PMP EXAM PREP

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Updated For The Most Recent Exam

The #1 Book for PMP EXAM PREP
with an Average 99% Pass Rate

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PMP, ITIL, CAPM, PROJECT+, CYSA+, SECURITY+, A+

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- **A Guide to the Project Management Body of Knowledge (PMBOK Guide) – Sixth Edition**, Project Management Institute, Inc., 2017.
- **A Guide to the Project Management Body of Knowledge (PMBOK Guide) – Seventh Edition**, Project Management Institute, Inc., 2021
- **Agile Practice Guide**, Project Management Institute, Inc. and Agile Alliance, 2017.

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About the Author

Nicholas Mendez (Nick Mendez) is a certified PMP, ITIL, CAPM, CASP, Project+, CySA+, Security+, and A+ professional with over eight years of experience in project management and IT.

Nick founded TeachMeIT after experiencing the impact certifications had on his own career development. He has since worked with hundreds of PMP candidates, guiding them through the exam preparation, exam success, and career advancement. Over time, he refined his focus, mainly specializing in PMP exam preparation, with the goal of making high-quality education more accessible.

TeachMeIT now provides 24/7 accessible online courses for a range of project management and technology certifications. It also offers exam prep books, study guides, practice questions and other resources available on platforms such as Udemy and TeachMeIT.co.

Nick dedicates this book to his brother, Shaun, who continues to be a motivation for him in both his personal and professional journey.

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Chapter 1
Introduction

Congratulations on taking the first steps to prepare for the Project Management Professional (PMP) exam! This book is your comprehensive guide to study for and pass the latest version of the PMP exam.

Preparing for this exam is a massive undertaking, and this book spans 25 chapters and covers a wide range of material, everything from foundational project management terms to the more complex ideas, concepts, and formulas. After reading this book thoroughly, you'll be more than ready to pass your exam come test day.

If you're looking to jump straight to information about the PMP application process and exam requirements, head to Chapter 2.

Why You Should Get Your PMP

Earning your PMP certification is one of the most important milestones a project manager can achieve in their career. Thousands of companies worldwide recognize the PMP certification as the gold standard of an experienced project manager, and over a million project managers worldwide are PMP certified.

Through passing the exam, employers will be confident in your ability to implement the best practices of project management in any environment, manage and coach project teams, and successfully lead projects to completion. It cements your knowledge as a project manager and gives you a significant edge over non-certified PMP project managers in both your career progression and your ability to compete in the job market.

The PMP is more than just an exam that you pass and earn a piece of paper to hang up on your wall. It's a well-known, powerful credential that will significantly increase your salary, promote career growth, and establish your professional credibility.

Increased Salary

PMP certified project managers earn an average salary of $123,000 per year compared to the non-certified project managers' salary of $93,000. If we do the math, PMP certified project managers make about $30,000 more and 32% more per year than non-certified project managers.

That's a pretty impressive yearly number, but let's put it into perspective across an entire career.

If you worked for 30 years with your PMP certification, the salary boost could add up to more than $900,000 in additional earnings**.** That's close to a million-dollar increase in pay over the course of your career when you have your PMP compared to working without one.

Career Advancement and Industry Recognition

In addition to increased earning potential, holding a PMP certification will advance your career in many different ways. Due to the difficulty of the exam and requirements to take it, only around 5% of project managers worldwide have a PMP certification. It's a very prestigious and widely recognized certification across multiple industries, organizations, and countries.

You can leverage your PMP on your resume and LinkedIn to attract more potential job offers and opportunities. You can also use your PMP to advance your career internally when you're already employed. Many high-level leaders, such as C-suite executives, SVPs, VPs, and department managers have been project managers or played the role of a project manager for a lengthy portion of their career.

Whether you're aiming for a promotion at your current job, searching for a new project manager position, or proving you have the skills to manage a complex project, being PMP certified will open a lot of doors in your career and make you stand out.

Greater Job Security

Given the need for skilled project managers, PMP certified project managers can expect much greater job security. Employers highly value certified PMPs, and certified PMPs are much less likely to be affected by layoffs or workforce reductions compared to non-certified project managers.

Global Opportunities

Even though the PMI (Project Management Institute) is a US-based organization, the PMP certification is renowned worldwide. This can open doors to networking globally, international job opportunities, and can also make you a strong candidate to work either remotely or in-person in many countries.

Leadership Skills

A good project manager not only knows how to manage a project, but also can coach and lead a project team. Understanding how to identify and talk to stakeholders, delegate responsibilities, coach employees, and stay on top of deliverables are skills that translate well into many leadership positions.

Get the Most Out of This Book with Our Study Tips

When working through this book, don't just passively read. Focus on engaging actively when you read and apply the material through note-taking, practice tests and exams, and other recommended study methods.

Use the following strategies to get the most out of this book.

Read Out Loud

One trick that will maximize your learning throughout this book is reading out loud. While you're reading, speak the words aloud as if you were reading to another person or a group. This will keep you dialed in and improve your focus. It will also significantly enhance your memory because you're activating both visual and auditory learning. Try it out in Chapter 3, where we begin our official exam prep and see how it works for you!

Use Active Reading

Active reading is reading with the intent to understand, not just looking at the material or rushing through it. To read actively, try highlighting important information in different colors with a marker, rephrasing topics in your own way through note taking, or creating questions you want to find the answers to in the chapter.

Create a Study Plan

Failing to plan is a common way that exam candidates struggle to get through exam preparation. To avoid this, set aside pre-planned study time each week for a certain number of weeks.

For example, an 8-week study plan might look like this:

Week 1-6

- ➢ Read and take notes on four chapters of this book per week.
- ➢ Take 2-4 practice quizzes per week.
- ➢ Supplement additional learning from other materials such as video as needed.
- ➢ Read through your notes on previous chapters 2-3 times per week.

Week 7-8

- ➢ Finish studying this book and completely review your notes, focusing on improving weak areas with further review and resources like an online video course.
- ➢ Take 2-3 practice exams, while focusing on fully simulating the exam testing environment. We'll discuss this more later in the book.

While this is just an example of a study plan, you should create one on a schedule that works for you and that you feel comfortable following. Additionally, you may choose other methods of studying such as joining an online study group, creating flashcards (either physical or digital), and using additional study resources. Create your own study plan and stick to it in order to best prepare for the exam.

Commit to Chapters

Aim to read chapters in their entirety and try to avoid ending your study session in the middle of a chapter. Completing a chapter in one sitting will help you retain information and provide a full understanding without continuously revisiting chapters. It will also help you feel accomplished during every study session and motivated to keep going.

Learn to Apply Study Knowledge

Rather than focusing on pure memorization, focus on actively applying the knowledge and concepts you learn from this book and your other study resources. This can be done by both applying study knowledge to practice questions, and during your real-life work as a project manager.

Project management in the real world requires the ability to understand, explain, and apply concepts. It will be the exact same way on the exam, and expect to see questions on the exam that test practical application. When studying, always ask yourself, "How would this fit in a real project, and how might I see this appear on the exam?"

Utilizing External Resources Outside of This Book

While this book is comprehensive, there are also other resources that can help supplement your learning.

Here are some additional resources that can improve your studying:

- **PMI Study Hall**: PMI's Study Hall (Essentials or Plus) offers excellent additional preparation tools for the PMP exam. PMI Study Hall is available on PMI's website directly.
- **PMBOK Guides & Agile Practice Guide**: The current exam is heavily based on PMBOK Guide 7th Edition, PMBOK Guide 6th Edition, and the Agile Practice Guide. You don't need to read these books completely, but it's worth picking them up for a quick read if you have time.
- **TeachMeIT Resources**: You can utilize practice tests, study guides, and more resources from our website (teachmeit.co), YouTube, Udemy, and other online courses.

Practice Exam

At the end of this book, you will find a full-length practice exam designed to test how well you can apply theory into an exam simulation. Additionally, I recommend you take at least one other full-length practice exam prior to taking the official exam. As time consuming as it can be, taking practice exams is far more time and cost-effective than having to retake the PMP entirely.

Introduction Summary

In this chapter, we introduced the purpose of this book, discussed why you should get your PMP certification, highlighted the benefits of being certified, and shared our practical study tips to get the most out of this book.

Regardless of where you are in your project management journey, this book is a complete resource for your PMP exam preparation.

When you're ready, continue on to the next chapter, which covers PMP exam eligibility, application process, and educational/contact requirements.

CHAPTER 2

PMP Exam Eligibility, Application, Overview, and Certification Process

Earning the PMP is a significant milestone in any project manager's career. However, before taking the exam, you must meet certain eligibility requirements, complete the exam application, and be accepted to take the exam.

This chapter will cover aspects of the PMP certification process, from applying and passing the exam to maintaining your certification. We'll examine the three main eligibility requirements that must be met to take the exam, the application process, an overview of the exam, and how to maintain your certification once you receive it.

PMP Eligibility Requirements: Formal Education, Work Experience, and Contact Hours

There are three eligibility requirements to take the exam, including formal education, project management work experience, and project management education hours. When submitting your application, you'll need to provide sufficient proof that you meet all three criteria.

You can meet the eligibility requirements by fulfilling one of the three option combinations outlined in figure 2.1.

Figure 2.1: *The Three Main Requirements for PMP Exam Eligibility*

	Requirement #1: Formal Education	Requirement #2: Project Management Work Experience	Requirement #3: Required contact/study hours (PM Education)
Option #1 Secondary Degree	Secondary degree (high school diploma, associate degree, or global equivalent)	Minimum of 5-year/60-month verifiable professional project management experience	35 contact/study hours are required UNLESS you have an active CAPM certification OR are a graduate of a GAC-accredited degree
Option #2 Four-year degree	Four-year degree (bachelor's degree or global equivalent)	Minimum of 3-year/36-month verifiable professional project management experience	35 contact/study hours are required UNLESS you have an active CAPM certification OR are a graduate of a GAC-accredited degree
Option #3 **Post-graduate Degree or GAC-accredited Bachelors**	Bachelor's or post-graduate degree from a GAC-accredited program* (bachelor's degree, master's degree or global equivalent)	Minimum of 2-year/24-month verifiable professional project management experience	35 contact/study hours are required UNLESS you have an active CAPM certification OR are a graduate of a GAC-accredited degree

Requirement #1: Formal Education

The first requirement to be eligible to take the PMP certification exam is formal education. There are three available options for being able to fulfill the formal education requirement.

You must have one of the following academic qualifications to meet the formal education requirement:

1. Secondary degree (high school diploma, associate degree, or equivalent)
2. Four-year degree (bachelor's degree or equivalent)
3. Bachelor's/Post-graduate degree from a GAC-accredited program (bachelor's or master's degree or equivalent).

The more advanced your education, the less project management work experience will be required.

Requirement #2: Project Management Work Experience

The second PMP certification exam requirement is project management work experience. The specific amount of required work experience required varies based on your formal education level. This is most easily understood through figure 2.1.

As an example, only having a high school diploma or associate degree will require you to have 5 years of experience; however, having a master's degree would require you to only have 2 years of experience.

What Qualifies as Valid Project Management Experience

To meet the project management experience requirement, your work experience must involve:

- **Leading Projects or Portions of a Project**: Demonstrating leadership through real life work experience, such as leading projects, managing major aspects of a project, such as stakeholder communication, and making important project decisions.
- **Directing Work**: Managing both employees and material resources, overseeing project execution, resolving issues, and ensuring the project's objectives are met on time and within budget and scope.

You do not need to have the job title of "Project Manager" or any other title for your work experience to count toward exam eligibility, as long as your experience falls within the requirements, it will count.

Please note, only project management work experience from the past 8 years counts toward eligibility requirements. Experience older than 8 years will not be considered when applying.

Important Note on GAC Degree

If you are a graduate of a GAC-accredited degree program, you will receive a 12-month credit toward the project management work experience requirement. You can also use the GAC course work to fulfill the 35 education contact hours requirement covered in requirement three.

Requirement #3: Required 35 Contact Study Hours

The third and final requirement to be eligible to take the PMP certification exam is to obtain 35 project management contact hours through project management education. These study hours are required to ensure that candidates have a solid understanding of project management knowledge prior to taking the exam.

Earning the 35 Contact Hours

To earn the 35 contact hours, you can complete a PMP preparation course online that is at least 35 hours long and focuses on major exam topics or focus areas. There are many online providers

that offer courses specifically for the PMP and offer a certificate of course completion that can be included in your application.

Waiving the 35 Contact Hours

From the hundreds of PMP applicants I've worked with, most end up needing to complete and submit the 35 contact hours on their application. However, it is possible to waive the 35 contact hour requirement if you either hold an active CAPM certification or have graduated from a GAC-accredited degree program.

Exam Application, Payment and Scheduling, and Application Audit

When you've verified you meet the PMP exam eligibility requirements, you will create a PMI account and submit your exam application. Once your application is accepted, you'll pay the exam fee and schedule your exam.

Figure 2.2: *PMP Application Process Steps*

Exam Application

After confirming exam eligibility, you can create an account and submit your application on PMI's website. PMI may require you to submit proof of your formal degree, work experience, and educational contact hours during the application process.

After verifying your information and submitting your application, PMI will review and either accept or audit your application in approximately 3-7 business days.

Application Audit

PMI may randomly audit any PMP application. They do this to confirm that the project management work experience and education that you've submitted are legitimate.

This does not happen to every application, nor should you panic if it happens to yours. If your application is audited, you will receive an e-mail notification and have 90 days to submit all the proper documentation to PMI directly through their website.

While passing an application audit is outside the scope of this book, rest assured that you will pass an audit as long as you have the appropriate documentation and work references.

Nick's Tip:

Make sure that you have all your documentation and professional references in place and ready before you submit your PMP application in case of an audit. Documentation that may need to be submitted could include a record of your diploma/degree or transcripts, signed work experiences from current or previous managers, and proof of the 35 project management contact hours (for example, a certificate from an online course). You can read more about PMI's application audit process directly on their website.

Payment and Scheduling

Once PMI notifies you that your application is approved, you can pay the exam fees and register for the exam. Exam registration is currently done through PearsonVue, which offers both in-person and at-home proctored testing options.

As of the time of the writing of this book, the PMP exam costs $405 for PMI members and $555 for non-PMI members.

Retake Policy for the PMP Exam

In the event that you don't pass the exam on your first try, you can retake it up to three times within one year, with each retake requiring payment of the full exam fee. After three consecutive failed attempts, you will have to wait one year before being eligible to retake the exam.

An Overview of the PMP Certification Exam

The PMP exam is very complex and consists of many elements. We'll provide a brief overview of the exam in this section, and an in-depth overview in Chapter 24.

Time Limit and Breaks

The exam consists of 180 questions to be completed in a 230-minute time period, giving you approximately 1 minute and 20 seconds per question.

You will also have two 10-minute breaks during the exam, the first after reaching the 60- question mark, then the second after completing 120 questions.

Types of Questions on the PMP Exam

The most recent exam questions focus heavily on applying project management concepts to react to real-world scenarios.

Common Question Formats

Multiple-Choice Questions: These questions present four answer options, and you must select the best choice. While there may be two or more options that seem correct, the correct answer will be the most appropriate one.

Multiple-Response Questions: Requires you to select potentially more than one correct answer from a list of provided answers. These questions will mention how many answers to select. For example: "Which are the benefits of stakeholder management? (Choose two)".

Matching Questions: A list of items in one column that must be matched to terms in another column.

Drag-and-Drop Questions: These questions require you to drag and drop elements in the right place, such as ordering project phases in the right sequence from start to finish.

Post-Exam: Immediate Feedback and Survey

Once you have completed and submitted your exam, you will immediately receive a "pass" or "fail" result. There will also be a short survey at the end, allowing you to provide feedback on your exam experience.

Exam Content Structure: What's Tested

The exact questions that will appear on the exam will be unique to each exam and each candidate, since the questions are randomly generated and impossible to predict exactly.

Despite the differences in questions that will appear from exam to exam, there are three major areas that represent where all questions will originate from:

1. **People**: 42% of the exam focuses on team leadership, soft skills, emotional intelligence, managing stakeholders, and person-to-person interaction in project management.
2. **Process**: 50% of the exam tests your knowledge on processes, tools, and techniques that are crucial to running a project.
3. **Business Environment**: 8% of the exam assesses how projects align with bottom line business objectives and organizational strategy.

Project Management Approaches Tested

The current PMP exam does not solely test traditional (predictive) project management approaches as it did in previous, older versions.

About half of the current exam covers predictive project management, while the other half now covers agile and hybrid techniques.

Modern organizations will often use a mix of methodologies, making knowledge of traditional, hybrid, and Agile approaches increasingly important. You will encounter questions from each of these approaches on your PMP exam.

The Exam Content Outline

The PMP Exam Content Outline, published by PMI, gives an authoritative overview for understanding the distribution of questions and the focus areas you can expect to find on the exam. I recommend reviewing the PMP exam content outline directly on PMI's website. It provides a very solid understanding of what exactly PMI wants you to know in order to pass the PMP exam.

Understanding the PMBOK 6 and PMBOK 7

The PMBOK 6 and PMBOK 7 are books published by PMI that focus on project management standards, terminology, guidelines, and best practices.

The current PMP exam is not based solely on the PMBOK 6th or 7th Edition. Instead, the exam implements information from both books, as well as other books such as the Agile practice guide.

The PMBOK 6th Edition focuses primarily on the 49 processes within five process groups (initiating, planning, executing, monitoring and controlling, and closing), and the PMBOK 7th Edition emphasizes a principle-based approach through the 8 project performance domains.

Both guides are useful and worth reading, but not required, since we'll cover the important concepts from both guides in this book.

How to Maintain your PMP, PDUs and Payment Dues

Once you pass your exam and are awarded your PMP, the clock starts on your 3-year period until you need to renew your certification. The PMP certification currently requires 60 Professional Development Units (PDUs) to be submitted to renew your PMP for another 3 years after the set expiration date.

It's crucial to renew your PMP Certification before it expires. If your certification expires, you will no longer be PMP certified and will need to retake the exam to be considered PMP certified.

Maintaining Your PMP Is a Four-Step Process

Maintaining your PMP requires 4 steps, including earning PDUs, submitting PDUs, paying the certification renewal fee, and receiving the certification renewal confirmation.

1. Earn PDUs

Professional Development Units (PDUs) are required to renew your certification and are gained through continued education, such as watching webinars, attending PMI chapter events, teaching others, and volunteering.

You can submit PDUs directly on PMI's website. You can track how many you have at any time to check how on track you are to renew your certification.

PDUs are categorized into two main areas:

- **Education:** At least 35 PDUs must come from education (including courses, webinars, conferences, etc.), with specific sub-categories such as technical project management, leadership, and strategic business management.
- **Giving Back:** Up to 25 PDUs can come from "giving back," which involves activities such as volunteering, creating content, or teaching others.

You will need to submit 60 PDUs in total to renew your PMP certification.

Nick's Tip:

Think of PDUs as the term that PMI uses around continuing education. You may have heard of other certification bodies utilizing Continuing Education Units "CEUs" which are similar to PMI's PDUs. Keep in mind that PDUs are not the initial contact hours that you get from the 35 hours of PM training.

2. Earning, Logging, and Reporting Your PDUs

Once you've earned your PDUs, you will need to provide a record of the activities you've completed and submit them on PMIs website directly to get credited for them. Once you've completed and logged 60 PDUs, you will move on to step 3.

3. Pay the Certification Renewal Fee

After you've submitted your PDUs, you will need to pay a renewal fee to renew your certification. Currently, the cost to renew your PMP Certification is $60 for PMI members and $150 for non-PMI members.

4. Receive Your Certification Renewal Confirmation

After submitting your PDUs and paying your renewal fee, PMI will then process your certification renewal. Once processed, PMI will send you a confirmation email, and extend your certification for another 3-year period.

PMP Exam Eligibility, Application, Overview, and Certification Process Summary

In this chapter we introduced /the three main exam eligibility requirements, the exam application process, an overview of the exam itself, and the process for maintaining this certification.

Before beginning your studies, make sure to verify you fit the exam eligibility requirements. In the next two chapters, we will begin studying the basic concepts of project management.

Chapter 3
Introduction to Project Management Fundamentals

There are many factors that affect the success of a project, and applying project management fundamentals efficiently is often one of the most important. Before diving into more advanced concepts later in the book, we'll start our exam prep in this chapter through building a strong foundation by learning these fundamentals.

In this chapter, we'll learn what a project is, the meaning of operational work, the role of a project manager, who stakeholders are, the three main approaches to managing projects, and a few other essential concepts.

Key Terminology

Constraints: Limitations or restrictions on a project, typically involving time, cost, scope, quality, resources, or risks.

Deliverables: Tangible or intangible outputs produced to meet project objectives.

Milestone: A significant point or event in the project timeline that marks the completion of a major phase, deliverable, or important task.

Operational Work: Ongoing, usually permanent efforts focused on maintaining and supporting business processes, systems, or environments.

PMO (Project Management Office): A centralized team, group, or department that provides project management standards, tools, support, and training to an entire organization and any project managers. The Project Management Office (PMO) functions to ensure projects and employees have what they need to succeed.

Portfolio: A collection of programs and subsequent projects that are managed as a group to achieve strategic objectives.

Program: A group of related projects managed in a coordinated manner to achieve greater benefits.

Project: A temporary endeavor undertaken to create a unique product, service, or result.

Project Charter: A formal document that officially authorizes a project and assigns the project manager authority to manage the project.

Project Life Cycle: The series of phases a project goes through from initiation to closure.

Project Management: The structured application of knowledge, skills, tools, and techniques to achieve a project's objectives.

Project Manager: The person responsible for leading the project, project team, and ensuring the successful completion of the project's objectives.

Stakeholder: Any individual, group, or organization that can affect or be affected by a project's outcomes.

Value: The benefit or worth a project provides to stakeholders and the organization undertaking the project.

Defining a Project and Operational Work

Projects are temporary business endeavors undertaken to create a unique product, service, or result. These projects are led by an appointed project manager who is in charge of a project team. Both the project manager and project team focus on accomplishing major project goals.

The desired goal of a project is to create a result that provides value for the organization undertaking the project, as well as internal and external stakeholders.

There are 5 important characteristics of a project:

- ➢ Projects are temporary.
- ➢ Projects have unique deliverables.
- ➢ Projects are progressively changed, developed, and refined.
- ➢ Projects have a specific start and end date.
- ➢ Projects' end result is to produce business value for both stakeholders and the organization undertaking the project.

Projects and Operational Work

While projects are temporary and always have estimated or specific start and end dates, operational work is any consistent and ongoing effort that maintains a business. You can think of operational work as regular business operations that don't include projects.

Projects are usually higher risk than operational work since they focus on innovation and change. Operational work, on the other hand, is typically lower risk because there are often established procedures and processes around the work.

Figure 3.1: *Examples of Projects and Operational Work*

Information Technology Example of Project and Operational Work	
Project	**Operational Work**
Upgrading all company computers to a new operating system. This involves researching, planning, purchasing, testing, installing the upgrade, and training employees on any new features. Once all computers have been upgraded and employees are trained, the project is complete and closed out.	Providing ongoing technical support to employees who use the upgraded systems from the upgrade project. This operational work includes troubleshooting issues, performing regular updates, and responding to help desk tickets. The operational work continues indefinitely as long as the systems are in use.
Sales Example of Project and Operational Work	
Project	**Operational Work**
Implementing a new Customer Relationship Management (CRM) system. This involves researching a CRM solution, acquiring it, implementing it, and training employees.	Sales people use the new CRM system to manage and reach out to clients, take notes, track sales, and continue day-to-day productivity and operations.

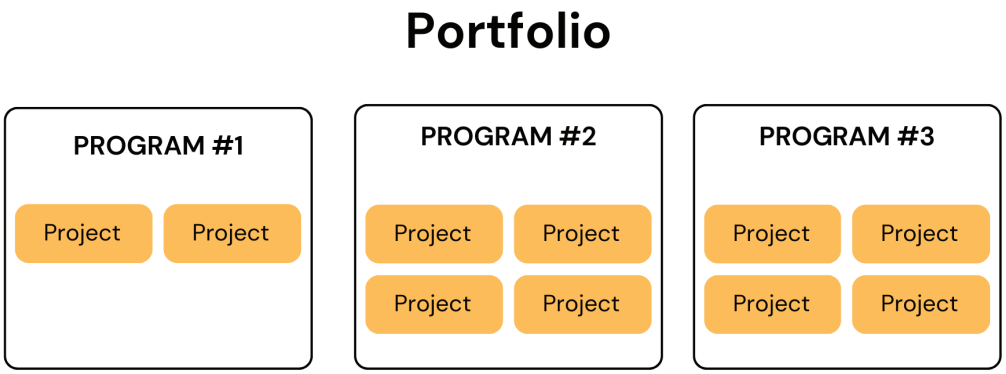
Projects, Programs, and Portfolios

Organizations often structure work into projects, programs, and portfolios in order to categorize, track, and manage business efforts. Figure 3.2 visualizes this hierarchy, placing portfolios at the top, related programs in the middle, and projects at the bottom.

By structuring their business efforts and work this way, organizations benefit by:

- ➢ Allocating resources and performing budgeting more effectively.
- ➢ Tracking and measuring performance across multiple areas.
- ➢ Ensuring all initiatives contribute real, measurable value to business goals.

Figure 3.2: *Visualizing Portfolio, Program, and Projects*



Program

A program is a collection of related projects managed together. Programs help categorize projects with similar strategic and business goals to deliver maximum value.

Technology Program Example: An organization has a technology modernization program, which oversees multiple internal projects. The program includes new laptop upgrades for employees and cybersecurity improvement projects.

Portfolio

A portfolio is a collection of related programs and projects organized, tracked, and managed at a high level.

Technology Portfolio Example: An information technology portfolio that encompasses programs for technology upgrades, software implementations, and employee training initiatives, with programs containing individual projects below it.

The Role of the Project Manager

The project manager is often an experienced employee within an organization that manages all project activities and leads the project team to ensure successful completion of project objectives. The project manager is usually formally designated through a project charter.

A project manager must demonstrate qualities such as strong leadership, communication skills, emotional intelligence, and business understanding. During a project, they are responsible for leading meetings, acting as liaisons between the project team and stakeholders, advocating for the project team, removing obstacles, resolving conflict, managing resources, and ensuring project success.

Project Manager Duties

- **Leadership & Team Management**

  Responsible for guiding the project team and delegating tasks to meet project goals. This is more than just directing or managing work and making sure it gets done. It also includes motivating and building trust with the project team, guiding team communications through appropriate channels, and taking ownership to resolve any conflicts that may arise.

- **Stakeholder Management**

  The project manager is responsible for managing any stakeholders that have an interest in the project. These stakeholders can be either internal or external to the organization that is undertaking the project. Stakeholders don't always support a project; sometimes they are against the project or have a neutral approach.

- **Problem Solving**

  There are many different problems and roadblocks that will inevitably come up during a project, and the project manager is responsible for addressing them. This can also include navigating internal or corporate politics, managing resource or budget limitations, resolving team conflict, and any other issues that may appear.

- **Risk Management**

  Risks can significantly impact a project, and project managers need to identify, assess, and respond to those risks. Often, this includes creating a risk management plan, monitoring risks, and proactively addressing risks before they are realized.

- **Budget & Finances Management**

  The project manager is responsible for managing the project's financial resources by tracking expenses, comparing them against the cost baseline, and ensuring the project remains within budget. This involves constantly making adjustments to address any monetary issues and prevent overspending.

- **Cost & Benefit management**

  The project manager must balance costs with benefits. This involves using a cost-benefit analysis to ensure that the financial cost of the project creates real benefits and value.

- **Quality Control**

  Quality control ensures that all the project's deliverables meet documented and required quality standards. The project manager helps develop the quality standards, implement quality assurance processes for the project team to adhere to, and conduct regular inspections or testing.

Stakeholders

A stakeholder is any individual, group of people, business, or organization that is affected by the project's outcomes. Since there are often many possible stakeholders, project managers and project teams may prioritize communication for a few of the "VIP" stakeholders. These VIP stakeholders usually have the most influence.

Stakeholders are:

- Project sponsors who provide direction for the project and sometimes funding.
- Internal project team members that execute on project plans and complete work.
- Customers or end users who are affected by or will benefit from the project.
- External vendors or contractors that provide materials, tools, knowledge, or labor.
- External regulatory agencies that ensure the project maintains compliance with any legal or industry regulations.

Defining Project Management

Project management is the application of knowledge, skills, tools, and techniques to ensure projects achieve their intended successful outcomes and value. This book focuses on project management through the lens of the PMP exam, and we'll cover all concepts, as you'll need to know them for certification.

Deliverables of a Project

Deliverables are the outputs produced during each phase of the project. They are unique to the project, and every project has its own deliverables released at different intervals. For example, in a construction project, the deliverable (the finished building or structure) is delivered at the end of the project. We will discuss deliverables more in depth in other chapters.

Milestones of a Project

A milestone is a significant point or event on the project schedule that shows a major phase, deliverable, or task has been completed. You can think of a milestone as a checkpoint that helps indicate whether the project is on track and succeeding.

Examples of Milestones:

- ➢ Finalizing project requirements and scope documentation.
- ➢ Completing a physical prototype of a new product.
- ➢ Reaching the halfway point of the project timeline.
- ➢ Delivering the final, completed product or service to the client.

Nick's Tip:

You may be familiar with OKRs or other concepts that are similar to milestones. However, keep your focus on milestones for now, as they are more relevant for tracking project progress as it relates to the PMP exam.

Two Project Environments: Internal and External

Projects exist within two environments, known as the internal and external, that are relative to the organization. It's important to know these environments because they can influence all aspects of the project.

Internal Environment

An internal environment involves projects that are specific to an organization, focusing on providing internal facing value. Internal projects have many internal stakeholders and very few external stakeholders.

Example: An IT hardware project to upgrade internal employees' work equipment, such as new keyboards, headsets, monitors, and laptops.

External Environment

An external environment involves projects that deliver value to external parties, such as customers, vendors, or the general public. These projects often have a mix of internal and external stakeholders and a primary focus on meeting the needs of external parties.

Example: A bank creates a mobile banking app for easy account access for customers.

Project Outcome

The project outcome is the end result of a project regarding the benefits and value it was created to deliver.

If the project is successful, it has accomplished its objectives and provided the value it was set out to create. If the project fails to meet its goals and objectives, it can be considered a failure. Achieving project success requires carefully balancing three constraints throughout the lifetime of the project. These three constraints are time/schedule, cost/budget, and scope, which we'll talk about in the next chapter.

Value

Generating value is the fundamental goal of all projects, as they exist to deliver a positive benefit or outcome that meets stakeholder needs. Because value is subjective and a recurring theme in project management, understanding its impact is crucial for both the exam and real-world application.

Nick's Tip:

Not every stakeholder will agree on what a valuable project outcome is. The best way to know what stakeholders value and what specific end result they desire is to interview major stakeholders and understand their expectations of what they want the project to deliver. This is best done at the beginning stages of the project.

The 3 Main Approaches to Managing Projects

There are 3 approaches to managing a project that you will need to know and that we'll be covering frequently in this book.

Predictive

Predictive project management, also known as traditional or Waterfall, relies heavily on up-front planning and stable project conditions. It is often used by risk-averse organizations that value planning, have high budgets, and could be impacted by regulations. With this approach, the scope, schedule, and budget are well defined up front.

Adaptive

Known as adaptive or Agile project management, this approach focuses on speed to execution, flexibility, collaboration, and openness to change. This is best used for projects that are highly likely to change, in less risk averse organizations or where there is a need for quick execution.

Hybrid

Hybrid is a mix of both predictive and adaptive approaches. A hybrid approach is usually tailored, which means it will take elements from both predictive and adaptive approaches and fit them to the project. This helps cater exactly to the project needs.

Working with the PMO

A Project Management Office (PMO) is an internal group within an organization that provides project management standards, tools, resources, guidance, best practices, knowledge and support to project managers, project teams, and any internal employee working on a project.

This support is part of Organizational Project Management (OPM), which focuses on connecting projects, programs, and portfolios together.

Project Documents

Project documents help organize, track, and communicate details about a project. They are created for formal authorization of the project, to document risks, define how stakeholders will be engaged, and many other aspects of the project.

We'll cover various project documents and their purpose in depth in Chapter 13.

Here are some examples of a few common documents:

- **Project Charter:** Formally authorizes the project, establishes its purpose, and assigns the project manager.

- **Stakeholder Register:** Identifies and lists stakeholders and their roles.
- **Project Scope Statement:** Defines project work that must be completed in order to deliver the project on time and correctly. Defining the scope helps prevent unnecessary work overall.
- **Risk Register:** Tracks risks and documents strategies for managing risks if they are realized.

Introduction to Project Management Fundamentals Summary

In this introductory chapter, we laid the foundation for understanding the fundamentals of project management. We discussed the definition of a project, the role of a project manager, who stakeholders are, the main approaches used for managing projects, and other important concepts such as deliverables, milestones, and value.

In the next chapter, we'll dive deeper into basic project management principles and concepts, exploring topics such as project phases, methodologies, leadership styles, tailoring approaches, process groups, and processes.

Chapter 4
Project Management Principles and Concepts

Building upon the fundamentals from the previous chapter, we'll now focus on project management principles and concepts. We will cover the 8 performance domains, 12 project management principles, project governance and compliance, the 5 process groups and 49 processes, leadership and management techniques, and the concept of tailoring.

These principles and concepts all impact different areas of a project, are closely connected to project fundamentals, and will be covered more in depth throughout this book.

Key Terminology

Baselines: Reference points (scope, schedule, cost) used to measure a project's actual progress against planned progress.

Compliance: Adherence to legal, ethical, or industry-specific standards and regulations.

Constraints: Any factors that limit the project, such as scope, time, and cost, which are interdependent and significantly impact each other.

Organizational Governance Systems: Organization-specific methods and frameworks for managing projects, programs, and portfolios.

Organizational Structure: The structure of an organization that impacts how projects are managed, specifically regarding what manager project team members report to and what job duties they have.

Performance Domains: Eight important focus areas that encompass nearly every aspect of project management.

PMIS (Project Management Information Systems): Technology tools used to manage various parts of a project, such as scheduling, resources, and reporting.

Process Groups: The five main stages in project management, including initiating, planning, executing, monitoring, and closing.

Project Governance: The authority, accountability, and decision-making processes that guide projects.

Risk: Any uncertain event that may positively (opportunity) or negatively (threat) impact project objectives if realized.

Stakeholders: Individuals or groups that are affected by a project's outcomes.

8 Performance Domains

The 8 Performance Domains are major focus areas that encompass nearly all aspects of project management. It's very important to understand these domains to pass the exam, and the next eight chapters are dedicated to learning more about them.

1. **Stakeholder Performance Domain:** Focuses on identifying, managing, and communicating with stakeholders to ensure their needs and expectations are addressed effectively.
2. **Team Performance Domain:** Involves building, training, maintaining and managing a high performing project team.
3. **Development Approach and Life Cycle Performance Domain:** Addresses selecting and tailoring the development approach (predictive, hybrid, or adaptive) and managing the project's life cycle.
4. **Planning Performance Domain:** Encompasses the planning of a project across many aspects.
5. **Project Work Performance Domain:** Explains strategies and managing project activities and deliverables, ensuring alignment with objectives and maintaining performance.
6. **Delivery Performance Domain:** Ensures the successful delivery of project outcomes.
7. **Measurement Performance Domain:** Assesses project performance using appropriate metrics, key performance indicators (KPIs), and evaluation methods.
8. **Uncertainty Performance Domain:** Navigates uncertainty by managing risks, including threats and opportunities.

12 Project Management Principles

The 12 Project Management Principles are PMI's guidelines and best practices to help project managers lead projects effectively. Throughout your exam preparation, you will naturally start to understand and think about using these principles.

The 12 Project Management Principles Are:

1. Be a diligent, respectful, and caring steward.
2. Create a collaborative team environment.
3. Effectively engage with stakeholders.
4. Focus on value.
5. Recognize, evaluate, and respond to system interactions.
6. Demonstrate leadership behaviors.
7. Tailor based on context.
8. Build quality into processes and deliverables.

9. Navigate complexity.
10. Optimize risk responses.
11. Embrace adaptability and resilience.
12. Enable change to achieve the envisioned future state.

Project Governance and Compliance

Project governance provides a structured framework specifically tailored to an organization, guiding how the organization plans, executes, and monitors projects. Governance helps ensure project success by establishing organizational standards for processes, systems, and accountability.

Organizational Governance Systems

Organizational governance refers to organization-specific methods and strategies for managing projects, programs, and portfolios. By utilizing these internal systems, project managers and the Project Management Office (PMO) can ensure that projects are implementing best practices, addressing issues appropriately, maintaining control over resources, and are in line with strategic goals.

Compliance, Regulations, and Standards

Certain projects, organizations, or industries may have to adhere to compliance requirements, regulations, or industry standards because of legal, ethical, or industry obligations. This ensures that projects maintain integrity and minimize risks.

Regulation Scenario: A database project that stores patient information for a hospital needs to adhere strictly to HIPAA regulations.

Compliance Scenario: A software development project for a FinTech company must comply with the Sarbanes-Oxley Act (SOX) requirements to ensure accurate financial reporting and prevent fraud.

Standards Scenario: An internal cloud migration project for an organization may follow ISO 27001 cyber security standards to ensure protection of sensitive data.

Define Roles and Responsibilities

We define the following project roles under project governance:

- **Project Manager:** The individual responsible for planning, executing, and managing the project.

- **Project Sponsor:** The individual or group of individuals providing strategic or financial support for the project. Project sponsors often hold significant influence over the project and can provide guidance.
- **Steering Committee:** A group of senior stakeholders overseeing the project's progress. Projects don't always use a steering committee, and they're more common in predictive than in Agile approaches.

Establishing Decision-Making Processes

Effective project governance includes creating structured procedures and protocols for decision-making and proposing changes to the project. For example, proposed changes to a project using a predictive approach often go through a change management process, where a Change Control Board (CCB) reviews the change and approves or rejects it. The change management process helps prevent unnecessary changes to the project.

Monitoring Project Performance

Monitoring project performance includes establishing metrics to collect and reporting systems to track progress and measure performance against baselines.

Project Management Information Systems

Project Management Information Systems (PMIS) are tools or software that help manage many aspects of a project including schedules, resources, risks, and reporting.

Inputs, Tools, Techniques, and Outputs (ITTOs)

Project management relies on a variety of processes (inputs), supported by tools and techniques, to achieve project objectives and deliver value (outputs). While in previous versions of the PMP exam ITTOs were important to memorize, the current exam doesn't place much emphasis on memorizing them. Instead, the exam now focuses more on scenario-based questions and practical application of knowledge rather than memorization. Therefore, we won't specifically address ITTOs in this book. However, knowing about them is still important for general project management, and there are many videos and resources available online if you'd still like to learn more.

Risk Management

Risk management is the process of identifying, assessing, and developing response strategies for potential risks that could impact a project. Risks can be either realized or unrealized. Realized risks are risks that have already occurred in the past or are occurring in the present. Unrealized risks are risks that have been identified, have not occurred, but may occur in the future.

Risks are usually identified in the beginning of a project, and a risk response strategy can guide the project team on how to respond to a certain risk. While most risks can be predicted, there will inevitably be risks in the project that were not predicted.

There are two types of risks, known as threats and opportunities:

- **Threats**: Negative risks that, if realized, could harm the project.
- **Opportunities**: Positive risks that, if realized, could benefit the project.

We will thoroughly discuss risk in chapter 12.

Project Management Concepts

The basic project management concepts are project baselines known as reference points, the three constraints (scope, time, and cost), the three types of organizational structure, the five process groups and 49 processes, and the PMI talent triangle. Throughout this book, we'll cover many more.

Project Baselines

Project baselines are reference points used to measure actual progress compared to planned progress. The three main baselines are the scope baseline (what is being delivered), the schedule baseline (when it's being delivered), and the cost baseline (what financial cost it's being delivered at). We'll explore baselines more in depth in Chapter 21.

Constraints

Constraints in project management are factors that influence project delivery, with the most common being scope, time, and cost. These 3 constraints are interconnected, meaning that a change in one will cause changes in the other two. For example, expanding the scope often increases both time and cost. We'll cover constraints in Chapter 21.

Organizational Structure

The structure of an organization is a major factor that dictates who employees report to and helps understand where they will spend most of their working time.

There are 3 types of organizational structures:

1. **Functional**: In a functional organization, teams report to their functional or department managers. and their project management responsibilities are limited to very specific functions or departments. In an example of a functional organization, an employee would work 35 hours (nearly full-time) on operational work and spend a very limited amount of time (such as 3-5 hours per week) on project work.

2. **Projectized**: In a projectized organization, project teams and individuals on the team report directly to project managers, and many aspects of the organization are structured around projects rather than operational work. In an example of a projectized organization, an employee working full-time focuses primarily on project work.
3. **Matrix**: In a matrix organization, project teams and individuals report to both a functional manager and a project manager. This a mix between projectized and functional, since individuals on the project team have to balance their day-to-day responsibilities in their functional role with project work. In an example of a matrix organization, an employee would work on both operational and project work.

The 5 Process Groups and 49 Processes

There are 5 main process groups with 49 processes. Understanding each process group and each process will expand your practical knowledge of how projects progress from start to finish.

1. **Initiating (Chapter 14):** Creating and setting the foundation for the project by formally authorizing the project and identifying stakeholders. Contains 2 processes.
2. **Planning (Chapter 15):** Developing comprehensive plans for how the project will be executed, monitored, and closed. Contains 24 processes.
3. **Executing (Chapter 16):** Performing the work defined in the project management plan to achieve the project objectives. Contains 10 processes.
4. **Monitoring and Controlling (Chapter 17):** Tracking project performance, ensuring alignment with the plan, and managing changes**.** Contains 12 processes.
5. **Closing (Chapter 18):** Finalizing the project, obtaining acceptance of deliverables, and closing out project activities. Contains 1 process.

We'll cover the 5 process groups exclusively from Chapter 13 to Chapter 18.

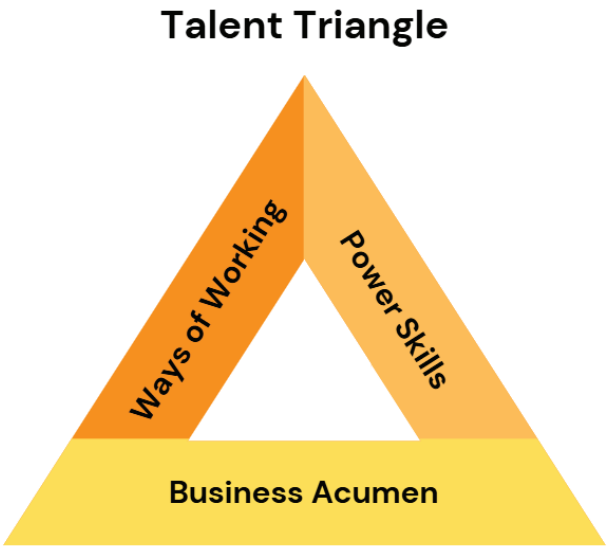
PMI Talent Triangle

The PMI Talent Triangle represents 3 essential factors that project managers need to succeed in modern project environments.

Essential Factors of the Talent Triangle:

1. **Ways of Working:** The project manager's ability to choose and adapt the best project management approach, framework, strategies, or methodology for a given project.
2. **Power Skills:** Leadership and people skills such as communication, negotiation, inspiring motivation, and team building.
3. **Business Acumen:** Understanding best business practices, organizational goals, industry trends, and financials.

Figure 4.1: *PMI Talent Triangle*



Leadership and Management in Projects

The ability to lead and manage project team members are two very important skills for project managers. The project manager will often customize or tailor their leadership style and management practices based on many different factors that will be covered throughout this book.

Leadership Styles

There are various leadership styles, such as servant leadership, autocratic leadership, transactional leadership, and laissez faire leadership. Each style takes a unique approach to motivating, coaching, building morale, and driving results within project teams. The leadership style a project manager should use will depend on personal preference, the project environment, project team dynamics, and organizational culture. We will cover leadership styles in depth in chapter 6.

Project Team Management

Project managers are responsible for creating collaboration, resolving conflicts, and promoting an environment where team members can succeed and complete their assigned work. We will discuss team management strategies, tips, and best practices in chapter 6.

Stakeholder Management

Stakeholder management, similar to project team management, is an ongoing process the project manager must engage in throughout the life of the project. Project managers must communicate with stakeholders, keeping them informed, addressing any concerns, and setting reasonable expectations. We will cover stakeholders and stakeholder management in chapter 5.

Tailoring

Tailoring is the process of customizing or adapting project management practices, processes, or approaches to fit the unique needs of a project. You can tailor nearly all aspects of a project in one way or another. We will talk about tailoring in more detail in Chapter 20.

Project Documents, Plans, and Updates

Project documents store essential information, details, and strategies about a project. Many of these documents are created during the planning phase of a project. As the project progresses through various phases and certain processes are completed, specific documents and plans are created or existing ones are updated with additional details. For example, once the risk register is created, it's continuously updated throughout the entire project.

There are 33 common documents and 20 plans that often appear on a project. Certain organizations may also have their own unique documents and plans, and certain approaches (for example, iterative or agile) may have specialty documents as well.

Figure 4.2: *33 Project Documents*

33 Project Documents	
Project Document	**Document Function**
1. Activity Attributes	Provides detailed descriptions and characteristics of each project activity.
2. Activity List	Lists all project activities required to produce deliverables.
3. Assumption Log	Records assumptions and constraints affecting the project.
4. Basis of Estimates	Documents the rationale and methods used to estimate costs, durations, or resources.
5. Change Log	Tracks changes made to the project scope, schedule, or costs.
6. Cost Estimates	Provides estimated costs for activities, tasks, or deliverables.
7. Cost Forecast	Predicts future project spending based on current progress.
8. Duration Estimates	Forecasts the time required to complete project activities.
9. Issue Log	Tracks project issues, their status, and resolutions.
10. Lessons Learned Register	Captures insights and lessons from project activities for future use.
11. Milestone List	Identifies key milestones and their completion dates.
12. Physical Resources Assignments	Allocates physical resources to specific tasks or activities.
13. Project Calendars	Defines working days and hours for project activities.
14. Project Communications	Records and tracks project-related communications with stakeholders.
15. Project Schedule	Defines the timeline for completing project activities and milestones.
16. Project Schedule Network Diagram	Visualizes the logical sequence and dependencies of activities.
17. Project Scope Statement	Defines the project's boundaries, deliverables, and objectives.

Figure 4.2: *33 Project Documents Continued*

Project Document	Document Function
18. Project Team Assignments	Identifies team members assigned to specific roles and responsibilities.
19. Quality Control Measurements	Tracks adherence to quality standards.
20. Quality Metrics	Specifies quality criteria to evaluate project deliverables.
21. Quality Report	Summarizes quality control findings and recommendations.
22. Requirements Documentation	Lists and describes project requirements and expectations.
23. Requirements Traceability Matrix	Links requirements to their origins and project deliverables.
24. Resource Breakdown Structure	Provides a hierarchical breakdown of resources by type.
25. Resource Calendars	Identifies resource availability over the project timeline.
26. Resource Requirements	Specifies the resources needed for each project activity.
27. Risk Register	Logs identified risks, their impact, and planned responses.
28. Risk Report	Summarizes overall risk exposure and management strategies.
29. Schedule Data	Contains detailed information about schedule components and constraints.
30. Schedule Forecast	Predicts future schedule performance based on progress.
31. Stakeholder Register	Identifies stakeholders and their roles, interests, and influence.
32. Team Charter	Defines team norms, values, and roles for effective collaboration.
33. Test and Evaluation Documents	Outlines procedures and criteria for validating deliverables.

Figure 4.3: 20 *Project Plans*

20 Project Plans	
Project Plan	**Plan Function**
1. Change Management Plan	Defines the processes for managing changes to project scope, schedule, cost, and other aspects.
2. Communication Management Plan	Outlines how project information will be communicated to stakeholders, including methods, frequency, and responsibilities.
3. Configuration Management Plan	Establishes procedures for tracking and controlling changes to project deliverables and artifacts.
4. Cost Baseline	Provides the approved version of the project budget against which performance is measured.
5. Cost Management Plan	Defines how project costs will be estimated, budgeted, and controlled throughout the project.
6. Development Approach	Describes the methodology or strategy (e.g., Agile, Waterfall) to be used for developing the project's deliverables.
7. Performance Measurement Baseline	Combines scope, schedule, and cost baselines to track and measure project performance
8. Project Life Cycle Description	Defines the stages a project will go through from initiation to closure.
9. Procurement Management Plan	Outlines the process for acquiring goods, services, or labor from external vendors.
10. Quality Management Plan	Details the quality standards, metrics, and processes to ensure deliverables meet project requirements.
11. Requirement Management Plan	Defines how project requirements will be collected, documented, tracked, and managed.
12. Resource Management Plan	Details how human, physical, and material resources will be acquired, allocated, and managed.
13. Risk Management Plan	Establishes the approach for identifying, analyzing, and responding to project risks.
14. Stakeholder Management Plan	Defines strategies for engaging stakeholders and addressing their expectations and concerns.
15. Schedule Baseline	Provides the approved project timeline and serves as a reference point for monitoring schedule performance.
16. Schedule Management Plan	Outlines how the project schedule will be developed, managed, and controlled.
17. Scope Baseline	Includes the approved project scope statement, WBS, and WBS dictionary as a reference for scope control.
18. Scope Management Plan	Details how the project scope will be defined, validated, and controlled.
19. Integration Management Plan	Ensures coordination and alignment of all project processes and components to achieve project goals.
20. Closing/Transition Plan	Outlines the steps for completing the project and transitioning deliverables to operations or stakeholders.

Project Management Principles and Concepts Summary

In this chapter, we explored the basic project management principles and concepts, including the 8 performance domains, 12 project management principles, project governance and compliance, 5 process groups and 49 processes, risk management, leadership styles, stakeholder management, and tailoring.

Everything that you've learned in this and the previous chapter will serve as a solid foundation when you read the rest of this book and throughout your studies. Over the course of the next eight chapters, we'll discuss the 8 performance domains, starting with the next chapter on the Stakeholder Performance Domain.

Chapter 5
Stakeholder Performance Domain

The Stakeholder Performance Domain is the first of the eight performance domains. This domain focuses on the people side of project management, including identifying, managing and engaging with stakeholders to ensure they're satisfied and aligned with project goals.

In this chapter we'll cover all aspects of stakeholders, communication strategies, and communication plans. Stakeholders play a huge role in the expectations of a project and what direction it will take. Most projects will have multiple different stakeholders, which all require specific considerations.

Main Outcomes and Objectives of the Stakeholder Performance Domain

The main outcomes and objectives of the stakeholder performance domain are:

- Building and maintaining positive relationships with stakeholders.
- Aligning stakeholder sentiment with identified project objectives.
- Ensuring stakeholders have a positive attitude and contribute to the project, while minimizing negative aspects of stakeholders who oppose the project.

Key Terminology

Stakeholder: Any individual, group, or organization that can influence, or impacted by decisions, actions, or outcomes related to a project, program, or portfolio.

Stakeholder Analysis: A structured approach to collecting and evaluating both quantitative and qualitative data to identify which stakeholders' interests need to be considered throughout the project.

Stakeholder Communication Plan: A structured approach for determining what information needs to be communicated with stakeholders and what medium it will be communicated through.

Stakeholder Engagement: The process of interacting and communicating with stakeholders to meet their expectations, needs, or concerns.

Stakeholder Register: A document listing all identified stakeholders, detailing their contact information, interests, roles, and potential impact on the project.

Push Communication: A one-way communication approach where information is sent to stakeholders without expecting immediate feedback.

Pull Communication: A communication method where stakeholders can retrieve information they need whenever they need it.

Introducing Stakeholders

A stakeholder is anyone that is affected by the progression or outcome of a project. Stakeholders could be individuals or groups of people internal to the organization, such as project team members, executives, managers, and employees, or external to the organization, such as vendors, contractors, customers, or even residents of a city. There are almost no limits to who could be considered as a stakeholder.

Stakeholder Identification

The first step in working with stakeholders first is identifying them. Stakeholders are the individuals, groups, or organizations that affect or are affected by the project. They can support, be neutral towards, or entirely opposed to the project or certain aspects of the project.

For any given project, there can be dozens, hundreds, thousands, or even millions of stakeholders depending on the size, reach and scope of the project.

Throughout the project, new stakeholders may be introduced, previous stakeholders' interest and sentiment may go up or down, and various factors surrounding stakeholders will change.

High-level Stakeholder Identification

High-level stakeholders are usually the first to be identified because they can make or break projects with their support. These high-level stakeholders can be thought of as "VIP stakeholders" as they're often prioritized first for communications and updates surrounding the project.

Identifying Internal Stakeholders

Once high-level stakeholders are identified, then internal stakeholders should be identified. Internal stakeholders are any stakeholders internal to the organization undertaking a project.

Common examples of internal stakeholders include:

- **Company Leadership**: Executive and senior leaders such as C-suite executives, and other senior leaders who guide overall business strategy and direction.
- **Functional Managers**: Managers from internal departments like finance, HR, and IT who oversee operations, resources, departments, employees, and specific business functions within an organization.

- **Governing Bodies and Committees**: Internal groups that often offer high-level oversight. These are groups such as the board of directors, steering committees, and compliance committees.
- **Project Management Office (PMO)**: The Project Management Office (PMO) can help oversee and ensure the success of project portfolios, programs, and projects. They provide resources, training, and help program and project managers. Not every organization will have a PMO, but many larger organizations do.
- **Internal Project Team Members**: Project team members are the individuals actively working on the project.
- **Internal Project Sponsors:** Internal project sponsors are usually high-level leaders that have a lot of power within the organization. They often have a vested interest in the project's success, and the project manager may work with them often to ensure project success.

Identifying External Stakeholders

External stakeholders are identified after internal stakeholders. As with internal stakeholders, external stakeholders' interest will constantly shift throughout the project.

Common examples of external stakeholders include:

- **Community**: The broader community outside of the organization that may be impacted at large. This is especially important during projects of public impact, for example, in public transport or infrastructure.
- **Customers or End-users**: Use or are affected by the project and the deliverables it creates.
- **Regulators**: Regulators such as government agencies or auditors ensure that compliance is being met for projects or deliverables in projects or industries that operate under regulations, standards, guidelines, or other potentially limiting legalities.
- **External Sponsors**: Project sponsors that are external to the organization could be financial backers or partners, or other parties that stand to benefit from the project's success.
- **Vendors and Suppliers**: Outside vendors and suppliers that are supplying labor, software, materials, etc. They have an interest in the project because the project is creating some sort of business transaction for them.
- **External Project Team Members:** There may be members on the project team that are external to the organization. These are usually experts who are providing some sort of contract labor, expertise, or consulting to the organization undertaking the project.

Defining Stakeholders As Groups

In any project, there are many stakeholders. These stakeholders are often identified as groups rather than single individuals.

For example, in an infrastructure project for a city with a population of 30,000, stakeholders may include the project team, the construction crew, zoning and construction regulators, government officials, vendors, and the residents of the community affected by the infrastructure development.

In this example, we do not classify all the residents individually. Rather, they're considered a stakeholder group. Although the project affects thousands of residents, the opinion of each individual resident may not necessarily impact the project directly. Instead, the group of residents represents an important stakeholder with influence over the project's progress.

Stakeholder Analysis

After identifying all potential stakeholders, project teams can perform a stakeholder analysis. This analysis gauges all identified stakeholders' power, influence, interests, and ability to impact the project.

Stakeholders are analyzed based on these factors:

- **Power and Influence:** How much influence stakeholders have on the project and their ability to affect the project given their power or status within the organization.
- **Interests, Expectations and Beliefs:** What they want from the project, how the project aligns with their goals and what they believe the project will accomplish.
- **Proximity to the Project:** How directly stakeholders are involved with the project.
- **Impact:** Their potential effect on project success.
- **Other Aspects:** Specific factors unique to the stakeholder or the project.

Understanding the unique factors each stakeholder brings to the table helps predict how a stakeholder might behave, and how to respond to them, ensuring positive outcomes or mitigate a negative one. Project teams should continue to analyze stakeholders as the project progresses because stakeholders' feelings, beliefs, values, power, and influence are constantly shifting.

Stakeholders Opportunities and Threats

We consider a stakeholder supporting the project an "opportunity" or a positive risk. However, if a stakeholder is not in support of the project, they are considered a "threat" or a negative risk.

We will cover opportunities and threats more in the chapter on the Uncertainty Performance Domain.

Stakeholder Interactions

Stakeholders often interact with each other, and the project team needs to consider the potential shifts in the project that can occur based on stakeholder interactions.

Nick's Tip:

Stakeholder analysis should be performed by and shared with only the project team. It should be used to help predict project outcomes based on stakeholder involvement.

Stakeholder Engagement Strategies

Keeping stakeholders engaged and updated on the progression of the project is crucial for maintaining their support and maintaining their investment in the project. Engagement needs to be done throughout the project by creating and using tailored communication methods, exercising active listening, and soliciting stakeholder feedback and opinions on important aspects of the project.

Project managers and project teams rarely engage in communication with all the stakeholders. Instead, they prioritize communication with specific stakeholders, often focusing on high-level stakeholders identified early in the stakeholder identification process. As the project progresses through different phases, communication needs for stakeholders may change.

Communication Strategies

There are several communication strategies that can help engage stakeholders. Project teams will usually document communication strategies in the project communication plan.

