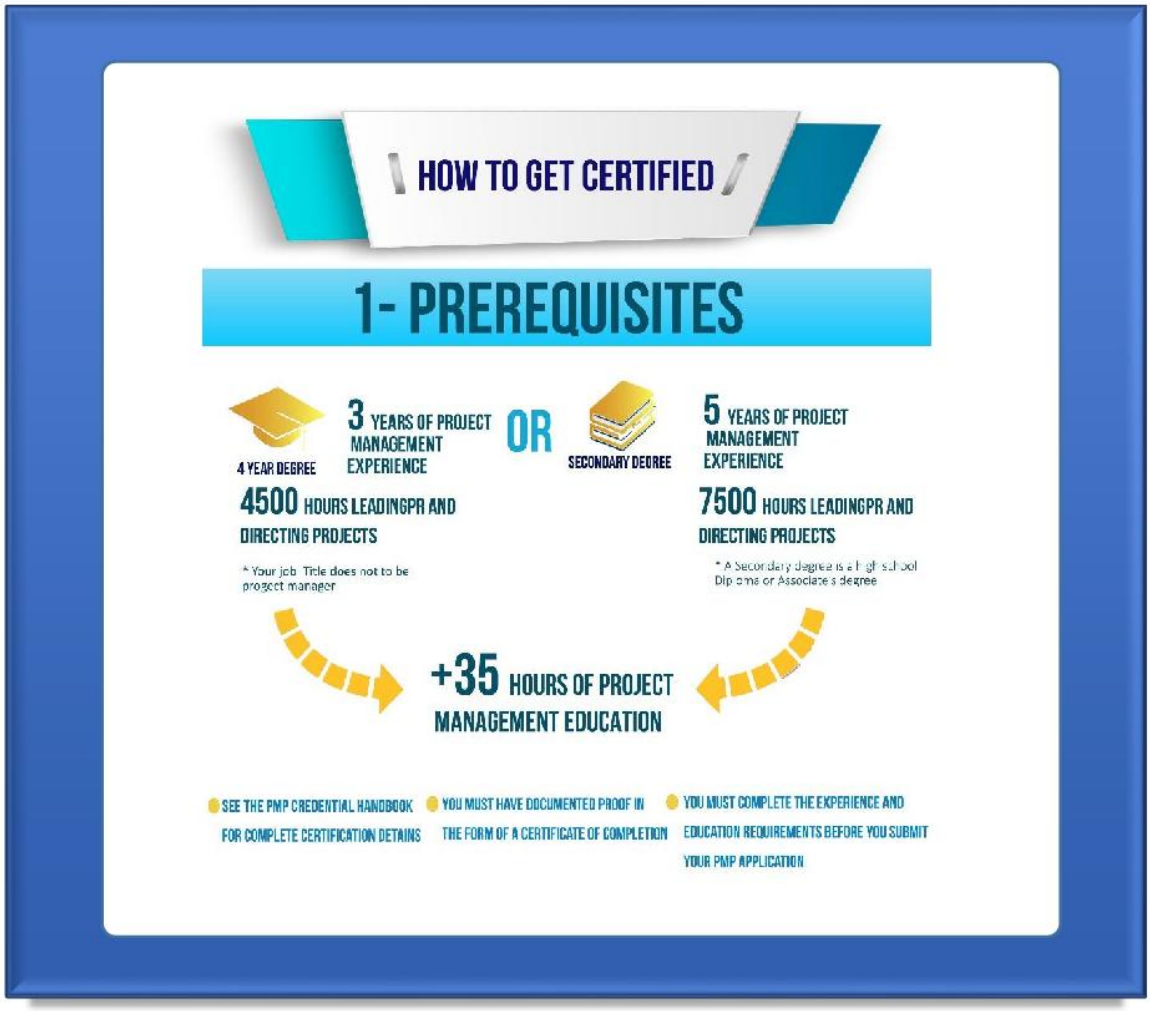
I.2. What is the PMP full path?

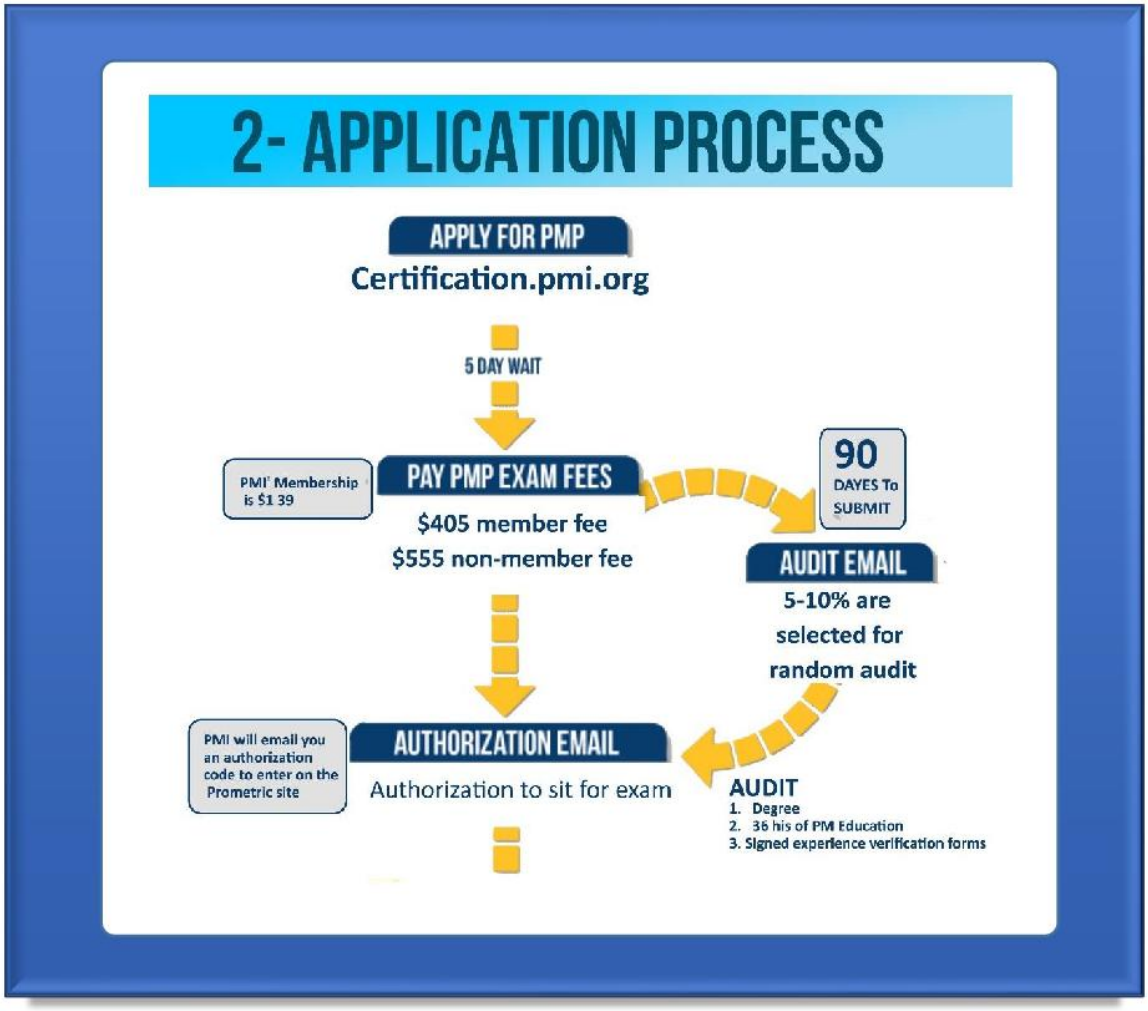
- Register to become a member of the Project Management Institute (PMI):
  - It costs $139 to become a member, but it saves you money on exam fees.
  - The standard non-member price to take the exam is $555. The PMI member price for the exam is $405.
- Take PMP Course to satisfy the required 35 hours (PDUs) education requirement.
- Submit your PMP application online.
- Project Management Institute (PMI) will review your application and respond within 3 to 5 business days.
- Once the application is approved, you will receive an invitation to pay for and schedule the exam.
- Schedule the exam with Prometric.
- You have one year to take the exam after your application has been approved.

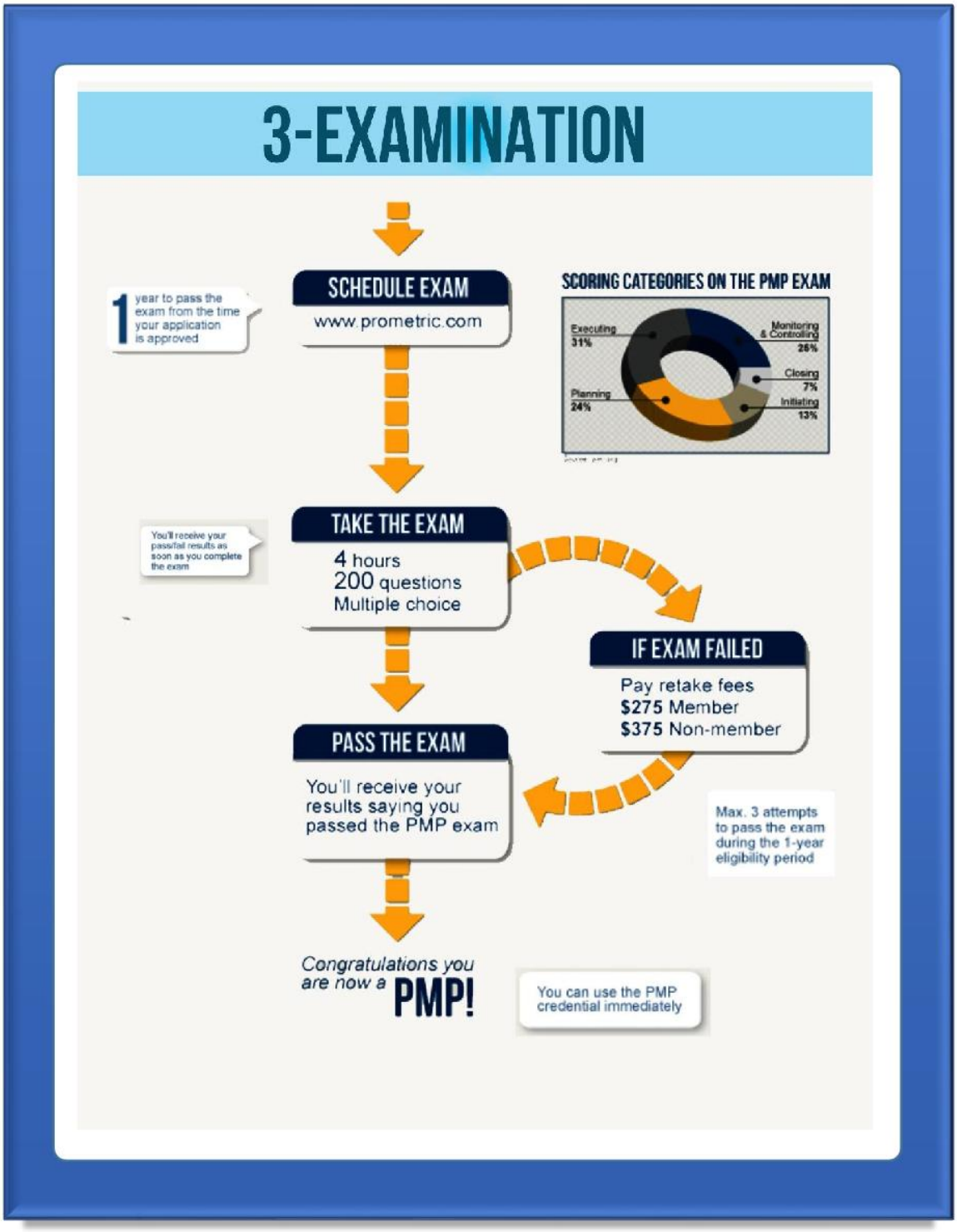
[1] (www.brightwork.com, 2018)

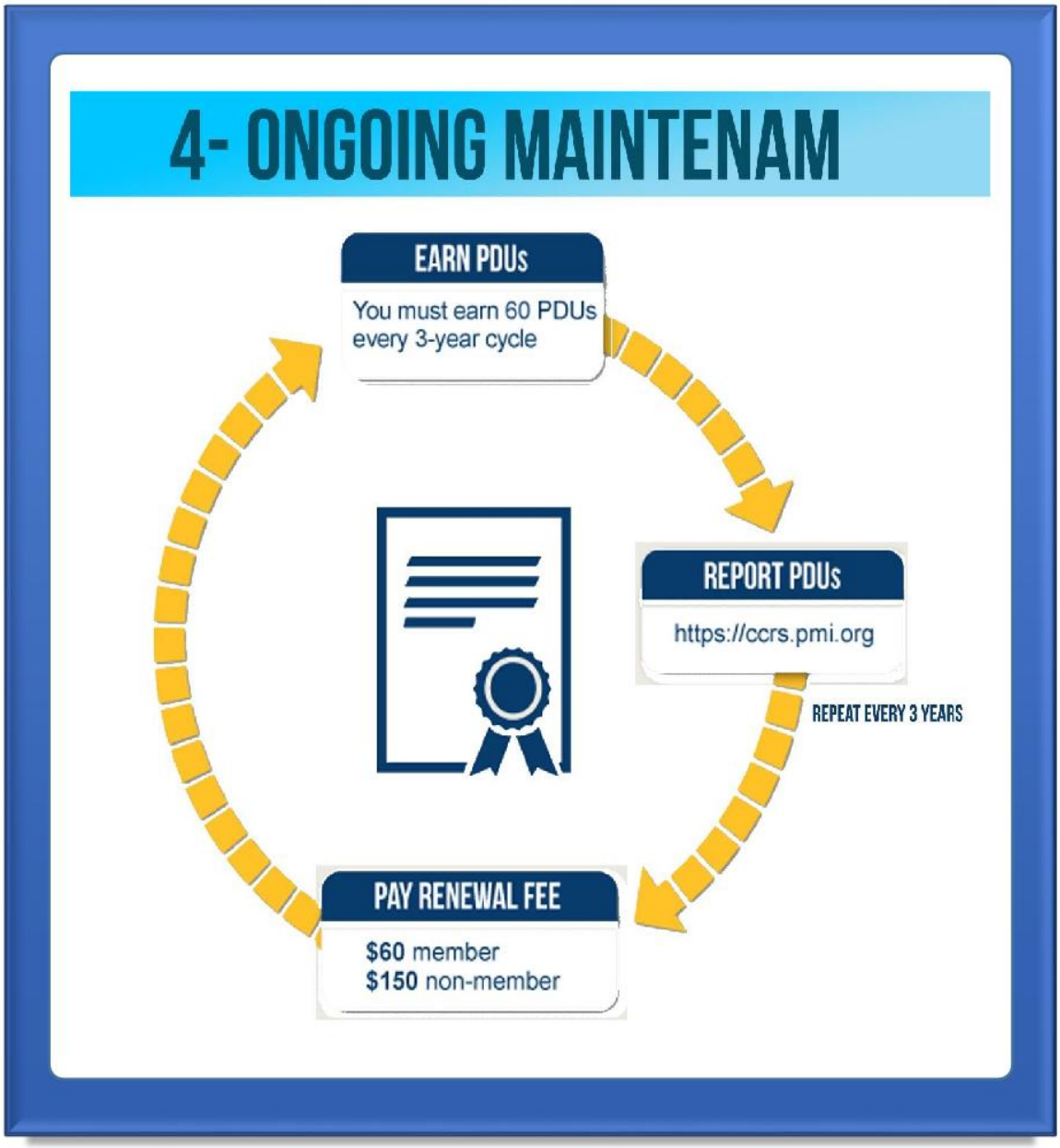
- You may take the exam up to three (3) times during the eligibility period.
- Take the PMP Exam: The PMP Exam is 200 questions with a 4-hour time limit. The questions are broken down into five process groups; Initiation (13%), Planning (24%), Executing (31%), Monitoring and Controlling (25%), Closing (7%).
- PMP Eligibility Requirements
- Bachelor's degree or global equivalent
- Minimum three years/36 months unique non-overlapping professional project management experience
- 4,500 hours spent leading and directing projects
- 35 contact hours of formal project management education
- High school diploma, associate's degree or global equivalent
- Minimum five years/60 months unique non-overlapping professional project management experience
- 7,500 hours spent leading and directing projects
- 35 contact hours of formal project management education

I.3. The full process is presented in details in below figures




2- APPLICATION PROCESS
APPLY FOR PMP
Certification.pmi.org
5 DAY WAIT
PMI Membership is $139
PAY PMP EXAM FEES
$405 member fee
$555 non-member fee
90
DAYES To SUBMIT
AUDIT EMAIL
5-10% are selected for random audit
PMI will email you an authorization code to enter on the Prometric site
AUTHORIZATION EMAIL
Authorization to sit for exam
AUDIT
1. Degree
2. 36 his of PM Education
3. Signed experience verification forms


3-EXAMINATION
1 year to pass the exam from the time your application is approved
SCHEDULE EXAM
www.prometric.com
SCORING CATEGORIES ON THE PMP EXAM
Executing 31%
Monitoring & Controlling 26%
Closing 7%
Planning 24%
Initiating 13%
You'll receive your pass/fail results as soon as you complete the exam
TAKE THE EXAM
4 hours
200 questions
Multiple choice
IF EXAM FAILED
Pay retake fees
$275 Member
$375 Non-member
PASS THE EXAM
You'll receive your results saying you passed the PMP exam
Max. 3 attempts to pass the exam during the 1-year eligibility period
Congratulations you are now a PMP!
You can use the PMP credential immediately

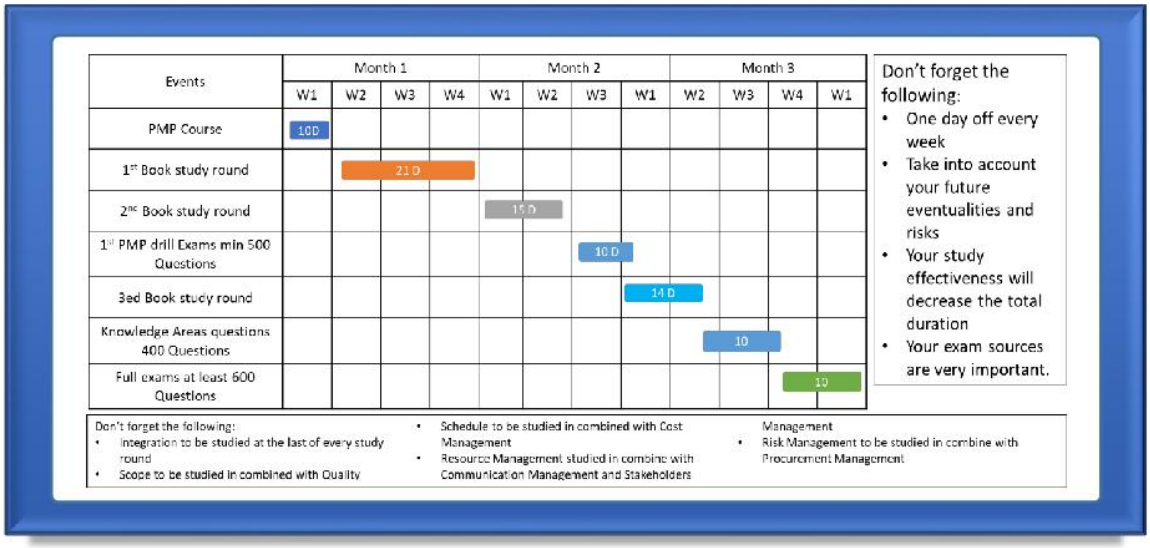

4- ONGOING MAINTENAM
EARN PDUs
You must earn 60 PDUs every 3-year cycle
REPORT PDUs
https://ccrs.pmi.org
REPEAT EVERY 3 YEARS
PAY RENEWAL FEE
$60 member
$150 non-member

I.4. How to study effectively for PMP exam?

- **Speed reading:** reading with a finger gives from 20% to 30 % more comprehension.
- **Figures and tables:** when you find referencing to figure or table while reading, go directly to that table or figure; this results in better understanding.
- **Determining the reading rate:** average person reads about 150 to 250 words/minute.

- **Printed book:** reading from printed books is faster than reading from screen by 20% to 30%.
- **Taking notes:**
  - Use text notes for instructional information (linear way).
  - Use mind-maps for general topics (non-linear way).
- **Highlighting:** avoid excessive highlighting; it should be done only for important notes and after good reading.
- **Review:** review notes within 48 hours of attending the lecture.
- **Study Plan 31500:**
  - Prepare a suitable place for studying.
  - Prepare a time schedule.
  - Define milestones for review.
  - Take a firm PMP course.
  - Select only one study book.
  - Study the book minimum three times.
  - Solve at least 1500 premium questions.
  - Finish the full job in max 90 days.
  - Exams sources (but not limited to):
    - ✓ PMASPIRE.
    - ✓ PMSTUDY.
    - ✓ OLIVERLEHMANN.
    - ✓ SIMPLILEARN.

➢ The following study plan could be followed:



I.5. PMP exam Day

You have come this far, and after weeks of study, you are now ready to take your Project Management Professional (PMP) ® exam. You know you have prepared yourself physically and mentally and that you are ready to tackle the exam questions confidently.

