



PMI® Authorized PMP® Exam Prep

Course Setup, Introduction, and Glossary

PMI® Authorized PMP® Exam Prep

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Using the PMI® Authorized PMP® Exam Prep Student Guide

Welcome!

Thank you for choosing the PMI® Authorized PMP® Exam Prep course.

To make the best use of the PMI® Authorized PMP® Exam Prep course materials, be sure to review all of the components of the PMI CHOICE platform. The PMI CHOICE platform is developed and hosted by Logical Operations (CHOICE LMS®) and has been customized specifically for PMI Authorized content.

Preparing for Class

This document follows the course slide by slide. You can take notes in this file and highlight concepts you want to revisit or you can refer to the "Notes Handouts" documents and take notes there.

Estimated Learning Time

The lesson durations given in the course content are estimates based on a typical class experience. The five lessons in this course are intended to be presented in a total of approximately 35 hours of instruction. The numbers below reflect maximum duration per lesson.

- Introduction: 30 minutes
- Lesson 1 (7 topics): 8 hours
- Lesson 2 (9 topics): 10 hours
- Lesson 3 (8 topics): 8 hours
- Lesson 4 (7 topics): 8 hours
- Lesson 5 (5 topics): 6 hours

Course-Specific Technical Requirements

Hardware

You will need complete systems to access your virtual classroom. You will need Microsoft Office applications to access the sample documents and templates. You need the following general hardware configurations:

- 1 gigahertz (GHz) 64-bit (x64) processor.
- 2 gigabytes (GB) of Random Access Memory (RAM).
- 32 GB available storage space.
- Monitor capable of a screen resolution of at least 1,024 x 768 pixels, at least a 256-color display, and a video adapter with at least 4 MB of memory.
- Keyboard and mouse or a compatible pointing device.
- Internet access (contact your local network administrator).

Software

- Microsoft® Office 365™ license (which provides the Microsoft Office apps)
- Microsoft® Windows® 10 Professional or Mac OS

Setting Up the Course

For each student and the instructor:

- Provide a system with Internet access and the given hardware requirements.
- Install Microsoft Windows 10.
- Log in to <https://login.microsoftonline.com> then on the Office 365 home page, select Install Office > Office 365 apps.

Install the Course Data Files

To install the course data files:

1. From the course Files tile on CHOICE, download the ATPPMP1Files<ver>.zip file to any location that is convenient for you.
2. Go to the download folder and locate and unzip (extract) the ATPPMP1Files<ver>.zip file. This will create a local ATPPMP1Files<ver> folder.
3. Open the ATPPMP1Files<ver> folder. It contains separate subfolders with your course overheads and the course data files.
4. Move or copy the ATPPMP1Data folder to the root of your C drive. This installs the data files to the location specified in the course activities.

About This Course

Course Description

The course enables candidates to develop professionally, increase their project management skills, apply a formalized and standards-based approach to project management, and seek career advancement by moving into a formal project manager job role, as well as to apply for the Project Management Institute, Inc. (PMI)[®] Project Management Professional (PMP)[®] certification.

Student Profile

This course is for individuals, who have on-the-job project management experience regardless of whether their formal job role is project manager, who are not certified project management professionals, and who might or might not have received formal project management training.

To ensure success in this course, you should have experience with basic project management concepts and have some working experience with project management. You can obtain this level of skills and knowledge by taking the following PMI courses:

- Introduction to Project Management
- Project Management Basics
- Introduction to Agile

Course Objectives

In this course, you will learn how to build and manage a team that will plan, execute, and complete a project that is aligned with the business environment. You will explore the following topics:

Lesson 1	Creating a High-Performing Team	Assemble and prepare the human resource element of your project
Lesson 2	Starting the Project	Plan for success by learning the tools and techniques employed by successful project managers
Lesson 3	Doing the Work	Execute and assess project work
Lesson 4	Keeping the Team on Track	Support and motivate your team members as individuals and as a cohesive unit
Lesson	Keeping the Business	Ensure the project is aligned

The PMI CHOICE Home Screen

Login and access information for your CHOICE environment will be provided with your class experience. The CHOICE platform is your entry point to the CHOICE learning experience, of which this course manual is only one part.

On the CHOICE Home screen, you can access the CHOICE Course screens for your specific courses. Visit the CHOICE Course screen both during and after class to make use of the world of support and instructional resources that make up the CHOICE experience.

Each CHOICE Course screen will give you access to the following resources:

- Classroom: A link to your training provider's classroom environment.
- eBook: An interactive electronic version of the printed book for your course.
- Files: Any course files available to download.
- Checklists: Step-by-step procedures and general guidelines you can use as a reference during and after class.
- Spotlights: Brief animated videos that enhance and extend the classroom learning experience.
- Assessment: Items you can complete for self-assessment of your level of understanding of the course content.
- Social media resources that enable you to collaborate with others in the learning community using professional communications sites such as LinkedIn or microblogging tools such as Twitter.

Visit your CHOICE Home screen often to connect, communicate, and extend your learning experience!

How to Use the Student's Edition

This document is divided into lessons and topics, covering a subject or a set of related subjects.

Checklists of procedures and guidelines can be used during class and as after-class references when you're back on the job and need to refresh your understanding.

Course Iconography

- Notes to help you contextualize the material are in purple.



Notes indicate extra information that can help you.



Examples are given in boxes cued with this icon.



These icons indicate **ideas** for further thinking or exploration of a topic. These are optional.

Introduction

Duration: 30 minutes

This brief, introductory module explains the course and the PMP certification.



WELCOME

Thank you for joining the PMI Authorized PMP Exam Prep course! If you've earned your CAPM® certification with us, welcome back. Or if you're coming from another project management background, certification or work experience, we are pleased to welcome you to PMI's community of learn. We are proud of our 50-year history of peer-to-peer learning and membership - wish you the best of luck as you undertake your PMP exam preparations.

Welcome and thank you for joining the course!

Let's get to know a little about each other's background.

Your Instructor

[Instructor name]
[Instructor Contact Information]
[x] years of


Meet your Instructor! This slide should be customized with their professional information.

Student Introductions



Now it's time to introduce yourself to the class.

You, Getting Certified

Four-year degree
• 36 months leading projects
• 36 months of project management education/training or CAPM® Certification
— OR —
A high school diploma or an associate's degree
• 48 months leading projects
• 60 months leading projects
• 30 hours of project management education/training or CAPM® Certification


Let's review the requirements for the PMP certification.

- In addition to studying and your academic preparation, your project management experience is very important.
- The exam is not a test of your ability to read and memorize exam preparation materials. The questions are scenario-based and written by working PMPs.
- So, think about how you apply the concepts we will learn and explore this week in your work.



'The Project Economy' is a term PMI coined during the 50th anniversary Transformation—it describes the work that we do and is a good introduction to the organization.

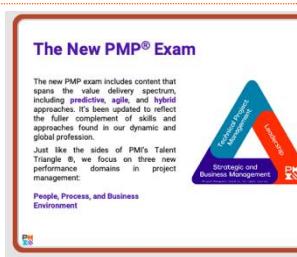
- PMI had its 50th anniversary in 2019.
- Earning your PMP essentially means becoming a part of the PMI community.
- Globally recognized and demanded, the PMP demonstrates that those with this designation have the experience, education, and competency to lead and direct projects. Once you pass the exam, you maintain the credential by obtaining Professional Development Units (PDUs). This is similar to the Certified Public Accountant (CPA) exam and professional development requirements.



Watch the short "Project Economy" video (1m 21s) from the PMI web site:
<https://www.pmi.org/The-Project-Economy>



Note: To further explore the PDU requirements, you can access the Spotlight on Earning PDUs presentation from the Spotlight tile on the CHOICE Course screen.



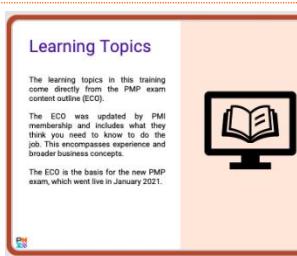
This slide introduces the new exam and the PMI Talent Triangle focus on people, process, and business environment.

We'll follow the guidance of both the PMI Talent Triangle and the PMP Exam Content Outline in this course.

Our three focus points this week will follow the shape of the PMI Talent Triangle. The study topics focus on:

- **People**, or project **leadership**;
- **Process**, or how to do the work; and
- **Business environment**, or how project managers and teams are leaders in an

organization that support strategic goals and business health.



This slide introduces the ECO as a study aid. This course does not explicitly reference the ECO by number. As it would be impossible to cover the entire breadth of the document in a week, we recommend that you use it as a checklist against your knowledge base and as guidance for what you need to learn as you prepare to take the exam.

The exam content was revised by a global committee of PMPs. They devised the topics on the new Exam Content Outline, or the ECO. The ECO is a detailed list of all the domains and tasks relevant to project management work. You should be familiar with this document as a study aid. Use it to check what you know and what you still need to know.

- Domains are defined as the high-level knowledge areas that are essential to the practice of project management.
- Tasks are the underlying responsibilities of the project manager within each domain area.

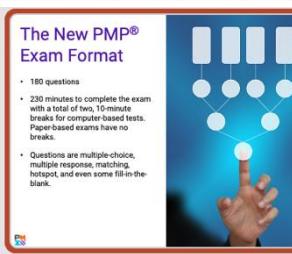
We have also listed deliverables and tools or process actions relevant to each task, for your reference. These are helpful to know, as you should be familiar with the tools, processes, and deliverables that correlate with the different areas of work in project management.



Note: You can access the PMP® ECO mapping document from the Files tile on the CHOICE Course screen. This helps to map the ECO content to the course.



Note: You can download a copy of the ECO from the PMP® Certification page on PMI.org.
<https://www.pmi.org/certifications/project-management-pmp>



This slide introduces the format of the new exam.

The new version of the PMP exam went live in January 2021. In addition to multiple choice questions, it now features new question formats.



We'll explore the ECO over five (5) lessons.

- 1. Creating a High-Performing Team:** We begin with the people, or leadership, element—specifically how we create a high-performing team.
- 2. Starting the Project:** Then we begin looking at “process”, and what’s involved in starting a project.
- 3. Doing the Work:** A further development of the “process” element with a closer look at how we do the actual work of the project.
- 4. Keeping the Team on Track:** A return to the “people” element with how to keep the team on track.
- 5. Keeping the Business in Mind:** And finally, we look at how your role is tied to organizational and business strategy.



Are you ready to start?

Glossary of Terms

80/20 rule

A general guideline with many applications; in terms of controlling processes, it contends that a relatively large number of problems or defects, typically 80%, are commonly due to a relatively small number of causes, typically 20%.

AB testing

A marketing approach used to determine user preferences by showing different sets of users similar services with one independent variable.

AC (Actual Cost)

The realized cost incurred for the work performed on an activity during a specific time.

accept

A strategy for managing negative risks or opportunities that involves acknowledging a risk and not taking any action until the risk occurs.

acceptance criteria

A set of conditions that is required to be met before deliverables are accepted.

active listening

A communication technique that involves acknowledging what you hear and clarifying the message to confirm that what you heard matches the message that the sender intended.

activity attributes

Multiple attributes associated with each schedule activity that can be included within the activity list.

activity dependency

A logical relationship that exists between two project activities. The relationship indicates whether the start of an activity is contingent upon an event or input from outside the activity.

activity duration estimates

The quantitative assessments of the likely number of time periods that are required to complete an activity.

activity list

A documented tabulation of schedule activities that shows the activity description, activity identifier, and a sufficiently detailed scope-of-work description so project team members understand what work is to be performed.

activity

A distinct, scheduled portion of work performed during the course of a project.

administrative closure

Involves verifying and documenting project results to formalize project or phase completion.

Affinity diagram

A technique that allows large numbers of ideas to be classified into groups for review and analysis.

agile life cycles

A project life cycle that is iterative or incremental. Also referred to as change- driven or adaptive, they work well in environments with high levels of change and ongoing stakeholder involvement in a project.

Agile project management

A project management methodology that uses an iterative and incremental approach that focuses on customer value and team empowerment. In agile project management, the product is developed in iterations by small and integrated teams.

Agile release planning

A process in which you determine the number of iterations or Sprints that are needed to complete each release, the features that each iteration will contain, and the target dates of each release.

agreements

Any documents or communication that defines the initial intentions of a project. Examples include contracts, memorandums of understanding (MOUs), service level agreements (SLAs), letters of agreement, letters of intent, verbal agreements, email, or other written agreements.

analogous estimating

A technique for estimating the duration or cost of an activity on a project using historical data from a similar activity or project.

approved change requests

Change requests that have been reviewed and approved by the change control board (CCB) and are ready to be scheduled for implementation.

assumption and constraint analysis

A process that explores the validity of the project assumptions within the constraints and identifies risks from any incompleteness or inaccuracy of these project assumptions.

attribute sampling data

Data that is counted such as the number of product defects or customer complaints.

auditing

An examination of a project's goals and achievements, including adequacy, accuracy, efficiency, effectiveness, and the project's compliance with applicable methodologies and regulations. It tends to be a formal, one-sided process that can be extremely demoralizing to team members.

autocratic

Using this group decision-making method, one member of the group makes the decision. In most cases, this person will consider the larger group's ideas and decisions and will then make a decision based on that input.

avoid

A strategy for managing negative risks or threats that involves changing the project management plan to remove the risk entirely by extending the schedule, changing the strategy, increasing the funding, or reducing the scope.

BAC

(Budget at Completion) The sum of all budgets established for the work to be performed.

bar chart

A graphic display of schedule-related information. In the typical bar chart, schedule activities or WBS components are listed down the left side of the chart, dates are shown across the top, and activity durations are shown as date-placed horizontal bars. See also "Gantt chart".

benchmarking

The comparison of actual or planned products, processes, and practices to those of comparable organizations to identify best practices, generate ideas for improvement, and provide a basis for measuring performance.

benefit cost analysis

A financial analysis tool used to determine the benefits provided by a project against its costs.

benefits management plan

The documented explanation defining the processes for creating, maximizing, and sustaining the benefits provided by a project or program.

bidder conferences

The meetings with prospective sellers prior to the preparation of a bid or proposal to ensure all prospective vendors have a clear and common understanding of the procurement. Also called vendor conferences, pre-bid conferences, or contractor conferences.

bottom-up estimating

A method of estimating project duration or cost by aggregating the estimates of the lower-level components of the WBS.

brainstorming

A technique that involves a facilitator to help a group identify project risks in a free-form session where ideas are generated, built on, and recorded.

breach of contract

The failure to meet some or all the obligations of a contract.

burndown chart

A tool that is used to track the progress of the project by plotting the number of days of Sprint against the number of hours of work remaining.

business case

A documented economic feasibility study used to establish the validity of the benefits of a selected component lacking sufficient definition and that is used as a basis for the authorization of further project management activities.

business risk

The inherent risk in any business endeavor that carries the potential for either profit or loss. Types of business risks are competitive, legislative, monetary, and operational.

business value

The net quantifiable benefit derived from a business endeavor. The benefit may be tangible, intangible, or both.

CCB

(Change Control Board) A formally chartered group responsible for reviewing, evaluating, approving, delaying, or rejecting changes to the project, and for recording and communicating such decisions.

cease and desist letter

A document sent to an individual or a business to stop (cease) allegedly illegal activities and to not undertake them again (desist).

change control form

A document used to request a project change. They can also be recommendations for taking corrective or preventive actions. See also "change request".

change control system

A set of procedures that describes how modifications to the project deliverables and documentation are managed and controlled.

change management

The process of managing project changes in a structured and standardized manner.

change management plan

A component of the project management plan that establishes the Change Control Board, documents that extent of its authority, and describes how the change control system will be implemented.

change request

Request for change sent to the upper management or the Change Control Board (CCB) for its evaluation and approval. See also "change control form".

checklist analysis

A technique for systematically reviewing materials using a list for accuracy and completeness.

CI

(Continuous Improvement) The ongoing effort to improve products, services, or processes.

Close Project or Phase process

The process of finalizing all activities for the project, phase, or contract.

close-out meetings

Sessions held at the end of a project or phase; they involve discussing the work and capturing lessons learned.

co-location

An organizational placement strategy where the project team members are physically located close to one another in order to improve communication, working relationships, and productivity.

coaching

The act of giving guidance and direction to another person so that they can make better decisions.

code of accounts

A numbering system used to uniquely identify each component of the WBS.

Code of Ethics and Professional Conduct

A PMI® publication that describes the ethical and professional behavior expectations of an individual working as a project management professional.

communication methods

A systematic procedure, technique, or process used to transfer information among project stakeholders.

communication models

A description, analogy, or schematic used to represent how the communication process will be performed for the project.

communication requirements analysis

An analytical technique to determine the information needs of the project stakeholders through interviews, workshops, study of lessons learned from previous projects, etc.

communication styles assessment

A technique to identify the preferred communication method, format, and content for stakeholders for

planned communication activities.

communication technology

Specific tools, systems, computer programs, etc., used to transfer information among project stakeholders.

communications management plan

A component of the project, program, or portfolio management plan that describes how, when, and by whom information about the project will be administered and disseminated.

completion contract

A type of contract that is completed when the vendor delivers the product to the buyer and the buyer accepts the product.

configuration management

A tool used to manage changes to a product or service being produced as well as changes to any of the project documents such as schedule updates.

configuration management plan

A component of the project management plan that describes how to identify and account for project artifacts under configuration control and how to record and report changes to them.

configuration management system

A collection of procedures used to track project artifacts and monitor and control changes to these artifacts.

conflict management

The application of one or more strategies for dealing with disagreements that may be detrimental to team performance.

context diagram

A visual depiction of the product scope showing a business system (process, equipment, computer system, etc.), and how people and other systems (actors) interact with it.

contingency plan

A risk response strategy developed in advance, before risks occur; it is meant to be used if and when identified risks become reality.

contingency reserves

Time or money allocated in the schedule or cost baseline for known risks with active response strategies.

contract change control system

The system used to collect, track, adjudicate, and communicate changes to a contract.

contract

A mutually binding agreement that obligates the seller to provide the specified project or service or result and obligates the buyer to pay for it.

control account

A management control point where scope, budget, actual cost, and schedule are integrated and compared to earned value for performance measurement.

Control Procurements process

The process of managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate, and closing out contracts.

controlling PMO

A type of PMO that provides support and requires compliance through various means. Compliance may involve adopting project management frameworks or methodologies; using specific templates, forms, and tools; or conformance to governance.

CoQ

(Cost of Quality) All costs incurred over the life of the product by investment in preventing nonconformance to requirements, appraisal of the product or service for conformance to requirements, and failure to meet requirements.

cost aggregation

Summing the lower-level cost estimates associated with the various work packages for a given level within the project's WBS or for a given cost control account.

cost baseline

The approved version of the time-phased project budget, excluding any management reserves, which can be changed only through formal change control procedures and is used as a basis for comparison to actual results.

cost management plan

A component of a project or program management plan that describes how costs will be planned, structured, and controlled.

cost of conformance

The money spent during a project to avoid failures. This includes prevention costs that build a quality product and appraisal costs that assess the quality.

cost of non-conformance

The money spent after a project is complete because of failures. This includes internal and external failure costs.

cost-reimbursable contract

A type of contract involving payment to the seller for the seller's actual costs, plus a fee typically representing the seller's profit.

CPAF contract

(Cost Plus Award Fee contract) A category of contract that involves payments to the seller for all legitimate actual costs incurred for completed work, plus an award fee representing seller profit.

CPFF contract

(Cost Plus Fixed Fee contract) A type of cost-reimbursable contract where the buyer reimburses the seller for the seller's allowable costs (allowable costs are defined by the contract) plus a fixed amount of profit (fee).

CPI

(Cost Performance Index) A measure of the cost efficiency of budgeted resources expressed as the ratio of earned value to actual cost.

CPIF contract

(Cost Plus Incentive Fee contract) A type of cost-reimbursable contract where the buyer reimburses the seller for the seller's allowable costs (allowable costs are defined by the contract), and the seller earns its profit if it meets defined performance criteria.

critical path activity

Any activity on the critical path in a project schedule.

critical path

The sequence of activities that represents the longest path through a project, which determines the shortest possible duration.

cultural awareness

Understanding the cultural differences of the individuals, groups, and organizations in the project stakeholder community so you can adapt communication strategies to avoid or reduce miscommunication and misunderstandings.