Examples of these communication strategies are:

- **Communicating and Engaging Early**: Stakeholder engagement starts during project initiation and continues throughout every phase of the project until completion. Early involvement and building relationships with the stakeholders is crucial, and it helps manage expectations while increasing the likelihood of project success.
- **Prioritizing Stakeholders:** Once high-level stakeholders are identified, the project team will need to prioritize communications to focus on those stakeholders.
- **Managing Expectations:** Every stakeholder will have a different understanding of how a project should go and the results it should achieve. It's important to set expectations early and throughout the project and clarify what is realistic and possible. When issues arise, oftentimes expectations need to be managed and clarified, especially during times of unforeseen risks appearing.

Formal vs Informal Communication

Both formal and informal communication can be used to communicate information about a project project manager, project team and stakeholders.

Each form of communication serves different purposes:

- **Formal Communication:** Formal communication is structured and follows set processes. It's planned, documented, and often communicated through reports, presentations, or meetings. It's mainly used for official communication in regards to project updates, contracts, and stakeholder meetings.

  Example: A project manager holds a monthly meeting with important stakeholders and the project team, outlining current progress, potential and realized risks, and next steps.

- **Informal Communication:** Informal communication is unplanned, casual, and quick. It's used for simple day-to-day exchanges and problem-solving through chats, messages, emails, or short meetings.

  Example: A brief voice call between a project team member and the project manager to clarify details of a task.

Figure 5.1: *Contrasting Formal and Informal Communication*

Formal and Informal Communication		
Communication Method	**Formal Communication**	**Informal Communication**
Structure	Highly structured and planned	Casual, spontaneous, and flexible
Documented	Often documented for future reference	Not typically documented
Tone	Professional and official	Personal, easy-going and conversational
Speed of delivery	Usually slow because of formalities	Fast, immediate, and on-demand
Example	Official project meetings, reports, contracts, e-mail updates, presentations	Instant messages, quick emails, last minute or impromptu conversations

Push, Pull, & Interactive Communication

Push, pull, and interactive communications are forms of communication strategies adopted to streamline project communication.

- **Push Communication:** Push communication is a one-way communication that can be sent and received at any time without expectation of an immediate response.

  Common push communication methods: Sharing updates, reports, or information through email. Information is "pushed" out proactively to stakeholders, ensuring they have the information with no need for them to respond in real-time.

Example of push communication on a project: A project manager sends a weekly status report through email every Friday to all high-level stakeholders, detailing project progress.

- **Pull Communication:** Pull communication gives the stakeholder the ability to find information on their own whenever they need it. This is usually done through accessing project resources that already exist.

  Common pull communication methods: A stakeholder accessing a project intranet site, shared folder, internal wiki or knowledge base, or real-time data dashboard to access information. Stakeholders "pull" the information whenever they need it and at their own discretion.

  Example of pull communication on a project: A stakeholder accesses a project's intranet site to access existing project documents, such as the project charter.

- **Interactive Communication:** Interactive communication is two-way communication with real-time communication between parties. This focuses on immediate discussions, updates, feedback, and collaboration.

  Common Interactive Communication Methods: Include meetings (virtual or in-person), phone calls, workshops, and videoconferencing. This is ideal when stakeholders need more complex discussions or immediate feedback.

  It can be used for one time situations known as onetime interactive communication or on a frequent basis known as repeating interactive communication.

  Example of interactive communication on a project:

  One-time Interactive Communication: The project manager, project team, and key stakeholders gather for a project kickoff meeting on a video call to discuss project goals, concerns, and expectations.

  Repeating Interactive Communication: Once a week on Mondays at 3:00 PM, the project manager and project team meet to discuss important project progress.

Tailored Communication Plans and Feedback

Not all stakeholders need or desire the same amount or methods of communication. In order to understand each stakeholder's communication preferences, their preferences can be gathered through surveys, focus groups, or by asking them directly.

Once stakeholder feedback is gathered, the project team can create a tailored communications plan. This is a custom plan detailing how communications will be handled, including communication frequency, channels, and methods each stakeholder prefers. The project team can refer to this plan throughout the project to make sure each stakeholder gets the information they need and remains engaged, supportive, and satisfied.

Managing Difficult Stakeholders

The project manager and project team will eventually face difficult or opposing stakeholders. These stakeholders can resist certain aspects of a project, or the entire project. When problems arise, they often demand unrealistic responses or changes that aren't in line with the project's scope, budget, or schedule.

This is where the project manager will need to set expectations and work on actively managing these stakeholders through effective communication and negotiation. The project manager should focus on being a good servant leader and shielding the project team from any difficult or distracting stakeholders that may affect the team's work.

Strategies to Manage Difficult Stakeholders:

- **Early Engagement:** Focus on proactively addressing concerns before they escalate.
- **Transparency:** Keep communication open, honest, and productive. Don't make promises that aren't realistic or can't be fulfilled.
- **Demonstrating Benefits:** Show how the project aligns with their specific interests.
- **Conflict Resolution:** Use techniques like active listening and negotiation to address any conflict that comes up.

Stakeholder Monitoring and Adjustment

Project managers must continuously monitor and adjust stakeholder engagement, communication, and participation throughout the project. As the project progresses, stakeholder attitudes, interests, and power will also change. The project team will need to continuously adapt engagement strategies to make sure that stakeholders are receiving the proper amount of communication and maintain positive sentiment for the project.

Stakeholder Sentiment Change

If stakeholder sentiment changes from positive to negative, it is important to understand why it shifted and work to remedy it. If stakeholder sentiment shifts from negative to positive, it indicates that the project is well-managed, progressing appropriately, and meeting stakeholder needs.

Stakeholder Performance Domain Interaction with Other Domains

The stakeholder performance domain affects all of the other domains, particularly the:

- **Team Performance Domain**: The stakeholder performance domain will interact with the team performance domain. Since project team members can be considered stakeholders,

managing them is critical to building a productive and collaborative working environment. We cover the team performance domain in the next chapter.

- **Uncertainty Performance Domain:** Managing stakeholders is essential as stakeholders can either be threats or opportunities to the project. Prior engagement with stakeholders helps reduce uncertainties and to gain their support for risk management strategies. We will discuss the uncertainty performance domain in depth later in the book.

Stakeholder Performance Domain Summary

In this chapter on the Stakeholder Performance Domain, we learned how to identify, analyze, communicate with, and monitor stakeholders. By implementing the knowledge and best practices in this domain, project teams ensure the best chance of stakeholders' support and overall project success.

In the next chapter, we will explore the Team Performance Domain, where we discuss how team dynamics and management contribute to project success.

CHAPTER 6
Team Performance Domain

The Team Performance Domain focuses on the project team aspect of project management, including team collaboration, communication, leadership, and interpersonal skills.

In this chapter we'll cover who comprises the project team, common leadership styles and how to tailor them, project team culture, strategies for building and maintaining a high-performing team, factors for driving team performance, and how to establish a shared vision with the team.

The primary goal when working with a project team is to build and maintain a high-performing team and positive culture that drives positive project results. This is achieved through trust, shared ownership, and effective communication between individual team members.

Main Outcomes of the Team Performance Domain

The main outcomes and objectives of the Team Performance Domain are:

- ➢ Fostering shared ownership and accountability among team members.
- ➢ Achieving high performance both collectively and individually.
- ➢ Developing effective leadership and communication skills within the team.

Key Terminology

Interpersonal Skills: Skills such as communication, emotional intelligence, conflict management, and active listening that are crucial for effective teamwork and leadership.

Leadership Style: The approach or strategy used by the project manager or other project team leader to guide, motivate, and manage the project team. A few common styles include autocratic, democratic, laissez-faire, and servant leadership.

Project Management Team: A group of people who coordinate and manage the overall project. Their role includes strategic planning, risk management, and decision-making to guide the project toward successful completion.

Project Manager: The person who oversees the project and leads the project team. The project manager ensures that the project meets its goals, budget, deadlines, and objectives through all phases of project planning and execution.

Project Team: The group of people doing the actual work on the project, completing deliverables, and contributing their expertise to complete tasks and deliverables. The project team includes all

individuals involved in executing the work necessary to achieve the project's objectives, including the project manager and the project management team.

Team Culture: The set of values, behaviors, and practices that define how the project teams interact, collaborate, and perform. Positive team culture is essential for high performance.

Team Development: Developing and improving the teams, mainly focusing on communication, collaboration, and shared goals. It also involves enhancing team members' problem-solving skills and encouraging positive dynamics among them so that they can work cooperatively and cohesively on projects.

Defining the Project Management Team and the Project Team

When we discuss the project team, there are two terms that are frequently brought up that can be confusing to distinguish between.

These terms include:

1. **The Project Management Team:** This describes the project team members who are directly involved in managing the project at a high level. Usually, this is the project manager and can sometimes include a few additional team members.
2. **The Project Team:** The project team encompasses all the individuals working on the project, particularly those who work on and produce project deliverables and project outcomes.

The major distinction between the two is that the project management team focuses on the administrative, strategic, and managerial aspects of the project, while the project team is broader, including everyone contributing by both planning and execution of the project.

Common Leadership Styles

Effective leadership is critical to ensuring the project team performs at a high level and maintains morale. Usually, the project manager is the appointed leader of the project and is the one who provides leadership to the project team. It's also common for experienced project team members to step up to take specific leadership roles as needed. The exact leadership style chosen depends heavily on the project team's experience, the project approach being used (either traditional or agile), and other factors.

There are two main leadership structures, known as centralized and distributed leadership. Both structures have their own sub-set of leadership styles, which allow project managers to best lead their specific project and project team.

Centralized Management and Leadership

In a centralized leadership structure, a clear hierarchy exists, with decisions and leadership responsibilities resting on one individual, usually the project manager. The three typical examples of centralized leadership are autocratic, transactional, and charismatic leadership.

1. **Autocratic Leadership**

   In this style, the project manager makes decisions with little to no input from the project team. It allows for extremely fast decision-making but often reduces long-term team engagement, fosters conflict, high turnover, low team morale, and limited innovation because of the lack of team input.

   Example: A project manager increases the workload of all the software developers on the project team to quickly complete a deliverable before an impending deadline. Since the project manager does this without first consulting project team members, it falls under centralized leadership.

2. **Transactional Leadership**

   Transactional leadership focuses on leading through using rewards and punishment to drive project team performance. In this leadership style, leaders assign project team members clear goals, tying performance to incentives such as financial bonuses or consequences, such as losing a promotion.

   Example: Everyone on a project team is financially motivated to be mindful of project budget and to keep the project below budget throughout the phases of project execution. At the end of the project, it's reported that the project comes in under budget, and the project team receives a monetary bonus.

3. **Charismatic Leadership**

   Leaders use charismatic leadership to inspire and energize the project team through enthusiasm and a shared project vision. Charismatic leaders often focus on driving motivation and promoting a strong sense of purpose and community among project team members.

   Example: A project manager rallies the project team during a meeting with an inspiring speech about how the project will not only transform the company's future but also improve the project teams' careers and positions in the company.

Distributed Management and Leadership

In distributed leadership, leadership is decentralized, focusing heavily on collaboration between the project manager and the project team. The project manager focuses on providing the resources and coaching needed to succeed, and project team members help make decisions or may take on leadership roles depending on their expertise. This form of leadership allows for the most flexibility and freedom for the project team.

The common distributed leadership styles are servant leadership, democratic leadership, laissez-faire leadership, and situational leadership.

1. **Servant Leadership**

   The servant leadership style and philosophy focuses on the leader's primary role being serving the project team by removing obstacles, fostering team and individual growth, and empowering all project team members to perform at their best. Servant leadership is the most relevant type of leadership to know for the current exam because of the popularity of it within Agile environments.

   Four Main Characteristics of Servant Leadership:

   Putting the Team First: Putting energy towards ensuring that the project team receives proper care, coaching, and satisfaction with the work they're doing. Servant leaders prioritize preventing unnecessary stress for the project team.

   Obstacle Removal: Identifying and eliminating any barriers to team performance. Some of these barriers include conflict, lack of resources and support, accountability issues, and lack of incentives.

   Being a Diversion Shield: Protecting the team from unnecessary distractions that can divert their attention from important project work.

   Encouragement and Development Opportunities: Fostering personal and professional growth and development within the project team.

2. **Democratic Leadership**

   In democratic leadership, the project manager and project team make decisions together through open collaboration and discussion. All team members' opinions are valued and considered. This leadership style creates a high level of engagement throughout the teams, but can significantly slow down the decision-making process because of the amount of conversation that occurs.

   Example: The entire project team openly discusses and votes on the best way to tackle a new project requirement.

3. **Laissez-faire Leadership**

   In this form of leadership, the project manager takes a hands-off approach, allowing the project team to have autonomy in making crucial decisions. This can empower the project team, but can also lead to a general lack of direction if not managed properly.

   Example: The project manager allows the project team to work and find solutions independently as they confront challenges while executing the project.

4. **Situational Leadership**

   In situational leadership, the project manager adapts their leadership style based on the project team's experience and maturity, as well as the project's needs or requirements.

Situational leadership requires significant flexibility and awareness to pull off and can allow the project manager to change leadership styles as the project dictates. This is also called "tailored leadership" or "tailoring your leadership style".

Example: The project manager uses autocratic leadership at the beginning of the project, but moves toward a democratic leadership during the middle of the project.

Factors For Tailoring Leadership Styles

Leadership styles should be tailored or changed to the unique needs of a project based on different project factors, such as the location and experience of the project team and organization factors.

Location of the Project Team

With the rise of remote work and the potential for project team members being spread across the globe, location matters now more than ever. Achieving strong and consistent levels of communication, collaboration, and performance in a project team that has people working in different states, countries, and even continents can be very difficult.

Six ways to ensure remote teams work well together:

- **Effective Equipment:** Ensure that all team members have proper audio and video equipment and capabilities for meetings.
- **Communication Standards:** Make sure that communications are in line and set standards for communication and ongoing contact, for example, e-mail and instant messaging.
- **Time Zone Management:** For international teams, setting a standard time zone for meetings and updates will allow team members to calculate time differences and avoid confusion.
- **Centralized Knowledge:** Create and maintain an internal project wiki, SharePoint, or site set-up for team info and collaboration
- **Team Relationships:** Set aside time for project team member introductions and team-building efforts throughout the project.
- **In-person Meeting:** If possible, have at least one face-to-face meeting to allow for relationship building in person.

Experience and Maturity of the Project Team

The more work experience and maturity the project team has will influence the leadership style selected. Consider factors such as the project team members' seniority in the organization, familiarity with each other, and if they have experience with the specific project type being undertaken.

Inexperienced and New Team Members

On projects with less experienced team members, the project manager plays two major roles. These roles include guiding the project team closely, as well as supporting individual team member growth.

Example: In an IT project comprising mostly new entry-level tech employees, the project manager adopts an autocratic leadership style in the beginning. As the project team becomes more experienced and familiar, the project manager adopts a democratic style.

Experienced and Senior-Level Team Members

When the project team consists of experienced and senior-level team members, the project manager can usually be more hands off with their leadership style, with a focus on directing work. Most senior-level team members can be self-sufficient and capable of managing their own responsibilities. However, the project manager will still need to provide individual support and coaching as needed.

Example: A construction project has mid-level to senior-level employees who have been at the company for many years. The project manager implements a democratic or laissez-faire leadership style at the start of and throughout the project.

Organizational Governance Structures

Every organization is unique and will vary in what structures, values, and standards it has in place. Often, project managers tailor their leadership styles to these specific organizational factors.

High-level internal employees, including C-level executives and top management, also dictate management and leadership styles. Many organizations have specific leadership styles that are adopted by all employees in the company, whether the work is operational or project oriented.

Organization Experience With This Type Of Project

The organization's familiarity with the type of project being undertaken also influences the leadership style chosen. As a project manager, you might use a specific leadership style that is common within your organization. However, if a new project type comes up, such as an innovative technology project, it may require a unique leadership style that is uncommon in the organization.

Example #1: Project Type Is New to the Organization

When managing a project that is unfamiliar to the organization, a project manager will usually adopt a centralized leadership style. This allows the project manager to provide the team with clear instructions and close guidance, especially during the early stages. As the project team

becomes more confident, the leadership style used by the project manager can change to allow the project team more freedom and autonomy to help with project decisions and work.

Example #2: Project Type Is Common to the Organization

In contrast, when the organization has worked with a project type previously, the project manager can implement a more distributed leadership style, such as a servant leadership style from the beginning of a project. Since the team is likely experienced with the processes and challenges of this type of project, they can have more autonomy in decision-making upfront.

The project manager's role in this scenario shifts to facilitating and supporting the team, encouraging collaboration, and providing guidance only when necessary or when asked. This fosters a more empowered and collaborative team dynamics with very minimal shift from start to finish.

Team Development

In any project, developing a high-performing project team is one of the most important areas a project manager can invest time into. It requires employing team development best practices, including creating a shared vision, defining roles and responsibilities, creating standard team operations, and providing guidance and growth.

Vision

A clear, easily understandable, compelling and shared vision of project success is crucial to aligning the project team with the project's objectives. Project team members need to understand how their roles specifically contribute to achieving broad project goals and success.

Besides aligning the team, a shared vision also creates a sense of personal investment and purpose for each team member, as they see their contributions leading to project completion.

Example: In a project to develop a new software, the project team implements Agile methodologies and focuses on short-term sprints. The project manager continuously reminds the team of their shared vision and how their work contributes to the upcoming software launch and company.

Roles and Responsibilities

Clearly defining roles and responsibilities ensures that everyone on the team knows their job duties and what to work on. It also significantly reduces the amount of confusion and work overlap, while increasing accountability among individual team members.

Example: In a construction project, delegating one engineer to be responsible for site inspections while another engineer handles quality control. This ensures that there is clear accountability for specific deliverables and no work overlap.

Project Team Operations

Strong team operations start with effective communication, problem solving, and making effective decisions. By establishing clear team norms, communication protocols, and expectations for collaboration, the team can function smoothly and develop at a strong pace.

Example: A diverse team working remotely with team members in multiple countries establishes a rule that all due dates or references to time should be in CST (Central Standard Time).

Guidance and Growth

Project managers often guide the entire project team and individual team members to keep everyone on track with their work, deliverables, and tasks. Guidance and growth should be continuous at all stages of the project, not just tied to immediate deliverables of a project.

The project manager can facilitate growth by identifying two areas where a project team or individual is performing well, and one area where there needs improvement. By working together, the project team and project manager can identify goals for improvement together and take steps to meet those goals, becoming more effective and productive.

As project managers we can also coach project team members and help them achieve career goals like skill development, experience gain, and exposure to specific project areas or niches. The more a project manager will invest in team members, the more they will invest in the project.

Nick's Tip:

When offering feedback on an individual's performance, start by commenting on two areas they are doing well, and then identifying one area that need improvement.

This approach reinforces positive feedback, and while providing one clear, actionable focus for growth. Overloading someone with criticism can significantly discourage them, but highlighting their strengths first along with an area of improvement significantly helps motivate and encourage improvement.

Project Team Culture

Every project naturally develops its own team culture, which is created by a mix of the norms and culture of the organization, the project team's attitude and sentiment, and the behaviors of individual project team members. This includes how project team members interact, collaborate, and communicate with each other. The project manager should always strive to establish a baseline culture that fosters both respect and open communication.

Factors in Team Culture

A few different factors, including transparency, integrity, honesty, and ethics sway team culture.

1. **Transparency:** Openness in one's way of thinking, decision making, and ways of understanding information builds a solid team culture. Honest communication is the key to being transparent. Transparency around goals, performance, risks and challenges ensures that the team can work towards solutions together.
2. **Integrity Through Honesty:** Being honest are ways of demonstrating integrity.
3. **Honesty:** Honesty is shown through being forthcoming of risks, being open with bad news and not hiding it, giving accurate status reports on projects, and communication.
4. **Ethics:** Ethics go hand in hand with honesty. Someone can be ethical in many ways with examples of being ethical including disclosing conflicts of interests, reporting defects or negative effects in products or deliverables, demonstrating fairness, and making decisions based on financial, stakeholder, organizational, and environmental impacts.

Respect and Positive Discourse

Respect and positive discourse, when present in a project team, can significantly enhance performance and understanding between the team.

Respect is demonstrated by acknowledging and valuing the skills, expertise and perspectives that each team member brings to the project. It also includes being non judgemental to how other team members uniquely approach their work.

Positive discourse encourages productive conversations where differing opinions are present. These conversations create mutual understanding, learning, growth and collaboration between the team rather than conflict or hostility. The focus of positive discourse is to find win-win solutions that benefit everyone, and avoid unproductive debates that create tension and contribute to win-lose situations that only benefit one person or party.

Support and Courage

Providing support and courage helps build positive morale and team culture. When project team members feel properly supported, they display courage, they often take more calculated risks, contribute innovative ideas, and improve productivity.

Support involves the project manager helping the project team through problem solving, removing roadblocks, providing encouragement, showing empathy, and active listening. When done right, supporting provides a platform for team members' complaints, fostering a trusting environment and creating a positive culture.

Courage involves empowering team members to take new risks, propose new solutions, and challenge ideas constructively. A team culture that values courage motivates the team to voice differing opinions, innovate, and try alternative approaches, knowing they won't be penalized for failure.

Project Success

Both throughout the project and at the end of the project, it's important to celebrate success and recognize accomplishments at an individual and team level to nurture high morale and motivation. This requires acknowledging achievements, no matter how small, and to show appreciation for the hard work and effort being put in by the project team.

Celebrating success can be as simple as a verbal recognition during a meeting, written acknowledgment via email, or financial bonus.

Factors For Building and Maintaining a High-Performing Team

Building and maintaining a high-performing team on a project takes a significant amount of work, but pays dividends throughout the project. It necessitates open communication, shared ownership, building trust and collaboration, promoting adaptability and resilience, and empowerment and recognition.

Open Communication and Shared Ownership

Open communication and shared ownership are essential aspects of building a high-performing team. When team members feel heard through open communication and take ownership of their work, they are more engaged, motivated, and committed.

- **Open Communication:** Through open and honest communication, team members feel comfortable expressing their opinions, concerns, and ideas. This openness promotes problem-solving, innovation, and collaboration in meetings, brainstorming sessions, and other project activities.
- **Shared Understanding and Shared Ownership:** A shared understanding and ownership of the project's objectives and outcomes is critical to team performance. When all team members understand the purpose of the project and take ownership of their work, they often contribute far more to project goals.

Trust and Collaboration

Trust is the cornerstone of effective teamwork. When project team members trust each other and the project manager as their leader, they are far more likely to contribute fully and collaborate effectively.

- **Trust:** Trust between the project team, the project manager, and the organization is crucial. If the project team has a solid foundation of trust built, they are much more likely to put 100% effort into their work. Without a solid foundation of trust in any area, it's unlikely that the project team will deliver the highest quality work they're capable of.
- **Collaboration:** Collaboration is when project team members work together to help complete work, answer questions, or provide assistance and guidance to each other. This collaboration between team members drives better teamwork, execution of tasks and higher quality work compared to isolated, independent work.

Adaptability and Resilience

The ability to adapt to changes and recover from any setbacks is essential for the project team to maintain high performance under periods of pressure.

- **Adaptability:** Adaptability is the ability to adjust quickly to new requirements or changes. Changes in a project can happen in scope, budget, schedule, and more. By being adaptable, the project team can maintain productivity in an ever-changing project environment.
- **Resilience:** Resilience is the ability to recover from setbacks (such as missed deadlines, unexpected issues, delays in receiving supplies). Resilience allows the team to remain focused and motivated despite non-favorable conditions.

Empowerment and Recognition

Empowering team members to make independent decisions significantly increases their autonomy. Additionally, recognizing their contributions helps create an environment of motivation.

- **Empowerment:** When team members are empowered to make decisions on their own, without constant oversight or micromanaging, they feel more confident and invested in their work. Micromanagement opposes empowerment and significantly hinders performance and should be avoided.
- **Recognition:** Similar to celebrating success, recognizing individuals or the team for their hard-earned accomplishments boosts morale and encourages high performance. Even small acknowledgements like a "thank you" to an individual or the team for hard work can go a long way in driving performance.

Factors For Driving Team Performance

Driving team performance on projects requires the project manager to demonstrate excellent emotional intelligence, conflict management, critical thinking, and an understanding of how team members are motivated. These factors are vital leadership skills that help to sustain and drive project team performance throughout a project.

Emotional Intelligence

Through demonstrating emotional intelligence as a project manager, you can better understand project team members individually and connect with them. There are four main aspects of emotional intelligence you should be aware of.

Four Core Aspects of Emotional Intelligence:

- **Self-Awareness**: Understanding your own emotions and how they affect your thoughts, behaviors, and ultimately others on the project team.
- **Self-Management**: Controlling your own emotions, especially under pressure.
- **Social Awareness**: Recognizing the emotions, needs, and concerns of others on the project team and being able to respond appropriately.
- **Social Skills**: Building and maintaining positive relationships within the team. Social skill involves open, honest and clear communication, collaboration, and resolving conflicts through best conflict management practices.

Conflict Management

Conflict is inevitable in any project, and how it's managed will play a large role in a team's success. It doesn't always have to be negative. In fact, conflict can drive innovation and problem-solving when addressed correctly by using these best conflict management guidelines.

Conflict Management Guidelines Include:

- **Communicate Openly and Respectfully:** Ensure that communication is clear, direct, and free of personal attacks, biases, or negative beliefs.
- **Addressing Conflict Early:** Don't wait for tensions to rise and conflicts to escalate before addressing them. The longer conflicts go unaddressed, the more damage it can cause to a project team's morale and productivity. Address conflicts as soon as possible.
- **Use Active Listening:** When addressing conflicts, allow everyone involved to express their viewpoints one at a time. Listen and validate each person's perspective before moving towards a resolution. One of the greatest gifts you can give your team as a leader is making team members feel that they have been heard, understood, and appreciated.
- **Negotiate:** After you've heard why a conflict has started, work towards negotiating an outcome where all parties involved can benefit. We will discuss negotiation tactics later in the book.
- **Focus On Issues:** When resolving conflict, keep the conversation on the issue rather than on someone's personal attributes. By focusing on issues and not people, the conversation stays productive instead of turning into a debate or personal dispute.

- **Think of Now and The Future:** Avoid revisiting old issues or blaming past actions for anyone on the team. Focus on resolving the current conflict, and setting a positive direction for the future.

Critical Thinking

Critical thinking helps us recognize our own biases, identify root causes of issues, and solve complex issues. It involves disciplined, rational, and evidence-based thinking. Project managers must approach situations with an open mind and objectively analyze information without letting personal biases interfere.

Common concepts in critical thinking are using imagination, insight, intuition, reflective thinking, and metacognition to navigate issues and reach positive conclusions.

These Factors Help With Critical Thinking:

- **Information Gathering:** Research and collect unbiased, well-balanced information from credible sources.
- **Problem Solving:** Recognize, analyze, and resolve problems methodically.
- **Data Analysis:** Analyze data and evidence objectively.
- **Pattern Recognition:** Observe events and interactions to identify meaningful patterns and relationships.
- **Logical reasoning:** Apply inductive, deductive, and abductive reasoning to reach logically sound conclusions.
- **Identifying Bias:** Recognize false premises, analogies, unstated assumptions, and emotional appeals that could cloud judgement.

Motivation and Motivational Factors For Team Members

Motivating the project team is one of the most difficult, yet most important, aspects of team leadership. Every team member has different factors that drive their desire to perform and the amount of effort they put into their work.

Motivation comprises two categories:

1. **Intrinsic motivation:** Intrinsic motivation is the internal motivation found from within oneself. It's the personal satisfaction, fulfillment, joy, purpose, or happiness that project team members get from doing their work.

   Factors associated with intrinsic motivation are autonomy, responsibility, achievement, challenge, belief in the work. Belief in the work comprises understanding that the work done will make a difference in the company, the world, the project, and in personal growth and development.

Examples of Intrinsic Motivation

Example #1: A team member enjoys the challenge that a project provides and sees the way it will play a role in their personal and professional growth, so they work as hard as they can on the project.

Example #2: A project team member feels a strong sense of purpose because they believe the project will benefit their local community. The satisfaction they get from contributing to a local cause motivates them to put in extra effort and go above and beyond expectations.

2. **Extrinsic motivation:** Involves external rewards to promote team members, such as promotions, bonuses, or recognition from leadership

   Examples of Extrinsic Motivation

   Example #1: A project team member understands that their performance on this project will be tied to a potential large financial bonus. They perform brilliantly and receive the bonus at the end of the project.

   Example #2: A project team member is working toward a promotion that has been promised to those who exceed performance targets on a project. This external incentive motivates them to work hard and ensure that the project is delivered successfully, on time, and on budget.

It's not always easy to determine what inspires a team member. Many people have a dominant motivator, meaning they will be more stimulated by either intrinsic or extrinsic reasons. A blend of both intrinsic and extrinsic motivation tends to motivate most people. By understanding and reacting to how each team member is motivated, you can successfully drive strong team performance.

Nick's Tip:

Understanding motivation when leading a project team is critical. Remember, project team members are dedicating many hours of their lives to ensuring a project goes smoothly, and they need to be properly motivated, rewarded, and treated with the respect they deserve.

Establishing A Common Vision

A common vision is a great leadership tool to help motivate project team members, provide purpose, motivation, passion, and direction to the project team. Created together by both the project manager and the project team, it defines what the project aims to accomplish, what impact it will have, and how each individual working on the project will contribute to the bigger picture.

A strong vision consists of:

- **Purpose:** Defining why the project exists and what its intended outcome is.
- **Success Criteria:** What defines successful and acceptable project work.
- **Vision Drift:** How the project team will recognize when they're drifting away from the vision.
- **Impact:** Explains how the project will positively impact the future of the individual, the project team, the project and the organization's overall goals.

The shared vision needs to be clear, concise, and actionable. It ultimately unites the team, inspires passion, and creates a shared understanding of the project's goals and how everyone benefits from it.

Interaction with Other Performance Domains

The Team Performance Domain primarily interacts with 2 other performance domains:

- **Stakeholder Performance Domain**: Collaborating with stakeholders to ensure team efforts align with project goals.
- **Uncertainty Performance Domain**: Managing risks and uncertainties while keeping the team motivated and aligned with project objectives.

Team Performance Domain Summary

A project's success depends not only on processes, tools and systems, but also on the project team's performance, collaboration, and leadership. As the leader of the project, the project manager needs to create an environment where project teams can thrive, ensuring the success of the overall project.

This chapter highlighted the critical role of all aspects of team dynamics, including leadership styles, team development, motivation, rewards, and culture in building and maintaining high-performing teams.

In the next chapter, we'll cover the Development Approach and Life Cycle domain, focusing heavily on the three development approaches including predictive, hybrid, and Agile.

Chapter 7
Development Approach and Life Cycle Performance Domain

The Development Approach and Life Cycle Performance Domain focuses on choosing the most appropriate development approach for a project and structuring the project into phases to ensure a smooth progression from start to finish. The development approach and project life cycle significantly impact many areas, from how planning is done, risk is managed, deliverables are released, and all aspects of the project.

In this chapter, we'll cover development and delivery cadence, the three development approaches, factors to consider when selecting a development approach, and life cycle phases.

In the rest of the book, we will use the terms traditional, predictive, and waterfall which are different terms that all reference the same development approach. We will also mention adaptive and Agile which are used interchangeably to reference the same approach.

Main Outcomes of the Development Approach and Life Cycle Domain

The main outcomes and objectives of the Development Approach and Life Cycle Domain are:

- ➢ Choosing the best development approach that fits with project goals and requirements.
- ➢ Structuring the project life cycle to ensure that deliverables are produced and delivered on time, providing value appropriately throughout the project phases.
- ➢ Understanding and implementing the proper delivery cadence that contributes to effective project execution.

Key Terminology

Approach Type: The method used to manage and produce project deliverables. The three main approach types, which we'll explore later in this chapter, are predictive, hybrid, and Agile/adaptive. Each approach offers varying amounts of flexibility and structure based on project needs.

Delivery Type: How a project's deliverables are structured to be released to stakeholders. There are 4 delivery types, including single delivery, multiple deliveries, periodic deliveries, and continuous delivery.

Deliverable: A verifiable and unique product, result, or service that is required to complete a process, phase, or the entire project.

Development Approach: The strategy or method used to create and evolve the project deliverables, such as predictive, adaptive, or hybrid.

Development Cadence: The rhythm or timing of project activities and deliverables.

Project Life Cycle: The series of project phases that span the entire duration of a project, from initiation to closure.

Project Phase: A series of related project activities that culminate in the completion of deliverables.

Development Cadence and Life Cycle Relationship

The development approach that a project uses will directly influence when and how frequently deliverables are produced, and how the project progresses through its life cycle. The relationship between the project development cadence and the project life cycle will determine if the project is delivered incrementally (mainly used by adaptive approaches) or all at once (mainly used by predictive approaches).

- **Development Cadence**: Defines the regular frequency that project deliverables are worked on and finished. This frequency can be weekly, monthly, or at specific project milestones.
- **Project Life Cycle**: The life cycle is the structured sequence of phases a project follows from start to finish, shaped by the development cadence and type of deliverables to ensure progression of project goals.

Delivery Cadence

Delivery cadence is how often completed project deliverables are released, while development cadence determines how frequently work is completed to produce the deliverables that will be released.

There are 4 types of delivery cadences:

1. Single Delivery

In single delivery, deliverables are provided all at once at the very end of a project. A predictive or traditional approach primarily uses single delivery, making it ideal when stakeholders expect all deliverables, features, or results at once.

Example of Single Delivery: Construction on a new office building is completed and stakeholders receive the deliverable, the finished building, at the end of the project and upon project closure.

2. Multiple Deliveries

With multiple deliveries, deliverables are released throughout the project, usually at planned intervals or stages. Deliverables in this scenario can either be done sequentially (one deliverable must be completed before the next) or in parallel (different deliverables being worked on at the same time), depending on the project and stakeholder requirements. There are two forms of multiple deliveries. These are known as sequential deliveries and parallel deliveries. This is most often found in hybrid or Agile projects.

Sequential Deliveries

In sequential deliveries, one deliverable must be completed before moving on to the next phase of the project. This forces the project to progress step-by-step, with each phase of the project depending on the previous phase being finished before starting the next. This method for deliveries is useful when tasks and deliverables need to be completed in a specific, logical order.

Example of Sequential Deliveries: In a construction project, the foundation must be completed before beginning any other work. All other deliverables in this example depend on the foundation.

Parallel Deliveries

In parallel deliveries, multiple deliverables can be worked on simultaneously, with no dependencies or specific work order. This approach is more flexible and can significantly reduce the project timeline, since different teams can handle separate deliverables concurrently.

Example of Parallel Deliveries: In a building infrastructure project, the design of multiple systems such as plumbing, HVAC, electrical, and security can be done simultaneously. Each system is designed at the same time, allowing the project to progress quickly with no requirement for order of work.

3. Periodic Deliveries

Deliverables are provided on a regular schedule, such as monthly, bi-monthly, weekly, or bi-weekly. This approach works well in Agile projects where incremental progress needs to be shown.

Example of Periodic Deliveries: In a subscription-based software project, new features and updates (the deliverables) are released once per month as part of the development cycle.

4. Continuous Delivery

Delivering small batches of work continuously as they are completed. Continuous delivery is common in Agile projects, specifically software and digital product development. This delivery allows for quick value and often relies on automation to push changes directly into production.

Example of Continuous Delivery: In an online e-commerce shop, new features such as updated product listings, pricing changes and discounts are continuously integrated throughout the day. In this example, the e-commerce customer would always have access to the latest improvements on the e-commerce shop, because they would be pushed out and available immediately upon completion.

Introducing Development Approaches

Understanding and selecting the proper development approach is one of the earliest and most important decisions in a project. The approach chosen will significantly affect every aspect of the project, including planning, execution, delivery, risk management, and ability to handle change.

There are three different approaches to manage a project: traditional (predictive), hybrid, and Agile (adaptive), all compared in figure 7.1. In this book we use the terms 'traditional' and 'predictive' interchangeably and likewise 'Agile' and 'adaptive' are used synonymously.

Figure 7.1: *Comparing the 3 Development Approaches*

3 Development Approaches			
Aspect	**Traditional (Predictive/Waterfall)**	**Hybrid**	**Adaptive (Agile)**
Planning	In-depth and detailed planning upfront	Mix of upfront and iterative planning	Iterative, incremental planning, very minimal upfront planning
Flexibility In Project Changes	Low	Medium	High
Scope Changes	Difficult, not expected	Moderate	Frequent, expected
Risk Management	Managed early	Continual monitoring based on project needs	Adjusts as project progresses
Stakeholder Engagement	High during planning, low during execution	High in adaptive parts, low in predictive parts	Continuous throughout
Common Delivery Type	One-time	Mixed	Continuous, incremental
Common Industries:	Construction, infrastructure	Complex IT Projects	Software Development, E-Commerce, Startups

Traditional Approach

The traditional approach, also known as predictive or Waterfall, is popular in established organizations or industries that require stability and predictability. A traditional approach is characterized by extensive upfront planning, clear requirements, minimal flexibility for change once execution begins, and low risk tolerance. Once planning is complete, project work is executed in a pre-planned and sequential (step-by-step) manner.

Characteristics of Traditional Approaches

- **Fixed Scope:** The project scope is well-defined, consistent and stable throughout the project with minimal room for changes.
- **Upfront Planning:** Detailed planning is done in the beginning of the project, including cost estimation, resource allocation, and risk analysis.
- **Sequential Phases:** Involves phases such as gathering requirements, design, development, testing, and deployment that follow one another in a rigid, predefined, and sequential order.
- **Low Risk Tolerance:** There is very little risk tolerance, especially as most risks are identified up-front. Once potential risks are identified, a risk response plan can identify actions that will be taken if the risk appears or is realized. Risks that randomly emerge during the project when using a traditional approach are usually unpredictable, such as sudden regulatory changes that will need to be addressed quickly.

When to Use a Traditional Approach

- When project requirements are well defined up-front and very unlikely to change.
- High-stakes projects where predictability and control are essential, such as in construction, hardware, or heavily regulated industries.
- When projects have very high levels of investment, requiring careful upfront planning to minimize risk.

Examples of Projects Using Traditional Approach

- **Construction:** In a construction project to build a new bank branch, the bank implements a traditional approach due to the need for stability, predictability and low risk in the project. After initial planning is done to create the approved construction blueprint, every phase of construction must be completed as planned and in sequence. Any changes to the project after the planning phase will be costly, and at the very end of the project the deliverable, the finished building, is released.
- **Laptop Deployment:** In a project to deploy new laptops to employees, a traditional approach is taken. Detailed planning upfront specifies how many laptops are needed, what

laptops or models will be used, when they'll be deployed, and the total project budget. The project then progresses sequentially and in order, from the beginning of procuring the laptops, to setting up the laptops, to deploying them. Any changes after the initial project planning is completed will be costly, for example, if the laptops procured aren't compatible with required banking software, then completely different laptops would have to be procured.

Hybrid Approach

A hybrid approach combines elements of both traditional and adaptive approaches, allowing project teams to tailor their development approach based on project requirements. One major benefit of using a hybrid approach is that it allows any part of a project to be handled using the most appropriate blend of the two approaches.

Characteristics of Hybrid Approaches

- **Tailored Approach**: A hybrid approach provides a tailored means of addressing specific elements of the project, combining the advantages of both traditional and adaptive approaches.
- **Flexibility**: Different project phases or deliverables may use different elements of each approach. For example, traditional elements for stable aspects, adaptive for uncertain and changing aspects. This high level of adaptability gives project teams the power to respond quickly to changes in project requirements.

When to Use a Hybrid Approach

- When part or parts of a project have well-understood requirements, while other parts are uncertain and need flexibility.
- When certain deliverables need quick turnaround time, while other deliverables require thorough up-front planning using predictive approaches.
- When using an all traditional or all adaptive approach doesn't mesh well with certain project conditions.
- When there is a large, complex project where different teams handle entirely different aspects of the project. For example, a technology project may need physical hardware installed by one team, and software developed for that hardware by a completely different team.

Examples of a Project Using Hybrid Approach

Software Development and Hardware Deployment Project: A project involving both software development (which uses adaptive/Agile methods) and hardware deployment (which uses

predictive/traditional methods) could employ a hybrid approach to accommodate both areas of the project.

Adaptive Approach

The adaptive approach, also known as Agile, emphasizes flexibility, rapid delivery, and quick response to changing requirements throughout the life of the project.

Unlike a traditional approach, an adaptive approach focuses on minimal upfront planning. This includes progressive elaboration through working in short sprints or iterations, frequently incorporating feedback and responding to changes arising from each iteration.

Characteristics of Adaptive Approaches

- **Highly Flexible:** Ideal for projects with high uncertainty or rapidly changing requirements.
- **Short Iterations:** Work is performed in short cycles known as sprints, usually lasting between 1-4 weeks.
- **Continuous Feedback:** Stakeholders actively engage in providing feedback, and work around the product evolves based on that feedback.
- **Prioritized Backlog:** Instead of a fixed scope, the project operates on a prioritized list of features or deliverables known as a backlog, which will change naturally during the project when new deliverables are needed.

When to Use Adaptive Approaches

- Projects with high uncertainty where requirements will change over time.
- Software development projects, where user or stakeholder feedback is critical in shaping the final product.
- Projects where stakeholders need continuous value, early benefits, and quick time to market or execution.
- Projects that have a limited budget and need to demonstrate value quickly. This is very common in startups.

Example of a Project Using an Adaptive Approach

Software Development: A project for the development of a mobile app requires quick execution, continuous changes and new requirements based on feedback, shifting market trends, and new technology. Given the potential for frequent changes and a high level of uncertainty, this project is best suited for using an adaptive approach.

Nick's Tip:

Throughout this book, remember that "traditional" and "predictive" are used interchangeably to describe the same development approach, while "adaptive" and "Agile" are also used interchangeably.

Factors For Selecting the Right Development Approach

Both traditional and adaptive approaches have their own unique use cases and specific characteristics that should be considered and compared before deciding.

1. Product, Service, or End Result Needs

Innovation

The amount of innovation a project needs will be one of the first factors to consider when deciding between a traditional or adaptive approach.

Predictive Approach: For projects that the organization and project team has experience with, or if there's low amounts of innovation needed, a predictive approach is ideal. This allows for detailed planning upfront, with less emphasis on flexibility, since factors and potential outcomes are well known.

Example: A construction project to build a new home based on a previously used blueprint from a previous project with the same team would be low innovation and a good case for utilizing a predictive approach. Since the design and construction process are well understood, and the construction team has built an identical house before, there is no need for innovation beyond small changes that might be required by the client.

Adaptive Approach: On the other hand innovative projects, especially those involving new technologies or solutions, benefit from an adaptive approach. This allows for greater flexibility as requirements are likely to evolve during the project, and frequent feedback is necessary to define the deliverables.

Example: A project developing an AI tool likely uses an adaptive approach, as the project may involve innovative requirements, challenges, and heavily rely on stakeholder feedback to continuously refine the project.

Requirements Stability and Certainty

The stability and certainty of a project's requirements helps choose the right development approach.

Predictive Approach: Works best when the project's requirements are stable, certain, and well-defined upfront.

Example: When a company expands operations and requires the construction of a new manufacturing plant. Planning upfront can include the costs of building a new plant, the required technology to establish the plant, and all the project execution procedures.

Adaptive Approach: For projects where requirements are unstable, uncertain, and change is expected throughout the project, taking an adaptive approach is ideal.

Example: Developing a chatbot and chat sequence for a company's customer service chat on their website. Even though they only have an idea of what the chatbot will do, they begin the project and come up with requirements along the way.

Scope Stability

Scope stability refers to how certain, defined, and stable a project's scope is.

Predictive Approach Scope Stability: In projects where scope is clear and changes are unlikely, using a predictive method is appropriate.

Example: Construction of a bridge follows a set scope, where factors like design, materials, and dimensions are defined in the beginning, with little room to change once the project starts.

Adaptive Approach Scope Stability: For projects that predict frequent changes in scope, adaptive approaches will work better.

Example: In a marketing project, the scope will change over time as market feedback, research, results, and stakeholder opinion evolve.

Risk

Projects with high risk could experience compliance issues, safety concerns, or significant project impact that needs to be understood before selecting an approach.

Predictive Approach to Risk: Predictive approaches are useful for projects with high-stakes risks that require extensive upfront planning, such as projects with potential safety concerns, legal regulations, or compliance issues. The primary risks in these projects may be failure to comply with safety or regulatory standards, which make upfront planning and risk mitigation critical.

Example: A company starts a project to develop a new pharmaceutical drug. A predictive approach is used to adhere to strict safety and regulatory guidelines. This project involves detailed planning and risk assessments from the early stages to ensure compliance throughout the development process.

A**daptive Approach to Risk:** Adaptive approaches are used when the primary predicted risks involve uncertainty, volatility, or need for change in requirements. These projects are usually not concerned with safety or regulatory risks, but have the need for flexibility and frequent changes.

Example: In a project to develop a new software, an adaptive approach can accommodate changing client or stakeholder needs. Instead of planning everything upfront, the project team can plan

minimally up front and work in short iterations while receiving frequent feedback. This allows them the freedom to quickly address additional risks identified through customer requirements or market changes.

2. Project Variables

Stakeholders Considerations

Stakeholders' needs or requirements can significantly dictate which development approach will be taken.

Predictive Approach for Stakeholders: A predictive approach can be used when stakeholders have clear requirements, expectations, and needs that are known at the beginning of the project. With this approach, stakeholders will have less active involvement after the planning phase of the project.

Adaptive Approach for Stakeholders: When stakeholders' requirements are predicted to change throughout the project and stakeholders need to be significantly involved throughout the project.

Schedule Constraints

The exact time or schedule that the deliverables are expected to be delivered by is another influence on the development approach to be used.

Predictive Approach Schedule Constraints: Best suited for projects with fixed, planned schedules and strict deadlines with little room for delay or change.

Adaptive Approach Schedule Constraints: Effective when the planned schedule is flexible or will likely change after project planning and during execution.

Funding Uncertainty

Occasionally, there may be uncertainty or change in funding around a project which will impact which approach to implement.

Predictive Approach Funding: Stable and secured funding works very well with the upfront and long-term planning of a traditional approach. A lot of time and money can be used even during the initial planning stage.

Adaptive Approach Funding: When funding is uncertain or may be subject to change, an adaptive approach can be useful. This works very well in startup environments where funding is often inconsistent and may fluctuate up and down during the project. With a startup, a minimum viable product (MVP) may be created with initial funding to gauge how viable the project will be.

3. Organizational Factors

Organizational factors such as company structure, culture, capability, and even the project team play a large role in selecting the right approach.

Organizational Structure

An organization's structure significantly influences many areas, including management and leadership style, risk tolerance, project team formation, and other factors.

Predictive Approach: Useful when an organization has many levels of management and formalized decision-making that promote upfront planning and control. Commonly used in government, manufacturing, construction where specific processes and compliance are required.

Adaptive Approach: Works very well with smaller, flat organizational structures, where project teams are self-organizing. Often these organizations have less structure, but prioritize giving project teams and employees fast decision making, flexibility, and execution as quickly as possible. Commonly used in startups and technology companies.

Organization Culture

Even the culture of an organization can affect the approach chosen. Organizations that use predictive approaches tend to be more established, structured, and process driven. With adaptive approaches, these organizations are often newer and fast paced, such as startups, focusing on flexibility and quick execution.

Predictive Approach Organization Culture: Commonly used in organizations that value proper and upfront planning, decision making from an appointed authority, and proper management oversight. Useful for stability and certainty in the entire project.

Adaptive Approach Organization Culture: Ideal for organizations that enable autonomy, innovation, and speed to execution. Project teams tend to be self-managed, with decision making often being done by the project team.

Organizational Capability.

An organization's capability to execute a project includes employee expertise, workforce capacity, financial capacity and business incentives, all of which influences which approach is chosen.

Predictive Approach Organizational Capability: Best for established organizations with dedicated teams, established processes, sufficient financial resources, and ability to invest significant time and effort up-front for planning.

Adaptive Approach Organizational Capability: Preferred by startups or fast-moving organizations with lean teams that need to execute quickly due to market demands, evolving customer needs, or funding limitations. Since adaptive or Agile is a newer form of project management, employees often need to be trained on this approach.

Team Size and Geographical Location

The size and location of the project team significantly impact collaboration and communication, which play a role in development approach selection. This is especially true in organizations and teams that heavily rely on employees who work remotely.

Predictive Approach Team Size and Location: Ideal when team sizes are large, usually over 10 people.. The team can work in-office, hybrid or remote. Predictive can also be scaled up or down relatively easily, depending on project and team needs.

Adaptive Approach Team Size and Location: Mostly used when there is a team size of between 5-10 people and when the team is working in the same physical space. Adaptive approach can be scaled up and used for virtual or remote team use, but it thrives with face-to-face interaction between project team members.

Defining Life Cycle and Phases

A project life cycle comprises distinct phases unique to the project. Each phase represents a different stage of the project's progression. The exact number and name of the phases varies from project to project, but usually spans from project initiation all the way to project closure.

In adaptive projects, life cycles are flexible and not always predefined. Instead, work is delivered incrementally through short iterations or sprints which usually last a few weeks and allow for feedback and changing requirements.

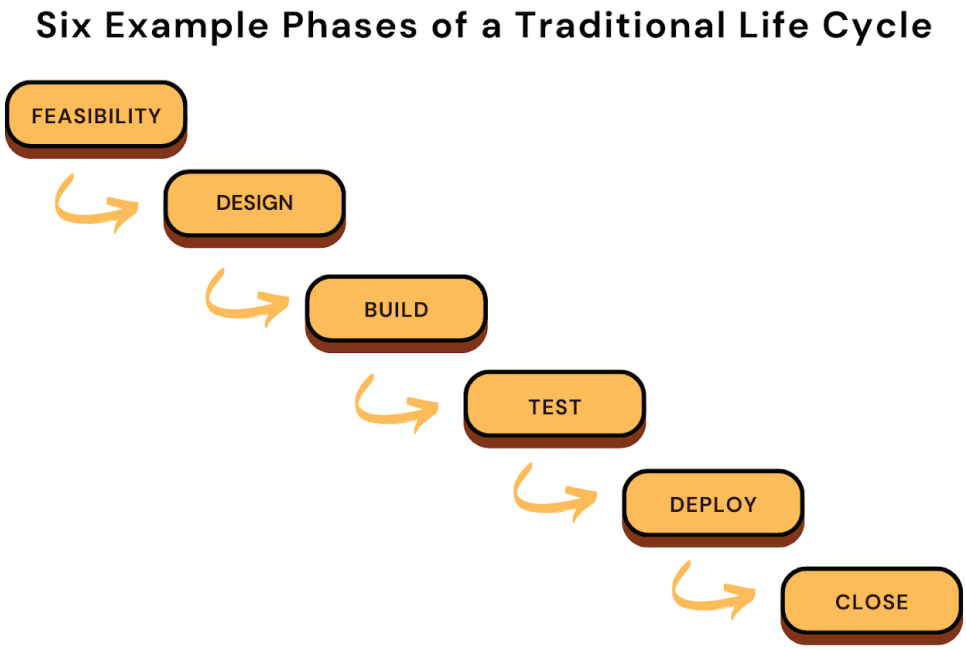
A hybrid approach can integrate both a project life cycle and iterations or sprints.

Example phases of a project life cycle for a house construction project:

- **Feasibility (Initiation):** Assess whether the business case is valid and achievable. This phase is generally very similar from project to project, just with a different name.
- **Design:** In this second phase, called the design phase in this project specifically, blueprint plans for construction and the deliverables are developed.
- **Build:** This is the third phase, called the build phase in this project specifically, focusing on building the structure for the project.
- **Test:** The fourth phase, called the test phase in this project specifically, focuses on testing the quality of the construction.
- **Deploy**: The fifth phase, called the deploy phase in this project, focuses on the final touches of the construction such as official final inspection and approval from the new homeowners.
- **Close (Closure):** Officially completing the project and ensuring documentation is archived, team members are debriefed, any last activities are done, and the project is officially closed out.

Keep in mind, not every project will go through the same phases and phase names are specific to each project. In this example, the project calls the initiation phase "feasibility" and is the start of the project. Every project will go through some variation of the first phase (initiation) and the last phase (closure).

Figure 7.2: *Six example phases of a traditional life cycle*



At the end of each phase, a phase gate review can be conducted. This review evaluates project progress, and determines if the desired outcomes have been achieved before the project moves to the next phase. Specific criteria that might need to be met include criteria around deliverables, contractual obligations, specific performance targets, or other metrics.

Interactions with Other Performance Domains

The Development Approach and Life Cycle Performance Domain primarily interacts with 3 other performance domains:

- **Stakeholder Performance Domain**: The development approach chosen can influence how stakeholder communication is performed. For example, an adaptive approach requires frequent and continuous stakeholder communication and feedback due to potential changes or evolving requirements.
- **Planning and Uncertainty Domains**: Risks and uncertainty are planned for and addressed based on the development approach chosen. Usually, traditional approaches are more risk averse, while adaptive approaches are less risk averse.

- **Team Performance Domain**: The development approach affects team dynamics, especially the autonomy the project team will have and the leadership style that the project manager will employ.

Development Approach and Life Cycle Performance Summary

The Development Approach and Life Cycle Performance Domain ensures that a project's cadences, phases and development approach are best suited for the project.

In this chapter, we covered development and delivery cadences, the three project development approaches and factors to consider when choosing the right approach, as well as project life cycle and phases. Focus on studying and reviewing what instances you'd need each development approach for. Understanding each of these elements is essential not only when beginning a project, but also executing through each phase of the project.

In the next chapter, we'll cover the Planning Performance Domain, focusing on the different aspects of planning a project.

Chapter 8
Planning Performance Domain

The Planning Performance Domain focuses on preparing, organizing, and coordinating all project activities. Planning is a crucial step at the beginning of a project and an ongoing process that changes with new information and requirements.

This chapter will cover topics such as planning variables, project deliverables, communications, procurement and contracting, scheduling, estimating, budgeting, change management, and metrics.

Main Outcomes of the Planning Performance Domain

The main outcomes and objectives of the Planning Performance Domain are:

- Organize and coordinate progression of the project to maintain momentum, ensuring tasks are completed on schedule and resources are properly utilized.
- Deliver project outcomes by focusing on the bigger picture.
- Keep up to date on evolving project related information and utilize that information to produce the necessary deliverables.
- Ensure adequate and appropriate time is spent on planning for the situation.
- Provide sufficient planning information to manage stakeholder expectations. This ensures that all stakeholders are on the same page and can make informed decisions based on accurate data.
- Establish a process to adapt plans and keep them flexible based on changing conditions.

Key Terminology

Accuracy: The assessment of how correct an estimate is.

Backlog: A prioritized list of tasks or features that are waiting to be worked on and completed, most often used in Agile project environments.

Budget: The approved cost estimate for the project or a component of the work breakdown structure (WBS).

Crashing: A technique used to shorten a project schedule by adding resources with minimal cost increase.

Cycle Time: The total time it takes to go through a process.

Estimate: A quantitative assessment of project variables such as costs, resources, effort, and duration. We'll cover 3 estimating techniques in this chapter, including relative, deterministic, and probabilistic estimating.

Fast Tracking: A method that allows activities or phases typically done in sequence to be performed in parallel to save time.

Precision: How exact or precise something is.

Qualitative: Data or information that focuses on understanding qualities, characteristics, and insights. It cannot be described by numbers.

Quantitative: Data or information that can be measured and expressed in numbers.

Re-baselining: The process of adjusting the project baselines to reflect changes that occurred during project execution, often due to scope changes or re-planning efforts.

Reserves: A set amount of time or budget allocated to account for uncertainties or risks, ensuring the project can still meet its objectives despite deviations from the plan. We will discuss 2 types of reserves in this chapter.

Scope: The amount of work performed to deliver a project's deliverables, covering both the product and project scope.

Throughput: The number of tasks or work items that can be completed in a given amount of time.

Work Breakdown Structure: A visual planning tool used to break down an entire project into smaller tasks.

Planning Variables

Planning variables are the factors that influence how a project is planned in terms of complexity, deliverables, and goals.

Common Planning Variables

- **Development Approach:** As covered in the previous chapter, the development approach (whether traditional, hybrid, or adaptive) dictates how much initial planning is done, the flexibility the project will have, and when work is delivered.
- **Project Deliverable Complexity:** The complexity of project deliverables impacts the planning process. Projects with complex and tangible deliverables, such as construction, require detailed, upfront, and structured traditional planning. On the other hand, projects in areas like software development typically use adaptive planning to accommodate changes as the project progresses.

- **Organizational Requirements:** Internal organizational governance, policies, and procedures can significantly influence specific planning processes and project documents or artifacts used. Organizations may have mandatory documentation or frameworks to use in project planning.
- **Market Conditions:** External market conditions and pressures can affect planning. For example, in e-commerce, time to market is very important. A project to develop a new product would require less upfront planning in order to speed up the delivery process and maintain competitive edge by time to market.
- **Legal or Regulatory Restrictions:** Some industries can be limited by legal or regulatory restrictions. These restrictions can require specific planning or formal documents to be created before regulatory approval is given for the project to move forward.
- **Social and Environmental Considerations**: In some projects, planning may need to account for the social and environmental impacts of deliverables.

Planning Project Deliverables

A large part of project preparation is planning deliverables to ensure they can meet the desired quality and schedule requirements. This process begins by thoroughly understanding the business case, the expectations of stakeholders and customers, and the full scope of the project.