However, as in any endeavor, you will need to be ready for the actual battle - in this case, the PMP exam. The day before, you should have a good rest and eliminate any distractions. For instance, be sure that you take a day-off from your work on the day of the exam. The last thing you need is be concerned with issues regarding your job. Empty your mind of this kind of distractions for the exam.
Here are some PMP® exam tips on how to handle your actual PMP exam day:

Wake up early

Rise early and have a good breakfast, avoiding anything unfamiliar, or any exotic food that would give you an upset stomach. (This actually happened to me and I was feeling quite ill throughout my 4-hour exam.)

Wear comfortable clothes on your PMP exam day

You don't know the temperature at the exam site so it is best to come prepared. Wear several layers of clothes that can easily be taken off in case it becomes warm enough for you, or you can bring a sweater or jacket just in case.

Bring your IDs

As a general rule, you must present at least two ID's to sign in. Bring your passport and Driver's License with identical information which means they have matching data such as your name, address and other information about you. Social Security ID's and work badges will not be accepted.

Be early on your PMP exam day

It is also a good idea to go to the exam site early in order for you to take in the location and adjust your mind and body to the actual examination. There is nothing like getting in tune with the surroundings before an exam to help you relax. Besides, being an early bird adds to your confidence.

Everything you need on your PMP exam day is provided

You will not be allowed to take anything inside the actual testing room. Everything you need for the exam is provided. You will be assigned to a locker for personal items like your wallet, cell phones, and your watch. Also, put your bottled water and snacks for your break into the locker. Don't worry about a calculator or watch. You can use the computer-based calculator and tell the time from the computer you will be working on during the exam.

Relax

Before you actually start, take a little time to sit before your computer, breathe deeply and absorb everything you see to help you relax. Find your rhythm before plunging in. Once you are ready, take the 5-minute guided tour to learn about the exam interface. I did not take it and almost missed a few questions because I did not fully understand it. Spending time on the guided tour will help you calm down and understand the interface. The tour does not count towards your exam time. Once you begin your exam, the clock starts and the four hours begin ticking. Moreover, it does not stop ticking should you take breaks. However, a 5-10 minute break at around half-time is recommended.

Read each question carefully and understand them before answering

If you are not sure of your answer, you can "mark" them and move on to the next question. Marking allows you to quickly find it again and come back later to check the answer. Many test takers also report that they may come across a question later on in the test that triggers a memory to solve one of the questions they marked correctly.

Don't panic

Do not panic when you come across series of difficult questions that you cannot answer that happens to everyone; mark the questions and move on. Let your subconscious work on them while you focus on other areas of the exam, then come back and suddenly the answer seems obvious.

Ignore other examinees

Throughout the exam, you will notice many people coming and going, ignore them; these are examinees who take different exams with different durations.

You can see how important it is to be prepared for your exam day. There is a lot to do before you actually sit down at the computer to take the test, so it is a good idea to have as many things ready the night before as possible; it will make your morning calmer, more organized and put you in the proper frame of mind to pass your exam.[2]

[2] (project management prepcast, 2018)

II

How to Read this Book?

This book has been written and revealed based on Project Management Body of Knowledge (PMBOK) sixth edition. It is presented in a structured and systemic approach to facilitate a clear understanding of project management concepts, tools, techniques, and methodologies. This chapter will assist the reader to comprehend how to get the most excellent performance from studying from this book.

II.1. Book Structure and Components

This book comprises 14 chapters could be classified into three main categories as shown in Table II.1.

Table II.1: Classification of Book Chapters

Chapters	Classification / Description
1, 2, and 3	The first three chapters present the central concepts and fundamentals of project management; this includes defining the project management terminologies, project environments, organizational structures, and project manager role.
4, 5, 6, 7, 8, 9, 10, 11, 12, and 13	Each chapter of these ten chapters presents a knowledge area which comprises several project management processes that are integrated to maximize the efficiency of project management.
14,15	The last two chapters present a practical case study that illustrates how different project management processes could be implemented real projects and a particular chapter for Agile or adaptive development life cycles.

The knowledge areas chapters form the majority of the book components; the structure of these chapters is described in the following section.

II.2. Knowledge Areas Chapters

Based on PMBOK sixth edition, there are ten project management knowledge areas, which are:

- Project integration management;
- Project scope management;
- Project schedule management;
- Project cost management;
- Project quality management;
- Project resource management;
- Project communication management;
- Project risk management;
- Project procurement management; and
- Project stakeholder management.

Each knowledge area is presented in a separate chapter; this chapter includes the following sub-sections.

II.2.1. General Concepts of the knowledge area

This section presents the primary fundamentals of the specific knowledge area and its role in the project management framework; for example, the general concepts of project resource management knowledge area is described as follows:

"Individuals with assigned roles and responsibilities constitutes the project team; they work together to achieve the project objectives. It is the responsibility of the project manager to acquire, manage, motivate, and empower the project team. Physical resources include equipment, materials, supplies, etc. The failure to manage and control resources efficiently result in: Delays; Low quality; and High costs."

II.2.2. Emerging Practices and Trends in Knowledge Area

In this section, the new evolving approaches and considerations related to the knowledge area are presented; the presentation is usually in a tabular format as shown in Table II.2 which shows an example of emerging practices/trends in the project procurement management knowledge area.

Table II.2: Emerging Practices and Trends Example

Emerging practices / Trends	Description
Advances in tools	• Online procurement tools are used to advertise procurements and provide the sellers with the procurement documents. • In construction and engineering industries, Building Information Modeling (BIM) is widely being used to save effort, time, and cost in projects.

II.2.3. Tailoring Considerations for Applying Knowledge Area

This section presents the items that could be tailored to provide benefits for the knowledge area being implemented, and consequently for the whole project management activities. Table II.3 shows an example of tailoring considerations in the project communications management knowledge area.

Table II.3: Tailoring Considerations Example

Tailoring Considerations	Description
Knowledge management	The existence of knowledge management repository and its use.

II.2.4. Considerations for Applying Knowledge Area in Agile or Adaptive Environment

Projects with agile/adaptive environments require iterations and are more flexible than projects with predictive environments. In each knowledge area chapter, consideration for applying this knowledge area in agile/adaptive project environments are presented; for example, the following is a consideration for applying project cost management in the agile / adaptive environment:

"Lightweight estimation methods can be used to obtain a fast, high-level forecast of project labor costs, which could be adjusted easily when changes arise."

II.2.5. Knowledge Area Processes

Each knowledge area comprises several project management processes; in this section, the project management processes of the knowledge area is presented first in a tabular format showing the process name, description, and the related project management process group (initiating, planning, executing, monitoring and controlling, or closing). Table II.4 shows an example of representing the description of one of the project management processes, the project communications management knowledge area.

Table II.4: Project Management Processes Example

Process	Description	Process Group
Plan Communication Management	Developing a suitable plan for communication activities in order to fulfill stakeholders' needs considering the existing organizational assets.	Planning
Manage Communications	Ensuring suitable and timely creation, distribution, and collection of project information.	Executing
Monitor Communications	Ensuring the fulfillment of the information needs of the project stakeholders.	Monitoring and Controlling

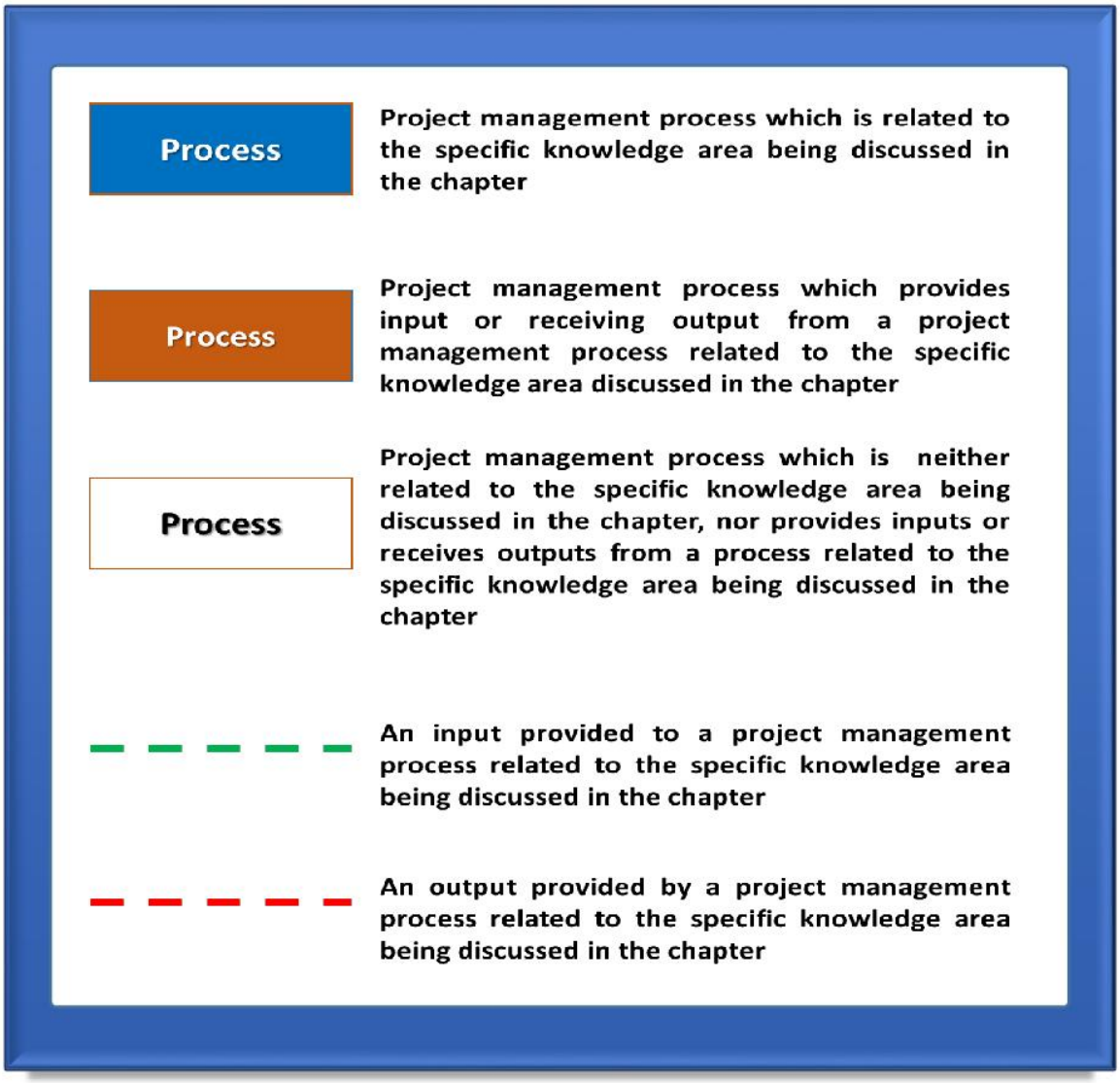


Figure II.1: Legend of Key Interactions Figure

After presenting the project management processes in the tabular format, a figure is then presented showing the key interactions between the project management processes of the specific knowledge area and other processes in other knowledge areas. Figure II.1 presents the legend used in developing these figures in order to understand it clearly.

Considering this legend, the key interactions figure is presented as shown in Figure II.2 which presents an example of key interactions in project cost management.

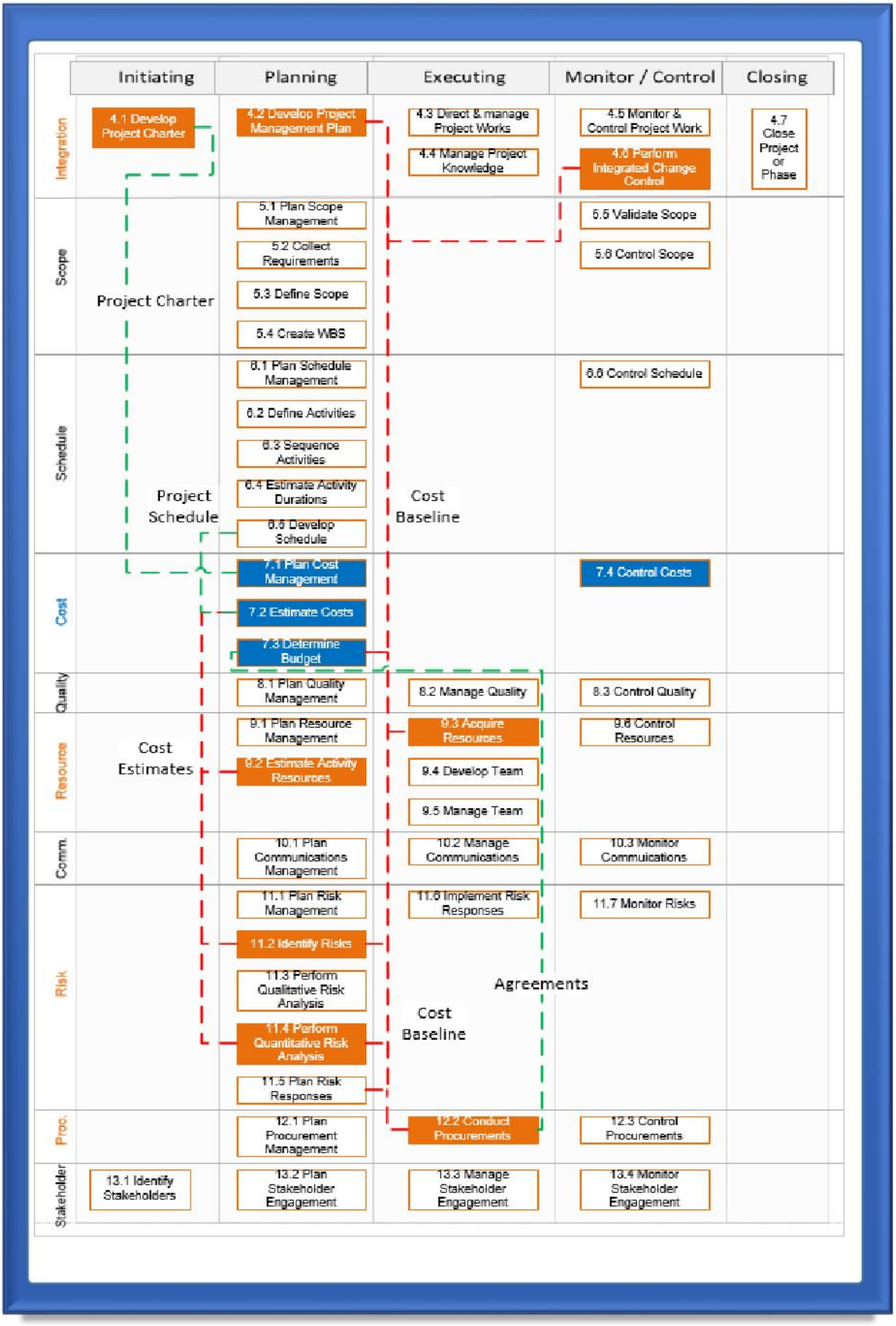


Figure II.2: Example of Key Interactions Figure

Each project management process related to the knowedge area chapter is then explained in details; this starts by presenting the process description and its value in a tabular format as shown in Table II.5 which presents which presents "*Plan Risk Management*" process.

Table II.5: Example of Project Management Process Description and Value

Process Description	Process Value
Defining and documenting how to conduct risk management activities for a project.	It ensures effective structured risk management and compliance with risk management activities and the organizational objectives.

The inputs, tools and techniques, and outputs of the process are then presented in a Figure as shown in Figure II.3 which is related to "*Plan Risk Management*" process.

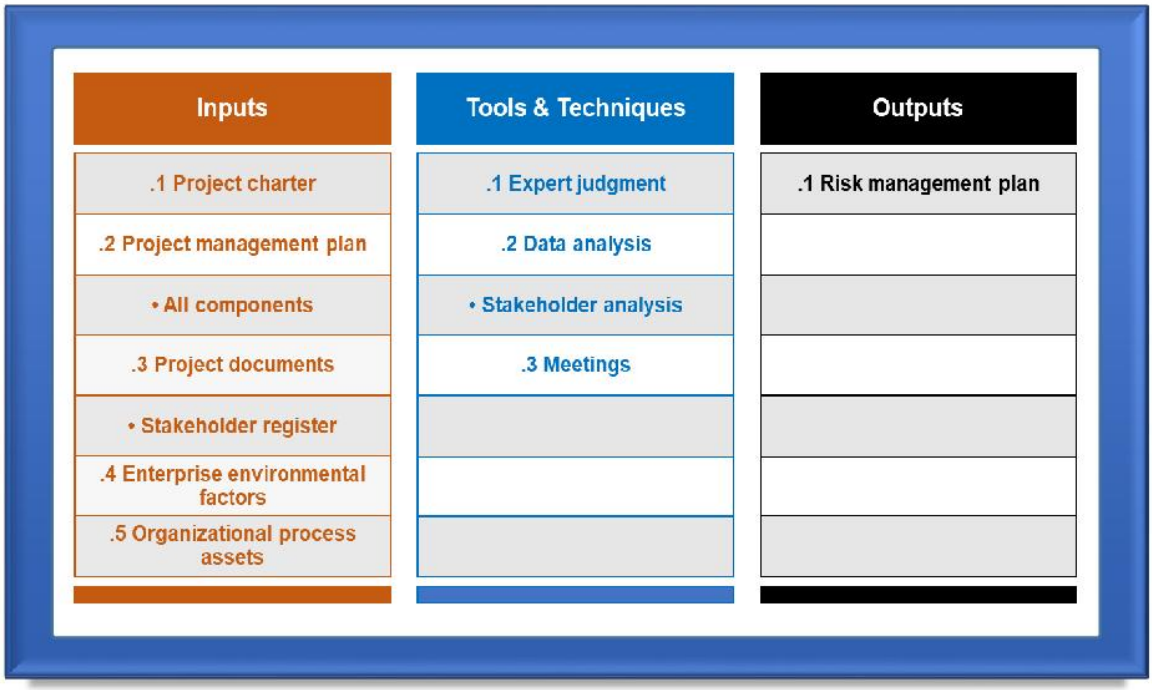


Figure II.3: Example of Inputs, Tools, and Techniques, and Outputs of Project Management Process

The flow of data/interaction between the project management process and other elements or processes is then presented as shown in Figure II.4 which shows an example of data flow of "Manage Quality" process.

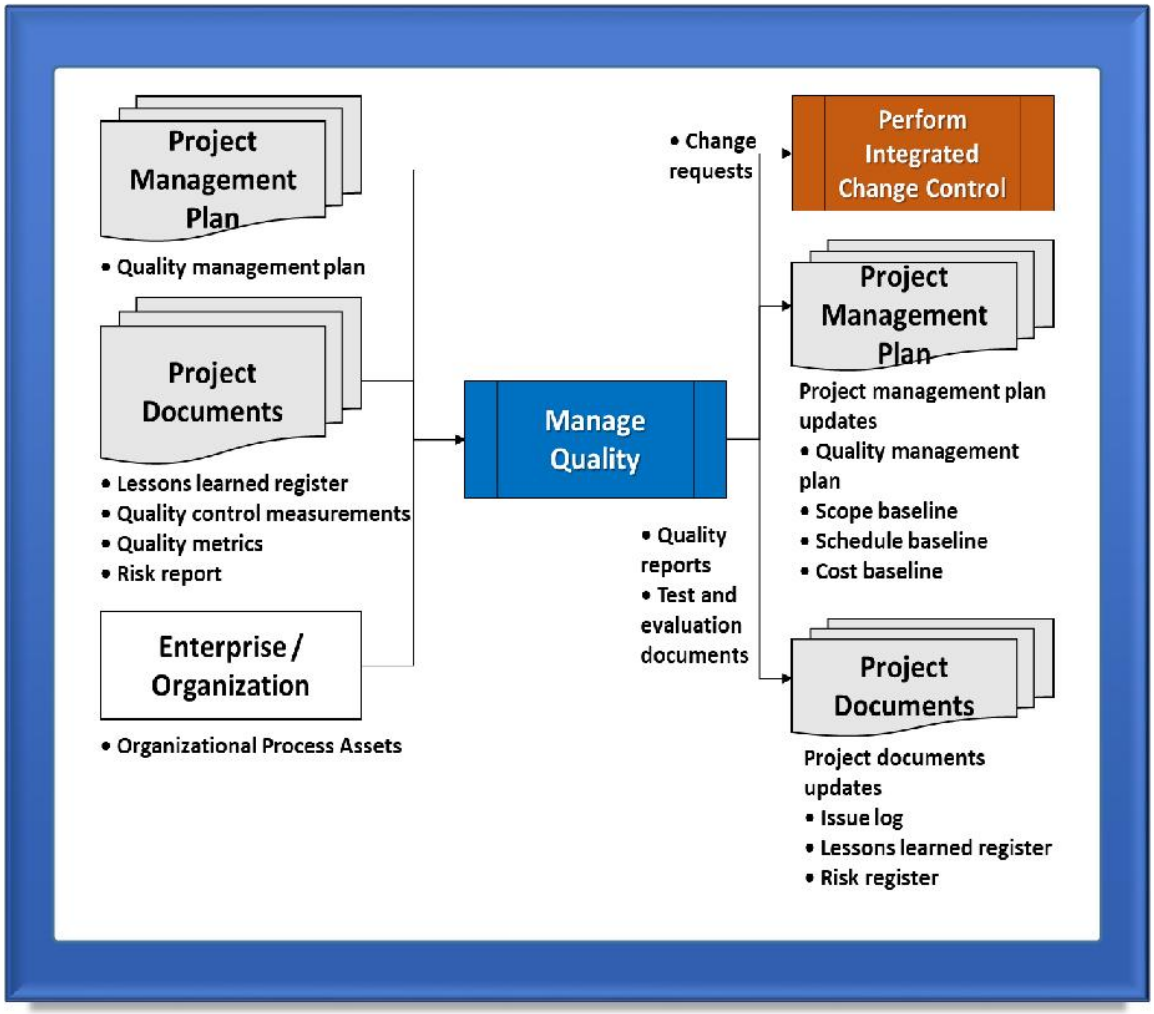
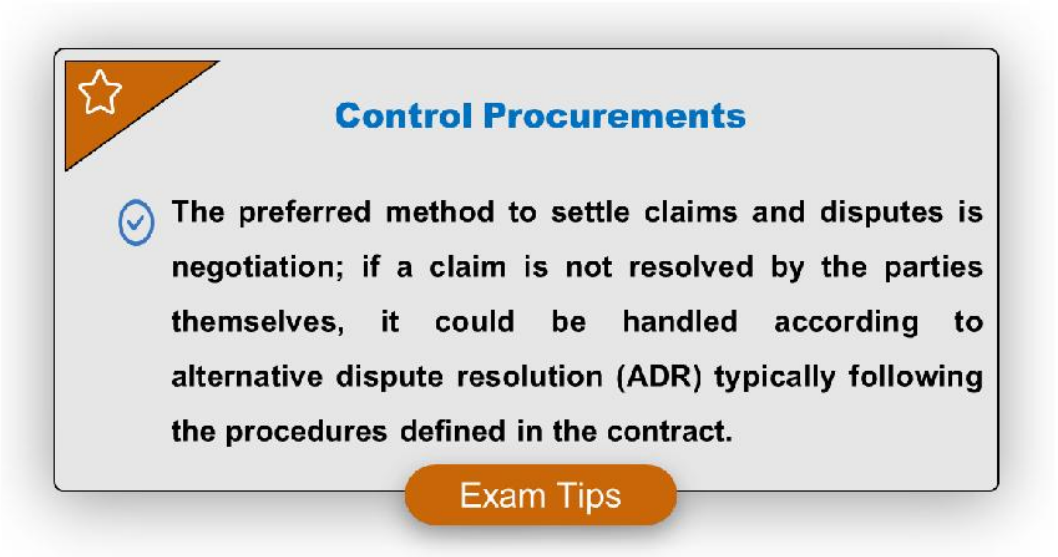


Figure II.4: Example of Data Flow / Interaction of a Process with other Elements

After that, the inputs, tools and techniques, and outputs are then described in details with illustrative figures and examples when necessary; it is essential to mention that the book usually does not repeat the description/explanation of an input, a tool, a technique, or an output which has been described in details in another process to allow more focus and concentration on unique items.