CV

(Cost Variance) The amount of budget deficit or surplus at a given point in time, expressed as the difference between the earned value and the actual cost.

daily standup

A short, 15-minute meeting in which the complete team gets together for a quick status update while standing in a circle. Also referred to as a daily scrum.

de facto regulations

Regulations that are widely accepted and adopted through use.

de jure regulations

Regulations that are mandated by law or have been approved by a recognized body of experts.

debriefing

A less formal, more cooperative means of discussing the positives and the negatives of the project, what worked, and what will be done differently next time. This discussion includes technology issues, people issues, vendor relationships, and organizational culture.

decision making

The process of selecting a course of action from among multiple options.

decision tree analysis

A diagramming and calculation technique for evaluating the implications of a chain of multiple options in the presence of uncertainty.

decomposition

A technique used for dividing and subdividing the project scope and project deliverables into smaller, more manageable parts.

deliverable

Any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or projects.

directions of influence

A classification model that groups stakeholders based on how they influence the project: upwards (senior management), downwards (team or specialists), outwards (external), sideways (project manager's peers), and prioritization.

directive PMO

A type of PMO that takes control of projects by directly managing the projects.

discretionary dependency

A relationship that is established based on knowledge of best practices within a particular application area or an aspect of the project where a specific sequence is desired.

document analysis

A technique used to gain project requirements from current documentation evaluation.

DoD

(Definition of Done) A team's checklist of all the criteria required to be met so that a deliverable can be considered ready for customer use.

DoR

(Definition of Ready) A team's checklist for a user-centric requirement that has all the information the team needs to be able to begin working on it.

EAC

(Estimate at Completion) The expected total cost of completing all work expressed as the sum of the actual cost to date and the estimate to complete.

EEF

(Enterprise Environmental Factors) Conditions that are not under the immediate control of the team, and that influence, constrain, or direct the project, program, or portfolio.

effect-based risk classification

A way of analyzing the major risks inherent to a project that could have an impact on its success.

These major risks include time, cost, quality, and scope.

effort

The number of labor units required to complete a scheduled activity or WBS component, often expressed in hours, days, or weeks. Contrast with duration.

EI

(emotional intelligence) The ability to identify, assess, and manage the personal emotions of oneself and other people, as well as the collective emotions of groups of people. EQ is also a commonly used abbreviation.

elapsed time

The actual calendar time required for an activity from start to finish.

EMV

(Expected Monetary Value) A method of calculating the average outcome when the future is uncertain.

enhance

A strategy for managing positive risks or opportunities that involves increasing the probability that the opportunity will happen, or the impact it will have by identifying and maximizing enablers of these opportunities.

escalate

The strategy in which you determine that a threat is outside the scope of the project or beyond the project manager's authority. You then forward the threat to a person or part of the organization at a higher level.

ETC

(Estimate to Complete) The expected cost of finishing all the remaining project work.

EV

(Earned Value) A measure of work performed expressed in terms of the budget authorized for that work.

EVM

(Earned Value Management) A methodology that combines scope, schedule, and resource measurements to assess project performance and progress.

expert judgment

Judgment provided based upon expertise in an

application area, knowledge area, discipline, industry, etc., as appropriate for the activity being performed. Such expertise may be provided by any group or person with specialized education, knowledge, skill, experience, or training.

explicit knowledge

Knowledge that can be codified using symbols such as words, numbers, and pictures. This type of knowledge can be documented and shared with others.

exploit

A strategy for managing positive risks or opportunities that involves attempting to make sure that the opportunity happens.

external dependency

Types of activity dependencies that exist between project activities and non-project activities and can be out of the project's control.

facilitated workshops

Organized working sessions held by project managers to determine a project's requirements and to get all stakeholders together to agree on the project's outcomes.

facilitation

A skill used to lead or guide an assembled group toward a successful conclusion such as making a decision or finding a solution.

FF

(Finish-to-Finish) A logical relationship in which a successor activity cannot finish until a predecessor activity has finished.

FFP contract

(Firm Fixed Price contract) A type of fixed price contract where the buyer pays the seller a set amount (as defined by the contract), regardless of the seller's costs.

fixed price contract

An agreement that sets the fee that will be paid for a defined scope of work regardless of the cost or effort to deliver it.

float

Also called slack. See also "total float" and "free float".

focus groups

An elicitation technique that brings together pre-qualified stakeholders and subject matter experts to learn about their expectations and attitudes about a proposed product, service, or result.

FPEPA contract

(Fixed Price with Economic Price Adjustment contract) A fixed-price contract, but with a special provision allowing for pre-defined final adjustments to the contract price due to changed conditions, such as inflation changes, or cost increases (or decreases) for specific commodities.

FPIF contract

(Fixed Price Incentive Fee contract) A type of contract where the buyer pays the seller a set amount (as defined by the contract), and the seller can earn an additional amount if the seller meets defined performance criteria.

free float

The amount of time that a schedule activity can be delayed without delaying the early start date of any successor or violating a schedule constraint.

FS

(Finish-to-Start) A logical relationship in which a successor activity cannot start until a predecessor activity has finished.

functional organization

An organizational structure in which staff is grouped by areas of specialization and the project manager has limited authority to assign work and apply resources.

funding limit reconciliation

The process of comparing the planned expenditure of project funds against any limits on the commitment of funds for the project to identify any variances between the funding limits and the planned expenditures.

Gantt chart

A bar chart of schedule information where activities are listed on the vertical axis, dates are shown on the horizontal axis, and the activity durations are shown as horizontal bars placed according to start and finish

dates.

IFB

(Invitation for Bid) Generally, this term is equivalent to request for proposal. However, in some application areas, it may be a narrower or more specific meaning. A type of procurement document that is most commonly used when deliverables are commodities for which there are clear specifications and when the quantities are very large. The invitation is usually advertised, and any seller may submit a bid. Negotiation is typically not anticipated. These are sometimes used interchangeably with RFPs.

impediment

An obstacle that prevents the team from achieving its objectives.

increment

A functional, tested, and accepted deliverable that is a subset of the overall project outcome.

incremental life cycle

An adaptive project life cycle in which the deliverable is produced through a series of iterations that successively add functionality within a predetermined time frame. The deliverable contains the necessary and sufficient capability to be considered complete only after the final iteration.

Influence/impact grid

A classification model that groups stakeholders on the basis of their involvement in and impact on the project.

influencing

The act of presenting a good case to explain why an idea, decision, or problem should be handled a certain way, without resistance from other individuals.

information radiator

The generic term for visual displays placed in a visible location so everyone can quickly see the latest information. In agile practice, also known as "Big Visible Chart".

insurable risk

A risk that has only the potential for loss and no potential for profit or gain. An insurable risk is one for which insurance may be purchased to reduce or offset the possible loss. Types of insurable risks are direct property, indirect property, liability, and

personnel-related.

interactive communication

An exchange of information between two or more people that ensures common understanding for everyone participating in that exchange.

internal dependency

A type of activity dependency that exists between project activities and is usually under the project's control.

interpersonal skills

Skills used to establish and maintain relationships with other people.

interview

A formal or informal approach to elicit information from stakeholders by talking with them directly.

IRR

(Internal Rate of Return) The interest rate that makes the net present value of all cash flow equal to zero.

issue

A current condition or situation that may have an impact on the project objectives.

issue log

A document where information about issues is recorded and monitored.

iteration

A timeboxed cycle of development on a product or deliverable in which all of the work that is needed to deliver value is performed.

iterative life cycle

A project life cycle where the project scope is generally determined early in the project life cycle, but time and cost estimates are routinely modified as the project team's understanding of the product increases. Iterations develop the product through a series of repeated cycles, while increments successively add to the functionality of the product.

JAD

(Joint Application Design) Specialized workshops that include both SMEs and the development team together to discuss and improve on the software development process.

job shadowing

See "observations".

Kanban board

A visualization tool that enables improvements to the flow of work by making bottlenecks and work quantities visible.

knowledge management

Connecting individuals, in person or virtually, to share knowledge and collaborate together.

KPI

(Key Performance Indicator) A set metric used to evaluate a team's performance against the project vision and objectives.

lag

The amount of time whereby a successor activity will be delayed with respect to a preceding activity.

lead

The amount of time whereby a successor activity can be advanced with respect to predecessor activity.

leadership

The ability to step up and guide others to achieve results. Leadership abilities are gained through experience, building relationships, and taking on initiatives.

lean

An agile method used primarily in manufacturing that focuses on achieving outcomes with little or no waste.

lessons-learned register

A project document used to record knowledge gained during a project so that it can be used in the current project and entered into the lessons-learned repository.

lessons-learned repository

A store of historical information about lessons learned in projects.

majority

A group decision-making method in which a majority of group members agree on the course of action to take.

make-or-buy analysis

The process of gathering and organizing data about product requirements and analyzing them against available alternatives including the purchase or internal manufacture of the project.

make-or-buy decisions

Decisions made regarding the external purchase or internal manufacture of a product.

management reserves

An amount of the project budget or project schedule held outside of the performance measurement baseline (PMB) for management control purposes, that is reserved for unforeseen work that is within the scope of the project.

mandatory dependency

A relationship that is contractually required or inherent in the nature of the work.

matrix organization

An organizational structure in which the project manager shares responsibility with the functional managers for assigning priorities and for directing the work of persons assigned to the project.

MBI

(Minimum Business Increment) The smallest amount of value that can be added to a product or service that benefits the business.

milestone

A significant point or event in a project, program, or portfolio.

milestone charts

A type of project schedule bar chart that only includes milestone or major deliverables as points in time.

milestone list

A document that contains the significant points or events in a project.

mind mapping

A technique used to consolidate ideas created through individual brainstorming sessions into a single map to reflect commonality and differences in understanding and to generate new ideas.

mitigate

A strategy for managing negative risks or threats that involves taking action to reduce the probability of occurrence or the impact of a risk.

Monte Carlo simulation

An analysis technique where a computer model is iterated many times, with the input values chosen at random for each iteration driven by the input data, including probability distributions and probabilistic branches. Outputs are generated to represent the range of possible outcomes for the project.

motivation

The inner drive that keeps people involved and wanting to complete work of high quality in a timely fashion.

multi-criteria decision analysis

This technique utilizes a decision matrix to provide a systematic analytical approach for establishing criteria, such as risk levels, uncertainty, and valuation, to evaluate and rank many ideas.

MVP

(Minimum Viable Product) The smallest collection of features that can be included in a product for customers to consider it functional. In Lean methodologies, it can be referred to as "bare bones" or "no frills" functionality.

negotiated settlements

Are undertaken to arrive at a final equitable settlement of all outstanding issues, claims, and disputes by negotiation.

negotiation

An approach used by more than one individual to come to an agreement or resolution.

nominal group technique

A technique that enhances brainstorming with a voting process used to rank the most useful ideas for further brainstorming or for prioritization.

NPS

(Net Promoter Score) Measures a customer's willingness to recommend a provider's products or services to another on a scale of -100 to 100.

NPV

(Net Present Value) The present value of all cash outflows minus the present value of all cash inflows.

observations

The techniques used to gain knowledge of a specific job role, task, or function in order to understand and determine project requirements. This is also known as job shadowing.

OPA

(organizational process assets) Plans, processes, policies, procedures, and knowledge bases that are specific to and used by the performing organization.

opportunity

A risk that would have a positive effect on one or more project objectives.

organizational theory

The study of how people, teams, and organizations behave to look for common themes for the purpose of maximizing efficiency and productivity, problem solving, and meeting the stakeholder requirements of a project.

outsourcing

Moving beyond the organization to secure services and expertise from an outside source on a contract or short-term basis.

overlapping relationships

A type of phase-to-phase relationship that contains phases that start prior to the previous phase ending.

parametric estimating

An estimating technique in which an algorithm is used to calculate cost or duration based on historical data and project parameters.

Pareto chart

A histogram that is used to rank causes of problems in a hierarchical format.

PDM

(Precedence Diagramming Method) A technique used for constructing a schedule model in which activities are represented by nodes and are graphically linked by one or more logical relationships to show the sequence in which the activities are to be performed.

phase gate

A point review at the end of a phase in which a decision is made to continue to the next phase, to continue with modification, or to end a project or program.

planning package

A WBS component below the control account with known work content but without detailed schedule activities.

plurality

Decisions made by the largest block in a group, even if a majority is not achieved.

PMIS

(Project Management Information System) An information system consisting of the tools and techniques used to gather, integrate, and disseminate the outputs of project management processes.

PMO

(Project Management Office) A management structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques. PMOs are more common in larger organizations because of the number of projects that can be in process all at the same time.

political awareness

The ability to recognize the power structure internal to the organization, and the ability to navigate the relationships.

portfolio management

The centralized management of one or more portfolios to achieve strategic objectives.

portfolio

Projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.

Power/influence grid

A classification model that groups stakeholders on the basis of their levels of authority and involvement in the project.

Power/interest grid

A classification model that groups stakeholders on the basis of their levels of authority and interest in the project.

precedence relationship

A logical dependency used in the precedence diagramming methods.

predictive life cycle

A form of project life cycle in which the project scope, time, and cost are determined in the early phases of the life cycle.

probability and impact matrix

A grid for mapping the probability of occurrence of each risk and its impact on project objectives if that risk occurs.

probability distribution

The scattering of values assigned to likelihood in a sample population. It can be visually depicted in the form of a probability density function (PDF).

procurement

The acquisition of goods and services from an external organization, vendor, or supplier to enable the deliverables of the project.

procurement audit

The review of contracts and contracting processes for completeness, accuracy, and effectiveness.

procurement documents

The documents utilized in bid and proposal activities, which include the buyer's invitation for bid, invitation for negotiations, request for information, request for quotation, request for proposal, and settler's responses.

procurement management plan

A component of the project or program management plan that describes how a project team will acquire goods and services from outside of the performing organization.

procurement SOW

Describes the procurement item in sufficient detail to allow prospective sellers to determine if they are capable of providing the products, services, or results.

product analysis

For projects that have a product as the deliverable, it is a tool to define scope that generally means asking questions about a product and forming answers to describe

the use, characteristics, and other relevant aspects of what is going to be manufactured.

product backlog

A prioritized list of customer requirements and the first step of Scrum in which priority is based on the riskiness and business value of the user story.

product box exercise

A technique used to explain an overarching solution wherein stakeholders try to describe aspects of a solution in the same way a marketer might describe product features and benefits on a box.

product owner

An individual or an organization who is responsible for gathering inputs about a product from the customer and translating the requirements into the product vision for the team and stakeholders.

product roadmap

A high-level visual summary of the product or products of the project that includes goals, milestones, and potential deliverables.

program management

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

program

Related projects, subsidiary programs, and program activities that are managed in a coordinated manner to obtain benefits not available from managing them individually. A project may or may not be part of a program, but a program will always have projects.

progressive elaboration

The iterative process of increasing the level of detail in a project management plan as greater amounts of information and more accurate estimates become available.

project artifact

Any document related to the management of a project.

project charter

A document issued by the project initiator or sponsor that formally authorizes the existence of a project and

provides the project manager with the authority to apply organizational resources to project activities.

project governance

The framework, functions, and processes that guide project management activities to create a unique product, service, or result to meet organizational, strategic, and operational goals.

project life cycle

A series of phases that a project passes through from its start to its completion.

project management plan

The document that describes how the project will be executed, monitored and controlled, and closed.

project management software

A computer application that helps plan, organize, and manage project resources and develop resource estimates for activities.

project management

The application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.

project manager

The person assigned by the performing organization to lead the team that is responsible for achieving the project objectives.

project phase

A collection of logically related project activities that culminates in the completion of one or more deliverables.

project requirements

For a project, these are the agreed-upon conditions or capabilities of a product, service, or outcome that a project is designed to satisfy.

project schedule network diagram

A graphical representation of the logical relationships among the project schedule activities. project schedule. An output of a schedule model that presents linked activities with planned dates, durations, milestones, and resources.

project scope statement

The description of the project scope, major deliverables, assumptions, and constraints.

project scope

The features and functions that characterize a product, service, or result.

project team

A set of individuals who support the project manager in performing the work of the project to achieve its objectives.

project

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

projectized organization

A structure where a project manager and a core project team operate as a separate organizational unit within the parent organization.

prototypes

A method of obtaining early feedback on requirements by providing a working model of the expected product before actually building it.

pull communications

Messages that require the interested people to access the information based on their own initiative.

push communications

Messages that are sent out to people who need to receive the information.

PV

(Present Value) The current value of a future sum of money or stream of cash flows given a specific rate of return.

PV

(Planned Value) The authorized budget assigned to scheduled work.

QFD

(Quality function deployment) Workshops that are commonly used in the manufacturing field to determine new product development requirements.

qualified vendors

The vendors who are approved to deliver the products, services, or results based on the procurement requirements identified for a project.

qualified vendors list

Contains details regarding vendors who meet the organization's requirements and to whom requests can be sent.

qualitative risk analysis

A technique used to determine the probability of occurrence and the impact of identified risk.

quality audit

A structured, independent process to determine if project activities comply with organizational and project policies, processes, and procedures.

quality gate

A special type of gate located before a phase that is strongly dependent upon the outcome of a previous phase. The quality gate process is a formal way of specifying and recording the transition between stages in the project life cycle.

quality management plan

A component of the project or program management plan that describes how applicable policies, procedures, and guidelines will be implemented to achieve the quality objectives.

quality metric

A description of a project or product attribute and how to measure it.

quality

The degree to which a set of inherent characteristics fulfills requirements.

quantitative risk analysis

Technique used to assess the risk exposure events to overall project objectives and determine the confidence levels of achieving the project objectives.

questionnaires

Written sets of questions designed to quickly accumulate information from a large number of respondents.

RACI chart

(Responsible, Accountable, Consulted, and Informed) A common type of Responsibility Assignment Matrix (RAM) that uses responsible, accountable, consult, and inform statuses to define the involvement of stakeholders in

project activities.

RAM

(Responsibility Assignment Matrix) A grid that shows the project resources assigned to each work package.

RBS

(risk breakdown structure) A hierarchical representation of potential sources of risk.

recognition

A more personalized, intangible, and experiential event that focuses on behavior rather than outcome.

regulations

Requirements imposed by a governmental body. These requirements can establish product, process, or service characteristics, including applicable administrative provisions that have government-mandated compliance.

relative authority

The project manager's authority relative to the functional manager's authority over the project and the project team.

requirements documentation

A description of how individual requirements meet the business need for the project.

requirements management plan

A component of the project or program management plan that describes how requirements will be analyzed, documented, and managed.

requirements traceability matrix

A grid that links product requirements from their origin to the deliverables that satisfy them.

resource calendar

A calendar that identifies the working days and shifts upon which each specific resource is available.

resource levelling

A resource optimization technique in which adjustments are made to the project schedule to optimize the allocation of resources and which may affect the critical path.

resource management plan

A component of the project management plan that describes how project resources are acquired, allocated, monitored, and controlled.

resource requirements

The types and quantities of resources required for each activity in a work package.

reward

A tangible, consumable item that is given to a person based on a specific outcome or an achievement.

reward and recognition plan

A formalized way to reinforce performance or behavior.

RFI

(Request for Information) A type of procurement document whereby the buyer requests a potential seller to provide various pieces of information related to a product or service or seller capability.

RFP

(Request for Proposal) A type of procurement document used to request proposals from prospective sellers of products or services. In some application areas, it may have a narrower or more specific meaning.

RFQ

(Request for Quotation) A type of procurement document used to request price quotations from prospective sellers of common or standard products or services. Sometimes used in place of request for proposal and, in some application areas, it may have a narrower or more specific meaning.

risk appetite

The degree of uncertainty an organization or individual is willing to accept in anticipation of a reward.

risk categorization

Organization by sources of risk (e.g., using the RBS), the area of the project affected (e.g., using the WBS), or other useful category (e.g., project phase) to determine the areas of the project most exposed to the effects of uncertainty.

risk impact

The likely effect on project objectives if a risk event occurs.

risk management plan

A component of the project, program, or portfolio management plan that describes how risk management activities will be structured and performed.

risk probability

The likelihood that a risk event will occur or prove true during the project.

risk register

A repository in which outputs of risk management processes are recorded.

risk threshold

The level of risk exposure above which risks are addressed and below which risks may be accepted.

risk tolerance

The maximum amount of risk, and the potential impact of that risk occurring, that a project manager or key stakeholder is willing to accept.

risk workshop

A technique that uses a special meeting conducted for the purpose of identifying project risks. In addition to the project team members, this workshop might also include the project sponsor, SMEs, customer representatives, and other stakeholders, depending on the size of the project.

risk

An uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.