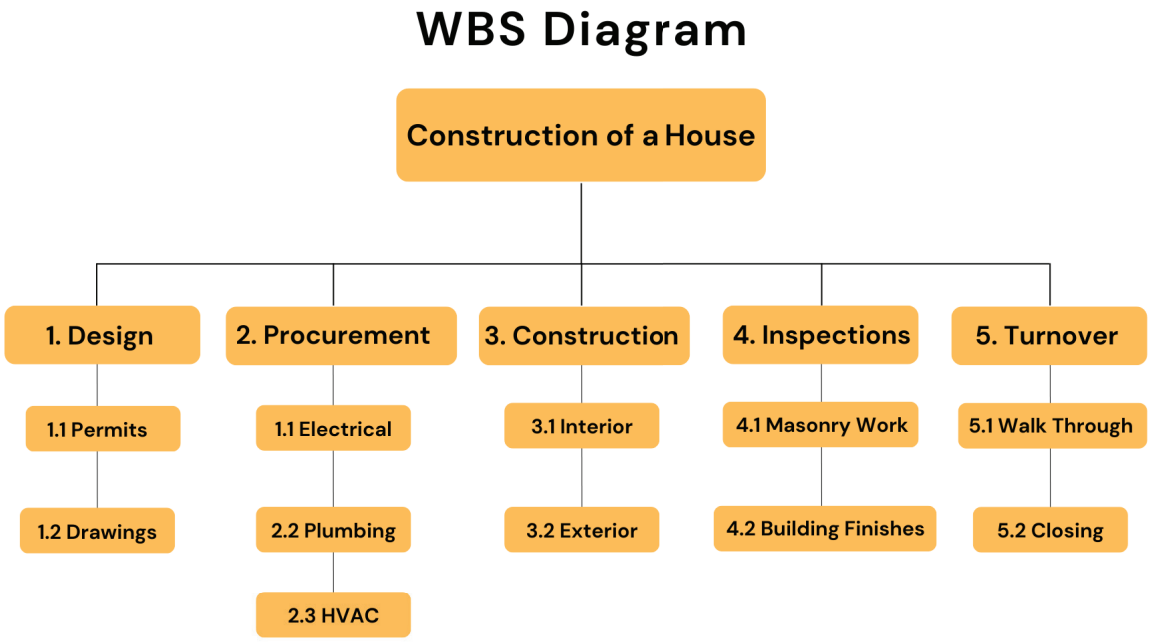
There are two project planning methods, traditional and adaptive planning.

Traditional Planning

Traditional planning, used with a traditional approach, identifies high-level deliverables early in planning. The project scope is then broken down into phases and decomposed from phases into smaller, more manageable tasks, using a Work Breakdown Structure (WBS) as shown in figure 8.1. This ensures that each part of the project is planned for, worked on, and delivered in order.

In a Work Breakdown Structure, the project sits at the very top, with each phase sitting below the project, the work package below the phase, and any tasks to be completed at the lowest level.

Figure 8.1: *WBS diagram demonstrating traditional planning for a construction project.*



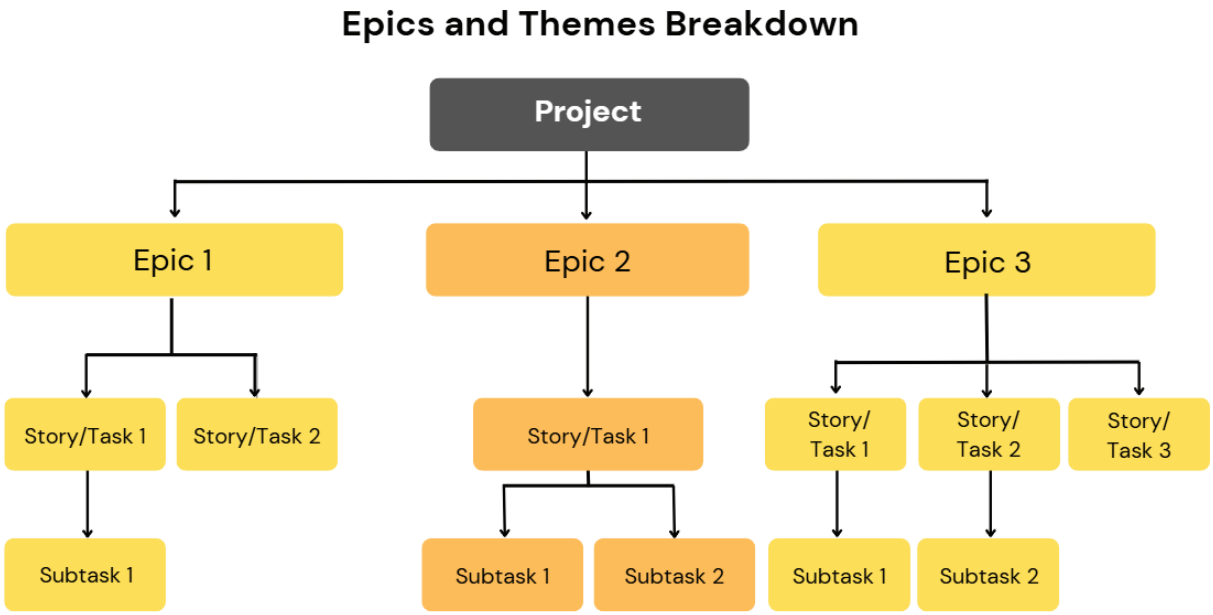
Adaptive Planning

When taking an adaptive approach, project work can be divided into high-level themes known as epics, which are then broken down and refined into user stories or backlog items for project team members to work on. User stories and backlog items are often prioritized by complexity, risk, and estimated time to complete.

While important tasks are usually planned for and addressed quickly, routine tasks, on the other hand, are planned for later in the project. Adaptive planning specifically uses the concept of the "last responsible moment," where non-urgent decisions or tasks are deferred to the last possible moment.

Adaptive planning has an advantage over traditional approaches because it allows project work to be easily modified, and deliverables can be released incrementally as they're completed throughout the project.

Figure 8.2: *A diagram breaking down epics and themes.*



Estimating

Estimating forecasts the amount of work, duration, costs, and resources required to complete the project. This is considered a quantitative process, meaning that the end result of an estimate is expressed in a number or set of numbers.

Estimates can be done at the beginning of the project or at any time throughout. As the project progresses and more relevant data becomes available, estimates can be performed again with new project information. The earlier in a project an estimate is performed, the less accurate it usually is due to a lack of data.

While estimates are useful for planning, they are inherently uncertain and should be considered alongside other factors. To make estimates effective, they should be analyzed, applied to decision-making, and then adjusted depending on specific project needs.

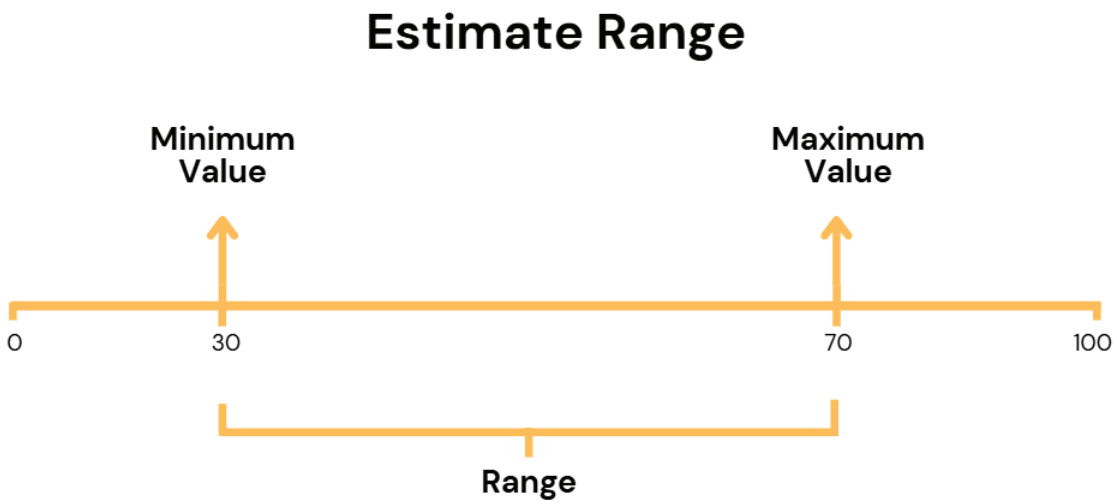
Four Main Factors In Estimating

Estimating relies on four main factors, range, accuracy, precision, and confidence.

1. **Range:** Range in an estimate is the span between estimated minimum and maximum values of a projected outcome. Early in a project, the range is broad due to limited information and high uncertainty. As the project progresses and estimates are performed again, the range will narrow because of new information and less uncertainty. For example, an initial cost estimate might have a range of $80,000 to $120,000, but as the project evolves,

the range could tighten to between $95,000 and $105,000. This gradual refinement helps project teams plan more effectively and make informed decisions.

Figure 8.3: *Estimate range including minimum and maximum values.*



2. **Accuracy:** Accuracy refers to how correct an estimate is in its predictions. For an estimate to be accurate, it has to closely reflect the actual outcome of a project. Accuracy can be measured by comparing original estimates to the final results, often expressed as a percentage or deviation from actual outcomes. For example, if a project cost estimate is $100,000, and the actual cost is $102,000, the estimate is quite accurate with a small deviation of $2,000 or about 2%.

3. **Precision:** Precision is the level of detail included in an estimate. For example, an estimate for a construction project could have a high level of precision by specifying many factors such as the exact quantities and unit costs of materials, labor hours, and equipment usage. On the other hand, it could have a low level of precision by approximating only total costs without clarifying specifics.

   While precision helps in planning and resource allocation, it doesn't mean the estimate is accurate or correct. It is possible for an estimate to be both precise and inaccurate, which can lead to serious issues if it's not aligned with the reality of project outcomes.

4. **Confidence:** Confidence is the level of certainty of an estimate. This is determined by the project team's familiarity with the task and estimation method, the reliability of any data used, and the clarity of requirements. For example, if a project manager and project team have had success on similar projects in the past, their confidence in an estimate they perform for a new, similar project will likely be high. Confidence in estimates is lower for innovative projects, technologies and processes, when there are unclear project requirements, or if the project team is inexperienced.

Estimating Techniques and Methods

Estimating techniques and methods vary greatly in complexity and application, depending on the level of uncertainty, the type of project, and available data. Some estimates aim to provide a singular figure or multiple figures, while others produce a wide range of possibilities.

Commonly Used Estimating Techniques

1. **Deterministic Estimating**: This method provides a single number known as a single "point" estimate. For example, one specific value such as "6 days" or "6 weeks."

   Deterministic estimating is straightforward, as well as easy and quick to use, making it useful for well-defined, low uncertainty tasks. However, it lacks flexibility in handling numerous or complex variables and uncertainty, which makes it less ideal for projects where conditions are changing or where multiple possible outcomes exist.

   Example of Deterministic Estimating: A project manager estimates that a task will take the project team approximately 6 days to complete based on their previous experience with similar tasks.

2. **Probabilistic Estimating**: Provides a range of possible outcomes along with probabilities of likelihood for each outcome. This estimate can be presented as either a single-point estimate with a probability, such as a task having an 85% chance of completion within 7 days, or as a range, such as varying chances of completion along an 8 to 12-day range. It's very useful in projects with high uncertainty or where multiple scenarios are possible.

   Example of Probabilistic Estimating: A project manager estimates a task has a 90% chance of being completed within 7-9 days and a 10% chance of requiring up to 12 days.

3. **Absolute Estimating**: Absolute estimating presents an exact number or numbers based on past data or previously known numbers to estimate work. This works well when there is historical data available or there are similar previously completed tasks with known times of completion.

   Example of Absolute Estimating: A project team knows that a previous report took 6 hours to produce; they can safely estimate a similar amount of time for a new report.

4. **Relative Estimating**: Rather than providing specific numbers or an exact figure, relative estimating compares tasks to one another, assigning estimates based on previous tasks.

   Example of Relative Estimating: In a project using an adaptive approach, a team may estimate that Task A will take twice as long as Task B, which takes 4 hours, and through this task comparison, they agree that Task A will take about 8 hours.

5. **Flow-Based Estimating**: Flow-based estimating is primarily used in adaptive projects that involve continuous delivery, iterative work, and repetitive or repeating tasks where there

is a way to measure production rates. This form of estimating relies on calculating the cycle time and throughput to predict how long it will take to complete a specified amount of work.

Cycle time refers to the total time it takes to complete one unit of work or task from start to finish. Throughput is the number of tasks that can be completed in a given period.

Example of Flow-Based Estimating: A team producing software updates estimates that it takes about 1.5 days to complete one update (cycle time) and typically completes 3 updates per week (throughput). Using these metrics, the team estimates that completing 9 required updates will take about 3 weeks at a rate of 3 updates per week.

Scheduling

Scheduling dictates the sequence, timing and planned completion of project activities and tasks. Depending on the project's approach, either traditional or adaptive scheduling methods are used.

Traditional Scheduling

Traditional scheduling follows a structured and sequential approach, focusing on clearly defining, ordering, and executing project work.

Additionally, traditional scheduling focuses on:

- ➢ Decomposing the project into specific and actionable activities, tasks or deliverables.
- ➢ Sequencing these activities to determine the flow and dependencies for tasks.
- ➢ Estimating the required effort, duration, people, budget, and resources needed to complete each activity.
- ➢ Allocating team members and resources to complete each activity based on availability and required skill sets.
- ➢ Adjusting sequence, estimate, and resources as needed until the project team agrees on an achievable schedule.

Adaptive Scheduling

Adaptive scheduling focuses on delivering value incrementally throughout the project. Instead of fully defining the schedule upfront, teams break the project into shorter iterations (sprints) and plan only for the next cycle after a cycle is completed. This allows for flexibility and frequent reassessment based on evolving stakeholder needs and feedback.

Schedule Compression

When a project's timeline differs from the desired end date, schedule compression techniques can be used. Schedule compression is the process of condensing the project schedule by increasing the amount of work that is done through either fast tracking or crashing.

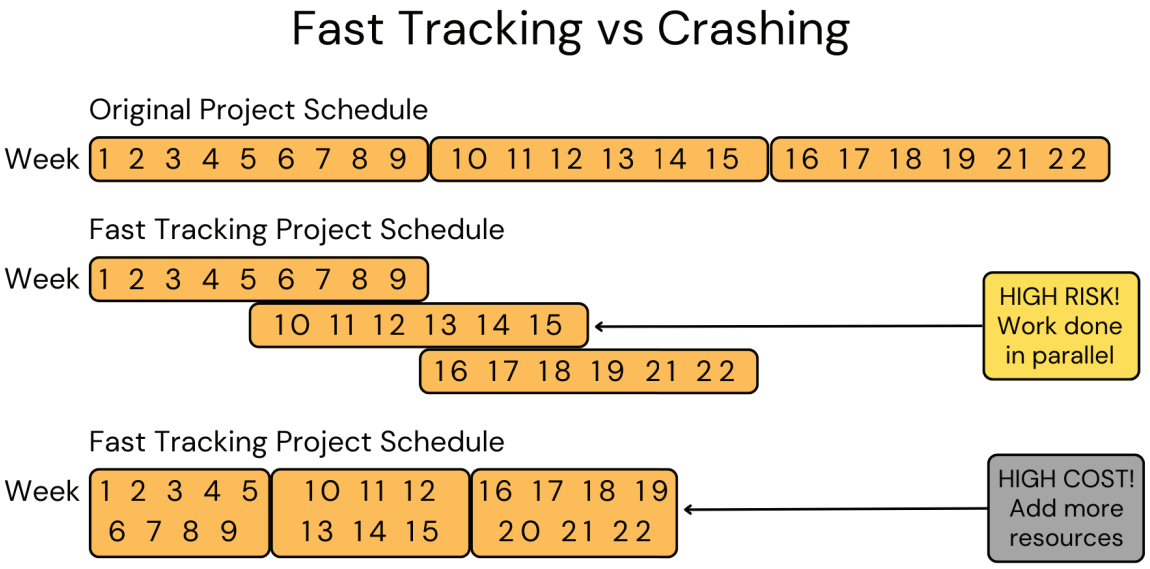
While schedule compression can help speed up a project and move it more quickly to completion, it also runs the risk of introducing team dissatisfaction. Team dissatisfaction can stem from overworking and burnout, which can increase project costs and re-work of tasks later down the line. Before opting for schedule compression, project managers should carefully consider factors like project team morale, budget constraints, and the overall scope of the project.

Crashing

Crashing involves adding resources such as people, overtime, or expedition of work to complete tasks faster and reduce the overall project timeline. Typically, this is done with the desire for minimal cost increase, and it can necessitate some creativity to implement within budget. This technique is useful when project deadlines are inflexible, and additional manpower or overtime can meet the new desired schedule.

Example: A construction company needs to complete a building project faster due to high demand and pressure from stakeholders. By extending work hours from the existing project team, the project's duration is shortened without significantly increasing costs. The project manager needs to be wary of team burnout and dissatisfaction in this case.

Figure 8.4: *Fast Tracking and Crashing*



Fast Tracking

Fast tracking involves executing tasks that should normally be done sequentially at the same time, which shortens the project schedule. This technique is fairly effective for a quicker delivery but introduces additional risks, such as rework if previous tasks are modified.

Example: In a web design project, the project team starts coding while the design of the user interface and layout of the website is still being finalized. Although this speeds up development, if the design or layout changes, it may require significant rework on the code, potentially causing delays and requiring additional costs.

Dependencies

When using schedule compression techniques such as crashing and fast tracking, it is important to understand the nature of dependencies between project activities. A dependency between project tasks requires one to be completed before the next one can start. Not all tasks within a project can be compressed because of dependencies.

Types of Dependencies

There are 4 main types of dependencies, mandatory, external, discretionary, and internal. Mandatory and external dependencies cannot be altered, while discretionary and internal dependencies can be.

1. **Mandatory Dependency:** This is a relationship that is either contractually required or intrinsic to the nature of the work. It cannot be altered by the project team.

   Example: In a construction project, you must lay a foundation before building a structure. The structure cannot come before the foundation, so there is a mandatory dependency between the construction of the building relying on the foundation being finished before beginning work.

2. **External Dependency:** This dependency is outside the project team's control and involves interactions and a dependency between project activities and non-project activities. This cannot be altered by the project team.

   Example: A project is delayed while waiting for a regulatory body's approval to move forward with the development of a new drug. This regulatory review is an external dependency that pauses project activities due to non-project activities (the regulatory review) that cannot be controlled by the project team.

3. **Discretionary Dependency:** This is a dependency and relationship based on project preferences or best practices, which can be modified by the project team.

   Example: A project team may choose to finish a draft report before starting a review process, even though these activities overlap. This dependency is based on the team's preference to ensure quality and clarity before review.

4. **Internal Dependency:** A relationship between two or more project activities that are within the project's control and may be altered if needed.

   Example: One project team member might rely on another team member's output before beginning their task, but scheduling adjustments can be made if needed.

Budget Estimates, Reserves and Cost Baselines

The project's budget is an important tool used to manage project spending. It ensures that budgeted funds are allocated and applied appropriately to different areas of the project at the right time based on progress.

The budgeting process begins by considering project costs and then creating and converting cost estimates into a financial plan, known as the cost baseline. This cost baseline sets clear expectations for how resources will be distributed over the project's timeline.

Budget estimates often include costs for labor, overhead, materials, supplies, and equipment.

Once these budget estimates are calculated, they are used to create the cost baseline, which is distributed along the project's schedule. With this information, project managers can monitor and control expenses as the project progresses.

Reserves

The project's budget often contains monetary reserves to handle uncertainties. These reserves can be thought of as backup funding that should only be used or accessed when absolutely necessary.

1. **Contingency Reserves**: These reserves are allocated for known, in-scope risks that are likely to occur and are identified during initial planning.

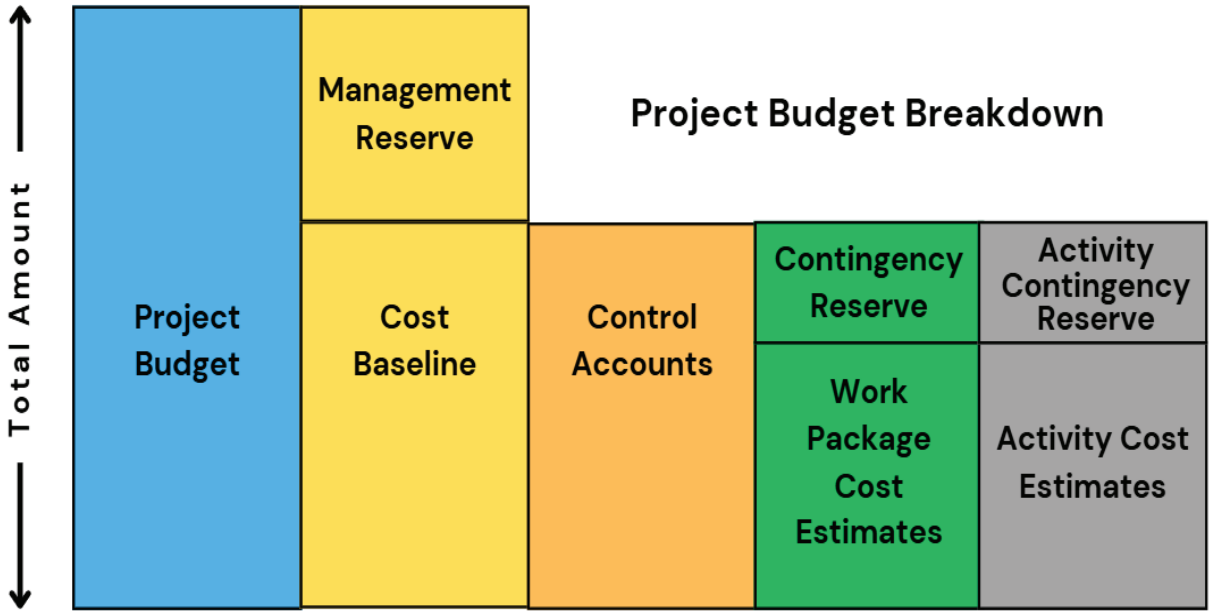
   Example: A software development project sets aside contingency reserves for potential bug fixes that are common, expected, and could delay a software release.

2. **Management Reserves**: These reserves are held for unforeseen risks that were not predicted in initial planning and fall outside the project's scope. They are not part of the cost baseline and typically require additional authorization from a project sponsor, organization executive, or PMO to deploy.

   Example: A sudden and unpredictable new regulation that affects an organization's cyber security project. This sudden regulation requires significant changes to project deliverables that can be mitigated by using management reserves. In this case, the project manager requests the organization's Chief Technology Officer to approve the management reserves.

By continually monitoring costs against cost baseline and strategically using reserves, a project can maintain strong financial health while adapting to changes without exceeding the budget.

Figure 8.5: *A projects budget containing contingency reserves, management reserves, project budget, work cost estimate, and cost baseline.*



Planning Communication

Communications should be carefully planned in order to keep stakeholders informed and provide the appropriate information in a timely fashion, through the right medium, and where that information is received from (such as reports, dashboards, calculations, etc.)

Consider these questions when planning communications:

1. **Who needs information?**

   Consider identifying stakeholders who need specific information. Different stakeholders will need various levels of detail and information.

2. **What information do they need?**

   Determine what information or type of information a stakeholder will need. For example, does the stakeholder need project progress reports, budget/financial updates, or issue escalations? There are a lot of different types of information that a stakeholder may need to have, and this should be tailored specifically to their requirements.

3. **Why should we share the information?**

   Consider the purpose behind why a stakeholder might need a piece of information before sharing it. Different communications addressing project information may have a different intent behind it; for example, seeking approval, addressing concerns, or simply providing updates on project progress.

4. **What is the best method of communication to provide information?**

   Focus on understanding the best method of communication to provide the information you've gathered while also considering specific stakeholder communication preferences.

5. **When or how often is the information needed? Is a schedule appropriate?**

   The timing and frequency of communication must be considered and planned as well. For instance, an executive stakeholder may only need weekly, bi-weekly, or monthly high-level updates, while the project team may need more frequent or daily check-ins. The frequency of communication should align with the project's schedule to allow for timely decision-making.

6. **Who has the Information?**

   Identify who is responsible for gathering and distributing information to ensure smooth and consistent communication. The project manager often takes this role, but sometimes a team lead can be delegated to take on the role of certain communications.

Physical Resources Defined

Physical resources in projects are any assets such as materials, equipment, software, product licenses, and testing environments. Employees are generally not considered physical resources. Effective planning for physical resources involves estimating needs accurately, managing supply chain logistics, and overseeing procurement activities to ensure availability when required.

Nick's Tip:

Physical resources are not only physical materials that you can touch or see in person. It also encompasses software programs, technology systems, licensing, etc. This highlights that physical resources are both tangible and intangible assets and any resources vital to the project besides people.

Procurement and Contracting

Projects in industries like engineering and construction often require significant physical resources that must be procured, stored, and managed efficiently. To prevent delays, project teams should consider lead times, storage capacity, transportation logistics, and delivery timing during procurement.

Effective procurement planning also involves balancing bulk ordering compared to storage costs, gauging material environmental impact, and mitigating risks that could delay or disrupt the project. Inventory must also be tracked from procurement to final use to ensure resources are accounted for, used efficiently, and available when needed.

Procurement

Procurement refers to the process of obtaining goods or services required to meet the needs of a project from external vendors or third parties. In project management, procurements can occur at any stage of the project, but upfront planning before initiating procurements is crucial to ensure that the procurement process runs smoothly and fits the project's requirements.

Nick's Tip:

There can be a variety of reasons why a project manager might choose to procure externally over produce internally. The decision to procure over produce is due to the need for faster turnaround, access to specialized expertise, lack of internal skills or capacity, better cost-effectiveness, or to mitigate risk.

Part of procurement planning is conducting a make or buy analysis to decide which deliverables should be created internally and which will need to be outsourced or purchased. The decision to make or buy is important and will significantly impact the project timeline, budget, planned expenses, and team workload.

Factors to Clarify From a Third-Party for Procurement:

- ➢ The types of goods or services needed
- ➢ Expected delivery timelines
- ➢ Pricing and payment terms
- ➢ Any other relevant technical, product, service, organizational, and regulatory requirements

The topic of procurement is discussed in depth in the next chapter, specifically addressing how to work with 3rd party vendors, including the topics of request for quotes (RFQs), request for proposals (RFPs), and more.

Change Management

Change is inevitable in any project and can arise as a response to a new understanding of project requirements, identified risks, and evolving and changing stakeholder needs. When considered from a planning viewpoint, a structured process for managing any potential changes should be created. In most organizations, this process is commonly known as change management.

In a traditional approach, change requests could trigger a need to re-baseline the project's scope, schedule, or budget. Change requests would generally be proposed to a Change Control Board (CCB) to be approved or denied.

In adaptive projects, changes can usually be handled less formally, either through reprioritizing backlogs or adjusting plans during review cycles.

Changes that involve any contract modifications will have specific processes, legal or regulatory guidelines in order to initiate a change and should be consulted with the appropriate internal departments, such as the legal department.

Metrics

Metrics in planning are used to evaluate project performance, progress, and success. They provide insights into deliverable quality, schedule adherence, resource allocation, and budget control.

By tracking key performance indicators (KPIs) and other relevant metrics, project teams can identify and address inefficiencies, potential risks, and performance issues early.

While nearly every aspect of a project can be measured, it is essential to only focus on only metrics that directly impact or assess a project's success. By consistently monitoring these metrics, project teams can ensure the project stays on track through proactive action.

Alignment

Effective planning ensures that all project activities are aligned with scope, quality standards, resource availability, budget, and stakeholder expectations. This coordination of activities extends across logistics, material deliveries, testing, and quality assurance.

Smaller projects often work with very simple plans that align all aspects of the project together, while larger projects may require an in-depth, comprehensive project management plan that integrates these elements.

Nick's Tip:

At a higher level, alignment across related projects in a program within an organization is important. The timing, resources, and general success of one project often impact others in a program or portfolio. Planning must consider other previous, present, or future projects and organizational operations as a whole.

Interactions with Other Performance Domains

The Planning Performance Domain interacts with 3 other performance domains:

- **Development Approach and Life Cycle Performance Domain:** Planning is influenced by the chosen development approach. Traditional approaches require a lot of planning at the start, while adaptive approaches continuously plan throughout the project.

- **Uncertainty Performance Domain:** Interacts directly with uncertainty by planning for and addressing risks. Plans around risk often need to be flexible with multiple options to handle emerging risks or new information, ensuring the project can navigate uncertainties.
- **Delivery Performance Domain:** Planning supports the delivery of project outcomes by establishing clear goals, timelines, and metrics for project and project team progress.

Planning Performance Domain Summary

The Planning Performance Domain focuses on preparing for, organizing and coordinating all project activities. While planning is essential at the beginning of a project, it's also an ongoing process all throughout the project no matter the development approach used.

This chapter explored many different aspects of planning, including planning variables, project deliverables, communications, procurement and contracting, scheduling, estimating, budgeting, change management, and metrics. Through effective planning, project teams can execute confidently, manage changing conditions, mitigate risks, and achieve project goals.

In the next chapter, we'll cover the work performance domain, focusing on the completion and execution of project activities.

Chapter 9
Project Work Performance Domain

The Project Work Performance Domain focuses on the execution and coordination of all activities required to complete project work and deliverables. It encompasses processes, constraints, team management, communication, stakeholder engagement, and continuous learning to ensure both successful project execution and ongoing team improvement.

In this chapter, we'll explore project work execution, process tailoring, managing competing constraints, managing team focus, effective communication, procurement, optimizing resources, and knowledge management.

This performance domain is crucial to keeping the project structured and ensuring that work is organized, managed, and completed as planned.

Main Outcomes of the Project Work Performance Domain

The main outcomes and objectives of the Project Work Performance Domain are:

- **Efficient and Effective Project Performance:** Ensures the project team delivers results as expected while minimizing delays, errors, and major roadblocks.
- **Optimized Project Processes:** Focuses on project processes being relevant for the project's environment and adjusted or modified when necessary.
- **Timely Stakeholder Communication:** Maintains stakeholder awareness of project progress, issues, and changes.
- **Effective Resource Management:** Involves managing physical resources like materials, equipment, and logistics to minimize delays and bottlenecks.
- **Effective Procurement Management:** Procurement is necessary when there are needs for resources that the project team can't or won't produce on their own. Procurement management involves creating requirements, choosing suppliers, performing contract negotiations, and ensuring resources are delivered on time and meet the expected standards.
- **Continuous Improvement and Learning:** Encourages the project team to learn as the project progresses, improving their capabilities and outcomes over time.

Key Terminology

Bid Documents: All documents used to solicit information, quotes, or proposals from vendors.

Bidder Conference: A meeting with potential vendors to clarify procurement requirements before they submit their bids.

Change Control Process: A formal process used in predictive/traditional projects to assess and approve potential changes to project scope, schedule, or resources.

Explicit Knowledge: Knowledge that is easily documented and shared using symbols, words, or numbers.

Lean Production: A methodology focused on minimizing waste while maintaining high productivity, often used in process optimization.

Lessons Learned: Insights gathered by the project team at the end of a project or phase to understand what went well, what didn't, and how future projects can be improved.

Process Tailoring: Adjusting processes specifically to fit the size, complexity, and context of a project.

Project Processes: Established procedures and steps to manage and execute project work efficiently.

Request for Information (RFI): A document used to gather more information from potential vendors before sending out detailed bid documents.

Request for Proposal (RFP): A document used to request proposals for complex or custom work where vendors propose solutions.

Request for Quote (RFQ): A document used to request a price quote from vendors for goods or services that are readily available.

Retrospective: A regular meeting held during an Agile project to evaluate team performance and processes, aiming for continuous improvement.

Tacit Knowledge: Personal knowledge gained from experience, which can be difficult to articulate and transfer.

Value Stream Mapping: A lean production technique used to identify the value-adding steps in a process and eliminate wasteful activities.

Project Work

Project work refers to the actual execution of specific tasks or activities necessary to complete the deliverables or phases of a project. This is the hands-on work that the project team is assigned to finish.

From a project manager perspective, it includes many different factors including the following:

- **Managing Workflow:** Handling existing tasks, integrating new tasks, and managing changes efficiently to prevent bottlenecks and ensure continuous project progression.
- **Maintaining Team Focus:** Ensuring the project team stays aligned with project objectives, keeping morale high, and minimizing distractions or deviations from the plan.
- **Optimizing Project Systems:** Establishing and refining efficient project processes that support smooth operations, whether through Lean methods or tailored project tools.
- **Communicating with Stakeholders:** Keeping stakeholders informed through consistent and clear communication, addressing their needs, and managing expectations.
- **Managing Resources:** Overseeing the flow of materials, equipment, supplies, and other physical resources to ensure they are available when needed, without causing delays.
- **Procurement:** Collaborating with 3rd-party vendors and contractors to ensure external goods and services that the project team cannot or will not create are sourced efficiently and align with project requirements.
- **Monitoring Change Control and Impacts:** Controlling and tracking any changes that could affect the project's scope, schedule, or resources and ensuring appropriate actions are taken to mitigate risks.
- **Facilitating Knowledge Transfer:** Driving continuous learning and improving team capability by sharing knowledge, conducting lessons learned reports, and refining processes for better future outcomes.

Project Processes

A project process is a repeatable, standardized, or structured method used to meet project needs consistently and efficiently. These processes are not just step-by-step instructions; they can also be approved tools, methods, frameworks, or standards of completion.

They can be applied across nearly every aspect of a project, including communication, procurement, quality management, and many other areas.

Project Process Examples

The specific processes used will vary from project to project, but all processes exist to help the project team produce results consistently.

These are the areas that can benefit from using project processes:

- **Risk Management:** Identifying, assessing, and responding to risks using a pre-established risk register.

- **Change Control:** Reviewing, approving, and documenting project changes to prevent scope creep.
- **Quality Management:** Implementing quality reviews, peer evaluations, and audits to maintain high work standards.
- **Task Sequencing:** Using Kanban boards to ensure tasks are worked on in a logical order.
- **Stakeholder Communication:** Implementing routine and structured meetings and reports to keep stakeholders informed.
- **Procurement:** Standardizing vendor selection, procurement methods, and contract management.

Process Tailoring

Process tailoring consists of modifying processes based on the size, complexity, budget, and environment of the project. Larger projects typically require more formalized and structured processes, while smaller projects can operate with greater flexibility and simplicity to remain efficient.

Process Tailoring Concepts and Practices

- **Lean Production:** Lean production is a methodology that focuses on removing inefficiencies and adjusting processes to eliminate non-value-adding activities.

  Example: Tools like value stream mapping can be used to identify important work and inefficiencies, allowing project teams to focus on what drives project value and success.
- **Identifying Waste:** Project teams should spend only the amount of time necessary on tracking, managing, and following processes. Identifying waste should be done whenever the project team realizes they are wasting time or effort in a specific activity or practice.

  Example: A project team realizes they are spending too much time in meetings, reviewing non-critical tasks. They decide to reduce unnecessary meeting time and focus efforts on actual deliverables, identifying and eliminating waste and improving efficiency.
- **Maximizing Value:** Evaluating current tasks or new activities to provide the most value based on time and effort spent. The project team must assess where group and individual time and resources are best spent.

  Group Example: In a software development project, the project team notices they are focusing too much time on a non-important feature. They decide to focus their effort more on an important feature that drives more value to many more users and stakeholders.

  Individual Example: A project team member realizes they are spending too much time in meetings that aren't relevant to their project role or work. They talk with the project manager and instead focus their time on tasks that drive the most value for their assigned work and skillset.

- **Retrospectives and Lessons Learned**: Regular retrospectives or lessons learned meetings create an opportunity for project teams to reflect on their performance, evaluate their processes, and suggest improvements. Lessons learned reports can be created to enhance efficiency and effectiveness in future project phases or new projects.

  Example: After every project phase, the project team meets to update the formal lessons learned report with any new knowledge gathered.

Competing Constraints

Leading a project requires a balance of managing and navigating various competing constraints. These constraints can include anything from fixed deadlines, regulatory or organizational requirements, budget limitations, and quality standards.

These constraints can require adjustments, such as extending the project timeline, modifying project scope, or in severe cases, requesting budgeting reserves. New constraints can emerge during a project, while existing constraints can change or even disappear. In addition to managing these competing constraints, the project team must also make sure that stakeholder expectations are being met.

Managing Team Focus and Effective Team Leadership

Managing team focus requires balancing both short-term and long-term efforts. Project managers must assess workloads to ensure tasks are achievable and reasonable for maintaining motivation and preventing burnout. The goal is to balance progression while simultaneously avoiding project team burnout and reduced productivity.

Effective team leadership helps the team be productive, informed about any issues or delays, and involved in addressing challenges such as budget overruns. Maintaining open communication and creating a healthy work environment are some examples of effective leadership.

Project Communications

Effective communication is critical for project work and involves both formal and informal exchanges among team members and stakeholders. In most projects, communication includes in-person, audio or video meetings, instant messaging, and emails.

Day-to-day communication is common when working on projects and can include requests for updates, reports, or presentations, often last minute. If these requests become too frequent for the project team, it could indicate that the current communication plan needs to be updated and its frequency potentially reduced.

Managing Procurements

Many projects require the procurement of external resources such as materials, equipment, software, or labor. Procurement can occur at any stage in the project, whether it's planned or spontaneous.

Typically, the project manager and project team will handle a few specific aspects of procurement like conducting initial research, requirements or scope of work, preparing vendor requests, and eventually a decision on a best option. Once that option is identified, the project team will work closely with a procurement specialist or department from their organizations. Generally, these are contracting officers, procurement teams, or legal departments, but this varies from organization to organization.

The procurement specialists will oversee the financial, legal, and compliance side of the procurement process. They usually possess the ability to sign and enter into contracts on behalf of the organization, in addition to mitigating risks and negotiating the best possible terms.

Nick's Tip:

Every organization is different, and a project manager's may or may not have the authority to enter into or sign contracts. Before beginning procurements, it is helpful to identify who in an organization will help with the process and has the authority to enter into a contract.

Procurement Documents

Before the procurement process officially begins, the project manager and qualified team members develop important documents to define exactly what is needed and to solicit bids from vendors. Documents such as the Request for Information (RFI), Request for Proposal (RFP), Request for Quote (RFQ), Statement of Work (SOW), and contract terms are all created prior to starting procurement. Once these documents are created, the project team can reach out to and solicit bids from vendors.

Soliciting Outside Bids from Vendors

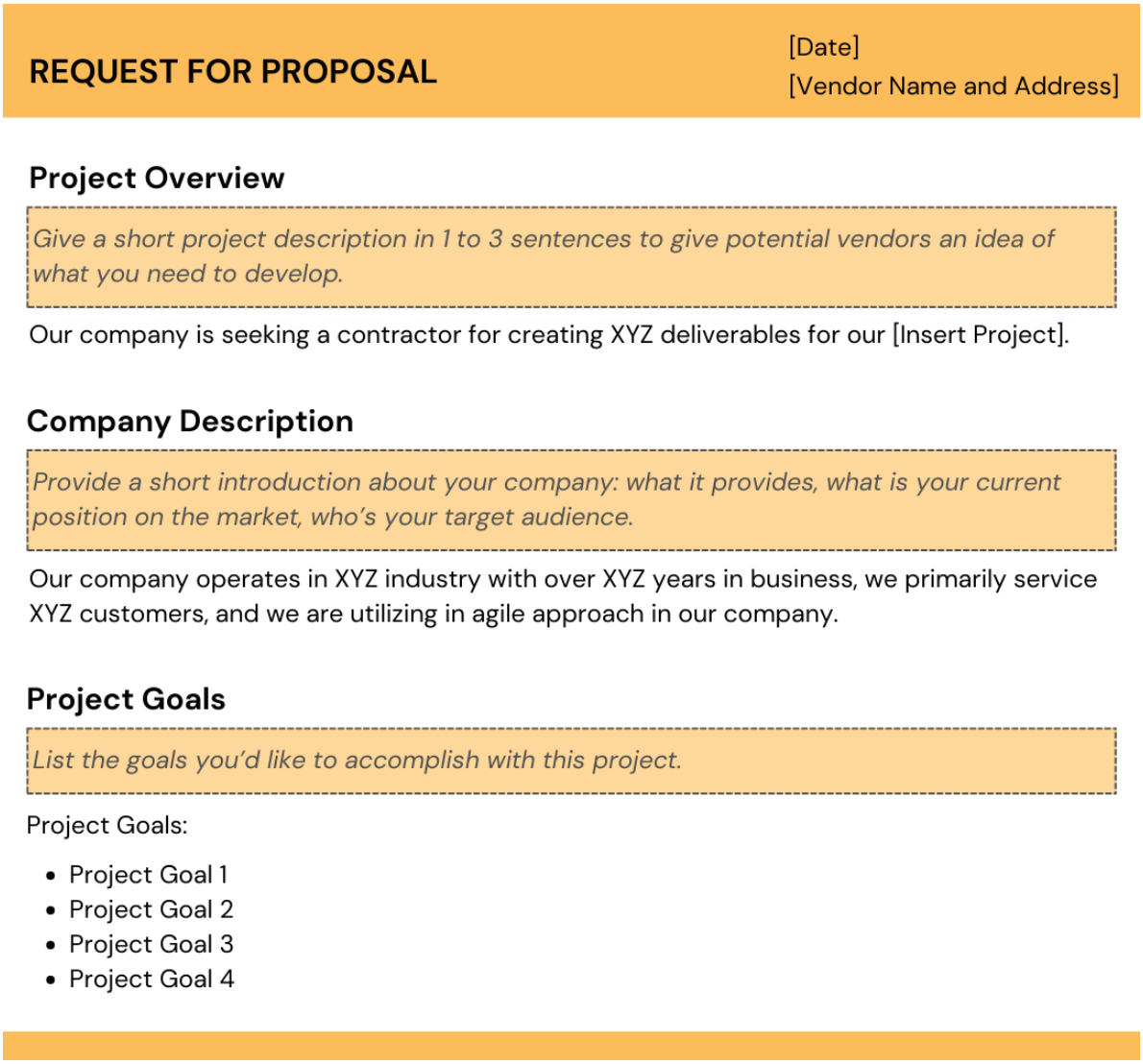
The bid process is how potential vendors compete for a contract and opportunity to fulfill the procurement needs. Bids are a great way for a company to gather multiple options in order to get the best fulfillment possible.

Three Common Bid Documents

- **Request for Information (RFI):** Created and distributed to vendors to gather details before creating and sending out formal bid documents. This is most often requested in a regular email.

- **Request for Proposal (RFP):** A document used when a project needs a specific solution that the vendor will propose. This is particularly useful in projects where the scope of the project is complex and the project team isn't entirely committed to a single, specific solution.
- **Request for Quote (RFQ):** A document sent to potential suppliers or vendors when price is the primary consideration. This document focuses on getting a price for a specific deliverable or solution that is clearly defined by the project team or project manager.

Figure 9.1: *A sample request for proposal (RFP)*



REQUEST FOR PROPOSAL

[Date]
[Vendor Name and Address]

Project Overview

Give a short project description in 1 to 3 sentences to give potential vendors an idea of what you need to develop.

Our company is seeking a contractor for creating XYZ deliverables for our [Insert Project].

Company Description

Provide a short introduction about your company: what it provides, what is your current position on the market, who's your target audience.

Our company operates in XYZ industry with over XYZ years in business, we primarily service XYZ customers, and we are utilizing in agile approach in our company.

Project Goals

List the goals you'd like to accomplish with this project.

Project Goals:

- Project Goal 1
- Project Goal 2
- Project Goal 3
- Project Goal 4

Figure 9.2: *A sample request for quote (RFQ)*

REQUEST FOR QUOTE

[Date]
[Vendor Name and Address]

Dear [Vendor Name],

We are currently seeking proposals for the [Project Name/Description]. We have identified your company as a potential vendor for this project and would like to request a quote from you.

Please provide us with your best quote for the following services:

Service/Product Name	Date of Completion	Other Specifics

We would like you to provide us with a detailed breakdown or cost for each service or product including any additional charges or fees that may apply.

In addition, please include the following information in your proposal:

- Your company's experience in industry
- Relevant qualifications and certifications
- A timeline for completing the project and all deliverables
- Any references or examples of similar projects you have completed in the past

We will be evaluating proposal based on price, quality, and your company's ability to meet our specific needs. Please submit your proposal no later than [Deadline for Submission]. If you have any question or require additional information, please do not hesitate to contact us.

Thank you for your time and consideration. We look forward to receiving your proposal.

Sincerely,
[Your Name]
[Your Company] [Phone] [Email Address]

Once bids are submitted, the project team will evaluate potential vendors based on their specific on important criteria, such as a vendor's experience, cost, reputation, and delivery time. After reviewing bids, the project manager and the contracting team or authority at the organization will negotiate terms with the vendor such as cost, deadlines, and any other important aspects. This ensures both parties agree on all details before creating and signing a legal contract.

Contract Signing and Vendor Integration

After selecting a vendor and finalizing negotiations, the contract is signed, and the vendor is now considered a project stakeholder. At this point, any project documents are updated to reflect the vendor's contributions, including timelines, costs, and quality standards. The vendor's role will need to be considered and managed in certain parts or the entire project, and their involvement needs to be integrated into project operations.

Managing Physical Resources

Many projects need access to physical materials and supplies in order to complete deliverables. Proper management ensures that these important resources are available as needed, while communicating this availability with the project team, stakeholders, and supporting vendors.

When managing large amounts of physical resources, such as in a construction project, an organization may use an integrated logistics system. This is an internal process that an organization uses to plan, order, transport, store, track, and distribute resources efficiently. A logistics system is usually governed by company policy and can be tailored to the project, ensuring resource availability is aligned with project requirements and minimizing delays.

Primary Objectives of Managing Physical Resources

- ➢ Reduce material handling and storage on-site.
- ➢ Reduce waste and scrap.
- ➢ Decrease wait times for obtaining physical materials.
- ➢ Promote an efficient work environment.

New Work and Changes

New work and changes to a project will happen and must be properly managed to avoid budget, resource difficulties, and schedule delays. How new work and changes are handled depends on the development approach used in the project.

Agile approaches tend to handle new work and changes smoothly. In these projects, new tasks are added to the product backlog, with the project manager and product owner managing scope, budget, and resource availability. The product owner also prioritizes tasks to ensure the most important ones are prioritized and completed on schedule. Any changes to the project can generally be discussed and approved in meetings with the project manager, project team, product owner, and/or stakeholders.

In traditional projects, changes and new work are less frequent but must be managed more formally and can be more time consuming. Proposed changes must go through a change control process, and submitted to a change control board (CCB) by the change requestor. Adjustments

that come up are usually proposed to the scope, budget, and resources. Once changes are approved, project documents such as the project scope statement, schedule, and requirements are updated and any changes communicated to the relevant stakeholders.

Lessons Learned, Knowledge Management, and Knowledge Types

Lessons learned and knowledge management ensure that valuable insights gained during a project are retained for the project team to learn on the current project. These practices can also contribute to more widespread organizational learning and long-term success on future projects.

Lessons Learned

Throughout a project, especially after important phases or milestones, the project team should reflect on their performance and identify areas of improvement. This practice is known as lessons learned.

Lessons learned can be gathered through regular meetings and retrospectives or at specific intervals in the project. To save that knowledge, a document known as a lessons learned report can be created, and any lessons learned can be documented through that report to be referenced later.

Knowledge Management

Projects offer valuable learning experiences, often providing insights and knowledge that are not only relevant to current but also to future projects.

Knowledge can be categorized into three areas:

- **Project Specific:** Knowledge relevant only to the current project.
- **Process Specific:** Relevant to improving processes, practices, or workflows, such as simplifying documentation with a new template. This can be either project or organization specific.
- **Organization Specific:** Specific to the entire organization. Some examples are creating training documents or videos on how to use a newly implemented software that everyone in an organization will need to use.

Explicit and Tacit Knowledge

There are two main types of knowledge that project teams can develop.

These types of knowledge include:

1. **Explicit Knowledge:** Structured information that can easily be documented and shared with others, such as a training video, a knowledge or how-to article, a step-by-step procedure, or a report.

2. **Tacit Knowledge:** Knowledge that can only be gained through hands-on experience. Tacit knowledge can be difficult to express and is often only able to be transferred directly from the person who has the knowledge to the person who desires the knowledge. Common examples of relaying tacit knowledge are through coaching, mentorship, collaboration, job shadowing, or hands-on training.

Interactions with Other Performance Domains

The Project Work Performance Domain interacts with 3 other performance domains:

- **Planning Performance Domain:** The Work Performance Domain supports planning by providing structure and processes.
- **Delivery Performance Domain:** Through coordinating and managing project activities, the Work Performance Domain ensures work is executed efficiently and delivered on time.
- **Measurement Performance Domain:** The Work Performance Domain helps with measurement by tracking progress and providing performance data through metrics, which ensures the project is on track and any areas of improvement are identified.

Work Performance Domain Summary

In this chapter, we covered the Work Performance Domain. This domain is essential to the execution and coordination of project activities so that work is organized, managed, and completed as planned.

Major focus areas for this domain include processes, team management, resource optimization, maintaining clear communication, balancing competing constraints, and continuous improvement through lessons learned. Through effective knowledge and management of these areas, project teams can increase both short-term and long-term organizational growth and project success.

In the next chapter, we'll cover the Delivery Performance Domain, focusing on creating deliverables with proper quality and releasing them on schedule.

Chapter 10
Delivery Performance Domain

The Delivery Performance Domain ensures that project deliverables are completed on time and meet quality standards. This domain plays a critical role in driving project success by focusing on quality assurance, schedule adherence, and value delivery.

In this chapter, we'll explore how projects deliver value, defining deliverable requirements, managing scope, ensuring quality, and understanding the potential for subpar project results.

Main Outcomes of the Delivery Performance Domain

- Align projects with business objectives and support organizational strategic progress.
- Achieve the intended outcomes the project set out to deliver.
- Deliver project benefits within the planned time frame.
- Ensure the project team thoroughly understands all project requirements.
- Stakeholders approve of and are satisfied with the project deliverables.

Key Terminology

Acceptance Criteria: Specific conditions that must be met for a customer or stakeholder to accept the deliverable.

Change Control System: A formal process used to ensure that any changes to a project's scope, schedule, or cost are formally reviewed, approved, and documented.

Cost of Quality (COQ): Any and all costs incurred over the life of a product by investing in preventing nonconformance to requirements, appraising the product or service for conformance, and addressing failures to meet requirements.

Definition of Done (DoD): Criteria that must be met for a deliverable to be considered ready for customer use or release.

Done Drift: A concept in fast-changing (typically Agile) environments where the definition of "done" or project completion constantly changes due to either market demand or competitor changes.

Quality: Characteristics that must be met to fulfill project, product, or service requirements.

Requirement: A condition, capability, or quality that must be present in a product, service, or result in order to satisfy a business need.

Scope: The products, services, or results to be created and provided by the project. The main reason why the project was undertaken.

Scope Creep: An uncontrolled movement away from the project scope without formal approval or proper adjustments to time, cost, or resources.

Work Breakdown Structure (WBS): Breaking up of the total scope of work into smaller tasks to be carried out by the project team. Often known as "decomposition" of the scope.

When and How Projects Deliver Value

Projects deliver value to stakeholders through two primary delivery intervals. Complete delivery (predictive approach) at the end or incremental delivery (Agile/adaptive) throughout the project.

Using a predictive approach, projects release most of the deliverables at the end of the project, with most value only realized after the project is finished. These types of projects typically align with organizations and industries that have longer product cycles or require more time to fully realize the benefits of the project.

For projects that follow an Agile approach, value can be delivered continuously throughout the project as smaller components of the project are completed and released, benefiting the business and stakeholders throughout the project's duration. These approaches allow organizations to demonstrate and realize value sooner, which is especially useful in startups or other fast-paced environments.

Justifying and Demonstrating Value

No matter the approach used, a business case is usually created before a project starts, and it plays a major role in justifying the project and estimating the business value the project is anticipated to create. The structure of the business case can vary. Some projects will have detailed ROI (return on investment) projections, while others might outline high-level goals, such as the problem being solved, potential revenue streams, and the project's overall cost structure.

Roadmaps or baselined plans are used for demonstrating and measuring value through meeting planned outcomes and accomplishing milestones. These documents guide the project from planning to delivery, ensuring that value is created and aligns with project expectations.

Deliverables

Deliverables are the tangible or intangible outputs created during a project to meet specific project needs or requirements. They can range from smaller contributions, like prototypes, reports, blueprints, or software features, to the final product, service, or result that fulfills the project's overall purpose.

Nick's Tip:

You can think of deliverables as always being part of the bigger picture of the project. Whether it's a small contribution or the entire intended result the project was created to deliver, each deliverable plays a critical role in moving the project to successful completion. These outputs help track progress, maintain alignment with stakeholder expectations, and ensure the project remains on course.

Defining and Managing Deliverable Requirements

Regarding deliverables, requirements are the conditions or capabilities that must be present in a deliverable for it to contribute to the project's goals. These requirements serve as the foundation for defining a project's scope and are used to help guide the creation, design, and production of deliverables. They are often unclear at the beginning of the project and may need to be defined after initial planning.

There are 4 steps in managing requirements:

1. **Eliciting requirements:** Eliciting requirements is the process of gathering and identifying requirements for a project. This can be done in many different ways, through meeting with stakeholders, interviewing, observing, and analyzing data of past similar projects.
2. **Documenting requirements:** Once requirements are received, it's crucial to document them for future reference. Requirements should be clear, concise, verifiable, consistent, and complete.
3. **Evolving requirements:** Requirements may change over time even when they are known. It's common for requirements to change significantly and over time in Agile projects, but not as often in traditional projects.
4. **Managing requirements:** No matter if the project uses a predictive approach or an Agile approach, managing requirements is an important part of meeting deliverables. Poor requirement management can result in issues like scope creep, cost overruns, and schedule delays. Most often, managing requirements is done by a business analyst or product owner—usually just one person on the project team. This person is there to ensure that stakeholders approve changes and that requirements stay aligned with overall project goals.

   By creating, managing, and continuously refining requirements, a project can create value, satisfy stakeholders, and meet intended outcomes.

Scope and Scope Management

Project scope, or simply "scope," refers to the total products, services, outcomes, and value that a project is created to deliver. It defines exactly what needs to be accomplished to meet stakeholder needs while keeping the team focused on completing relevant work that contributes to the project goals within a specific timeline.

Scope Creep

Scope creep occurs when new requirements or features are added to a project's original scope without proper approval through a change control process or adjustments to the schedule, budget, or resources. This leads to extreme delays, potential overruns, and even project failure.

To manage or prevent scope creep, project managers can implement a change control system, often with a Change Control Board (CCB). This system provides a structured approach to evaluate new requests to scope change, ensuring that any changes are formally approved or rejected based on their predicted value, resource availability, and potential impact on timelines and delivery.

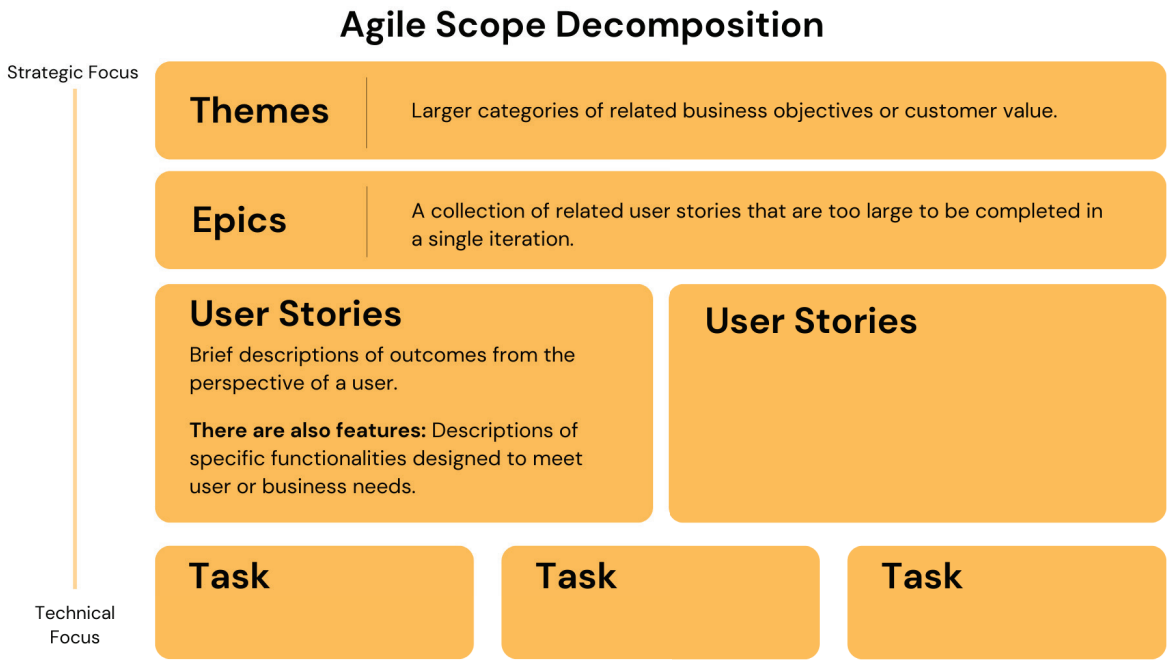
Scope Decomposition

Once project scope is defined, it can be broken down into more manageable parts; this process is known as scope decomposition. Both predictive and Agile projects utilize a form of scope decomposition.

In predictive projects, this is done by implementing a Work Breakdown Structure (WBS). A WBS uses a hierarchical representation of the scope of work. As you go down each level in a WBS, projects and deliverables are broken down into smaller tasks with greater detail that the project team can complete and manage more easily.

In Agile projects, scope decomposition is different, breaking down larger themes into smaller epics, user stories, and tasks as shown in figure 10.1. There are also features that are essentially instructions or descriptions of specific functionalities that must be added.

Figure 10.1: *Agile scope decomposition*



Defining Deliverable Completion

Deliverable completion is the standards and criteria that deliverables must meet in order to be accepted. Every project will have different quality expectations, which must be met to prevent low quality or unfinished deliverables from being accepted.