II.2.6. Exam Tips

In each chapter, the book presents exam tips that could contribute to the success in the PMP exam. The exam tips are presented in the chapters and located in the section of the related project management process. The exam tip is presented as shown in Figure II.5 which is related to *"Control Procurements"* process.



II.2.7. Summary

At the end of each chapter, a comprehensive summary is presented to remind the reader of what has been read and studied. The summary provides a high-level description of what has been described in the chapter; it is imperative to be regularly reviewed.

II.2.7. Practice Questions

After the detailed explanation presented in each chapter and the summary, 20 practice questions are presented for each knowledge area chapter (while 30 questions are presented after the end of the first three chapters of the book). The questions are designed to cover all the project management processes described in the chapter; some of the questions are situational questions while others are covering trends and emerging practices, tailoring considerations, considerations for agile environments, inputs, tools and techniques, outputs, and central concepts and fundamentals.

II.3. Case Study

Chapter 14 of this book presents a comprehensive case study which presents implementing the project management processes in a construction projects. This case is presented considering the real-life project stages; it presents the processes performed in initiating, planning, executing, monitoring and controlling and closing.

This chapter shows several project management templates and outputs which provides a clear understanding of implementing project management in real projects; this facilitates studying and increases the chance of success in the PMP exam.

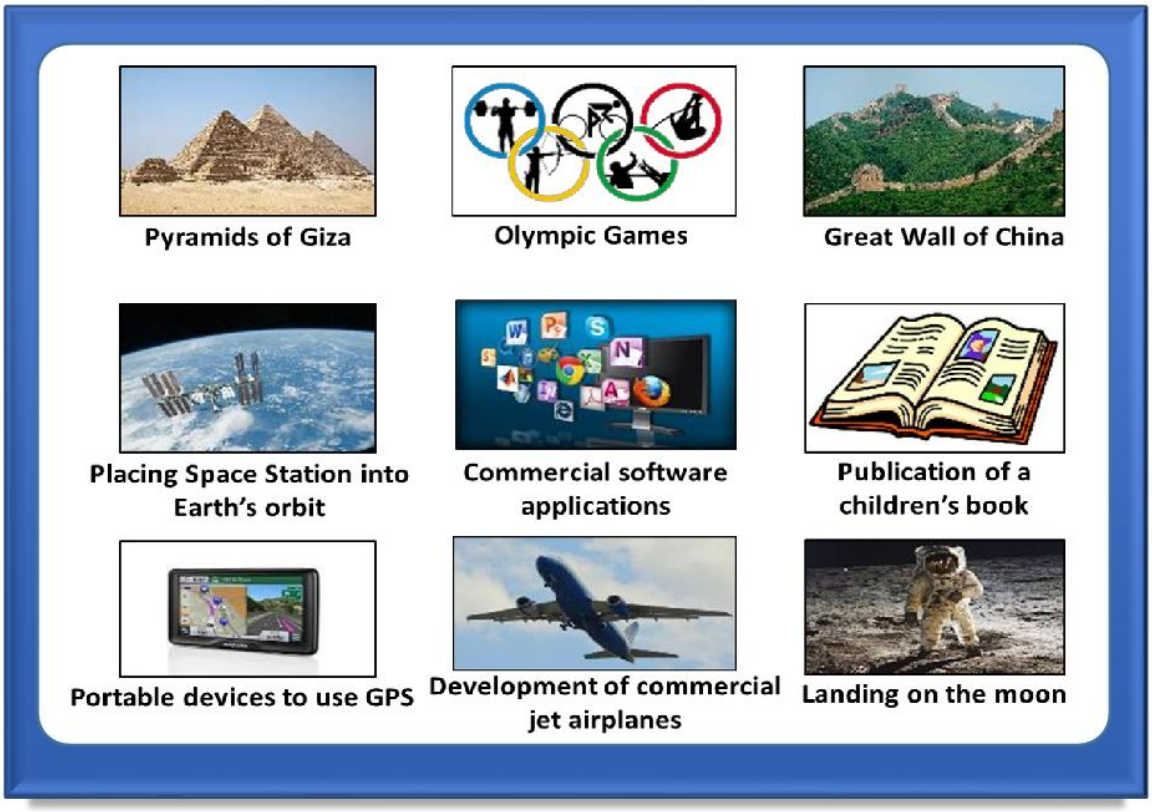
II.4. Agile on the go

In this chapter, we quickly address the so-called adaptive or Agile project management approach, to give the student a quick and transient view of the basics of this methodology; to the extent required. So that he/she will be well prepared for few Agile questions may appear in PMP Exam. This is beside the course of listing the methodology within the Book as listed in the PMBOK 6th.

CHAPTER 1

Introduction

Project management was utilized long time ago in order to effectively produce several project outcomes such as:



1.1. Project Characteristics

A project is a temporary endeavor undertaken to create a unique product, service, or result. Projects are undertaken in order to fulfill objectives by producing deliverables. Fulfillment of project objectives may produce one or more of the deliverables presented in Table 1.1.

Table 1.1: Project Deliverables

Unique Product	Unique Service	Unique Result	Unique combination of products, services, or results
• Component of another item. • Enhancement or correction to an item. • New end item.	• A business function that supports production or distribution.	• Outcome or document (Such as the knowledge developed by a research project).	• Such as a software application, its associated documentation, and help desk services.

Some project deliverables and activities may include repetitive elements. Repetition does not change the fundamental and unique characteristics of the project work.

Office Buildings Construction Projects

Repetition: Same Materials, Same Teams, etc.

Uniqueness: Location, Design, Environment, People involved, etc.

The following are examples of Projects:

- Developing a new pharmaceutical compound for market;
- Expanding a tour guide service;
- Merging two organizations;
- Improving a business process within an organization;
- Acquiring and installing a new computer hardware system in an organization;
- Exploring for oil in a region;
- Modifying a computer software program used in an organization;
- Researching to develop a new manufacturing process; and
- Constructing a building.

Introduction

It is important to understand the term "temporary" in the context of project management; "temporary" indicates that the project has a definite beginning and end; it does not mean that the project has a short duration.

Exam Tips

The project could be considered to be ended if one of the cases, shown in Figure 1.1, exists.

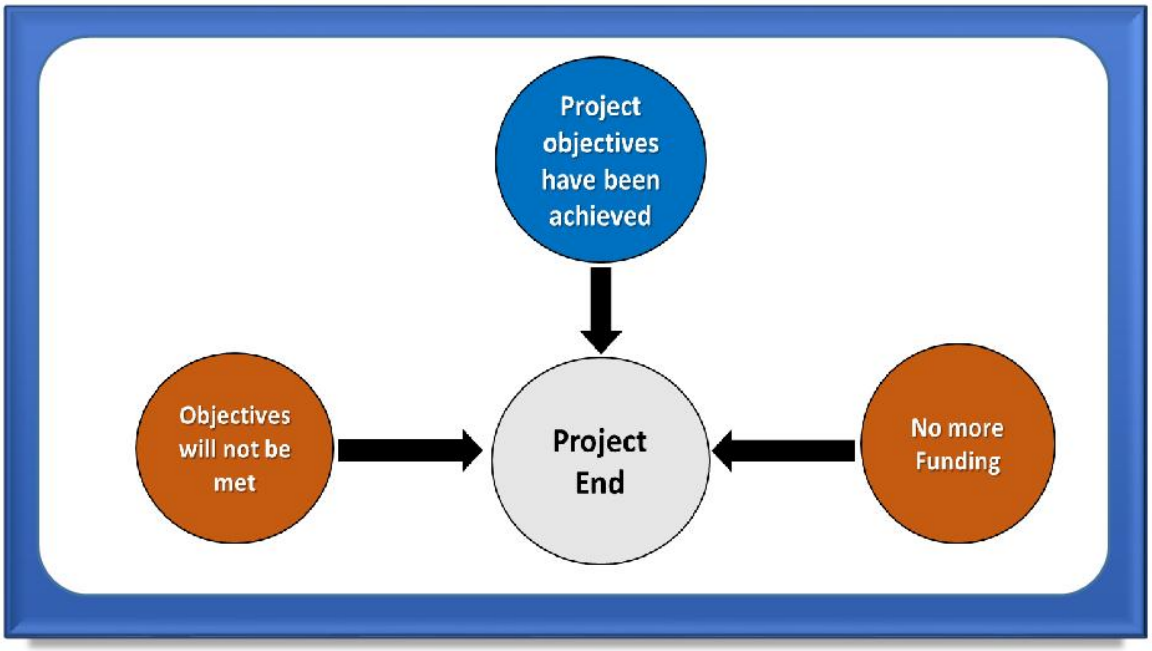


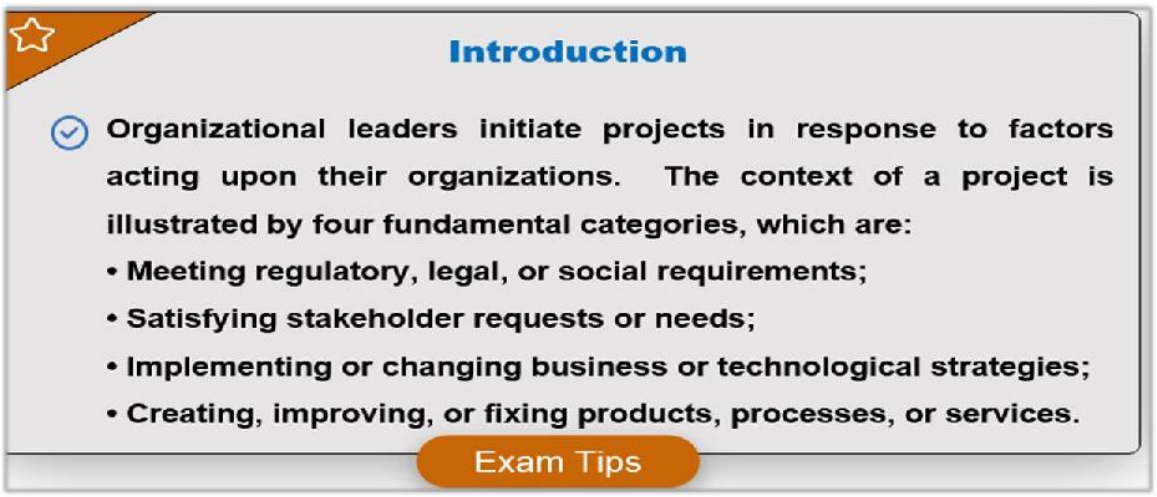
Figure 1.1: Project Ending Factors

The project could achieve different types of benefits, which are: tangible, intangible, or both tangible and intangible. Examples of tangible elements and intangible elements are presented in Table 1.2.

Table 1.2: Examples of Tangible Elements and Intangible Elements

Tangible Elements	Intangible Elements
• Monetary assets. • Stockholder equity. • Utility. • Fixtures. • Tools. • Market share.	• Goodwill. • Brand recognition. • Public benefit. • Trademarks. • Strategic alignment. • Reputation.

1.2. Project Management



The main characteristics of project management are presented in Table 1.3.

Table 1.3: Project Management Characteristics

Characteristics	Description
Definition	The application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.
Method of Accomplishment	Appropriate application and integration of the project management processes identified for the project.
Value	Enables organizations to execute projects effectively and efficiently.

1.3. Relationship of Project, Program, Portfolio, and Operations Management

There are three scenarios for managing project:

- Stand-alone project;
- Within a program; or
- Within a portfolio.

1.3.1. Program Management

A program is defined as a group of related projects, subprograms, and program activities managed in a coordinated way to obtain benefits not available from managing them individually.

Program management is the application of knowledge, skills, and principles to a program to achieve the program objectives and to obtain benefits and control not available by managing program components individually.

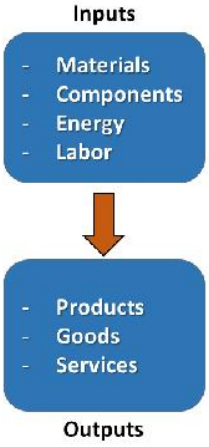
1.3.2. Portfolio Management

A portfolio is defined as projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.

Portfolio management is defined as the centralized management of one or more portfolios to achieve strategic objectives; the programs or projects of the portfolio may not necessarily be interdependent or directly related.

The portfolio management has the following characteristics:

- It Guides the decisions related to organizational investment;
- It allows the selection of the optimal mix of programs and projects in order to meet strategic objectives;
- It provides decision-making transparency and prioritizes team and physical resource allocation; and
- It Increases the likelihood of realizing the desired return on investment;
- It centralizes the management of the aggregate risk profile of all components.



1.3.3. Operations Management

The Main characteristics of operations Management are:

- It is concerned with managing processes that transform inputs into outputs;
- It is an area outside the scope of formal project management;
- It is concerned with the ongoing production of goods/services; and
- It ensures that business operations continue efficiently by using the optimal resources needed to meet customer demands.

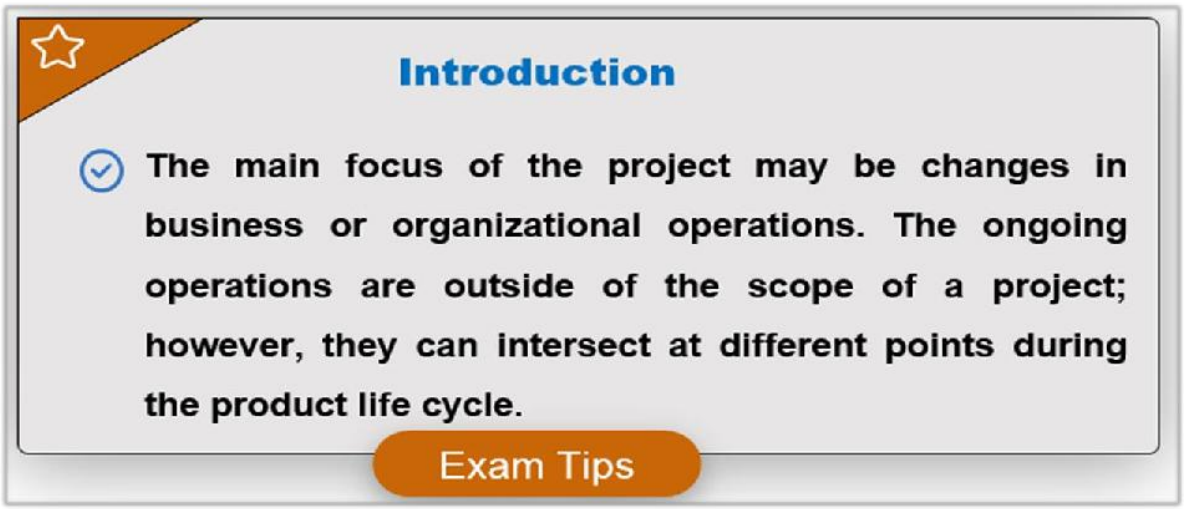


Figure 1.2 shows the intersection between projects and operations.

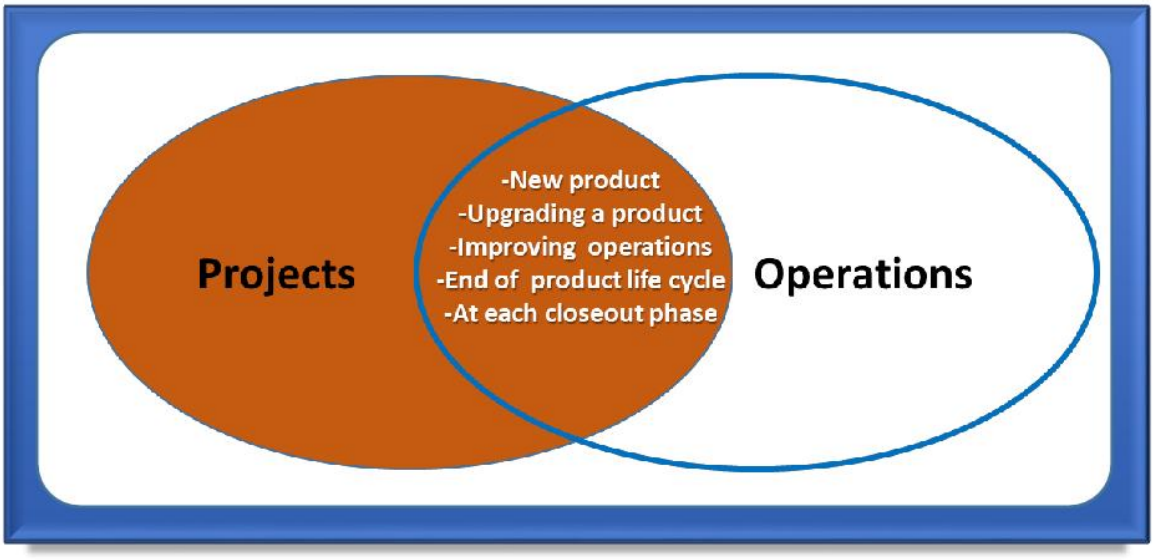


Figure 1.2: Intersection between Projects and Operations

1.3.4. Organizational Project Management (OPM) and Strategies

The purpose of OPM is to ensure that: the right projects are being undertaken; the critical resources are allocated appropriately, and all levels of the organization understand the strategic vision. Figure 1.3 shows the organizational environment.