ROI

(Return on Investment) A financial metric of profitability that measures the gain or loss from an investment relative to the amount of money invested.

root cause analysis

An analytical technique used to determine the basic underlying reason that causes a variance or a defect or a risk. A root cause may underlie more than one variance or defect or risk.

SAFe

(Scaled Agile Framework) A knowledge base of integrated patterns for enterprise-scale lean-agile development.

salience model

A classification model that groups stakeholders on the basis of their level of authority, their immediate needs, and how appropriate their involvement is in terms of the project.

schedule management plan

A component of the project or program management plan that establishes the criteria and the activities for developing, monitoring, and controlling the schedule.

scope baseline

The approved version of a scope statement, WBS, and its associated WBS dictionary, that can be changed using formal change control procedures and is used as a basis for comparison to actual results.

scope creep

The uncontrolled expansion to product or project scope without adjustments to time, cost, and resources.

scope management plan

A component of the project management plan or program management plan that describes how the scope will be defined, developed, monitored, controlled, and validated.

Scrum master

The coach of the development team and process owner in the Scrum framework. Removes obstacles, facilitates productive events, and defends the team from disruptions.

Scrum team

Dedicated, self-managing, cross-functional, fully empowered individuals who deliver the finished work required by the customer.

Scrum

An agile framework for developing and sustaining complex products, with specific roles, events, and artifacts.

sequential relationships

A type of phase-to-phase relationship that contains consecutive phases that only start when the previous phase is complete.

servant leadership

A type of leadership style used in agile and other types of projects which encourages the self-definition, self-discovery, and self-awareness of team members by listening, coaching, and providing an environment which allows them to grow.

SF

(Start-to-Finish) A logical relationship in which a predecessor activity cannot finish until a successor

activity has started.

share

A strategy for managing positive risks or opportunities that involves allocating some or all of the ownership of the opportunity to a third party.

simulation

An analytical technique that models the combined effect of uncertainties to evaluate their potential impact on objectives.

SLA

(Service Level Agreement) A contract between a service provider (either internal or external) and the end user that defines the level of service expected from the service provider.

SoS

(Scrum of Scrums) A technique to operate Scrum at scale for multiple teams working on the same product, coordinating discussions of progress on their interdependencies, and focusing on how to integrate the delivery of software, especially in areas of overlap.

source selection criteria

A set of attributes desired by the buyer which a seller is required to meet or exceed to be selected for a contract.

source-based risk classification

A method of analyzing risk in terms of its origins.

SPI

(Schedule Performance Index) A measure of schedule efficiency expressed as the ratio of earned value to planned value.

Sprint backlog

A list of work items identified by the Scrum team to be completed during the Scrum sprint.

Sprint planning

A collaborative event in Scrum in which the Scrum team plans the work for the current sprint.

Sprint retrospective

This critical part of the Scrum process is attended by the Product Owner, Scrum Master, and the Scrum team to analyze from a process perspective what is working well and what

is not and to agree upon changes to implement.

Sprint review

A review at the end of each iteration with the Product Owner and other customer stakeholders to review the progress of the product, get early feedback, and review an acceptance from Product Owner of the stories delivered in the iteration. Also referred to as a Demo.

Sprint

A timeboxed iteration in Scrum.

SS

(Start-to-Start) A logical relationship in which a successor activity cannot start until a predecessor activity has started.

stakeholder analysis

A technique of systematically gathering and analyzing quantitative and qualitative information to determine whose interests should be taken into account throughout the project.

stakeholder cube

A three-dimensional classification model that builds on the previous two-dimensional grids to group stakeholders.

Stakeholder Engagement Assessment Matrix

A matrix that compares current and desired stakeholder engagement levels.

stakeholder engagement plan

A component of the project management plan that identifies the strategies and actions required to promote productive involvement of stakeholders in project or program decision making and execution.

stakeholder register

A project document including the identification, assessment, and classification of project stakeholders.

stakeholder

An individual, group, or organization that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio.

standard

A document established by an authority, custom, or

general consent as a model for example.

statistical sampling process

A process that involves dividing sampling data into two categories—attribute and variable—each of which is gathered according to sampling plans. As corrective actions are taken in response to analysis of statistical sampling and other quality control activities, and as trend analysis is performed, defects and process variability should be reduced.

statistical sampling

Choosing part of a population of interest for inspection.

storyboarding

The prototyping method that uses visuals or images to illustrate a process or represent a project outcome. Storyboards are useful to illustrate how a product, service, or application will function or operate when it is complete.

supportive PMO

The type of PMO that provides a consultative role to projects by supplying templates, best practices, training, access to information, and lessons learned from other projects.

SV

(Schedule Variance) A measure of schedule performance expressed as the difference between the earned value and the planned value.

SWOT analysis

An analysis of strengths, weaknesses, opportunities, and threats of an organization, project, or option.

T&M contract

(Time and Material contract) A type of contract that is a hybrid contractual arrangement containing aspects of both cost-reimbursable and fixed-price contracts.

T-shaped

Refers to a person with one deep area of specialization and broad ability in the rest of the skills required by the team.

tacit knowledge

Personal knowledge that can be difficult to articulate and share such as beliefs, experience, and insights.

task board

Used to visualize the work and enable the team and stakeholders to track their progress as work is performed during an iteration. Examples of task boards include Kanban boards, to-do lists, procedure checklists, and Scrum boards.

team building

The process of continually supporting and working collaboratively with team members in order to enable a team to work together to solve problems, diffuse interpersonal issues, share information, and tackle project objectives as a unified force.

team charter

A document that records the team values, agreements, and operating guidelines as well as establishing clear expectations regarding acceptable behavior by project team members.

team management plan

A component of the resource management plan that describes when and how team members will be acquired and how long they will be needed.

team resource management

The processes necessary to organize, manage, and lead the people on the project team as well as the processes needed to procure and manage physical resources for a project.

team-building activities

The specific functions or actions taken to help the team to develop into a mature, productive team. They can be formal or informal, brief or extended, and facilitated by the project manager or a group facilitator.

teaming agreement

A legal contractual agreement between two or more parties to form a joint venture or any other arrangement as defined by the parties to meet the requirements of a business opportunity. The parties can be internal or external to the organization executing the project.

term contract

A type of contract that engages the vendor to deliver a set amount of service—measured in staff-hours or a similar unit—over a set period of time.

threat

A risk that would have a negative effect on one or more project objectives.

three-point estimating

A technique used to estimate cost or duration by applying an average or weighted average of optimistic, pessimistic, and most likely estimates when there is uncertainty with the individual activity estimates.

timebox

A fixed period of time; for example, 1 week, 2 weeks, 3 weeks, or 1 month.

tolerance

The quantified description of acceptable variation for a quality requirement.

total float

The amount of time that a schedule activity can be delayed or extended from its early start date without delaying the project finish date or violating a schedule constraint.

TQM

(Total Quality Management) An approach to improve business results through an emphasis on customer satisfaction, employee development, and processes rather than on functions.

training

An activity in which team members acquire new or enhanced skills, knowledge, or attitudes.

transfer

A strategy for managing negative risks or threats that involves shifting the impact and ownership of the risk to a third party and paying a risk premium to the party taking on the liability of the risk.

trend analysis

An analytical technique that uses mathematical models to forecast future outcomes based on historical results.

trigger condition

An event or situation that indicates that a risk is about to occur.

unanimity

Agreement by everyone in the group on a single course of action.

unique identification code

A specific configuration of a code of accounts that assigns a particular alphanumeric sequence of characters to each element of a WBS.

user story

A brief description of deliverable value for a specific user. It is a promise for a conversation to clarify details.

Validate Scope

The process of formalizing acceptance of the completed project deliverables.

value stream mapping

A lean enterprise technique used to document, analyze, and improve the flow of information or materials required to produce a product or service for a customer.

value stream

An organizational construct that focuses on the flow of value to customers through the delivery of specific products or services.

variable sampling data

Data from a sample that is measured on a continuous scale such as time, temperature, or weight.

variance

A quantifiable deviation, departure, or divergence away from a known baseline or expected value.

variance analysis

A technique for determining the cause and degree of difference between the baseline and the actual performance.

version control

A system that records changes to a file, in a way that allows you to retrieve previous changes made to it.

virtual team

A group of people with a shared goal who fulfill their roles with little or no time spent meeting face-to-face.

waiver

The giving up of a contract right, even inadvertently.

warranty

A promise, explicit or implied, that goods or services will meet a predetermined standard.

WBS dictionary

A document that provides detailed deliverable, activity, and scheduling information about each component in the work breakdown structure.

WBS

(work breakdown structure) A hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

work package

The work defined at the lowest level of the work breakdown structure for which cost, and duration are estimated and managed.

work performance data

The raw observations and measurements identified during activities being performed to carry out the project work. They can be recorded in the PMIS and project documents.

work performance information

The performance data collected from controlling processes, analyzed in comparison with project management plan components, project documents, and other work performance information.

work performance report

The physical or electronic representation of work performance information compiled in project documents, intended to generate decisions, actions, or awareness.

work shadowing

An on-the-job technique that enables someone to learn about and perform a job while observing and working with another more experienced person, or mentor



Lesson 1

Create a High-Performing Team

PMI® Authorized PMP® Exam Prep

Creating a High-Performing Team

Lesson Time: 8 hours

Lesson Introduction

The success of your project depends on the people involved. The project team members are vital to doing the work of the project efficiently and effectively. The stakeholders connected to the project have the ability to help or hinder a project's success and therefore need to be kept engaged along the way. A key role of a project manager is the assembling and managing of the project team and any additional stakeholders. High-performing teams have a shared understanding of and commitment to the project and possess the appropriate training that empowers them to do the work.

In this lesson, you learn what's involved in creating a high-performing project team.

This lesson addresses tasks from the People domain of the PMP® Exam Content Outline.

Lesson Objectives

In this lesson, you will learn how project managers and teams:

- Determine project team member requirements, appraise team skills, and maintain team knowledge transfer.
- Collectively define project ground rules based on context, such as organizational rules and team dynamics.
- Determine a negotiation strategy and negotiate project agreements.
- Organize around team strengths and support team task accountability.
- Ensure team members and stakeholders are adequately trained.
- Continually evaluate the effectiveness of virtual team member engagement.
- Reach consensus and support the outcome of the parties' agreement.

Lesson Topics

	Title	Slides
Topic A	Build a Team	2-27
Topic B	Define Team Ground Rules	28-39
Topic C	Negotiate Project Agreements	40-56
Topic D	Empower Team Members and Stakeholders	57-67
Topic E	Train Team Members and Stakeholders	68-81
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Topic G	Build a Shared Understanding About a Project	94-112

Topic A

Build a Team

You need talent, skill, and people who can get the project going. Let's take a look at what it takes to build a team!



Build a Team

Finding the talent, giving the motivation and inspiration to do their best—this is your first and foremost responsibility.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Building a Team

Project Resource Management includes the processes to identify, acquire, and manage the human resources needed to successfully complete a project.

Resource management is the project management area focused on categorizing, allocating, managing, and releasing human resources.



Project Team (Definition)

A project team is a set of individuals who support the project manager in performing the work of the project to achieve its objectives.

Roles on the project team can include:

- ✓ **Project management staff members** who perform activities such as budgeting, scheduling, reporting and control, risk management, and project communications. This role may be supported by a PMO.
- ✓ **Project staff members** who perform the work to create the project deliverables.
- ✓ **Supporting experts** who perform work to develop the project management plan. These roles can include legal, logistics, engineering, testing, and so on.
- ✓ **Business partner members** that support the business partnership.



Project Teams

As a critical part of project resource management, you need to be able to do the following:

- Estimate, acquire, and manage teams of people.
- Estimate the other resources those team members will need to carry out the work.
- Obtain the people.
- Develop the team, improve their competencies, facilitate interactions, and create an effective teaming environment.
- Track team performance, create, and execute improvements based on feedback, resolve issues, and manage team personnel changes



Project Team Member Requirements

These are a few of the major considerations you should think about when building a team.

- The team will need to have enough of the relevant skill sets to perform the work and produce the desired results.
- Try to avoid single-points-of-failure, where only one resource has a needed skill to perform a particular type of work.

- Make use of what are called generalizing specialists, who have a core competency but have general skills in other areas that can be leveraged as needed by the team to support its objectives.
- In addition to the team members themselves, you will need to identify the other physical supports that the team members will require to be able to perform—equipment, access rights, etc.).
- The **Plan Resource Management process** encompasses both planning for the team members and for the physical resources those team members will require to perform.



Stakeholder (Definition)

A stakeholder is an individual, group, or organization that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio.

- Stakeholders for a project, as the name implies, have a stake in the project and its deliverables.
- You need to be able to perform the following tasks:
 - Identify stakeholders
 - Plan stakeholder engagement
 - Manage stakeholders
 - Monitor stakeholder engagement
- Managing stakeholder influence and engagement throughout the project will have a large impact on a project's outcomes and success. That is why you need to engage with them strategically.
- Stakeholders may have competing interests, needs, priorities, and opinions. They may have conflicting visions for the project's outcomes, so managing them carefully is an important part of your role.



Project Stakeholders

- Stakeholders take on a variety of roles and responsibilities on a project, and can include members of the project team, customers, end users, and many other individuals and groups of people.
- Stakeholders may or may not be actively involved in project work and could affect or be affected by a decision, an activity, or an outcome of a project.



Idea: Ask you to categorize the named stakeholders in the graphic according to the parameters above—i.e., which are typically members of the project team, which are not? Which are typically active in project work?



Stakeholder Identification

- Identify internal and external stakeholders of a project as early as possible, learn what their needs are, and secure their participation in defining the project's parameters and success criteria.
- Although it may be difficult to negotiate a consensus early in the project, it is far less painful and costly than getting to the end of the project only to learn that someone's needs were not met or were misunderstood.
- Stakeholders are the people best able to help the project succeed, as they have a specific interest in the project objectives and its success.
- Once created, the communications management plan and stakeholder engagement plans should describe the stakeholders and the planned engagement model.



Stakeholder Identification – Tools & Techniques

- Identify project stakeholders regularly and analyze and document relevant information regarding their interest, involvement, interdependencies, influence, and potential impact on project success.
- As the project progresses, Change Logs, Issue Logs, or Requirements documents can also unearth additional stakeholders.
- The stakeholders' lists may be affected by different organizational environment factors.
- Existing templates and stakeholder registers from previous projects may be useful.



Stakeholder Register (Definition)

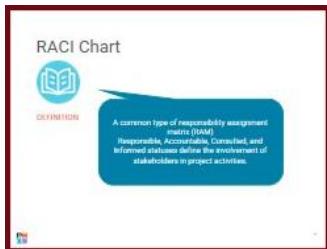
A list of individuals or organizations who are actively involved in the project, whose interests may be negatively or positively affected by the performance or completion of the project and whose needs or expectations need to be considered.

Documents like the Business Case and Benefits Management Plan should provide the names of the stakeholders.



Stakeholder Register

- **Name or organization** – Stakeholders can be individuals or entities.
- **Project Role** – Position on the project or job title in the organization.
- **Major Requirements** – Which of the project requirements are they concerned with?
- **Expectations** – Take note of their expectations of the project. You will have learned this during an interview, for example.
- **Influence** – What degree of impact can this stakeholder have on the project. Use descriptive terms and ensure everyone understands what the terms mean.
- **Areas of Interest** – Take note of project areas where you expect they will have inputs or interest.
- **Internal/External** – Is their role inside the company or not?
- **Supporter?** – Note this stakeholder's view of the project. Is it supportive, tolerant, resistant, critical, and so on? Use descriptive terms so that this information can be useful.



RACI Chart (Definition)

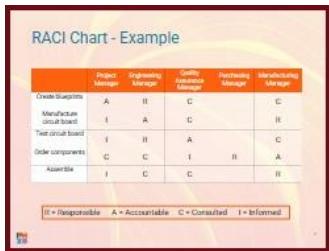
A RACI chart is a common type of Responsibility Assignment Matrix (RAM) that uses responsible, accountable, consult, and inform statuses to define the involvement of stakeholders in project activities.

RACI stands for: **Responsible, Accountable, Consulted, Informed**



Note: The RACI chart is also called a RASI chart, where "S" stands for "Support."

A use case about circuit board production is given on the next slide.



RACI Chart Example

The RACI matrix helps identify who is responsible for making decisions and how the people responsible are supported. RACI is generally used to provide clarity on the roles and responsibilities assigned to each project team member.



Team Skills Appraisal

The project leader needs to perform an assessment of team members for skills, aptitude, attitude, work style, and other characteristics.

Assessments of the team members and the team holistically enable the team to:

- Identify its strengths and weaknesses
- Help assess opportunities for improvement
- Build trust
- Establish communications mechanisms

These may help to better identify:

- Team preferences
- Aspirations
- Information processing and organization
- Decision-making processes
- Interactions with other team members



Pre-Assignment Tools

These are a few ways of assessing team members.

There are a number of tools and techniques to support skills appraisals. These may include:

- Attitudinal surveys
- Specific assessments
- Structured interviews
- Ability tests
- Focus groups



Idea: Have you used any of these in a project? Think about some examples.



Diversity, Equity and Inclusion

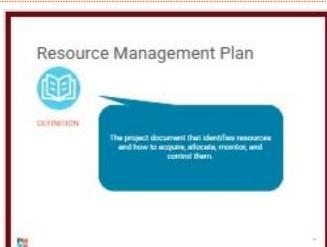
Project teams are global and diverse
with different cultures, physical ability, language, etc.
Create an environment that optimizes the team's diversity and builds trust and mutual respect.
Team development objectives should:

- ✓ Improve trust to raise team morale, reduce conflict, and support teamwork.
- ✓ Create a collaborative culture to improve individual and team performance and facilitate cross-training and mentoring.
- ✓ Empower the team to participate in decision making and own the solutions they create.

Diversity, Equity, and Inclusion (DEI)

Diversity, Equity, and Inclusion, or DEI, is an established human resource component or initiative in most global workplaces.

- Here, we need to emphasize that every single project has diversity. People come from different backgrounds of gender, language, ability or disability, nationality, and so on.
- DEI initiatives work towards establishing equitable and “psychologically safe” workplaces, which is a practice element in Disciplined Agile.
- You should seek to create an environment that takes advantage of this diversity and builds a team climate of mutual trust.
- Team DEI development objectives might include:
 - Improving team knowledge and skills to reduce cost and time and improve quality.
 - Improving trust to raise team morale, reduce conflict, and improve teamwork.
 - Creating a collaborative culture to improve individual and team performance and facilitate cross-training and mentoring.
 - Empowering the team to participate in decision making and own the solutions they create.



Resource Management Plan

DEFINITION

The project document that identifies resources and how to acquire, allocate, monitor, and control them

Resource Management Plan (Definition)

The Resource Management Plan is a component of the project management plan that describes how project resources are acquired, allocated, monitored, and controlled.



Resource Management Plan

Roles and Responsibilities

- ✓ Role – A person's function in a project
- ✓ Authority – Rights to use resources, make decisions, accept deliverables
- ✓ Responsibility – Assigned duties
- ✓ Competence – Skills and capacities required

What's in the Plan

- ✓ Project Organization Chart – visualization of team and reporting relationships
- ✓ Project team resource management – Team resource guidelines – How to define roles, responsibilities and authority
- ✓ Training strategies and requirements
- ✓ Team development methods
- ✓ Resource controls – To manage physical resources
- ✓ Recognition Plan – To reward/recognize team members

Resource Management Plan

Part of your project team's resource management plan will include a resource schedule. The resource management plan might encompass the following:

- Identification of resources
- Acquisition of resources
- Roles and responsibilities
- Roles—The function of the person in the project.

- Authority—Rights to use resources, make decisions, accept deliverables, etc.
- Responsibility—Assigned duties to be performed.
- Competence—Skills and capacities required to complete the desired activities.
- Project Organization Chart—Defines the project team members and their reporting relationships.
- Team resource management—Guidance on the lifecycle of the team resources, how they are defined, staffed, managed, and eventually released.
- Training strategies and requirements.
- Team development methods to be used.
- Resource controls for the management of physical resources to support the team.
- Recognition Plan—How team members are rewarded and recognized.

As the project manager and team estimate activity resources, they will produce a resource calendar that identifies the following:

- Working days, shifts, hours, weekends, and holidays
- Physical resource availability
- When and for how long resources will be available during the project
- Attributes such as skills, experience levels, and geographies



Virtual Teams

Many project teams now are virtual teams with members that are not co-located.