There are 3 factors that must be clarified to define deliverable completion:

- **Acceptance or Completion Criteria:** Define what specific conditions must be met for the deliverable to be considered complete. If there is a customer, they will likely need to accept the criteria as well. Completion or acceptance criteria are often documented in the project's scope statement.
- **Technical Performance Measures:** Specific technical performance criteria could define the completion of tasks or components for a deliverable.
- **Definition of Done (DoD):** Implemented in Agile or adaptive approaches, Definition of Done is a criteria or checklist of conditions that must be met before a deliverable is considered complete.

Changing Targets of Completion

In fast-paced environments, the definition of what constitutes a deliverable being 'completed' or 'done' can shift frequently. Evolving changes in requirements, features, or emerging technologies can lead to different ideas or targets of when a deliverable is considered done.

Constant adjustments to what is considered "done" can lead to an issue known as "done drift," which constantly shifts the target of completion and makes it ultimately unattainable.

To avoid done drift, project teams can establish a clear Definition of Done (DoD) for deliverables at the start of the project and regularly revisit it during sprint reviews or retrospectives and occasionally with any stakeholders or customers as needed. While developing a DoD is a good start, project teams will also need to manage stakeholder and customer expectations in order to ensure there isn't a constant shift in expectation.

Managing Delivery Quality

Delivering a project requires ensuring that the work and deliverables meet set quality standards. Scope and requirements define *what* needs to be delivered; quality focuses on *how well* deliverables are produced. Quality requirements and standards are typically found in completion criteria, definitions of done (DoD), statements of work, project documentation at the project level, as well in organizational policies, procedures, and processes at the organizational level.

Cost of Quality (COQ)

Cost of quality (COQ) is the total cost incurred to ensure a product or service meets quality standards.

Let's cover the 3 main aspects of COQ, prevention, appraisal, and failure costs associated with quality.

Prevention Costs

These costs come from preventing defects and failures in a product or service before they can negatively impact customers or users.

Four prevention methods used are:

- **Quality Assurance** (QA): A system of evaluating and monitoring aspects of a service or product for quality. Very common in physical products.
- **Quality Planning:** Creating plans to maintain quality and reliability.
- **Product Requirements:** These are requirements that the end product must fit. They could be things related to the product as well, such as materials used.
- **Training**: For the development, preparation, and maintenance of programs.

Appraisal Costs

Appraisal costs are involved in determining how well quality standards are being implemented. This is accomplished by evaluation, measurement, and monitoring of physical resources, products, and services.

Three appraisal methods are:

- ➢ **Quality Auditing:** Confirming that an implemented quality system is working properly.
- ➢ **Verification:** Ensuring that products, services, or physical resources are measuring up to required specifications.
- ➢ **Supplier and Vendor Rating:** Assessing suppliers and vendors for potential products and services procurement.

Failure Costs, Internal and External Failure

Failure costs are expenses associated with defects in a product or service, including internal costs for addressing issues before reaching the customer and external costs for correcting defects after delivery.

Internal Failure Costs

Involve finding and correcting defects before a customer receives a product. These occur when a product doesn't meet quality standards, such as when there is:

- ➢ **Waste**: Unnecessary work caused by poor communication, organization, or errors.
- ➢ **Scrap**: Physical resources that cannot be repaired or sold.
- ➢ **Rework:** Correcting defects in a product by doing work again.
- ➢ **Failure Analysis:** Performed to find the root causes of defects.

External Failure Costs

Involve defects that are found after the product reaches the customer, often requiring some sort of fixing, remediation, or correcting of defects after delivery.

- ➢ **Repairs and Servicing:** Fixing products that have been returned or are in the customer's hands.
- ➢ **Warranty:** Covering claims for failed products or re-performed services, whether refund, replacement, or fixing the product.
- ➢ **Complaints:** Handling customer complaints and returns related to the defective product.
- ➢ **Reputation Cost:** Potential damage to reputation and consumer sentiment from product defects.

Cost of Change

The cost of change is any financial cost to make modifications to a project, product, or process after it has already entered development or production.

Change in a project can increase significantly as a project progresses, with early changes being less expensive and easier compared to changes made during later stages in the project, which are often time-consuming and costly.

Nick's Tip:

Whenever calculating the cost of change (or cost for development or production in general), make sure to take into account the estimated cost of labor or time spent.

For example, in a website project, a company decides to redesign its visual interface or GUI mid-project. The cost of change must account for factors like third-party services, development time, and previously completed work. Ignoring in-house labor costs can lead to underestimating the exact impact of such changes.

Subpar Results

A project may fail to deliver the intended results or outcomes it was initially set out to achieve. Since projects are often innovative, there is always the risk of a project not meeting expectations or producing subpar results. From a business standpoint, this is a possibility an organization must accept before undertaking a project.

Failure is a risk that exists in every single project, particularly in experimental or high-risk ventures. For example, organizations creating breakthrough technologies or new medicines must invest what they are willing to lose, knowing the outcome is uncertain. In such cases, several failures may occur before success is achieved. Other projects may fall short due to external factors, such as missing market opportunities or being overtaken by competitors. While effective project management can mitigate these risks, uncertainty is inherent in the pursuit of unique deliverables.

Interactions with Other Performance Domains

The Delivery Performance Domain builds upon the Planning Performance Domain by transforming plans into completing and actioning on deliverables. Delivery structure and cadence are influenced by the Development Approach and Life Cycle Performance Domain, and it draws on the Project Work Performance Domain to manage resources, processes, and handle procurements necessary for deliverable completion. These interactions all ensure that the project team can create and complete deliverables within project goals and stakeholder expectations.

Delivery Performance Domain Summary

In this chapter, we explored the Delivery Performance Domain, which focuses on ensuring that project deliverables meet quality standards and are completed on schedule.

We specifically covered topics including defining deliverable requirements, managing scope, ensuring quality, and understanding the potential for subpar project outcomes.

Through managing all of these aspects of a project effectively, project managers can prevent scope creep, minimize delays, and ensure that deliverables provide real and expected results to stakeholders.

In the next chapter, we will cover the Measurement Performance Domain.

Chapter 11
Measurement Performance Domain

The Measurement Performance Domain focuses on measuring, tracking, and evaluating project performance by continuously monitoring baselines, goals, business objectives, and stakeholder expectations. Key Performance Indicators (KPIs), metrics, and data-driven insights all help project teams identify variances, take corrective action, and drive continuous improvement.

In this chapter, we'll learn how to establish effective measures, understand KPIs and SMART criteria, determine what metrics to measure, forecast project performance, analyze and use metrics effectively, and avoid common problems with metrics.

Main Outcomes of the Measurement Performance Domain

- ➢ Ensure a clear understanding of the project's health and status at all times.
- ➢ Generate and utilize actionable data to guide decision-making.
- ➢ Take timely and effective actions to ensure project performance stays on track.
- ➢ Achieve set project and business goals through leveraging accurate forecasts and informed decision-making.

Key Terminology

Baseline: The approved version of a work product, serving as a reference point for comparing actual performance or results.

Burn chart: A visual tool common in Agile projects used to track project progress, illustrating the amount of work completed over time (burnup) or the amount of remaining work (burndown).

Dashboard: A visual display, using charts and graphs to track project progress or performance across key metrics. Usually created in a project management tool.

Key Performance Indicators (KPIs): Quantifiable measures used in evaluating the success of a project. KPIs include both leading indicators and lagging indicators, which we'll discuss in this chapter.

Metric: A specific attribute of a project or product, along with a method for measuring it.

Variance: A measure of the deviation between planned and actual performance. Variance helps identify areas where the project is underperforming or overperforming.

Establishing Effective Measures

Establishing effective measures ensures that the most critical and most usable aspects of a project are accurately tracked, evaluated, and reported to the project team and any necessary stakeholders. When properly implemented, measures enable project teams to track progress, evaluate data, report status, and make informed decisions to optimize project performance and improve outcomes in both the present and future.

Key Performance Indicators (KPIs)

Key Performance Indicators, known as KPIs, are quantifiable (able to be put into numbers) measures used to evaluate and measure a project's success. There are two categories of KPIs, leading indicators and lagging indicators.

Leading indicators: Predicting future changes

Leading indicators predict changes or trends in a project, allowing project teams to address potential issues and risks early, before they escalate and become larger issues.

Example: A project manager notices a high number of tasks in progress, with few being completed. This indicates potential bottlenecks, which can be investigated early to prevent future delays.

Lagging indicators: Measuring past events

Lagging indicators measure past performance and completion of project goals through analysis of past completed project deliverables. These indicators are easier to quantify and include schedule or cost variances, completed deliverables, and resource consumption.

Example: A project team reviews the number of deliverables completed at the end of a phase. They notice 5 deliverables were not completed as originally planned. This helps the team understand that they need to improve task completion rates for the next phase and can also validate the early warnings provided by leading indicators.

Effective Metrics Using SMART

Metrics are valuable tools, but the use of metrics should focus only on important data that provides actionable insights. Avoid working with non-relevant and useless metrics, as they can waste time more than provide benefit.

The SMART framework helps define qualities of effective metrics:

> **(S)pecific:** Measurements should be as specific as possible as to what needs to be measured.

Example: Instead of tracking project "progress," track "the percentage of project tasks that have been completed by the due date."

(M)eaningful: In order to maximize effectiveness, metrics should be meaningful to the project's business case, requirements, or scope of work.

Example: If a project's goal is to reduce costs, a meaningful metric could be "cost savings per completed deliverable." A meaningless or non-useful metric in this case would be tracking the number of meetings held weekly.

(A)chievable: The metrics should be achievable for that specific project. Every project will have different people, resources, and requirements. Metrics employed need to make sense given the specific attributes or limitations of the project.

Example: A small project team has decided based on their resources that completing 5 deliverables per week is achievable. Making the metric higher than that, 15 deliverables per week for example, would not be achievable.

(R)elevant: Relevancy in metrics means that the information is useful, valuable, and useful in the larger story that is the project itself.

Example: On a project focusing on improving customer satisfaction, tracking the "average response time to customer queries" is relevant, while tracking "number of internal customer service team meetings" is not very relevant and has little to do with the focus of the project.

(T)imely: Time of measurement is crucial. Working with outdated or too old information can create misunderstandings in the present project. It's important to work with measurements that make sense.

Example: Tracking the amount of budget used weekly during a project lifecycle fits into the "timely" aspect. However, reviewing the budget at the end of the project with no week-to-week or month-to-month tracking would be considered "untimely" and may lead to missed financial targets or the project going over budget.

Nick's Tip:

You can implement the SMART framework in goal setting for an individual person or in a group setting as well. The SMART framework isn't specific to just project managers— many teachers, coaches, and mentors use it too. It encourages people to define actionable goals that can be set for short-, mid-, and long-term visions.

Metrics to Measure

Metrics are quantifiable and provide insights into the performance, progress, and outcomes of a specific project or business initiative. Different projects, businesses, and organizations will

prioritize and gather varying metrics depending on their overall goals, processes, and key performance indicators (KPIs).

Let's explore some of the most commonly used metrics and their applications across different aspects of project management.

Delivery Measurement

Delivery metrics focus on tracking current work in progress and are commonly used in adaptive approaches. These metrics provide insights into team productivity and current workflow.

Important aspects of delivery

- **Work in Progress (WIP):** Tracks the work items currently being worked on. This metric helps the project team ensure they are managing a reasonable number of tasks simultaneously, preventing burnout and improving quality.
- **Lead Time:** Measures the time from when a work item or task enters the backlog to when it is completed. Shorter lead times indicate an efficient, fast, and productive process.
- **Cycle Time:** The amount of time it takes to work on and complete a task. Similar to lead time, but focuses specifically on task completion. Shorter cycle times equate to higher productivity, and consistent cycle times can help predict future project performance.
- **Queue Size:** Refers to the number of work items waiting to be worked on (known as "the queue"). By comparing queue size with the work in progress (WIP) limit, the team can improve workflow efficiency.
- **Batch Size:** Measures the estimated amount of work expected to be completed during an iteration.
- **Process Efficiency:** Process efficiency is a metric to analyze and optimize workflow. It calculates the ratio of value-adding time (tasks in development or verification) to non-value-adding time (tasks waiting or idle), with higher ratios signifying a more efficient process.

Baselines

A project baseline serves as a reference point for tracking a project's performance, most commonly with cost, schedule, and scope baselines. There are other baselines that may be used, with deliverables serving as the primary metric.

Schedule baseline metrics

- **Start and Finish Dates:** For schedule baseline, compare the actual start and finish dates of tasks to the planned start and finish dates. This reveals what tasks are being started and completed on schedule.

- **Effort and Duration:** Comparing actual effort and duration against planned effort and duration to validate whether the time and resources allocated to tasks were estimated accurately.
- **Feature Completion Rates:** Reviewing the rate at which features or deliverables are accepted. This helps assess progress and provide insight into whether the project is on track to meet deadlines and cost estimates.
- **Critical Path:** The critical path is the sequence of tasks in a project that dictates the fastest possible way to complete the project. Any delays in critical path tasks will directly impact the overall project timeline. For example, in a building construction project, the building's foundation has to be completed on time or else it will delay all other work on the project.
- **Schedule Variance (SV):** Schedule variance measures the difference between realized value and planned value, particularly for critical path (defined below) tasks. It measures how much a project is behind or ahead of schedule.
- **Schedule Performance Index (SPI):** SPI is an earned value management metric that assesses how well the project work is going compared to the planned schedule. It provides a ratio of earned value to planned value, helping track overall schedule performance. The formula for Schedule Performance Index is:

  SPI (Schedule Performance Index) = EV (Earned Value) / Planned

Figure 11.1: *Calculating Schedule Variance*

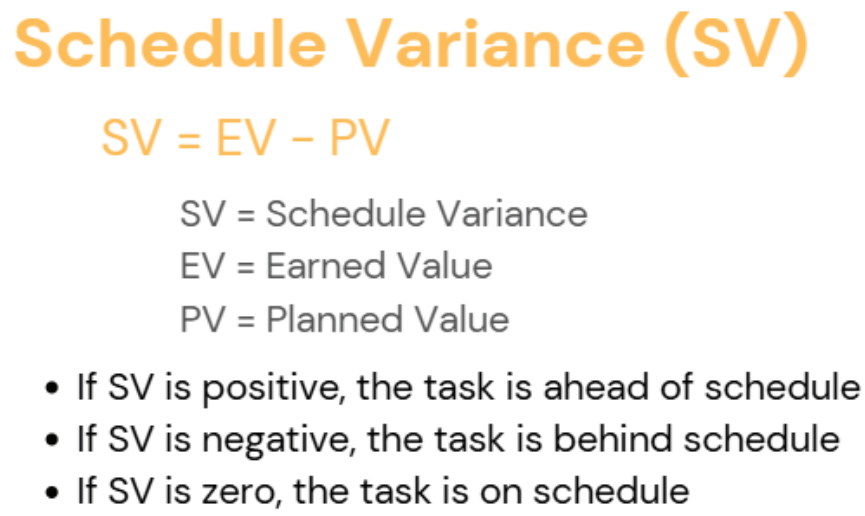
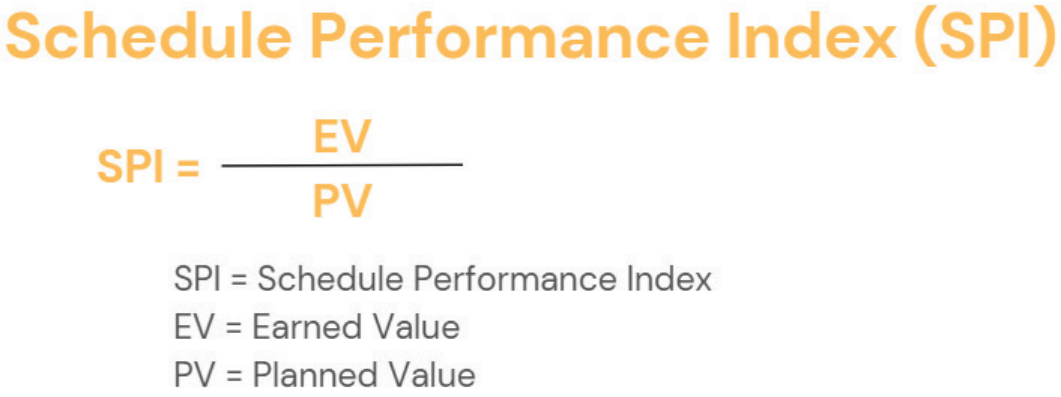


Figure 11.2: *Calculating Schedule Performance Index (SPI)*



Cost Baseline Metrics

- **Actual Cost vs. Planned Cost:** This compares the actual cost of resources, labor, etc., with the estimated costs. This is often called the burn rate, reflecting how quickly the project is "burning" money or spending resources compared to the plan.
- **Cost Variance (CV):** Cost variance is calculated by comparing the earned value to the actual cost of deliverables. It indicates whether the project is under or over budget.
- **Cost Performance Index (CPI):** The Cost Performance Index reflects the cost efficiency of a project. It compares the earned value to actual costs to show how well the project is sticking to its budget.

Figure 11.3: *Calculating Cost Variance*

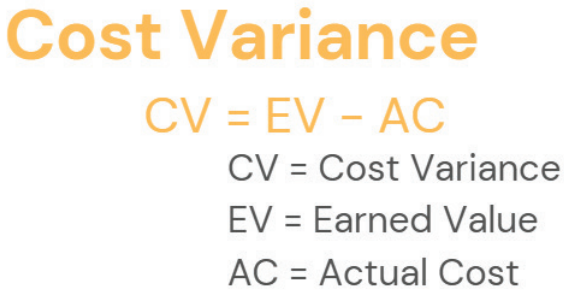
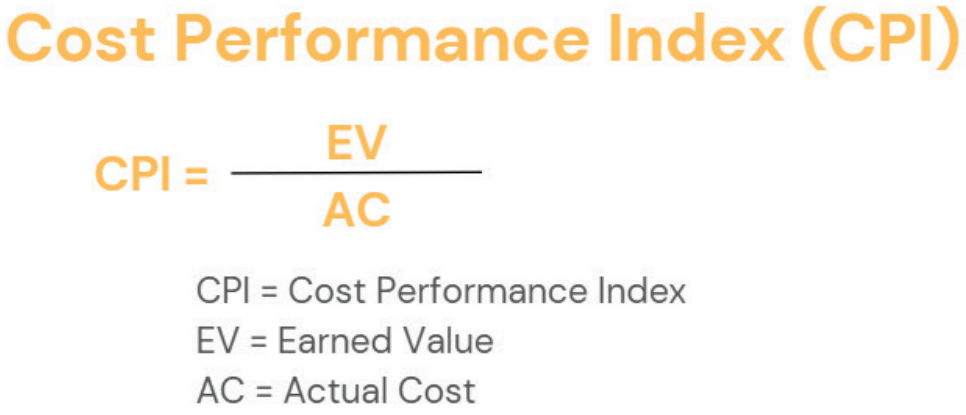


Figure 11.4: *Calculating Cost Performance Index (CPI)*



Resource Measurements

Resource measurements are often a part of cost measurements to ensure that project resources are being utilized effectively and within budget.

There are two measures, evaluating price variance and usage variance:

- **Usage Variance:** Usage variance evaluates how actual resource usage compares to the planned resource usage, calculated by subtracting planned usage from actual usage. A significant variance could indicate inefficiencies or unplanned changes in project scope.
- **Price Variance:** This assesses the difference between the planned cost of resources and their actual cost, calculated by subtracting the estimated cost from the actual cost. Variances here could highlight budget overruns, procurement issues, or volatile pricing of materials and services.

Business Measurements

These can be used to ensure that project deliverables are aligned with the business case and benefit realization plans in order to drive value.

The four business measurements are:

- **Return on Investment (ROI):** Return on Investment is a measurement of the financial return or value generated from a project. Project managers will calculate ROI before starting a project to make a business case, and ROI is measured throughout the project to ensure it's delivering value.
- **Net Present Value (NPV):** Net present value is the difference between the project's benefits and its costs. A positive NPV means the project is receiving more value than it costs. A negative NPV means the project is not generating more value than it costs.

Example: A company invests $50,000 in a project that generates $20,000 annually for three years. After calculating the NPV of $60,000 ($20,000 per year for 3 years), it shows $10,000 more value than the initial cost, indicating the project is financially beneficial.

- **Cost-benefit ratio:** The cost-benefit ratio measures the benefit vs the financial cost of the project. A cost-benefit ratio higher than 1.0 indicates positive value, while anything below 1.0 is negative in value and would not make sense for a project.

  Example of ROI of >1.0: A company invests $1,000,000 in a project to integrate a toll booth on an existing road. They receive $1,500,000 in yearly revenue after the project is successfully completed on budget, making the ROI 50% and the ratio 1.5, meaning the project is successful.

  Example of ROI of <1.0: A company invests $100,000 in a software project, only to make $75,000 off the software during its lifespan.

- **Planned benefits vs actual benefits:** This measurement is a comparison of the planned benefits the project will receive versus the actual benefits realized throughout the project or at the end of the project. It helps understand if the project is delivering on expected value or benefits.

  Example: A healthcare project for a hospital plans to reduce patient wait times by 30% with new intake and care management software. However, by the middle of the project, it's shown that patient wait times have only improved by 12%. This gives the project manager an understanding of how to re-adjust the project focus to meet original planned benefits.

Stakeholders Satisfaction Measurements

Stakeholders' satisfaction and feelings toward the project need to be measured in order to understand where they are in terms of support and sentiment of the project.

Methods to measure stakeholder satisfaction:

- **Net Promoter Score (NPS):** Net promoter score measures how likely a stakeholder is to recommend a specific product or service to others. It's typically scored from -100 to +100, with -100 indicating they would not give a recommendation at all and +100 reflecting a strong willingness to recommend, which also shows positive sentiment and satisfaction.
- **Mood chart**: A mood chart can be used to gauge stakeholders' sentiment on a project. By listing out the most important stakeholders on a project and their feelings week to week or month to month about how the project is going and its overall impact. This tool can be used at the beginning of a project and throughout the project's life.

Methods to measure project team satisfaction:

- **Team Morale:** Team morale can be measured through surveys and questionnaires, specifically asking about how team members feel their work is contributing to the organization

and the world, how appreciated they feel, and how satisfied they are with the project, project work, and the project team. Measuring team morale is crucial to avoid burnout and should be done at the beginning and throughout the project.

- **Mood charts:** A mood chart can also be used for gauging project teams satisfaction in addition to stakeholder satisfaction. The mood charts for the project team can be updated more often (daily) when used to gauge a project team's satisfaction versus gauging a stakeholders satisfaction, which might be done weekly, bi-weekly, or monthly.

Forecasting

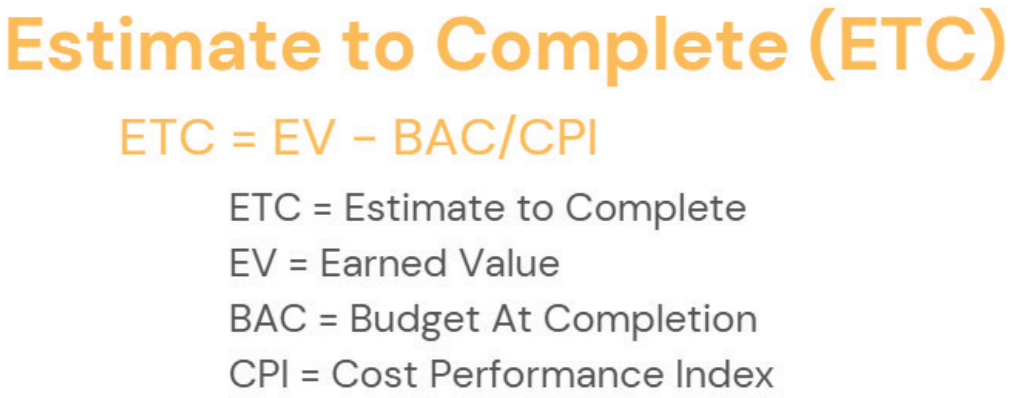
Project teams use forecasts and measurable data to predict future project outcomes, allowing them to adjust plans and project work as necessary. Forecasts can be qualitative, relying on expert judgment, or causal, aiming to understand how specific events may impact future outcomes. Quantitative forecasts use historical data to estimate future performance.

Common quantitative forecasting methods include ETC, EAC, VAC, TCPI, and analysis.

Estimate to Complete (ETC)

ETC estimates the cost needed to complete all remaining project work. One common way to calculate ETC is by subtracting Earned Value (EV) from the budget at completion (BAC) and dividing by the Cost Performance Index (CPI).

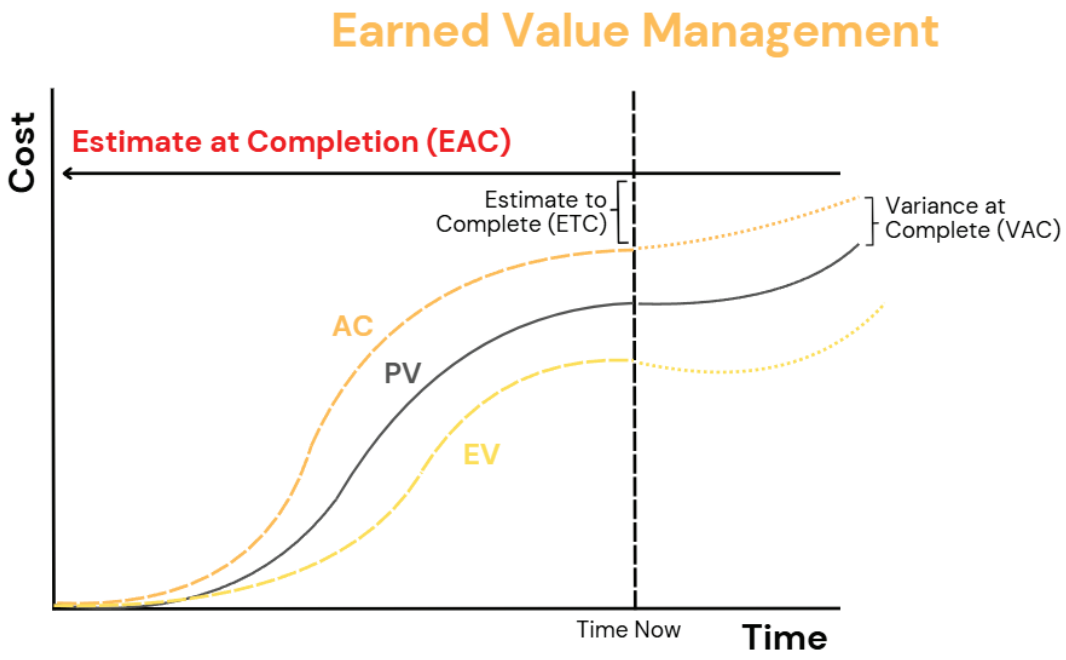
Figure 11.5: *Calculating Estimate to Complete (ETC)*



Estimate at Completion (EAC)

EAC forecasts the total cost required to complete all project work. A typical calculation assumes that future performance will mirror past performance, by dividing BAC by CPI. This measure helps project teams anticipate final costs based on current progress.

Figure 11.6: *Calculating Estimate at Completion (EAC)*



Variance at Completion (VAC)

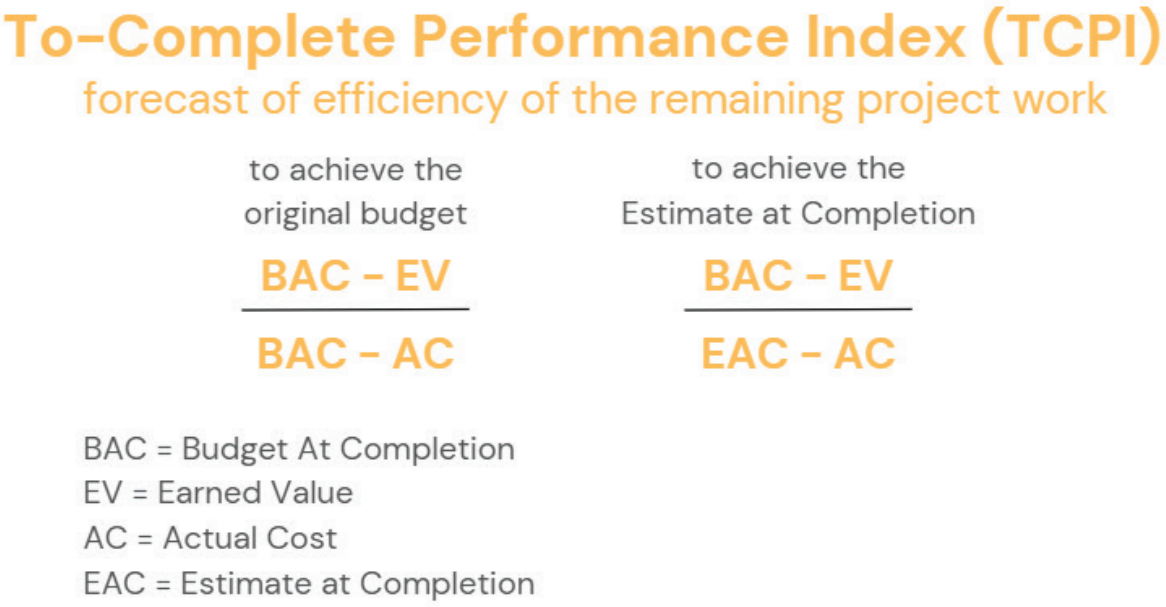
VAC forecasts the amount of budget surplus or deficit at project completion. It is calculated by subtracting EAC from BAC. A positive VAC indicates a project is likely to finish under budget, while a negative VAC signals a potential overrun.

Figure 11.7: *Calculating Variance at Completion (VAC)*

To-Complete Performance Index (TCPI)

TCPI measures the cost performance required to meet a specified financial goal. It is calculated as the ratio of the remaining work to the remaining budget, guiding the team on how efficiently the project team needs to perform to stay within budget.

Figure 11.8: *Calculating To-Complete Performance Index (TCPI)*



Analysis

Another essential aspect of forecasting is analysis, which involves examining data to make predictions.

Let's cover the two analysis methods:

- **Regression Analysis:** Examines the relationship between input variables and output results, primarily focusing on historical data. This analysis method helps project teams estimate future performance based on past trends. For example, a project manager analyzes past project data and finds that for every 10% increase in labor, there is a 15% increase in task completion.
- **Throughput Analysis:** Throughput analysis evaluates the number of tasks completed in a specific amount of time. Teams using adaptive practices may rely on metrics, such as velocity, story points, or features completed compared to any remaining to estimate completion dates and ensure progress is on track. For example, an Agile project team calculates that they complete 20 story points per sprint and compares it to tasks in the backlog to ensure the progress is on schedule.

Viewing & Using Measurement Data

Measurements collected can be easily displayed through visual means, such as dashboards, information radiators, and visual controls.

Dashboards

A common way of showing large quantities of information is a dashboard. Dashboards collect information electronically and can generate different charts and numbers that depict status. Dashboards offer high-level summaries of data and allow drill-down analysis into contributing data. Oftentimes, dashboards are used in both project management and regular business operations to see the bigger picture of various aspects of a project or operations.

There are many different programs that allow you to create a dashboard. There are many project management and technology operation platforms like Jira, ServiceNow, Asana, Trello and more.

Figure 11.9: *Dashboard with important metrics and information for a marketing project*

Information Radiators

Information radiators are visual displays of information that provide project information to an entire organization. These are often accessible by nearly anyone or are posted in common areas for on-site employees. Information radiators are also known as Big Visible Charts (BVCs) and they are often manually and physically created, not digital. They are most used in projects taking a predictive approach but can be used in Agile as well.

Visual Controls

Visual controls are the Agile and lean version of information radiators that we discussed above. They provide a clear, visual picture of processes and can depict a lot of different information about projects, such as specific tasks and deliverables. Just like information radiators, visual

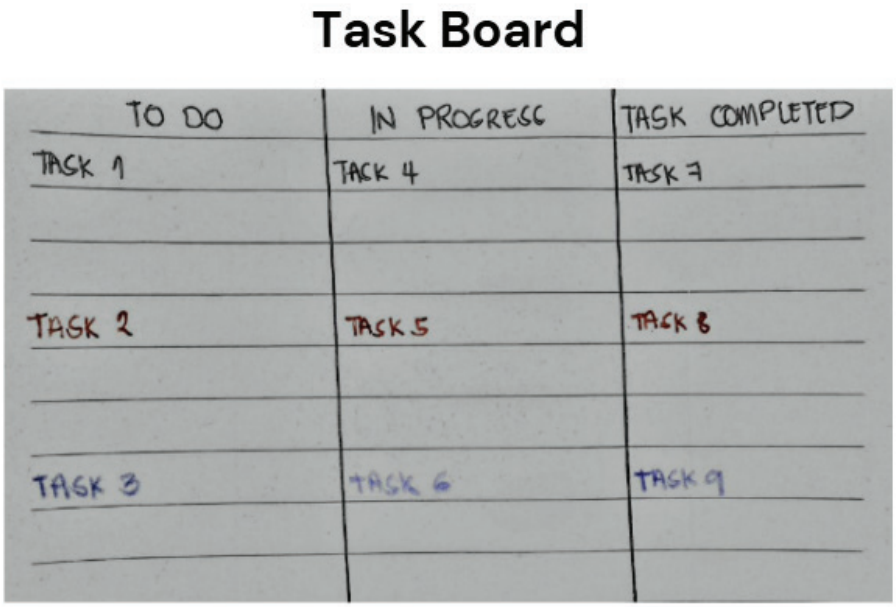
controls should be easily viewable for everyone to see. There are 2 types of visual controls, task boards and burn charts.

Task boards

Task boards are visual boards (either physical or digital) that represent the current status of planned work. These boards typically display work in categories such as "to do," "in progress," and "completed." Most digital task boards let you name, create, and set your own categories too, for example, "blocked" or "on hold," which are useful for distinctly labeling tasks.

For physical task boards, sticky notes or markers of different colors can be used to represent task types, while dots can indicate how long tasks have been in progress for. On flow-based projects using kanban boards, task boards can limit work in progress.

Figure 11.10: *Physical Task Board Showing To Do, In Progress, and Completed Tasks*



Burn charts

Burn charts, also known as "velocity charts," illustrate project team velocity, which shows how quickly deliverables are produced, validated, and accepted within a given timeframe and schedule.

There are two types of burn charts, burnup and burndown charts. A burnup chart tracks work currently completed compared to expected work. A burndown chart tracks how much work remains.

These charts help teams monitor progress toward goals and can be used to manage project scope. Both burnup and burndown charts can use "story points," which are a unique unit of measure specifically for Agile projects that reflects the effort or complexity required to complete a task.

Figure 11.11: *Burnup Chart*

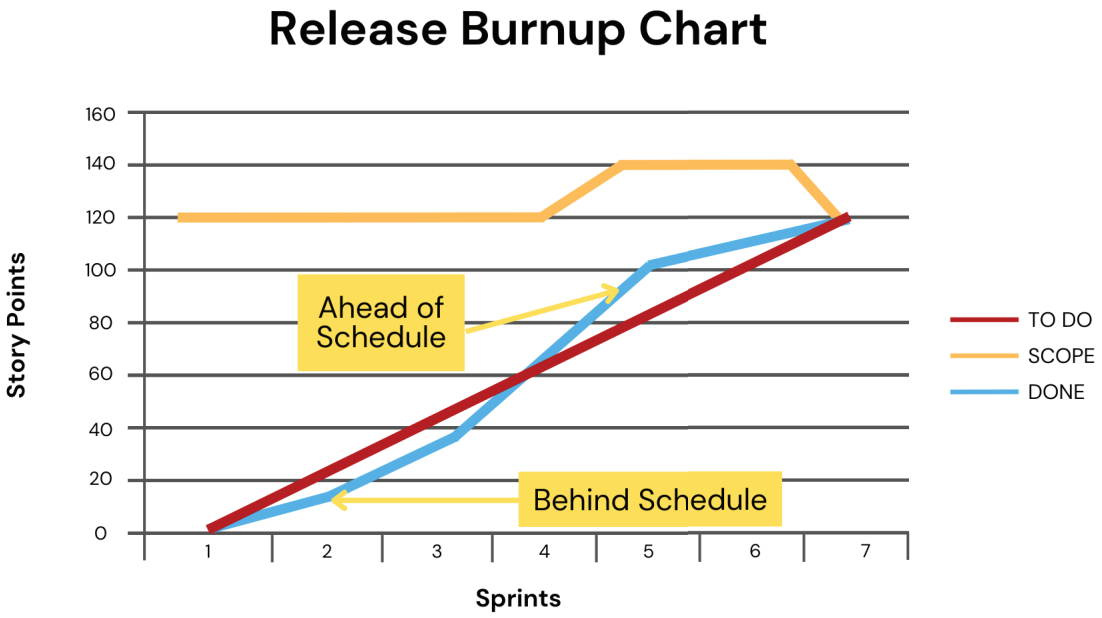
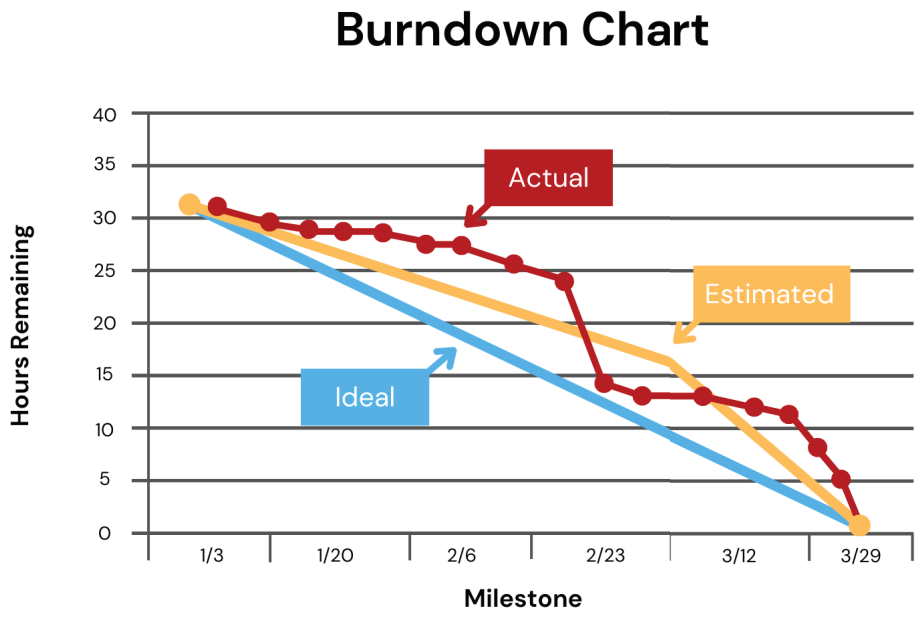


Figure 11.12: *Burndown Chart*



Potential Problems with Metrics

Project metrics are crucial in helping teams understand, track, and achieve their objectives, but there are potential problems that arise when using metrics. When we understand these problems,

both project managers and the project team can design and measure more effective metrics while avoiding time wasting associated with unneeded measurements.

Hawthorne Effect

One of the first problems to be aware of when working with metrics is the Hawthorne Effect. This effect states that simply measuring something can influence its behavior or output.

For example, if a project team knows they are being mainly measured on the number of hours they work, they might stay late or work more hours regardless of productivity.

To avoid the Hawthorne Effect, it's important to ensure that metrics encourage appropriate behavior that produces results toward the project goals and business value, instead of behavior that just produces volume or numbers that don't really matter.

Vanity Metrics

Vanity metrics are measurements that provide useless data that offers little to no value for project or business decision-making.

For example, in a digital marketing project, tracking the increase in the number of social media followers for a product might look impressive on paper. However, if those followers aren't converting into customers, the metric doesn't offer a realistic view of business or project success.

Demoralization of the Project Team

Setting goals is a huge part of ensuring that work gets done realistically and on time. However, if goals are set to the point they are unattainable, it can completely demoralize the entire project team and may cause burnout or a huge increase in stress.

Misusing Metrics

Misuse of metrics can mislead the project team or stakeholders and could even manipulate how people see the project. Common examples of misusing metrics are focusing on less important metrics over valuable ones, prioritizing short-term performance over long-term results or completing easier, out-of-sequence tasks just to increase immediate performance.

Confirmation Bias

Even the most well-intentioned project manager can fall into the trap of interpreting data in a way that supports their existing beliefs, known as confirmation bias. This bias occurs when we overlook information that challenges our views and instead focus on data that reinforces ideas or viewpoints we already have. As a project manager, you can avoid confirmation bias by involving neutral 3rd parties, analyzing data objectively, and staying open to insights that may challenge your own views.

Correlation vs. Causation

A common mistake when working with metrics and data is a lack of understanding that correlation isn't always causation.

For example, as a project manager you might assume that having a large amount of team members on the project team will directly result in faster project completion. However, the increased team size could be counterbalanced by a complex project, which might take longer to complete regardless of team size. You must always consider correlation and causation when interpreting and using data.

Analyzing Performance with Metrics

When tracking a project's performance, you will need to set thresholds for key metrics like schedule, budget, or work speed (velocity). Thresholds define acceptable ranges for performance and productivity, with any results that are outside of the acceptable range indicating a potential problem.

For example, a project schedule might have a threshold set at +5% for delays and -10% for early completion. If the project timeline exceeds the +5% delay limit, it means the project is running behind schedule. The action to remediate a schedule delay could involve reallocating resources or adjusting timelines to get the project back on track before further delays occur.

On the other hand, if the project timeline falls below -10% for early completion, it could mean that resources were underutilized or other tasks should have been worked on.

Project teams should proactively track and respond to a threshold before it is breached. To prepare ahead of time, an exception plan can be created. An exception plan is a set of actions that the project team will undertake if performance crosses a threshold. This plan doesn't need to be highly formal or overcomplicated; it can be as straightforward as holding a meeting to address the issue and take action.

Interactions with Other Performance Domains

The Measurement Performance Domain interacts with the Planning, Project Work, and Delivery Performance Domains by using plans as benchmarks to track project progress. It supports improvement through lessons learned and collaborates with the Team and Stakeholder Performance Domains to align metrics with project goals. It also helps adapt metrics to unforeseen events and identifies risks, promoting proactive decision-making.

Measurement Performance Domain Summary

In this chapter, we reviewed the Measurement Performance Domain, focusing primarily on tracking, evaluating, and utilizing project data to measure progress, ensuring stakeholders are satisfied and aligned with project goals.

Additionally, we covered various metrics, measures, forecasts, and formulas that are likely to appear on the exam. We also discussed how project managers can convert data and metrics into visual displays, such as dashboards and burn charts. Lastly, we covered potential problems encountered when using metrics.

In the next chapter, we'll delve into the Uncertainty Performance Domain and explore strategies for navigating risk and unpredictability in project environments.

Chapter 12
The Uncertainty Performance Domain

The Uncertainty Performance Domain is the final performance domain; it focuses on managing the unpredictable aspects of a project including risks, ambiguity, complexity, and volatility within projects.

This chapter covers many aspects of risk including identification, management, response strategies, reserves, and documents like the risk register. We'll also discuss how to conduct risk reviews, assess risks, and mitigate negative risk (threats) while capitalizing on positive risk (opportunities).

By understanding these important aspects of uncertainty and risk, project teams can anticipate challenges, adapt to changes, and make informed decisions when uncertainty arises.

Main Outcomes of the Uncertainty Performance Domain

- Developing an awareness and understanding of technical, social, political, market, and economic environments in which projects operate.
- Identifying and responding to uncertainty to minimize negative impact or disruptions.
- Recognizing and managing the interdependence of multiple variables that influence project outcomes.
- Anticipating and responding to potential risks including threats and opportunities.
- Delivering projects while minimizing negative impacts from unforeseen events or conditions.
- Identifying and leveraging risk opportunities to enhance project performance and outcomes.
- Utilizing budget reserves to ensure constant progress toward project objectives while minimizing roadblocks.

Key Terminology

Ambiguity: Unclear, vague, or uncertain conditions.

Complexity: A characteristic of a project that arises from the interaction of many interconnected elements.

Management Reserve: A budget or time reserve set aside to deal with unforeseen risks that are outside the project's planned scope.

Opportunity: A positive form of risk that, if realized, improves project outcomes.

Progressive Elaboration: An iterative process of increasing the level of detail in a project as more information becomes available and uncertainties are reduced over time.

Resilience: The ability or quality of a project team or organization to quickly adapt to unexpected changes or challenges without significantly impacting project performance.

Risk: Uncertain events that can positively (opportunities) or negatively (threats) impact and affect project objectives.

Risk Appetite: The level of risk that an organization or project stakeholder is willing to accept in pursuit of project objectives. Risk appetite reflects the level of uncertainty that can be tolerated before action is needed.

Simulation: Models or made-up scenarios created to predict potential risks and responses to mock real-world scenarios.

Threat: A negative event or condition that, if it occurs, can harm the project's objectives. Threats are negative risks, and the project management team needs to choose how it will address predicted or realized threats.

Uncertainty: The lack of knowledge or predictability of events or conditions.

Volatility: The potential for rapid, unpredictable changes that can significantly impact the project's objectives, resources, or environment.

Navigating Uncertainty

Uncertainty refers to the lack of clarity or predictability in project outcomes and is an inherent aspect of all projects. While it is impossible to predict every outcome, there are several strategies to help your project team prepare for uncertainty.

Information Gathering

Reducing uncertainty begins with gathering information through research and consulting internal or third party experts. Prioritize important information to avoid overwhelming the project team with unnecessary details.

Preparing for Multiple Outcomes

When uncertainty presents a few potential outcomes, the project team can develop response plans for each possible outcome. This includes having a main or preferred solution and contingency plans if needed. For situations with a lot of possibilities, the project team can categorize potential outcomes, assess their likelihood, and prioritize.

Utilize Set-Based Design

Set-based design involves exploring options early in a project to reduce uncertainty. This approach allows the team to compare solutions for balancing time, cost, quality, or risk without committing to a single solution pre-maturely before its effectiveness can be verified. As the project progresses, the project team should eliminate less effective options based on findings, focusing the design on the most viable and effective solutions. This reduces uncertainty and ensures the final approach aligns with project goals and constraints.

Build Resiliency

Resiliency refers to the ability of the project team and organization to quickly adapt to unexpected changes and learn from setbacks.

Managing Ambiguity

Ambiguity refers to the uncertainty or lack of clarity in understanding or decision-making. Effectively managing ambiguity is crucial in a project, as many aspects may remain unclear and require careful handling.

Two Types of Ambiguity

- **Conceptual Ambiguity:** This type of ambiguity consists of unclear concepts, definitions or terms that cause confusion. To fix this, develop shared understanding around what certain words, terms, acronyms or jargon mean.
- **Situational Ambiguity:** Situational ambiguity occurs when multiple outcomes are possible. This can be addressed through scenario and contingency planning before any outcome is realized.

Two Techniques to Manage Ambiguity

- **Progressive Elaboration:** Continuously refining the project plan as more details emerge.
- **Experiments and Prototyping:** Testing of ideas, concepts or designs by experimenting in order to reduce ambiguity.

Managing Complexity

Project complexity refers to difficulty in managing a project due to multiple factors, such as human behavior, system behavior, and ambiguity. These factors can all interact unpredictably, leading to unforeseen problems or delays. Due to the unpredictable nature of complexity, outcomes and results cannot always be accurately forecasted. To address this, project managers and teams must actively monitor and manage complexity using a few approaches.

Systems-Based Approaches

Systems based approaches focus on simplifying very complex systems by understanding their interconnections.

This can be done through two techniques:

- **Decoupling:** This involves separating parts of a system to simplify and clarify the system by reducing the amount of variables and understanding how each part works on its own.
- **Simulation:** Realistic scenarios can be used to model components of a system. For instance, in a project initiated to launch a new product, customer behavior can be simulated by analyzing purchase patterns from previous product lines, allowing marketers to predict how a new customer list might respond to targeted promotions.

Reframing Approaches

Reframing approaches involve different perspectives to better understand complexity, methods of diversity, and balancing to uncover new insights and solutions.

There are two reframing approaches:

- **Diversity:** Addressing complexity is done by viewing systems from multiple perspectives. This can be done through various forms of group thinking with the project team, such as brainstorming.
- **Balancing:** Balancing uses a mix of predicted and historical (past) data to give a broad understanding of potential trends, risks, and outcomes, which helps project teams anticipate future challenges while learning from previous experiences.

Process-Based Approaches

Process-based approaches focus on managing complexity through structured, step-by-step methods, such as iterative development, engaging stakeholders to ensure alignment and incorporating fail-safes to negate unexpected issues.

There are 3 parts of process-based approach:

- **Iterate:** Building or creating incrementally by adding one thing at a time. After each iteration, the project team can evaluate what worked, what didn't, customer or stakeholder feedback, and lessons learned.
- **Engage:** Involve customers and stakeholders to ensure buy-in and alignment, as well as enhance engagement and collaboration between the project team and stakeholders.
- **Fail safe:** For critical components, having a fail safe allows for redundancy and a back-up plan to ensure functionality in the event of a major failure.

Managing Volatility

Volatility refers to rapid and random changes that impact a project, usually impacting the project cost and/or schedule. Unfortunately, volatility by its nature is very hard to manage since it involves unexpected events that can happen at random times.

Two Methods for Managing Volatility

1. **Alternatives Analysis:** Having alternatives in place to allow for additional options in the event of volatility. This could be communicating with different vendors for materials, outsourcing certain parts of the work of the project, and having relationships already built with outside contractors in the event of staffing issues.
2. **Reserve:** Monetary reserves can be used to manage volatility by providing backup funding in the event of budget overruns. Oftentimes, difficulties in procurement can be reduced by offering higher financial incentives or willingness to pay a premium to vendors.

Example of Managing Volatility

In a construction project, the project team is having difficulty obtaining building materials. Materials that were once in stock have recently sold out, and any new orders placed are on a 2-month backorder.

If materials are needed quickly, this can be addressed in two ways. First, conducting an alternatives analysis could help identify alternative materials that may be in stock and available for purchase. The second way involves using reserves to buy from a different vendor who has the original materials in stock but charges a significant cost markup or premium for them.

Understanding Risk and Risk Management

Risk in a project refers to any uncertain event or condition that can impact a project. Risks are not always negative; in fact, they can also be positive and benefit the project.

The two types of risks are known as threats and opportunities. Threats are risks that can have a negative impact on the project if realized. Opportunities are risks that can have a positive impact on the project if realized. Effectiveness in risk management lies in both identifying risks and planning appropriate responses to mitigate threats and capitalize on opportunities.

In addition, risks are by their nature very uncertain—there is no guarantee that a risk will happen, and the probability that a risk will be realized should be considered when planning. A realized risk is one that has occurred, and an unrealized risk is one that has not occurred yet but could potentially occur in the future.

Risk Response Strategies

Managing threats and opportunities requires selecting the appropriate response strategies based on the nature of the risk and the possibility that the risk will be realized.

The goal when you are planning your risk response strategies is to minimize the negative impact of threats and maximize the potential benefits of opportunities.

Threats

Threats are negative risks that can disrupt project objectives, such as delays, budget overruns, or quality issues. Project teams should proactively identify and prepare for threats throughout the project lifecycle.

1. **Avoid**: Avoid the threat entirely by altering the project plan, such as changing scope or processes.

   Example: In a product development project, the project team identifies a risk with new environmental regulations and compliance standards around materials used in the product that could delay production. To avoid the new regulations, the project team decides the best choice is to adjust their scope by using alternative materials that are already certified as compliant, ensuring production proceeds without regulatory hurdles.

2. **Escalate**: Escalate the threat to a higher authority when it falls outside the project team's control.

   Example: In a construction project, new zoning regulations create a roadblock stopping the project team's work completely. The project manager escalates the issue to senior leadership and legal to negotiate with local authorities since this falls outside the project team's responsibilities.

3. **Transfer**: Shift or transfer of responsibility for managing the threat to a third party, such as through insurance or contracting.

   Example: In a retail store renovation project located in a flood prone area, the risk of flooding is transferred to an insurance company when the project team purchases flood insurance.

4. **Mitigate**: Take actions or preventive measures to reduce the likelihood or impact of the threat.

   Example: In a pharmaceutical project, the project team reduces the risk of air contamination by using air filters and regularly cleaning equipment. They are mitigating the risk by taking steps to reduce the likelihood of contamination spreading.

5. **Accept**: Acknowledge the threat and either create a contingency plan or do nothing until the threat is realized. If the threat is realized, then either the project team can execute on the contingency plan, do nothing, or perform any actions available at the time.

Example: In an international shipping project, the project team decides to accept the risk of potential customs delays that have impacted similar projects in the past. They prepare a contingency plan to adjust delivery timelines if delays do happen, instead of doing nothing.

Opportunities

Opportunities are positive risks that, if realized and managed, can improve project outcomes by reducing costs, speeding up timelines, or enhancing quality. Taking advantage of opportunities involves planning how to maximize their potential benefits by implementing the right response strategies.

Opportunity Response Strategies:

1. **Exploit**: The project team chooses to act to ensure the opportunity occurs and exploit it, such as allocating resources to maximize its impact.

   Example: In a software development project, a new tool is discovered that can significantly reduce coding time. The project team reallocates resources to fully implement the tool, with time savings realized and the project finishing ahead of schedule.

2. **Escalate**: Elevate the opportunity to higher authority if it's beyond the project manager's control.

   Example: In a construction project, an opportunity to secure a bulk discount on materials arises, but the purchase price exceeds the project manager's authority. The project manager escalates the opportunity to senior leadership or stakeholders to approve the larger purchase and secure the cost savings.

3. **Share**: Allocate ownership of the opportunity to a third party who can best capture its benefits.

   Example: In a marketing campaign, the project team identifies a very lucrative advertising opportunity. While the project team can't capitalize on it due to budget constraints, they instead partner with a PR agency who does have the resources to capitalize on it. The project team shares the opportunity with the PR agency, and in exchange, the PR agency gives the project team social media exposure.

4. **Enhance**: Taking actions to increase the likelihood or impact of the opportunity.

   Example: In a product development project, the project team identifies a market trend that aligns with their new product release. They increase marketing efforts and accelerate development to capitalize on the trend, boosting the product's impact and success at launch.

5. **Accept**: Acknowledge the opportunity without taking specific action, but remain open to capitalizing on it if it does occur.

Example: In a clinical research project, the team discovers a possible opportunity to expand their study based on promising results. However, due to budget and timeline constraints, they decide not to take any action but will revisit the opportunity in the future.

Managing Overall Project Risk

Overall project risk is the total exposure of the project to both threats and opportunities. This encompasses the impact of all identified risks, as well as the general uncertainty that may arise from the project's complexity, ambiguity, and volatility. Response strategies for overall project risk (such as mitigation, acceptance) are similar to those used for individual risks but are applied to the entire project rather than specific events.

The goal of managing overall risk is to ensure that the level of exposure is aligned with both the projects and the organization's risk appetite and thresholds, which define how much risk is acceptable in pursuit of project objectives. If overall risk is unmanageable, stakeholders may re-assess parts of the project or cancel it.

Risk Reserves: Contingency and Management Reserves

In chapter 8, we learned that a reserve is a budget buffer that exists to be deployed in the event any risks are realized in a project. The project manager typically requires PMO, executive, or sponsor approval before spending reserves.

Contingency Reserves

Contingency reserves are for remediating known risks that have been identified in the planning phase. The funds are only used if the specific risk actually appears and is realized.

Example of Using Contingency Reserves: The project team identifies the potential risk for delays due to internal equipment shortages. The risk is realized, and the project manager requests and gains approval to deploy the contingency reserves to acquire more equipment.

Management Reserves

Management reserves are for unknown risks that can emerge anytime during project execution. Unlike contingency reserves, management reserves cover unforeseen situations that were not predicted in an initial risk assessment. These might include unplanned scope changes, sudden regulatory changes, or external factors that affect the project.

Example of Using Management Reserves: During an e-commerce project in product launch phase, a new government regulation is passed that requires specific safety testing. This regulation was not accounted for in the original risk assessment, and it will significantly delay product launch if not addressed. The project manager requests and gains approval to deploy the management reserves (used for unknown risks) to cover the extra safety testing costs.

Risk Register

A risk register is a comprehensive document used to identify, assess, and track risks throughout a project. It serves as a go to for documenting potential threats and opportunities, along with other factors like likelihood, impact, response strategies and who is responsible for monitoring and managing the risk. The project team creates the risk register during the planning phase and will regularly update it throughout the project.

Figure 12.1: *Example of a risk register*

Risk Register

Identification				Risk Assessment		
Status	Description	Category	Cost Impact (1)	Probability	Impact	Tolerance
Closed	Supplier prince increase due to low availability.	Supplier	$7,500	Possible	Minor	Prepare response
Active	Stakeholders not engaging.	Stakeholders		Possible	Major	Prepare response
Active	More labor needed.	Resources	$9,000	Almost Certain	Moderate	Report to board
Active	Large scope change to project.	Requirements	$45,000	Unlikely	Catastrophic	Prepare response

Risk Review

The project manager and team perform regular risk reviews to assess and update risks. The risk review is used to identify, evaluate, and update the status of potential risks within the risk register. Remember, risks to a project will include both threats and opportunities.

Daily standup meetings with the project team can help spot potential threats or immediate blockers that may delay project progress. Weekly status meetings specifically for risk help keep risk management current by addressing newly identified risks and reassessing existing ones.

Nick's Tip:

A project manager should focus on establishing regular risk review sessions with not only the project team but also high priority stakeholders. These risk review sessions generally won't need to happen everyday but perhaps every week, every other week, or once a month.