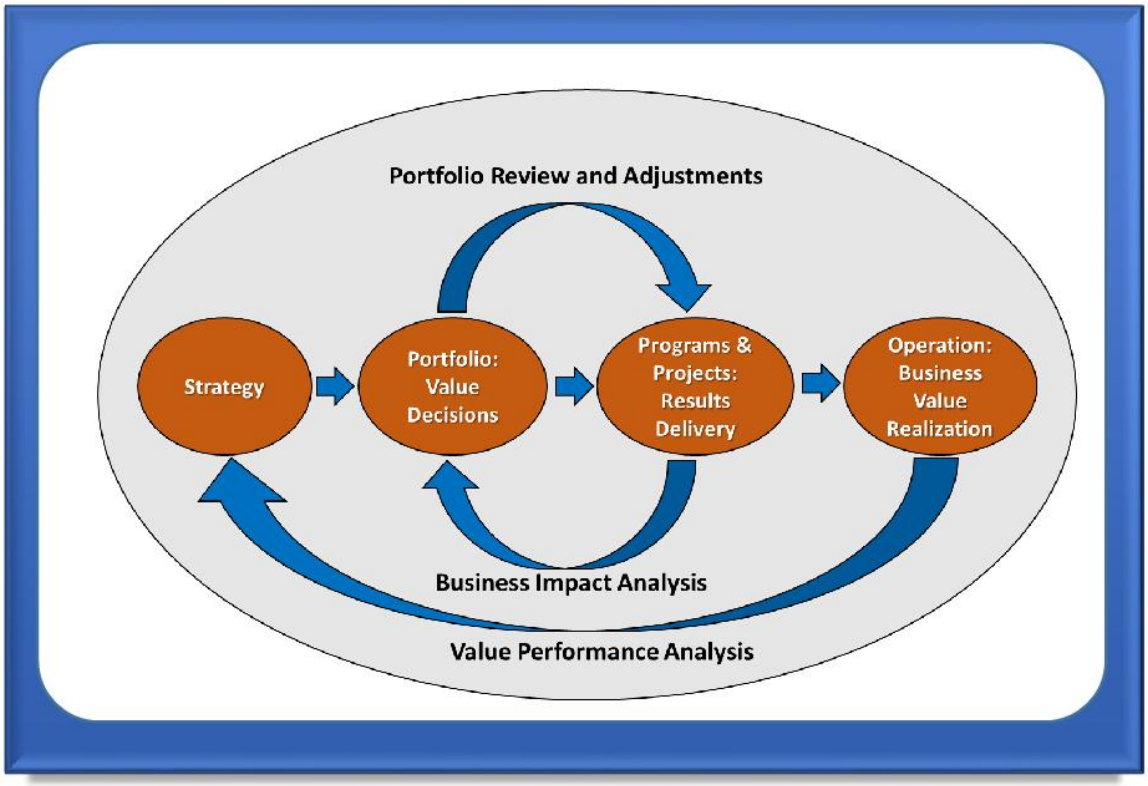


Figure 1.3: Organizational Environment (PMBOK 6th Edition)

1.4. Components of PMBOK Guide

1.4.1. Project and Development Life Cycle

Project life cycle is the series of phases that a project passes through from its start to its completion.

The phases can be:

- Sequential;
- Iterative; or
- Overlapping.

Project life cycles can be:

- Predictive; or
- Adaptive.

There are generally one or more phases that are associated with the development of the product; Development life cycles can be predictive, iterative, incremental, adaptive, or a hybrid model as presented in Table 1.4, and as presented in below sections.

Table 1.4: Project and Development Life Cycles

Type	Description
Predictive Life Cycle	• Project scope, time, and cost are determined in the early phases of the life cycle. • Any changes to the scope are carefully managed. • May also be referred to as waterfall life cycles.
Iterative Life Cycle	• Project scope is determined early in the project lifecycle • Time and cost estimates are routinely modified as the understanding of the product increases. • Iterations develop the product through a series of repeated cycles • Increments add to the functionality of the product.
Incremental Life Cycle	• Deliverable is produced through a series of iterations that successively add functionality within a predetermined time frame. • The deliverable contains the necessary and sufficient capability to be considered complete only after the final iteration.
Adaptive Life Cycles	• Are Agile, iterative, or incremental. • The detailed scope is defined and approved before the start of an iteration. • Adaptive life cycles are also referred to as agile or change-driven life cycles.
Hybrid Life Cycle	• Combination of a predictive and an adaptive life cycle. • Elements of the project that are well known or have fixed requirements follow a predictive development life cycle. • Elements that are still evolving follow an adaptive development life cycle.

Predictive Life Cycle

It is a plan-driven approach in which the main project constraints (time, scope, and cost) are all determined at a detailed level at the start of the project; phases are laid out sequentially as shown in Figure 1.4.

This approach could consider progressive elaboration or rolling wave planning; this does not change the scope but only allows rolling out the schedule into shorter passes. This approach is not flexible in case of late changes to the project and results in cost damages for reworks.

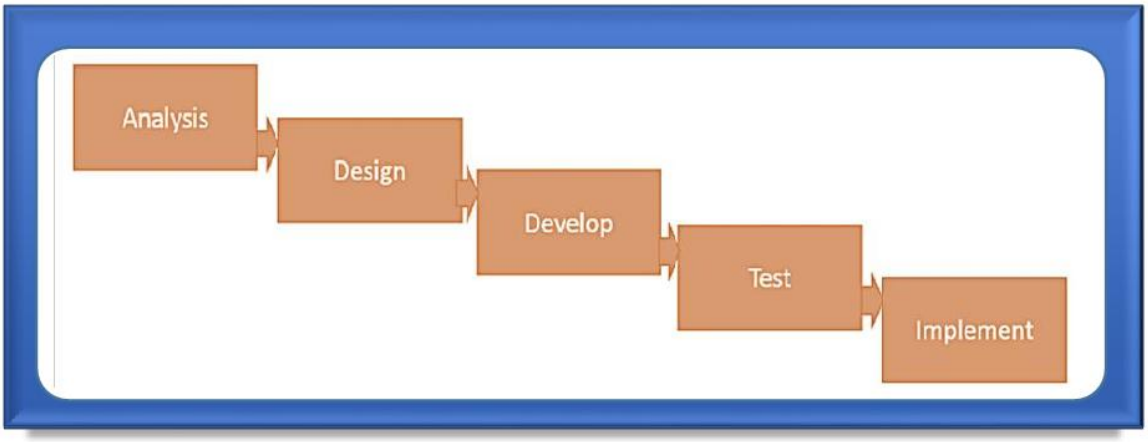


Figure 1.4: Predictive Life Cycle

Iterative Life Cycle

This approach is effective when the delivery timeframe is short, and requirements are not clear enough. It depends on breaking down the project into smaller phases; the project is executed in small iterations providing the capability to better define requirements at each cycle. This approach recommends defining the scope early but allows modifying time and cost after each iteration as more understanding is achieved. Figure 1.5 illustrates the iterative life cycle.

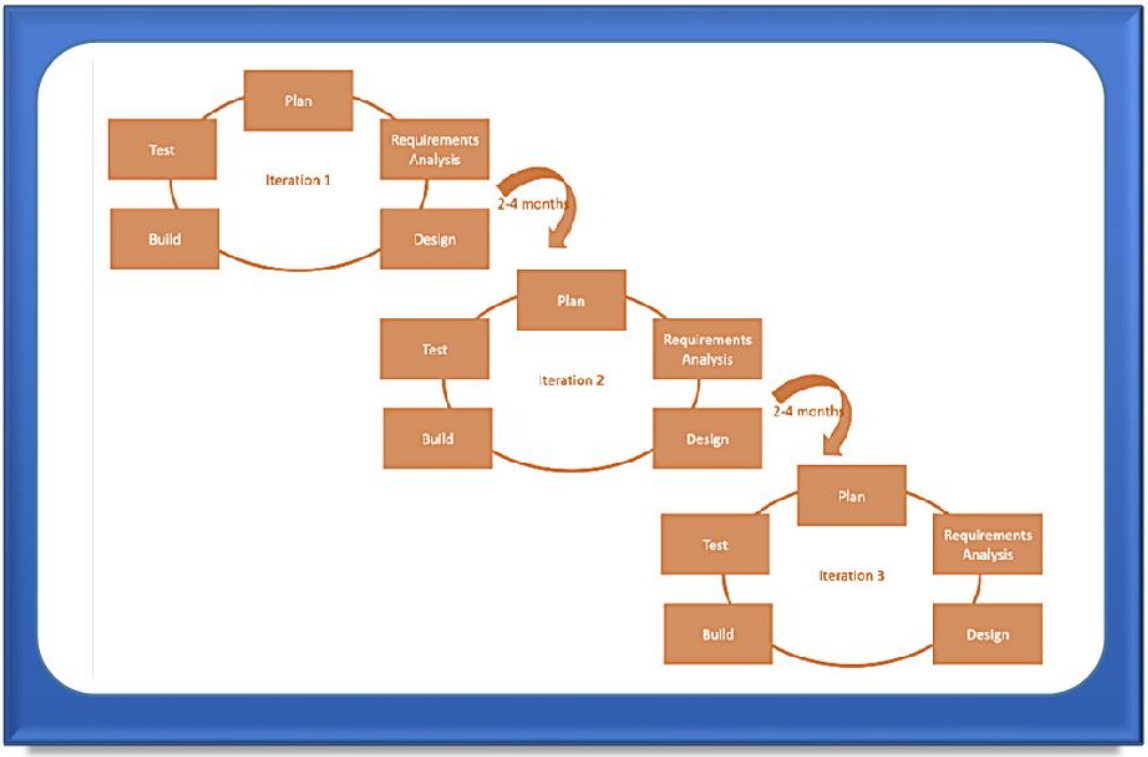


Figure 1.5: Iterative Life Cycle

Incremental Life Cycle

This approach depends on developing the product through implementing incremental steps having predetermined timeframes. Each increment adds functionality to the product, and it is repeated until the final product is produced. This approach requires signoff at each exist point by customers; it reduces risks associated with changes, and it is useful in case of prototyping. Figure 1.6 illustrates the incremental life cycle.

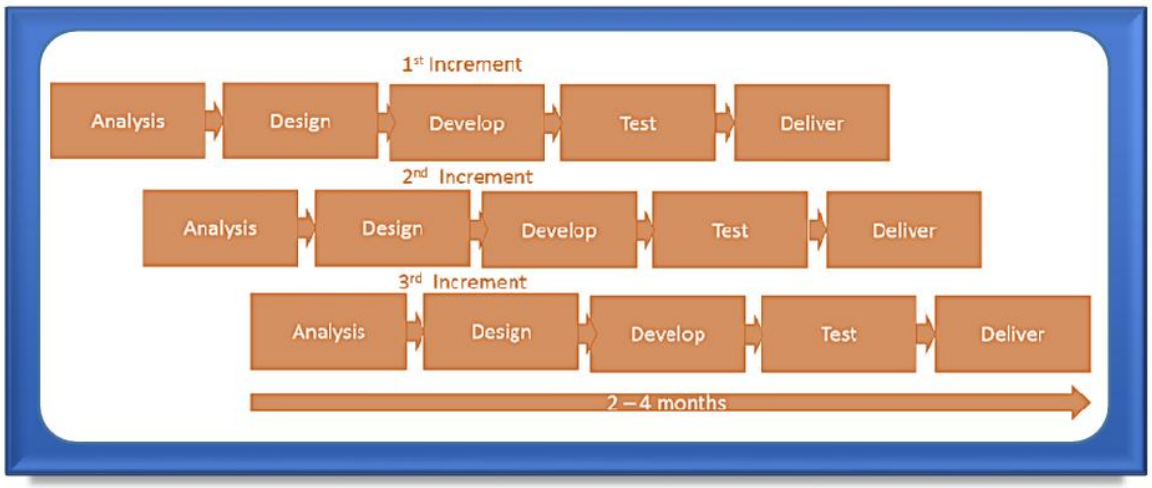


Figure 1.6: Incremental Life Cycle

Adaptive Life Cycle

Could be referred to as Agile; this approach is effective for fast project execution. It is effective in handling changes and reducing risks.

The main critical success factors for this approach are: involving the customer intimately, and the capability to define incremental requirements at the start of each iteration.

Iterations could be sequential, interactive, overlapping, and parallel; iterations usually last from two to four weeks.

Figure 1.7 illustrates the adaptive life cycle.

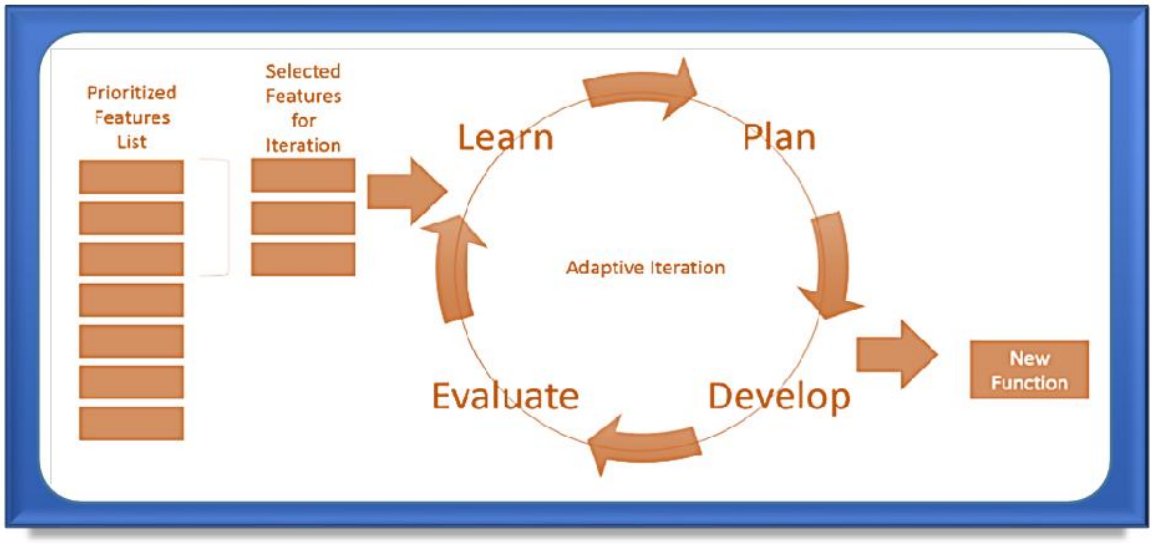


Figure 1.7: Adaptive Life Cycle (Source: https://blog.iil.com/project-management-life-cycles-explained-based-on-the-pmbok-guide-sixth-edition/)

Hybrid Life Cycle

The hybrid approach takes the best of all the previous approaches. The predictive approach could be considered for known project elements, and adaptive approach could be considered for elements which will become apparent over time.

1.4.2. Project Phase

Project phase is a collection of project activities that are logically related in order to support the completion of one or more deliverables; phases could be described objectively by name, number, or duration.

1.4.3. Phase Gate

A phase gate is held at the end of a phase. In order to compare the performance and progress of the project to:

- Project business case;
- Project charter;
- Project management plan; and
- Benefits management plan.

A decision is made as a result of this comparison to:

- Continue to the next phase;
- Continue to the next phase with modification; or
- End the project.

1.4.5. Project Management Processes

Project management processes are a series of project management activities that are executed in order to manage the project lifecycle. Each process is represented by a set of inputs, tools and techniques, and outputs (deliverable or outcome) as shown in Figure 1.8.

Introduction

It is essential to understand the interaction between the different project management processes.

Exam Tips

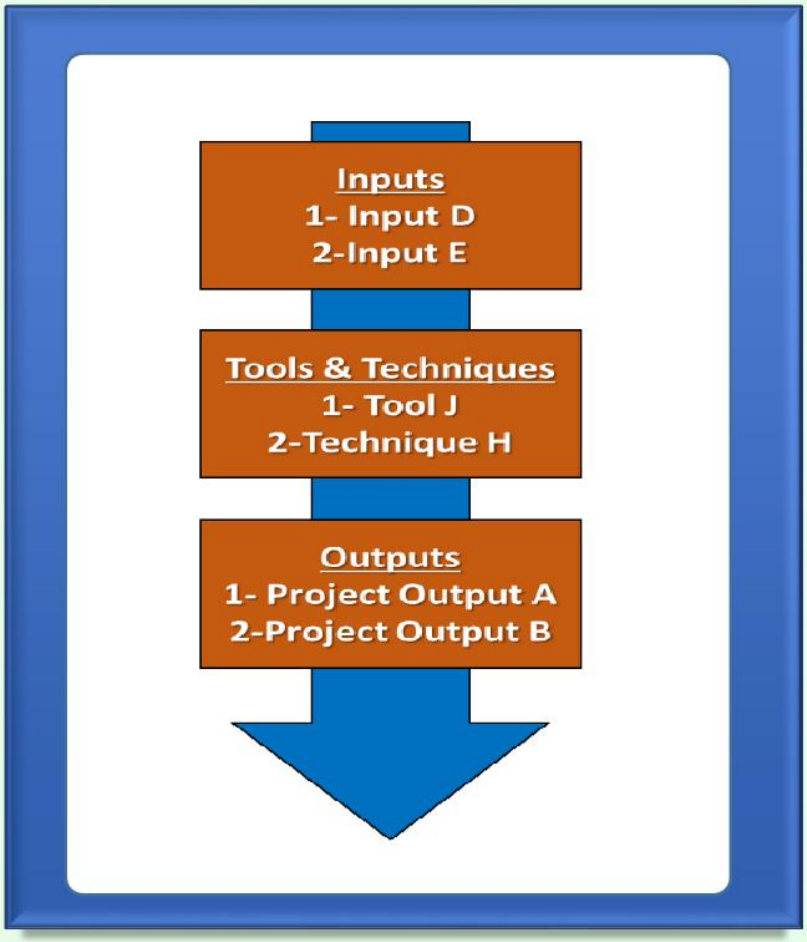


Figure 1.8: Project Management Process Representation

The number of iterations of a process and interactions between processes varies as shown in Table 1.5.

Table 1.5: Number of Iterations of Processes

Processes used once or at predefined points in the project	Processes that are performed periodically as needed	Processes that are performed continuously throughout the project
Such as: • Develop Project Charter; and • Close Project or Phase.	Such as: • Acquire Resources (performed as resources are needed); and • Conduct Procurements (performed before needing the procured item).	Such as: • Define Activities (especially if rolling wave planning or an adaptive approach are used) • Many of the monitoring and control processes are ongoing from the start of the project until it is closed out

1.4.6. Project Management Process Groups

A Project Management Process Group is a logical grouping of project management processes to achieve specific objectives of the project; project management processes are grouped as shown in Table 1.6.

Table 1.6: Project Management Process Groups

Process Groups	Description
Initiating	• Define a new project or a new phase. • Obtaining authorization to start the project or phase.
Planning	• To establish the scope of the project. • To refine the objectives. • To define the required actions to attain the project objectives.
Executing	• To complete the work defined in the project management plan in order to meet and achieve the project requirements.
Monitoring and Controlling	• To review, and track the project progress and performance. • To identify any areas in which changes to the plan are required and initiate the required changes.
Closing	• To formally close and complete project, phase, or contract.

1.4.7. Project Management Knowledge Areas

Project Management Processes are also categorized by Knowledge Areas, which is an identified area of project management defined by its knowledge requirements and described in terms of:

- Its component processes and Practices;
- Inputs and outputs; and
- Tools and techniques.

Knowledge Areas are defined separately although they are interrelated; The PMBOK Guide identified ten knowledge areas which are commonly used as shown in Table 1.7.

Table 1.7: Project Management Process Groups

Knowledge Area	Description
Integration Management	Processes and activities to identify, define, combine, unify, and coordinate different processes and project management activities.
Scope Management	Processes required to ensure the project includes all the work required, and only the work required, to complete the project successfully.
Schedule Management	Processes required to manage the timely completion of the project.
Cost Management	Processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so the project can be completed within the approved budget.
Quality Management	Processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements, in order to meet stakeholders' expectations.
Resource Management	Processes to identify, acquire, and manage the resources needed for the successful completion of the project.
Communications Management	Processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project information.
Risk Management	Processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.
Procurement Management	Processes necessary to purchase/acquire products, services, or results needed from outside the project team.
Stakeholder Management	Processes necessary to: • Identify the people, groups, or organizations that could impact or be impacted by the project; • Analyze stakeholder expectations and their impact on the project; and • Develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

The project management processes in each knowledge area categorized by process groups are presented in Figure 1.9.

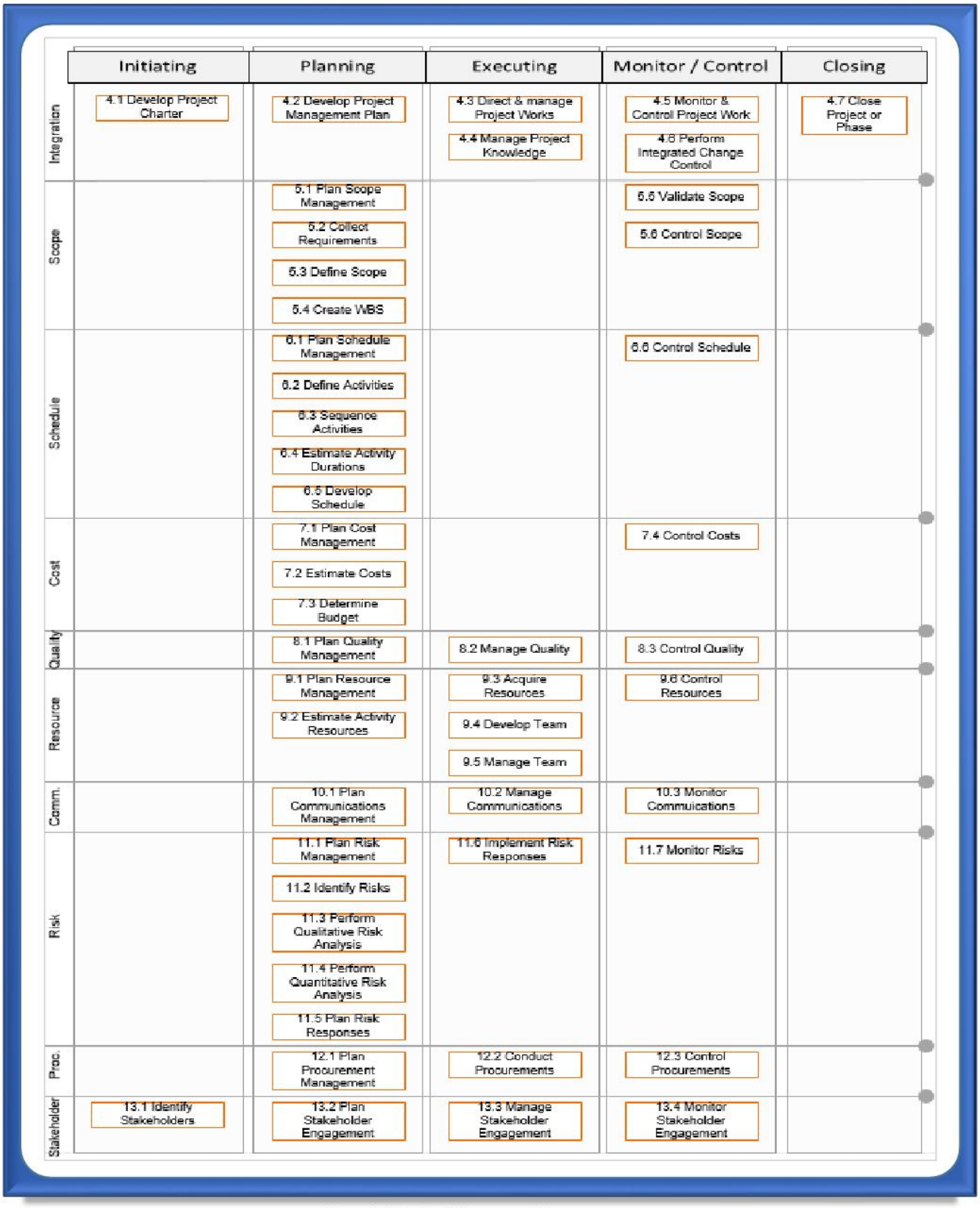


Figure 1.9: Project Management Processes

The project management data and information flow are shown in Figure 1.10.