Virtual teams:

- Are defined as a group of people with a shared goal who fulfill their roles with little or no time spent meeting face-to-face.
- Create opportunities for finding team members with greater skills, at lower costs, and allow a project to avoid relocation expenses.
- Create challenges for managing communications and enabling effective team performance.
- Can leverage technology solutions to facilitate face-to-face communications, store and share files, create threaded discussions and wikis, and manage the team's calendar.
- Can be difficult, for a number of reasons, including:
 - Bonding and team identity can be hard to create when team members are geographically dispersed

because finding ways to provide a sense of team spirit and cooperation may be difficult.

- Communication and information sharing needs to rely on various forms of technology because teams cannot meet face-to-face. However, managing electronic collaboration so that everyone on the team can reliably transmit and access information from one another can be challenging.
- Because roles, reporting, and performance can be harder to track on a dispersed team, individual contributions may be overlooked.



Virtual Team Considerations

Let's follow and fill in this flow chart about virtual team work.

- Top row – Considerations or benefits of virtual teams
- Middle row – Challenges associated with virtual teams
- Bottom row – Solutions to the challenges



Idea: We've proposed two possible solutions to the challenges of "managing communications" and "Enabling effective team performance". Can you think of solutions to these challenges and to the third one, "Bonding and team dynamic might be difficult to develop"?



Assign Project Responsibilities

Defining the responsibilities within the project team depends on a number of factors.

- Teams that use a **traditional approach** explicitly define and delegate individual and team responsibilities as part of an overall work breakdown structure.
- Whereas teams using an **agile or hybrid approach** self-organize, and the members of the team determine who will perform which work.

Whether through assigning or self-organizing, open communications and effective collaboration are critical to tailor the approach to project and team needs.

In general, though, identifying a suitable resource to perform a responsibility might be based on the following:

- **Experience:** Does the team member have the relevant experience to carry out the activity?
- **Knowledge:** Does the team member have relevant information about the customer need, prior implementations, and the nuances of this project?
- **Skills:** Does the team member have the relevant skills?
- **Attitude:** Does the team member have the ability to collaborate with the other team members?
- **International factors:** Consider team member location, time zone, and communications needs.



Rates

Each resource has a cost factor. This explains how you work with the cost factor of resources.

The project manager is responsible for project budget and disbursements. Resource requirements should be met using the most cost-effective resource given the needs of the project, resource availability, and other factors.



Resource Assignment

The project manager is expected to document the team members assigned to the project, their roles and responsibilities, and may include a project team directory, project organization charts, and project schedules.

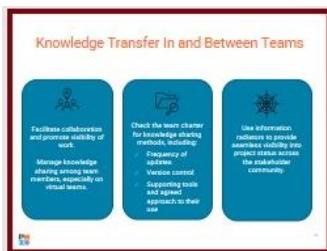
These assignments make up an important part of the project management plan, and it is broader in scope than the resource management plan. Resource assignment details in the project management plan include:

- Team members assigned to the project
- Their roles and responsibilities
- Project team directory
- Project organization charts
- Project schedules



Nurturing Team Performance

When you are setting up your team, you should be thinking ahead about how you will support them. This is the subject of Lesson 4, but you need to plan for it during this stage.



Knowledge Transfer in and Between Teams

Make a plan for how you will capture and share knowledge within your team and then make it available for concurrent or future teams. Let's take a look at how project managers set up teams for successful knowledge sharing and transfer.

- Facilitate collaboration and promote visibility of work.
- Manage knowledge sharing among team members, especially on virtual teams.
- Check the team charter for knowledge sharing methods, including:
 - Frequency of updates
 - Version control
 - Supporting tools and agreed approach to their use
- Use information radiators to provide seamless visibility into project status across the stakeholder community.

TOPIC B

Define Team Ground Rules

In order for the team to perform effectively, they need to collectively define project ground rules based on context, such as organizational rules and team dynamics.



Define Team Ground Rules

After we've built the team, the next step is establishing working ground rules.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Teams Norms

Team norms are the agreed standards of conduct for all project team members.

- Establish these norms early in the project, to set the stage for appropriate range of behaviors and actions.
- Team norms are a shared set of mutually-agreed rules. It's a means of keeping a standard and accountability in case of problems.
- Align your team norms with the PMI Code of Ethics and Professional Conduct.



PMI® Code of Ethics and Professional Conduct

The PMI® Code of Ethics and Professional Conduct describes the ethical and professional behavior expectations of any individual working as a project management professional.

The four most important are:

- Responsibility
- Respect
- Fairness
- Honesty

Teams should adopt a similar set of ethics that sets expectations among the team members for honesty, integrity, and commitment to supporting the team's objectives in an ethical manner.



Team Charter (Definition)

The team charter is a document that enables the team to establish its values, agreements, and practices as it performs its work together



Team Charter

A good team charter should include:

- The team's shared values.
- Guidelines for team communications and the use of tools.
- How the team makes decisions.
- How the team resolves conflicts when disagreements arise.
- How and when the team meets.
- Other team agreements (such as shared hours, improvement activities).

Ideally the charter should be produced by the team, or at least with the team's active participation. The team charter can and should be reviewed and updated as needed on a periodic basis.



Ground Rules (Definition)

- Ground rules are clearly set, written expectations regarding the code of conduct for team members.
- Ground rules include all actions that are considered acceptable and unacceptable in the project management context.
- Ground rules are included in the project charter.



Ground Rules

- By committing to a clearly defined set of ground rules, the team sets expectations for performance, decreases the risk of confusion, and improves performance.

- High performance teams need to have visibility into each other's work, clear rules on expectations and communications, and how to handle conflicts among the team members when they inevitably occur.
- By establishing clear ground rules up front, and deciding how violations will be dealt with, the team sets expectations for itself, and provides itself a tool to maintain and norm its performance.
- The project manager seeks to create an environment where the teams can perform effectively and build trust.
- Ground rules contribute to these ends by enabling the team to take ownership of its rules, set expectations for itself around how the team will operate together, and establish effective mechanisms to handle conflicts that will inevitably occur.
- Key objectives include:
 - Facilitating effective team collaboration
 - Promoting visibility of work and progress
 - Enabling the team to self-organize and self-manage as much as practicable



Negotiation Skills

Every team will negotiate roles and responsibilities, priorities, assignments, and deliverables. All team members should develop good skills in negotiation among themselves and with other stakeholders as required.



Internal and External Team Member Communication

The team will need to have regular communications with stakeholders outside the team. In many cases, the project team may have dependencies with other external teams, and collaboration will be required in order to ensure effective expectations—i.e., management among the various stakeholders. Part of an effective team charter may include communications protocols inside the team (team meetings, shared calendars, etc.) as well as periodic communication with external stakeholders to generate feedback, manage dependencies, and ensure alignment.



Conflict Management

Conflict is inescapable, but clearly set ground rules can help avoid or mitigate conflict.

The team should focus on its core values when addressing “serious” violations. Accountability, shared expectations, and transparency are paramount.



Idea: Have you been on a project in which clear ground rules would have prevented conflict?



GUIDELINES: Manage and Rectify Ground Rule Violations

- When the team establishes its charter, it sets expectations for the ground rules about how the team is to operate, and what methods will be used to handle conflicts that occur.
- For violations of the team’s ground rules, the team and the project manager should assess opportunities for remediation
- If the violation is serious—and it’s a good idea to define levels of violations—the team may need to remove or replace the offending team member.

TOPIC C

Negotiate Project Agreements

Now that the team has been assembled, you might need to facilitate negotiations to reach an agreement about the project objectives.



Negotiate Project Agreements

This is the third topic in Lesson 1. We explain a few concepts and artifacts in the first few slides before discussing the negotiations process.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Project Agreement Objectives

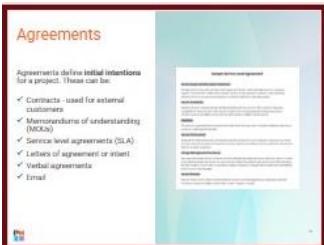
This is an overview of how you'll be able to monitor the work in a project and judge when work is completed.

An important part of the project agreement is clarity on how the respective parties will report on and verify that the objectives of the project are met.

In a project using traditional methods, each deliverable is identified and objective acceptance criteria for each are identified.

In an agile project, since the actual deliverables will vary as the product backlog is added to, reprioritized, and so forth, each story needs to have clearly defined acceptance criteria approved by the customer.

The project may also specify a Definition of Done for the project, releases, iterations, and user stories.



Agreements

This slide is about agreements in general. An SLA is depicted on the slide, so that is explained, below.

Agreements:

- Help to define relationships between a service provider (internal or external) and the end user.
- Describe the level of service expected from the service provider.
- Can incorporate expectations for service utility (functional performance) and service warranty (including availability, speed, security, continuity, and other usability expectations).
- Can take the form of contracts, MOUs, SLAs, letters, verbal, or email correspondence.

SLAs govern a service after a project is delivered and define the expected level of performance. Ideally, effective SLAs should reflect business-driven metrics, including such things as transaction processing, customer satisfaction, etc.



Reaching Agreements in Negotiations

As we learned in the first topic, negotiations are discussions that are aimed at reaching an agreement.

As part of an external procurement, the agreement may specify the rights, obligations, and terms of a purchase in order to facilitate a mutual agreement prior to signing a contract.

Soft skills like active listening are extremely useful during negotiations.



Negotiation Strategy

While an external negotiation should be led by a member of the procurement team authorized to sign contracts, the project manager and project team members assist as needed.

If using a traditional project approach, strive to clearly describe the project's intended deliverables, how completion and quality will be measured, and what the cost will be.

In a more agile approach, the exact deliverables will be variable as the customer modifies, adds, and reprioritizes items in their product backlog. So, you need to ensure that performance levels for the deliverables are defined and agreed.



Negotiations

This list of items comprises what we use to reach agreements in a negotiation and also what's produced as a result of an agreement.



Idea: Can you differentiate between the items in this list? Which are used in reaching an agreement and which are the produced because of an agreement?



Prioritization Techniques

When thinking about what work needs to be done to produce project deliverables or outcomes, you have to prioritize.

Project managers may be asked to help the customer prioritize the list of work. In this case, you can use a prioritization technique.

Prioritization techniques include:

- **Product backlog** - In agile approaches, you maintain and manage a product backlog. The product backlog is owned by the customer—or the product owner in Scrum—and reflects a list of desired capabilities, written as User Stories, and a prioritized list, with the items that have the highest business value and highest business risk listed first.
- **Kano model** - Identifying certain features or capabilities as Basic, Performance, or Excitement helps in the prioritization of which capabilities are truly must-have, what features may create meaningful competitive differentiators, etc.
- **MoSCoW (MSCW) analysis** - Categorize features as Must Have, Should Have, Could Have, and Won't Have (for now). This helps customers organize their thinking about what are truly must- have capabilities and enables identification of a Minimum Viable Product (MVP).
- **Paired Comparison Analysis** - Looking at each pair of stories and prioritizing one over the others.
- **100 Points Method** - Each stakeholder is given 100 points and can multi-vote their points across all the stories, which then give a weighted priority when combined.



Performance Reports

Part of the negotiation is defining how project performance will be captured and reported.

Example metrics might include:



- Percentage of work completed
- Quality and technical performance metrics
- Start and finish of scheduled activities
- Change requests
- Defects
- Actual costs and durations

Work performance data is defined as the raw observations and measurements identified during activities that are part of project work.

Work performance data is integrated and contextualized in reports that should:

- Generate decisions
- Raise issues, actions, and awareness

Agile projects may also include:

- Stories completed and accepted
- Progress tracked using a product backlog
- Team delivery of stories against iteration plans



Expert Judgment (Definition)

Expert judgment is a key input of many project management processes.



Experts

As part of negotiating a project agreement, the project manager needs to identify relevant subject matter expertise to use during the project.

- Help assess needs.
- Identify potential solutions and approaches.
- Ensure understanding of the larger project context.



Resource Calendars (Definition)

The resource calendar identifies working days, shifts, and when specific resources are made available to the project.



Resource Calendars

Use a calendar to determine resource availability during a planned activity period. Then take this into account when estimating project activities.

The calendar may also identify key resource attributes such as skills and experience levels to ascertain if the resources with the proper skills to carry out certain types of work will be available during different aspects of the project.



Review Team Performance and Identify Lessons Learned Regularly

You may not think this is a task to complete before project kickoff, but it is.

In the context of estimating project requirements and negotiating, team performance metrics and lessons learned data from current or past projects are helpful.

Therefore, ensure that you are planning for team performance reviews and ensure that lessons learned, or project retrospectives are part of your project team strategy. This data will be helpful in the current moment and in the future.



Lessons Learned Register (Definition)

A lessons learned register records knowledge gained during a project so that it can be used in the present moment and also made into an artifact for later use.



Lessons Learned

We're using the term "lessons learned" here, but these ideas are similar in agile project retrospectives.

An effective project team should regularly review its performance and identify specific improvements that will increase the team's overall efficiency and effectiveness.

Having this register can improve the team's project performance and potentially that of other teams and other projects as well.

Agile teams schedule a ceremony called a retrospective at the end of each iteration to identify potential issues, solutions, and improve the processes the team uses to improve its overall performance.



Special Intervals

Down time during work often causes disruption and distress, so be sure to identify and include reasons for down time in your negotiations and agreements for project work.

“Blackout” or “Go Live” times are often necessary during production of work.

TOPIC D

Empower Team Members and Stakeholders

Project managers need to get a feel for their teams, identify and organize around team strengths, and set up systems to ensure the teams are accountable for their tasks.



Empower Team Members and Stakeholders

Welcome to the fourth topic in this lesson! Let's discuss why empowering team members and stakeholders is an essential part of building a high-performing project team.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Team Strengths

When forming teams, it is critical to understand the needed competencies and to identify individual as well as team strengths. This includes skills, knowledge, working practices—any aspect or characteristic that will promote project success.

In addition, you should identify any challenges that the team will need to overcome to obtain better performance.

Use a technique such as SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis to identify team strengths and weaknesses that may be addressed during the project.



Team Decision-Making Tools

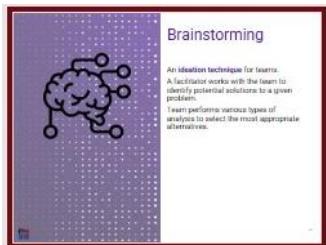
Decision-making is a core function of all teams. They need to make decisions about activities, risks, estimates, and many other challenges.

Forming a team includes deciding how the team will make decisions together, and how they will handle conflict resolution when disagreements arise.

As the initial Team Charter is produced, the team needs to address decision making and conflict resolution.



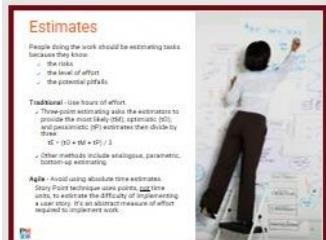
For example, it may be highly desirable to seek consensus, but the team may want to identify how they will respond when consensus can't be reached; for example, by deciding in advance to take the highest estimate in case of persistent disagreements.



Brainstorming

Brainstorming is an ideation technique. It empowers team members and stakeholders by enabling everyone to become involved in generating the ideas that lead to solutions and decisions.

In brainstorming, a facilitator works with the team to identify a series of potential solutions to a given problem and then performs various types of analyses to assist the team in selecting the most appropriate alternatives.



Estimates

Estimating tasks should be performed by the people doing the work; they are the ones closest to it and have the best knowledge of the risks, level of effort, and potential pitfalls associated with the task.

There are a few methods of estimating tasks:

- In general, traditional project managers use **hours of effort** to identify the length of time a task will take, often with some caveats.
- **Three-point estimates**, which estimate the best case, normal case, and worst-case timescales, might be used to provide a clearer sense of the level of uncertainty and to set expectations appropriately.
- Agile projects tend to avoid using absolute time estimates as the level of uncertainty in the work is often high. Instead, a relative measure like **Story Point estimating** is used.

Story Point estimating can be helpful as an integrated assessment of risk, innovation, and pure effort involved in carrying out a particular task because it allows for not

knowing everything that's needed to know to provide a precise time estimate. In addition, this technique allows the team to have a useful benchmark for the overall level of effort and the customer to have a meaningful sense of how much work the team can perform in an iteration.



Team Task Accountability

Promote accountability by empowering people to take responsibility for work. Effective project managers generally encourage the team members themselves to "self-organize" for them to determine the work that must be done in order to meet an objective, to identify how to perform that work and who should perform it.

Focus on visibility and collaboration by using Gantt charts or Kanban boards.

It is critical to have visibility on who is performing which tasks and when to ensure effective collaboration and use of team resources. This may be tracked and managed as part of a large project schedule or more simply on team task boards that facilitate collaboration and promote visibility across the team.



Retrospective

Continual improvement has long been an objective in all aspects of business, but much of the time operational work, firefighting, and other reactive activities have crowded out the opportunity for teams to seek real improvements in their processes and practices.

Agile practices like Scrum have popularized a ceremony called a Retrospective, which time specifically set aside for the team to reflect on its performance and practices, identify and solve problems, and identify specific proposed improvements for how the team works together.



Retrospective

There are literally hundreds of different methods and techniques for running a retrospective, but they generally follow a model like this.

- **Set the Stage** - Do some kind of check-in activities to engage the team.
- **Gather and Share Data** - Team Performance metrics, Earned Value Analysis, etc.
- **Generate Insights** - What's working? Where are challenges? Problem Analysis.
- **Make Decisions** - Agree on 1-2 improvements/changes to try in the subsequent iteration.
- **Close** - New Information, Appreciation, and Thank-Yous.



GUIDELINES: Evaluate Demonstration of Task Accountability

The project manager should determine how task accountability will be tracked and managed.

As part of developing a Work Breakdown Structure (WBS), tasks to produce the deliverables should be identified, preferably by the team members who will be performing the work. When a WBS dictionary (or work package) is produced, each of the relevant tasks and assignees to produce the deliverable is identified, tracked, and managed.

In a more agile approach, task identification and tracking are generally handled by the team themselves as part of iteration planning. Generally, each of the committed user stories for that iteration are decomposed into the required tasks, which then are tracked and managed by the team using an information radiator like a Kanban or task board. As work is pulled in for execution, the team member takes ownership of the tasks and works to complete them. The entire team is accountable for ensuring that all of the work required in the iteration is performed to deliver the committed stories for that iteration.



GUIDELINES: Determine and Bestow Levels of Decision-Making Authority

In general, it is good management practice for decisions to be made at the “right” level. Therefore, project managers should defer appropriate decisions to the team, while maintaining control and visibility into the overall plan and progress.

- Team members should identify, plan, and manage tasks as much as possible by the team members themselves. They are the ones closest to the work and will have the best visibility into what needs to be done to perform the work and deliver the needed results.
- Teams performing the work also should estimate the work. Especially in teams where a number of different people are sharing the overall workload, not every team member can perform a certain amount of work in the same time. Using relative estimates helps the team focus on the rough overall level of work without getting too precise on the exact number of hours it will take; hour estimates may differ widely based on risk, the level of innovation required, and who will actually be performing that work and their relative skills and experience.
- Empower the teams to drive their own improvement. Techniques like retrospectives emphasize that it is important for project success for the teams to set aside time for their own continual improvement. The efficiencies teams develop by doing continual improvement far outweigh the time set aside to do it.

TOPIC E

Train Team Members and Stakeholders

Another key objective of the project manager is to make sure team members and stakeholders are adequately trained.



Train Team Members and Stakeholders

This is the fifth topic in this lesson.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Training and Coaching Plan

To enable the best performance from your team, training and coaching need to be an integral part of your team functions.

Team members may need to be trained in different aspects of the project, the customer environment, and the solution approach. Users, customers, and other stakeholders will require training and other knowledge transfer to ensure successful onboarding of the solution. This is a critical component of the overall organizational change management work required to ensure customer readiness.



Training and Coaching

Training provides specialized skill building for individuals and the team.

Coaching is a long-term relationship between individuals, which aims to transfer skill sets and knowledge from the more experienced party to the less experienced party.



Training and Coaching Plan

The team should have a plan for training, coaching and mentoring activities.

Here are some guidelines:

- When** – Timing is important. Skill training for a deliverable (product or service) should happen close to the time of delivery or implementation to avoid delays and to ensure the customer accepts the product or service successfully.
- Which** – How do you decide which training, coaching, and mentoring activities you need to have for your high-performing team? A gap analysis is a great method.
- Formalization through certification** – Consider whether the team, the project, or the organization would benefit from pursuing specialized certifications. They can be a valuable investment.
- Scope** – In addition to technical and practical skills, also consider soft skill training, or knowledge or experience sharing.