Interactions with Other Performance Domains

The Uncertainty Performance Domain works closely with the Planning, Project Work, Delivery, and Measurement Performance Domains to plan for and manage uncertainty. Ideally, risks, ambiguity, and uncertainty can be identified and worked into the Planning Performance Domain, which are then executed on in the Delivery Performance Domain. The Measurement Performance Domain helps provide insights by analyzing when certain risks will or have been realized.Together, these domains all interact to manage uncertainty and minimize threats to the project.

Uncertainty Performance Domain Summary

In this final performance domain, we focused on strategies for addressing many aspects of uncertainty, including risks (both threats and opportunities), ambiguity, complexity, and volatility to ensure project continuation and minimize disruption.

We also covered risk identification, management, response strategies, implementing reserves, and the risk register. Additionally, we explored how to conduct risk reviews, assess potential threats and opportunities, and implement strategies to mitigate negative risks (threats) while capitalizing on positive risks (opportunities).

You've done a great job so far on your studies of the performance domains! Make sure to spend some time reviewing the domains and taking any necessary notes. In the next chapter, we will introduce the important concept of the 5 process groups and 49 processes.

Chapter 13
Introduction to The 5 Process Groups and 49 Processes

This chapter introduces the 5 process groups and 49 processes, a crucial area of study for the PMP exam and project management. These groups provide a structured approach to project management.

We will set the stage for the next five chapters, where we'll explore each process group in-depth, along with their associated processes.

The latest updates to the PMP exam emphasize questions on the practical application of the process groups and processes across all project approaches, including traditional, hybrid, or adaptive projects. As you go through the following chapters, consider how each process applies to real-world projects.

5 Process Groups

In the next 5 chapters, we'll cover these 5 process groups in order.

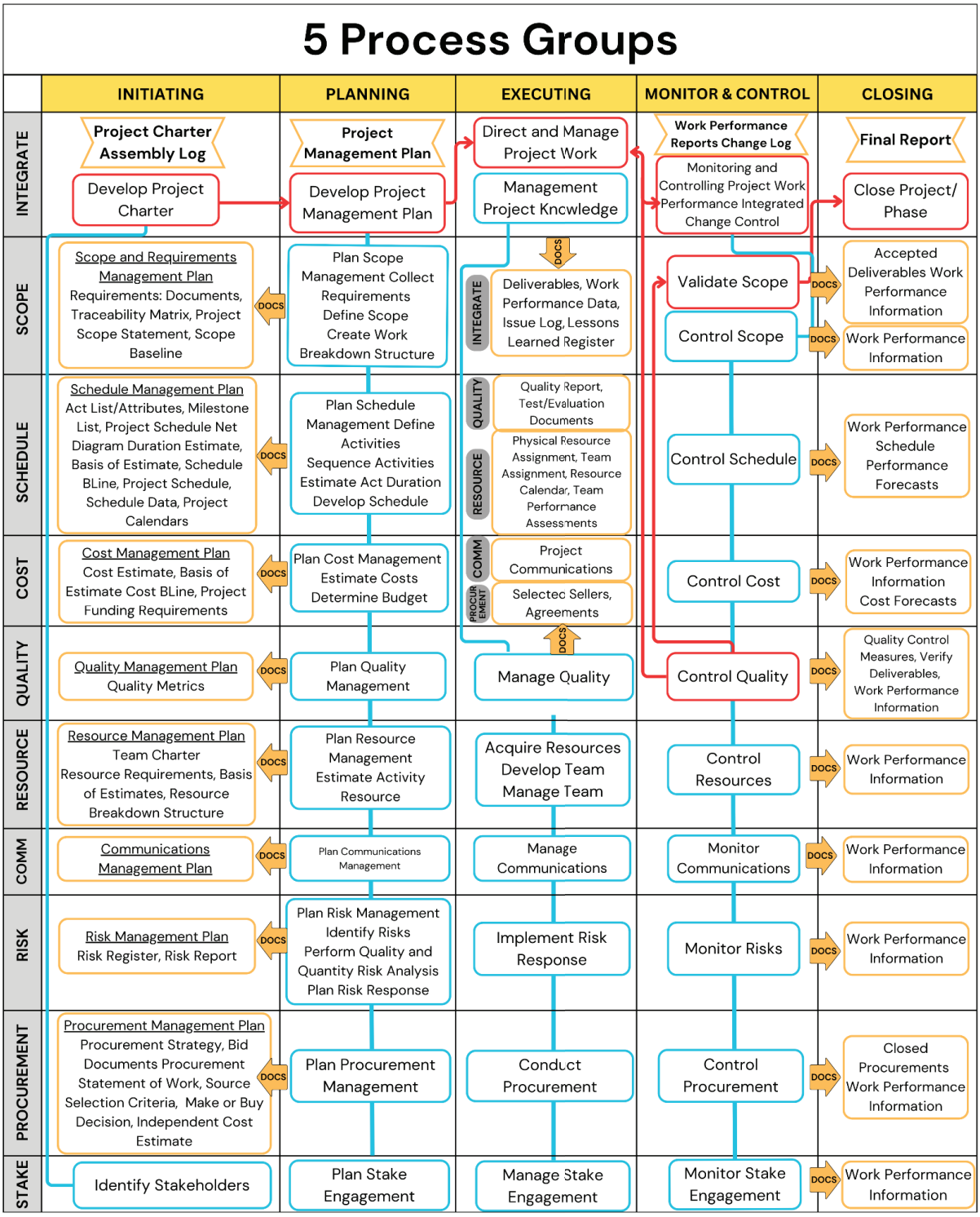
1. **Initiating (Chapter 14):** Lays the foundation for the project by formally authorizing it and identifying stakeholders. Contains 2 processes.
2. **Planning (Chapter 15):** Developing comprehensive plans for how the project will be executed, monitored, and closed. Contains 24 processes.
3. **Executing (Chapter 16):** Performing the work defined in the project management plan to achieve the project objectives. Contains 10 processes.
4. **Monitoring and Controlling (Chapter 17):** Tracking project performance, ensuring alignment with the plan, and managing changes**.** Contains 12 processes.
5. **Closing (Chapter 18):** Finalizing the project, obtaining acceptance of deliverables, and closing out project activities. Contains 1 process.

These process groups are not strictly sequential. Depending on the development approach (predictive, hybrid, or Agile), they may overlap. For example, you may return to planning during execution to refine certain elements.

49 Processes

Each process focuses on a specific aspect of project management to ensure smooth project progression. While the 5 Process Groups represent the stages or phases of project work, the 49 processes represent specific activities within those phases.

Figure 13.1: *5 Process Groups Visualized*



Common Documents Per Process Group

Process groups rely on specific documents that guide activities, track progress, document important project information and support decision making. Below, we'll explore the documents contained in each process group and their significance.

Initiating Process Group Documents

1. **Project Charter**: Officially and formally authorizes the project, assigns a project manager, and provides a high-level overview of scope, objectives, and stakeholders.
2. **Stakeholder Register**: Identifies and documents stakeholders, their roles, interests, and levels of influence and power.

Planning Process Group Documents

1. **Project Management Plan**: A comprehensive all-in-one document integrating all subsidiary plans, such as scope, schedule, cost, quality.
2. **Scope Statement**: Defines project deliverables, main area of work, and deliverable acceptance criteria.
3. **Requirements Documentation**: Defines the needs, expectations, and requirements of the project. This includes what needs to be done, how the end product or service should function, and what it should look like.
4. **Work Breakdown Structure (WBS)**: Breaks down the project from high-level tasks or deliverables into smaller, manageable components that can be worked on.
5. **WBS Dictionary**: Provides detailed descriptions for each WBS element.
6. **Schedule Baseline**: The approved version of the project schedule includes milestones and deadlines.
7. **Cost Baseline**: The approved version of the project budget, including cost estimates for resources and activities.
8. **Scope Baseline**: The approved version of the project scope including deliverables and requirements.
9. **Risk Register**: Lists identified risks, potential impacts, and planned responses.
10. **Communication Management Plan**: Defines how and through what medium project information will be shared with stakeholders.
11. **Resource Management Plan**: Details how resources (both human and physical) will be assigned, allocated, and managed.
12. **Procurement Management Plan**: Outlines the approach to acquiring goods and services from external vendors.

13. **Stakeholder Engagement Plan**: Describes the strategies for maintaining stakeholders' engagement and interest in the project.
14. **Quality Management Plan**: Defines quality standards and how quality will be controlled and measured.

Executing Process Group Documents

1. **Project Team Assignments**: Documentation of project team members' roles, duties and responsibilities. It can also be a verbal agreement or explanation between the team.
2. **Change Requests**: Any proposed changes to project scope, schedule, cost, or other parameters may need to go through an appropriate approval process.
3. **Issue Log**: Tracks project issues, their status, and any efforts towards resolution.
4. **Lessons Learned Register**: Captures lessons from an ongoing project for future project phases or projects.

Monitoring and Controlling Process Group Documents

1. **Performance Reports**: Outline how the project, project team, and individuals are performing. These reports include status reports, progress updates, and performance data compared to baselines.
2. **Risk Reports**: Updates on currently identified risks, responses, and any new risks.
3. **Change Log**: This document tracks all approved or rejected change requests.
4. **Variance Analysis Reports**: Documents deviations from project baselines and any corrective actions needing to be taken.
5. **Quality Control Checklists**: Provides easy to follow guidelines and tracks adherence to quality standards.

Closing Process Group Documents

1. **Final Project Report**: Summarizes project outcomes, performance metrics, and achievement of objectives.
2. **Contract Closure Documentation**: Confirms the closure of all project-related contracts if necessary.
3. **Final Stakeholder Feedback**: Gathers feedback on the project outcomes.
4. **Lessons Learned Register**: Documents final lessons and insights to improve future projects.
5. **Project Closure Checklist**: Ensures all closing tasks for the project have been completed.

Process Groups and Processes vs ITTOs and Knowledge Areas

You may wonder why this book emphasizes the eight Performance Domains, five Process Groups, and 49 Processes instead of ITTOs (Inputs, Tools, Techniques, and Outputs) or the ten Knowledge Areas from previous PMP exam editions.

Here's why we focus on the performance domains, process groups, and processes:

- **Relevant to the Current Exam**: The latest version of the PMP exam focuses on the practical understanding and application of processes, rather than memorizing ITTOs like previous exam versions did.
- **Performance Domains Over Knowledge Areas**: The 10 Knowledge Areas from previous exam versions have mainly been replaced by the 8 Performance Domains, which are more relevant to the current exam.
- **Practical Application**: Understanding the process groups offers a practical way to understand and manage projects from start to finish, which is essential for both the exam and real-world project management.

While ITTOs may be worth studying separately, they are no longer a primary focus or necessity for exam preparation. If you'd like to explore ITTOs more, the PMBOK 6 or online resources can help you better understand them.

Introduction To The 5 Process Groups and 49 Processes Summary

In this chapter, we introduced the 5 process groups, the 49 processes, and the important documents associated with each process group. We also discussed the importance of understanding each process group and process from a practical application stand point when preparing for and taking the PMP exam.

Over the next five chapters, we'll dive into each of the 5 process groups and the 49 processes. We'll begin with the Initiating Process Group in the next chapter.

Chapter 14
Initiating Process Group

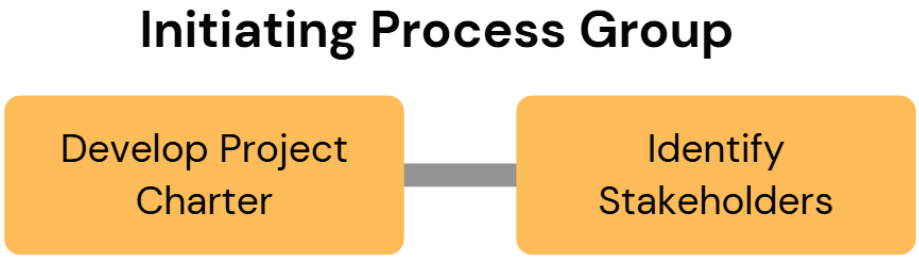
Project Initiation, also known as the initiating process group or initiation, is the first of the five groups, containing 2 processes. This process group is the starting point and foundation of every project, ensuring clear goals, proper authorization, and the availability of resources.

Skipping or not investing enough time into the initiation stage can lead to unclear objectives, a lack of buy-in from stakeholders, and potential project delays or failures.

Two Processes In The Initiating Process Group

1. **Develop Project Charter:** The develop project charter process involves creating the document that formally authorizes the project and defines its high-level objectives.
2. **Identify Stakeholders:** The identify stakeholders process focuses on identifying all individuals or groups affected by the project and sets the stage for effective stakeholder engagement.

Figure 14.1: *The 2 Processes from the Initiating Process Group*



Process #1: Develop Project Charter

The Project Charter is usually the first project document, created to formally authorize and establish the project. It usually comes after a project sponsor, the PMO (Project Management Office), or another stakeholder initiates the project. This document gives the project manager authority to officially start the project, ensuring it aligns with the organization's goals, and allows the project manager to use organization resources and funding to carry out the project.

It also outlines high-level risks, constraints, and assumptions to help guide early project planning. When the organization undertaking the project has assistance from external parties, then a formal contract between the two organizations can be created in place of the project charter.

Objectives of the Project Charter

- **Defines High-Level Goals and Establishes Scope:** Outlines what the project aims to achieve and how it will operate. It also sets boundaries for scope to avoid overreach or scope creep.
- **Officially Formalizes the Project:** With the project charter being officially created, the project is now established within the organization, and with that resources such as funding and internal labor are delegated.
- **Assigns the Project Manager and Grants Authority:** The project charter gives the project manager the formal authority to lead the project.

Process #2: Identify Stakeholders

Identifying stakeholders is the second and last process in initiation. This involves identifying all individuals, groups, or organizations impacted by or influencing the project.

Early stakeholder identification ensures their needs and concerns are addressed throughout the project life cycle. The project team can assess stakeholder communication needs, building trust and stakeholder relationships.

Objectives of Identifying Stakeholders

- **Identify Key Stakeholders and Their Expectations:** Develop a list of all major stakeholders and understand their specific interests, needs, and concerns as it relates to the project.
- **Analyze Stakeholder Influence and Interest:** Once stakeholders are identified, the project team can determine each stakeholder's power, level of influence, and involvement of each stakeholder in the project. This can be done with a power-interest grid.
- **Categorize Stakeholders:** After stakeholders are identified and analyzed, we can then group stakeholders together based on their influence, interest, and impact. By categorizing stakeholders, we can tailor engagement strategies effectively.

Integration of the Two Initiating Processes

The two processes in the initiating stage are interconnected as well as linked with other processes in other process groups.

For example, a well-defined and clear project charter clarifies how to identify stakeholders. Stakeholder feedback during initiation can also refine the project charter to ensure it aligns with organizational needs and expectations, demonstrating how both processes can affect each other.

Exam Tips and Strategies For the Initiating Process Group

1. Focus on understanding the purpose of the Develop Project Charter and Identify Stakeholders processes.
2. Be prepared to answer questions that test practical application, such as the role of the finished project charter in decision-making and aspects of stakeholder identification and management.
3. Avoid common mistakes such as neglecting to update the project charter or overlooking less influential stakeholders when answering questions. Keep in mind the project charter, like many project documents, will be continuously updated throughout the project.
4. Understand that the Initiating process group and the two processes we discussed create the beginnings for the next process groups, including effective project planning and execution.

Initiating Process Group Summary

In this chapter, we covered the first process group, initiating. We focused on the two processes for this group, integration with other processes, and exam tips.

In the next chapter we'll discuss the second process group, planning, which contains 24 processes.

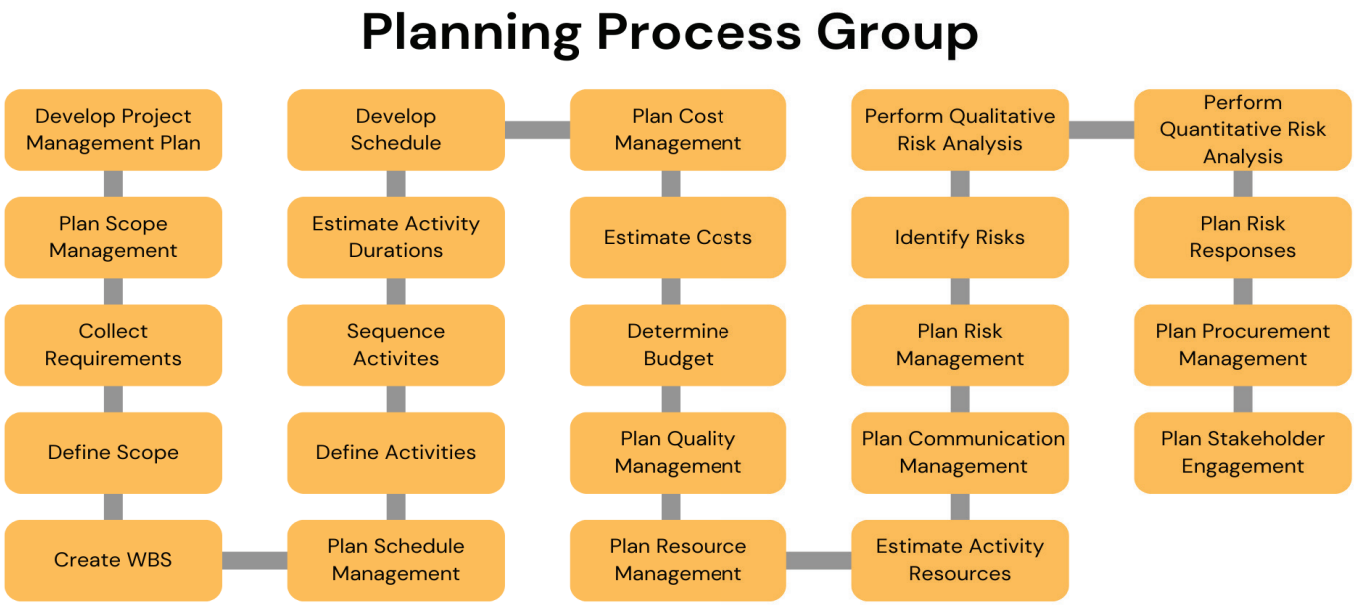
Chapter 15
Planning Process Group

The Planning Process Group is the second of the five process groups and one of the most crucial. This process group involves creating a detailed plan, complete with project objectives and detailed documents to guide project execution and delivery.

It contains a total of 24 processes that touch on every aspect of the project, from scope and schedule to quality and risk. The processes in this process group are all interconnected, forming a robust plan that ensures project success.

The following figure outlines all 24 processes.

Figure 15.1: *The 24 processes from the planning process group*



The 24 Processes of the Planning Process Group Explained

1. **Develop Project Management Plan:** Consolidates all project plans into one comprehensive document, the project management plan. This plan serves as a baseline for the project manager and team to oversee project execution.
2. **Plan Scope Management:** Clarifies how the project scope will be defined, monitored, and managed.

3. **Collect Requirements:** Identifying and documenting project requirements such as business, stakeholder, and regulatory requirements.
4. **Define Scope:** Involves creating a detailed description of the project scope.
5. **Create WBS (Work Breakdown Structure):** Breaks down the project scope into smaller, more manageable tasks to allow more effective execution.
6. **Plan Schedule Management:** Defines how the project schedule will be managed and controlled throughout the project.
7. **Define Activities:** Identifies and documents all project activities required to produce project deliverables.
8. **Sequence Activities:** Determines the logical order of activities and dependencies to help in creating a project schedule.
9. **Estimate Activity Durations:** Forecasts the time needed to complete project activities, helping to establish the project timeline.
10. **Develop Schedule:** Creates a detailed project timeline with specific milestones and dependencies.
11. **Plan Cost Management:** Establishes how project costs will be estimated, budgeted, and managed to ensure financial alignment.
12. **Estimate Costs:** Determines the resources required for each project task, activity, or deliverable, including monetary, time, and labor costs.
13. **Determine Budget:** Adding together all estimated costs to establish a cost baseline to help in monitoring and control.
14. **Plan Quality Management:** Establishes quality standards and control processes that the project and its deliverables must meet.
15. **Plan Resource Management:** Identifies the resources needed for project execution and plans for how they will be managed.
16. **Estimate Activity Resources:** Estimates the types, quantities and potential availability of resources required for each activity.
17. **Plan Communications Management:** Determines the communication needs of stakeholders and in what ways project information will be distributed.
18. **Plan Risk Management:** Planning for identification, analysis, and potential responses to project risks.
19. **Identify Risks:** Focuses on identifying and documenting potential risks (both threats and opportunities) that could impact the project and documents them for analysis and management.

20. **Perform Qualitative Risk Analysis:** Analyzes risks based on their probability of occurrence and impact on project objectives if realized using risk ratings, probability matrices, and expert judgement.
21. **Perform Quantitative Risk Analysis:** Estimates the probability of occurrence and potential impact of high-priority risks on project objectives using numerical data, statistical methods, and mathematical models.
22. **Plan Risk Responses:** Develops strategies to address risks when they're realized.
23. **Plan Procurement Management:** Defines how goods, services, labor or results will be acquired from external vendors or contractors.
24. **Plan Stakeholder Engagement:** Develops strategies for engaging stakeholders and managing their expectations throughout the project.

Integration of the Planning Processes

The planning process group is highly interconnected, with each process being impacted by others. For example, the scope management plan facilitates the development of the project schedule, while risk management strategies influence resource and budgeting processes. Together, these processes ensure a comprehensive, realistic, and adaptable project plan.

Planning processes often require updates as any new information or changes emerge.

Exam Tips and Strategies

1. **Documents:** Understand that each process may create or update a document, but not always. For example, the "develop project management plan" process will create a project management plan. However, the "Monitor and Control Project Work" process will update existing plans or documents and generate performance reports.
2. **Focus on Practical Applications**: Understand how each planning process contributes to overall project planning, how they relate, and focusing on practical application in project scenarios.
3. **Understand Integration:** Be prepared for questions that test your ability to logically and practically connect processes, such as linking risk planning with budgeting or schedule development.

Planning Process Group Summary

In this chapter, we explored the second process group, the Planning Process Group. This process group provides the foundation to successful project execution, containing 24 processes which is more than any other group. Most planning processes create new documents, plans, or update existing ones.

You're ready to move on to the next chapter, which covers the third process group, known as the executing process group or execution, containing 10 processes. In this next process group, plans created during planning are executed and brought to life, delivering actionable results.

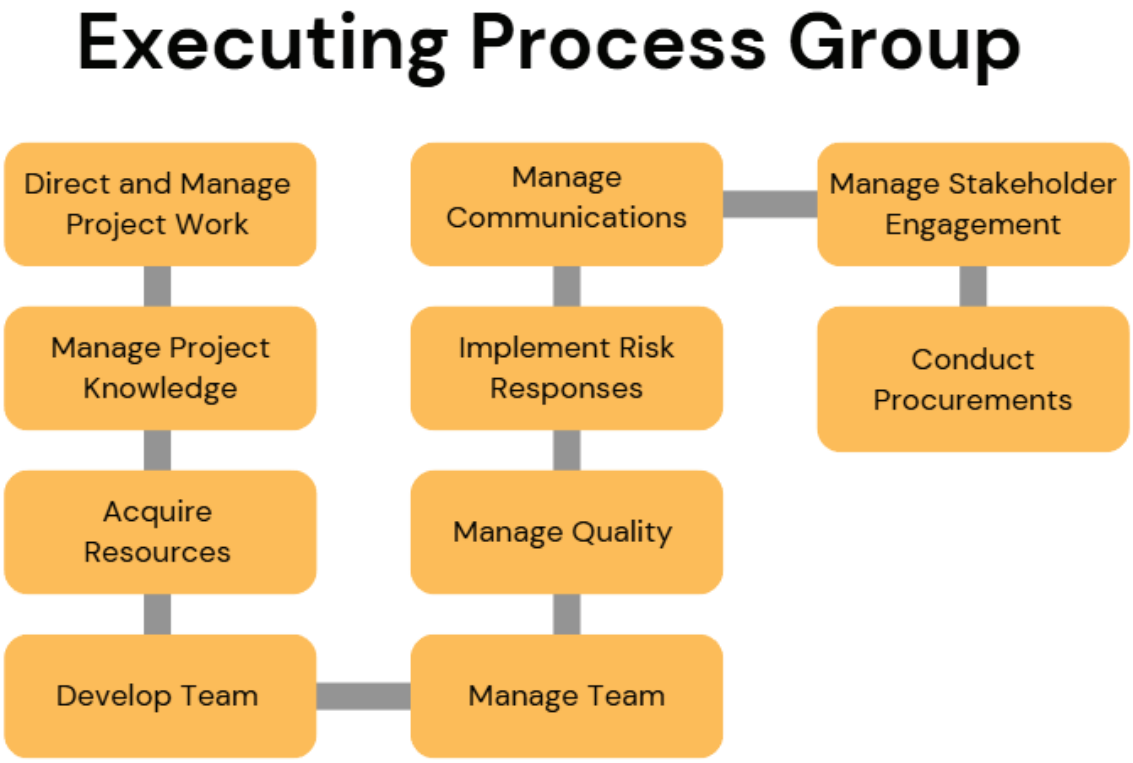
Chapter 16
Executing Process Group

The executing process group, also known simply as execution, is the third of the five process groups, consisting of 10 processes in total. Executing is where the plans developed in the planning process group are implemented, marking the official start of project work.

The project manager and project team will collaborate to execute the project management plan and address areas of execution such as completing project work, team development, communication, risk management, procurement, and stakeholder engagement.

Executing requires more time, effort, and resources than any other process group or phase. During execution, project tasks are completed in alignment with established quality standards.

Figure 16.1: *The 10 processes from the executing process group*



The 10 Processes of the Executing Process Group Explained

1. **Direct and Manage Project Work:** Guides project team members and other resources in the execution and completion of project tasks.

2. **Manage Project Knowledge:** Gathers knowledge throughout the project to create lessons learned and to improve future outcomes in both the project and organization.
3. **Acquire Resources:** Secures human, material, and equipment resources needed to complete the project.
4. **Develop Team:** Improves project team member interactions, communication, and working conditions to create a productive environment.
5. **Manage Team:** Leads the team with an appropriate leadership style, resolves conflicts, monitors performance and adjusts assignments to ensure the project stays on track.
6. **Manage Quality:** Verifies that processes and deliverables meet established quality standards through consistently checking and monitoring quality.
7. **Implement Risk Responses:** Executes risk responses to address realized threats and opportunities.
8. **Manage Communications:** Ensures the project team and stakeholders maintain communication, as well as receive timely and accurate project information.
9. **Manage Stakeholder Engagement:** Maintains stakeholder relationships and addresses their concerns, while providing appropriate updates, and manages their expectations.
10. **Conduct Procurements:** Acquires the necessary goods, labor or services from external suppliers, contractors or other third parties outside of the project team.

Integration of the Executing Processes

The executing process group closely integrates with the planning process group by converting plans into finished deliverables. It also initiates the monitoring and controlling processes to track progress and ensure alignment with objectives.

For example, the direct and manage project work process drives the creation of deliverables, which are then monitored for quality and progress.

Team development and management processes also drive project execution. As we learned in the team performance domain, a well developed project team will perform tasks and project work more effectively.

Exam Tips and Strategies

- **Focus on Practical Execution:** Understand how the 10 processes in this group are applied to and impact projects practically.
- **Interconnected Processes:** Be prepared to answer questions about how these processes interact with each other and other process groups.
- **Stakeholder Engagement:** Focus on strategies for managing stakeholder communications, expectations, and maintaining their involvement.

Executing Process Group Summary

This chapter explored the third process group, the executing process group, where project plans are transformed into real work, creating deliverables and accomplishing project milestones. We learned about how this process group translates plans into realized deliverables, the role of each of the 10 processes, and how these processes integrate.

Now you're ready to move on to the next chapter, which covers the monitoring and controlling process group. This process group ensures the project remains on track through monitoring various project factors and making necessary adjustments.

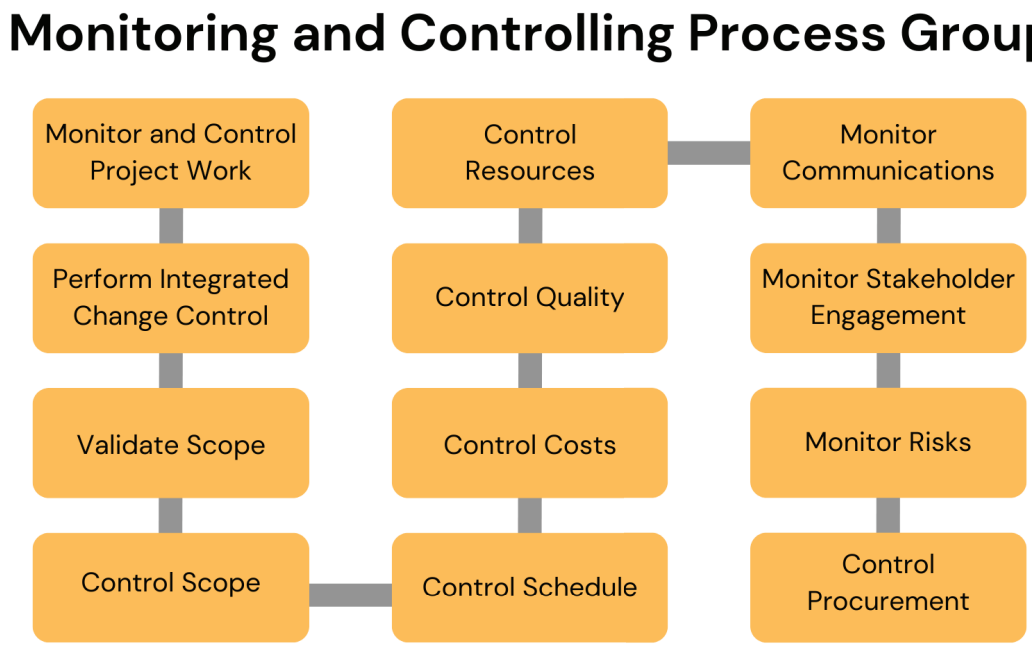
Chapter 17
Monitoring and Controlling Process Group

The monitoring and controlling process group is the fourth process group, focusing on ensuring project stability and consistency with project plans. This is achieved by tracking performance, managing changes, and maintaining control.

By identifying variances from the project plan, assessing their impact, and implementing corrective actions, this process group ensures smooth project progression without disruptions. It works closely with the planning and executing process groups to implement updates and maintain control throughout the project.

This group contains 12 processes that address scope, schedule, cost, quality, risks, stakeholder engagement, and more.

Figure 17.1: *The 12 processes from the monitoring and controlling process group*



The 12 Processes of the Monitoring and Controlling Process Group Explained

1. **Monitor and Control Project Work:** Monitors through tracking, reviewing, and reporting on project performance and controls the project by addressing any deviations as necessary.

2. **Perform Integrated Change Control:** Evaluates, approves, or rejects proposed changes.
3. **Validate Scope:** Ensures deliverables meet defined requirements and are formally accepted by stakeholders.
4. **Control Scope:** Prevents scope creep by requiring any proposed scope changes to be submitted for approval. Only approved changes are implemented.
5. **Control Schedule:** Tracks project progress against schedule baseline, implementing adjustments as needed to ensure timely project completion.
6. **Control Costs:** Monitors project expenses, compares them to the cost baseline, and takes corrective actions to manage any discrepancies or variances as needed.
7. **Control Quality:** Inspects deliverables to ensure project quality standards are met and identifies any defects.
8. **Control Resources:** Monitors resource utilization to ensure proper use and availability.
9. **Monitor Communications:** Ensures project communications are effective, timely, and tailored to the needs of stakeholders.
10. **Monitor Risks:** Tracks previously identified risks, implements risk response strategies as necessary, and identifies new risks.
11. **Control Procurements:** Manages all aspects of procurement, including vendor relationships, contract performance, current inventory, and resource availability, making adjustments as needed.
12. **Monitor Stakeholder Engagement:** Ensures stakeholders remain engaged and their expectations are managed throughout the project.

Integration of the Monitoring and Controlling Processes

The monitoring and controlling process group integrates closely with all other process groups, mainly the planning and executing process groups. For example, the control schedule process in monitoring and controlling works with the schedule baseline created in planning and helps with adjustments during execution.

Monitoring and Controlling Process Group Summary

In this chapter, we examined the monitoring and controlling process group, which consists of 12 processes. This group plays a critical role in tracking project performance, managing and implementing changes, and maintaining control over the project.

Now that you have a solid understanding of the monitoring and controlling process group, you are ready to move on to the next chapter and final process group, the closing process group.

Chapter 18
Closing Process Group

The closing process group is the fifth and final process group, containing only one process. Once a project reaches this point, it marks the official conclusion, with all aspects completed, deliverables accepted, resources released, and lessons learned documented.

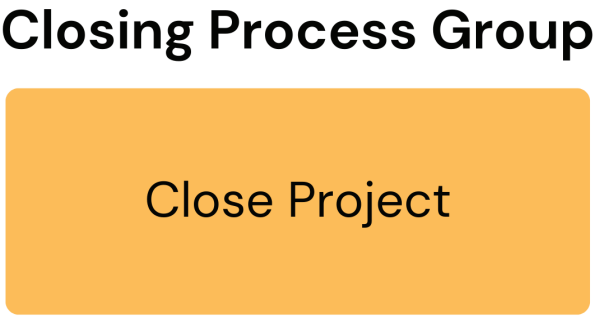
These actions are commonly performed upon project closing:

- **Ensure All Open Tasks and Issues Are Resolved:** Confirm that all open tasks, issues, or change requests are resolved satisfactorily.
- **Compliance and Audit Requirements:** Ensure any compliance or audit requirements have been met.
- **Contract and Financial Closure:** All procurement and service contracts, as well as third-party labor agreements, must be settled and closed. Additionally, all project financials should be sorted out, as well as ensuring there are no outstanding invoices or payments due.
- **Final Reports**: Any final reports should be created, finalized, and archived. Often a final project report or summary can be created for key stakeholders highlighting the project's performance, outcomes, and completion of objectives.
- **Transition of Deliverables**: Deliverables are formally handed over to necessary parties, such as customers or stakeholders.
- **Stakeholder Feedback**: Final stakeholder feedback is gathered to document lessons learned and confirm overall satisfaction with project outcomes.
- **Recognition and Celebration**: All project team members and anyone who worked on the project should be recognized and celebrated to help boost morale and engagement for future projects.

One Process

This process group contains only one process, the "Close Project" process, which formalizes the successful completion and closure of the project.

Figure 18.1: *The one process from the closing process group.*



Four Main Objectives of the Close Project Process

- **Formalize Acceptance of Deliverables:** Confirm that all deliverables meet established quality standards and are formally accepted by any necessary stakeholders, clients, or third parties.
- **Complete Administrative Work:** Ensure all documentation, approvals, and financials are finalized and archived (with potential backups) for future reference.
- **Document Lessons Learned:** Document and archive any lessons learned from the project to improve processes, practices, or procedures in future projects.
- **Release Resources:** Officially release or reallocate project team members, equipment, and other resources as necessary.

Integration of the Closing Process Group

Although it consists of a single process, the closing process group integrates with all other process groups. The close project or phase process relies on the outputs of the other groups, such as specific plans from the planning process group, deliverables from the executing process group, and updates from the monitoring and controlling process group.

Exam Tips and Strategies

- **Understand the Role of Closing:** Understand why the closing process group is essential, despite consisting of only one single process.
- **Deliverables and Documentation:** Be prepared to answer questions on the importance of deliverable acceptance, contract closure, and lessons learned which all relate to the closing process group.

- **Don't Underestimate Closing:** Recognize the importance of documenting lessons learned and formalizing the project beyond simply completing tasks. Remember, closing marks official project completion and ensures there is nothing remaining to do for the project.

Closing Process Group Summary

In this chapter, we explored the final process group, the closing process group. This process group marks the official ending of a project. We discussed some of the common actions that take place at the end of a project, as well as the sole process in this group, the close project process.

Now that we've completed our learning on this final process group, we've finished our study of the five process groups.

In the rest of the book and the following seven chapters, we will look at very specific and advanced areas of project management. These areas include tailoring, in-depth traditional, hybrid and agile project management, models, methods, and artifacts. You're nearing the completion of the exam preparation in this book, so keep going!

Chapter 19
Models, Methods, and Artifacts

Models, methods, and artifacts provide the tools and frameworks to plan, execute, manage, and monitor projects effectively. The selection of models, methods, and artifacts depends on project needs, goals, and the project environment. Additionally, they may need to be tailored to fit unique project factors.

In this chapter, we'll learn about various models, methods, common artifacts, meetings, and events.

When selecting models, methods, or artifacts, consider the following:

- ➢ Avoid anything that will cause duplication or unnecessary effort.
- ➢ Ensure relevance and potential usefulness to the project and the project team.
- ➢ Prevent misinformation or prioritizing individual needs over project priorities.

Key Terminology

Artifact: A template, document, output, or project deliverable created at any time during a project.

Cross-Cultural Communication: A communication model that explains how different cultural backgrounds affect communication.

Cynefin Framework: A conceptual framework that helps diagnose cause-and-effect relationships in complex environments.

Gantt Chart: A bar chart that visually represents the project schedule with tasks and timelines.

Method: A way to achieve a certain outcome, output, result, or project deliverable.

Model: A way of explaining a process or framework.

OSCAR Model: A coaching and mentoring framework focusing on outcome, situation, choices, actions, and review (OSCAR).

Risk Register: A document used to track project risks, including their impact, probability, and planned responses.

SWOT Analysis: A method for identifying strengths, weaknesses, opportunities, and threats in a project or organization.

Tuckman Ladder: The 5 stages of team development including Forming, Storming, Norming, Performing, and Adjourning.

Wideband Delphi: A consensus-based estimation technique where experts repeatedly refine estimates after rounds of discussion.

Defining Models

In project management, a model is a framework that helps project teams analyze, predict, and navigate project scenarios. Models simplify complex situations, allowing teams to better understand relationships, patterns, and potential choices. They offer structured guidance through frameworks that help teams approach and understand various situations and challenges.

Situational Leadership Models

Situational leadership involves adapting leadership styles to specific situations, stakeholders, individuals, and the project team to improve performance. The two situational leadership models are situational leadership and the OSCAR model.

Situational Leadership

Measures project team member development, focusing on competence and commitment. As team members gain competence (abilities, knowledge and skills) and commitment (confidence and motivation), the project manager can change their leadership styles to focus less on coaching and more on delegating and managing work.

OSCAR Model

The OSCAR model is a coaching model that helps project managers tailor their coaching style to the specific needs of the individual project team members.

This model focuses on five key factors:

- **O**utcome: Identifying the desired result of an individual project team member
- **S**ituation**:** Understanding and realizing how a project team member's skills, abilities, and knowledge impact their performance and relationships.
- **C**hoices and consequences**:** Identifying what choices a project team member can make during a project and the consequences of those choices to the individual, project team, and project overall.
- **A**ctions: Focusing on a project team member's completion of project work within a set time.
- **R**eview: Working with a project team member to offer support and ensure that they are motivated.

Communication Models

Effective communication, as we've covered in previous chapters, is a crucial area of project management. There are many aspects of communication that must be handled, including communication with the project team, stakeholders, and outside vendors.

The two main communication models are cross-cultural communication and gulf of execution and evaluation.

Cross-Cultural Communication

States that communication is influenced by the sender and receiver's background, including language, life experience, and cultural norms. Awareness of these cultural factors is key to successful project communication, especially in projects that involve a diverse group of people.

Gulf of Execution and Evaluation

This model measures the gap between what a user expects a system or product to do and what the system or product actually does. It can be thought of as expectation versus reality. In project management, it helps project managers see how closely a project deliverable aligns with stakeholder expectations.

Motivation Models

Project team members and stakeholders are all driven and invested in a project due to different motivations. Motivation models enable project managers to identify and tailor communications and motivation strategies to maximize engagement and productivity, both from individuals and from the project team. The four main motivation models are hygiene and motivational factors, intrinsic and extrinsic motivation, theory of needs, and theory of X, Y, Z.

Hygiene and Motivational Factors

States that job satisfaction is driven by factors known as "motivational factors" such as career growth, advancement, and satisfaction or finding purpose with the work being performed. A lack of motivational factors often leads to complete job dissatisfaction and burnout.

On the other hand, "hygiene factors" such as salary expectations, benefits, and company policies that can lead to dissatisfaction if not met.

Intrinsic and Extrinsic Motivation

Intrinsic and extrinsic motivation factors drive motivation in project team members. Most people in the world are both intrinsically and extrinsically motivated to varying degrees, but some may be more motivated by one or the other.

Intrinsic motivation is the internal motivation that comes from within, through personal satisfaction, fulfillment, joy, happiness. In the context of work, intrinsic motivation is the purpose that team members get from doing their work and the role their work plays in their own self growth and development.

External motivation comes from factors outside of oneself such as monetary bonuses, promotions, time off, and recognition and praise from leadership.

Theory of Needs

The theory of needs explains that people are driven by 3 main needs:

- **Achievement** Means that someone is motivated by completing goals, deadlines, and enjoys the challenge of progress.
- **Affiliation** Means that someone is motivated by belonging to a group, an environment, or a bigger purpose than self.
- **Power** Means that someone is motivated by leading, motivating, coaching, and responsibility.

Theory of X, Y, and Z

The theories of X, Y, and Z are used for measuring individual team member motivation and how effective management styles are for each theory.

Theory X suggests people are primarily extrinsically motivated, working mainly for monetary income, bonuses, or rewards. It emphasizes a hands-on, authoritative management style as being most effective in leading these individuals.

Theory Y theorizes that people are intrinsically motivated, seeking personal fulfillment and purpose in their work. A coaching or supportive management style is most effective in leading those who achieve personal satisfaction in their work.

Theory Z focuses on individuals who work to fulfill personal values or answer a higher calling. A leadership or management style that supports individuals in pursuing their deeper purpose works best with these individuals.

Change Models

Many projects involve changing systems, behaviors, or cultures. Managing changes requires strategically transitioning from a current state to a desired future state.

Managing Change in Projects and Organizations

Changes in projects and organizations are guaranteed to happen. This model outlines five elements for successfully managing change:

- ➢ **Formulate change**: Explains why a specific change is necessary and its potential benefits.
- ➢ **Plan change**: Identifies the activities or what needs to be done in order to transition to the new, desired state.
- ➢ **Implement change**: Execute on the work for the change plan and make improvements to implement the change.
- ➢ **Manage transition**: During the transition, this is addressing any ongoing needs or issues that come up during the change.
- ➢ **Sustain and Maintain change**: Ensure the new processes continue to work and discontinue old processes or behaviors.

Main Change Models

ADKAR Model

When change occurs, we need to be cognizant of not only how it affects the project but also how it affects individual team members on our project team. The ADKAR model is a five-step framework focused on addressing individual change:

1. **A**wareness: An individual must first understand why the change is needed and how it fits into the present or future situation.
2. **D**esire: Desire to support and be part of the change at an individual level.
3. **K**nowledge: People must be taught how to understand and implement the change.
4. **A**bility: Ability is the hands-on practice and support an individual needs to carry out the change.
5. **R**einforcement: Ensure the change is maintained over time by offering and hearing feedback and recognition.

The 8-Step Process for Leading Change

Leading changes is done in an 8-step process outlined as follows:

1. **Create urgency**: Identify threats and opportunities that highlight the need for change.
2. **Form a coalition**: Assemble influential leaders, managers, team members, and high-level stakeholders to support the change.
3. **Create a vision for change**: Define the values and goals behind the idea for the change.
4. **Communicate the vision**: Share the vision clearly to those who need to understand the vision.
5. **Remove obstacles**: Address barriers and blockers that prevent progress, including outdated processes or stakeholder resistance.
6. **Create short-term wins**: Create quick, easy wins initially to gain momentum and support.

7. **Build on the change**: Set and accomplish long-term goals with continuous improvement to accomplish the change.
8. **Anchor changes in company culture**: Push for the changes to become part of the organization's culture by recognizing high achievers and telling success stories and benefits of the change.

Virginia Satir Change Model

The Virginia Satir change model explains how individuals experience change on an emotional level.

There are 6 stages in this model:

1. **Late status quo**: Where things are going as usual, where everything feels familiar and routine.
2. **The foreign element**: An event or disruption introduces the potential change.
3. **Chaos**: People understand the change, and feel anxious or uncertain as they need to adjust to it.
4. **The transforming idea**: A new approach emerges to deal with the change.
5. **Practice and integration**: People practice new behaviors to deal with the change and learn what works for them.
6. **New status quo**: The change becomes part of the new normal, and it's business as usual again.

Transition Model

The transition model differentiates between the aspects of change and the psychological process of transitioning through it.

There are 3 stages in this model:

1. **Ending, Losing, and Letting go**: People initially resist change due to feelings of fear, anger, or uncertainty.
2. **The Neutral Zone**: People start adjusting to the change, which may bring both a duality of frustration and creativity.
3. **The New Beginning**: People embrace the change, are open to learning and eventually become more skilled and energized by this new way of working.

Complexity Models

As we learned in the uncertainty performance domain chapter, projects involve uncertainty and unpredictable outcomes. Complexity models help project managers and project teams to navigate

these challenges by focusing on understanding cause-and-effect relationships and addressing project complexity.

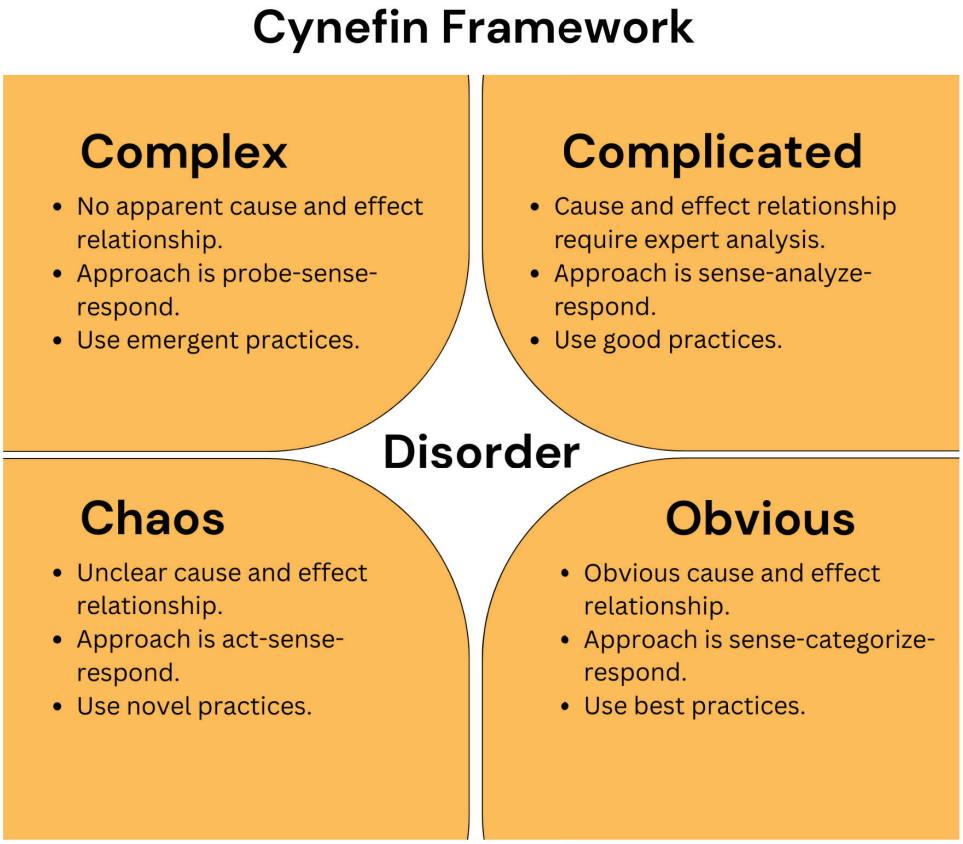
Cynefin Framework

The Cynefin framework helps reveal cause-and-effect relationships in the project to help in decision making.

This framework categorizes problems into five terms:

- **Obvious:** Where clear cause-and-effect relationships can be seen and identified. Respond by using best practices to deal with obvious problems.
- **Complicated:** Known unknowns with multiple possible or correct answers. To address complicated problems, assess facts and apply practices.
- **Complex:** Unknown unknowns with no clear right answers. Respond by understanding and probing complex problems until an answer or solution can be found and acted on.
- **Chaotic:** No apparent cause and effect. Take immediate action to stabilize the situation before responding with a thorough plan of action.
- **Disorder:** No clarity in the situation. Break it into smaller parts to understand and manage each with one of the other four contexts.

Figure 19.1: *Cynefin Framework*



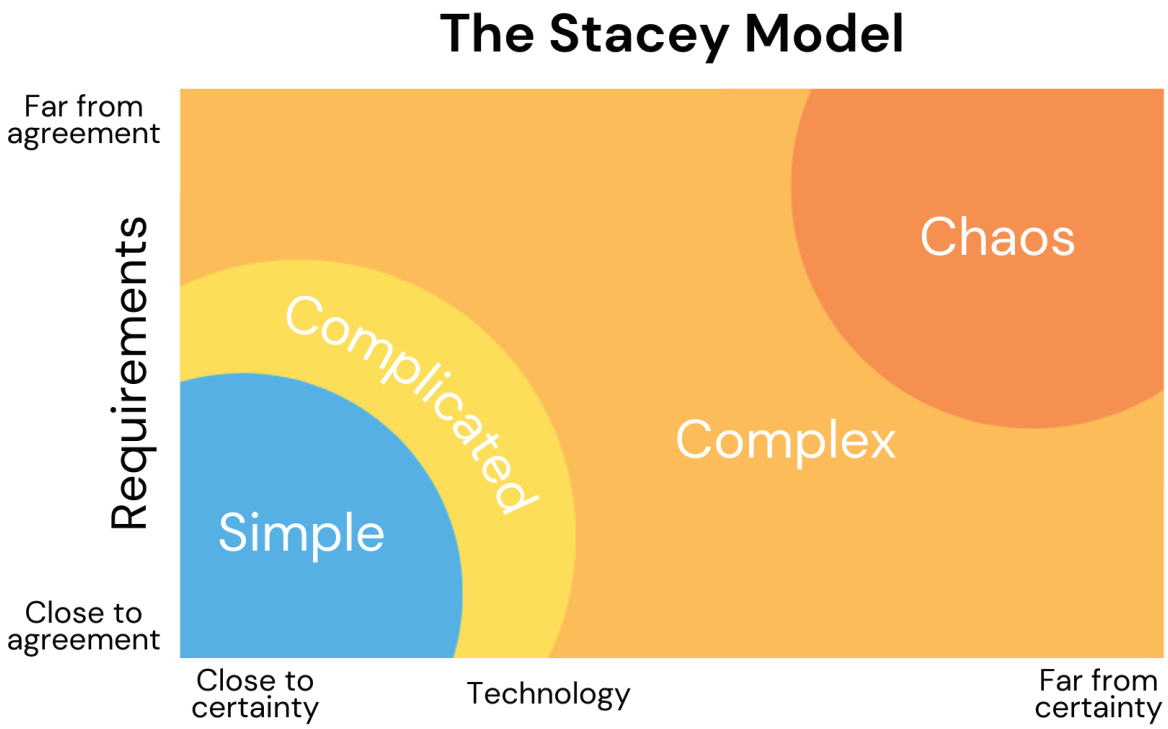
Stacey Matrix

The Stacey matrix, also known as the Stacey model, focuses on two aspects of understanding project complexity.

- **Uncertainty of Requirements:** How clearly defined the project requirements are.
- **Uncertainty of Technology:** How clearly understood the technology needed to achieve the deliverables is.

Projects are classified as simple, complicated, complex, or chaotic, based on two dimensions of uncertainty in requirements and technology. The level of complexity then guides the project management approaches for execution.

Figure 19.2: *Stacey Matrix*



Project Team Development Models

Project teams continue to develop from the start of a project, all the way to the final stages. Understanding team development enables project managers to guide, coach, and support team growth effectively.

There are two main models for team development:

Tuckman's Ladder

Tuckman's ladder identifies five stages of team development that high-performing teams will go through, from starting the project to project conclusion.

Project teams can fluctuate between the stages and even regress to previous stages. For example, a team may make it to the norm stage only to go back to the storm stage. Not all project teams actually reach the performing stage, with some teams being so incompatible that they completely disband before getting to that stage.

The Tuckman's Ladder, Consisting of The 5 stages of Team Development:

Forming: The project team comes together for the first time. Team members get to know each other's roles, skills, and backgrounds. Generally, a kickoff meeting is the first time the project team meets each other. You can think of the "forming" phase as when the group is first formed.

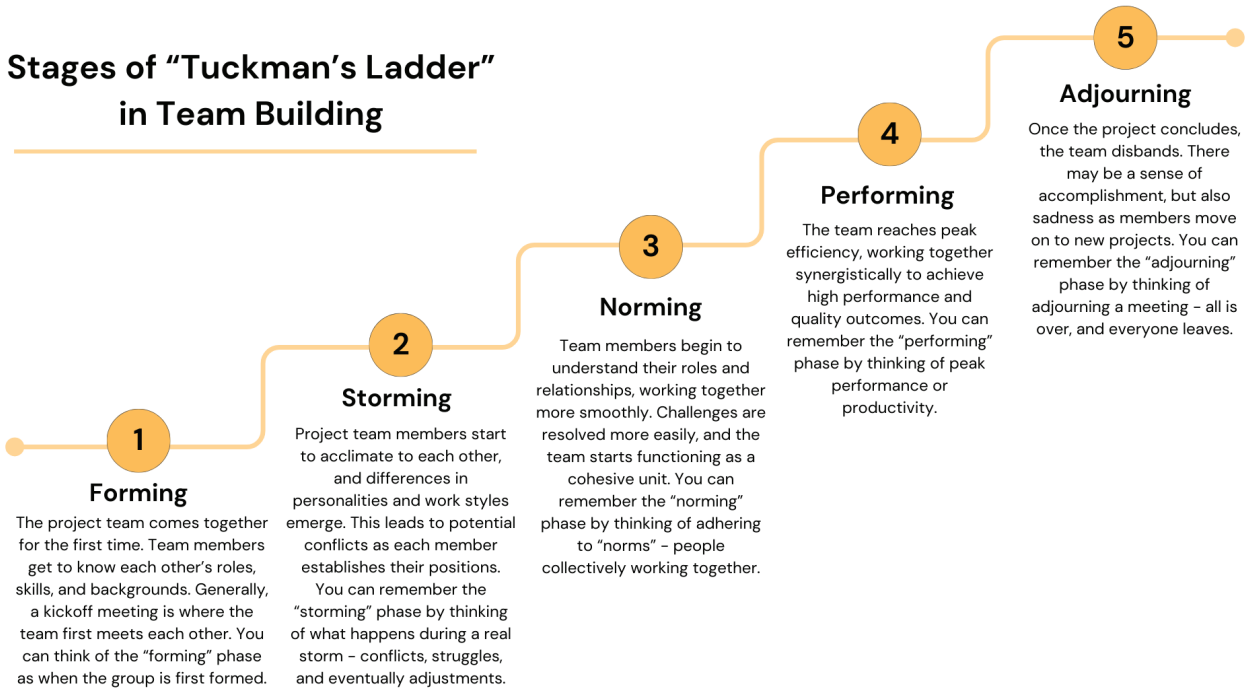
Storming: Project team members start to acclimate to each other, and differences in personalities and work styles emerge. This leads to potential conflicts as each member establishes their positions. You can remember the "storming" phase by thinking of what happens during a real storm: conflicts, struggles, and eventual adjustments.

Norming: Project team members begin to understand their roles and relationships, working together more smoothly. Challenges are resolved more easily, and the team starts functioning as a cohesive unit. You can remember the "norming" phase by thinking of adhering to "norms" people collectively working together.

Performing: The project team reaches peak efficiency, working together synergistically to achieve high performance and quality outcomes. You can remember the "performing" phase by thinking of peak performance or productivity.

Adjourning: Once the project concludes, the project team disbands. There may be a sense of accomplishment, but also sadness as members move on to new projects. You can remember the "adjourning" phase by thinking of adjourning a meeting. Everything is over, there is nothing left to address, and everyone leaves.

Figure 19.3: *The 5 stages of team development (Tuckman's Ladder)*



Nick's Tip:

A simple acronym to remember Tuckman's ladder and its five stages of team development is FSNPA. Form, Storm, Norm, Perform, Adjourn.

Drexler/Sibbet Team Performance Model

The Drexler/Sibbet team performance model outlines seven steps that help project teams move from formation of the team all the way to high performance and sustainability.

- **Step 1: Orientation:** The project team defines its main purpose and mission, often generally during a kickoff meeting or through a project charter.
- **Step 2: Trust Building:** Team members get to know each other's skills and abilities, establishing trust and understanding within the team.
- **Step 3: Goal Clarification:** The team refines project goals, clarifying stakeholder expectations, requirements, and acceptance criteria.
- **Step 4: Commitment:** The team aligns on how to achieve the goals, establishing detailed plans such as schedules, budgets, and resource needs.
- **Step 5: Implementation:** The team begins executing tasks, breaking down high-level plans into detailed actions to create deliverables.
- **Step 6: High Performance:** The team operates efficiently with minimal oversight, achieving synergy and high levels of performance.

➢ **Step 7: Renewal:** The team responds to any changes in deliverables, stakeholders, or team structure by reassessing and adjusting how they work to ensure success.

Common Methods

Methods in project management are tools and techniques used by the project team to gather and analyze data, estimate costs or effort, and facilitate effective collaboration.