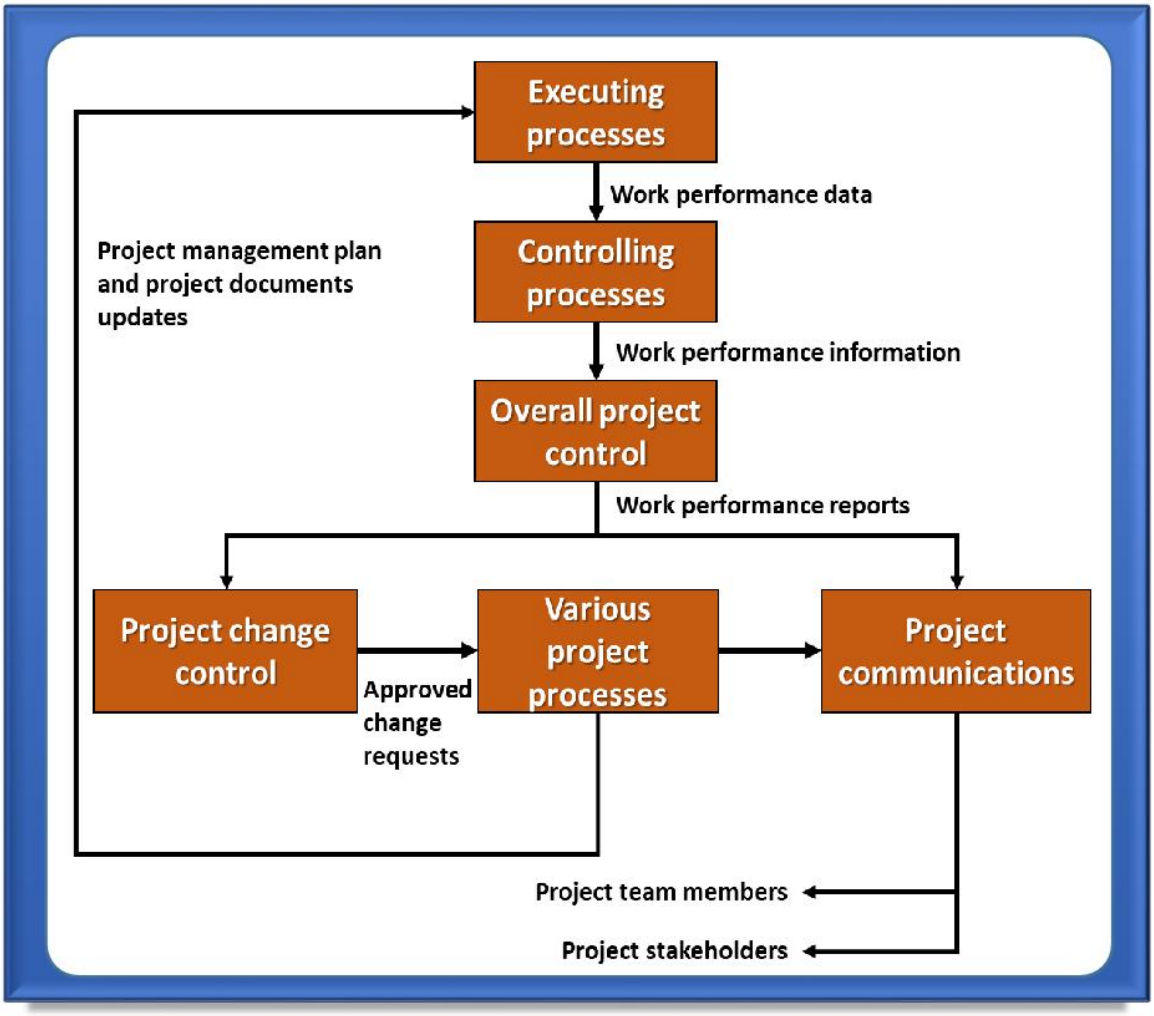


Figure 1.10: Project Management Data and Information Flow (PMBOK 6th Edition)

1.5. Tailoring

It is essential to differentiate between methodology and good practice in project management context. A project management methodology is a system of practices, techniques, procedures, and rules used uniformly by project managers to effectively execute their work; while good Practice does not mean that the knowledge described should always be applied uniformly to all projects.

The PMBOK guide is a recommended reference for tailoring representing good practice; it is not a project management methodology. The main characteristics of a project management methodology are:

- Experts could develop it;
- It could be purchased from vendors;
- It could be obtained from professional associations; or
- It could be purchased from governmental agencies.

1.6. Project Management Business Documents

The project manager should ensure that the project management approach captures the intent of business documents. The project management business documents are presented in Table 1.8.

Table 1.8: Project Management Business Documents

Business Document	Description
Project business case	• It is a documented economic feasibility study. • It is used to validate the benefits of a selected component lacking sufficient definition. • It lists the project objectives and reasons for its initiation. • It helps the project success measurement at the project end against the project objectives. • It is used throughout the project lifecycle. • It may be used before the project initiation and may result in a go/no-go decision for the project.
Project benefits management plan	It describes key elements of the benefits and may include: • **Target benefits** (the value expected to be gained by the project). • **Strategic alignment** (Alignment of project benefits to the organizational business strategies). • **The timeframe for realizing benefits** (by phase, short-term, long-term, and ongoing). • **Benefits owner** (the person accountable to monitor, record, and report benefits throughout the planned timeframe). • **Metrics** (direct measures and indirect measures to be used to show benefits realized). • **Assumptions** (expected factors to be in place or evidence). • **Risks** (risks for the realization of benefits).

These two documents are interdependent and iteratively developed and maintained throughout the project lifecycle.
Project success may include additional criteria linked to the organizational strategy and to the delivery of business results; the project objectives may include:

- Meeting the financial measures as documented in the business case, such as:
  - Net present value (NPV);
  - Return on investment (ROI);
  - The internal rate of return (IRR);
  - Payback period (PBP); and
  - Benefit-cost ratio (BCR).
- Meeting business case nonfinancial objectives;
- Completing movement of an organization from its current state to the desired future state;
- Fulfilling contract terms and conditions;
- Meeting organizational strategy, goals, and objectives;
- Achieving stakeholder satisfaction;
- Acceptable customer/end-user adoption;
- Integration of deliverables into the operating environment of the organization;
- Achieving agreed-upon quality of delivery; and
- Meeting governance criteria.

1.7. Summary

This chapter presented an introduction to the main concepts of project management and its related components. The main project characteristics are: uniqueness, and have definite start and end. The project could be considered to be ended if the project objectives have been achieved, when there is no more funding, and if the objectives will not be met.

The program management deals with managing several projects in a coordinated way in order to obtain more benefits; the portfolio management deals with group management of projects, programs, subsidiary portfolios, and operations. The ongoing operations are outside the scope of the project although they intersect at different points.

The project and development life cycles include predictive life cycle, iterative lifecycle, incremental lifecycle, adaptive life cycle, and hybrid life cycle.

The main project management components include: project management processes (49 processes), project management process groups (initiating, planning, executing, monitoring and controlling, and closing), and knowledge areas (integration management, scope management, schedule management, cost management, quality management, resource management, commusnication management, risk management, procurement management, and stakeholder management).

Tailoring is an effective approach in project management in order to benefit from available templates, databases, and procedures. In this chapter additionally, the project business documents has been discussed in order to define why a project should be undertaken considering the project objectives and success measures.

CHAPTER 2

The Environment in which Projects Operate

Projects are influenced and affected by their surrounding environment; the effects or influences could be favorable or unfavorable. The two major categories of influences are Enterprise Environmental Factors (EEFs); and Organizational Process Assets (OPAs). The description of EEFs and OPAs is presented in Table 2.1; while the classifications and components of these two influences are shown in Figure 2.1.

Table 2.1: Enterprise Environmental Factors VS Organizational Process Assets

Enterprise Environmental Factors (EEFs)	Organizational Process Assets (OPAs)
• Originate from the environment outside of the project (often outside of the enterprise). • May have an impact on the organizational, portfolio, program, or project level.	• Internal to the organization. • May arise from the organization itself, a portfolio, a program, another • project, or a combination of these elements.

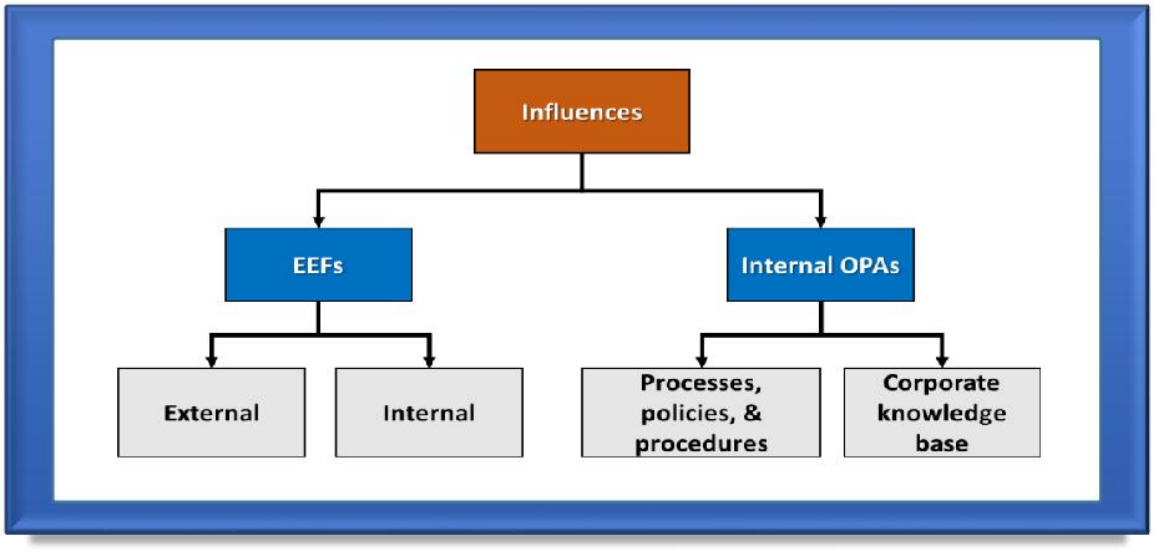


Figure 2.1: Classifications and Components of EEFs and OPAs

2.1. Enterprise Environmental Factors (EEFs)

The enterprise environmental factors (EEFs) could be classified into Internal EEFs; and External EEFs. Table 2.2 presents several components of internal, and external EEFs.

Table 2.2: Enterprise Environmental Factors Components

Internal EEFs	External EEFs
• **Organizational culture, structure, and governance** (vision, mission, leadership style, hierarchy and authority relationships, ethics, & code of conduct). • **Geographic distribution of facilities and resources** (factory locations, virtual teams, and shared systems) • **Infrastructure** (existing facilities and equipment) • **Information technology software** (scheduling software tools, configuration management systems, work authorization systems, etc.). • **Resource availability** (contracting and purchasing constraints, approved subcontractors, and collaboration agreements). • **Employee capability** (existing human resources expertise, skills, competencies, and specialized knowledge).	• **Marketplace conditions** (competitors, market share brand recognition, and trademarks). • **Social & cultural influences & issues** (political climate, codes of conduct, and ethics). • **Legal restrictions** (country or local laws and regulations). • **Commercial databases** (benchmarking results, industry risk study information, and risk databases). • **Academic research** (industry studies, publications, and benchmarking results). • **Government or industry standards** (regulatory agency regulations and product standards). • **Financial considerations** (currency exchange rates, interest rates, inflation rates, etc.). • **Physical environmental elements** (working conditions, weather, and constraints).

2.2. Organizational Process Assets (OPAs)

The main characteristics of organizational process assets (OPAs) are presented in Table 2.3.

Table 2.3: Organizational Process Assets Characteristics

Item	Description
Definition	OPAs are assets that influence the management of the project, such as the plans, processes, policies, procedures, and knowledge bases specific to and used by the performing organization.
Main Components	• Practice, or knowledge from the performing organizations involved in the project that can be used to execute or govern the project. • Lessons learned from previous projects and historical information. • Completed schedules, risk data, and earned value data.
Grouping Categories	• Processes, policies, and procedures. • Organizational knowledge bases.

2.3. Organizational Systems

2.3.1 Organizational Systems Overview

- The project manager needs to understand where responsibility, accountability, and authority reside within the organization in order to efficiently operate.
- The organization defines constraints, within which projects are operated.

Multiple factors interact within an individual organization creating a unique system that impacts the project operating in that system. The system factors and the system principals are presented in Table 2.4.

Table 2.4: System Factors and System Principals

System Factors	System Principals
• Governance frameworks. • Management elements • Organizational structure types.	• Systems are dynamic • Systems can be optimized. • System components can be optimized. • Systems and their components cannot be optimized at the same time.

2.3.2. Governance Frameworks

The characteristics of organizational governance framework are presented in Table 2.5.

Table 2.5: Organizational Governance Framework Characteristics

Item	Description
Governance Concept	• Multidimensional • Considers people, roles, structures, and policies • Requires providing direction and oversight through data and feedback.
Governance Framework Components	• Rules; • Policies; • Procedures; • Norms; • Relationships; • Systems; and • Processes
Governance Framework Influence	• Method of setting & achieving organization's objectives. • Method of monitoring & assessing risk. • Method of optimizing performance.

2.3.3. Management Elements

The characteristics of management elements are presented in Table 2.6.

Table 2.6: Management Elements Characteristics

Item	Description
Definition	The components that comprise the key functions or principles of general management in the organization.
Basis of allocation within organization	• Governance framework • The organizational structure type selected.
key functions or principles	• Division of work using specialized skills and availability to perform work. • Authority is given to perform work. • Responsibility to perform work appropriately assigned based on such attributes as skill and experience. • The discipline of action. • Unity of command (only one person gives orders for any action or activity to an individual). • Unity of direction (one plan and one head for a group of activities with the same objective). • General goals of the organization take precedence over individual goals. • Paid fairly for work performed. • Optimal use of resources. • Clear communication channels. • Right materials to the right person for the right job at the right time. • Fair and equal treatment of people in the workplace. • Clear security of work positions, and safety of people. • Open contribution to planning and execution by each person. • Optimal morale.

2.3.4. Organizational Structure Types

There is not a one-size-fits-all structure for any given organization. In order to determine appropriate organizational structure type, trade-offs must be considered between two key variables, which are:

- Organizational structure types available for use; and
- How to optimize them for a given organization.

The different types of organizational structure and their influences on projects are shown in Table 2.7.

Table 2.7: Organizational Structures and their Influence on Projects

Type	Work Groups Arranged by	Project Manager's Authority	Project Manager's Role	Resource Availability	Who Manages the Project Budget?	Project Management Administrative Staff
Organic / Simple	Work is done side by side / flexible	Low	Part-time / coordinator	Low	Owner	Little / none
Functional	Job	Low	Part-time / coordinator	Low	Functional Manager	Part-time
Multi-divisional	Product / Program / Portfolio / Region	Low	Part-time / coordinator	Low	Functional Manager	Part-time
Matrix-strong	Job Function	Moderate-High	Full-time	Moderate-High	Project Manager	Full-time
Matrix – weak	Job function	Low	Part-time / coordinator	Low	Functional manager	Part-time
Matrix – balanced	Job function	Low to moderate	Part-time / coordinator	Low to moderate	Mixed	Part-time
Project-oriented	Project	High to almost total	Full-time designated job role	High to almost total	Project manager	Full-time
Virtual	Network structure with nodes at points of contact with other people	Low to moderate	Full-time or part-time	Low to moderate	Mixed	Could be full-time or part-time
Hybrid	Mix of other types	Mixed	Mixed	Mixed	Mixed	Mixed
PMO	Mix of other types	High to almost total	Full-time designated job role	High to almost total	Project manager	Full-time

2.3.5. Project Management Office (PMO)

The primary value of project management office (PMO) is providing standardization (for project-related governance processes), and facilitation (for sharing of resources, methodologies, tools, and techniques). The PMO authority includes (not limited to):

- Acting as an integral stakeholder
- Acting as key decision maker to maintain the alignment of the projects with the business objectives;
- Making recommendations;
- Leading the transfer of knowledge;
- Terminating projects when needed; and
- Taking other actions as required.

The PMO primary function includes (not limited to):

- Providing support to project managers;
- Managing shared resources across all projects;
- Identifying and developing project management methodology, best practices, and standards; and
- Coaching, mentoring, training, and oversight.

The responsibilities of PMO range from providing support functions to the direct management of one or more projects. The types of PMO are presented in Table 2.8.

Table 2.8: PMO Types

Item	Supportive PMO	Controlling PMO	Directive PMO
Description	• Provide a consultative role to projects • PMO supplies: ➢ Templates; ➢ Best practices; ➢ Training; ➢ Information access; and ➢ Lessons learned.	• Provide support and require compliance, that may involve: ➢ Adoption of project management frameworks or methodologies ➢ Use of specific templates, forms, and tools ➢ Conformance to governance frameworks.	• Directly managing the projects. • Project managers are assigned by and report to the PMO.
Level of Control	Low	Moderate	High

2.4. Summary

This chapter presented the environment in which projects operate. Several influences could be either favorable or unfavorable to the project; the two major categories of influences are Enterprise Environmental Factors (EEFs); and Organizational Process Assets (OPAs).

EEFs are usually originated from the environment outside of the project (often outside of the enterprise); while OPAs are assets that influence the management of the project, such as the plans, processes, policies, procedures, and knowledge bases specific to and used by the performing organization.

The organizational systems are considering the governance framework and different management elements. There are several types of organizational structure which vary according to the project manager's authority, and role, who manages the budget, and the method of arranging work groups; these types are weak matrix, balanced matrix, project-oriented, virtual, hybrid, and PMO.

The project management office (PMO) provides standardization (for project-related governance processes), and facilitation (for sharing of resources, methodologies, tools, and techniques). The types of PMO are: supportive (consultative role), controlling (require compliance), and directive (directly manages the project.)..

CHAPTER 3

The Role of the Project Manager

Project manager is the person responsible for managing the project to achieve project objectives and goals. The project manager's authority could vary according to the organizational structural types (from low in weak matrix types to high in project-oriented and PMO types). The project manager does not have to be a technical expert. The project manager could carry out or participate in the following tasks:

Promoting good communication;

- Resolving team issues;
- Managing stakeholders needs and expectations;
- Developing the project management plan;
- Defining any required project management processes and leading related implementation;
- Maintaining control by measuring performance and determining variances;
- Ensuring that the project is achieving its objectives;
- Integrating the project components together; and
- Applying proactive techniques more than problem-solving techniques.

The Role of the Project Manager

The project manager is always proactive and focuses on preventing and mitigating any problem rather than solving it.

Exam Tips

3.1. Project Manager Sphere of Influence

The project manager fulfils several roles within his / her sphere of influence; the fulfilled roles reflect the capabilities of the project manager and present the contribution of the project management profession. Figure 3.1 shows the sphere of influence of project manager.