T-Shaped Skills

Focus on enabling team members to think of themselves as “T-shaped”.

It's no longer enough for most of us to be experts in one focused area. We need to develop competencies and expertise across a broad range of areas. So, consider the depth as well as breadth of team members' knowledge.



Required Competencies

We mentioned using a gap analysis to identify required competencies. Here is some further detail:

- Identify the required competencies before executing a training plan.
- Think about which “hard” and “soft” skills are needed.
- What type of training do the various stakeholders need? Some will require more in depth or different training than others.
- Finally, you may need to tailor team training to ensure they are familiar with the customer's business, culture, desired outcomes, and project context.

Elements of Training

Provided to teams, small groups, and individuals
Covers management, technical, or administrative topics
Delivery methods:
 ✓ Instructor-led classroom
 ✓ Virtual classroom
 ✓ Self-paced e-learning
 ✓ Document review
 ✓ Interactive simulations
 ✓ On-the-job training



Elements of Training

Training is a well-known and versatile way of imparting knowledge and skills to individuals, small groups, or whole teams.

Consider from the many forms of training available:

- Instructor-led, classroom – physically present or co-located
- Virtual classroom, instructor-led
- Self-paced eLearning
- Document review
- Interactive simulations
- On-the-job training

Training Options

Option	Description
Virtual Instructor-led training	✓ Live online, instructor-led training through a virtual meeting or virtual training environment. Simulated hands-on labs are possible.
Self-paced eLearning	✓ Content available to students online. This can include rich-media video, simulated lab exercises, etc. For self-paced learning, it is important to have clear materials.
Document review	✓ For knowledge transfer, sharing relevant documents may be sufficient.

Training Options

This table describes some of the training methods we just listed. Let's explore them a bit more.

This course is delivered as either a live (in-person) or online, instructor-led training through a virtual environment. Simulated, hands-on labs are often made available this way as well.

Self-paced eLearning is another option. It is scalable and can include rich-media video, simulated lab exercises, etc.

Training Cost and Schedule

Consider the costs of training the project team and customer stakeholders as part of the budget.

Use a training calendar to:

- ✓ Publish and expand a specific calendar of training dates and locations
- ✓ Publish schedule to customers
- ✓ Create a mechanism for registration and sending confirmation messages.
- ✓ Provide class numbers and a way to track attendance.
- ✓ Manage the training schedule to avoid delaying the project delivery timeline.



Training Cost and Schedule

Training costs are part of a project budget. But they are also elements that need to be scheduled!

- Use a training calendar to publish and support training
- Ensure stakeholders can see the training schedule
- Facilitate and confirm registration through the calendar, ideally
- Track attendance with class rosters
- Use the schedule to manage the training schedule in alignment with the project schedule

Pairing and Coaching

Pairing customer stakeholders together reinforces the learning through collaboration.

Coaching enables an experienced team member to coach a less experienced team member.

- ✓ Positions team building and a collaborative environment.
- ✓ Relationships can be informal or ad-hoc, curated by the individuals themselves or formally established by the organization.



Pairing and Coaching

Pairing enables collaboration between stakeholders. They can learn together, and within the pairing, use collaboration to reinforce concepts and knowledge.

Coaching fosters team building and collaboration. Coaching can happen informally, or opportunities can be made deliberately.



Certifications

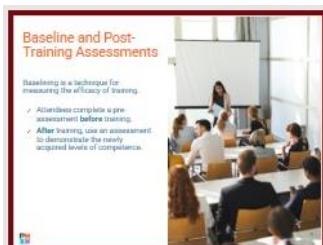
Training does not always lead to formal certification, and certification is not always necessary. However, sometimes it is useful.

Some trainings end with a training credential, or topical certification: a certificate or badge are examples.

Beyond that are professional certifications. An industry certification demonstrates credibility of expertise or skill. Industry credentials are portable and may be a desirable reward for the certification holder, as this demonstrates their knowledge and skills to a wider audience for advancement or employment opportunities. Investing in certification for your team shows them that you and/or the organization are helping them improve their skill set.



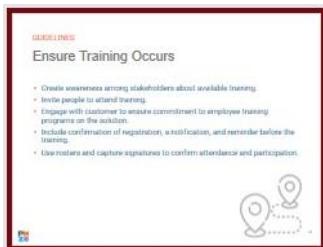
The PMP®, for example, is an industry-recognized and premier professional certification.



Baseline and Post-Training Assessments

You can and should measure the efficacy of training.

One technique for doing this is baselining, where attendees are provided a pre- assessment to measure pre-existing skills, then a post-assessment after the training is completed to demonstrate the new levels of competence.



GUIDELINES: Ensure Training Occurs

Scheduling and procuring suitable training are only the first step in a project manager's role of ensuring the team is properly trained. Some other actions might include:

- Creating awareness among the stakeholders about available training.
- Invite people to attend training.
- Engage with customer management to obtain their buy-in and commitment for their employees to attend the training programs.
- Sending registration confirmation notices and reminders prior to the training event to ensure they have not forgotten.
- Create rosters for each delivery of the training, capturing signatures to confirm attendance and participation in any pre- or post-assessments.

TOPIC F

Engage and Support Virtual Teams

Projects almost always use virtual teams. In this topic, you will look at how to stand up and help your virtual team become effective and high- performing, and to continually evaluate the effectiveness of virtual team member engagement.



Engage and Support Virtual Teams

This is the sixth lesson in this topic. We mentioned virtual teams earlier, noting especially the challenges. Now, it's time to delve a bit deeper in this topic.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Collaboration Technology

This is about the technology used to communicate in virtual teams. Planning for communication in virtual teams is discussed in later, in slide 89.

Virtual teams need collaboration tools and technology. While technologies to enable team planning, collaboration, and communications are important, they are not a substitute for good team planning activities. We will discuss this in a few moments.

Team working choices will have substantial implications for collaboration technology; not only which technologies the team uses, but how they use the tools.



For example: If the team values and prioritizes transparency, then collaboration and working methods will need to be highly visible to all.

Here is a list of some common collaboration tools used for virtual teams:

- Shared task boards and burndown/burnup charts to promote visibility.

- Shared messaging and chat boards to enable quick ad hoc communications.
- Knowledge repositories to store shared documents.
- Video-conferencing tools to create more opportunity for face-to-face collaboration.

Any combination of these types of tools can be useful, if your team has decided how to use the tools to help the team promote visibility and enable collaboration.



Virtual Team Member Needs

Let's shift now to what a virtual team needs to thrive.

The list begins with the basics:

- A shared goal
- A clear purpose
- Clarity on their role and what is expected of them.

Because the team is not co-located, project managers of virtual teams will spend a substantial amount of their time "knocking down virtual walls" to ensure the teams are able to effectively collaborate and operate as a team, and not just a series of isolated individuals.



Virtual Team Member Engagement

Managing engagement with virtual team members requires persistence and a focus on good team dynamics, especially transparency, accountability, and active attention to effective communications.

Teams communicate better face-to-face, and there is lots of evidence of the criticality of being able to assess body language and tone of voice to ensure that team members have bought into the approaches they are using together to solve problems.

So how do we set up a virtual team for success? There are two main methods:

- Investment in and active use of **videoconferencing tools** enable team meetings to more fully integrate all aspects of the team and to ensure that the team members are committed to their solution approaches.
- Another key area is **visibility into work and work status**. Even a small team will have trouble aligning its work activities unless effective tools are

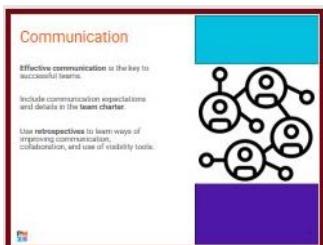
implemented to collaborate and promote visibility. Many tools enable the use of Kanban-style boards to visualize the work to do, to track (and limit) work-in-progress, and to note when work activities are completed, and objectives have been met.



Note: While these technologies can certainly support your team's endeavors, **how** the team uses the tools and how well the tools' use reflects the team's values and priorities is critical.



For example: If the team doesn't keep the information on a task board current, it's always out of date, and people can't make decisions or pull work based on what the board says, thus defeating a lot of the purpose.



Communication

While it's trite to say that communication is key, it clearly is. Successful teams get to be successful by working together to execute work, solve problems, and produce solutions.

In a virtual team, the need for effective communications is even greater due to the lack of opportunity for osmotic learning from just being around your other team members.

Part of an effective **team charter** is to make decisions as a team about how, when, and why you communicate with one another, and what the shared expectations are. This may include shared work hours for scheduling team meetings, how the team is expected to use and not use tools like threaded discussion groups, shared document repositories, and even webcams.

A team that has made a commitment to itself to manage communications effectively will experiment on how to use the tools in the most effective way; the emphasis must be on getting results.

Good **retrospectives** often focus on specific ways the team can improve communication, collaboration, and the use of their tools to improve visibility.



Engagement Assessment

When a team is first engaged, care should be taken to identify team members who will be able to successfully form a coherent working team and work together to achieve the team's objectives. While all teams need people with certain subject matter expertise and capabilities, effective teamwork, collaboration, and communications are especially important in whether the virtual team will be able to perform effectively.

This is especially important in virtual teams.

As new members may join the team over time, the team itself will need to go through the process of re-forming, storming as necessary to produce a new set of team norms, and then begin the process of continual improvement as the team strives for greater efficiency and effectiveness.



Idea: What's been your experience working in virtual teams? What has worked and what has not? How have visibility, transparency, and communication played a part in your virtual team experiences?



Communications Plan

In the same way the project manager establishes a communications plan for engaging with other project stakeholders, a communications plan **for the team itself** should be created and executed. Again, the objective is effective collaboration and broad, accurate visibility across all of the relevant stakeholders.

This may include:

- **Working times** - When will the team meet? When are shared hours? Do they hold daily stand-up meetings? Grooming meetings to clean their backlogs? Sprint Planning meetings? Sprint Reviews? Retrospectives? You need to make these decisions and document them in the communications plan.
- **Working methods** - How do team members update status on team task boards and/or burndown charts? How often do team members update their work status?
- **Communications method** - What are their preferred communications approaches? Chat channels? Phone? E-mail? Shared task boards? Plan for initial

communications expectations for the team, and then encourage the team to adopt its own practices and experiment with ways to drive iterative improvements to their communications approaches.



GUIDELINES: Implement Options for Virtual Team Member Engagement

Key guidelines for implementing effective virtual teams include:

- Focus on collaboration and team norms before focusing too much on tools. Allow team members to figure out how and why they need to communicate and collaborate with one other, then look at how technologies and tools can help.
- Recognize that team formation in a virtual environment is difficult, so it's critical to reinforce the teams' mutual commitments, achievements, and opportunities.
- Virtual teams will require a significant amount of feedback and reinforcement of the team goals and objectives, or collaboration will quickly devolve to individual behavior and performance instead of the team's shared goals.
- When possible, provide opportunities for the virtual team members to meet in person, build relationships, have fun together, and nurture their shared commitment to the project's goals.



Calendar Tools

- Shared calendars are available in many tools to help team members plan meetings, coordinate feedback, and improve visibility into project goals and activity status.
- In general, timeboxing meetings is a good idea. It:
 - Improves focus,
 - Encourages the team to set clear agendas and objectives, and
 - Helps with keeping the work on track.

As part of team formation, the team should make decisions about how best to manage its calendars with an overall goal of promoting visibility among the team and the other relevant stakeholders.



Variance Analysis

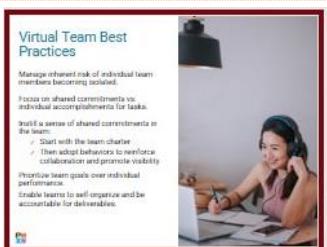
Because the virtual team environment is so complex and potentially challenging, you are well-served by assessing performance more often.

The project manager may produce variance analysis of different kinds as the team carries out its work. Variance is defined as a quantifiable deviation, departure, or divergence away from a known baseline or expected value. Variance analysis may include:

- Accuracy of team estimates
- Delivery in a sprint or by an established milestone
- Team performance against targets—perhaps measured by story points completed or successful burndown during an iteration.

Results of a variance analysis may be shared with the team as part of a retrospective and may serve as the basis for problem solving, identification of lessons learned, and proposed experiments to improve team performance in subsequent iterations.

Use the results to motivate and challenge team members in positive ways.



Virtual Team Best Practices

Let's review a few of the things we discussed in this topic.

TOPIC G

Build Shared Understanding about a Project

One of the first goals in onboarding a team for a project is to ensure that they reach consensus and support the outcome of the parties' agreement.



Build a Shared Understanding About a Project

This is the final topic in this lesson.

A shared understanding is more than scope, schedule, and objectives. It's enabling our team to understand the importance of the project to the organization's strategic objectives.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Project Vision

A vision is a desired end-state, often described as a set of desired objectives and outcomes. When a new project begins, it is critical to have a clear vision of the desired end objectives.

Depending on how well defined the deliverables of the project are, a more traditional waterfall approach or a more agile approach might be adopted. The more agile the approach, the more likely it is that the specific components of the solution are not clearly understood and subject to change.

The project vision should be sufficiently immutable to serve as the "north star" for the project; the various components may change or adapt, but the vision should be reasonably consistent.

Many projects may begin with the creation of a vision statement. This may describe the product or solution, intended users or consumers of the solution, key desired objectives, differentiators from competitive approaches, key features and benefits, etc.



Project Charter (Definition)

A project charter is a document issued by the project initiator or sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.

The project initiator or sponsor is a person who provides resources and support for the project and is accountable for enabling the project's success. An effective project charter conveys why the project is being initiated and what the project's outcomes will be, ensures that you have support for the project, and gives you the authority to apply resources to project activities.



Project Charter Contents

The project charter contains much of the information that a team member needs to understand the value, content, and importance of a project.



Idea: Brainstorm exactly how each of these elements can contribute to a greater shared understanding of a project.



Project Overview Statement

Another document that conveys the intent and vision of a project is the overview statement.

It should:

- Be brief and clear.
- Capture the project's objective, the problem or opportunity it solves, and list the success criteria.



How to Run the Project

Traditional, agile, and hybrid are covered extensively later on. This is an overview.

Project management methodologies are adaptable and able to suit any kind of project. You need to be able to understand the benefits and suitability for each approach in order to choose your Way of Working, or WoW.



Kickoff Meeting

Once you have all of these elements in place, it's time for kickoff.

This is the moment in the project where the planning leads to action. It's usually a meeting in which a few things need to happen:

- Establish the project context
- Assist in team formation
- Ensure that the team is aligned to the overall project vision

Activities during kickoff may include:

- Define the vision statement
- Define the team charter
- Facilitate creation of the following with your customer or product owner:
 - User story writing
 - Estimation of effort
 - Prioritization planning
 - Initial product backlog

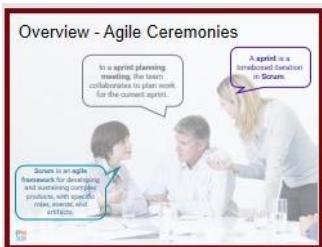


Iteration Planning

If you've decided to work in an agile or hybrid mode, then you'll be working in iterations. These are intervals of work in which product development moves along in a successive, phased approach.

In this case, teams will perform iteration planning, or sprint planning, to:

- Review the highest prioritized user stories, or key outcomes,
- Ask questions,
- Agree on forecasts for story completion, and
- Once agreed, determine the activities needed to deliver iteration objectives.



Overview – Agile Ceremonies (1 of 2)

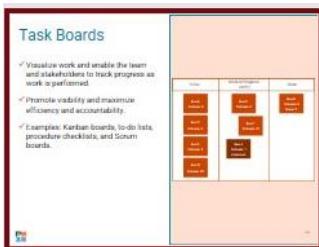
This is an overview of some terms used in agile projects.

- **Scrum** is an **agile framework** for developing and sustaining complex products, with specific roles, events, and artifacts.
- A **sprint** is a timeboxed iteration in **Scrum**.
- In a **sprint planning meeting**, the team collaborates to plan work for the current sprint.



Overview – Agile Ceremonies (2 of 2) Continued.

- Hold **daily standups**—short (10-15 minute) daily meetings—for the team to reaffirm commitment to objectives for the iteration, identify potential blockers, and coordinate the day's work.
- In a **Sprint Review** at the end of each iteration, the Product Owner and other customer stakeholders review progress and receive feedback for that iteration.
- A Scrum Master facilitates a **Sprint Retrospective** for the team to identify improvements. They review the team's processes and practices and identify ways to improve performance and collaboration.



Task Boards

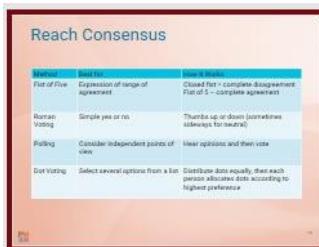
Task boards are a fantastic way of enabling shared understanding. By making data visible, everyone has access to it. This creates an atmosphere of transparency and information-sharing.



Consensus (Definition)

Reaching consensus shows that the project operates in collaborative, shared decision-making mode.

Don't forget to use your negotiation skills here! And in the next slide, let's look at ways of getting consensus quickly and fairly.



Reach Consensus

Depending on the kind of problem you are trying to solve, one method may be better than the other.

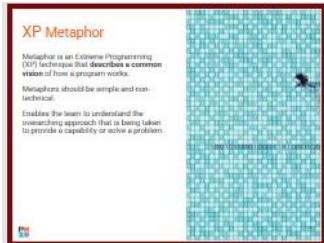


Idea: Can you think of examples of when each of the methods would be useful? Explain how or why.



Estimation Techniques

Teams will need to make estimations of time or effort during a project. So that everyone knows that these estimates are not made arbitrarily or autocratically, we can employ one of these techniques.



XP Metaphor

If you need to describe how a program works in an IT project, the team may use an XP metaphor—to put the concept into words anyone can understand.



Product Box – Collaboration Game

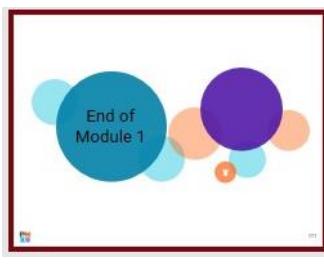
Another technique of explaining a solution is “product box”. It can work like an “elevator pitch”. Basically, we are encouraging the explanation of a complex idea in parts so that everyone can understand.



GUIDELINES: Reach Consensus and Support the Outcome of the Parties’ Agreement

Once the consensus is reached, everyone has to support it, even if they have a different, personal point of view.

People won’t always agree. But this is the challenge of leadership: to set the stage for the best performance of our human resources and to engender a high-performing team.



End of Lesson 1

This is the end of the first lesson. The next lesson takes us into the “Process” element of project management: How to start a project. We’ll take up the “People” element again in Lesson 4, when we come back to the topic of keeping your team motivated and on track.



Student Edition

Lesson 2

Starting the Project

PMI® Authorized PMP® Exam Prep

Starting The Project

Duration: 10 hours

Lesson Introduction

Now that you've assembled a high-performing, engaged, and empowered project team, you are ready to plan and start the project.

Planning includes all aspects of a project, including budget, schedule, scope, quality, project activities, procurement, and closure. You also need to determine the appropriate project methodology or method.

Learning Objectives

In this lesson, you will learn how project managers and teams:

- Assess project needs, complexity, and magnitude to determine the appropriate project methodology/methods and practices.
- Plan and manage the scope.
- Plan, prepare, modify, and manage the project schedule based on methodology.
- Plan and manage the budget and resources.
- Plan and manage the quality of products and deliverables.
- Integrate project planning activities.
- Plan and manage procurement strategy.
- Establish the project governance structure.
- Plan and manage project/phase closure.

Lesson Topics

	Title	Slides
Topic A	Determine Appropriate Project Methodology/Methods & Practices	2-17
Topic B	Plan and Manage Scope	18-86
Topic C	Plan and Manage Schedule	87-133
Topic D	Plan and Manage Budget and Resources	134-152
Topic E	Plan and Manage Quality of Products and Deliverables	153-172
Topic F	Integrate Project Planning Activities	173-184
Topic G	Plan and Manage Procurement	185-209
Topic H	Establish Project Governance Structure	210-219
Topic I	Plan and Manage Project/Phase Closure	220-234

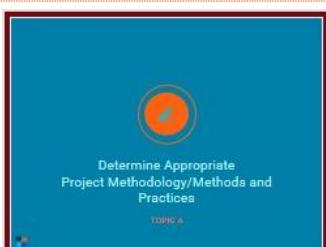
Topic A

Determine Appropriate Project Methodology/Methods and Practices

Every project is unique, even if it's been done before. You need to understand which methods suit the type of work and outcomes. There is no one way to manage every project. Knowing and understanding project management best practices is one part of the equation. Determining and applying the most appropriate methodology and practices to your project is another part.