Figure 19.4: *Common Methods*

Common Methods	
Methods	**Purpose**
1. Assumption and Constraint Analysis	Identifies and analyzes assumptions (factors assumed to be true) and constraints (factors limiting project work) to create consistency.
2. Check Sheets	Checklists for gathering data. They can also be used to create charts for analysis.
3. Cost of Quality (CoQ)	Measures the total cost over the project lifecycle of ensuring that deliverables meet the required standards, including prevention costs and costs related to failures or defects. Generally used in manufacturing or industries that produce a tangible product or physical end result.
4. Decision Tree Analysis	A technique used to assess multiple decision paths and their outcomes, incorporating uncertainty and expected monetary value (EMV). Often represented by a visual diagram.
5. Earned Value Analysis (EVA)	Evaluates project performance by comparing planned and actual scope, cost, and schedule metrics.
6. Expected Monetary Value (EMV)	A calculation that quantifies the monetary impact of a specific risk by multiplying the probability of occurrence by the financial cost or impact of the risk.
7. Forecasting	Involves predicting future conditions or events based on available data. This can be done qualitatively (through expert judgment) or quantitatively (based on past data). Examples include econometric forecasting.
8. Influence Diagram	A visual tool that maps out relationships, time sequencing, and influences between variables and outcomes in a project.
9. Impact Mapping	A strategic planning method used to visually document the connection between organizational goals and project outcomes, helping teams understand what their work is achieving.
10. Life Cycle Assessment	A comprehensive analysis that evaluates the environmental impact of a product or process over its entire lifecycle. This assessment generally considers factors of materials, production methods, and eventual product disposal.
11. Make-or-Buy Analysis	Evaluates whether project needs such as materials, resources, services, workers, or expert specialty can be done or fulfilled by the internal team or if it needs to be outsourced in some form. This is done by weighing costs, time, resources, and strategic alignment. Since every organization has different resources, you should always be prepared to do a make or buy analysis.
12. Modeling	Creating simplified representations of systems, processes, or deliverables, such as prototypes or diagrams, to identify anything subpar.
13. Net Promoter Score (NPS)	Measures customer or end user satisfaction and loyalty by determining the likelihood of the customer recommending a product or service.
14. Probability and Impact Matrix	A grid used to evaluate the likelihood and potential consequences of risks to prioritize what is most important to respond to.

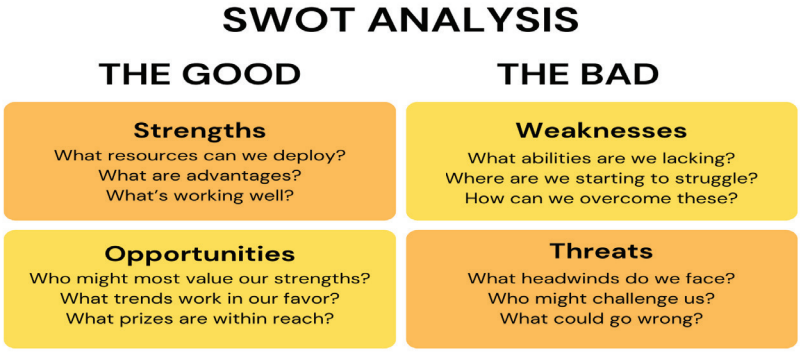
Figure 19.4: *Common Methods Continued*

Methods	Purpose
15. Process Analysis	Reviews project processes to identify opportunities for improvement or better efficiency.
16. Regression Analysis	A technique used to identify relationships between variables, allowing for the prediction of one variable based on changes in another.
17. Reserve Analysis	Evaluates the amount of reserve time or monetary budget to ensure it's sufficient for addressing the remaining risks and uncertainties.
18. Root Cause Analysis	Focuses on identifying the underlying reasons behind variances, defects, or problems, helping to address the real cause or source rather than the symptom.
19. Sensitivity Analysis	Assesses how different factors impact project outcomes by modeling how variations in certain risks or inputs affect results.
20. Simulations	Uses models to simulate possible outcomes based on varying assumptions and risk scenarios.
21. Stakeholder Analysis	An analysis on stakeholders based on qualitative and quantitative data. This is done to understand stakeholders' influence, interests, and the best ways to engage them. Results of the stakeholder analysis are partilcularily useful when used for tailoring communications with stakeholders.
22. Trend Analysis	Uses past performance data to predict future outcomes and detect trends that could influence a project.
23. Timebox	Sets a fixed period during which specific work must be completed, often used in Agile and iterative projects (e.g., 1-2 week sprints).
24. Value Stream Mapping	A lean management method that documents, analyzes, and improves the flow of information or materials required to deliver a product or service.
25. Variance Analysis	Compares actual project performance against the baseline to understand deviations and their causes.
26. What-if Scenario Analysis	A tool for evaluating potential scenarios and their impact on project objectives, enabling project managers to create contingency plans based on potential outcomes.

SWOT Analysis

Assesses internal strengths and weaknesses, along with external opportunities and threats.

Figure 19.5: *SWOT analysis*



Business Analysis Methods

Business analysis methods consist of various calculations used to understand specific project circumstances, such as project budget or costs.

- **Payback Period:** Calculates the time required to recover an initial investment, typically expressed in days, weeks, months or years.
- **Internal Rate of Return (IRR):** Measures the projected annual growth of a project's investment, including initial and ongoing costs.
- **Return on Investment (ROI):** Determines the project's cost of investment to its expected net benefit, expressed as a percentage.
- **Net Present Value (NPV):** Evaluates future benefits and costs at the time of investment, factoring in future conditions such as inflation.
- **Cost-Benefit Analysis:** Compares project costs to expected benefits before initiation to determine if the project's value outweighs its costs.

Data Gathering and Analysis Methods

These methods are used to collect, assess, understand, and evaluate important project information.

- **Alternatives Analysis:** Analyzes different options to achieve project goals by comparing potential strategies or methods.
- **Benchmarking:** Compares project performance, products, or processes against industry best practices, standards, or measurements to identify areas for improvement.

Estimating Methods

Estimating methods are often used on projects to approximate the amount of time, cost, or resources needed to complete tasks, goals, and deliverables. These methods range from using historical data to more complex methods that account for uncertainty, helping project managers plan and allocate resources effectively. Focus on understanding what these methods are and we will cover specific formulas for calculating them in chapter 24.

- **Affinity Grouping:** This method classifies tasks or items into similar categories based on similarities. For example, grouping tasks by their priority, such as high, medium and low priorities.
- **Analogous Estimating:** Uses historical data and information from a previous activity or project to estimate the cost or duration of a current project. This method is useful when there is limited information to work with for a current project. Drawing from past information becomes very useful in estimating.

- **Function Point Estimating:** Primarily a software development estimate, function points estimating measures the size of a software, making it easier to estimate how much effort will be needed to complete tasks and deliverables.
- **Multi point Estimating (PERT):** This method estimates cost or duration by taking an average or weighted average of three best estimate values: optimistic likelihood, pessimistic likelihood, and most likely. It accounts for uncertainty and variability in activity duration or costs by calculating a more balanced estimate from the three values.
- **Parametric Estimating:** Uses statistics and historical data to calculate either monetary cost or time duration, such as cost per unit of a new product or time required to complete each task.
- **Relative Estimating:** Involves creating estimates by comparing a task to other similar tasks, considering factors like effort, complexity, and uncertainty. Story points in Agile usually express relative estimates rather than absolute or certain units of time or cost.
- **Single-Point Estimating:** In this form of estimating, a single estimate is created from any present and relevant data, resulting in a single best guess or single value. Unlike range estimates, this method does not account for variability or uncertainty, focusing on the creation of a very straightforward estimate.
- **Story Point Estimating:** This method is unique to Agile and assigns abstract points to tasks (user stories) to estimate the relative effort and time needed to complete. These story points help teams understand the complexity associated with completing a particular task or story.
- **Wideband Delphi:** A variation of the Delphi method, this technique uses multiple rounds of individual estimates from subject matter experts (SMEs). After each round of estimating, the SMEs discuss and rationalize their estimates, including their high and low estimators. The process repeats until the SMEs can reach a general agreement on what a realistic estimate is for that specific scenario.

Meetings and Events

As a project manager, you are likely already aware how crucial meetings and events are in communication, as well as keeping a project on track. While meetings are important, it's important to respect everyone's time and balance meetings with time for the project team to work outside of meetings.

There are many types of meetings and events in project management, including:

- **Daily Standups:** Short, daily meetings where the project team discusses progress, plans for the day, and any blockers. Most common in Agile environments.

- **Retrospectives:** Regularly scheduled meetings, usually occurring at the end of a sprint or iteration. In this meeting, a project team reflects on the work that's been completed and identifies ways to improve moving forward.
- **Risk Review Meetings:** Periodic meetings held to assess the current status of risks, identify new risks, and create or evaluate risk responses. Commonly found in both predictive and Agile.
- **Backlog Refinement:** Used to re-prioritize and clarify backlog items. Common in Agile environments.
- **Bidder Conference:** A meeting held with prospective outside vendors or sellers to clarify procurement needs, project details, and any other pertinent information before a bid or proposal is officially submitted.
- **Change Control Board (CCB):** A formal meeting where proposed changes to the project are evaluated, approved, or rejected. The project manager, important stakeholders and decision makers participate in these meetings to ensure changes are properly managed and the projects scope stays stable. Usually held in predictive projects.
- **Kickoff Meeting:** This meeting marks the normal start of a project or a phase. Stakeholders and team members come together in this meeting to set and clarify goals, expectations, and project deliverables.
- **Iteration/Sprint Planning:** Agile project teams commonly use this meeting to plan the upcoming iteration or sprint, discussing goals, tasks, and priorities.
- **Lessons Learned Meeting:** Held after major project phases or milestones, these meetings document successes, challenges, and recommendations for future phases or even future projects in the organization. The Agile version of a lesson learned meeting is a retrospective.
- **Steering Committee Meetings:** A high level meeting where high level and senior stakeholders provide guidance, make decisions, and review the project's current progress and alignment. Not every project will have a steering committee or steering committee meetings.
- **Status Meeting:** A regularly scheduled event to provide updates on the project's current state, progress, risks, and next steps.

Common Artifacts in Project Management

Artifacts in project management are essential documents, logs, reports, tools, or outputs created throughout the project. They are useful in many project aspects, including high-level business overviews, establishing project authority, tracking progress, involving stakeholders, and supporting decision-making. The artifacts we will discuss are useful for project managers to manage scope, resources, risks and deliverables, while ensuring transparency across all project phases.

Strategy Artifacts

Strategy artifacts are documents created at the beginning of a project to define and clarify its purpose, predicted value, and compatibility with organizational goals. These documents are often the first step towards establishing a business case and to begin project alignment with stakeholders. Often created at the projects beginning, they can also be updated throughout the project if necessary.

- **Business Case**: A comprehensive document that outlines the predicted benefits of the project, including costs, risks, and expected outcomes. It ultimately defines how the project will provide value and a justification or business incentive to take on the project.
- **Business Model Canvas**: A one-page visual document that describes the project's value proposition, customers or stakeholders, and financials of the project.
- **Project Brief**: Provides a quick and high-level overview of the project's goals, deliverables, and processes, ensuring all stakeholders have a common understanding before proceeding.
- **Project Charter**: A formal document that officially authorizes the project's existence. It defines objectives, budget, schedule, scope, stakeholders, and deliverables while granting the project manager authority to manage the project and allocate resources.
- **Project Vision Statement**: Often developed by the project manager with the project team's input, the vision statement is an outline of the project's purpose and predicted end result.
- **Roadmap**: A visual timeline that highlights important milestones, giving a strategic overview of project progression through what has been completed and what still needs to be accomplished.

Logs and Registers

Logs and registers are important project documents used to track changing aspects and provide a record of critical project details, updates, and decisions.

- **Assumption Log**: Tracks project assumptions (factors assumed to be true) and potential constraints (limitations). This log is revisited and updated throughout the project to check assumptions and change plans as needed.
- **Backlog**: A list of work that needs to be done, commonly used in Agile projects.
- **Change Log**: A comprehensive record of all proposed and accepted changes made during the project, including the change status (approved, rejected, or in progress) and how it impacts the project.
- **Issue Log**: Tracks and monitors current and ongoing issues that may impact project goals or end result. Each issue notated in the issue log is assigned to a team member to ensure accountability and resolution.

- **Lessons Learned Register**: Documents insights the project team has gained throughout the project, focusing on successes, challenges, and recommendations for future stages of the current project or other future projects in the organization.
- **Risk Register**: Identifies project risks, assessing their probability and potential impact, and documenting response strategies such as mitigation. Response strategies are employed when a project risk is realized.
- **Risk-Adjusted Backlog**: A backlog that incorporates work to address risks, including threats and opportunities.
- **Stakeholder Register**: Documents stakeholder information, including their interests, influence, and tailored communication or engagement strategies.

Plans

Project plans outline how specific project areas will be executed on and controlled. These plans ensure that the project follows a structured path, with clear information on roles, responsibilities, and expectations for work.

- **Change Control Plan**: Describes how changes will be managed, who has the authority to approve changes, and the procedures for documenting, evaluating, proposing, and implementing changes.
- **Communications Management Plan**: Defines how, when, and who is responsible for distributing project information that needs to be shared. It includes communication channels, communication frequency, and the stakeholder communication matrix.
- **Cost Management Plan**: Outlines how project costs will be estimated, budgeted, and controlled.
- **Iteration Plan**: A plan used in Agile for a current iteration, outlining tasks and goals for the short time frame.
- **Procurement Management Plan**: Details how goods and services will be procured, including vendor selection criteria, procurement timelines, contract types and who has the authority to officially enter into contracts for project procurement.
- **Project Management Plan**: A comprehensive document describing how the project will be completed.
- **Quality Management Plan**: Outlines the quality objectives and processes for ensuring the project meets set quality standards and quality assurance practices.
- **Release Plan**: Dictates the schedule and expectations for delivering releases of a product. Primarily used in Agile.
- **Requirements Management Plan**: Describes how requirements will be managed, identified, and documented throughout the project.

- **Resource Management Plan**: Provides a strategy for acquiring, allocating, and monitoring project resources, ensuring that the team has the necessary tools and materials to meet objectives.
- **Risk Management Plan**: Outlines the risk management processes for identifying, assessing, and controlling risks.
- **Scope Management Plan**: Provides guidance on how the project scope will be defined and controlled throughout a project to ensure that required work is complete and helps to avoid scope creep.
- **Schedule Management Plan**: A plan created for controlling the project's schedule.
- **Stakeholder Engagement Plan**: Strategies for effectively engaging stakeholders, ensuring their involvement in project decision-making and execution.
- **Test Plan**: Describes the strategy for testing deliverables, including what testing will be done, and the criteria that must be met for acceptance.

Hierarchy Charts

Hierarchy charts are useful to project managers for breaking down complex project structures into smaller, manageable components, providing clarity on team roles, tasks, risks, and resources.

The types of breakdown structures:

- **Organizational Breakdown Structure (OBS)**: Maps out organizational teams or departments responsible for specific project tasks and activities.
- **Product Breakdown Structure (PBS)**: Decomposes the project into its individual components and deliverables.
- **Resource Breakdown Structure (RBS)**: Hierarchically represents the categories and types of resources needed for the project.
- **Risk Breakdown Structure (RBS)**: Organizes potential project risks into specific categories and groups to make risk management more efficient.
- **Work Breakdown Structure (WBS)**: Breaks the total scope of work into smaller, more manageable tasks that can be delegated to the project team to ensure all necessary work is included in the project.

Baselines

Baselines act as reference points to how project performance is measured. Any major deviations from a set baseline can indicate the need for attention or correction. While predictive project management more commonly uses baselines, Agile projects can and often use them as well.

Types of baselines:

- ➢ **Budget**: The approved financial allocation in a set dollar amount for the project or specific components of the WBS.
- ➢ **Milestone Schedule**: Lists key project milestones and planned dates.
- ➢ **Performance Measurement Baseline**: Integrates the scope, schedule, and cost baselines measure project performance.
- ➢ **Project Schedule**: A timeline that links project activities to planned start and finish dates, durations, and resources.
- ➢ **Scope Baseline**: Combined project's scope statement, WBS, and WBS dictionary. Useful for tracking performance against the agreed-upon scope.

Visual Artifacts

Visual artifacts help visualize important data and information, which can significantly help in decision making and communication.

- ➢ **Affinity Diagram**: Visual diagram that groups large sets of ideas into similar categories or groups for analysis.
- ➢ **Burnup and Burndown Charts**: These charts track the progress of work completed (burnup) or work remaining (burndown) over each iteration. Most commonly used in Agile to track sprint progress.
- ➢ **Gantt Chart**: A bar chart that provides a visual representation of the project schedule, showing clear relationships between tasks and timeline progression.
- ➢ **S-Curve**: Displays project data, such as costs or work completed over time. This is useful for understanding differences between planned and actual performance.
- ➢ **Dashboards**: Provides real-time project data through visual charts and graphs. Dashboards are great for tracking and observing visible insights on how the project is progressing. They are often created in project management software directly.
- ➢ **Flowchart**: A visual representation of the steps in a process, helping teams understand workflows.
- ➢ **Cycle Time Chart**: Shows the average time taken to complete work items can be used to see how the team is performing and where time is being allocated.
- ➢ **Scatter Diagram**: Plots two variables on a graph, useful for identifying relationships or correlations between the variables.

Nick's Tip:

Focus on meaningful metrics and important information, especially when working with visual artifacts. It's not a good use of resources or time to make charts or dashboards display meaningless data. Often, project teams can get carried away with dashboards without first considering if it's relevant and necessary.

Reports

Reports are used to document, present, and summarize project information. They are often created for stakeholders who need official updates on progress or performance. Project management software can help create reports in nearly any format.

- **Status Report**: Summarizes current project performance, listing what was recently accomplished and where the project is heading.
- **Risk Report**: Provides a summarized report of project risks, including their status, trends, and planned or actualized responses.
- **Quality Report**: Identifies quality issues and control measures while offering recommendations for process or product improvements.

Agreements and Contracts

Contracts are used as a legal agreement between the project team and external vendors or stakeholders, with the contract defining timeline expectations, deliverables, and payment terms. Organizations can use various contracts and agreements, with legal or procurement departments typically selecting the appropriate contract type and assisting the project manager and team with procurement.

These are common agreement and contract types used by project managers:

- **Cost-Reimbursable Contracts**: The contractor is reimbursed for allowable costs and has the potential to receive an additional fee. This is suitable for projects with changing or evolving scope, since it allows flexibility for actual expenses as well as an additional fee so the contractor earns a profit.
- **Fixed-Price Contracts**: Establishes a set price for work to be performed, regardless of the actual costs. Ideal for projects with well-defined requirements and low risk of scope changes, for example, predictive projects.
- **Time and Materials (T&M)**: Payment is based on time spent and materials used, typically used on projects with uncertain scope, such as agile projects, and projects that have both labor and material costs.

- **Indefinite Delivery Indefinite Quantity (IDIQ)**: Contracts that specify flexibility for the quantity of services or supplies within a set time period. This contract type is ideal for projects where the exact amount of resources or deliverables needed is uncertain.
- **Memorandum of Understanding (MOU):** An MOU is a non-binding/non-contractual document that outlines two or more parties agreeing to begin to collaborate and work together on a project. It does not create obligations, instead it establishes a beginning framework for cooperation and building trust, including shared goals and responsibilities.
- **Memorandum of Agreement (MOA):** An MOA is a formal and legally binding document that explains the different roles, responsibilities, and obligations of each party involved in the agreement. This document is a great foundation before developing and signing a formal contract.
- **Service Level Agreement (SLA):** An official Service Level Agreement (SLA) is a formal contract defining performance metrics, responsibilities, and expectations between a service provider and a client. SLAs can also be used between an internal department in an organization and the organization itself, such as for response times in an IT department.

Figure 19.6: *Application of models, methods, and artifacts across performance domains.*

Models, Methods, and Artifacts

Artifact	Performance Domain							
	Team	Stakeholders	Dev Approach and LifeCycle	Planning	Project Work	Delivery	Measurement	Uncertainty
Strategy Artifacts:								
Business Case		x		x				
Project Brief		x		x				
Project Charter		x		x				
Project Vision Statement		x		x				
Roadmap		x	x	x				
Log and Register Artifacts:								
Assumption Log				x	x	x		x
Backlog				x	x	x		
Change Log					x	x		
Issue Log					x			
Lessons Learned Register					x			
Risk-adjusted Backlog				x				x
Risk Register				x	x	x		x
Stakeholder Register		x		x				
Plan Artifacts:								
Change Control Plan				x	x	x		
Communications Management Plan		x		x	x			
Cos Management Plan				x				
Iteration Plan				x				
Procurement Management Plan				x	x			
Project Management Plan		x		x	x			
Quality Management Plan				x	x	x		
Release Plan				x		x		
Requirements Management Plan				x		x		
Resource Management Plan				x	x			
Risk Management Plan				x	x			
Scope Management Plan				x		x		
Schedule Management Plan				x	x	x		
Stakeholder Engagement Plan		x		x				x
Test Plan				x	x	x	x	
Hierarchy Chart Artifacts:								
Organizational Breakdown Structure	x	x		x				
Product Breakdown Structure				x		x		
Resource Breakdown Structure	x			x	x		x	
Risk Breakdown Structure					x			x
Work Breakdown Structure				x		x	x	
Baseline Artifacts:								
Budget				x	x		x	
Milestone Schedule			x	x	x		x	
Performance Measurement Baseline				x	x	x	x	
Project Schedule				x	x		x	
Scope Baseline				x	x	x	x	

Figure 19.6: *Application of Models, Methods, and Artifacts Across Performance Domains Contuinuation*

Models, Methods, and Artifacts

Artifact	Performance Domain							
	Team	Stakeholders	Dev Approach and LifeCycle	Planning	Project Work	Delivery	Measurement	Uncertainty
Visual Data and Information Artifacts:								
Affinity Diagram								
Burn Chart				x	x			
Cause-and-effect Diagram				x		x	x	
Cycle Time Chart					x	x		
Cumulative Flow Diagram						x	x	x
Dashboard						x	x	
Flow Chart					x		x	
Gantt Chart				x	x	x		
Histogram				x	x		x	
Information Radiator							x	
Lead Time Chart					x		x	
Prioritization Matrix		x				x		
Project Schedule Network Diagram				x	x	x		
Requirements Traceability Matrix				x	x			
Responsibility Assignment Matrix				x		x	x	
Scatter Diagram					x			
S-curve				x	x	x	x	
Stakeholder Engagement Assessment		x		x				
Matrix				x	x	x		
Story Map						x		
Throughput Chart				x		x	x	
Use Case					x	x		
Value Stream Map						x	x	
Velocity Chart							x	
Report Artifacts:								
Quality Report					x	x	x	
Risk Report					x			x
Status Report					x			
Agreements and Contracts:								
Fixed-price		x		x	x	x	x	x
Cost-reimbursable		x		x	x	x	x	x
Time And Materials		x		x	x	x	x	x
Indefinite Time Indefinite Quantity (IDIQ)		x		x	x	x	x	x
Other Agreements		x		x	x	x	x	x
Other Artifacts:								
Activity List		x		x	x			
Bid Documents	x	x		x	x			
Metrics				x		x	x	
Project Calendars	x			x	x			
Requirements Documentation		x		x		x	x	
Project Team Charter	x				x			
User Story		x		x		x		

Models Methods and Artifacts Summary

In this chapter we covered common models, methods, and artifacts used in projects. These three tools cover many aspects of project management from coaching, team development, performing estimates, setting baselines, and many other uses. Everything we covered in this chapter can appear on your exam in one form or another, so plan to spend quite a bit of time reviewing your notes or doing a second readthrough.

In the next chapter, we will explore tailoring and hybrid project management.

CHAPTER 20

Tailoring Project Management Approaches and Hybrid Project Management

Every project is unique and requires tailoring to address its specific needs. Tailoring is the practice of customizing various factors of a project, including the approach, governance, processes, tools, and communication styles.

This chapter explores when, how, and why project managers and project teams use tailoring. We'll also dive into hybrid project management, where predictive and adaptive approaches can be combined for a tailored project approach.

Key Terminology

Agile/Adaptive Approach: A flexible project management approach suited for changing project conditions. It is commonly used in environments where project requirements evolve over time, as with Agile.

Governance: The framework of authority, processes, and decision-making involved in managing a project.

Hybrid Approach: A combination of both predictive and adaptive project management methods used to customize aspects or approaches of a project. For example, a project might use predictive approaches for some deliverables and adaptive approaches for others.

Predictive/Traditional Approach: A project management approach where the project scope, schedule, and costs are defined early in the project and with minimal changes allowed after project initiation. This is typically used for projects with well-defined requirements and low levels of uncertainty.

Suitability Filter: A tool used to determine whether a project is best suited for a predictive, adaptive, or hybrid approach.

Tailoring: The process of customizing project management methods, strategies, governance, and processes to fit the specific needs, complexities, and requirements of a project.

Important Concepts Regarding Tailoring

The three main concepts of tailoring are balancing competing demands, customizing methodologies, and adapting.

Balancing Competing Demands

Tailoring balances the project schedule, budget, deliverable quality, regulatory compliance, and stakeholder satisfaction.

Customizing Methodologies

Rather than using standard approaches (like predictive, Agile, or hybrid) without modification, the project team can adapt specific aspects of an approach like planning, processes and frameworks.

Adaptation and Understanding

The main purpose of tailoring is to adapt as much as possible to the uniqueness of the project. Tailoring requires a deep understanding of the project's environment, goals, and desired end result to choose the right project management methods, leadership styles, tools, and artifacts.

Nick's Tip:

Tailor to increase efficiency or outcomes within a project. There may be temptation to tailor everything, but remember to focus on tailoring only what is necessary and what will maximize results for the least amount of effort.

Reasons To Tailor

Tailoring provides the customization needed for projects to succeed. The reasons we tailor are to fit the unique needs of a project, utilize resources efficiently, and increase project team and stakeholder satisfaction.

Fit the Project and Organization Needs

Tailoring involves considering factors like project size, complexity, and regulatory requirements. Additionally, it's important that the approach we choose for the project aligns with the organization's culture, values, goals, and project management best practices. Tailoring ensures compliance with organizational standards and outside regulatory requirements.

Efficient Use of Resources

Tailoring helps use resources efficiently by reducing unnecessary work, processes, or waste that don't contribute to project progression.

Increased Project Team and Stakeholder Satisfaction

Involving the project team in tailoring aspects of the project fosters a sense of ownership, commitment, and focus on project goals. Tailoring necessary project aspects to stakeholder needs builds stronger engagement, for example in the case of tailoring communication to stakeholder needs.

Tailoring In Response to Issues

Tailoring is often done preemptively at the start of a project or phase, or as a response to any issues that arise during the project.

These issues indicate a need to implement tailoring:

- **Poor-quality deliverables:** Address poor quality deliverables by improving quality assurance and collaborating with the project team to ensure compliance.
- **Delays in project work:** Mitigate delays by identifying bottlenecks, adding team members or external resources, adjusting schedules and work orders, and streamlining approval processes.
- **Unengaged stakeholders:** Improve stakeholder engagement by understanding their wants and needs and implementing tailored communication plans.
- **Resource shortages:** Resolve resource shortages by optimizing resource allocation strategies to effectively meet project demands.

What To Tailor

There are a few common areas that should be focused on when first tailoring. Areas to focus on tailoring first are the development approach, processes, aspects of communication and leadership, software, and methods and artifacts.

Life Cycle and Development Approach Selection

Tailoring the development approach is necessary when neither predictive nor adaptive approaches fully suit a project. In these cases, we tailor by using a hybrid approach, implementing elements of both predictive or adaptive approaches. Additionally, we can tailor the phases of the project life cycle to by creating custom phases based on predicted project progression and requirements.

Processes

Tailoring processes involve adding, removing, blending or modifying project procedures to better suit the project's unique requirements.

Tailoring a project's processes involves:

- **Adding**: Introducing new processes into a project. For example, introducing safety checks or other inspections for a physical product, ensuring compliance and quality.
- **Removing**: Completely eliminate unnecessary processes that don't add value to the project. For example, removing communication of unnecessary metric reports that the project team and stakeholders both agree they don't need.
- **Modifying**: Making necessary changes to existing processes to fit project needs, requirements, or team demands. For example, adjusting an existing quality assurance process to add a required step for peer review.
- **Blending**: Combining different processes or elements of processes in order to maximize value. For example, combining an Agile stand-up meeting with a predictive traditional weekly status meeting.
- **Aligning**: Standardizing processes across different teams or disciplines to ensure consistency. For example, standardizing the use of e-mails on Fridays at 2:00 pm as a communication method for non-urgent project status updates.

Engagement, Communication, and Leadership

Tailoring engagement and communication includes understanding the project team, empowering them, and successfully integrating outside parties into the project team.

These should all be considered for tailoring:

- **Communication Methods:** Tailor communication methods, strategies and based on project team, stakeholder, and outside party preference.
- **Leadership Style:** The way a project manager leads and manages is often tailored based on factors related to the project and the project team.
- **Project Team Experience:** Evaluate the skills and capabilities of the project team. Tailor the project team by selecting team members based on the project type, complexity, and operating environment.
- **Empowerment:** Decide on the level of responsibility and decision-making power given to the project team and certain individuals on the team.
- **Integration:** Ensure alignment between internal staff and external contributors and parties, including contractors and partners, to create a cohesive team.

Software

Software selection and use should be tailored to the project's size, complexity, budget constraints and the project team's experience or preferences. There are many types of software that can fit a wide variety of business needs, and can often be modified easily.

Methods and Artifacts

The use of methods, techniques, and project artifacts (e.g., reports, dashboards) should be tailored on project size, organizational standards, and specific project needs. Methods and artifacts often require a lot of tailoring due to the sheer amount that are used in projects.

How To Tailor

Once it's clear what needs to be tailored and why it should be tailored, the next step is tailoring, which is done through a few different means:

Select the Development Approach

The first step to tailor a project is to select a development approach either predictive, hybrid, or adaptive. Selecting the development approach is based on project characteristics that we've covered in previous chapters. If a lot of tailoring is required, or if the project necessitates certain aspects of predictive and Agile, a hybrid approach works best.

Tailor for the Organization, Project and Project Team

Tailoring is also done to align with organizational policies, governance, and strategic goals. This could mean tailoring approval processes, quality assurance processes, communication plans, reporting structures, and metrics and reporting.

Implement Constant Improvement

Tailoring implements principles of Kaizen, a Japanese philosophy that focuses on continuous improvement. By regularly improving, adapting and refining processes, tailoring ensures continuous project improvement, and the project team becomes more efficient.

Tailoring the 8 Performance Domains

We covered the 8 performance domains in earlier chapters, and in this section, we will briefly go over the 8 performance domains again. We'll specifically focus on what should be tailored for each domain.

1. Stakeholder Performance Domain

This domain consists of considering stakeholder factors and tailoring communication and engagement strategies to fit the specific preferences, needs, and locations of project stakeholders.

Tailoring the stakeholder performance domain includes:

- Considering what stakeholders are internal and what stakeholders are external to the organization

- ➢ Identifying and understanding any language or cultural barriers
- ➢ Accurately gauging the number of stakeholders involved in the project. If there are a lot of stakeholders, it is recommended to prioritize high level or "VIP" stakeholders.
- ➢ Using the appropriate communication channel, method and technology for stakeholder communication

2. Team Performance Domain

Tailoring leadership style as well as the project team's operations to match the needs of the project, based on team size, location, experience and composition.

Tailoring the team performance domain includes:

- ➢ Assessing the geographic distribution of team members and the impact of multiple time zones on meeting times and work expectations.
- ➢ Adapting different leadership styles to suit the skill levels and experience of the team.
- ➢ Considering any individual or cultural differences within the team and tailoring leadership styles to best support all individuals and team dynamics.

3. Development Approach and Life Cycle Performance Domain

The selection of a development approach and project life cycle can be tailored based on the nature of the project's deliverables and the organization.

Tailoring the development approach and life cycle performance domain includes:

- ➢ Deciding whether to use predictive, hybrid, or iterative (agile) approaches depending on project factors such as industry, predicted scope changes, regulations, etc.
- ➢ Assessing the project's size and scope to determine the most suitable life cycle phases.
- ➢ Customizing the development approach to meet industry standards, regulations and audit requirements.

4. Planning Performance Domain

Planning is tailored based on internal and external factors. Many aspects of planning can be tailored, such as schedule or budgeting techniques, the procurement process, and risk management.

Tailoring the planning performance domain includes:

- ➢ Adapting scheduling and cost estimation methods based on the project's size, the organization's available resources, and external environmental factors.
- ➢ Modifying the procurement management process, due to predicted supply chain issues or regulatory requirements.

- ➢ Ensuring that risk management and contingency planning account for predicted variables that affected previous projects.

5. Project Work Performance Domain

Project work can be tailored to improve execution on tasks. This includes customizing workflows, tools, and communication methods to enhance efficiency, collaboration, and work performance.

Tailoring the project work performance domain includes:

- ➢ Implementing the best team development and leadership style based on project team factors such as size, experience, and attitudes.
- ➢ Using the tools and techniques that best support project execution, including task management, delegation and progress tracking.
- ➢ Establishing clear processes for collecting, storing, communicating and accessing project information and lessons learned reports.

6. Delivery Performance Domain

Delivery performance can be tailored to ensure that project work is productive while still meeting required quality and compliance standards.

Tailoring the delivery performance domain includes:

- ➢ Adapting quality assurance processes to industry standards and regulatory requirements.
- ➢ Modifying existing organizational control policies to suit the current project.
- ➢ Considering and tailoring work based on existing or new governmental laws, policies, or restrictions that may affect the project.
- ➢ Implementing sustainability features into product development that are specific to the product.

7. Uncertainty Performance Domain

The uncertainty performance domain focuses on managing risks and uncertainties that can affect project success. Tailoring the approach to risk management focuses on the project's complexity, goals, and tolerance of risk.

Tailoring the uncertainty performance domain includes:

- ➢ Adapting strategies to deal with unpredictable risks, such as random market fluctuations, new competitors releases, or other factors that could affect project outcomes.
- ➢ Aligning risk tolerance with the project and organization's strategic goals, ensuring that opportunities are maximized and threats are minimized.

- ➢ Assessing the projects level of innovation. Higher innovation introduces more risk, and tailoring risk strategies can help manage this uncertainty.

8. Measurement Performance Domain

The measurement performance domain focuses on defining the success criteria and gathering metrics to evaluate project performance. Tailoring this approach focuses on ensuring measurements are important and relevant to project goals and stakeholder needs.

Tailoring the measurement performance domain includes:

- ➢ Defining the way financial and non-financial value will be measured.
- ➢ Clarifying what important metrics will be used to track progress during and after project completion. Non-important metrics can also be clarified to avoid collecting meaningless data.
- ➢ Understand and tailor project reporting based on specific stakeholder needs. Certain stakeholders will need certain reports, and not every stakeholder has a need for every report or type of information.

Introduction to Hybrid Project Management

Hybrid project management combines the strengths of predictive (traditional) and adaptive (Agile) approaches, balancing both stability and flexibility. The combination of both approaches can create a very effective and tailored approach, but requires a lot of consideration, work, and experience from the project manager to implement effectively.

For example, in a technology project deploying a custom security solution, predictive approaches can be used for regulatory compliance, budget management, and hardware deployment. Meanwhile, adaptive methods can be applied to the development of the software and user interface.

When to Use Hybrid Project Management

Hybrid project management is used in situations where a balance between structured, predictive approaches and flexible, adaptive approaches is desired.

- ➢ **Projects with both stable and evolving elements**: Some aspects, such as regulatory compliance or hardware deployment, require a predictive approach, while others, like software development or the need for consistent customer feedback, benefit from an adaptive approach.
- ➢ **Projects with varied stakeholder expectations**: Hybrid is especially useful when different stakeholders or departments expect different levels of communication, involvement, reporting, and flexibility. These different expectations can be fulfilled with a hybrid

approach and certain processes, such as communication tailored to satisfy all expectations and requirements.

- **Organizations or industries that favor hybrid approaches:** If your organization or industry operates with a mix of traditional (predictive) and agile (adaptive) practices, then your project will most likely adapt a hybrid approach.

Figure 20.1: *Industries That Use Hybrid Project Management*

Hybrid Project Management Common Industries and Use	
Industry	**Hybrid Approach Often Uses**
Education	Predictive for curriculum planning and institutional or governmental education requirements, adaptive for new technologies for teaching.
Finance	Predictive for compliance and risk, adaptive for unique finance software, technology, programs and apps.
Healthcare	Predictive for regulations, adaptive for developing new patient care solutions.
Technology	Predictive for physical hardware deployment, adaptive for software development.

Hybrid Project Management Benefits

The primary benefit of hybrid project management is its flexibility in customizing every aspect of the project. Using hybrid project management, the best parts of predictive and adaptive approaches can be blended and implemented into a project.

Other benefits of hybrid project management:

- Balance between long-term planning and short-term execution
- Enhanced risk management with faster responses to changes and uncertainties
- Greater control over schedule timelines and deliveries
- Improved stakeholder engagement
- Increased project team collaboration, communication, and efficiency
- Optimized resource, budget, and labor allocation
- Strong alignment with both project and organizational goals
- Project flexibility and adaptability

Tailoring in Hybrid Project Management

Tailoring blends perfectly with hybrid project management. By combining the two, projects can be customized exactly as needed to achieve the best results.

Common examples of tailoring in hybrid project management:

- **Adjust Processes and Tools:** Using hybrid approaches, project teams can adapt their tools, methods, and processes, ensuring a perfect balance between planning and execution.
- **Stakeholder Management:** Stakeholder communication and engagement strategies greatly benefit from tailoring. For example, predictive parts of a project may require formal reporting, while adaptive portions may focus on collaborative, live meetings.
- **Risk and Uncertainty Management:** In hybrid projects, risk management can be tailored to address both foreseeable risks typically found in predictive approaches, and evolving and uncertain risks that are more common in adaptive environments. This ensures that risk management strategies are flexible enough to handle any type of risk.

Tailoring Project Management Approaches and Hybrid Project Management Summary

In the first half of this chapter, we explored the importance of tailoring to meet the unique needs of a project. Tailoring involves customizing project processes, plans, communication and tools, based on factors such as project complexity, project team and organizational factors, and stakeholder requirements.

The second half of this chapter focused on hybrid project management, which utilizes both predictive and adaptive for a customized approach. Hybrid approaches allow project teams to implement specific elements of stability and planning from predictive approaches, while also being able to execute quickly and be open to change with adaptive approaches.

In the next chapter, we'll focus on in-depth predictive project management.

Chapter 21
Predictive Project Management

Throughout this book, we covered the three primary project management approaches, including predictive (traditional), adaptive (Agile/iterative) and hybrid. This chapter will conclude our study of predictive project management, covering the final concepts you'll need to know for the exam.

We'll cover the concepts of the triple constraint, baselines, change control, risk management, and common use cases and industries where the predictive approach is most effective.

Nick's Tip:

If you feel like you've got a good handle and understanding of predictive approaches, feel free to skip this chapter and move on to the next chapter which covers adaptive project management.

Key Terminology

Baselines: Approved reference points for scope, schedule, and cost. Baselines are used to monitor the project and ensure it's performing well.

Change Control: Process of evaluating, approving, or rejecting proposed changes to project scope, schedule, or budget.

Change Request: A proposal to modify the project scope, schedule, or cost. These requests are reviewed and then accepted or rejected by an internal Change Control Board (CCB).

Predictive Project Management: A highly planned, structured and sequential approach to managing projects. Commonly referred to as traditional or waterfall project management.

Risk Management: The identification, analysis, and response strategies to risks. A risk register documents identified risks, potential for realization, their impact, and response strategies.

Scope Creep: Uncontrolled changes or continuous growth in the project scope, resulting in significant project delays or increased costs. In extreme cases, scope creep can even cause a project to outright fail. Change requests can serve as a great safeguard against scope creep.

Triple Constraint: The three elements of scope, schedule, and cost, which need to be balanced to ensure project objectives.

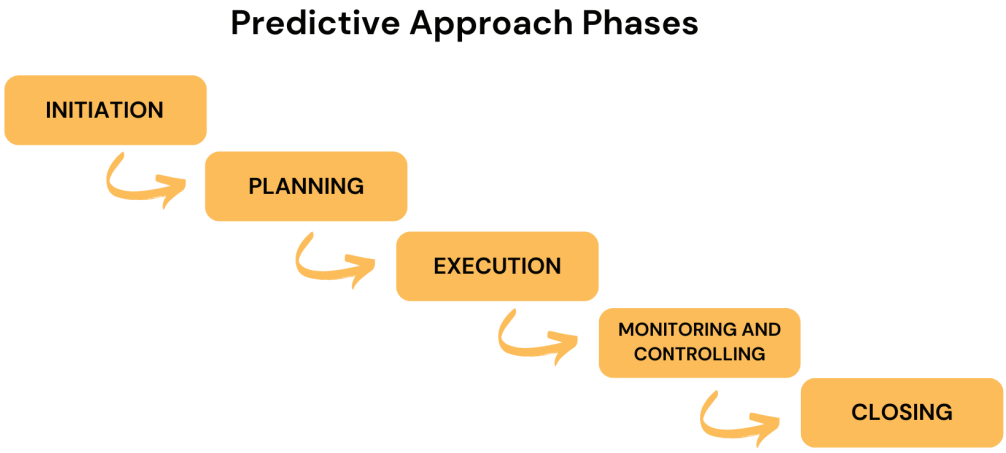
Predictive Project Management Defined

Predictive project management, also known as traditional or Waterfall, is a structured and sequential approach to managing projects, ideal for stable, well-defined projects.. It focuses on detailed planning up front, maintaining stable project conditions, clear processes, and creating well-defined objectives, deliverables, and requirements. It operates in a linear manner, containing five sequential phases where each phase must be completed before the next begins.

Predictive Approach Phases Include:

1. Initiation
2. Planning
3. Execution
4. Monitoring and Controlling
5. Closing

Figure. 21.1: *Predictive Approach Phases*



Nick's Tip:

While the phases have the exact same names as the process groups, they are slightly different. The phases in predictive project management represent the linear stages of a project lifecycle, and each phase must be completed before the next phase can begin.

The process groups, on the other hand, contain related processes that can occur across multiple phases, and are not sequential.

Phases are sequential, while process groups can overlap.

Figure 21.2: *Principles, benefits, and drawbacks of predictive project management*

Predictive Project Management		
Principles	**Benefits**	**Drawbacks**
Detailed and upfront planning focusing on stability, predictability, and control Sequential phase progression with minimal or no overlap Provides clearly defined deliverables, timelines, and cost estimates	Clear and transparent deliverables, timelines, and budget Provides a good starting point for compliance with regulations and quality standards Facilitates resource planning and risk management through structured processes	Difficulty adapting to unpredictable risks or random changes Risk of scope creep, cost overruns or even project failure if initial project changes Limited and costly flexibility after the initiation of the project

Communication in Predictive

Communication is critical in every project, especially so in predictive project management, where any changes made after planning can be costly. Expectations, communication preferences, and relationships should be clarified as much as possible early in the project. Additionally, high levels of communication with the project team, stakeholders, and sponsors should be maintained throughout the project.

Predictive Specific Tools, Techniques, and Methods

Similar to adaptive approaches, predictive has its own unique tools, techniques, and methods:

- **Gantt Chart:** Used to plan and track the project, including task dependencies, milestones, and critical paths.
- **Critical Path Method (CPM):** A technique to identify the sequence of tasks that determines the project duration.
- **Earned Value Management (EVM):** A comprehensive method for measuring project performance against cost and schedule baselines.
- **Milestone Charts:** Used to track significant points in the project timeline, providing checkpoints that signal progress.
- **Work Breakdown Structure (WBS):** A decomposition of the scope of work to be carried out, breaking the scope into smaller, more actionable tasks.
- **Project Schedule Network Diagrams:** Visual displays of activities, dependencies, and sequences in the project schedule.

- **Change Control Boards (CCBs):** A formal board or group of people that review, approve, or reject change requests for the project.

Common Challenges in Predictive

Predictive project management faces its own unique set of challenges and issues that are likely to appear and must be addressed.

Below, we outline common challenges in predictive project management and practical solutions to overcome them.

- **Scope Creep** → Uncontrolled changes to project scope can lead to schedule delays, budget overruns or resource overutilization.

  Solution: Implement a formal change control process and conduct regular scope reviews.

- **Delayed Approvals** → Bottlenecks in project work are being caused by slow decisions from stakeholder or sponsors.

  Solution: Establish a formal approval process, and communicate deadlines to stakeholders.

- **Misaligned Expectations** → Discrepancies between stakeholder expectations and the reality of a project's scope or deliverables.

  Solution: Create a detailed project charter outlining specific project objectives. Focus on managing expectations from the start with stakeholders.

- **Resource Constraints** → Limited availability of project team members, materials, or funds.

  Solution: Conduct resource planning early and maintain buffers or reserves in the project schedule and budget. Respond to resource constraints as needed, as some may be unpredictable.

- **Inadequate Risk Management** → Failing to identify or address risks. This can severely impact a project depending on the risk.

  Solution: Meet with the project team regularly to identify and document risks, as well as creating and updating response strategies in the risk register.

- **Communication Breakdowns** → Ineffective communication that leads to misunderstandings or conflict amongst the project team.

  Solution: Train the project team on proper communication. Develop and follow a structured communication plan for instances when certain communication should be used.

- **Cost Overruns** → Deviations from the established cost baseline caused by poor initial estimates or unforeseen expenses.

  Solution: Ensure initial cost estimates are accurate at the beginning of the project, and continuously monitor costs and perform budget reviews.

- **Quality Issues** → Deliverables not meeting standards, usually caused by insufficient quality controls.

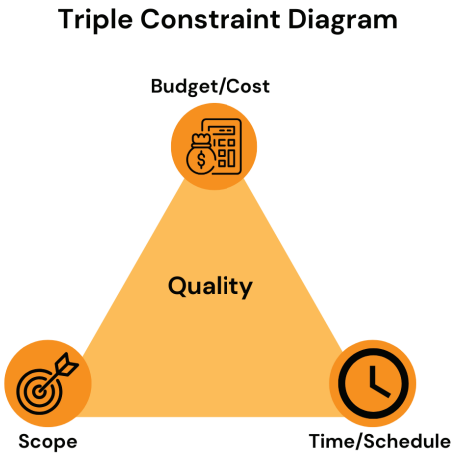
Solution: Establish clear quality metrics and perform regular quality assurance.

Triple Constraint

The Triple Constraint, in predictive project management, represents the three main elements of every project: scope, time, and cost. These constraints are interdependent, with any change in one constraint directly affecting the other two. For example, increasing the project scope will usually increase cost and time for project completion.

Successful predictive project management relies on balancing these three constraints to meet project objectives while staying within any set limits.

Figure 21.3: *Triple Constraint Diagram*



Baselines

Baselines serve as reference points for monitoring and controlling the project, and are extremely useful in predictive project management. Project managers compare actual progress to the baseline to determine if the project is on track or if it needs adjustments.

Three Primary Baselines

Scope Baseline: Defines the approved project scope, including deliverables, and requirements. The scope baseline ensures the project stays focused on its intended objectives and helps prevent scope creep.

Schedule Baseline: The approved version of the project schedule, including milestones and deadlines. Helps track progress and address any delays or disruptions to ensure the project is delivered on time.

Cost Baseline: Outlines the approved project budget, including cost estimates for resources and activities. This enables monitoring and tracking of expenses and ensures that the project remains financially viable and within budget.

Common Documents and Plans

Predictive project management utilizes many documents and plans to guide the project from initiation to closure. If you need a re-cap of the documents and explanations of them, refer back to chapter 4 and chapter 13, where we discussed the most common documents for each of the 5 process groups.

Change Control

Change control is a structured process in predictive project management used to manage and control changes to the project scope, schedule, or cost. Proposed changes are documented through change requests, evaluated for their potential impact on the project, and reviewed by an internal Change Control Board (CCB). If a change request is approved by the CCB, then the changes are implemented in a way to minimize disruptions and scope creep while also implementing the adjustments from the request.

Risk Management

Risk management in predictive project management focuses on risk identification, analysis, and responding to potential risks. Risks are documented in a risk register and prioritized based on their probability of occurrence and impact. Once documented, project teams develop response strategies and plans to address both threats (negative risk) and opportunities (positive risk). Predictive projects prioritize stability, making risk management essential for minimizing uncertainty and maintaining control.

Tailoring

As discussed in the previous chapter on tailoring, nearly any aspect of a project approach can be tailored. For example, smaller projects might reduce unnecessary formal documents or approvals, while larger and highly regulated projects may use additional custom documents and a modified approval process. Tailoring can make predictive approaches more flexible, practical, scalable, and effective towards achieving project goals.

Predictive Project Management Use Cases and Differences Compared to Adaptive

Predictive (traditional) project management is used when projects are stable and unlikely to change, adaptive (Agile) projects are used in uncertain or unstable projects that have a high likelihood of change.

When to Use Predictive Project Management

- **Time to Plan Up Front:** When a project manager and project team have enough time, resources, and ability to plan up front, predictive project management works very well.
- **Clear Requirements**: When the project scope and requirements are well-defined and unlikely to change throughout the life of the project.
- **Stable Environments**: When the organization and project environment is stable, and when any changes (either intentional or unintentional) to the project would be extremely costly, disruptive, or even impossible to implement.
- **Detailed Planning and Large Scale, Long Term Projects**: When the project is large scale and long term, that requires detailed up-front planning.
- **When Regulations, or Laws Are at Play:** When there are tight regulations or laws in place, or even the potential for regulations and laws to be enacted, predictive project management helps avoid unnecessary risks.

When to Use Adaptive (Agile) Project Management

- **Limited Time for Upfront Planning:** Adaptive approaches are perfect for project situations or environments where there is limited time to plan a lot up front. It excels at planning a small amount at the beginning, then immediately executing and changing plans as necessary.
- **Uncertain or Evolving Requirements**: When requirements are likely to change or be refined during the project, adaptive is a good choice.
- **High Flexibility Required**: When the project requires the flexibility to perform quick adjustments based on feedback or new, changing conditions.
- **Shorter Iterative Projects**: When the project benefits from delivering in smaller increments with frequent stakeholder involvement and feedback.
- **Low Likelihood of Regulations:** Adaptive is a perfect choice when there is a low likelihood of needing to meet regulatory compliance or laws throughout the project.

Common Industries for Predictive Project Management

Organizations that use a predictive approach are often in industries that are very stable and less likely to change. Predictive is best suited for projects with clearly defined requirements, fixed timelines, and where changes can be costly or disruptive.

Industries That Use Predictive Project Management

Construction

Construction projects, such as building homes, offices, or other infrastructure, use a predictive approach. These projects require stability and minimal changes after planning. For example, the building design, materials, and scope are clearly defined before construction begins, and any changes would have significant financial and schedule impacts on the project. These projects also follow a linear approach, with phases of planning, procurement, and building taking place sequentially.

Manufacturing

In manufacturing, predictive project management is most often used because of the need for consistent and stable design, development, and delivery. This approach is useful for managing resource allocation, supply chain logistics, and production schedules, where deviations could lead to costly downtime or delays.

Technology Hardware Projects

Predictive project management is commonly used in IT projects involving hardware, such as installing data centers, networking devices, end-user equipment, or other infrastructure. These projects benefit from the predictable and methodical process of predictive approaches, as any changes can disrupt the project. For projects involving both hardware and software, a hybrid approach is usually most applicable.

Government Projects

Public infrastructure projects, such as public transportation, including buses and trains, or other city development, use predictive project management because of governmental requirements, regulations, and budget constraints.

Predictive Project Management Summary

In this chapter, we completed the last of our studies on predictive (traditional) project management. We focused on the concept of predictive project management and that it is a structured, sequential, and conservative approach. We also discussed concepts such as the triple constraint, baselines, change control, risk management, tailoring, and common industries for predictive.

In the next chapter, we will complete our studies on adaptive (Agile) project management, focusing on important and advanced concepts that have not been previously covered.

Chapter 22
Advanced Agile Project Management

Agile is a modern project management approach focusing on rapid execution, adaptability, minimal upfront planning, and quick speed to market. It's commonly used in startups and software industries, and especially projects that focus on developing a software product. We've already covered it quite a bit in this book, and in this and the following chapter we will conclude our exam prep on Agile.

In this chapter we will study Agile core values, concepts, frameworks, unique benefits, mindset principles, project life cycles, and other essential knowledge needed to fully understand Agile for the PMP exam.

Key Terminology

Agile: Also known as adaptive project management, this approach emphasizes minimal upfront planning, speed, flexibility, incremental value delivery, and continuous improvement.

Backlog: A prioritized list of work items that need to be completed.

Kaizen: A principle focused on constant improvement through refining processes and improving all aspects of work.

Incremental Delivery: Breaking down and delivering project work in parts to enhance feedback and adaptability.

Iteration: A short cycle of work, creating flexibility for teams to review, adjust, and improve through multiple iterations.

Kanban: A visual workflow management method used to improve efficiency and flow.

Product Owner: An Agile specific role responsible for managing the backlog and setting priorities.

Scrum: An Agile framework that defines team roles, events, and artifacts.

Sprint: A specific time period for completing project work, usually lasting 1-4 weeks, with specific objectives or goals for the sprint.

Benefits and Limitations of Agile

Agile was developed to meet the demands of today's fast-paced and rapidly changing work environments. Unlike predictive approaches, Agile emphasizes minimal up-front planning, quick execution, high flexibility, and incremental value delivery.

Understanding both Agile's benefits and limitations is essential for selecting the best approach for a project. Agile provides value in many different ways, and also has its own limitations.

Benefits of Agile

- **Quick Time to Market:** Agile enables projects to begin with minimal upfront planning. This encourages project teams to rapidly define and execute work on a product or service idea, resulting in a quick time to market.
- **Flexibility:** Teams can adapt quickly to changing requirements, keeping the project very flexible and can change based on evolving needs.
- **Frequent Feedback:** Regular feedback helps align deliverables with both stakeholder and customer expectations, minimizing wasted effort while enhancing stakeholder and customer satisfaction.
- **Faster Delivery:** Using incremental delivery, Agile enables project teams to release deliverables as they're finished, accelerating progress.
- **Enhanced Collaboration:** Agile promotes a collaborative team environment that improves communication and problem solving.
- **Ideal For Startups:** Agile is ideal for projects in startup environments that have limited budgets and the need quick results.

Limitations of Agile

- **Less Effective for Fixed, Stable Requirements:** Agile is not suited for projects that have strict requirements.
- **Regulatory Constraints:** Projects requiring strict compliance or regulations do not benefit from Agile. Its flexibility can conflict with the delays caused by documentation requirements, lengthy approval processes or legal and regulatory issues.
- **Steeper Learning Curve:** Project teams accustomed to a predictive approach may need extra training, coaching, gradual adjustments, and time to learn and implement Agile methodologies.
- **Predictability Challenges:** The focus on flexibility can make long-term planning and forecasting more challenging for Agile to address.
- **Potential Scope Creep:** While Agile offers the ability to constantly adapt, this can be a drawback, as it can lead to scope creep. Agile generally does not have a set change control

process or change control board. This can significantly impact schedule and budget if scope is not controlled properly.

Common Agile Practices

Using Agile effectively relies on implementing common best practices that help project teams adapt quickly, support continuous improvement, increase responsiveness, and influence stakeholder satisfaction.

Let's explore some of the common Agile practices:

- **Frequent Feedback and Re-prioritization:** Ongoing stakeholder and customer feedback and re-prioritization allow teams to adjust tasks and focus on changing objectives.
- **Continuous Improvement (Kaizen):** Through Kaizen, the Japanese term for continuous improvement, project teams can implement incremental improvements in their processes, creating an environment of learning and continuous refinement.
- **Timeboxing:** Involves setting a dedicated period of time to complete specific tasks. Usually these are 1 to 4 weeks and known as a sprint. It helps project teams stay focused and prioritize work while minimizing delays.
- **Prioritizing Customer Collaboration Over Contract Negotiation:** Agile focuses on continual communication between providers and customers or end users to ensure needs are met and expectations are properly set. It focuses on collaboration rather than strictly adhering to set contract terms.
- **Responding to Change:** Agile teams are encouraged to adapt plans and priorities as the project evolves, ensuring they remain flexible and responsive to both customer needs and emerging insights.
- **Cross-Functional Teams:** These teams often bring together members from different internal departments, allowing for enhanced collaboration, innovation, and adaptability.
- **Daily Stand-ups:** Brief daily meetings used to review project progress, address any obstacles or roadblocks, and set daily priorities.
- **Retrospectives:** Regular reviews held at the end of each sprint to reflect on successes, challenges, and areas for future improvement.

The Agile Manifesto and Mindset

In 2001, the Agile movement formally began with the release of the "*Manifesto for Agile Software Development*", which outlined core values and twelve guiding principles. Initially created for projects in the software industry, these principles now help support adaptability, efficiency and continuous improvement across many project environments.

The 12 Agile Foundational Principles

1. **Customer Satisfaction:**

   The highest priority is to satisfy the customer through early and continuous delivery of valuable software.

2. **Embrace Change:**

   Welcome changes in requirements, even late in development. Agile processes implement flexibility for change to create competitive advantage.

3. **Frequent Delivery:**

   Release deliverables frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

4. **Collaboration:**

   The project manager, project team, and stakeholders should work together closely and throughout the project.

5. **Motivated Individuals:**

   Focus on how motivated individuals can impact and build a project. Give them the environment and support they need, and trust them to get the job done.

6. **Face-to-Face Communication:**

   The most efficient and effective method of communication with a project team is face-to-face conversation.

7. **Measure of Progress:**

   Completed deliverables, such as working software, are the primary measure of progress.

8. **Sustainable Development:**

   Agile promotes sustainable development. Sponsors, the project team, and users should be able to maintain a constant pace indefinitely.

9. **Attention to Excellence:**

   Continuous attention to technical excellence and design significantly enhances deliverable quality.

10. **Simplicity:**

    Simplicity is the art of maximizing the amount of work done without overcomplicating things.