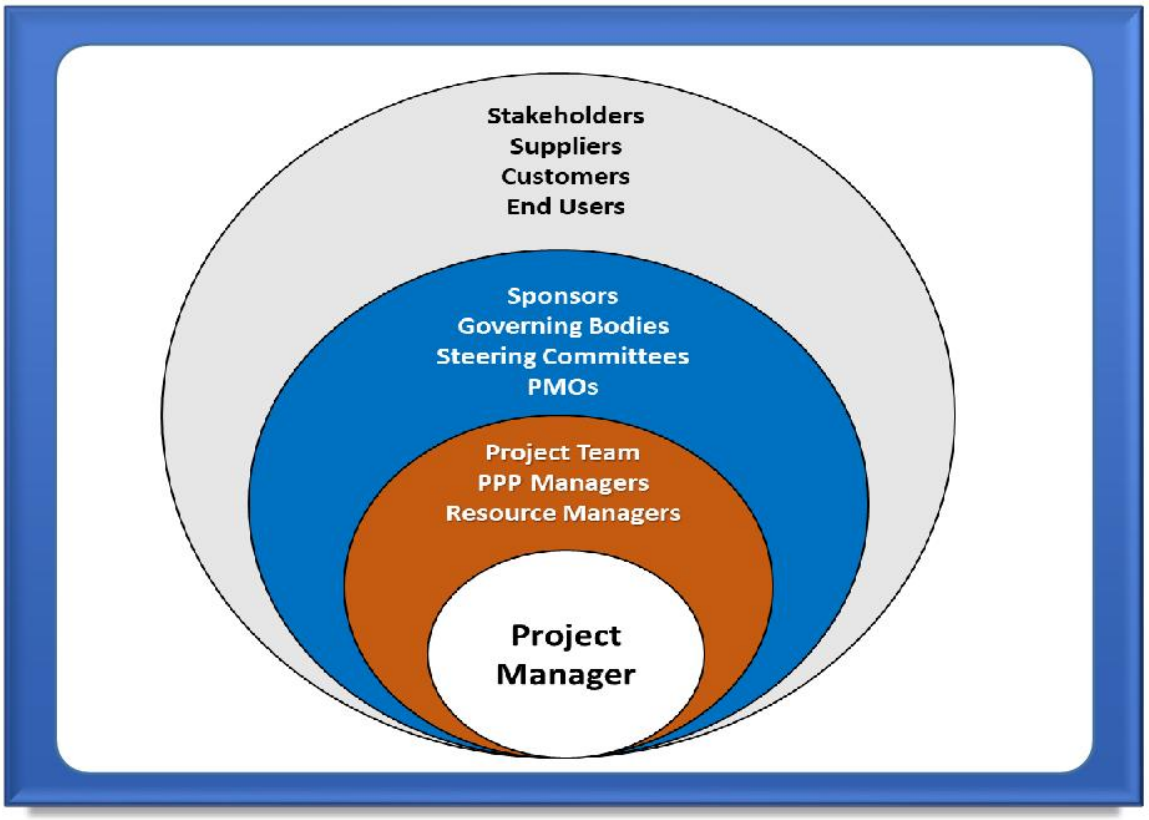


Figure 3.1: Project Manager Sphere of Influence (PMBOK 6th Edition)

The influences of the project manager could be categorized into three main categories, which are:

- Project;
- Organization; and
- Industry.

3.1.1. Project Influences

The project influences include (not limited to):

- Leading the project team in order to achieve project objectives;
- Balancing the different project constraints considering the available resources; and
- Performing communications.

The positive attitude and the communication skills are the main characteristics that distinguish the project manager.

3.1.2. Organizational Influences

The organizational influences include (not limited to):

- Interaction of the project manager with other project managers proactively;
- Other independent projects or projects that are part of the same program may impact a project due to:
  - Demands on the same resources;
  - Priorities of funding;
  - Distribution of deliverables; and
  - Alignment of project goals and objectives with those of the organization.




3.1.3. Industry Influences

The project manager uses industry trends and sees how it may impact or apply to the current projects, these trends include:

- Product and technology development;
- New and changing market niches;
- Standards;
- Technical support tools;
- Economic forces;
- Influences affecting the project management discipline; and
- Process improvement and sustainability strategies.

3.2. Project Manager Competencies

The Project Management Institute (PMI) recent studies applied project manager competency development (PMCD) framework to the skills needed by project managers through the use of The PMI Talent Triangle® (shown in Figure 3.2). The PMI talent triangle on three skill sets as shown in Table 3.1.

Figure 3.2: PMI Talent Triangle (PMBOK 6th Edition)

Table 3.1: Skill Sets

Skill Sets	Description
Technical project management	• The knowledge, skills, and behaviors related to specific domains of the project, program, and portfolio management. • The technical aspects of performing one's role.
Leadership	• The knowledge, skills, and behaviors needed to guide motivate, and direct a team, to help an organization achieve its business goals.
Strategic and business management	• The knowledge of and expertise in the industry and organization that enhanced performance and better delivers business outcomes.

3.2.1. Technical Project Management Skills

The technical project management skills are skills related to the effective application of project management knowledge in order to produce the desired outcome of the project. The primary / main skills demonstrated by project managers are shown in Figure 3.3.

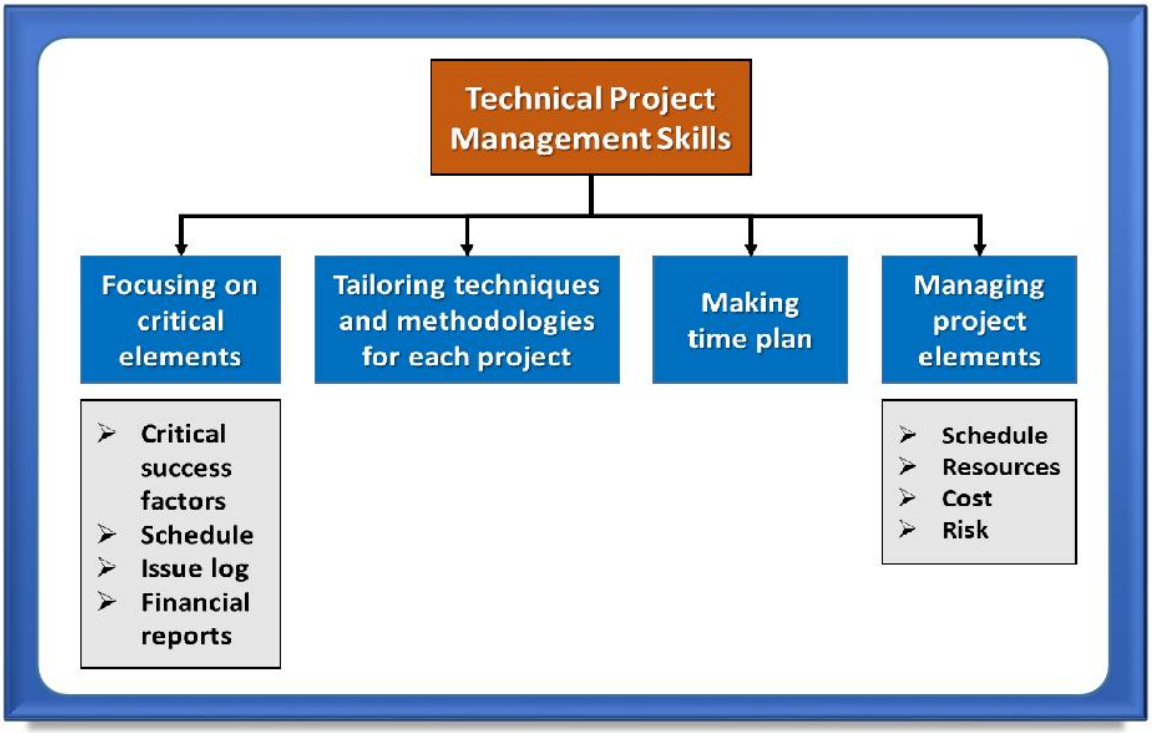


Figure 3.3: Technical Project Management Skills

3.2.2. Strategic and Business Management Skills

The primary purpose of having these skills is to:

- Explain essential business aspects of a project to others;
- Developing an appropriate project delivery strategy by working with the project sponsor, team, and subject matter experts; and
- Implementing the developed strategy in a way that maximizes the business value of the project.

The strategic and business management skills involve the ability to consider and understand the organization's high-level overview and apply decisions that are aligned with strategic objectives of the organization; this requires working knowledge of other functions, such as:

- Finance;
- Marketing; and
- Operations.

The strategic and business management skills include applying related product and industry expertise.

3.2.3. Leadership Skills

Dealing with people represents a large part of the project manager's role; the project manager should study people's behaviors and motivations. Leadership skills involve the ability to:

- Guide a team;
- Motivate a team; and
- Direct a team.

These skills may include demonstrating essential capabilities such as:

- Negotiation;
- Resilience;
- Communication;
- Problem-solving;
- Critical thinking; and
- Interpersonal skills.

Research shows that the qualities and skills of a leader include managing relationships and conflict by:

- Building trust;
- Satisfying concerns;
- Seeking consensus;
- Balancing competing and opposing goals;
- Applying persuasion, negotiation, compromise, and conflict resolution skills
- Developing and nurturing personal and professional networks;
- Taking a long-term view that relationships are just as meaningful as the project; and
- Continuously developing and applying political acumen.

The comparison between leadership and management is presented in Table 3.2.

Table 3.2: Leadership versus Management

Leadership	Management
Guide, influence, and collaborate using relational power.	Direct using positional power.
Develop.	Maintain.
Innovate.	Administrate.
Focus on relationships with people.	Focus on systems and structure.
Inspire trust.	Rely on control.
Focus on long-range vision.	Focus on near-term goals.
Ask what and why.	Ask how and when.
Focus on the horizon.	Focus on the bottom line.
Do the right things.	Do things right.
Focus on vision, alignment, motivation, and inspiration.	Focus on operational issues and problem-solving.

The leadership style could be a combination of multiple factors associated with the project, such as:

- Leader characteristics (attitudes, moods, needs, values, ethics);
- Team member characteristics (attitudes, moods, needs, values, ethics);
- Organizational characteristics (its purpose, structure, and type of work performed); and
- Environmental characteristics.

Several leadership styles are presented in Table 3.3.

Table 3.3: Leadership Styles

Leadership Style	Description
Laissez-faire	The team makes their own decisions and establish their own goals, also referred to as taking a hands-off style.
Transactional	Focuses on goals, feedback, and accomplishment to determine rewards; management by exception.
Servant leader	Presents commitment to serve and put other people first; focuses on other people's growth, learning, development, autonomy, and well-being.
Transformational	Empowering followers through idealized attributes and behaviors, and effective motivation.
Charismatic	Able to inspire people.
Interactional	A combination of transactional, transformational, and charismatic.

Personality refers to the individual differences in:

- Thinking Patterns;
- Feeling; and
- Behaving.

Different personality characteristics are shown in Table 3.4.

Table 3.4: Personality Characteristics

Characteristics	Description
Authentic	Accepts others for what and who they are, show open concern.
Courteous	Ability to apply appropriate behavior and etiquette.
Creative	Ability to think abstractly, to see things differently, to innovate.
Cultural	A measure of sensitivity to other cultures including values, norms, and beliefs.
Emotional	Ability to perceive emotions and the information they present and to manage them.
Intellectual	A measure of human intelligence over multiple aptitudes.
Managerial	A measure of management practice and potential.
Political	A measure of political intelligence and making things happen.
Service-oriented	Evidence of willingness to serve other people.
Social	Ability to understand and manage people.
Systemic	Drive to understand and build systems.

3.3. Performing Integration

By working with the project sponsor, project managers contribute to the integration and execution of the strategy, they understand the strategic objectives and ensure the alignment of the project objectives and results with those of the portfolio, program, and business areas.

Some projects may be referred to as complicated and considered difficult to manage; complexity within projects is a result of:

- **System behavior:** The interdependencies of components and systems;
- **Human behavior**: The interplay between diverse individuals and groups; or
- **Ambiguity:** Uncertainty of emerging issues and lack of understanding or confusion.

3.4. Summary

This chapter highlighted the active role of project manager in directing their projects to achieve the defined objectives. The project manager sphere of influence includes project, organization, and industry.

The project manager should combine three main skills which are: technical project management (managing schedule, costs, and risks), strategic and business management (maximizes the business value of the project), and leadership (guiding, motivating, and solving problems).

There are several personality characteristics, such as social, creative, political, etc. The project manager personality has a useful role in guiding the project to its required objectives.

Integration is the responsibility of the project manager; working with the sponsor ensures the alignment of the project objectives and results with those of the portfolio, program, and business areas.

3.5. Practice Questions

1. Which of the following is not an example of projects?
   a- Constructing an administrative building.
   b- Developing a new software.
   c- Researching in a specific area of knowledge.
   d- The daily operation works in an organization

2. Could the project be considered to be ended in all of the following cases except?
   a- Project objectives have been achieved.
   b- Changes to the project scope are requested by the customer.
   c- Objectives will not be met.
   d- No more Funding.

3. The benefits could be tangible or intangible, which of the following is a tangible benefit?
   a- Monetary assets.
   b- Trademarks.
   c- Strategic alignment.
   d- Reputation.

4. Project and ongoing operations could intersect at different points, such as?
   a- Upgrading a product.
   b- Estimating duration of project activities.
   c- Estimating costs of project activities.
   d- Identifying risks.

5. Guiding organizational investment decisions and selecting the optimal mix of programs and projects to meet strategic objectives are features of?
   a- Project management.
   b- Program management.
   c- Portfolio management.
   d- Operations management.

6. Which of the following is concerned with the ongoing production of goods/services?
   a- Project management.
   b- Program management.
   c- Portfolio management.
   d- Operations management.

7. In which project management process group does the project scope is established?
   a- Initiating.
   b- Planning.
   c- Executing.
   d- Closing.

8. Which development life cycle is applicable when the project scope is determined early in the project life cycle, and time and cost estimates are routinely modified as the understanding of the product increases?
   a- Predictive life cycle.
   b- Iterative life cycle.
   c- Incremental life cycle.
   d- Hybrid life cycle.

9. Which of the following knowledge areas is concerned with purchasing and acquiring products, services, or results needed from outside the project team?
   a- Project resource management.
   b- Project scope management.
   c- Project procurement management.
   d- Project communication management.

10. A system of practices, techniques, procedures, and rules used by those who work in a discipline, is best described as:
    a- A methodology.
    b- A guide.
    c- A good practice.
    d- A Standard.

11. Organizational culture, structure, and governance are considered a/an?
    a- Internal EEF.
    b- External EEF.
    c- Internal OPAs.
    d- Strong matrix.

12. Lessons learned from previous projects, and historical information are considered a/an?
    a- Internal EEF.
    b- External EEF.
    c- OPA.
    d- Constraint.

13. Multiple factors interact within an individual organization creating a unique system that impacts the project operating in that system; which of the following is considered a system principal?
    a- Governance frameworks.
    b- Management elements.
    c- Organizational structure types.
    d- Systems are dynamic.

14. Which of the following could not be a project constraint?
    a- Cost.
    b- Project duration.
    c- Expected weather during the project.
    d- Quality.

15. Ali is a project team member in GTH organization; in this organization, the role of the project manager is more like a coordinator, while the functional manager manages the project budget; what is the organizational structure type of this organization?
    a- Matrix – Weak.
    b- Matrix balanced.
    c- Hybrid.
    d- PMO.

16. Hany is a project manager in MLK organization; he is a full time designated to the job, he has total authority, and he manages the project the budget; the work groups in this organization are arranged by project; what is the organizational structure type of this organization?
    a- Virtual.
    b- Matrix balanced.
    c- Hybrid.
    d- Project-oriented.

17. Assets that influence the management of the project, such as the plans, processes, policies, procedures, and knowledge bases specific to and used by the performing organization, could be referred to as:
    a- Enterprise environmental factors.
    b- Organizational process assets.
    c- Governance concept.
    d- Matrix-balanced.

18. All of the following are governance framework components except?
    a- Rules.
    b- Procedures.
    c- Norms.
    d- Project schedule.

19. What is the Project Management Office (PMO) type where the PMO is directly managing the projects and has a high level of control?
    a- Supportive PMO.
    b- Directive PMO.
    c- Controlling PMO.
    d- Balanced PMO.

20. What is the level of control of the controlling PMO?
    a- High.
    b- Moderate.
    c- Low.
    d- No control.

21. Which of the following is not a category for the influences of the project manager?
    a- Project.
    b- Organization.
    c- Industry.
    d- Media.

22. Which of the following is not an organizational influence in the project manager sphere of influence?
    a- Interaction with other project managers.
    b- Demands on same resources.
    c- Market niches.
    d- Funding Priorities.

23. What are the three skill sets represented by the PMI talent triangle?
    a- Technical project management.
    b- Meeting management.
    c- Leadership.
    d- Strategic and business management.

24. The knowledge, skills, and behaviors needed to guide, motivate, and direct a team, to help an organization achieve its business goals, is best described as?
    a- Leadership.
    b- Strategic management.
    c- Knowledge management.
    d- Communication skills.

25. Managing project elements, such as cost, schedule, and risk, is related to which skills of the project manager's skills?
    a- Leadership.
    b- Strategic management.
    c- Business management.
    d- Technical project management skills.

26. Which of the following is a primary difference between leadership and management?
    a- Guiding and collaborating is related to management; while directing using positional power is related to leadership.
    b- Guiding and collaborating is related to leadership; while directing using positional power is related to management.
    c- The project manager is not a leader.
    d- Relying on control is related to leadership; while inspiring trust is related to management.

27. Who is responsible for performing integration?
    a- Project team.
    b- Project manager.
    c- Customer.
    d- Project sponsor.

28. When a team makes their own decisions and establish their own goals, also referred to as taking a hands-off style, the leadership style is?
    a- Transactional.
    b- Transformational.
    c- Servant leader.
    d- Laissez-faire

29. When empowering followers through idealized attributes and behaviors, and effective motivation; the leadership style is?
    a- Transactional.
    b- Transformational.
    c- Servant leader.
    d- Laissez-faire

30. The ability to think abstractly, to see things differently, and to innovate, is related to which personality characteristic?
    a- Authentic
    b- Creative.
    c- Social.
    d- Authentic.

Answer Sheet

1	a	b	c	d
2	a	b	c	d
3	a	b	c	d
4	a	b	c	d
5	a	b	c	d
6	a	b	c	d
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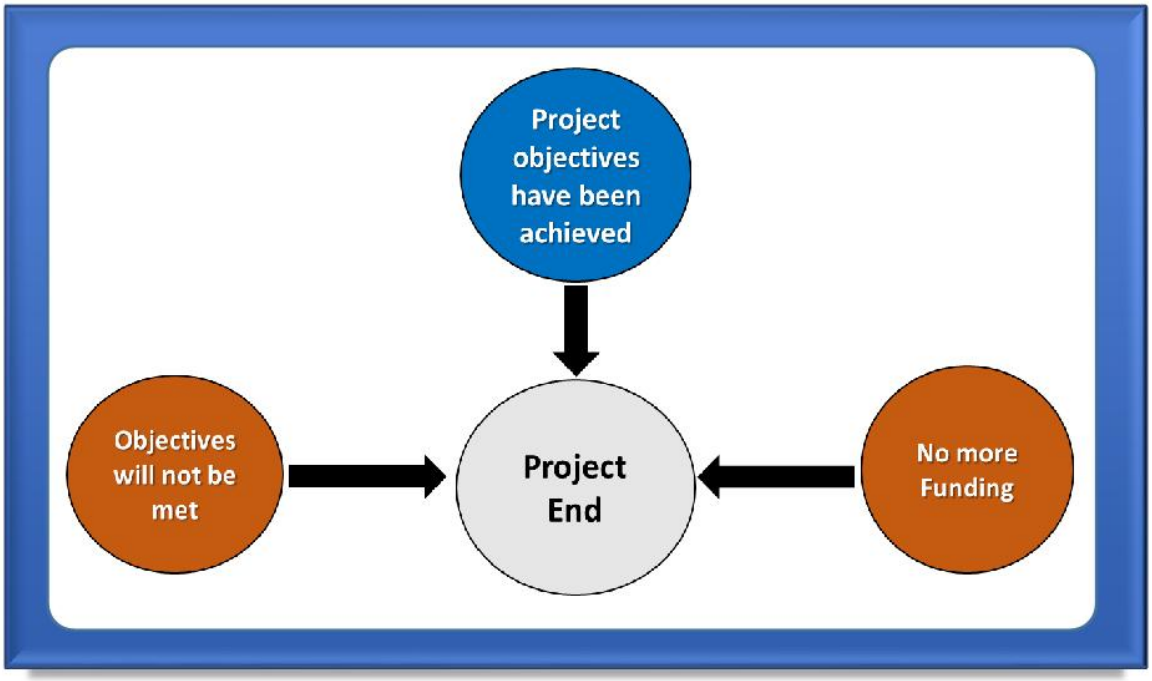
23	a	b	c	d
24	a	b	c	d
25	a	b	c	d
26	a	b	c	d
27	a	b	c	d
28	a	b	c	d
29	a	b	c	d
30	a	b	c	d

3.6 Practice Answers

1- Answer: **d**

The project should have a definite beginning and end; the daily routine operational tasks are not considered projects.

2- Answer: b

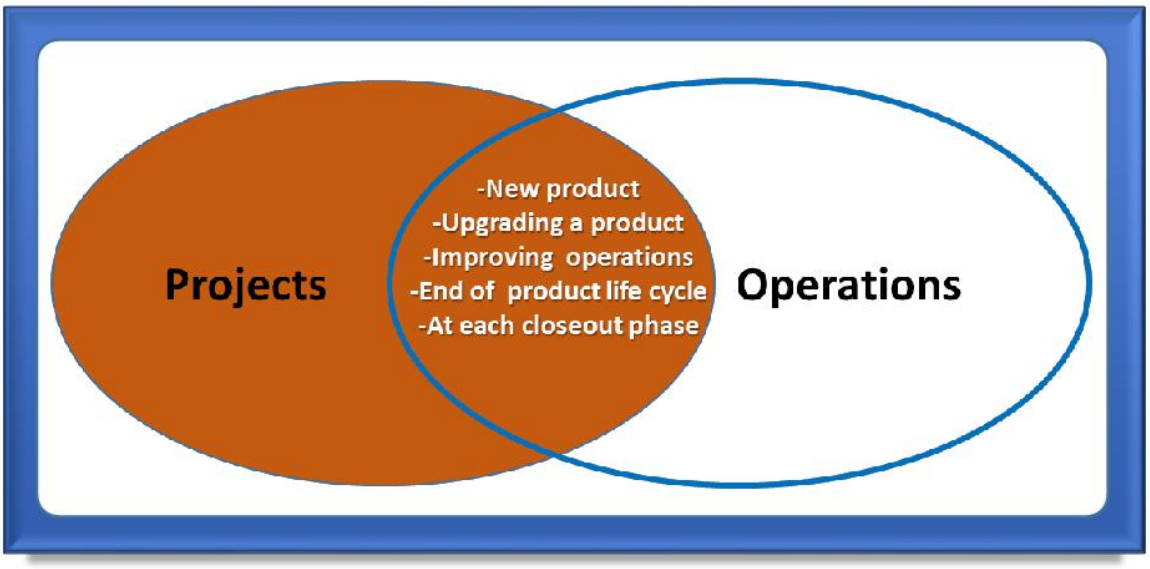


3- Answer: a

Examples of Tangible Elements and Intangible Elements

Tangible Elements	Intangible Elements
• Monetary assets. • Stockholder equity. • Utility. • Fixtures. • Tools. • Market share.	• Goodwill. • Brand recognition. • Public benefit. • Trademarks. • Strategic alignment. • Reputation.