Here's what we'll cover in this lesson. Let's learn about how to start project work!



Determine Appropriate Project Methodology/Methods and Practices

This is the first topic in our learning about how to start a project. We'll learn about project management methods and practices.



Deliverables and Tools
This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Business Case and Business Needs Documents

Most projects start with the business case. This may be preceded by a business needs document. These documents contain the seeds of your project. So, let's make sure you understand what they are.

A **business case** is a documented economic feasibility study used to establish the validity of the benefits of a selected component that is lacking sufficient definition. In other words, it's the first step in authorizing project activities.

A business needs document is a related, less-detailed deliverable that may precede the formal business case.

The business needs document expresses the goal—what needs to be created or what needs to be performed.

The business case explains the justification, feasibility, and return on investment (ROI) involved in pursuing that goal.



Project Implementation Plan

The goal of any project is to deliver some product or service for a customer, whether internal or external to the organization.

Depending on what the product or service is, the team should select the methodology that fits. Usually, this means which method delivers value to the organization most quickly. Additionally, project planning should ensure minimal negative disruption to the business and address concerns relative to the project and business environment.

Project Implementation Plans should consider all stakeholders, schedules, risks, budgets, and quality standards.

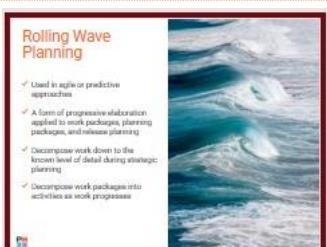
Depending on the method used, the team will be creating outputs or deliverables, or a combination of both. You plan for these in the project plan.

- Project deliverables may be delivered all at once, at the end of the project.
- Project outputs are delivered throughout the project.



Rolling Wave Planning (Definition)

Planning rarely happens all at once and at the beginning of the project anymore. So-called “rolling wave” planning enables you to begin work, even if terms and conditions are uncertain and subject to change.



Rolling Wave Planning

Let's look at some characteristics of rolling wave planning.

- It can be used in either agile or predictive approaches or teams
- It enables you to begin working even if you don't

- have a full picture or all of the details
- It's a form of progressive elaboration (we'll define that in the next slide), that you apply to work packages, planning packages, or release planning.

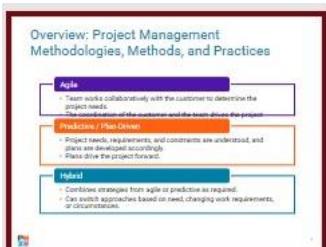
Rolling wave planning works in this way: teams decompose work down to level of known detail during strategic planning. And as work progresses, they continue decomposing work packages into activities.

We will ensure you understand each of these terms later in this lesson.



Progressive Elaboration (Definition)

Progressive elaboration is the iterative process of increasing the level of detail in a project management plan as greater amounts of information and more accurate estimates become available.



Overview: Project Management Methodologies, Methods, and Practices

There may not be an ideal approach to manage your project, but experienced project managers can choose the best approach, depending on the resources, timelines, stakeholders, industry, the project work, and many other factors.

Every project and situation require an assessment of what method, or way of working, will work the best.

Let's consider the three major methods of, or approaches to, project management: Agile, Predictive or Plan-driven, and Hybrid.

- **Agile** – This is a more modern approach wherein the team works collaboratively with the customer to determine the project needs, quickly building outputs based on those assumptions, getting feedback, and continuing forward or adapting as much as needed.
 - The aim is to deliver value early by regularly confirming and incorporating input.
 - The team's work, together with the customer's input, drives the project forward.
- **Predictive / Plan Driven** - A more traditional approach wherein, as much as possible, the project needs, requirements, and constraints are

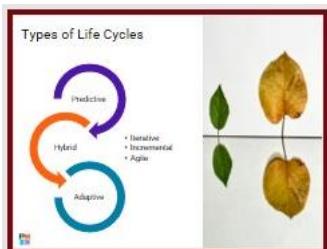
understood at the beginning of the project, and plans are developed accordingly.

- Those plans drive the project forward.
- The more well planned out, the more predictive and controlled the project is.
- **Hybrid** – A third option is to incorporate components of both approaches.



Examples are:

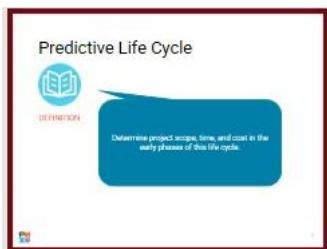
- Using a particular strategy or technique from one methodology for a certain need.
- Blending the various approaches concurrently on the project.
- Switching approaches based on need, changing work requirements, or circumstances.



Types of Life Cycles

A life cycle is a way of describing the nature and trajectory of a project.

- There are two major types of project life cycles: predictive and adaptive.
- ‘Hybrid’ is exactly that, a blend of the two.
- In adaptive life cycles, we use iterative, incremental, or agile approaches.



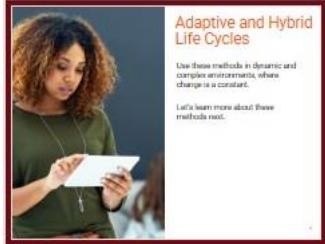
Predictive Life Cycle (Definition)

- A predictive life cycle is a form of project life cycle in which the project scope, time, and cost are determined in the early phases of the life cycle.
- In other words, in a predictive life cycle, you determine project scope, time, and cost as early in the project as possible.
- This is a preferred cycle to use when project outcomes are well understood and known, such as enhancements to an established product.
- Predictive cycles are formal and enable the project team to stay focused on each phase of the project before having to move forward into the next phase.



Predictive Life Cycle

Just as the name suggests, predictive life cycles are very good when you have fixed requirements and fixed expectations of those requirements. There is a high element of control—and, thus, predictability—in projects which follow a predictive life cycle.



Adaptive and Hybrid Life Cycles

There may be fewer and fewer cases of projects that can adopt purely predictive life cycles. That's because we are living in an age of high complexity and change, where predicting outcomes is fraught with difficulty, and business needs and conditions, as well as external environmental factors change rapidly and without notice.

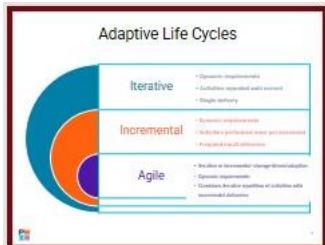
The adaptive life cycle enables projects to operate with flexibility so that plans can respond effectively to change.



Hybrid Methods

A balance of the two life cycles is often the necessary compromise. Teams can combine predictive and adaptive approaches to adopt a hybrid method of working and to balance the business's need for predictable outcomes along with a way of managing change effectively.

In these blended approaches, organizations typically use shorter delivery time frames, iterative product releases, and involve stakeholders regularly, but they tend to do more in-depth planning and requirements gathering up front.



Adaptive Life Cycles

You need to have a good understanding of what 'iterative' and 'incremental' mean. Agile life cycles are discussed in depth on the next slide. It's included in this graphic because agile is also an adaptive life cycle.

An adaptive life cycle can be helpful in uncertain or undefined environments.



For example: When developing a brand-new product, the high-level vision for the product exists, but all the details such as limitations, size, and functions, will be discovered and identified as each phase is completed (progressive elaboration).

This type of life cycle is also beneficial when managing a

changing objective and scope or when partial delivery of the objectives provides value.

Usually, the sequence of the phases defined by most project life cycles involves some type of handoff or deliverable. Most often, deliverables from one phase are approved before work begins on the next phase.



For example: Design specifications are approved and handed off before the design phase begins. However, a subsequent phase may begin before approval is gained on the deliverables of a previous phase, if the risks are considered acceptable. It helps the project management team plan work to a greater level of detail as the project progresses.

This cycle is like an extension or corollary of the overlapping relationship, but in this case the same phase repeats itself multiple times—once in every iteration.

- In an **iterative life cycle**, the project scope is generally determined early in the project life cycle, but time and cost estimates are routinely modified as the project team's understanding of the product increases. Teams develop a product through a series of repeated cycles—or iterations—while increments successively add to the functionality of the product.
 - Achieving the project objectives via iterations is best accomplished when leveraging the learning and successes—as well as failures—from the previous iterations. By capturing and applying the lessons learned at the end of each iteration, typically in the form of a retrospective session, teams can improve, grow, and become more efficient with every iteration.
 - Stakeholder engagement is critical to continuous improvement and driving towards the optimal solution. Frequent and meaningful feedback from all involved in the project enables the product evolution across iterations.
- In an **incremental life cycle**, the deliverable is produced through a series of iterations that

successively add functionality within a predetermined time frame. The deliverable contains the necessary and sufficient capability to be considered complete only after the final iteration.

Both types of life cycles include project phases that are intentionally placed and repeated as the team's understanding of the deliverables is developed and understood. In most cases, the team will work with a high-level vision because the deliverables will be defined up front and developed with more detail and characteristics as the project moves through each phase.



Adaptive Life Cycles

Moving on from iterative and incremental, we have the world of 'agile', which has become a catch-all for non-predictive approaches. But let's try to understand what they really are.

Agile life cycles can be iterative or incremental in nature. They are sometimes also called 'change-driven' or 'adaptive'.

- They work well in environments with high levels of change and ongoing stakeholder involvement in a project.
- This is similar to iterative and incremental life cycles, but they move at a much more rapid pace.
- Agile life cycles are used in a highly flexible, interactive, adaptive organization where project outcomes are realized while the project work is being completed, and not at the beginning of the project.
- This method is used when dealing with a rapidly changing environment, when scope and requirements are difficult to define in advance, and small incremental deliverables have value to stakeholders.

Typical Use Cases	
Methodology	Typical Use Cases
Agile	<ul style="list-style-type: none"> - Deliberate projects - Iterative projects - Small teams - Projects with changing requirements - "Sprint" of about 1 month
Traditional	<ul style="list-style-type: none"> - Sequential - Linear - Large teams - Project planning and management requires a hierarchy from top to bottom
Waterfall	<ul style="list-style-type: none"> - Comprehensive audience workflow respects its own methods and practices - Linear
Rapid	<ul style="list-style-type: none"> - Many iterations and requirement shifts - Short planning or setting technical area and scope in brief stages

Typical Use Cases

As mentioned, the approach best suited for your project depends on many factors. Project managers must assess the needs, complexity, and magnitude of the work, but also the expectations of stakeholders.



Idea: Look at the examples on the first two rows. Can you think of examples for the last three rows?

Topic B: Plan and Manage Scope

The project team must complete work in order to achieve project outcomes.

What that work is, what must be done, guiding that work, ensuring the work is done, and setting criteria as to what “done” is, so it can be properly validated are all elements the project team must plan for and manage throughout the project.



Plan and Manage Scope

In the second (and longest) topic of this lesson, we look at how to plan for the project’s scope. As we’ll see, there is a lot of work involved in managing the effort and the scope of the project.



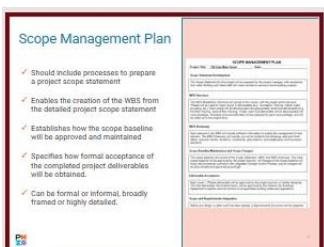
Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Scope Management Plan (Definition)

A scope management plan is a component of the project management plan or program management plan that describes how the project scope will be defined, developed, monitored, controlled, and validated.



Scope Management Plan

As a project manager, you will reference the project charter and any subsidiary plans of the project management plan when developing the scope management plan.

Another factor you must consider during the development is whether or not any environmental factors are pertinent to the project.

The scope management plan provides guidance to you on how you’ll manage scope-related activities that range from collecting requirements, writing the scope statement, to breaking down the work that needs to be done.



Scope Management Tools and Techniques

Use the following tools and techniques to help develop the scope management plan.

- Use internal and external experts that have experience in similar projects to apply **expert judgment**. These individuals can be consulted when you are ready to put the plan together.
- Alternatives analysis is a technique used to identify different ways of collecting requirements, elaborating the project and product scope, creating the product, and validating and controlling the scope. This analysis can have an influence on the scope management plan.
- Hold meetings with any team member who will be involved with the creation of the scope management plan.



Project Requirements (Definition)

Project requirements are the agreed-upon conditions or capabilities of a product, service, or outcome that the project is designed to satisfy.

Requirements are the determined and documented needs and expected project outcomes and expectations of the project customer, sponsor, and stakeholders.



Product Requirements (Definition)

Distinct from project requirements, product requirements are the agreed-upon conditions or capabilities of a product, service, or outcome that the project is designed to satisfy.



Project and Product Requirements

Some high-level requirements may already be documented and in the project charter, but as the project manager, you must verify that all requirements are determined and documented during this process.

Requirements create the foundation for building the WBS and are verified regularly during the project execution process.



For example: Some of the requirements for a new house might include the square footage of each room; the type of counter tops needed in the kitchen and each bathroom; a central vacuuming system; and the size and materials used for a deck.

Any project will have many requirements, and it is important to determine the requirements early in the project.

Throughout the life of the project, the requirements may change. Stakeholders might add new requirements during the project—sometimes even during project execution—as well as changing others.



Project Scope (Definition)

This is the work performed to deliver a product, service, or result with the specified features and functions. "Project scope" may include "product scope."



Product Scope (Definition)

The product scope is the statement of features and functions that characterize a product, service, or result.



Project and Product Scope

Let's make sure we understand project and product scope properly. Make sure you are differentiating between 'project' and 'product' scope.



Tolerances

Tolerance is a quantified description of acceptable variation for a quality requirement. It applies to budget, time, quality, and non-functional requirements.

With established tolerances for a project—areas within the purview of the project manager—project managers can effectively manage certain issues and control the project without having to escalate to the project board for review and approval.



For example: Project A has set a tolerance so that the project manager can control issues with a budget or time variance of less than 5% but be required to escalate any variances that exceed that threshold.



Enterprise Environmental Factors (EEFs)

DEFINITION

Conditions (internal or external) not under the control of the project team, that influence, constrain, or direct the project at organizational, portfolio, program, or project level.

Enterprise Environmental Factors (EEFs) – (Definition)

EEFs are things outside out the project team's control. These are internal or external conditions that influence, constrain, or direct the project at organizational, portfolio, program, or project level.



Organizational Process Assets (OPAs)

DEFINITION

Plans, processes, policies, procedures, and knowledge bases specific to and used by the performing organization. These assets influence the management of the project.

Organizational Process Assets (OPAs) – (Definition)

OPAs are assets that influence the management of the project. This includes plans, processes, policies, procedures, and knowledge bases that are specific to and used by the performing organization.



EEFs and OPAs

- Projects exist and operate in environments that can influence them, favourably or unfavourably.
- EEFs and OPAs are two major categories of project influences.

EEFs and OPAs

EEFs and OPAs are two major categories of project influences.



Enterprise Environmental Factors (EEFs)

Internal	External
<ul style="list-style-type: none"> Organizational structure, culture, and governance Geographic distribution of facilities and resources Infrastructure Financial availability Employee capability 	<ul style="list-style-type: none"> Marketplace conditions Economic and cultural influences and issues Legal restrictions Commercial databases Government or industry standards Academic research Financial considerations Physical environmental elements

Enterprise Environmental Factors (EEFs)



Idea: Can you think of examples of actual EEFs, using the information and cues in the table?



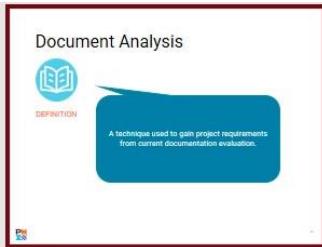
Organizational Process Assets (OPAs)

- Processes, policies, and procedures are established by the project manager for the project.
- Templates, lifecycles, and checklists can be tailored but not updated.
- Organizational knowledge bases are updated throughout the project with project information.
- Updated information such as financial performance, lessons learned, performance metrics and issues, and defects.

Organizational Process Assets (OPAs)

Here, we review the characteristics of OPAs. We said they include the processes, policies, and procedures of an organization. So, the project needs to co-exist within the parameters set by the OPAs.

Project work, in turn, can influence and affect OPAs.



Document Analysis (Definition)

Document analysis is a technique used to gain project requirements from current documentation evaluation.



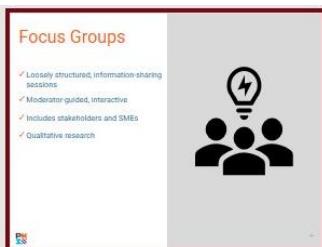
Document Analysis

The document analysis method can be used to derive new project requirements from existing documentation such as business plans, service agreements, marketing materials, current process diagrams, application software documentation, and more.



Focus Groups (Definition)

Focus groups are an elicitation technique that brings together pre-qualified stakeholders and subject matter experts to learn about their expectations and attitudes about a proposed product, service, or result.



Focus Groups

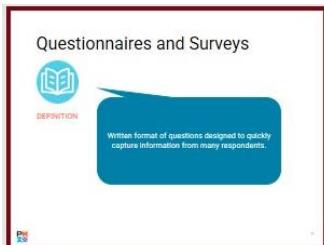
Focus groups can be small events or discussions that are designed to be less structured and more for information-sharing sessions within a small group of people.

Project managers will use focus groups to bring together SMEs and other stakeholders to gain further information and clarification on specific project requirements.

These events are typically conducted by a trained moderator who will propose pre-selected questions and keep the discussions on track with the selected theme.



For example: A focus group might be used to gather customer feedback for a product that is scheduled to be updated.



Questionnaires and Surveys (Definition)

Questionnaires are written sets of questions designed to quickly accumulate information from a large number of respondents. They typically target a specific area or subject.



Questionnaires and Surveys

This technique is useful when the group is varied and located in multiple locations.

The results of the questionnaires and surveys can be sent out and returned quickly and the results can be analyzed in a timely manner.

In most cases, the results will be used to conduct a statistical analysis and used by decision makers to prioritize, categorize, and determine requirements.



For example: You might survey users of a banking application to see how they are using the system.



Benchmarking (Definition)

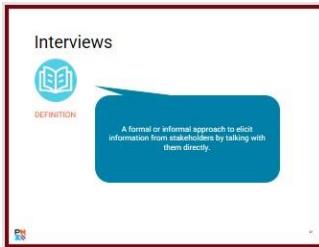
Benchmarking is the comparison of actual or planned products, processes, and practices to those of comparable organizations to identify best practices, generate ideas for improvement, and provide a basis for measuring performance.



Benchmarking

This technique can be helpful in determining a project's requirements by comparing current requirements against a proven or best practice standard within the same professional field or product area.

A benchmark can be used to measure performance and to generate ideas for project requirements.



Interviews (Definition)

An interview is a formal or informal approach to elicit information from stakeholders by talking with them directly.



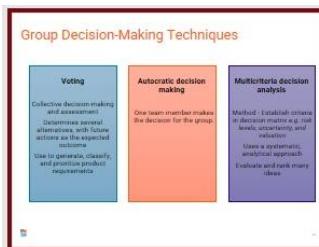
Interviews

Through discussion, you can record any pertinent information you need for your project requirements.

With this information, you can further identify and define specific project outcome features and functions.



For example: An interview might be helpful when you need to get specific feedback from an end user of a product or service to find out what is useful and what is not.



Group Decision-Making Techniques

Decision-making techniques are used by a group to reach a decision. This technique is an assessment process that can have multiple alternatives and can lead to many outcomes.

- **Voting** is a way of factoring in a lot of input before making a decision.
- In **autocratic decision-making**, one team member makes the decision for the group.
- Teams can use **multicriteria decision analysis** to make decisions. This involves the use of systematic and analytical approaches.



Types of Voting

If teams use voting to make a decision, they first consider and discuss the alternatives and outcomes. Then team members can indicate their choice. Here is an overview of the different types of voting:

- **Unanimity** - Agreement by everyone in the group on a single course of action.
- **Majority** - The majority represents more than 50% of the group's ideas. This is a good method to use with large groups, but it can be difficult with extremely large groups with a wide diversity.

in views about a subject.