11. **Self-Organizing Teams:**

    The best architectures, requirements, and designs emerge from self-organizing teams.

12. **Reflection and Adjustment:**

    At regular intervals, the team reflects on how to become more effective. After reflecting, the project team adjusts its behavior according to the reflections.

Agile is commonly viewed as an adaptive approach, and can also be considered a methodology, framework, or set of techniques guided by the 12 Agile core principles.

There are two primary strategies to implement Agile values and principles effectively. The first strategy is to select and then tailor Agile to suit the project, organizational or industry specific requirements.

The second strategy is to apply best practices that fit the project and align with Agile's core values, such as using iterative refinements or dividing large projects into multiple releases. The ultimate goal of using both strategies is to deliver continuous value to customers throughout the lifetime of the project, leading to better business outcomes.

Two Work Categories: Definable Work and High Uncertainty Work

Project work can be categorized into two types, known as definable work, and high-uncertainty work.

Definable work refers to projects with well-understood processes, procedures, and is often modeled after similar previous projects. These projects benefit more from a predictive approach due to their known elements, predictability, and stability requirements. A common industry for definable work is construction.

On the other hand, high-uncertainty work involves projects that require innovation, flexibility, and adaptability due to less predictable elements, risks, outcomes, or requirements. High-uncertainty work projects work best with an Agile approach. A common industry for high-uncertainty work is software development.

Common Agile Approaches: Kanban, Lean, and Scrum

In Agile project management, Kanban, Lean, and Scrum are three commonly used approaches, each offering unique ways to help project teams achieve specific goals. They enable project teams to prioritize tasks, deliver value incrementally, and adapt to change. All of these approaches can be used together or individually and address different aspects of Agile.

Each approach aligns with Agile's core values, focusing on different aspects:

- ➢ Kanban emphasizes flexibility and visibility by tracking work in progress, enabling teams to adjust quickly. It is primarily a method to visualize and manage workflow.
- ➢ Lean promotes value-driven work and waste reduction, with a focus on continuous improvement. It is a philosophy focused on reducing waste while maximizing value.
- ➢ Scrum provides structure through defined roles, time-boxed sprints, and regular check-ins, ensuring accountability and focus. It is an Agile framework.

In the following figure, we explore some of the unique aspects of each approach.

Figure 22.1: *Common Agile Approaches*

Agile Approaches and Methods			
Aspect	**Scrum**	**Kanban**	**Lean**
Overview	Structured Agile framework focused on roles, events, and time-boxed sprints.	Visual workflow management, heavily focused on ensuring work is managed.	Foundational approach focused on maximizing value and eliminating waste.
Strengths	Provides clear structure and iterative progress.	Offers flexibility and adapts to changing priorities easily.	Emphasizes efficiency, value delivery, and kaizen.
Project Use	Ideal for projects with evolving requirements and frequent deliverables.	Works well for ongoing work with high variability and frequent changes.	Useful for eliminating inefficiencies and focusing on value are priorities.
Team Workflow	Organized around short, fixed sprints (1-4 weeks) with set goals.	Continuous flow, no fixed time frames; tasks move through columns on a board.	Focus on eliminating bottlenecks and streamlining steps across the process.
Ease of Implementation	Requires some setup and training for roles and sprint ceremonies.	Simple to adopt with minimal disruption; easy to start and refine over time.	Low up-front effort, ongoing commitment to process improvement.

Project Life Cycles

A life cycle is a structured sequence of phases that guide a project from initiation to completion. The project life cycle determines how work is planned, executed, and delivered throughout a project. As project managers, we choose the appropriate life cycle to align the project approach with its unique requirements and characteristics.

Agile life cycles are flexible, using iterative and incremental approaches that enable teams to adapt to change stages. For complex projects requiring both predictability and adaptability, hybrid life cycles blend Agile with predictive methods, creating a balanced approach. Frequent feedback loops in these cycles allow continuous refinement and promote project teams to progress based on changing requirements.

Nick's Tip:

Project Life Cycle vs Project Approach: What's the Difference?

A project life cycle represents the sequence of phases a project undergoes, such as initiation, planning, execution, and closing. The project life cycle (including the phases) creates the structural framework or "skeleton" of the project, guiding it from start to finish.

In contrast, a project approach is the specific method (predictive, hybrid or Agile) used to manage and complete the work within each phase of the life cycle. This approach defines how the project team will complete tasks, handle changes, and address challenges as they move through the project stages.

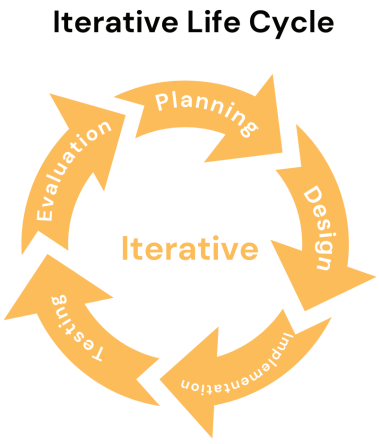
In summary, the life cycle is the structure of the project's phases, while the approach is the method used to handle and execute the work within those phases.

Four Types of Life Cycles

The four main types of project life cycles each offer distinct advantages, and we'll explore them in detail.

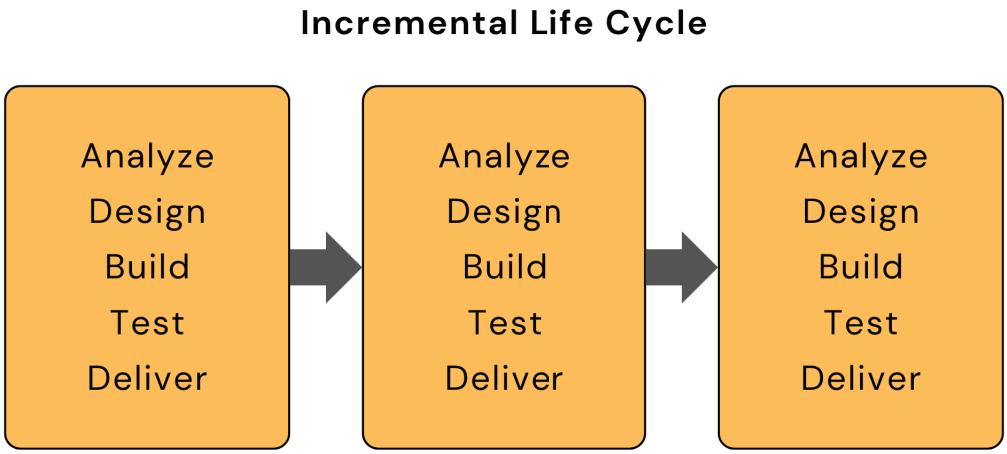
- **Predictive Life Cycle:** In this life cycle, most planning occurs upfront at the start of the project and most variables are known. There is usually a low level of risk or changes to the project, a stable project team, and high certainty. After planning, execution begins in a single, linear, step-by-step sequence.
- **Iterative Life Cycle:** The iterative life cycle refines work over multiple cycles known as "iterations", allowing for feedback and adjustments on partially completed deliverables. Best suited for complex projects with evolving requirements, focusing on learning and improvements over speed. Each iteration is typically time-boxed to a few weeks and incorporates stakeholder feedback from previous iterations.

Figure 22.2: *Iterative life cycle example*



➢ **Incremental Life Cycle:** Parts of the project are delivered in stages, allowing value from deliverables to be realized quickly. This works well with projects that prioritize early delivery of usable features or components, rather than waiting for a complete final product. Feedback from early delivery can help guide adjustments, reducing potential rework and allowing for easy changes. Incremental life cycles are especially great for emphasizing speed and continuous delivery over a single, final release.

Figure 22.3: *Incremental life cycle example*



➢ **Agile Life Cycle:** The Agile life cycle combines iterative and incremental approaches, enabling continuous refinement and frequent delivery of value. With this life cycle, changing requirements are expected, and each iteration focuses on delivering completed features that address project needs.

Figure 22.4: *Agile Life Cycle*

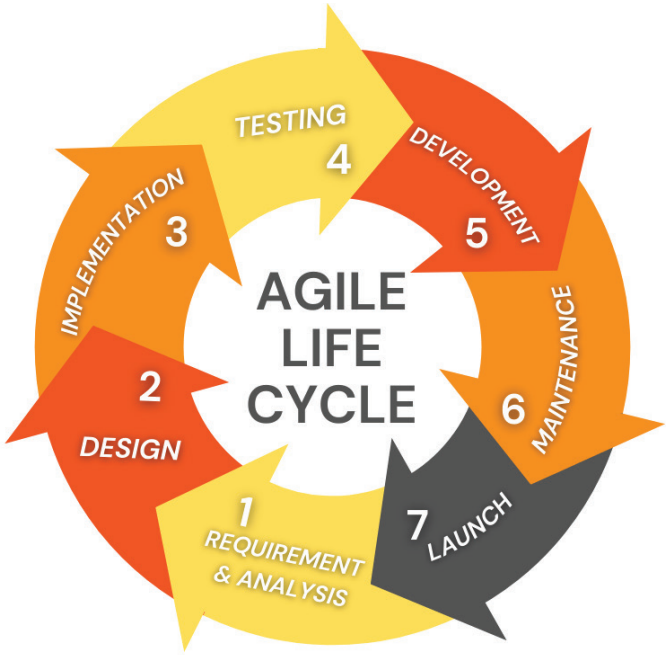


Figure 22.5: *Characteristics of Life Cycles*

Characteristics of Life Cycles				
Life Cycle Type	**Activities**	**Delivery**	**Definition**	**Best Used For**
Predictive	Performed once for the entire project	Single delivery	Majority of planning done upfront, followed by a single, linear sequence of execution.	Highly structured projects with stable requirements and low uncertainty. Planning occurs up-front and project execution follows a single, linear sequence. Good for managing costs.
Iterative	Repeated until correct	Single delivery	Allows for continuous feedback on incomplete work, enabling refinement and modification.	Flexible projects where requirements may change or need refinement over time. Some planning is done in the beginning, but work and outputs may change original plans.
Incremental	Performed once for a given increment	Frequent smaller deliveries	Produces completed deliverables in stages, allowing immediate use and value.	Projects that benefit from incremental delivery, allowing partial use or review at the end of each sprint. Plans deliveries in advance.
Agile	Repeated until correct	Frequent small deliveries	Combines iterative and incremental approaches to deliver frequent value and adapt continuously.	Projects with high uncertainty, changing requirements with a need for flexibility, adaptability, and regular feedback and updates. Planning up front is minimal.

Assessing Agile Life Cycle Suitability

Suitability filters evaluate factors like a project's nature, environment, and team dynamics that help determine whether it is suitable for Agile.

Suitability filters to evaluate Agile compatibility:

- **Project Complexity**: Degree of difficulty or complexity in the project.
- **Flexibility of Requirements**: Likelihood of frequent changes or adaptations to project requirements.

- **Stakeholder Engagement**: Amount of engagement needed with stakeholders throughout the project.
- **Team Collaboration**: Ability of team members to work and collaborate together.
- **Time Sensitivity**: Need for rapid delivery of parts of the project, allowing for iterative and incremental releases.
- **Organizational Readiness**: Overall culture and willingness of the organization to support Agile principles, values, and practices.
- **Customer Involvement**: Degree in which customers or end-users will provide ongoing feedback and take part in development cycles.
- **Risk Tolerance**: Ability to manage and accept iterative, flexible approaches in place of rigid planning and control.
- **Project Size:** Appropriateness of Agile for smaller projects or for portions of larger projects that can be broken down incrementally.

Hybrid Life Cycles

Hybrid life cycles combine elements of the four main project life cycles, allowing project teams to balance structure, adaptability, and delivery. They help address both predictable and unpredictable aspects of a project.

Typically, hybrid life cycles apply an Agile approach in early project phases that have high uncertainty, such as software development, enabling teams to be flexible for changes. Later phases, like ones that involve regulatory approval, commonly adopt a predictive life cycle for stability.

Implementing Agile Life Cycles In An Unfamiliar Environment

Implementing Agile life cycles and techniques commonly requires a gradual approach, especially for project teams and organizations accustomed to predictive methods. Agile techniques can feel risky, rushed, and unfamiliar. A phased transition can be implemented to allow project teams to slowly incorporate Agile, focusing on lower-value projects, phases, or deliverables.

As teams build confidence, they can incorporate more Agile techniques to enhance value delivery and adaptability. This gradual and slower shift helps tailor Agile adoption, enabling a smoother, more effective transition.

Tailoring and Blending Agile Approaches

Project teams will often need to combine multiple Agile frameworks and practices to tailor to specific project needs. Some teams may start with a single framework like Scrum or Kanban, then adapt or incorporate elements from other Agile practices, such as Extreme Programming (XP) to increase efficiency.

Tailoring for Project Needs

Project factors like team experience, demand patterns, and workflow flexibility contribute to tailoring Agile. Any modifications or tailoring should align with the project's unique requirements and the team's capabilities, optimizing both speed and quality.

In-Depth Agile Project Management Summary

In this chapter, we took an in-depth look at Agile project management, focusing on Agile terminology, benefits and limitations, common practices, and the Agile Manifesto. We also explored the two types of work in Agile, popular methods and approaches like Kanban, Lean, and Scrum, as well as the four project life cycles, and tailoring for Agile.

In the next chapter, we'll delve into Agile implementation and organizational factors, officially concluding the exam preparation portion of the book. Keep pushing forward, you're almost ready for your exam!

Chapter 23
Agile Implementation and Organizational Factors

In this final chapter on Agile, we'll shift our focus to real-world application, exploring different aspects including mindset, leadership approaches, organizational factors, measurements and metrics, and procurement and contracting strategies.

Key Terminology

Agile Mindset: A way of thinking that prioritizes adaptability, collaboration, and continuous improvement, guiding team behavior and decision-making in Agile projects.

Agile PMO: A Project Management Office (PMO) that operates with a collaborative, value-driven mindset, adapting to Agile projects.

Backlog: The prioritized list of tasks or user stories for a project.

Backlog Refinement: Updating and prioritizing backlog items to prepare for upcoming iterations or sprints.

Cross-functional Teams: Project teams created from multiple departments and skill disciplines.

Cumulative Flow Diagram: A visualized display of work in progress across stages, helping to spot bottlenecks.

Daily Standup: A recurring short, focused meeting, usually 15 minutes or less, where project team members discuss progress and blockers.

Dynamic Scope: An Agile specific definition of project scope. This keeps the scope flexible in the event of new requirements, insights, or feedback arise.

Flow-based Agile: Agile method focusing on continuous workflow, often using Kanban to visualize tasks and promote flexible task management. Flow-based Agile does not use iterations or sprints.

Generalizing Specialist (T-Shaped Professionals): A team member with expertise in one area and versatile skills in many other areas, allowing flexibility in what type of tasks they can complete.

Iteration-based Agile: An Agile method that organizes work into fixed-length cycles or sprints. The terms "iteration" and "sprint" are often used interchangeably.

Kanban Board: A visual tool representing the flow of work in a sprint. Kanban boards help track progress and any bottlenecks very quickly.

Minimum Viable Product (MVP): The smallest, functional version of a product, quickly produced to assess business viability for a product and gather early feedback from users, customers, and stakeholders.

Organizational Change Management: The set or common process of change management based specifically on an organization's processes.

Procurement and Agile Contracting: Agile specific procurement and contracting methods that focus on flexible collaboration, changes, and value-driven payment milestones, plans, or terms.

Retrospective: A session held at the end of each sprint to reflect on successes, challenges, and improvement areas. Useful for improving future performance or documenting lessons learned.

Scaled Agile Framework (SAFe): A framework for scaling Agile practices across multiple project teams or even an entire organization.

Self-managing Teams: Project teams that independently manage themselves, common in Agile.

Servant Leadership: A common leadership style that focuses on empowering the project team and works very well in an Agile environment.

Sprint: Also known as an iteration, a sprint is a set timeline, often 1-4 weeks, in which the team completes project work and gathers feedback.

Sprint Planning: A collaborative session where the project team plans tasks out for the upcoming sprint or iteration.

Story Points: A unit of measure for estimating task effort for a task or set of tasks.

Team Augmentation: Integrating external members into the internal project team in order to enhance collaboration.

Work in Progress (WIP) Limit: A cap on active tasks, set to reduce burnout and improve focus and productivity.

Understanding Iteration vs. Flow-Based Agile

In Agile, there are two primary ways of organizing work: iteration based and flow-based approaches.

Iteration-based Agile focuses on fixed cycles of work known as sprints or iterations, lasting around 1-4 weeks. In each sprint, the project team focuses on completing a pre-planned and set amount of tasks. This promotes regular feedback that allows for quick changes based on feedback and promotes long term continuous improvement through retrospectives at the end of each iteration. An iteration based approach is great for projects that require frequent check-ins and feedback.

Flow-based Agile, in contrast, does not use iterations. It organizes work through a constant flow. Tasks are chosen from a prioritized backlog based on the project team's availability and current workload. Each task progresses continuously through various stages on a Kanban board until completion. This enables teams to adapt to changing priorities without waiting for a sprint to end, making it ideal for projects with a need for uninterrupted delivery. Specifically, flow-based Agile focuses on minimizing the amount of work in progress (WIP) and providing a visualization of task flow, which helps discover bottlenecks and increase productivity.

Creating an Agile Mindset

Agile requires more than simply implementing methodologies and practices. It also requires the project manager actively encouraging, coaching, and promoting an Agile mindset within the project team.

Consider the following questions when fostering an Agile mindset:

- How can the project team embody Agile principles in daily operations?
- What can be delivered quickly to gain early feedback for the next cycle?
- How can the team maintain transparency, honesty, and open communication?
- What tasks can be reduced, or avoided altogether to focus on high-priority goals that drive the most value?
- What leadership style is needed to support the project team in reaching its objectives?

Leadership in Agile

Servant leadership is the most common leadership style in Agile, and is most relevant to know for the current exam. It focuses on empowering project team members by prioritizing their well-being and growth, providing coaching, and removing unnecessary roadblocks.

Three Elements of Servant Leadership

Servant leaders focus on three elements (known as the 3 P's) that strongly support project teams working in Agile projects and environments.

- **Purpose**: Servant leaders help establish a shared vision with the project team and purpose for why the project exists.
- **People**: They create a supportive environment that allows each team member to contribute effectively, promoting trust and accountability across the project team.
- **Process**: They can be flexible in their approach, allowing changes or customization to important processes.

Agile Project Team Structure, Roles, Responsibilities, and Challenges

Building effective Agile project teams requires very specific and deliberate structuring, thoughtful role assignments, clear responsibilities, and responses to challenges.

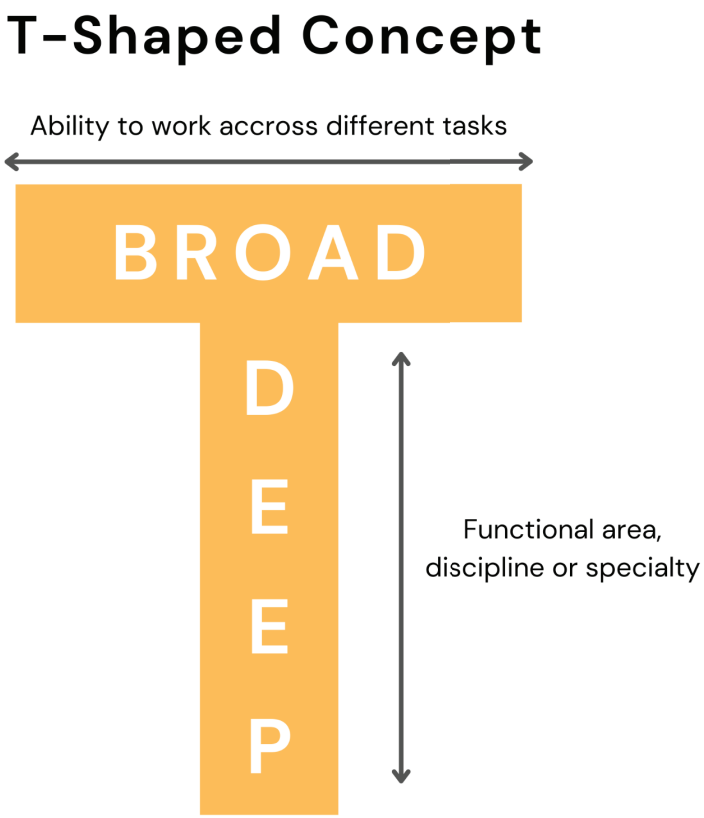
Agile Project Team Structure

Structuring project teams in Agile projects helps in fostering collaboration, efficiency, and adaptability. There are some main elements of Agile team composition, including dedicated cross-functional teams, ideal project team size and location, optimized workspaces, and the importance of generalizing specialists to ensure flexibility and independence in achieving project goals.

Four main factors to consider when structuring an Agile Team

1. ***Dedicated, Full-Time, and Cross-Functional Teams:*** Agile teams should be cross-functional, comprising members from various departments with varying and complementary skills, and full-time, if possible. Specifically, Agile benefits from full-time and dedicated project team members by minimizing task switching and competing priorities.
2. ***Team Size and Co-location:*** For the best results when using Agile, aim for project teams to consist of 3-9 members. Co-location or close physical proximity of project team members enhances communication, team building, and strengthens team dynamics.
3. ***Communication:*** Effective communication is crucial in Agile, building on best practices covered in this book. As a project manager,try to understand how each team member prefers to communicate, and tailor your communication methods specifically for them. For geographically dispersed teams, tools like document sharing, video meetings, and screen sharing can help enhance collaboration through virtual means.
4. ***Specialists (T-Shaped Team Members):*** In Agile teams, "T-shaped" project team members are people who have expertise in one specific area (like coding, research, budgeting, etc) but also have broader skill sets that allow them to help on many areas of the project. They're called T-Shaped team members because they resemble the letter "T", as figure 23.1 shows.

Figure 23.1: *T-Shaped team members concept*



Roles in Agile Teams

In Agile teams, there are a few different roles that contribute to and make up the team. Oftentimes, responsibility is shared between the entire project team.

Primary roles in an Agile team and their responsibilities:

- **Product Owner:** Manages the project vision, goals, and priorities, oversees the backlog, and acts as the main decision-maker for what the team works on.
- **Cross-Functional Team Members:** Executes on the work needed to create the product or service, possessing all skills necessary.
- **Team Facilitator (Scrum Master/Coach):** Assists in implementing Agile practices and maintaining productivity within the team.

Organizational Challenges and Roadblocks To Agile Success

Agile implementation often requires adjustments and acceptance at the organizational level to ensure cross-functional collaboration, clear priorities, and strong support from top management.

- **Breaking Down Silos:** Isolated departments or teams are known as silos. They usually work independently with little interaction between each other and hinder collaboration

when using Agile. To create effective cross-functional teams, organizational leadership can dissolve silos by bringing together team members from various departments, promoting shared high-level organizational goals, and encouraging open, judgment-free communication.

- **Reducing Multitasking and Task Switching:** Full-time team members are important for Agile. By allocating team members to specific projects full-time, organizations can limit context switching, leading to happier employees, higher quality work, and faster delivery. However, this is not always possible, and it can be difficult in the real world to allocate employees full time because of operational requirements.
- **Buy-In From Managers and Stakeholders:** Agile project teams need buy-in and support from mid and high-level managers as well as stakeholders to remain focused, effective, and motivated. Involving stakeholders in planning sessions and Agile ceremonies can also increase their support and engagement.

Encouraging an Agile Culture

Encouraging an Agile culture that promotes productivity starts with building trust. When team members trust each other, they communicate openly, share ideas freely, and feel safe to take risks, which encourages innovation. Creating a safe environment involves promoting constructive feedback, respecting all perspectives or opinions, and ensuring equal opportunities for everyone on the team to grow and contribute.

Feedback loops are processes used in Agile to gather insights from ongoing or completed work to guide future actions and improvements. For example, retrospectives provide a feedback loop where teams reflect on recent successes and areas for growth, creating the opportunity for continuous improvement and change over time.

Chartering the Agile Projects and Project Team

Agile projects, like predictive, officially begin with creating a project charter. The project charter defines the project's purpose and how the project is going to create business value.

In Agile, chartering goes beyond project creation, it also covers:

- **Creating a Project Vision**: Clarifying why the project is being undertaken, and creating a shared vision and understanding around that. This is project vision or shared vision is crucial to keep the team focused.
- **Identifying Beneficiaries**: Who will gain value from this project, and how will they benefit?
- **Clarifying the Definition of "Done" (DoD)**: What criteria will determine that a project or task is considered "done"? Setting these release and acceptance criteria helps the team maintain a clear standard of quality and clarify when deliverables are complete.

Project Team Charter

In addition, the project team may also create an understanding of how they will work together in the form of a project team charter. This team charter promotes a collaborative environment by establishing how team members interact and support each other, creating a strong foundation for success in an Agile environment.

This consists of:

- **Team Values**: What values the project team wants to promote within their working environment, such as working at a sustainable pace and standard working hours.
- **Ground Rules and Group Norms**: Norms around meeting conduct, like respecting everyone's time and limiting multitasking during team discussions.

Common Agile Team Practices

Retrospectives

Retrospectives allow project teams to review their work, identify areas for improvement, and make adjustments, often conducted at the end of each iteration or certain milestones. During retrospectives, there is a strong focus on identifying both qualitative (team observations, thoughts and feelings) and quantitative (metrics) insights. The team can then use these observations and insights to help create a few actionable items to focus on in their next iteration, avoiding overloading themselves with too many changes at once.

Backlog Preparation and Refinement

The project backlog is a prioritized list of tasks or user stories needed to achieve project goals. User stories are brief descriptions of features that end users would like to see. Unlike predictive project plans, the backlog doesn't require detailed planning up front.

Product owners refine and prioritize the backlog. They might use a product roadmap, which provides a high-level overview of expected deliverables over time, and can change based on changing work or priorities. The product owner and project team may meet together and update, detail, and prioritize backlog items to prepare for upcoming iterations.

Daily Standups

A daily standup is a short, focused meeting (usually under 15 minutes) where project team members discuss current progress, future tasks, and obstacles. The goal with a standup is to ensure work is going well, roadblocks are addressed early, and keeping the project team accountable. To keep the standup productive, it's advised to have each individual keep their updates short (between 1-2 minutes ideally) so everyone has a chance to speak.

Demonstrations and Reviews

At regular intervals, such as once every two weeks, the project team showcases deliverables for stakeholders for feedback. This provides the project team with user feedback, allowing them to pivot if needed. Demonstrations are scheduled at the end of an iteration in iteration-based Agile, and in flow-based Agile, they occur when important work is completed.

Remember, one of the main aspects of Agile is frequent delivery, and project teams need to be prepared to fulfill any delivery or schedule requirements.

Iteration Planning

Agile teams plan in short cycles, usually only as far as the project team's available capacity for work. Factors like vacations or professional/personal commitments need to be taken into account so the team can commit to realistic workloads. This iterative planning approach enables teams to plan, execute, learn, adjust and then adjust plans in cycles, gradually refining their capacity estimates as they progress.

Iterations and Incremental Delivery

Agile projects rely on delivering value incrementally, throughout the project and in each cycle or phase. Iterations help create a cadence for delivery, enabling the team to get frequent feedback. Each increment builds on the last, contributing to the overall product development.

Addressing Agile Project Challenges

Project teams will encounter unique Agile specific challenges. Addressing these issues quickly keeps the project on track, sets realistic expectations and goals, and keeps the project team organized, productive, and high-performing.

Let's explore potential problems and solutions that may be encountered.

Problem: Unclear team purpose, mission or vision

Solution: Use Agile chartering to clearly define the project team's shared vision, mission, and purpose from the beginning. If the purpose becomes unclear during the project, it may be time to re-define it.

Problem: Ambiguous stakeholder product requirements

Solution: Collaborate with stakeholders to clarify realistic product requirements. Use tools like user story mapping to break down requirements into manageable tasks.

Problem: Poor user experience

Solution: Utilize user experience (UX) design practices. Involving real users early and often to ensure early prototypes provide a good user experience.

Problem: Lack of clarity on work assignments or progress

Solution: Implement daily stand-ups, especially for project teams new to Agile. Ensure clear requirements and expectations on tasks when delegating them, and work with struggling team members to provide clarity.

Problem: Persistent obstacles and roadblocks

Solution: Implement a servant leadership style to ensure that project team members are shielded from unnecessary, avoidable roadblocks coming from outside the team.

Problem: Frequent delays due to backlog management

Solution: Collaborate with the product owner and project team on the backlog. Ensure that the backlog is well managed with realistic expectations of the project team's workload.

Problem: Complex or overly intricate product design

Solution: Apply the Agile principle of simplicity by implementing the most simple and effective thing that could viably work and then getting feedback. This reduces unnecessary complexity and keeps the project focused on delivering value quickly and at a reasonable cost.

Introducing Agile Metrics and Measurements

Agile metrics focus on in-progress or finished deliverables. These metrics allow teams to observe their actual work output and adjust it based on real data, creating a reliable forecasting and decision-making process.

Transitioning to Agile Metrics

Agile promotes gathering, reporting, and utilizing different metrics than those used in predictive project management. Unlike predictive metrics, which estimate future outcomes, Agile metrics reflect actual, current progress and allow for continuous optimization. Teams new to Agile will need to get used to the present progress Agile measures.

Downfalls of Predictive Status Reporting

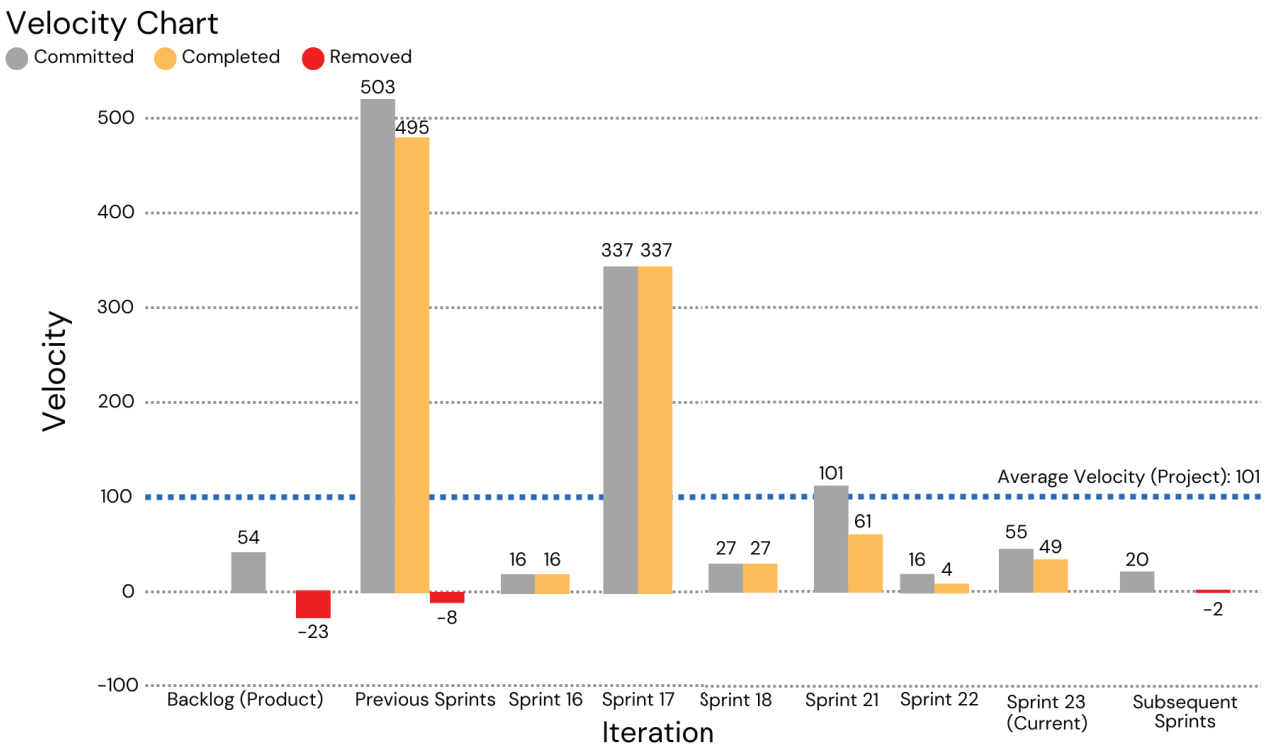
Predictive reporting relies on percentage completion, which can misrepresent progress. For example, a predictive project can be marked "90% complete" even when critical tasks remain uncompleted. This lack of real accuracy in predictive metrics often leads to unexpected delays and reveals problems too late for effective response.

Agile Metric Applications

Velocity

Velocity measures the work completed during an iteration or sprint, usually expressed by story points. This metric becomes useful over time, helping teams forecast the time that future work may take. For example, if a team averages 15 points per iteration and has 150 points remaining, they can predict it will take 10 more iterations to finish. Velocity is often visualized with a velocity chart.

Figure 23.2: *Velocity chart*



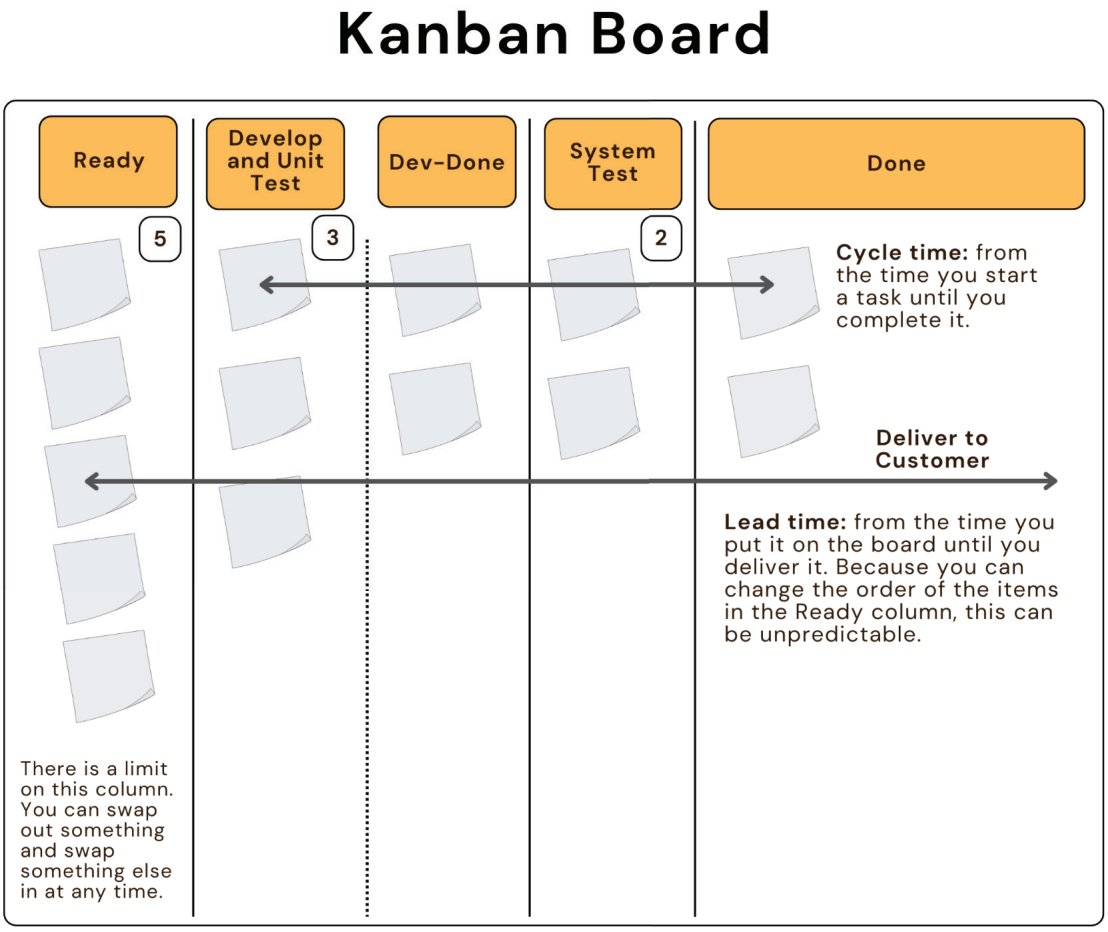
Cycle Time and Lead Time

Cycle time and lead time are metrics that help measure the time efficiency project teams are on various tasks.

- Cycle time refers to how long a task takes from start to finish.
- Lead time measures the total time from when a task is added to the board until it's finished, the total time to delivery.

Monitoring cycle and lead time allows the project team to identify and fix bottlenecks, helping maintain a steady and consistent workflow. A kanban board is often used to visualize both cycle and lead time.

Figure 23.3: *Kanban board showing cycle time and lead time*

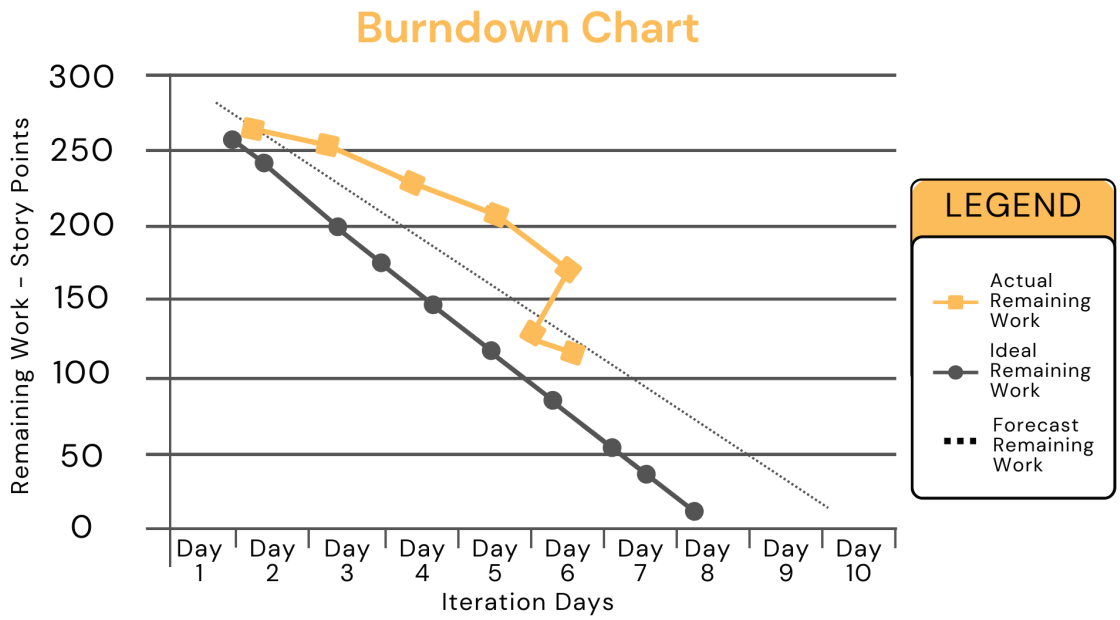


Burndown and Burnup Charts

Burndown and burnup charts provide visual displays and make it easy for teams to monitor the current work in progress and previous work completed.

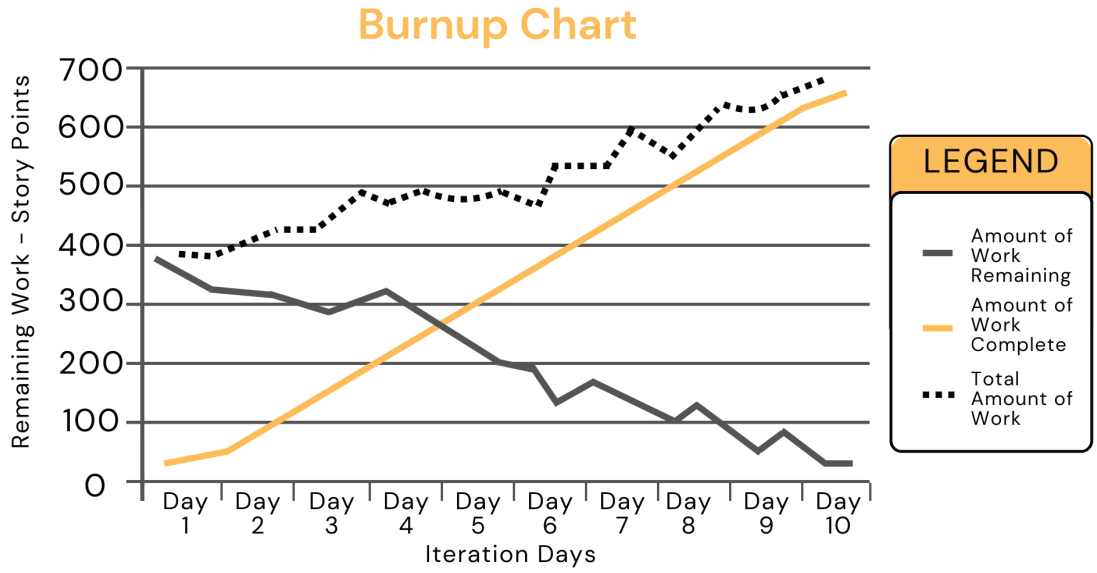
Burndown charts show what remaining work is left over the current iteration, helping project teams to gauge if they're on track.

Figure 23.4: *Burndown chart*



Burnup Charts show previously completed work over time, focusing on scope changes and helping project teams understand the total work done in comparison to the total work left to be completed.

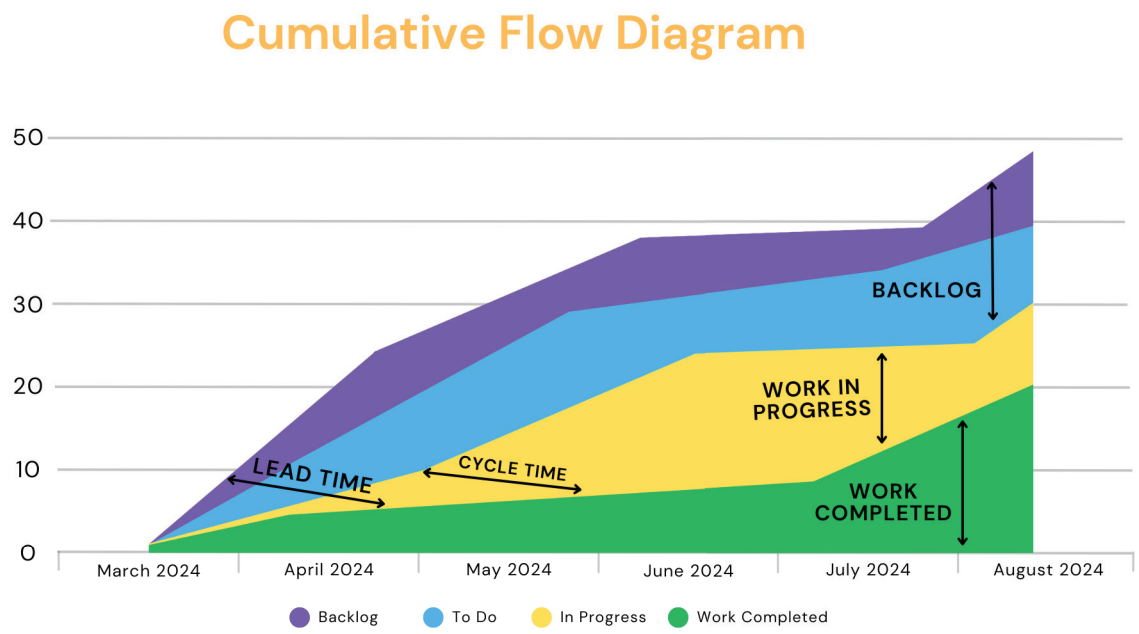
Figure 23.5: *Burnup Chart*



Cumulative Flow Diagram (CFD)

Cumulative Flow Diagrams (CFD) displays the current work in progress (WIP). Project teams can easily see where work is piling up in certain phases, revealing bottlenecks. For example, if tasks accumulate in the testing phase, it may be a sign that the team needs to address testing capacity.

Figure 23.6: *Cumulative Flow Diagram*



Work Item Age and Work In Progress Limits

Monitoring the age of each work item and setting work in progress (WIP) limits is essential in Agile. Work item age tracks how long each task has been in the workflow, helping project teams identify what tasks are taking too long. WIP limits cap the number of tasks in each phase to maintain a manageable workload among the project team and promote their focus.

Using Agile Metrics for Forecasting, Planning, and Team Health

Agile metrics provide a foundation for more accurate planning and forecasting by focusing on short-term data. Metrics like velocity and cycle time give project teams a realistic view of their capacity, allowing for precise short term goals, and the rejection of long term baselines. As the team's work becomes consistent, this data enables clearer projections for when remaining tasks will be completed, balancing flexibility and forward planning.

Agile also utilizes quantitative and qualitative metrics. Quantitative metrics are ones that can be measured in numbers, such as cycle time and velocity. Qualitative metrics that cannot be measured in numbers, like team morale and customer satisfaction, can help give insight into the project team's engagement, project manager leadership effectiveness and proper fulfillment of customer needs.

Introduction to Organizational Considerations for Agile

Projects exist under organizations, and organizational factors like culture, policies and politics, change management processes and structure heavily influence how a project is managed, what

direction it takes, and potential outcomes. As a project manager, it can be a challenge to understand how to balance organization factors with managing your project.

Change Management

Organizational change management involves the process of evaluating and implementing proposed project changes. An Agile project operating within a predictive organization may experience pushback due to change management.

Drivers for Change Management

Change management is crucial in Agile projects due to fast pace, frequent delivery, and constant adjustments.

Two primary drivers for change management are:

1. **Changes Caused By Accelerated Delivery**: Agile's fast delivery pace presents challenges to slower paced organizations.
2. **Changes Caused By the Transition to Agile Practices**: Shifting to Agile can immensely disrupt established routines. Differences in change management, communication and coaching, and previous predictive strategies can cause problems when transitioning to Agile.

Organizational Culture

Organization and business culture play a role in the project management approach a project manager will use. Specific industries will also impact the approach taken, with some industries leaning more either predictive or Agile.

Assessing Organizational Readiness for Agile

Adoption and implementation with Agile depends on the organization's openness to embrace and implement it. One of the hardest parts of implementing Agile is not in the strategies, techniques, processes or methods, but rather the hardest part is getting buy-in on the people's side. This becomes especially crucial at the organizational level where leadership must be willing to support cultural shifts and Agile working environments and conditions.

Here are some characteristics of an Agile ready organization:

- **Executive Sponsorship**: If executives and leadership are open to and ready to commit to investing in Agile practices, it's an excellent sign that it can be implemented effectively.
- **Acceptance of New Performance Metrics**: When moving to Agile, there will be a shift from predictive individual performance metrics to team assessments. This can be completely

new to many managers and leaders. If managers and leaders can accept new performance criteria, it will significantly help implement Agile.

- **Project Management Structure**: Depending on the PMO and project management structure, it can either help or hinder Agile adoption. The more rigid the PMO and project management structure, the less successful Agile will be.
- **Talent Management and Skills Development**: The organization can support Agile through recruiting experienced talent and developing current employees. Executives, managers, and even human resource departments can help with attracting and retaining new employees experienced in Agile, as well as developing existing internal employees. It's a good sign if the organization has education reimbursements, and has plans in place for each employee to continue to level up their skills.

Conversely, there are some characteristics of an organization that is not Agile-ready:

- **Departmental Silos**: Silos are departments that perform minimal collaboration and communication with other internal departments. Initiating work between these silo teams or departments is difficult when implementing Agile.
- **Short-Term Profit Focus**: Many organizations, corporations and businesses are focused on cost over quality, particularly on influencing quarterly profits. If an organization is focused on short-term profit, it will significantly hinder Agile adoption.
- **Individual Incentive Focus**: If an organization has a heavy incentive for rewarding individuals only, it will be a roadblock to Agile. Agile focuses on teamwork and project completion over solely high performing individuals. While there are certain departments that will always have an individual focus, such as sales, if the entire organization is individually incentivized, it will be very difficult to implement Agile long term.
- **Specialized Skill Sets**: If employees are so specialized that they cannot contribute much outside of one skill set, and are not trained to become T-shaped employees, it will be difficult to implement Agile. Agile relies heavily on team members being able to perform multiple roles as needed during the project.

In short, organizations that succeed with Agile adoption often have the positive characteristics of an Agile ready organization we discussed, as well as leadership and organizational buy-in.

Nick's Tip:

Businesses that are considered startups will naturally begin using Agile and often continue to be Agile. This is because startups usually have lower budgets than established corporations, and also have the most concern for quick execution and seeing results immediately.

Agile Procurement and Contracting

Agile procurement and contracting focuses on collaboration with suppliers and vendors. One of the main focuses is for sharing risk and reward between the organization undertaking the project and third parties helping with the project. These methods ensure both the organization and third party vendor or supplier have some "skin in the game" by sharing risk and reward between both parties.

Not every vendor or supplier will be in favor of Agile focused contract terms.

Strategies for Agile procurement and contracting:

- **Multi-Tiered Structure**: This approach divides contract terms for flexibility. Fixed items, like warranties, are permanently set in an agreement. Meanwhile, variable elements (such as rates) are listed separately in a service schedule. A statement of work will cover scope and budget, allowing for flexibility to update parts of the contract as needed.
- **Emphasis on Value Delivered**: Agile contracts can assign payments and milestones to the incremental delivery of realized business value. This ensures work is consistent with project needs, encourages feedback, and allows the project to adapt as requirements change.
- **Fixed-Price Increments**: Projects can be broken down into fixed-price deliverables, such as user stories, rather than locking in the entire project scope and budget all at once. This approach gives organizations control over spending and segments it into specific milestones or stages while limiting the suppliers' risks by avoiding large, single commitments.
- **Not-to-Exceed Time and Materials**: Agile contracts often cap budgets at a fixed amount, which gives the organization flexibility to introduce new ideas while staying within budget. This model manages costs and allows for adjustments.
- **Graduated Time and Materials**: To share financial risks and provide incentives, a customer may reward a supplier with a higher hourly rate for premature delivery or penalize them with rate reductions for delays. This incentivizes timely, quality work and makes the supplier feel like they have some skin in the game as they are rewarded for quick work and penalized for slow work. Usually, incentives or penalizations will be clarified before work starts.
- **Early Cancellation Option**: If enough value is delivered early, an Agile contract may allow customers to cancel the remaining scope for a set fee, usually negotiated in the beginning of the contract. This option limits budget exposure and gives suppliers revenue for early success, focusing on real value rather than just completing the easiest parts of the project scope.
- **Dynamic Scope Option**: Fixed-budget contracts can allow adjustments to scope at specified project points. This flexibility lets customers adapt to current needs as the project develops while minimizing supplier risk.

- **Team Augmentation**: This involves integrating supplier team members directly within the customer's project team. Instead of paying for each deliverable, the customer pays the supplier based on the supplier team's current work capacity and how much they're able to assist on the customer's project.
- **Favor Full-Service Suppliers**: Agile favors customers partnering with a single, full-service supplier that can meet all customer needs. While using multiple suppliers can spread risk, a full-service supplier significantly streamlines project communications, expectations, and work completion.

Agile Business Impacts

For an organization to effectively adopt and support Agile, its business practices will have to change. Nearly all departments within an organization will be impacted when Agile is officially adopted, and it's a huge shift that almost everyone in the organization will need to prepare for.

Finance departments may need to adjust how they calculate profits and capitalize on projects, and procurement departments may revise contracts to align with Agile's incremental approach. Human resource departments and department specific managers will need to move from individual incentives toward team-based rewards, while management works on refining performance evaluations and metrics. Keep in mind, some departments or employees, such as employees in sales or executives, may need to remain on individual incentives for strategic business purposes.

Scaling Agile: Frameworks and Best Practices

Scaling Agile requires implementing frameworks and best practices that support projects across the organization, especially in different programs and portfolios. Starting small, then building up slowly, is crucial during early implementation stages for successful scaling, as well as ensuring Agile project teams feel confident and supported throughout the process.

There are traditional Agile methods like Scrum and Extreme Programming (XP) that work well with one small project team, but aren't as great for scaling across multiple project teams in different projects across an organization. Frameworks like Scaled Agile Framework (SAFe), Large Scale Scrum (LeSS), and Disciplined Agile all enable Agile scaling.

Agile PMOs (Project Management Offices)

An Agile Project Management Office (PMO) focuses on creating business value in an organization by monitoring programs, portfolios, and projects while also supporting, guiding, and assisting project teams. The PMO takes a constantly changing role, actively assisting in, advising, and assessing projects to assess potential business value.

Three Core Functions of an Agile PMO

1. **A Value-Driven Approach:** An Agile PMO takes a value driven approach, focusing on tailoring how it works with each project and team. Since project needs vary, some projects may enlist the PMO to provide tools and templates, while others might benefit from coaching or specific guidance that the PMO can provide. Essentially, in an Agile setting, the PMO focuses its efforts on where it can provide the most value.
2. **Invitation-Oriented Engagement:** Rather than requiring specific approaches, an Agile PMO encourages project teams to work with the PMO as necessary. By making engagement an invitation instead of a requirement, it promotes more engagement, creating a very effective and collaborative relationship.
3. **Providing Multidisciplinary Expertise:** An Agile PMO is often skilled in and can provide support for many project needs.

Agile PMOs may provide:

- **Standards and Templates**: Providing standardized Agile tools and templates like user story formats, test cases, and diagrams.
- **Training and Mentorship**: Organizing Agile training sessions, coaching, and mentorship to improve skills across teams.
- **Organizational Learning**: Collecting project data as well as retrospective reports to support learning across the entire organization.
- **Stakeholder Management**: Providing guidance on stakeholder communication and management throughout Agile projects.
- **Leadership Development**: Establishing guidelines for recruiting, coaching, upskilling, and guiding potential Agile leaders.

Agile Implementation and Organizational Factors Summary

This chapter wraps up our final studies on Agile. We covered many aspects of Agile, including developing an Agile mindset, leadership styles, team management, Agile metrics and measurements, organizational factors and many other aspects of Agile.

In the next chapter, we'll shift gears and begin preparing you for your exam taking experience, covering common formulas, tips, mistakes, mindset strategies, and the PMI code of ethics.

CHAPTER 24

Exam Formulas, Tips, Mindset, Common Mistakes and Ethics

This is the final exam prep chapter in our book, where we shift gears from learning theory to understanding essential exam information that will significantly improve your odds of passing the exam.

In this chapter, we'll cover exam formulas, test-taking strategies, mindset tips, common mistakes to avoid, and PMI's Code of Ethics.

Exam Formulas

There are many formulas that calculate project schedule, costs or budget, performance, and other project factors. While these formulas have been covered in previous chapters, now is the time to focus on memorizing them before you sit for your exam.

Figure 24.1: *Exam Formulas Table*

Exam Formulas Table	
Name/Term	**Formula**
Actual Cost (AC)	**No formula; total monetary amount spent to date**
Agile Team Capacity	**Team Capacity = (Total Hours Available - Non-Project Time)**
Budget at Completion (BAC)	**No formula; the total budget at project completion**
Communications Channel	**N(N-1)/2**
Cost Variance (CV)	**CV = EV - AC**
Cost Performance Index (CPI)	**CPI = EV / AC**
Cycle Time (Flow-Based Agile)	**Cycle Time = Work Completed Date - Work Start Date**
Estimate at Completion (EAC)	**EAC = BAC / CPI**
Estimate to Completion (ETC)	**ETC = EAC - AC**
Earned Value (EV)	**EV = Actual % Complete x BAC**
Expected Monetary Value (EMV)	**EMV = Probability × Impact**
Lead Time	**Lead Time = Delivery Date - Start Date**
Planned Value (PV)	**PV = Planned % Complete x BAC**
PERT - Beta	$\frac{\text{(Optimistic + 4* Realistic + Pessimistic)}}{6}$
PERT - Standard Deviation	**(Pessimistic - Optimistic)/6**
PERT - Triangular Distribution	$\frac{\text{(Optimistic + Realistic + Pessimistic)}}{3}$
Schedule Performance Index (SPI)	**SPI = EV / PV**
Schedule Variance (SV)	**SV = EV - PV**
To-Complete Performance Index (TCPI)	**TCPI = (BAC - EV) / (BAC - AC)**
Variance at Completion (VAC)	**VAC = BAC - EAC**

Environment and Support System

Before your exam, set up a quiet study place and inform your support system, such as your spouse, family, and friends. Undertaking the PMP exam is a long journey, and you should have all the help you can get.

- **Develop A Quiet Study Space:** Make sure that you have somewhere you can go to study quietly. Whether it's a quiet room in your house, a co-working space, or even your work or office, having a quiet study space is crucial to your studying.

- **Inform Your Support System:** Leading up to the exam, you should mention to your support system or those closest to you that you're studying for this exam and how important it is for your career. Let them know that you may be busy, away from your phone more often, and are working on getting this certification. It's especially important if you're taking the exam from home and need the house to be quiet on a certain day. You need all the support and understanding you can get.

Final Studying

While we introduced many study tips at the beginning of the book, we have some final tips for you as you wrap up your studying and exam preparation.

Final studying tips:

- **Diversify Your Study Materials:** This book is a great foundation to studying, and we also recommended that you watch our video course before taking your official exam.
- **Take Practice Exams:** Take at least 3 full length practice exams before you take the real exam. When you take these exams, try to simulate your actual testing environment and eliminate all distractions, as well as using a timer to ensure you don't go over on time.
- **Establish A Schedule and Don't Stop Studying:** Do not take long breaks in studying or stop studying for extended periods of time. Ideally, you should have a schedule established for how often you will study.

Week Before the Exam Tips

The week before your exam, you should focus primarily on a high-level review of all topics, addressing weak areas, taking practice exams, and memorizing formulas.