4- Answer: **a**



5- Answer: **c**

Portfolio management has the following features:

- Guide organizational investment decisions.
- Select the optimal mix of programs and projects to meet strategic objectives.
- Provide decision-making transparency and prioritize team and physical resource allocation.
- Increase the likelihood of realizing the desired return on investment.
- Centralize the management of the aggregate risk profile of all components.

6- Answer: **d**

The Main characteristics of operations Management are:

- It is an area outside the scope of formal project management
- It is concerned with the ongoing production of goods/services.
- It ensures that business operations continue efficiently by using the optimal resources needed to meet customer demands.
- It is concerned with managing processes that transform inputs into outputs.

7- Answer: **b**

Planning process group includes:

- Establishing the scope of the project.
- Refining the objectives.
- Defining the required actions to attain the project objectives.

8- Answer: **b**
Iterative lifecycle has the following features:
- Project scope is determined early in the project lifecycle
- Time and cost estimates are routinely modified as the understanding of the product increases.
- Iterations develop the product through a series of repeated cycles
- Increments add to the functionality of the product.

9- Answer: c
Project Procurement Management includes the processes necessary to purchase/acquire products, services, or results needed from outside the project team.

10- Answer: **a**
A methodology is a system of practices, techniques, procedures, and rules used by those who work in a discipline. Project management methodology is applied by project managers to their work. The PMBOK guide is not considered a methodology; it is a recommended reference for tailoring as it identifies and presents "Good Practice," which does not mean that the knowledge described should always be applied uniformly to all projects.

11- Answer: **a**
Internal EEFs include:
- **Organizational culture, structure, and governance** (vision, mission, leadership style, hierarchy and authority relationships, ethics, & code of conduct).
- **Geographic distribution of facilities and resources** (factory locations, virtual teams, and shared systems)
- **Infrastructure** (existing facilities and equipment)
- **Information technology software** (scheduling software tools, configuration management systems, work authorization systems, etc.).
- **Resource availability** (contracting and purchasing constraints, approved subcontractors, and collaboration agreements).
- **Employee capability** (existing human resources expertise, skills, competencies, and specialized knowledge).

12- Answer: c
Main components of OPAs are:
- Practice, or knowledge from the performing organizations involved in the project that can be used to execute or govern the project.
- Lessons learned from previous projects and historical information. Completed schedules, risk data, and earned value data.

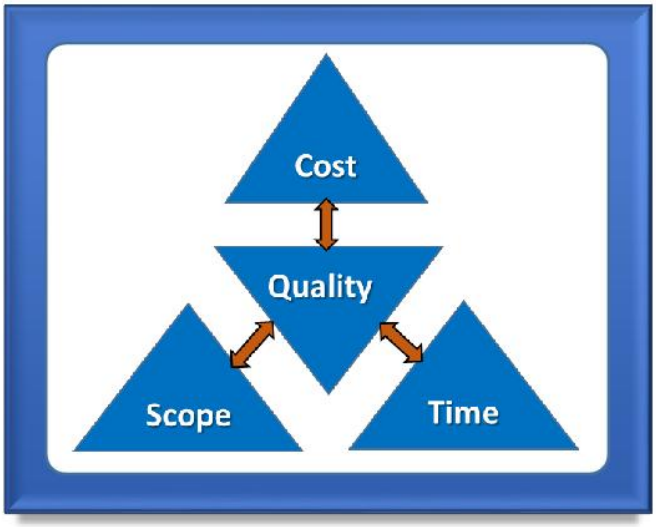
13- Answer: **d**

System Factors and System Principals

System Factors	System Principals
• Governance frameworks. • Management elements • Organizational structure types.	• Systems are dynamic • Systems can be optimized. • System components can be optimized. • Systems and their components cannot be optimized at the same time.

14- Answer: **c**

The expected weather is considered an assumption; the project constraints could be: cost, time, scope, and quality.



15- Answer: a

The matrix-weak type has the following characteristics.

Type	Work Groups Arranged by	Project Manager's Authority	Project Manager's Role	Resource Availability	Who Manages the Project Budget?	Project Management Administrative Staff
Matrix – weak	Job function	Low	Part-time; done as part of another job and not a designated job role like coordinator	Low	Functional manager	Part-time

16- Answer: d

The project-oriented type has the following characteristics.

Type	Work Groups Arranged by	Project Manager's Authority	Project Manager's Role	Resource Availability	Who Manages the Project Budget?	Project Management Administrative Staff
Project-oriented	Project	High to almost total	Full-time designated job role	High to almost total	Project manager	Full-time

17- Answer: b

Organizational process assets (OPAs) are assets that influence the management of the project, such as the plans, processes, policies, procedures, and knowledge bases specific to and used by the performing organization.

18- Answer: **d**

Governance framework components include:

- Rules;
- Policies;
- Procedures;
- Norms;
- Relationships;
- Systems; and
- Processes.

19- Answer: **b**

The directive PMO has the following characteristics:

- Directly managing the projects.
- Project managers are assigned by and report to the PMO.
- High level of control.

20- Answer: **b**

The controlling PMO has the following characteristics:

- Provide support and require compliance, that may involve:
  - Adoption of project management frameworks or methodologies
  - Use of specific templates, forms, and tools
- Conformance to governance frameworks.
- Moderate level of control.

21- Answer: **d**

The influences of the project manager could be categorized into three main categories, which are:

- Project;
- Organization; and
- Industry.

22- Answer: **c**

The organizational influences include (not limited to):

- Interaction of the project manager with other project managers proactively;
- Other independent projects or projects that are part of the same program may impact a project due to:
  - Demands on the same resources;
  - Priorities of funding;
  - Distribution of deliverables; and
  - Alignment of project goals and objectives with those of the organization.

23- Answer: **b**

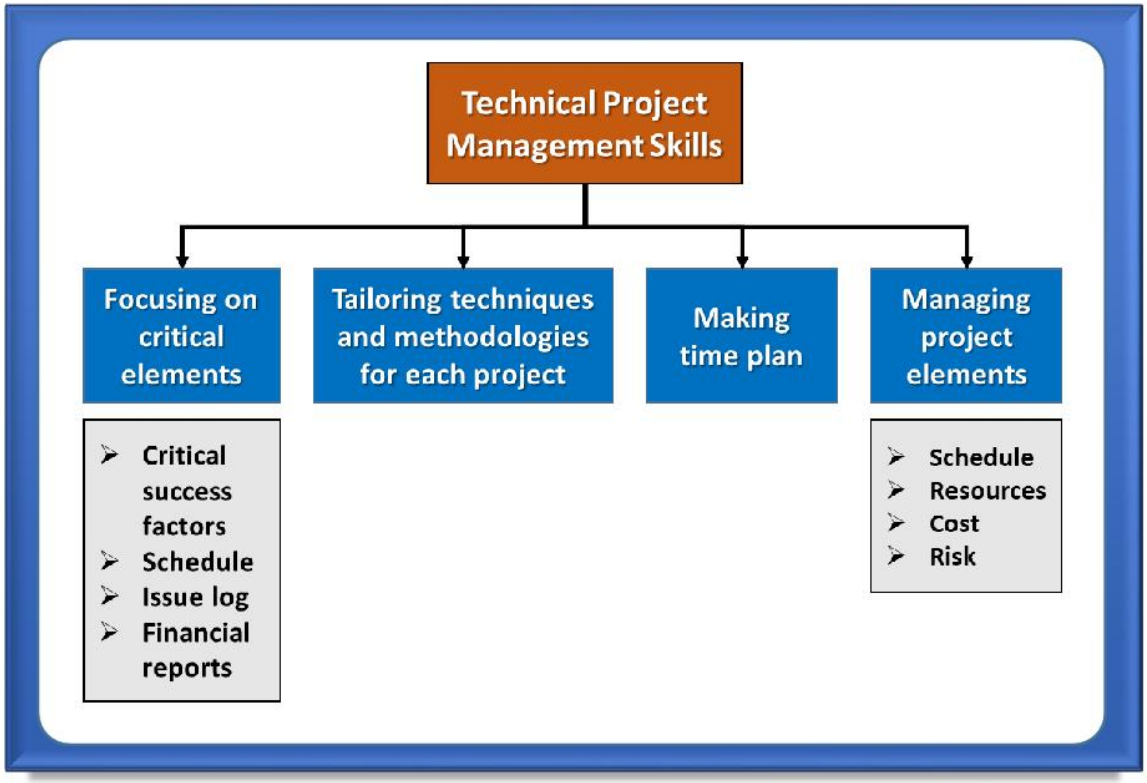
24- Answer: a

Leadership is one of the skill sets, which are:

Skill Sets	Description
Technical project management	• The knowledge, skills, and behaviors related to specific domains of the project, program, and portfolio management. • The technical aspects of performing one's role.
Leadership	• The knowledge, skills, and behaviors needed to guide motivate, and direct a team, to help an organization achieve its business goals.
Strategic and business management	• The knowledge of and expertise in the industry and organization that enhanced performance and better delivers business outcomes.

25- Answer: **d**

The technical project management skills include:



26- Answer: **b**

Leadership versus Management

Leadership	Management
Guide, influence, and collaborate using relational power.	Direct using positional power.
Develop.	Maintain.
Innovate.	Administrate.
Focus on relationships with people.	Focus on systems and structure.
Inspire trust.	Rely on control.
Focus on long-range vision.	Focus on near-term goals.
Ask what and why.	Ask how and when.
Focus on the horizon.	Focus on bottom line.
Do the right things.	Do things right.
Focus on vision, alignment, motivation, and inspiration.	Focus on operational issues and problem-solving.

27- Answer: **b**

Performing integration is the responsibility of the project manager; by working with the project sponsor, project managers contribute to the integration and execution of the strategy, they understand the strategic objectives and ensure the alignment of the project objectives and results with those of the portfolio, program, and business areas.

28- Answer: **d**

Leadership Style	Description
Laissez-faire	The team makes their own decisions and establish their own goals, also referred to as taking a hands-off style.

29- Answer: **b**

Leadership Style	Description
Transformational	Empowering followers through idealized attributes and behaviors, and effective motivation.

30- Answer: **b**

Personality Characteristics

Characteristics	Description
Creative	Ability to think abstractly, to see things differently, to innovate.

CHAPTER 4

Project Integration Management

Integration management in project management context is mainly concerned with combining and coordinating the different processes and project management activities within the project management process groups. The project integration management is the responsibility of the project manager; it focuses on developing the project charter, and the project management plan; it also focuses on managing, monitoring, and controlling project work, managing changes to the project, and efficiently closing the project. The project integration management chapter covers the following topics:

- General concepts of project integration management;
- Emerging practices and trends in project integration management;
- Tailoring considerations for applying project integration management;
- Considerations for applying project integration management in agile or adaptive environments; and
- Project integration management processes.

4.1. General Concepts of Project Integration Management

In the project management context, integration includes characteristics of unification, consolidation, communication, and interrelationship.

Project Integration Management includes making choices about:

- Resource allocation;
- Balancing competing demands;
- Examining any alternative approaches;
- Tailoring the processes to meet the project objectives; and
- Managing the interdependencies among the Project Management Knowledge Areas.

Project integration management is specific to project managers; while specialists may manage other knowledge areas (cost management, schedule management, etc.).

Project integration management covers the following tasks:

- Ensuring the project work is aligned with the project and the business objectives;
- Providing the project management plan which is considered the base for carrying out project work and for performance measurement;
- Making integrated decisions regarding critical changes impacting the project;
- Measuring and monitoring the project's progress and taking appropriate action to meet project objectives;
- Collecting data on the results achieved, analyzing the data to obtain information, and communicating this information to relevant stakeholders; and
- Completing all the work of the project and formally closing each phase, contract, and the project as a whole.

4.2. Emerging Practices and Trends in Project Integration Management

The emerging practices and trends in project integration management are presented in Table 4.1.

Table 4.1: Emerging Practices and Trends in Project Integration Management

Emerging practices/trends	Description
Use of automated tools	• It is necessary to use a project management information system (PMIS) because of a significant amount of data required to be integrated.
Use of visual management tools	• Visual management tools are used by some project teams, rather than written plans and other documents, in order to capture critical project elements.
Expanding the project manager's responsibilities	• Project managers are being called on to initiate and finalize the project, such as developing the project business case and benefits management.
Hybrid methodologies	• Some project management methodologies are evolving to integrate successfully applied new practices.

4.3. Tailoring Considerations for Applying Project Integration Management

Several factors and items should be considered for tailoring when applying project integration management; these tailoring considerations are presented in details in Table 4.2.

Table 4.2: Tailoring Considerations for Applying Project Integration Management

Tailoring Considerations	Description
Project life cycle	Considers the appropriate life cycle type and phases.
Development life cycle	Considers the appropriate development life cycle for the product, service, or result (predictive, adaptive, or hybrid approach).
Management approaches	Considers the appropriate management approach based on the project complexity and the organizational culture.
Knowledge management	Considers the appropriate method of knowledge management and transfer to achieve collaborating working environment.
Change	Considers the appropriate method of managing changes.
Governance	Considers and defines the appropriate control boards, committees, and other stakeholders to be involved in the project.
Lessons learned	Defines the type of information to be collected in order to improve and provide the success for future projects.
Benefits	Defines when and how benefits should be reported.

4.4. Considerations for Applying Project Integration Management in Agile or Adaptive Environment

Iterative and agile approaches support the engagement of team members as local domain experts in integration management. The team members determine how plans and components should be integrated.

4.5. Project Integration Management Processes

The project integration management comprises seven project management process. These processes and their related process groups are presented in Table 4.3.

Table 4.3: Project Integration Management Processes

Process	Description	Process Group
Develop Project Charter	Developing an authorization document of the project existence, and for the project manager to utilize the resources of the organization to the activities of the project.	Initiating
Develop Project Management Plan	Defining, preparing, and coordinating all plan components and consolidating them into an integrated project management plan.	Planning
Direct and Manage Project Work	Performing the defined work in the project management plan and implementing the approved changes in order to achieve the objectives of the project.	Executing
Manage Project Knowledge	Using existing knowledge and creating new knowledge to manage the project efficiently.	Executing
Monitor and Control Project Work	Reviewing, tracking, and reporting the overall project progress in order to meet the objectives of the performance as defined in the project management plan.	Monitoring and Controlling
Perform Integrated Change Control	• Reviewing all change requests; • Approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan • Communicating the decisions.	Monitoring and Controlling
Close Project or Phase	Completing and finalizing all activities for the phase, project, or contract.	Closing

The key interactions between project integration management processes and other processes in other knowledge areas is presented in Figure 4.1.

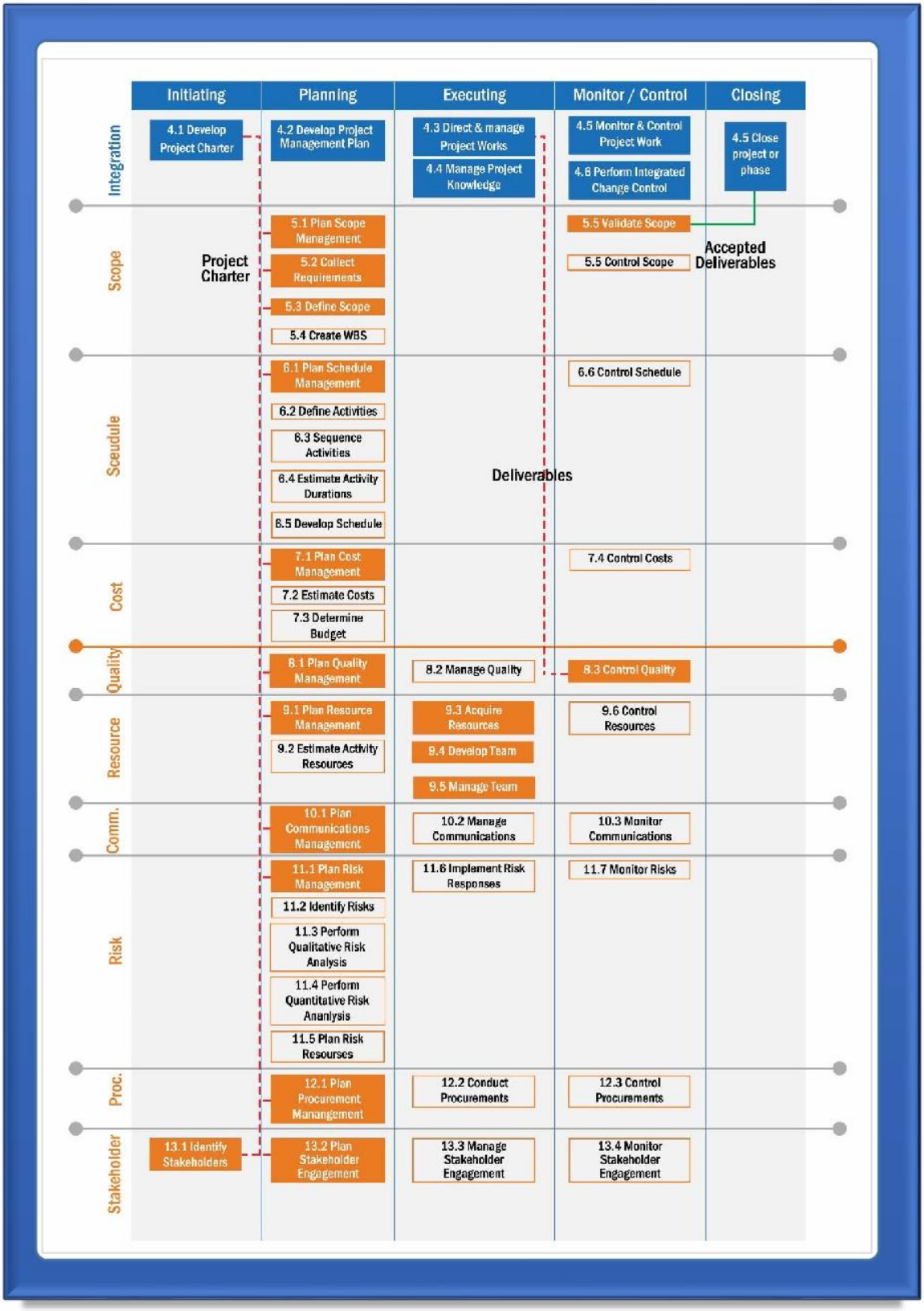


Figure 4.1: Key Interactions between project integration management processes and other processes

4.5.1. Develop Project Charter

4.5.1.1. Develop Project Charter Overview

Develop Project Charter is a project management process related to initiating process group. The description and value of this process are presented in Table 4.4; the inputs, tools and techniques, and outputs are presented in Figure 4.2; the interaction with other elements is shown in Figure 4.3.

Table 4.4: Develop Project Charter Description and Value

Process Description	Process Value
It is the process of developing an authorization document of the project existence, and for the project manager to utilize the resources of the organization to the activities of the project.	It links the project to the organizational strategic objectives and shows the commitment of the organization to the project.