- **Plurality** - Decisions made by the largest block in group, even if a majority is not achieved.
- **Autocratic** - Using this method, one person makes the decision. In most cases, this person will consider the larger group's ideas and decisions and will then make his or her decision based on the best decision.
- **Agile methods** – Fist of five, thumbs up/down/sideways, planning poker, and so on



Data Representation

Visual representations of data are powerful tools for showing data so that you can then make a decision. Mind mapping and affinity diagrams are two such ways. We explore a few of these methods later in this lesson.



Observations (Definition)

Observations, also referred to as job shadowing, is a technique used to gain knowledge of a specific job role, task, or function in order to understand and determine project requirements.

This technique allows decision makers to directly observe a job when a job or task is complex and detailed and cannot be described easily.



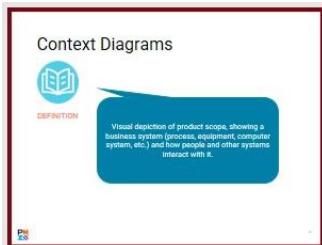
For example: For a product assembly improvement project, project team members might observe the actual assembling of the product in a manufacturing plant to better understand a process and determine project requirements.



Facilitated Workshops (Definition)

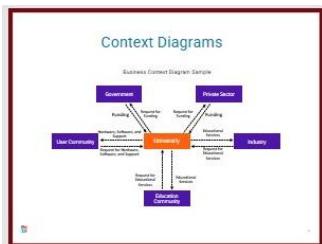
Facilitated workshops are organized working sessions held by project managers to determine what a project's requirements are and to get all stakeholders together to agree on the project's outcomes.

There are different types of workshops used depending on the industry you are working in.



Context Diagrams (Definition)

A context diagram is a visual depiction of the product scope showing a business system (process, equipment, computer system, etc.), and how people and other systems (actors) interact with it.



Context Diagrams

The diagram includes the business process, equipment, or computer system and what roles interact with those systems.

The diagram depicts specific business and actor inputs to the business system, as well as the business and actor outputs of the system.



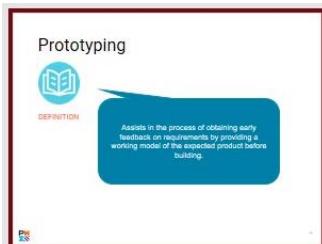
Storyboarding (Definition)

Storyboarding is a prototyping method that can use visuals or images to illustrate a process or represent a project outcome.

Storyboards are useful to illustrate how a product, service, or application will function or operate when it is complete.



For example: In software development, a storyboard might be used to show how a customer service application will function from a user's perspective by showing the results of each option available within the application.



Prototyping (Definition)

Prototyping is a method of obtaining early feedback on requirements by providing a working model of the expected product before actually building it.

The prototype can be used for evaluation and experimentation by project stakeholders and other team members.

The results of the evaluation can then be analyzed and assembled into a prioritized list of redesign ideas for the prototype, or a detailed list of project requirements.

This process can be cyclical with many prototypes.

revisions until the project requirements are determined.



Requirements Documentation

Requirements documentation is a description of how individual requirements meet the business need for the project.

The documentation is composed of all the individual requirements needed for a project to meet the business' and stakeholders' needs.

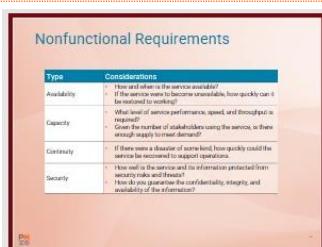
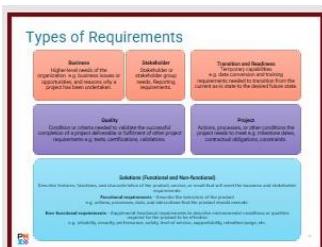
The composition of the documents will vary depending on the specific needs of a project. For example, very detailed and categorized, to a simple list of high-level requirements.

Requirements documentation can include any or all of the following components:

- Business requirements
- Stakeholder requirements
- Solution requirements
- Transition and readiness requirements
- Support and training requirements
- Project requirements
- Quality requirements

Types of Requirements

Collecting requirements is an important step in defining project scope. Let's examine this list of requirements types that a project team needs to collect in order to properly describe the scope.



Nonfunctional Requirements

These are the supplementary or contextual requirements that support the functional requirements for the product or project.

They include:

- Availability
- Capacity
- Continuity
- Security



Requirements Management Plan (Definition)

The requirements management plan is a component of the project or program management plan that describes how requirements will be analyzed, documented, and managed.



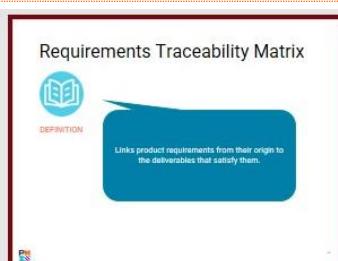
Requirements Management Plan

This plan provides guidance on how the process of collecting requirements will be managed.

Components of the requirements management plan require project managers to choose the most effective relationships to aid in the project's success and document this approach in the plan.

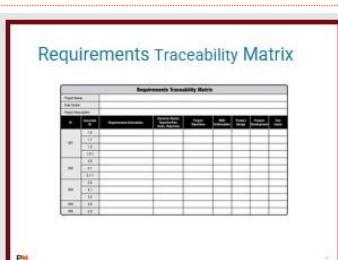
These components include:

- How requirements activities will be planned, tracked, and reported.
- Configuration management activities
- Requirements prioritization process
- Metrics used and the rationale for using them.
- Traceability structure



Requirements Traceability Matrix (Definition)

The requirements traceability matrix is a grid that links product requirements from their origin to the deliverables that satisfy them.



Requirements Traceability Matrix

This is a blank requirements traceability matrix template. Let's learn about and identify what's needed to complete the matrix.

The purpose of this matrix is to justify each requirement determined and to link it directly to the business and project objectives.

This matrix can be used to track the progress of requirements throughout the project life cycle and to verify that the requirements have been met once the project closes out.

It can also be helpful to manage a project's scope and any

proposed changes to the scope.

Here's a list of the tracing requirements included in the traceability matrix:

- Business needs, opportunities, goals, and objectives.
- Project objectives.
- Project scope and WBS deliverables.
- Product design.
- Product development.
- Test strategy and test scenarios.
- High-level requirements to more detailed requirements.
- Work package mapping.
- Stakeholder reference, so you can track each individual requirement to a stakeholder.



GUIDELINES: Collecting Project Requirements

Review:

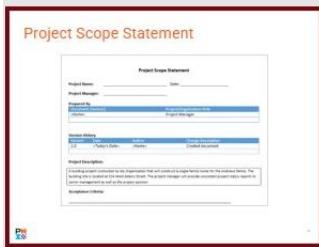
- the **scope management plan** for clarity as to how project teams will determine which type of requirements need to be collected for the project.
- the **requirements management plan** for the processes that will be used throughout the collect requirements process to define and document the stakeholder needs.
- the **stakeholder engagement plan** to understand stakeholder communication requirements and the level of stakeholder engagement in order to assess and adapt to the level of stakeholder participation in requirements activities.
- the **project charter** for the high-level description of the product, service, or result so that detailed requirements can be developed.
- the **stakeholder register** to identify stakeholders who can provide information on the requirements.

Use tools and techniques such as interviews, focus groups, facilitated workshops, interpersonal and team skills, decision-making techniques, questionnaires and surveys, observations, prototypes, benchmarking, context diagrams, and document analysis to collect requirements for the project.



Project Scope Statement (Definition)

The project scope statement is the description of the project scope, major deliverables, assumptions, and constraints.

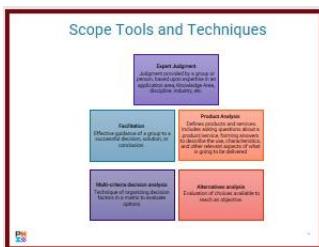


Project Scope Statement

Stakeholders and other project members can refer to the scope statement when scope development needs to be verified against the scope baseline, updated, or changed during the course of a project.

A project scope statement will be different for every project, it may include any, or all, of the following components:

- Project scope description
- Acceptance criteria
- Deliverable
- Project exclusion
- Constraints
- Assumption



Scope Tools and Techniques

Let's review the tools and techniques that project managers use to determine scope:

- **Expert judgment** - Used to analyze the information needed to develop the project scope statement. Such judgment and expertise can be applied to any technical detail.
- **Alternatives analysis** - This data analysis technique is used to develop as many potential options as possible to identify different approaches to execute and perform the work of the project.
- **Multi-criteria decision analysis** - A decision-making technique used to analyze ideas to ultimately evaluate and prioritize (by ranking) the ideas to assist in defining the project scope.
- **Facilitation** - Encouraging the key players to participate in facilitated workshops can help to reach a cross-functional and common understanding of the project objectives and their limits.
- **Product analysis** - For projects that have a product as a deliverable, product analysis is a

tool that generally means asking questions about a product and forming answers to describe the use, characteristics, and other relevant aspects of what is going to be manufactured.



Product Analysis (Definition)

Product analysis is a tool to define scope that generally means asking questions about a product and forming answers to describe the use, characteristics, and other relevant aspects of what is going to be manufactured.



Product Analysis

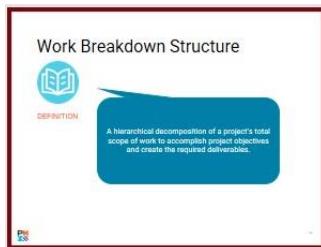
Depending on the product the project is delivering, you can use a number of analysis methods to create a working understanding of it and to develop the scope. These methods include product breakdown, systems analysis, requirements analysis, systems engineering, value engineering, and value analysis.



GUIDELINES: Develop a Project Scope Statement

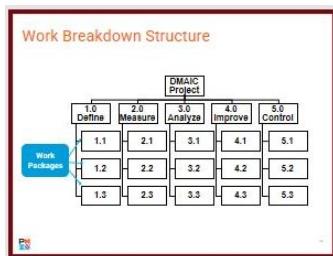
You can use the following guidelines when creating the scope statement for your project:

- Review the scope management plan for the activities for developing, monitoring, and controlling the project scope.
- Review the project charter for the high-level project description, product characteristic, and project approval requirements.
- Review the requirements documentation to select the requirements that will be included in the project.
- Review the OPAs such as policies, procedures, template for a project scope statement, project files from previous projects, and lessons learned from previous phases or projects.
- Use tools and techniques such as expert judgment, product analysis, alternatives analysis, and facilitated workshops to define the project scope.
- Document the project scope statement and update any project documents, as needed.



Work Breakdown Structure (Definition)

The work breakdown structure (WBS) is a hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

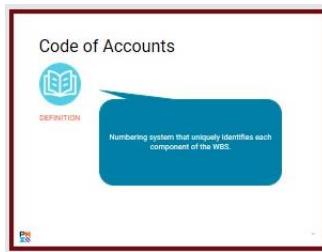


Work Breakdown Structure (Definition)

A WBS defines the total scope of work required to complete the project.

The deliverables and their component sub-deliverables are represented on the WBS in levels of descending order.

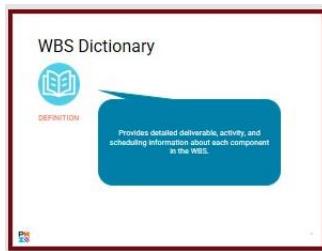
The WBS shown in the figure is a specialized approach known as DMAIC (Define, Measure, Analyze, Improve, and Control). This approach is commonly used in Six Sigma types of projects.



Code of Accounts (Definition)

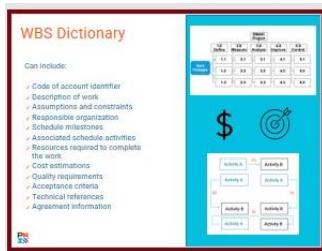
A code of accounts is a numbering system used to uniquely identify each component of the WBS.

A code of accounts system allows project managers to track individual WBS components by using a unique identification code, which is especially helpful in the areas of performance, reporting, and cost.



WBS Dictionary (Definition)

The WBS dictionary is a document that provides detailed deliverable, activity, and scheduling information about each component in the work breakdown structure.



WBS Dictionary

The document can be used as a reference when assigning and researching individual WBS component information.

The WBS dictionary can include any of the following:

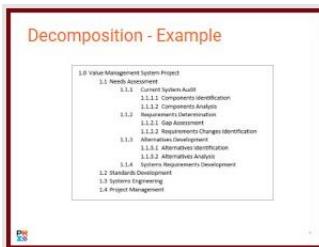
- Code of account identifier
- Description of work
- Assumptions and constraints

- Responsible organization
- Schedule milestones
- Associated schedule activities
- Resources required to complete the work
- Cost estimations
- Quality requirements
- Acceptance criteria
- Technical references
- Agreement information



Decomposition (Definition)

Decomposition is a technique used for dividing and subdividing the project scope and project deliverables into smaller, more manageable parts.



Decomposition - Example

The work package is the smallest chunk from the WBS, which includes the to-do activities, so you can ascribe duration and estimated cost.

The level of decomposition is based on specific project needs and the level of granularity needed to manage the project effectively.

There are a number of steps involved in the decomposition process:

- Identify the deliverables and the work tasks necessary to accomplish the deliverable.
- Structure and organize the WBS.
- Decompose high-level WBS scope components into low-level components.
- Develop and assign a unique identification code to each component.
- Review the decomposition of work packages and verify that they align with the project requirements.



Control Accounts, Work and Planning Packages

Let's look at the definitions of these terms, 'control account', 'work package' and 'planning package' before we see—in a graphic illustration—how they all work together.



Control Account (Definition)

A control account is a management control point where scope, budget, actual cost, and schedule are integrated and compared to earned value for performance measurement.

Control points are tracked by finance to verify that costs are within budget.

These accounts associated with different work packages within the WBS can be tracked and verified against the earned value of a project to check performance.

Work packages will be assigned to a control account and the work will be managed within that account throughout the project.

Control accounts may contain more than one work package, but each work package should be assigned to only one control account.



Planning Package (Definition)

A planning package is a WBS component below the control account with known work content but without detailed schedule activities.

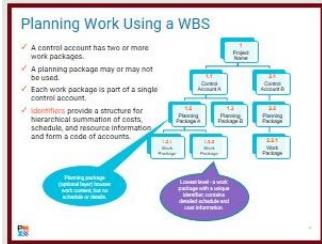
In other words, a placeholder for work that is yet to be determined by a requirement. It is placed within the control account but does not have specific activities applied.

The planning package work can be anything that must be designated within the control account but does not have a cost or a budget applied yet.



Work Package (Definition)

The work defined at the lowest level of the work breakdown structure for which cost and duration are estimated and managed.



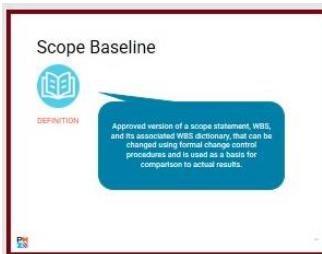
Planning Work Using a WBS

A work package must describe a deliverable that can be adequately scheduled, budgeted, and assigned to an individual person or group.

An important distinction to be made here is that the "work" referred to in a WBS is actually the products or deliverables that are a result of an individual work package, not necessarily the work itself.

Each level of the WBS breaks down the work into more and more layers until the work package is at a level that can be assigned, estimated for cost and duration, and tracked individually.

The goal is to eventually roll up each work package into the level above within the WBS hierarchy to gain the overall time and budget requirements.



Scope Baseline (Definition)

The scope baseline is the approved version of a scope statement, WBS, and its associated WBS dictionary, that can be changed using formal change control procedures and is used as a basis for comparison to actual results.

Scope Baseline

With these approved versions, the scope baseline for a specific project can be incorporated into the project management plan.

This is the baseline that you are monitoring and measuring against throughout the project.

If the data collected does not align with the scope baseline, then action may need to be taken depending on the variance.

A scope baseline may include any of the following components:

- Project scope statement
- WBS
- Work package
- Planning package
- WBS dictionary



GUIDELINES: Create a WBS

- Review the scope management plan that specifies how to create the WBS from the detailed project scope statement and how the WBS will be maintained and approved.
- Review the project scope statement for a description of the requirements that need to be satisfied and the work that will be excluded from the scope. Include a list and description of the specific internal or external restrictions or limitations that may affect the execution of the project.
- Review the requirements documentation to understand what needs to be produced as the result of the project and what needs to be done to deliver the project and its final products.
- Review the Enterprise Environmental Factors (EEFs) such as industry-specific WBS standards (such as ISO) that are relevant to the nature of the project and that may serve as external reference sources for creating the WBS.
- Review Organizational Process Assets (OPAs) such as policies, procedures, template for the WBS, project files from previous projects, and lessons learned from previous projects.
- Use tools and techniques such as decomposition to divide and subdivide the project scope into smaller, more manageable parts.
- Use expert judgment to analyze the information needed to decompose the project requirements into smaller component parts to create an effective WBS.
- Include notes on work products that may be delivered incrementally.
- Document the scope baseline and update any project documents, as needed.



Product and Iteration Backlogs

The work and activities from the work breakdown structure (WBS) or similar processes can be placed in backlogs.

A product backlog is essentially a list of all the expected work to deliver the product. A project's product backlog changes throughout the project.

Product backlog items (PBI) drop off when work is

completed. PBIs are edited and clarified as more is known or as product requirements may change.

PBIs are continually added as necessary when more work must be done. As such, grooming and refining the product backlog is an ongoing exercise, typically scheduled in weekly or monthly intervals.

The product backlog grooming also orders the items based on priority and other criteria.

To better manage the vast amount of work that must be completed, teams set up iterations with its own backlog based on items from the product backlog.

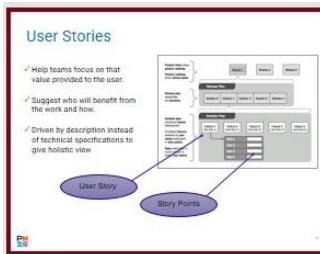
In an Iteration Backlog, the team determines what items from the product backlog can conceivably be completed within that time period based on the team's capacity.

Hence, teams must estimate the effort size of the work and understand the priorities of the business.



User Stories (Definition)

Short descriptions of required functionality; told from the user's point of view.



User Stories

Projects are created to deliver value of some kind—whether that is increased profits, an enlarged customer market, improved use, and so on. To retain focus on what the value is to the user, teams can use user stories.

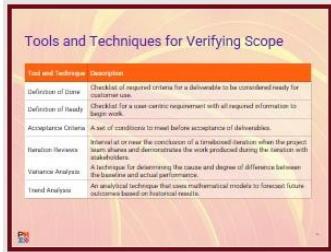
User stories aim to frame the need or desire of who is to benefit from the work of the team.

Typically, the value is described in a template such as "As a [user name or persona], I want to [objective or intent], so that I can [why the objective brings value]."

There are many variations of the sentence. As long as the sentence encapsulates the value to be created, you have a story.

Framing the user's desire as a story rather than a detailed requirement or specification enables the team

to focus more on what the user actually values over simply delivering to a specification.



Tools and Techniques for Verifying Scope

The following tools, techniques, and approaches can be used to verify the scope.

Definition of Done (DoD) - A team's checklist of all the criteria required to be met so that a deliverable can be considered ready for customer use.

Definition of Ready (DoR) - A team's checklist for a user-centric requirement that has all the information the team needs to be able to begin working on it.

Acceptance Criteria - A set of conditions that is required to be met before deliverables are accepted.

Validate Scope - The process of formalizing acceptance of the completed project deliverables. This usually involves reviewing the deliverables with the project customer or sponsor to ensure that they are satisfied with the final deliverable and securing their formal acceptance for the completeness of the deliverable.

Iteration Reviews - At or near the conclusion of a timeboxed iteration, the project team shares and demonstrates all the work produced during the iteration with the business and other stakeholders.

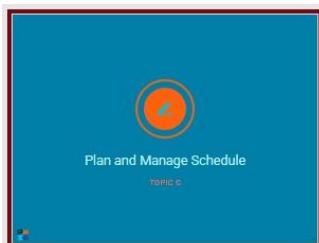
Variance Analysis - A technique for determining the cause and degree of difference between the baseline and actual performance. Any variances must be analyzed to determine whether they are acceptable or they merit corrective action to keep the performance within specifications.

Trend Analysis - An analytical technique that uses mathematical models to forecast future outcomes based on historical results. Review the project performance over time to determine if it indicates improvement or deterioration.

Topic C: Plan and Manage Schedule

The project schedule in its most basic form is simply a representation of how long a project takes to complete.

It includes a number of components, including the activities that will be performed to execute the project scope, the duration of each activity, and how the activities are related to each other.