Tips for the week before your exam:

- **High Level Review:** Focus on the high level concepts, like performance domains and process groups. Use summary notes, flashcards or highlighted pages/terms to refresh your memory.
- **Identify and Address Weak Points:** In the final 3-5 days before your exam, focus on reviewing any topics you've struggled with during practice exams or study sessions. Build on and reinforce those weak points.
- **Take a Full-Length Practice Exam:** Sit through and complete a practice test, taking (2) 10 minute breaks exactly as the exam does. This will help to get you ready for testing conditions. Do not do this closer than a few days to the exam in order to avoid cognitive strain.
- **Review Formulas and Calculations:** Brush up on and commit to memory any formulas that you've learned from this book or other study resources.

- **Organize Study Materials:** Ensure your notes, guides, and any study materials are organized and accessible for quick review.
- **Study with a Buddy or Group:** If possible, try to review with another exam candidate or a study group to go over concepts you don't understand and to quiz each other. There are many PMP study groups available online.
- **Relaxation Techniques:** Start using breathing exercises or other ways of relaxing to unwind your mind and body leading up to the exam. The goal of the week leading up to the exam is to sharpen your weak areas, and keep your mind in a low state of stress before your big test day.
- **Know the Exam Format:** If you haven't already, now is the time to familiarize yourself with the exam format, structure, methods of reading and answering questions.
- **Plan for the Exam Day:** If you're going to a testing center, figure out your driving route and travel time. For online exams, test your technology setup (webcam, microphone, mouse, keyboard and internet connection) on multiple days and ensure it fits the online proctors technology requirements before your exam.

Day Before the Exam

The day before your exam, focus on relaxation, with minimal studying or work. Remember, you aren't going to be able to learn much with only a day left before the exam, so don't try to cram or exhaust yourself. Focus on getting the rest you need, preparing your mindset, and getting ready for the exam.

Tips for the day before the exam:

- **Clear Your Schedule and Rest:** The day before the exam you should spend a lot of the day resting, reviewing any last topics, and mentally preparing for the exam tomorrow. Do not do any in-depth studying, any practice questions or exams, or any other mentally taxing work the day before the exam.
- **Visualize Success:** Spend some time visualizing what it will feel like to pass the exam, how it will impact your future, and the success you're going to have on your big day.
- **Last Technology Test:** If you're at home, ensure your technology is ready to go, and do one last test to ensure everything is working before your big day.
- **Sleep Early and Use An Alarm:** Prepare to wind down and minimize screen time an hour before your normal bedtime the night before the exam. If you'd like, meditate, read a book, go on a walk, or do something relaxing before you go to sleep. Make sure to set an alarm or two to wake-up on time if your exam is in the morning.

Day of The Exam

The day of the exam you should wake up at a set time, and begin your day on the right track. Try to minimize phone and screen time, and focus on self care, comfort, and getting to your exam early.

Tips for the day of the exam:

- **Light Meal and Hydrate:** Once you wake up on the day of the exam, you should eat a light meal and hydrate. Remember, you're going to be sitting with minimal breaks.
- **Temperature and Dressing Comfortably:** Wear comfortable clothing for your environment. If you're at home, you can also control the temperature and set it to what you feel most comfortable at. Testing centers, from my experience, can significantly vary in temperature, so I recommend that you call ahead of time to ask the temperature of the room or wear layers so you can be as comfortable as possible.
- **Have Snacks and Water on Standby:** Whether you're taking the test in person or at home, try to have snacks and water available for when you take a break.
- **Do Not Cram Last Minute:** Trust your preparation. Last-minute cramming can increase stress and confusion.
- **Be An Hour or more Early (both for in-person and at home exams):** Delays and issues may arise on your test day. To best prepare yourself, plan to be an hour early to your exam appointment, whether you have an in-person testing center exam, or are taking the exam at home.

During The Exam

The time has arrived for you to take your exam! As you sit down for your exam, focus on remaining calm, using test taking best practices both while answering questions and during review, and using your breaks.

Tips for taking the exam:

- **Read All Directions and Test the Exam Interface:** Take a few minutes before the beginning of the exam to read all directions you receive from the proctor and on the pre-test questionnaire. Familiarize yourself with the different aspects of the interface, such as flagging questions for later review, marking wrong answers, and the other tools available to help with test taking.
- **Read Carefully and Flag Difficult Questions:** Ensure you've read and fully understand each question before answering. If you encounter a question you're unsure about, flag it and move on to maintain your pace. You can revisit flagged questions during your final review.

- **Eliminate Obvious Wrong Answers:** Narrow down choices by eliminating answers that are obviously wrong to increase your chances of selecting the correct answer.
- **Don't Overthink Answers:** Your first instinct is often correct. Avoid second-guessing unless you have a strong reason to change an answer.
- **Stay Calm and Stay Focused:** It's normal to feel a bit nervous during the exam, but remember to stay composed. Take a few deep breaths periodically to center yourself.
- **Manage Time:** You have 230 minutes to complete 180 questions, which averages to about 1 minute and 15 seconds per question. Keep an eye on the clock, but don't let it create unnecessary pressure.
- **Use Scheduled Breaks:** Use the 2 scheduled breaks during the exam strategically. When you take your break, drink some water, enjoy a snack and close your eyes for a bit if you feel comfortable. This will significantly help you stay focused and keep your energy levels stable.
- **Stay Calm with Difficult Questions:** Encountering tough questions is normal. Flag them, move on, and return to them later with a clear mind.
- **Take Mini Breaks:** Even outside the scheduled breaks, remember that you can sit and clear your mind while taking your exam. Even spending 15 or 20 seconds focusing on your breathing can significantly help if you feel overwhelmed.
- **Use Your Review:** Before each break and before the end of the exam, you can review flagged questions and confirm your answers. This is a great time to use the best practices we've talked about when answering.

Common Exam Mistakes To Avoid

When I took my PMP exam a few years ago, I made a few mistakes that are common among test takers, and completely avoidable. The exam is not easy, and you need to have both the knowledge and ability to avoid making common mistakes to pass.

Here are some common exam mistakes and how to avoid them:

- **Not reading the questions carefully**

  Many test takers rush through questions and miss key details or misinterpret what's being asked, resulting in them selecting the wrong answer. You should always read the question entirely before answering. Additionally, if you don't understand the question the first time, you should read it again, or flag the question to come back to it later.

- **Overthinking questions**

  Questions on the exam are usually situational, and candidates may overcomplicate their thinking. Stick to PMI's best practices and avoid making assumptions beyond what's presented.

- **Not managing time properly**

  With 180 questions and a time limit of 230 minutes, it's crucial to pace yourself. Spending too long on difficult questions can leave you short on time for others.

- **Not flagging or reviewing difficult questions**

  If you're unsure of an answer, I recommend flagging the question and moving on to the next question. You can come back to flagged questions later with a clearer mind.

- **Changing answers**

  The first answer you select is usually right and many test takers doubt themselves and change their answers too often. Avoid second-guessing yourself unless you're certain about your newfound reasoning, or have a different understanding of the question after re-reading it.

- **Not using the exam breaks**

  The exam allows for 2 scheduled breaks. Make sure to take those breaks, you've earned them. Skipping the breaks can lead to mental fatigue and has no real benefit. Use breaks to reset your focus, take a breather, and return refreshed and with renewed clarity.

- **Neglecting formulas and calculations**

  Some candidates struggle with earned value management (EVM) or other formulas that we cover in this book. Practice these formulas in advance to ensure you're confident with the math and formula related questions that will come up on the exam.

- **Not knowing the difference between predictive, Agile, and hybrid approaches**

  While you may wonder how people take the PMP exam without knowing the difference between predictive, agile, and hybrid, these concepts are new to the exam in recent years, and some older exam resources are very outdated. Make sure you understand each approach and how to answer questions in scenarios on each of the three.

- **Panicking when you see unfamiliar scenarios, terms, and words**

  The exam is designed to test your ability to apply concepts you know in realistic situations. If you see unfamiliar terms, wording, or scenarios oftentimes you can use logical reasoning to understand what is being asked. Even if you don't know, don't spend too much time on questions you're unsure of up front. Select your best answer, or flag the question for later review to save time.

Mindset

Success during your exam isn't about just being able to recall facts. It also requires you to adopt a proper test taking mindset that enables you to properly evaluate each question and choose the best answer based on PMI's principles.

Understand these principles to develop the correct mindset:

1. **Prioritize Stakeholder Engagement and Customer Satisfaction:**
   - ➢ Consider the needs and expectations of stakeholders, including project team members, customers, and management.
   - ➢ If a stakeholder or customer rejects a deliverable, revisit the acceptance criteria or requirements. Always focus on delivering value to the customer.
2. **Emphasize Preventive and Corrective Actions:**
   - ➢ Corrective action in the form of removing project team members or making difficult decisions like canceling a project should always be a last resort. Focus on the most effective and least aggressive methods first, such as project team training, coaching, and collaborative problem solving.
3. **Champion Collaboration and Win-Win Outcomes:**
   - ➢ Resolve conflicts through collaboration and open communication rather than confrontation. Focus on outcomes that benefit all parties involved.
   - ➢ Avoid escalating issues unless absolutely necessary and only after proposing corrective measures. If necessary, escalate to the right parties in the correct order. For example, an issue with a project team member may be brought up to their functional manager first, not a C-suite executive.
4. **Protect Project Constraints and Change:**
   - ➢ Avoid decisions that will negatively impact the project's budget, scope, or schedule unless approved through the formal change control process. Always assess or re-assess risks before implementing approved changes.
5. **Leadership:**
   - ➢ Put your project team's needs first, enabling them to perform at their best. This is best done through implementing a leadership style like servant leadership.
   - ➢ Be supportive, empowering, and focused on creating a positive project environment.
6. **Follow Compliance and Regulatory Requirements:**
   - ➢ Compliance issues should always have a high priority. If regulations are involved, act on them as soon as possible to ensure adherence.
7. **Think Strategically and Use a Proactive Problem-Solving Approach:**
   - ➢ Anticipate potential challenges and address them before they escalate into larger issues through a risk identification and management process.
   - ➢ Train or mentor project team members who lack specific skills rather than immediately seeking replacements or outside labor.
   - ➢ Analyze situations holistically. Always ask, "What is the best course of action for the project as a whole?" before making a decision.

8. **Miscellaneous Mindset Tips:**
   - ➢ Try to avoid schedule delays, budget overruns or extra costs.
   - ➢ Value is important. Always choose the most valuable option given a scenario.
   - ➢ When encountering uncertainty that can't be addressed by the project team, consider consulting a Subject Matter Expert (SME) who may be able to help with the situation. Lessons learned from previous projects can also be helpful in this scenario.
   - ➢ Project team members should help the project manager make decisions. As the project manager, avoid making all decisions on your own.
   - ➢ In predictive projects, continuously revisit your initial plan and follow the proper change control process. Any change in a traditional environment will go through a Change Control Board and official change control process. Common terms in traditional are change control, change control board (CCB), and work breakdown structure (WBS).
   - ➢ In Agile projects, focus on customer feedback, creating self organizing project teams, understanding project owners' role in changes and the product backlog. When going from traditional to Agile in an organization, introduce Agile concepts slowly and get buy-in at the organizational level. Change in an Agile environment doesn't go through a change control process, instead, changes are discussed and prioritized in the product backlog. Common terms in Agile are product backlog, epic, user story, lean, Kanban, sprint, iteration, product owner, and minimum viable product (MVP).
   - ➢ Projects will always go through a closing phase, even if they're cancelled or completed quickly.
   - ➢ Prevent team burnout. Focus on assigning the team a main task or set of tasks, and don't continue to pile on work.
   - ➢ Don't select any answer that has no relevance to the question.
   - ➢ When there are budget issues, especially when reserves may need to be used, consult the project sponsor after analyzing the situation.

Code of Ethics

PMI's Code of Ethics helps guide ethical behavior for project managers and you will see questions on the exam focused on it. You do not need to study these in-depth, just understand that as a project manager, you are expected to act in a moral, ethical, and professional way at all times.

The 5 Code of Ethics:

1. Vision and Purpose

The *Vision and Purpose* of PMI's Code of Ethics and Professional Conduct is to ensure that project managers uphold high standards of ethical and honorable action, including respect and

responsibility in their work and adherence to laws or regulations of their country. This helps individuals navigate difficult ethical decisions and helps enhance the credibility of the profession.

2. Responsibility

Responsibility entails taking ownership of your actions and the consequences that result. This second code states that we have the responsibility to act in the best interests of not only our organizations, our project teams, and ourselves but also society, public safety, and the environment. It also means accepting work and tasks we are qualified for and fulfilling commitments reliably. Responsibility requires us to admit mistakes, correct them, and take accountability for our actions. Lastly, we are obligated to report any unethical, illegal behaviors or conflicts of interest that we encounter with the appropriate authorities.

3. Respect

Respect is the obligation to consider the wellbeing of the people, resources, and environment entrusted to us. This includes being mindful of cultural or societal norms, listening to and considering different perspectives, and resolving conflicts professionally. This third Code of Ethics places a high value on maintaining a level of respect for everyone, and encourages us to avoid gossip or undermining others. Project managers are expected to negotiate fairly, avoid abusing power, and respect the rights of others, which results in a respectful work environment with cooperation and trust.

4. Fairness

Fairness refers to making decisions free from bias, favoritism, prejudice, or personal gain. It also involves being transparent in decision-making, ensuring we are being objective and fair to everyone, and not discriminating based on race, gender, religion, or other factors. An honest and fair approach builds significant trust between the project manager, the project team, and stakeholders. Fairness also applies to project managers disclosing any of their own personal conflicts of interest, and avoiding accepting gifts, bribes, or donations.

5. Honesty

Honesty is demonstrating truthfulness in our actions and communications. As project managers, we are expected to speak the truth, provide accurate and complete information, and maintain openness and transparency in all actions. This includes sharing both good and bad news openly, while avoiding deceptive behaviors, such as making misleading statements or withholding information, as these can erode trust. Honesty builds credibility and creates a safe environment where others feel encouraged to speak the truth.

Exam Tips, Formulas, Mindset, Common Mistakes and Ethics Summary

This chapter provided the final formulas, tips, mindset, common mistakes and PMI ethics to officially conclude the study prep portion of this book. By now, you should feel comfortable scheduling your exam and taking your exam, while using any other additional resources outside of this book as necessary to finish your studies.

You've worked very hard to prepare for your exam, and by following these strategies, maintaining a strong mindset, and staying confident, you'll succeed on your exam day! I'm wishing you the best of luck in passing your certification exam and in your career journey!

In the next and final chapter, we will officially conclude this book and provide you with a full-length practice test.

Chapter 25
Conclusion and Practice Exam

Congratulations! You've reached the conclusion of the study portion of this book. By now, you should have a very strong understanding of the concepts and theory needed to pass the PMP exam. You should also be well equipped to continue and finish your studying, apply for, and pass your exam.

To continue building on what you've learned, take advantage of our online PMP resources at teachmeit.co and our full-length practice exam in this chapter.

You've done great so far, and being PMP certified is well within your reach. Trust in your preparation, stay positive, and continue to give it your all before and during your exam. Best of luck on your PMP journey!

Practice Exam Tips

Before taking this (or any other) practice exam, ensure you've fully read this book and watched the included online course provided. Practice tests are perfect to identify your weak areas, and prepare yourself to focus for extremely long periods of time in a testing environment.

Follow these guidelines to simulate the actual exam experience:

- **Prepare Your Environment**
  - Leave your phone and any other potential distractions in another room.
  - Ensure your home or test taking area is quiet.
  - Set aside about 3–4 hours to complete the practice exam in one sitting.
- **Simulate Real Exam Conditions**
  - Time yourself while taking the exam. Periodically check the time to ensure you're staying on point in focus. Remember, the real exam gives you 230 minutes (3 hours and 50 minutes) to complete the entire 180 questions on the exam, giving you about one minute and fifteen seconds per question.
  - Time and take your two 10-minute breaks. One break should be taken immediately after the first 60 questions and the other break after completing 120 questions.

➢ **Review and Reflect**

- Refresh your memory by reviewing the "Exam Tips" and "Mindset" sections in the previous chapter before starting.
- For any questions you answer incorrectly, read the explanations thoroughly and ensure you understand why you got them wrong.

Practice Exam Questions

1. **A project team is working on a construction project for developing a corporate office. Midway through execution, the client requests a major scope change, while requesting that the planned budget and timeline remain fixed. The project team is already struggling to meet current deadlines.**

   What should the project manager do first?

   A. Implement the change request immediately and then inform the client of the impact on budget and timeline later.

   B. Reject the change request due to budget and schedule constraints.

   C. Follow the change control process, assessing the impact on cost, time, and scope before proceeding.

   D. Escalate the issue to the project sponsor and request additional funding.

2. **An infrastructure project for building a power plant is experiencing extended delays due to unexpected weather conditions. The project team did not account for extended weather disruptions in the original risk assessment. The client is demanding that the team find a way to keep the project on schedule.**

   Which risk response strategy would be most appropriate in this situation?

   A. Transfer the risk by subcontracting the weather-dependent work to a third party.

   B. Communicate realistic expectations with the client, and accept the risk and adjust the project timeline accordingly.

   C. Mitigate the risk by increasing workforce capacity to compensate for delays.

   D. Avoid the risk by rescheduling all weather-dependent tasks to more predictable periods.

3. **A project manager is leading a marketing project that involves various stakeholders from different internal departments. Initially, all stakeholders were actively engaged, but recently, an important stakeholder has become disengaged and critical of the project's direction.**

   What is the best course of action?

   A. Remove the stakeholder from project communications to prevent further disruptions.

B. Schedule a one-on-one meeting with the stakeholder to understand and address their concerns.

C. Escalate the issue to the project sponsor and request intervention.

D. Proceed with the project as planned and ignore the stakeholder's objections.

4. **A global enterprise is actively rolling out an ERP software system across multiple countries. The project manager observes that team members from different time zones are struggling to keep up with timely communication. These delays have led to increased times for decision-making and misalignment in project execution.**

   What should the project manager do to improve collaboration?

   A. Implement asynchronous communication methods and schedule meetings at overlapping work hours.

   B. Require all team members to attend daily stand-up meetings at a standardized global time.

   C. Assign a single region to handle all communications to ensure consistency.

   D. Extend the project schedule to accommodate time zone differences.

5. **A project manager takes over a project and finds that different stakeholders have completely different expectations on important deliverables. The previous project manager left no formal documentation or notes outlining any agreed-upon expectations.**

   What should the project manager do first?

   A. Continue executing the project as per the existing plan, avoiding unnecessary disruptions.

   B. Meet with stakeholders individually to document their concerns and realign expectations.

   C. Escalate the issue to the project sponsor and request clarification.

   D. Modify the project scope to accommodate all stakeholder expectations.

6. **A project team using Agile is struggling to complete user stories within the sprint. The product owner frequently changes priorities during the middle of a sprint, leading to frustration among the development team.**

   What should the project manager do to resolve this issue?

   A. Enforce a strict change control process to prevent mid-sprint changes.

   B. Work with the product owner to refine backlog prioritization and ensure sprint commitments are realistic.

   C. Extend the sprint length to accommodate changing priorities.

   D. Ask the team to work overtime to complete all user stories.

7. **During a routine risk review, the project team identifies a new risk that, if realized, could result in significant budget overruns. The project sponsor has not been informed of this new risk yet.**

What is the best course of action?

A. Document the risk in the risk register and develop an appropriate response strategy.

B. Ignore the risk since the budget has already been approved.

C. Escalate the risk to senior management immediately.

D. Reduce the project scope to accommodate potential budget overruns that may arise from the risk.

8. **A project manager receives complaints from several team members that an important project team member is underperforming and missing deadlines. The delays are beginning to impact project milestones.**

   What is the most effective way for the project manager to handle this issue?

   A. Reassign the underperforming team member to a different role with fewer responsibilities.

   B. Remove the team member from the project and reallocate tasks to other team members.

   C. Issue a formal warning and escalate the matter to HR immediately.

   D. Privately discuss performance concerns with the important project team member and identify ways to improve.

9. **A government project requires strict regulatory compliance. The project sponsor pressures the project manager to fast track the schedule to meet an upcoming election deadline. The project team is concerned that fast tracking the schedule could result in compliance violations.**

   What should the project manager do?

   A. Implement fast-tracking while ensuring compliance is maintained.

   B. Proceed with fast tracking, while assuming regulatory compliance can be addressed later.

   C. Escalate the request to senior leadership for guidance.

   D. Push back on the request to avoid compliance risks.

10. **A project team has completed all user testing for a new web application. However, the client has unexpectedly requested an additional round of testing, which could significantly extend the project timeline.**

    How should the project manager handle this request?

    A. Approve the additional testing immediately without further consideration in order to satisfy the client.

    B. Conduct an impact analysis on cost, schedule, and scope before making a decision.

    C. Decline the request since testing was already completed.

    D. Escalate the issue to the project sponsor for resolution.

11. A project team has entered the execution phase, and the project manager notices that two critical tasks have dependencies that were overlooked during planning. These dependencies could significantly impact the project schedule.

What should the project manager do first?

A. Reassign project team members to complete both tasks simultaneously.

B. Analyze the impact on the project schedule and adjust accordingly.

C. Escalate the issue to the project sponsor for guidance.

D. Ignore the dependencies and focus on other scheduled tasks.

12. A project team is working under tight deadlines and many project team members are beginning to show signs of burnout. The project manager is considering different ways to boost team morale, while reducing burnout.

Which action would be the most effective?

A. Offer monetary incentives to motivate the team to work harder.

B. Reduce project scope to accommodate the team's capacity.

C. Remind the team of the project goals and encourage them to stay focused.

D. Reallocate or add additional resources to balance the workload more effectively.

13. A major stakeholder submits conflicting feedback on a deliverable. Other stakeholders have already approved the deliverable, but this stakeholder now wants significant revisions due to quality issues.

What is the best course of action for the project manager?

A. Proceed with the original project plan and ignore the conflicting feedback.

B. Arrange a meeting with the stakeholder to clarify their concerns and if the current deliverable quality warrants revisions.

C. Document the conflicting feedback but do nothing.

D. Modify the project deliverables to accommodate all feedback.

14. A vendor has failed to meet the agreed-upon service level agreement (SLA), causing a significant delay in project execution.

What should the project manager do first?

A. Terminate the contract and find a new vendor.

B. Escalate the issue to procurement for resolution.

C. Review the contract terms and discuss the issue with the vendor.

D. Accept the delay and adjust the project schedule accordingly.

15. A project sponsor has requested an update on how the project is going according to schedule. The project manager realizes that the schedule performance index (SPI) is .9, showing the project is behind schedule.

What is the best response?

A. Communicate the SPI value and propose corrective actions to bring the project back on track.

B. Ignore the SPI value and focus on completing remaining tasks.

C. Escalate the issue to senior management for guidance.

D. Request additional resources to improve the SPI immediately.

16. A project manager is overseeing an Agile project where the product owner frequently changes sprint priorities. The development team is struggling to meet their commitments due to shifting requirements.

What should the project manager do?

A. Enforce a strict change control process to prevent mid-sprint changes.

B. Work with the product owner to refine backlog prioritization and ensure realistic sprint goals.

C. Extend the sprint length to accommodate frequent priority changes.

D. Ask the team to work overtime to complete all tasks.

17. An important project team member has resigned in the middle of a critical phase.

What should the project manager do first?

A. Immediately hire a replacement and continue as planned.

B. Evaluate the impact of the resignation on the project schedule, resources and team workload.

C. Ask the remaining team members to absorb the extra workload by working overtime.

D. Escalate the issue to senior management for assistance in resolution.

18. A project sponsor has requested additional features to be included in the final deliverable in a project using a predictive approach. However, implementing these features will require additional resources and budget.

How should the project manager handle this situation?

A. Implement the changes immediately.

B. Conduct an impact analysis and then execute the change control process.

C. Reject the request in order to avoid scope creep.

D. Escalate the request to senior leadership for approval.

19. A project manager is leading a hybrid project for implementing a new technology that combines Agile for the software side and predictive for the hardware side. The Agile team is facing delays due to dependencies that the predictive team is responsible for completing.

What is the best course of action?

A. Delay the predictive work until all Agile sprints are entirely completed.

B. Convert the entire project to Agile.

C. Assign all dependency-related tasks directly to the Agile team.

D. Improve coordination between both teams and help the predictive team get on schedule.

20. A project is experiencing significant delays due to slow decision-making by the steering committee.

What should the project manager do to quickly resolve this issue?

A. Propose a streamlined process for decision making to the entire committee.

B. Accept the delays as part of the governance process and adjust the project schedule accordingly.

C. Have 1 on 1 meetings with each member of the steering committee to understand where the delays in decision making are coming from.

D. Reduce stakeholder involvement in decision making.

21. A project manager is working on a large infrastructure project when a government agency issues new regulations that significantly impact the project's compliance requirements.

What should the project manager do first?

A. Implement the new compliance requirements immediately without further consideration.

B. Assess the impact of the regulations on scope, cost, and schedule. Discuss how this may impact the project with stakeholders and the project team, then update the project plan accordingly.

C. Escalate the issue to senior management and request additional resources.

D. Request an immediate regulatory exemption in order to avoid project delays.

22. A project team is working on the rollout of a new software for internal use at a global airline company. Some regional teams are struggling with adoption of this new software due to cultural and operational differences.

What should the project manager do?

A. Standardize implementation processes across all regions, making it clear that it will be the same company wide no matter the region.

B. Assign regional leads to specifically tailor the rollout in each region based on cultural and operational requirements.

C. Delay the rollout until all teams can fully adopt the system.

D. Ignore regional concerns and push forward with the original plan.

23. A project is running behind schedule due to multiple unforeseen issues. The project manager and project team decide to crash the schedule.

What does this mean?

A. Adding more resources to the project in order to speed up task completion.

B. Reducing the project scope, resulting in less work to be completed in order to meet deadlines.

C. Ignoring delays and focusing only on future tasks.

D. Increasing project budget to hire consultants to provide ideas on how to increase project speed.

24. A new team member joins an Agile project mid-sprint and is unfamiliar with the team's workflow.

What is the best course of action to bring them up to speed?

A. Assign them a mentor to guide them through the workflow and sprint process.

B. Have them read the project documentation and learn independently.

C. Assign them a low-priority task to keep them busy.

D. Exclude them from the current sprint and have them join the next one.

25. A project sponsor is unhappy with the velocity of an Agile team. The project sponsor puts a lot of pressure on the project manager to increase the project team's productivity and deliver more user stories per sprint.

How should the project manager respond?

A. Increase the sprint length to accommodate more work.

B. Educate the sponsor on Agile principles and ensure expectations align with team capacity.

C. Push the team to work overtime to meet the sponsor's expectations.

D. Reduce testing efforts to speed up delivery.

26. A project to create a new product is on schedule and about 70% complete when a critical defect is discovered in a prototype deliverable.

What is the best course of action to quickly resolve the issue?

A. Continue with the project and address the defect post-delivery.

B. Bring in experts familiar with products similar to the prototype and have them fix the issue.

C. Perform a root cause analysis to identify the issue and then determine a corrective action plan.

D. Ignore the defect and focus on completing other remaining tasks.

27. A product owner is struggling to balance stakeholder demands and frequently changes priorities.

How should the project manager help assist the product owner?

A. Enforce strict priority-setting rules and limit mid-sprint changes.

B. Allow stakeholders to directly communicate their needs to the development team.

C. Increase sprint duration to accommodate shifting priorities.

D. Reduce stakeholder involvement in backlog refinement.

28. An important deliverable is delayed due to a vendor failing to meet their contract obligations.

What should the project manager do first?

A. Find an alternative vendor immediately.

B. Accept the delay and update the project timeline.

C. Escalate the issue to legal and request termination of the contract.

D. Review the contract terms and discuss corrective actions with the vendor.

29. A project has a budget at completion (BAC) of $500,000. At this point in the project, the earned value (EV) is $200,000, and the actual cost (AC) incurred so far is $250,000.

What is the Cost Performance Index (CPI), and what does it indicate about the project's current financial performance?

A. 0.80, the project is over budget

B. 1.25, the project is under budget

C. 1.00, the project is on budget

D. 0.50, the project is significantly over budget

30. A major stakeholder has been unresponsive, delaying project approvals.

What should the project manager do?

A. Proceed without the stakeholder's input.

B. Escalate the issue to the project sponsor.

C. Schedule a meeting with the stakeholder to discuss expectations.

D. Remove the stakeholder from the approval process.

31. In a software development project, the team members responsible for development report that a critical requirement is not feasible given current technology constraints.

What should the project manager do?

A. Remove the requirement from the project scope.

B. Work with stakeholders to explore alternative solutions.

C. Have the developers search for a workaround despite the reported constraints.

D. Delay the project until new technology is available.

32. A project manager is developing the project schedule using the Critical Path Method (CPM). The following tasks and their durations are listed:

- ➢ Task A: 4 days
- ➢ Task B: 3 days (depends on A)
- ➢ Task C: 5 days (depends on A)
- ➢ Task D: 6 days (depends on B and C)

What is the total duration of the project based on the critical path?

A. 12 days

B. 9 days

C. 14 days

D. 11 days

33. A project is experiencing significant scope creep due to unclear requirements.

How can the project manager prevent this in the future?

A. Implement stricter change control processes.

B. Engage stakeholders earlier to refine requirements.

C. Increase project budget to accommodate scope changes.

D. Shorten project timelines to minimize changes.

34. A project manager notices that a team member is frequently missing deadlines due to excessive multitasking.

What should the project manager do?

A. Assign additional team members to help with workload.

B. Work with the team member to prioritize their tasks effective.

C. Remove the team member from the project.

D. Increase the project schedule to accommodate delays.

35. A project team identifies a risk that could lead to major cost overruns that could result in nearly double the projected costs if not addressed. The project team calculates there is around a 80% chance of this risk occurring.

What is the best action to take first?

A. Accept the risk and allocate contingency funds.

B. Transfer the risk by outsourcing to a third party.

C. Ignore the risk since cost overruns are common.

D. Escalate the risk to the project sponsor, appropriate stakeholders, or senior management.

36. An Agile team is struggling with long daily stand-up meetings, significantly reducing productivity and team morale.

What should the project manager do?

A. Allow meetings to continue until all concerns are addressed.

B. Replace daily stand-ups with weekly meetings.

C. Shorten the stand-up meetings to a maximum of 15 minutes.

D. Reduce team size to make meetings more efficient.

37. A stakeholder wants to add a feature to a software currently in development in an Agile project. The requested feature, if implemented successfully, would significantly increase the potential for an increased sales price and overall profit. However, it will require a small investment of time and resources.

What should the project manager do?

A. Submit a change request to the change control board for approval.

B. Discuss the request with the product owner and evaluate its priority in the product backlog.

C. Reject the request to prevent scope creep and ensure the sprint remains on track.

D. Implement the change immediately since it has financial benefits.

38. A project team is experiencing conflicts due to differing work styles and communication issues.

What should the project manager do first?

A. Understand where communication issues are stemming from, and implement strategies for different work styles.

B. Reassign team members to different roles.

C. Ignore the conflicts and focus on project tasks.

D. Escalate the issue to HR for resolution.

39. A project manager has noticed that the project team has set up and is utilizing an unapproved messaging service to discuss project matters. A stakeholder has learned about the messaging service and expressed their concerns about discussing project information outside of internal communication platforms.

What should the project manager do?

A. Immediately inform the project team to discontinue use of this unapproved messaging service and hold a meeting to review the communications plan for the project.

B. Check the messages that were sent on the messaging service and ask the project team to show you all correspondence.

C. Research the messaging service and see if it is secure.

D. Re-assure the stakeholder that the project team is acting in a professional manner and there is no concern.

40. A project sponsor requests a last-minute change to a deliverable that has already been finalized. The project is operating with a predictive approach.

What is the best response?

A. Implement the change to keep the sponsor happy.

B. Delay the project to accommodate the change.

C. Reject the change outright.

D. Follow the change control process and assess feasibility.

41. A project team is using a Kanban board to track work. The board is frequently overloaded, leading to bottlenecks and slow progress.

What should the project manager do?

A. Remove low-priority tasks from the board and only display high priority tasks.

B. Limit work-in-progress (WIP) items to improve flow and decrease bottlenecks.

C. Increase the number of team members to handle more tasks to clear the board faster.

D. Extend work hours to complete more tasks of both low and high priority per day.

42. A software development team is transitioning from a predictive approach to an Agile one. Some team members resist the change, unfamiliar with the changes that Agile brings.

What should the project manager do?

A. Require the team to follow Agile processes without exception.

B. Provide Agile training and address team concerns.

C. Allow the team to continue using a predictive approach.

D. Split the team into Agile and predictive sub-teams to accommodate those who don't want to use Agile.

43. A new regulatory requirement significantly affects a project's timeline and scope. The project manager is concerned about meeting the new compliance deadline.

What should be done first?

A. Ignore any regulatory requirements.

B. Perform an impact analysis and update the project plan.

C. Ignore the regulation until the project is further along.

D. Increase the project budget to accommodate compliance efforts.

44. A major stakeholder submits a late-stage change request in a project using a predictive approach. If implemented, this change will significantly impact the project timeline.

How should the project manager respond?

A. Reject the request outright to maintain the schedule.

B. Evaluate the impact and follow the change control process.

C. Implement the change immediately to satisfy the stakeholder.

D. Escalate the request to the project sponsor.

45. A project team is working on a critical task when an expected risk becomes realized, completely halting project progress.

What is the best response?

A. Execute the predefined risk response plan.

B. Meet with the project team to understand their opinions on the risk.

C. Continue with the task and address the risk later.

D. Adjust the project schedule to accommodate the delay.

46. A client expresses dissatisfaction with a finished product, even though it meets all documented and agreed upon requirements.

What should the project manager do?

A. Ignore the feedback since the product meets requirements.

B. Escalate the issue to the project sponsor.

C. Modify the product to address the client's concerns without approval.

D. Engage with the client to understand their concerns.

47. A project manager is working on a hybrid project with both predictive and agile components. Some stakeholders are unfamiliar with agile practices.

How should the project manager address this?

A. Conduct agile training sessions for stakeholders.

B. Convert the entire project to a predictive approach.

C. Reduce stakeholder involvement in agile components.

D. Assign an agile coach to manage the agile components separately.

48. A vendor has repeatedly missed key deliverables, affecting project progress.

What should the project manager do first?

A. Review the contract terms and discuss corrective actions with the vendor.

B. Terminate the vendor contract and find a replacement.

C. Escalate the issue to legal for resolution.

D. Accept the delays and adjust the project timeline.

49. A project is running under budget, but the schedule is behind.

What should the project manager do?

A. Use available budget to add resources and accelerate progress.

B. Reduce project scope to meet deadlines.

C. Ignore the delay since the project is financially stable.

D. Extend project deadlines to maintain quality.

50. An agile team frequently struggles to complete sprint goals due to unclear backlog items.

How can the project manager address this?

A. Ensure backlog refinement sessions occur regularly.

B. Extend sprint durations to allow more time for completion.

C. Assign fewer backlog items per sprint.

D. Allow developers to work without a structured backlog.

51. A company merges two project teams, one using Agile and the other using Waterfall. The teams struggle to align their work processes and collaboration efforts.

What should the project manager do?

A. Establish clear communication channels and define integration points.

B. Require both teams to adopt the same methodology.

C. Split the teams and have them work independently.

D. Assign a dedicated liaison to coordinate between the teams.

52. A project manager receives a risk escalation regarding a critical supplier who may go out of business.

What should the project manager do?

A. Identify alternative suppliers and update the risk response plan.

B. Increase inventory to reduce dependency on the supplier.

C. Ignore the risk unless the supplier officially closes.

D. Request additional budget to secure resources from the existing supplier.

53. A project's earned value metrics show that the cost performance index (CPI) is 1.2, and the schedule performance index (SPI) is 0.8.

What does this indicate?

A. The project is over budget but ahead of schedule.

B. The project is under budget but ahead of schedule.

C. The project is on track with cost and schedule.

D. The project is under budget but behind schedule.

54. A project team member proposes a major process improvement that could save costs but requires a temporary schedule delay.

How should the project manager respond?

A. Evaluate the cost-benefit trade-off and discuss it with stakeholders.

B. Reject the idea to keep the project on schedule.

C. Implement the change immediately to reduce costs.

D. Ask the team member to test the improvement outside of project work.

55. A team is struggling to meet sprint deadlines due to excessive time spent on unplanned tasks.

How can the project manager address this issue?

A. Enforce stricter adherence to sprint planning.

B. Increase sprint duration to allow more flexibility.

C. Assign fewer tasks per sprint.

D. Remove timeboxing to accommodate unplanned work.

56. A project manager is reviewing earned value management (EVM) metrics and sees an SPI of 1.05 and a CPI of 0.95.

What does this indicate?

A. The project is slightly behind schedule but on budget.

B. The project is slightly ahead of schedule but over budget.

C. The project is on track in both schedule and budget.

D. The project is significantly over budget and behind schedule.

57. A project team member identifies a significant defect late in product development.

How should the project manager handle this?

A. Conduct a root cause analysis and work with the project team to develop and execute a resolution plan.

B. Deliver the product as-is and address the defect post-release.

C. Extend the schedule to allow time for a fix.

D. Ignore the defect since it was identified late in the process.

58. A stakeholder frequently requests work directly from project team members, instead of working directly with the project manager.

How should the project manager respond?

A. Meet with the stakeholder to enforce proper communication expectations and processes.

B. Allow the stakeholder to continue engaging the team directly.

C. Escalate the issue to the stakeholders manager.

D. Remove the stakeholder from project communications entirely.

59. A project has high stakeholder engagement, with every stakeholder having widely different expectations. Some stakeholders are mentioning that there needs to be change on the project.

How can the project manager better align expectations and handle this situation?

A. Proceed with the original project plan regardless of stakeholder concerns.

B. Reduce the number of stakeholders involved in decision-making.

C. Hold regular stakeholder meetings to address expectations, concerns, and project progress. Proceed with the original project plan unless there are reasonable changes discussed and requested.

D. Modify the scope to accommodate all expectations.

60. A project manager notices that project risks are not being effectively managed according to established project risk management strategies.

What is the best way to improve risk management?

A. Add contingency reserves to cover all risks.

B. Assign a dedicated risk manager to the project.

C. Ignore minor risks and focus only on critical ones.

D. Increase the frequency of risk review meetings and remind the project team of established project risk management strategies.

61. A project team utilizing a predictive approach is facing constant delays because of frequent changes in requirements.

What should the project manager do to mitigate this?

A. Implement a strict change control process.

B. Allow changes without restriction to maintain stakeholder satisfaction.

C. Extend project deadlines to accommodate the changes.

D. Escalate the issue to senior management for resolution.

62. A project sponsor has requested an urgent cost reduction on a project being undertaken in a startup environment that is already in execution.

What is the best approach?

A. Perform a cost-benefit analysis and improve areas where savings can be achieved without impacting quality.

B. Cut project team size immediately to reduce labor costs.

C. Reduce the project scope without consulting stakeholders.

D. Delay the project to negotiate lower vendor costs.

63. A project team implementing a hybrid approach to a unique project is struggling with task dependencies between Agile and predictive portions of the project.

What should the project manager do?

A. Delay the predictive workstream until the Agile workstream is completed.

B. Assign different teams to handle Agile and predictive tasks separately.

C. Remove dependencies to simplify project execution.

D. Develop an integrated project schedule that accounts for dependencies.

64. During a sprint review, an important stakeholder rejects a feature because it does not meet their expectations, even though it was approved earlier.

What is the best course of action to take first?

A. Discuss the stakeholder's concerns and evaluate possible solutions.

B. Proceed as planned since the feature was already approved.

C. Discuss with the project team the best course of action since the stakeholder has changed their mind.

D. Remove the feature from the product backlog.

65. A project team is missing important deadlines because of a lack of coordination between departments. The project manager believes one of the departments may be a silo department that is used to minimal interactions with other departments.

What should the project manager do?

A. Assign a single team to handle all tasks instead of involving multiple departments.

B. Extend project deadlines to account for departmental delays.

C. Meet with the project team members from the silo department and establish clear communication expectations and handoff points.

D. Ignore the issue since delays are common in cross-functional projects.

66. A project manager is working on a government project with strict compliance requirements. The client requests a minor change that could significantly impact compliance if implemented.

What should the project manager do?

A. Evaluate the impact on compliance and then consult the necessary compliance experts prior to proceeding with the change.

B. Approve the change since it is minor and unlikely to cause issues.

C. Implement the change and address compliance concerns later.

D. Reject the request outright to avoid any risk and circle back to it later if necessary.

67. A project team has encountered a major risk that was previously overlooked. The risk has not yet been realized with a low chance of occurring soon.

How should the project manager handle it?

A. Ignore the risk since it was not initially identified.

B. Update the risk register and develop a mitigation plan.

C. Proceed with the project as planned and focus on addressing the risk only if it comes up.

D. Stop all project work and review the risk immediately with the project team.

68. A team member reports that a supplier was initially on time at the start of the project, but is now frequently late with deliveries in the middle of the project.

What should the project manager do first?

A. Review the contract terms and address the issue with the supplier.

B. Find, contact, and solicit bids from alternative suppliers immediately.

C. Escalate the issue to the procurement team or the legal department for resolution.

D. Accept the delays and adjust the project timeline.

69. A project manager is concerned that fully remote team members are not effectively communicating.

What is the best solution?

A. Implement collaborative tools and schedule regular check-ins.

B. Require team members to be online at the exact same time daily.

C. Extend project deadlines to accommodate reduced collaboration.

D. Assign all virtual tasks to a single team to minimize miscommunication.

70. A project team member has recently started to deliver incomplete work or very low quality work.

What should the project manager do?

A. Ignore the issue and hope the team member improves over time.

B. Remove the team member from the project immediately.

C. Assign the incomplete tasks to another team member and accept the completed low quality work.

D. Have a private discussion with the team member to understand the issue and provide support.

71. A project sponsor requests a weekly progress report but frequently misses scheduled update meetings.

What should the project manager do?

A. Inform the project sponsor that if they don't attend scheduled meetings they will not be included in project updates in any form.

B. Reduce reporting frequency since the sponsor is not attending meetings.

C. Continue sending written updates through the appropriate communication channels and allow the sponsor to review at their convenience.

D. Stop providing updates until the sponsor prioritizes the meetings.

72. A project is in the final stages when a customer requests a new feature. Implementing it would significantly extend the project deadline.

What should the project manager do?

A. Communicate with the customer on an extended deadline after conducting a thorough impact analysis.

B. Approve the feature immediately to maintain customer satisfaction.

C. Reject the request since the project is nearing completion.

D. Weigh the decision with the project team to understand if they should implement it or not.

73. A critical software deployment is scheduled for the end of the month. The development team has identified a major security vulnerability that could expose user data if the update is released. Fixing the issue will require additional testing, which may push the deployment date back by two weeks. The project sponsor is pushing to meet the original deadline because of market competition.

What should the project manager do?

A. Proceed with the deployment as planned and issue a patch later.

B. Delay the deployment to fix the security issue or assign more resources to implement the fix on schedule, ensuring customer data is protected.

C. Escalate the issue to senior leadership and let them decide on the next steps.

D. Ignore the security concern since there is pressure to meet the deadline.

74. A pharmaceutical company is developing a new drug, and your project team is responsible for ensuring that all clinical trial data is collected and analyzed in compliance with regulatory requirements. The project team discovers that the data collected previously does not comply with requirements. This discovery could lead to regulatory penalties and project delays.

What should the project manager do first?

A. Conduct a root cause analysis and determine corrective actions to bring the project back into compliance.

B. Ignore the findings, as they were discovered late in the project and may not be significant.

C. Expedite the data collection process without informing regulators to keep the project on schedule.

D. Escalate the issue to senior leadership and request an exemption from the regulatory body.

75. **Your Agile software development team has been working in two-week sprints, but they frequently cannot complete all assigned work. The product owner has been pushing for additional work to be completed mid-sprint, and as a result, the team often cannot meet these new expectations. Team morale is declining, and developers are becoming frustrated over constantly changing priorities.**

    What should the project manager do?

    A. Implement stricter controls to prevent any changes once a sprint begins.

    B. Work with the product owner to prioritize backlog refinement and set realistic sprint goals.

    C. Extend the sprint length to allow for more flexibility in completing user stories.

    D. Ignore the issue and let the team adjust on their own.

Practice Exam Answers and Explanations

1. **Answer: C**

   Explanation: The change control process is essential in predictive project management (which a construction project would use), to assess the impact of changes before approval and implementation. Implementing the change immediately would lead to uncontrolled scope creep. Rejecting the change outright damages stakeholder relationships. Escalating should come after the impact is assessed.

2. **Answer: B**

   Explanation: Since the risk was not accounted for, setting expectations with the client and accepting the risk and adjusting the timeline is the most appropriate response. Transferring the risk would require contractual adjustments, mitigating by increasing workforce may not be feasible, and avoiding the risk may not be an option at this stage.

3. **Answer: B**

   Explanation: Engaging the stakeholder to understand their concerns is the best approach to realign expectations and prevent further conflict. Removing them from communications could increase resistance. Escalating should be a last resort, and ignoring the issue is not a proactive solution.

4. **Answer: A**

   Explanation: Asynchronous communication helps remote teams collaborate effectively while accommodating time zone differences. Forcing attendance at a single global time is not

appropriate and may create additional stress. Assigning a single country limits inclusivity, and extending the schedule does not solve communication issues.

5. **Answer: B**

   Explanation: Usually, stakeholder expectations are set early, but in this case the project manager must set them during the project since they are taking over an active project. Continuing with the current plan would cause further misalignment. Escalating should be reserved for disputes that cannot be resolved reasonably. Modifying the scope without proper evaluation or change control could create issues further in the project.

6. **Answer: B**

   Explanation: Ensuring proper backlog prioritization helps stabilize Agile workflows. Enforcing strict change control or a change control process contradicts Agile principles and is not appropriate. Extending sprints can affect planning, and working overtime is not a sustainable solution to this issue.

7. **Answer: A**

   Explanation: Documenting risks and creating response plans help proactively manage project threats. Ignoring the risk is not a suitable response strategy. Escalating is unnecessary if the project team can manage it. Reducing scope may not be required if there are possible risk mitigation strategies.

8. **Answer: D**

   Explanation: Discussing performance concerns privately allows the project manager to understand the issue and help the project team member improve. While it may be a necessary future action, reassigning them may not solve the problem. Escalating to HR is unnecessary without discussion, and removing them without trying to resolve the issue is not appropriate leadership.

9. **Answer: A**

   Explanation: Using fast-tracking is one method that allows the project to meet deadlines while maintaining compliance. Proceeding with fast tracking without addressing compliance is very risky and could lead to serious issues down the road. Escalating should be considered if the team cannot find a solution, and pushing back is not necessary in this case.

10. **Answer: B**

    Explanation: An impact analysis helps determine whether additional testing is feasible. Approving testing without assessment risks delays. Declining without any justification can damage client relationships and communication, and escalating should be done only if an agreement is not able to be reached.

11. Answer: B

Explanation: The project manager should assess the impact of the overlooked dependencies and adjust the schedule accordingly. Reassigning tasks without evaluating dependencies can cause more issues in the future. Escalating should always be a last resort. Ignoring dependencies can lead to project failure.

12. Answer: D

Explanation: Reallocating or adding additional resources balances the workload and reduces burnout. Offering monetary incentives rarely solves burnout issues. Simply reminding the team to stay focused is not a good leadership strategy and does nothing to address the issue, and reducing scope should only be considered after analyzing all options.

13. Answer: B

Explanation: Meeting with the stakeholder to understand their issues often opens a discussion around if revisions are really needed. Proceeding with the original plan ignores potentially valid concerns. Documenting the feedback but doing nothing does not help with maintaining stakeholder relationships. Modifying deliverables to accommodate all feedback causes scope creep.

14. Answer: C

Explanation: Reviewing the contract and discussing issues with the vendor ensures a structured resolution. Terminating the contract without discussion is drastic. Escalating to procurement should come after direct vendor discussions and if there is no clear resolution. Accepting delays without addressing them is not a best practice.

15. Answer: A

Explanation: Remember, SPI = EV (Earned Value) / PV (Planned Value). If SPI is greater than 1, it is ahead of schedule, if it is lower than 1, it is behind schedule. In this case, the SPI is .9 showing the project is behind schedule, and this should be communicated to the project sponsor.

Ignoring the SPI value does nothing to improve the project. Escalating the issue is unnecessary without previous action. Requesting additional resources is not appropriate unless absolutely necessary.

16. Answer: B

Explanation: The project manager should work with the product owner to set realistic goals and refine the backlog prioritization.

17. Answer: B

Explanation: Evaluating the impact of the resignation on important areas of the project helps determine the best course of action. Hiring a replacement immediately won't help in the short

term. Asking the team to absorb extra workload can significantly reduce morale. Escalating should be done only if necessary, after evaluating the impact.

18. Answer: B

Explanation: In a project using a predictive approach, conducting an impact analysis and following the change control process is the right answer. Implementing the change immediately is not a good option here, but might be in a project using Agile. Rejecting the request and escalating the request are not appropriate.

19. Answer: D

Explanation: In a hybrid project, improving coordination between Agile and predictive teams is the best approach. Aligning their work processes ensures smoother collaboration and minimizes delays caused by dependencies. Delaying predictive work or converting the entire project to Agile are not practical solutions. Assigning all dependency-related tasks to the Agile team may not be feasible or effective.

19. Answer: D

Explanation: In a hybrid project, improving coordination between Agile and predictive teams is the best approach. Aligning their work processes ensures smoother collaboration and minimizes delays caused by dependencies.

20. Answer: A

Explanation: Proposing a streamlined decision making process helps address issues with slowness. Accepting delays is not proactive, having one on one meetings is too time consuming to resolve the issue quickly, and reducing stakeholder involvement can cause significant issues.

21. Answer: B

Explanation: Assessing the impact first ensures an informed response. Implementing changes immediately is not best for long-term project success, while escalating or requesting an exemption is not the best to do at first.

22. Answer: B

Explanation: Assigning regional leads helps tailor the rollout to local needs, significantly improving satisfaction and adoption.

23. Answer: A

Explanation: Crashing a schedule means adding extra resources to speed up work. Reducing scope is not part of crashing, ignoring delays has nothing to do with crashing, and hiring consultants is not an appropriate strategy for crashing.

24. Answer: A

Explanation: Assigning a mentor will help onboard and integrate the new team member quickly. Reading documentation alone is insufficient, assigning a low priority task might be ok if the sprint is short but is not ideal, and excluding them from the sprint will delay their ability to contribute in the long term.

25. Answer: B

Explanation: Educating the sponsor on Agile principles ensures that expectations align with team capacity. Increasing sprint length or forcing overtime are not sustainable solutions.

26. Answer: C

Explanation: A root cause analysis will quickly help the project team to determine the best course of action for resolution. Bringing in outside experts may be an option, but is time consuming and will not quickly resolve the issue. Meanwhile, ignoring the issue, or delaying resolution and continuing with the project are not effective approaches.

27. Answer: A

Explanation: Enforcing priority-setting rules prevents unnecessary mid-sprint changes, maintaining stability in Agile workflows. Stakeholders input isn't the most relevant option, and reducing stakeholder involvement should be saved as a last resort. Increasing the sprint duration is not a reasonable way to handle constantly changing priorities and demands.

28. Answer: D

Explanation: Reviewing the contract and discussing corrective actions ensures a solution is found and acted on quickly. Finding a new vendor immediately without discussion is not appropriate, accepting the delay should never be done without discussion, and escalating the issue is unneeded unless there is no further resolution.

29. Answer: A

Explanation: We calculate CPI by using the formula CPI = EV / AC. In this question, we arrive at the answer of 0.80, which indicates the project is over budget.

Remember, CPI being over 1.0 means it's under budget (performing well), CPI being exactly at 1.0 means it's exactly on budget, and CPI being less than 1.0 means it's over budget (not performing well).

30. Answer: C

Explanation: Scheduling a meeting directly with the stakeholder he,;ls clarify expectations and ensure necessary approvals. Escalating the issue is not necessary, proceeding without their input is not advised, and removing the stakeholder without discussion can create conflict.

31. Answer: C

Explanation: CPM is calculated by determining the longest sequence of dependent tasks, which defines the shortest time needed to complete the project. In this case, when we calculate the critical path (Task A + C + D), it calculates out to 14 days for the CPM.

32. Answer: D

Explanation: Following the change control process ensures informed decision-making regarding scope changes.

33. Answer: B

Explanation: Engaging stakeholders earlier improves requirement clarity and prevents scope creep.

34. Answer: B

Explanation: Prioritizing tasks effectively helps prevent missed deadlines without overburdening the team.

35. Answer: D

Explanation: This is an instance where escalating the risk is advised, due to the high chance of occurrence. Taking action on the risk is not needed until discussion is had around the risk.

36. Answer: C

Explanation: Shortening stand-ups to 15 minutes keeps meetings efficient while maintaining productivity. Agile necessitates daily meetings, but meetings should not continue indefinitely. Reducing team size is not a reasonable approach to meeting problems.

37. Answer: B

Explanation: Discussing the request first and evaluating it is the right choice. A change request is not relevant in an Agile project, rejecting the request outright is not advised, and implementing the change immediately is not considering the whole picture.

38. Answer: A

Explanation: Understanding and implementing strategies for improved communication and different work styles is the best choice. Reassigning team members can be done if absolutely necessary. Ignoring the conflict will eventually result in major issues. HR is not needed unless there are already serious existing issues that violate company policy.

39. Answer: A

Explanation: In this case, only approved communication mediums should be used. The project manager should immediately discontinue project teams use of the messaging service and hold a meeting with them to review the project communication plan.

40. Answer: D

Explanation: Following the change control process ensures that last-minute requests are properly evaluated.

41. Answer: B

Explanation: Limiting work-in-progress (WIP) items improves workflow efficiency and prevents bottlenecks.

42. Answer: B

Explanation: Providing Agile training helps team members adapt to the new methodology.

43. Answer: B

Explanation: Performing an impact analysis ensures the project adapts effectively to the regulatory change.

44. Answer: B

Explanation: Evaluating the impact and following the change control process ensures an informed decision.

45. Answer: A

Explanation: Executing the predefined risk response plan for this specific risk. Since the project is completely halted, there is no need to meet with the project team, and the risk cannot be ignored.

46. Answer: D

Explanation: Engaging with the client helps address their concerns and ensure satisfaction.

47. Answer: A

Explanation: Conducting Agile training helps stakeholders understand Agile practices and expectations.

48. Answer: A

Explanation: Reviewing the contract terms and discussing corrective actions with the vendor is the best first step.

49. Answer: A

Explanation: Using the available budget to add resources can help accelerate project progress.

50. Answer: A

Explanation: Regular backlog refinement ensures clarity in user stories and improves sprint completion rates.

51. Answer: A

Explanation: Establishing clear communication channels ensures alignment between Agile and Waterfall teams.

52. Answer: A

Explanation: Identifying alternative suppliers and updating the risk response plan mitigates supply risks.

53. Answer: D

Explanation: A CPI of 1.2 indicates cost efficiency, but an SPI of 0.8 shows schedule delays.

54. Answer: A

Explanation: Evaluating the cost-benefit trade-off ensures a balanced decision regarding process improvements.

55. Answer: A

Explanation: Enforcing sprint planning ensures that unplanned tasks do not disrupt the schedule.

56. Answer: B

Explanation: An SPI of 1.05 shows the project is ahead of schedule, while a CPI of 0.95 shows it's over budget.

57. Answer: A

Explanation: Conducting a root cause analysis and developing a resolution plan ensures that defects are properly addressed without compromising quality.

58. Answer: A

Explanation: Reinforcing proper communication prevents stakeholders directly bypassing the project manager and disrupting set workflows.

59. Answer: C

Explanation: Regular stakeholder alignment meetings help clarify expectations and ensure project goals remain consistent.

60. Answer: D

Explanation: Increasing the frequency of risk review meetings and reminding the team of risk management strategies will improve this situation.

61. Answer: A

Explanation: Implement a more strict change control process to prevent frequent changes from causing project delays.

62. Answer: A

Explanation: An executed cost-benefit analysis can reduce costs without negatively impacting project quality. Startups are also notorious for having constantly shifting budgets.

63. Answer: D

Explanation: Developing an integrated project schedule ensures that dependencies between Agile and predictive are managed effectively.

64. Answer: A

Explanation: Discussing the stakeholder's concerns and evaluating solutions helps maintain positive stakeholder relationships and project alignment.

65. Answer: C

Explanation: Improving communication and establishing clear handoff points between departments enhances coordination and prevents delays.

66. Answer: A

Explanation: Evaluating compliance impact and consulting legal experts ensures that regulatory requirements are met before proceeding.

67. Answer: B

Explanation: Updating the risk register and developing a mitigation plan ensures that the new risk is properly accounted for and addressed if realized.

68. Answer: A

Explanation: Reviewing contract terms and addressing the issue with the supplier helps resolve delivery delays effectively.

69. Answer: A

Explanation: Implementing collaborative tools and regular check-ins fosters better communication in a virtual environment.

70. Answer: D

Explanation: Having a private discussion with the team member helps identify the root cause of incomplete work and provides support.

71. Answer: C

Explanation: Continuing to send written updates allows the sponsor to stay informed at their convenience without disrupting project communication.

72. Answer: A

Explanation: Communicating the potential for an extended deadline with the customer after conducting a thorough impact analysis.

73. Answer: B

Explanation: Delaying the release or adding more resources to fix the security issue ensures customer data is protected, preventing serious data breaches, security risks and legal consequences.

74. Answer: A

Explanation: Conducting a root cause analysis and determining corrective actions ensures the project complies with regulatory requirements and avoids penalties.

75. Answer: B

Explanation: Working with the product owner to prioritize backlog refinement and set realistic sprint goals improves team efficiency and prevents burnout.