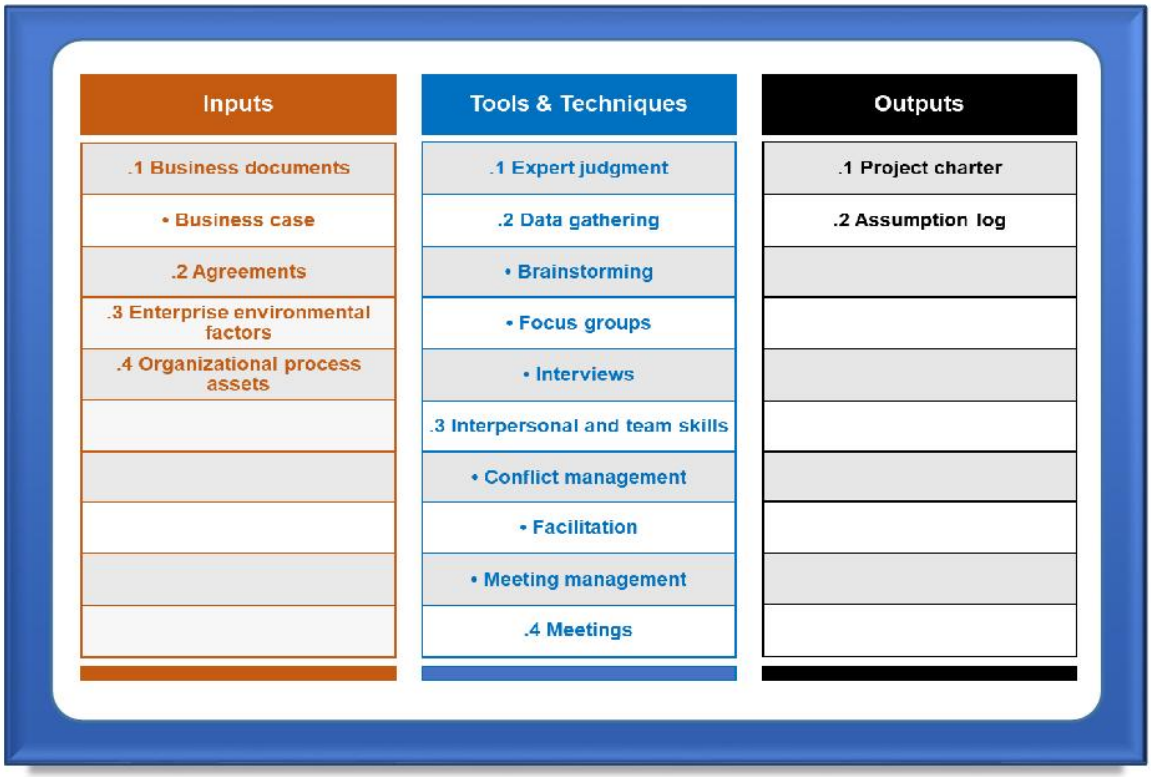


Figure 4.2: Inputs, Tools and Techniques, and Outputs of Develop Project Charter Process

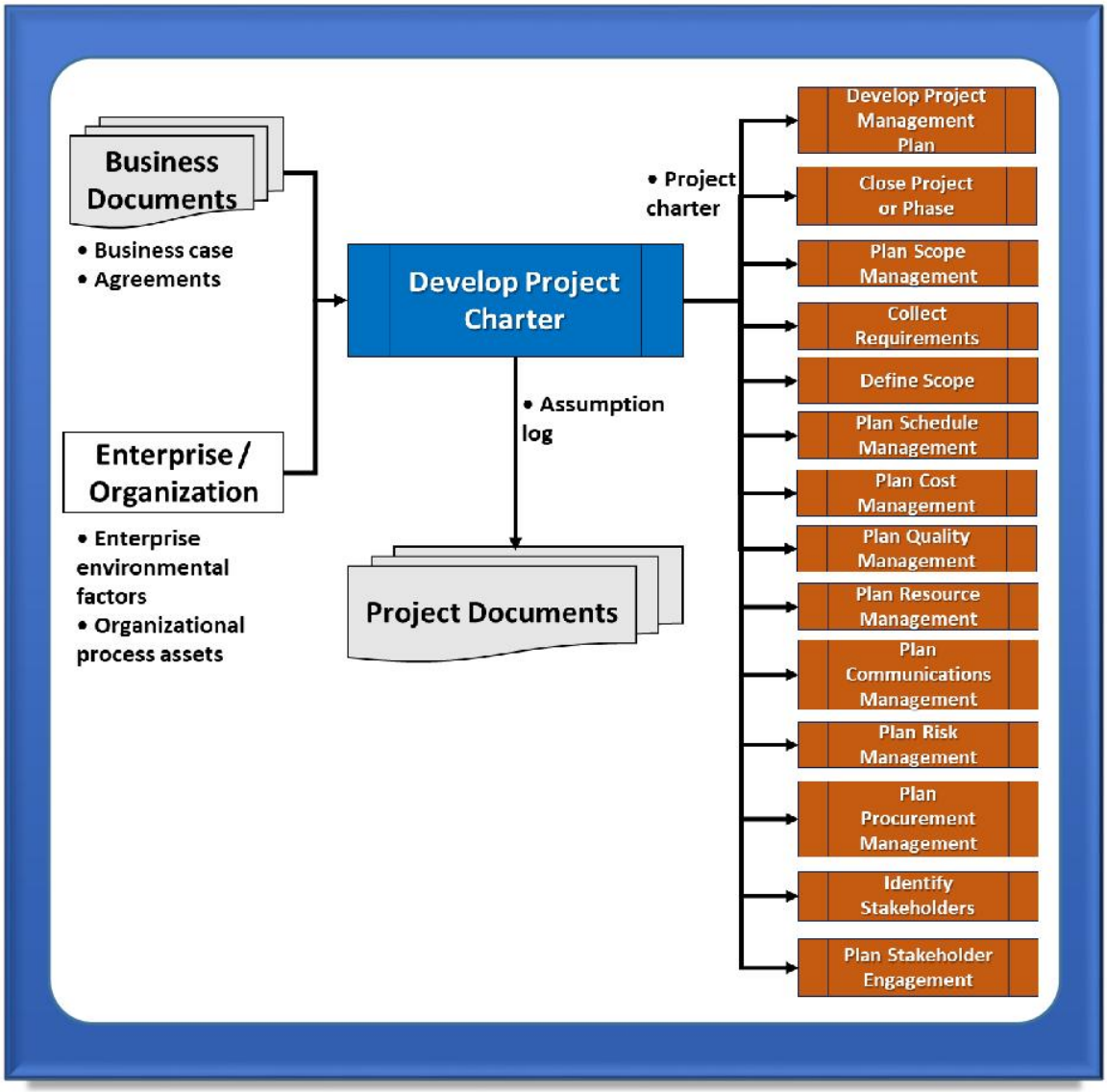
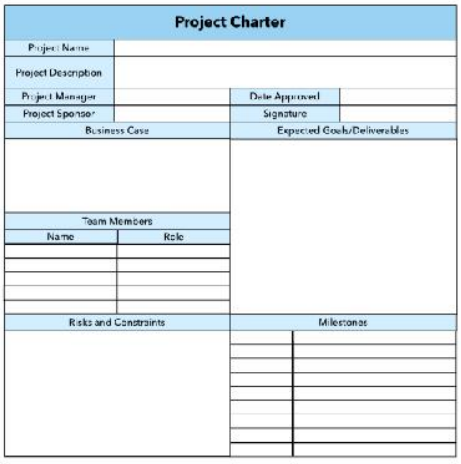


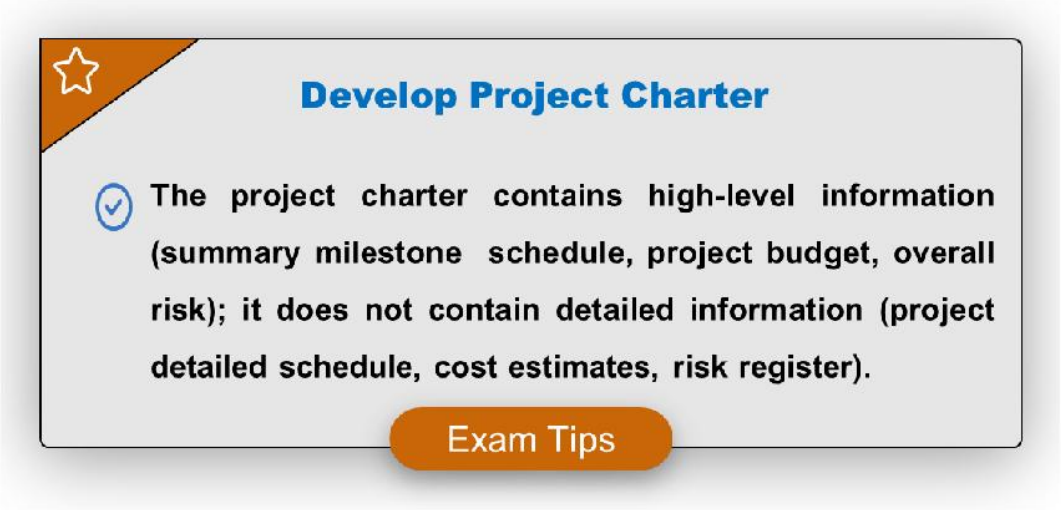
Figure 4.3: Develop Project Charter Interaction with Other Elements

The approved project charter formally initiates the project; in order to develop a project charter; it is essential to consider the following:

- **The reason for initiating the project:** whether due to external influences or other business needs.
- **The project nature:** if the project is an external project, a formal contract is preferred for agreement establishment; while a project charter may be used for internal agreements establishment, as it sets a partnership between the requesting and the performing originations.



- **Project Initiator:** the project initiator should be an external entity to the project that is capable of applying funding and resources to the project, examples of initiator could be (not limited to):
  - Sponsor;
  - Program, or project management office (PMO); or
  - A portfolio governing body chairperson or authorized representative.



4.5.1.2. Develop Project Charter Inputs

A. Business case:

In order to develop the project charter, it is crucial to determine the need to initiate this project; this is the role of the business case, which is the result of one or more factors presented in Table 4.5.

The approved business case is the business document that is used to create the project charter.

Table 4.5: Business Case Development Factors

Factor	Example
Market demand	Developing small size cars to facilitate movement in traffic jams.
Organizational need	The need to increase profit, or increase the business value.
Customer request	Providing extension to an existing residential compound.
Technological advance	Developing electronic online shopping services instead of the existing manual services.
Legal requirement	Establishing guidelines in a construction company for safety requirements.
Ecological impacts	Establishing procedures for transferring materials inside residential areas.
Social need	Provide infrastructure to villages.

B. Agreements:

Agreements have the following forms:

- Contracts (used when a project is being performed for an external customer);
- Memorandums of understanding (MOUs);
- Service level agreements (SLA);
- Letters of agreement;
- Letters of intent;
- Verbal agreements;
- Email; and
- Other written agreements.

C. Enterprise Environmental Factors:

The enterprise environmental factors include (not limited to):

- Government or industry standards;
- Legal and regulatory requirements or constraints;
- Marketplace conditions; and
- Organizational culture and political climate.

D. Organizational Process assets:

The organizational process assets include (not limited to):

- Organizational standard policies, processes, and procedures;
- Portfolio, program, and project governance framework;
- Monitoring and reporting methods; and
- Templates.

4.5.1.3. Develop Project Charter Tools and Techniques

A. Expert Judgment:

This is achieved by a group or a person with specialized education, knowledge, skill, experience, or training in the following topic (Strategy, Benefits management, industry technical knowledge, etc.)

B. Data Gathering:

Different techniques of data gathering are presented in Table 4.6.

Table 4.6: Data Gathering Techniques

Technique	Description
Brainstorming	• Led by the facilitator. • A quick technique to identify ideas. • Conducted in a group environment.
Focus groups	• Bring together stakeholders and subject matter experts. • More conversational way than interviewing by one-on-one technique.
Interviews	• By talking directly to stakeholders. • It is done to get information on high-level requirements, assumptions or constraints, approval criteria, and other information.

C. Interpersonal and Team Skills:

- **Facilitation:**
  It is the ability to guide a group event efficiently in order to reach a successful solution or decision.
- **Meeting Management:**
  Meeting management requirements are:
  - Preparing the agenda;
  - Ensuring the invitation of a representative for each key stakeholder group; and
  - Preparing and sending the follow-up minutes and actions.

4.5.1.4. Develop Project Charter Outputs

A. Project Charter:

The main characteristics of the project charter are presented in Table 4.7.

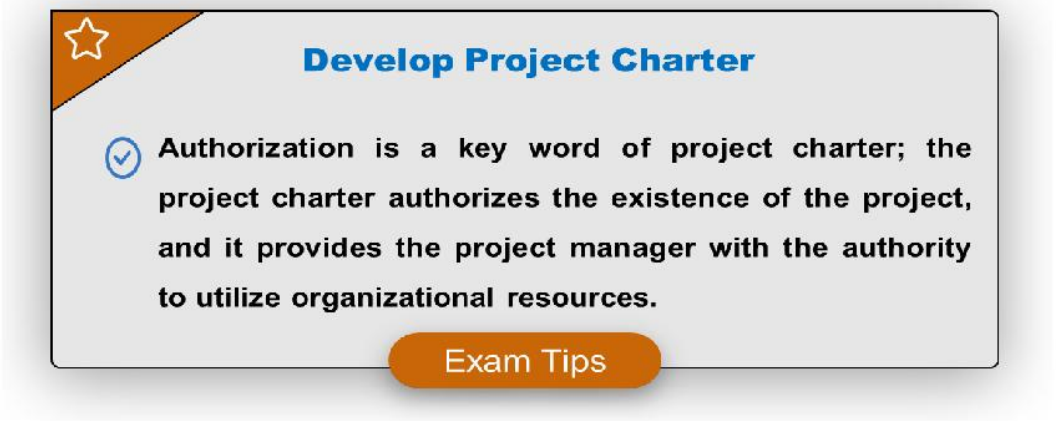


Table 4.7: Project Charter Characteristics

Technique	Description
Function	• It formally authorizes the existence of a project. • It provides the authority to the project manager to apply the resources of the organization to project. • It includes high-level requirements of project, product, service, or result.
Issued by	• Initiator; or • Sponsor.
Main Components	• Project purpose; • Measurable project objectives and related success criteria; • High-level requirements; • High-level project description, boundaries, and key deliverables; • Overall project risk; • Summary milestone schedule; • Preapproved financial resources; • Key stakeholder list; • Project approval requirements; • Project exit criteria; • Assigned project manager, responsibility, and authority level; • Name and authority of the sponsor or other person(s) authorizing the project charter.

B. Assumption Log:

The primary role of the assumption log is to record all constraints and assumptions throughout the life cycle of the project; the high-level assumptions are identified in the business case before project initiation, while the lower level task assumptions are generated throughout the project.

4.5.2. Develop Project Management Plan

4.5.2.1. Develop Project Management Plan Overview

Develop Project Management Plan is a project management process related to planning process group. The description and value of this process are presented in Table 4.8; the inputs, tools and techniques, and outputs are presented in Figure 4.4; the interaction with other elements is shown in Figure 4.5.

Table 4.8: Develop Project Management Plan Description and Value

Process Description	Process Value
Defining, preparing, and coordinating all plan components and consolidating them into an integrated project management plan.	Producing a document that is comprehensive enough to define the methods and procedures for performing work.

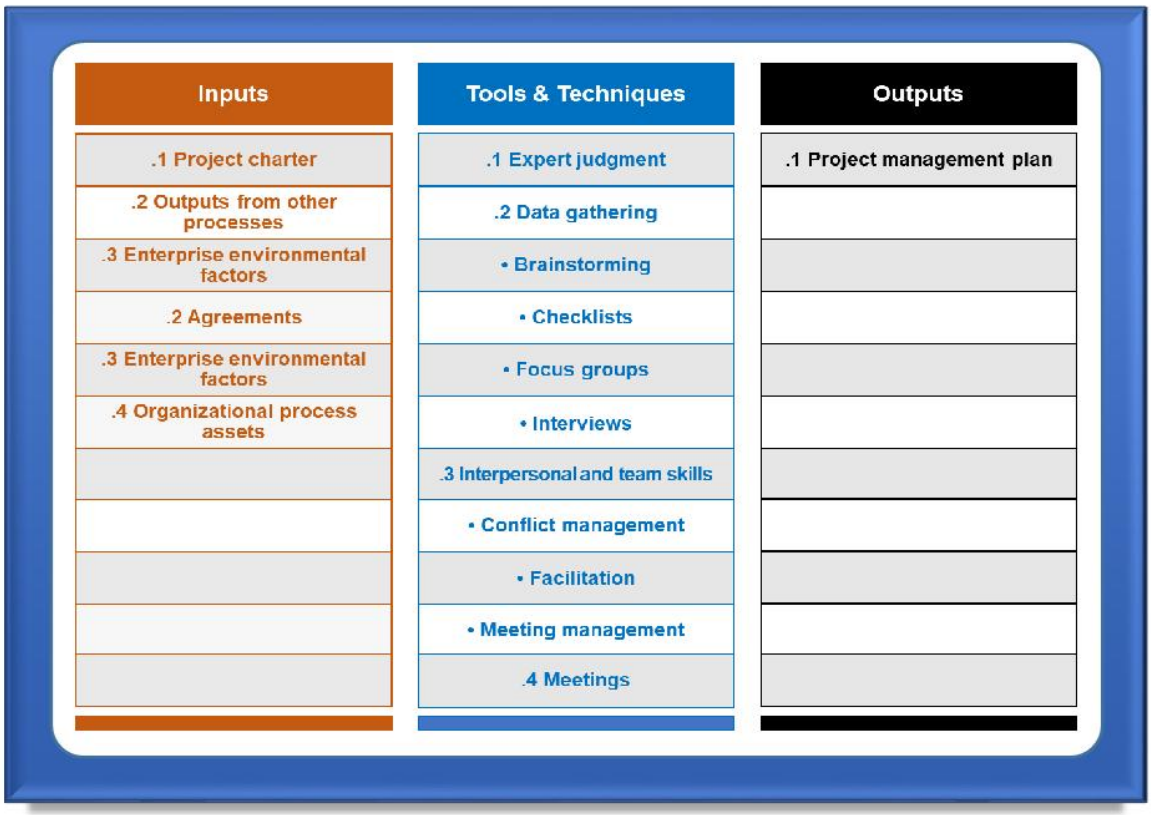


Figure 4.4: Inputs, Tools and Techniques, and Outputs of Develop Project Management

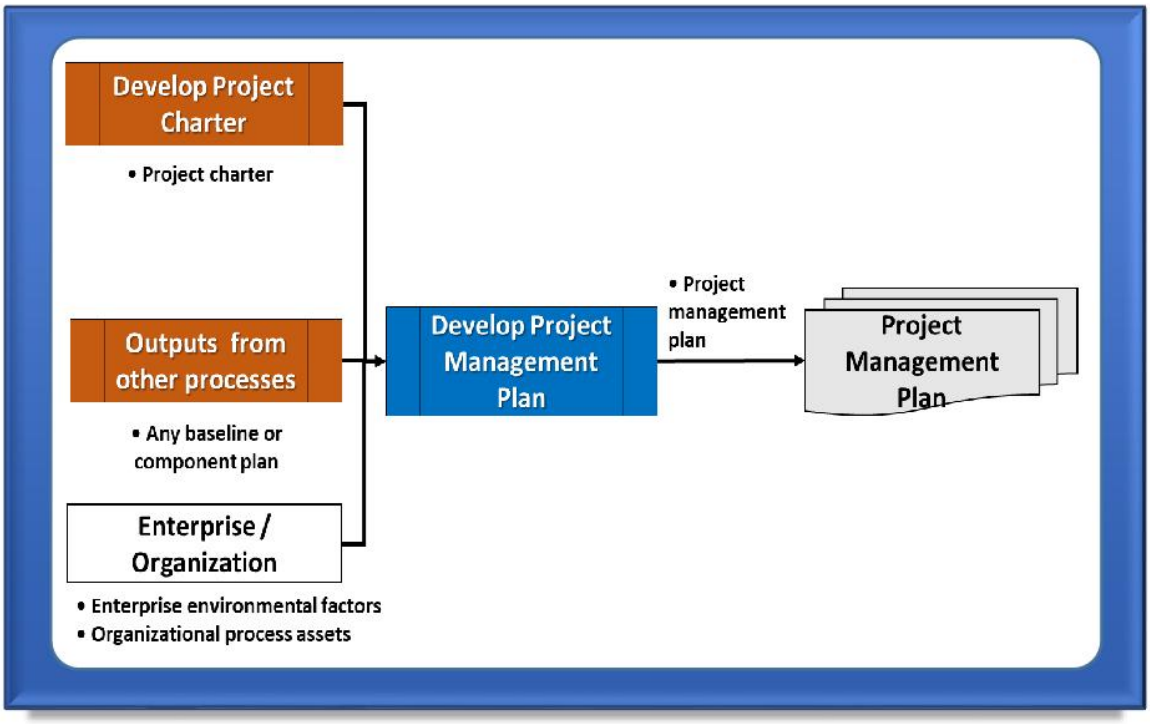


Figure 4.5: Develop Project Management Interaction with Other Elements

Develop Project Management

After the development of the project management plan and the approval by the specified stakeholders, it could be adjusted fully or partially in case of modifications or even updates through change control process.

Exam Tips

4.5.2.2. Develop Project Management Inputs

A. Project Charter:

It is used as a starting point for the planning process, and it includes information that could vary according to the information availability and the project complexity.

B. Outputs from other Processes:

- Outputs from many of the other processes are integrated to create the project management plan.
- Subsidiary plans and baselines that are produced from other planning processes.
- The changes to the project documents could lead to required updates to the project management plan.

C. Enterprise Environmental Factors:

The enterprise environmental factors include (not limited to):

- Government or industry standards;
- Legal and regulatory requirements or constraints;
- Organizational culture, structure, sustainability, and management practices;
- Organizational governance framework;
- Infrastructure (such as existing facilities and equipment).

D. Organizational Process assets:

The organizational process assets include (not limited to):

- Organizational standard policies, processes, and procedures;
- Project management plan template, including:
  - Guidelines and criteria for tailoring the organization's set of standard processes to satisfy the specific needs of the project; and
  - Project closure guidelines or requirements such as the product validation and acceptance criteria.
- Change control procedures, including:
  - Steps by which official organizational standards;
  - Policies;
  - Plans;
  - Procedures; and
  - Any project documents will be modified and how any changes will be approved and validated.
- Monitoring and reporting methods, risk control procedures, and communication requirements; and
- Project information from previous similar projects