Plan and Manage Schedule

We have just learned about how you plan and manage scope. The next step is the schedule.



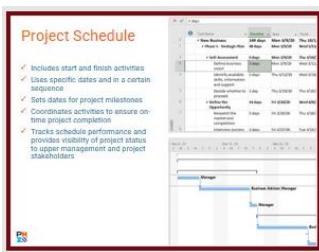
Deliverables and Tools (1 of 2)

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.

This list is continued on the next slide.



Tools, Activities & Processes – Continued



Project Schedule

The project schedule is an output of a schedule model that presents linked activities with planned dates, durations, milestones, and resources.

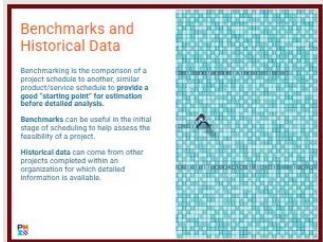
This visual presentation can include the project team's plan for starting and finishing activities on specific dates and in a certain sequence.

The schedule also specifies planned dates for meeting project milestones. With its supporting detail, the schedule is the main output of the develop schedule process.

The purpose of the project schedule is to coordinate activities into a master plan in order to complete the

project objectives on time.

It is also used to track schedule performance and to keep upper management and project stakeholders informed about project status.



Benchmarks and Historical Data

Benchmarking in the context of scheduling is the comparison of a project schedule to a schedule for a similar product or service produced elsewhere.



For example: If a widget can be designed in six months by other companies, your design for a comparable widget should not take a year.

Benchmarks can be useful in the initial stage of scheduling, to help assess the feasibility of a project.

Historical data, on the other hand, can come from other projects completed within an organization for which detailed information is available.

Such data is very useful when scheduling phases or individual activities of a project. It provides a good “starting point” for how long something should take, prior to detailed analysis.



Schedule Management Plan (Definition)

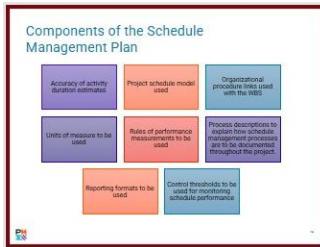
A schedule management plan is a component of the project or program management plan that establishes the criteria and the activities for developing, monitoring, and controlling the schedule.



Schedule Management Plan

It describes how activities will be defined and progressively elaborated and identifies a scheduling method and scheduling tool that will be used for a project.

It also determines the format of the schedule and establishes criteria for developing, monitoring, and controlling the project schedule.



Components of the Schedule Management Plan

- Project schedule model** - The project schedule model is the methodology and tool that will be used to develop the project schedule. Maintenance of the project schedule describes how to update the status and record the progress of the project during the project execution.
- Accuracy** - Level of accuracy is the acceptable range used to determine realistic activity duration estimates and may include an amount for risk contingency.
- Units** - Units of measure are defined for each resource such as staff hours, days, and weeks.
- Organizational links** - The WBS is used as the framework for the schedule management plan so that there is consistency with the estimates and resulting schedules.
- Control thresholds** - Control thresholds are the defined variance thresholds for monitoring schedule performance before action is taken. Expressed as percentage deviations from the baseline plan; for example, 10% behind schedule or 15% ahead of schedule.
- Rules** - This includes the rules of performance measurement; for example, Earned Value Management (EVM) rules.
- Reporting** - Reporting formats define frequency and formats for schedule-related reports.
- Process descriptions** - Process descriptions describe how the schedule management processes are documented.



Schedule Management Considerations for Agile/Adaptive Environments

Although a final completion date may be scheduled in an agile/adaptive approach, activities throughout the project tend to use iterative scheduling with a backlog or on-demand scheduling.

This allows priorities to be adjusted as the project environment evolves.

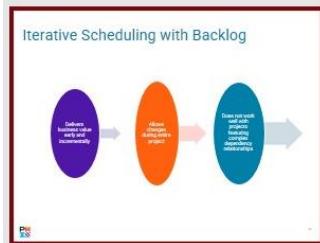
The agile approach uses short cycles for work, review, and adaptations or adjustments.

The rapid feedback about the approach and deliverables received becomes the basis for iterative scheduling and

on-demand pull-based scheduling.

Processes involved in Project Schedule Management include:

- Plan Schedule Management
- Define Activities
- Sequence Activities
- Estimate Activity Durations
- Develop Schedule
- Control Schedule



Iterative Scheduling with Backlog

This method uses progressive elaboration (rolling wave) techniques to develop and schedule activities in a specified time window, often two weeks, based on requirements defined in user stories.



Iterative Scheduling with a Backlog Process

The stories are prioritized and selected based on how long each will take and then the highest priority is constructed first, allowing a team to deliver business value early and incrementally.

Remaining stories are added to the backlog and will be constructed in subsequent time cycles based on their priority.

A benefit of this scheduling approach is that it allows changes/adaptations during the entire project, but it does not work well with activities that have complex dependency relationships.



On-Demand Scheduling

This method does not use traditional schedules at all, but rather has team members "pull" work from a queue as their availability allows.

Based on Kanban and Lean methodologies, this approach also provides incremental business value, while leveling out the work of the team members.

It works best when work can be divided into relatively equal amounts.

Does not work well with activities that have complex dependency relationships.

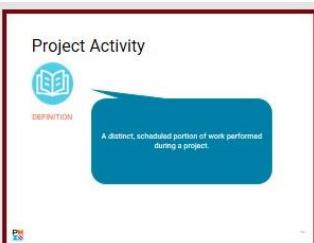
GUIDELINES: Develop a Schedule Management Plan



- Review the project management plan for information to develop the schedule such as the scope baseline and other scheduling-related information such as risk decisions.
- Review the project charter for a summary, high-level milestone schedule for the project, and for who will approve the project schedule.
- Review the EEFs such as organizational culture and structure, resource availability and skills, use of project management software, published commercial information, and organizational work authorization systems.
- Review the OPAs such as monitoring and reporting tools; historical information; lessons learned; schedule control tools; existing schedule control-related policies, procedures, and guidelines; templates; project closure guidelines; change control procedures; and risk control procedures.
- Use tools and techniques such as expert judgment and historical information to give the project team advice on schedule development and management from previous similar projects.
- Use meetings to develop the schedule management plan.
- Document the schedule management plan for the project.

Project Activity (Definition)

An activity is a distinct, scheduled portion of work performed during the course of a project.



Project Activities

Activities lay the foundation for estimating, scheduling, executing, monitoring, and controlling the project work.

The characteristics of an activity are:

- It has an expected duration. (How long will it take?)
- It consumes budget or human resources. (Who will do the work?)
- It has a performance-based name. (What is being



accomplished?)

Work packages from the WBS can be broken into smaller components called activities.

Activities do not appear on the WBS. They are documented separately in an activity list.

Additionally, they may be entered in the project schedule or documented in an individual's own work plans.



For example: A work package named "reserve conference room" might be broken down into the following activities:

- Determine budget
- Determine size requirement
- Determine date needed
- Identify possible room alternatives
- Select room
- Call to reserve room



Feature (Definition)

A set of related requirements that allows the user to satisfy a business objective or need.



Epic (Definition)

A very large collection of user stories. Epics can be spread across many sprints.



Features and Epics

Features can be used to group related functionality together that delivers business value.

The activities and efforts—including work such as documentation, bug fixes, testing, quality/defect repairs to correct current functionality—to deliver capability that can be estimated, tracked, and managed as a set.

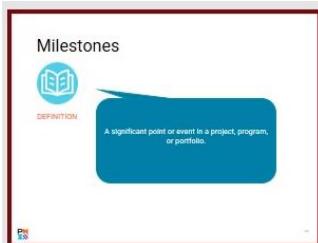


Working with Features

Scheduling aligned to features ensures associated work is coordinated.

Estimating features gives a view of when blocks of functionality can be released to the business and end users.

Progress can be measured based on the features accepted by the business compared to the features remaining.



Milestones (Definition)

A milestone is a significant point or event in a project, program, or portfolio.



Milestones

Milestones have no duration and trigger a reporting requirement or require sponsor or customer approval before proceeding with the project.

Milestones serve as markers and are defined by the project manager, customer, or both.



Milestone Chart

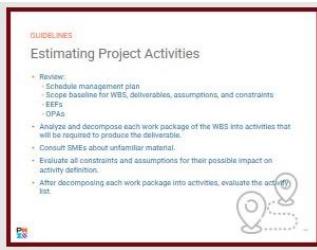
A milestone chart provides a summary level view of a project's schedule in terms of its milestones.

Milestones are typically listed from the left to right of the chart, and icons or symbols are used to show scheduled milestone events.

Time intervals—divided into hours, days, weeks, or months—are usually presented horizontally across the top or bottom of the chart, as illustrated in the figure.

Milestone charts can be effective in demonstrating the project's overall schedule to project team members, stakeholders, and upper management.

It is especially useful for upper management, who are usually not concerned with the level of detail shown in a Gantt chart.



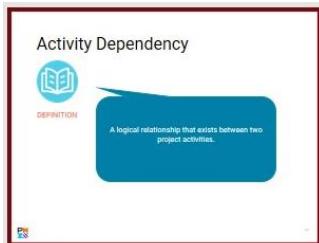
GUIDELINES: Estimating Project Activities

- Review the schedule management plan for information on the level of detail needed to manage the project work.
- Review the scope baseline for the WBS, deliverables, assumptions and constraints.
- Review the EEFs such as organizational culture and structure, published commercial information, and project management information systems.
- Review the OPAs such as lessons learned, standardized processes, templates and organizational policies, and procedures and guidelines for scheduling.
- Analyze and decompose each work package of the WBS into activities (if desired) that will be required to produce the deliverable:
 - Conduct brainstorming sessions with the project team to ensure that no required activities are overlooked.
 - Consult the scope statement to ensure that activities will enable you to meet the project objectives.
 - Consult subject matter experts (SMEs) about unfamiliar material.
 - Evaluate all constraints and assumptions for their possible impact on activity definition.
- Once you have decomposed each work package into activities, evaluate your activity list:
 - Ensure that the descriptions accurately reflect the actions to be performed.
 - Verify that the activity descriptions are as specific as possible.



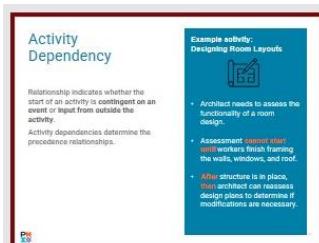
For example: If the desired outcome is a revised user manual, describe the activity as “revise user manual,” rather than “produce new user manual.”

- Confirm that the activities listed for each work package are necessary and sufficient for satisfactory completion of the deliverable.
- Verify that the list is organized as an extension of the WBS.



Activity Dependency (Definition)

An activity dependency is a logical relationship that exists between two project activities.



Activity Dependency

The relationship indicates whether the start of an activity is contingent upon an event or input from outside the activity.

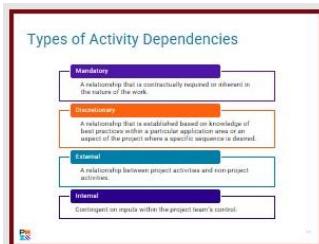
Activity dependencies determine the precedence relationships.



For example: an architect has designed a residence and has a vision for the room layouts.

However, he will not be able to assess the functionality of the design until the builders have framed in the structure with walls, windows, and a roof.

Once the structure is in place, he will be able to reassess the plans to determine if modifications are necessary.



Types of Activity Dependencies

Activity dependencies can be categorized as either mandatory or discretionary, and they can be either internal or external.

Activity dependencies categories include the following:

- **Mandatory** - A relationship that is contractually required or inherent in the nature of the work. They are referred to as hard logic or hard dependencies, where there is no way around this sequence.



For example: the sidewalk form must be built before the concrete can be poured.

- **Discretionary** - A relationship that is established

based on knowledge of best practices within a particular application area or an aspect of the project where a specific sequence is desired. They are also called soft logic. They are not necessary and can be modified as the project progresses, and a better sequence is found or the schedule needs to be condensed.

- **External** - A relationship between project activities and non-project activities.



For example: The delivery of a part that is needed to build a prototype.

- **Internal** - A dependency between project activities and is usually under the project's control.



For example: The software testing is dependent on the software being written by a software development team.



Precedence Relationships

A precedence relationship is a logical dependency used in the precedence diagramming methods (PDMs).

In other words, the precedence relationship exists between activities that describe the sequence in which the activities should be carried out.

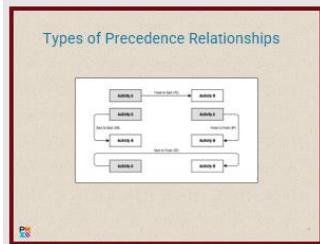
Each activity has two open points: start and finish. Precedence relationships consider appropriate logic while connecting these points.

Precedence indicates which of two activities drives the relationship (the predecessor activity) and which is driven by it (the successor activity).

In most situations, predecessors occur earlier in time than successors.

Precedence relationships are always assigned to activities based on the dependencies of each activity.

A finish-to-start relationship is an example of the precedence relationship: Drywall installation must finish before painting can begin.



Types of Precedence Relationships

There are four precedence relationship types. Predecessor activities come before a dependent activity and successor activities come after another activity.

1. **Finish-to-Start (FS)** - A logical relationship in which a successor activity cannot start until a predecessor activity has finished.



For example: The foundation for the house must be finished (Activity A) before the framing can start (Activity B). The total time for these two activities is the sum of A + B.

2. **Finish-to-Finish (FF)** - A logical relationship in which a successor activity cannot finish until a predecessor activity has finished.



For example: Construction must be finished (Activity A) before the building inspection can be finished (Activity B). The total time to complete both activities is the sum of A + B, minus any overlap.

3. **Start-to-Start (SS)** - A logical relationship in which a successor activity cannot start until a predecessor activity has started.



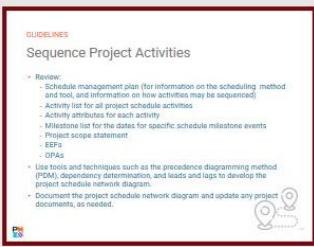
For example: The building design must start (Activity A) before the electrical layout design can start (Activity B). As with the FF example, the total time for activities A and B will vary, depending on when Activity B starts. But in SS, there is a longer window of time during which Activity B can begin.

4. **Start-to-Finish (SF)** - A logical relationship in which a successor activity cannot finish until a predecessor has started.

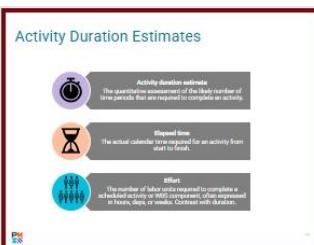


For example: Ticket sales (Activity B) don't end until the concert (Activity A) starts. The total time for two activities in an SF relationship is either A or B, whichever is longer.

GUIDELINES: Sequence Project Activities



- Review the schedule management plan for information on the scheduling method and tool, and information on how activities may be sequenced.
- Determine the dependencies among project activities by using your activity list and product descriptions.
- Identify predecessor and successor activities by reviewing the activity attributes for each activity, including predecessor or successor relationships.
- Review the milestone list for the dates for specific schedule milestone events.
- Review the project scope statement for the scope description, deliverables, constraints, and assumptions that may affect activity sequencing.
- Review the EEPs such as government or industry standards, Project Management Information System, scheduling tool, and work authorization systems.
- Review the OPAs such as activity planning policies, procedures, guidelines, and templates.
- Use tools and techniques such as Precedence Diagramming Method (PDM), dependency determination, and leads and lags to develop the project schedule network diagram.
- Document the project schedule network diagram and update any project documents as needed.



Activity Duration Estimates

Activity duration estimates are the quantitative assessments of the likely number of time periods that are required to complete an activity.

These estimates do not include any lags between the finish of one activity and the start of the next one. Each activity will have one duration associated with it, for example, two days, one week, or one month.

Remember that duration includes only working times, not non-working periods such as weekends or holidays.

You can refer to the schedule management plan for considerations that might affect activity durations.



Examples of things that might be affected are:

- Domestic and international holidays
- Unit of measurement used for durations
- Other projects and operations

Elapsed time is the actual calendar time required for an activity's completion. An activity that requires two weeks to complete would take four calendar weeks of elapsed time if there's a two- week plant shutdown in the middle.

Effort is the number of labor units required to complete a scheduled activity or WBS component, often expressed in hours, days, or weeks. Contrast with duration. The estimates of effort provide the basis for cost estimating and resource allocation.

GUIDELINES

Estimate Activity Durations

- Involve the work package owners or those familiar with the work of the activity.
- Consult lessons learned and historical information.
- Review the schedule management plan.
- Determine how you want to quantify the work that needs to be done.
- Review the resource requirements for each activity.
- Check the resource calendars for resource availability.
- Consider interactions with other projects or operations.
- Review the project scope statement for assumptions and constraints.
- Review the risk register for risks that may affect resource estimation.
- Document the activity duration estimates.



GUIDELINES: Estimate Activity Durations

Accurate activity duration estimates form the basis of an accurate project schedule. To ensure your estimates are as accurate and realistic as possible, follow these guidelines:

- Involve the work package owners or others who are familiar with the work of the activity.
- Consult lessons learned and historical information.
- Are there any detailed records from previous earlier iterations of this project or from similar projects that you could use to derive your estimates?
- Are there any relevant commercial duration estimating databases?
- Do any project team members have experience with similar activities?
- Review the schedule management plan to determine the appropriate estimation method to use and the level of accuracy needed to estimate activity durations.
- Determine how you want to quantify the work that needs to be done, in terms of the estimated hours of labor that will be needed, the number of units to be produced, and the number of customers to be served.

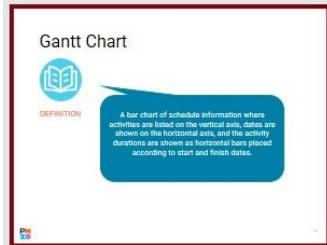


Schedule Presentation Formats

The project schedule can be presented in different formats, depending on the circumstances.

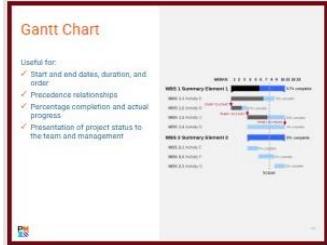
Three commonly used schedule formats are:

- Gantt chart
- Milestone chart
- Project schedule network diagram with dates



Gantt Chart (Definition)

Created by Henry Gantt, the Gantt chart is a bar chart of schedule information where activities are listed on the vertical axis, dates are shown on the horizontal axis, and the activity durations are shown as horizontal bars placed according to start and finish dates.



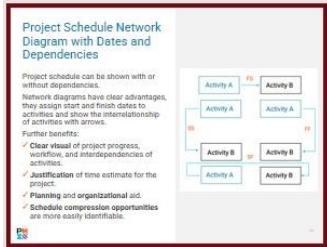
Gantt Chart

Tasks in the Gantt chart are listed down the left side and dates are listed across the top or bottom with bars to indicate start and finish dates.

Time is represented with horizontal bars that correspond to the activities.

Gantt charts may also show the dependencies of the project activities, as well as the percentage of the activity completed to date and the actual progress in relation to planned progress.

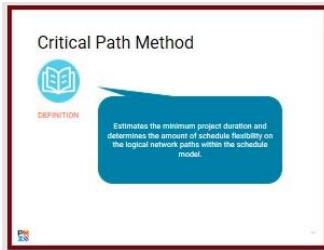
These charts are often used when presenting project status to upper management. A detailed view of the chart is used when reviewing project status with the project team.



Project Schedule Network Diagram with Dates and Dependencies

Adding dates to the project schedule network diagram helps when assigning start and finish dates to activities on the project schedule network diagram.

These types of charts can be useful when you need to communicate the project status in terms of activity precedence relationships.



Critical Path Method (Definition)

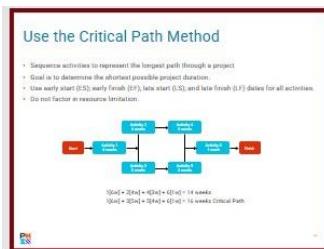
Estimates the minimum project duration and determines the amount of schedule flexibility on the logical network paths within the schedule model.



Critical Path Activity (Definition)

A critical path activity* is any activity on the critical path in a project schedule.

Generally, for all activities along the critical path, $ES = LS$ and $EF = LF$. There can be no flexibility in the start time or the finish time for these activities. Activities that are not on the critical path usually have some flexibility in their start and finish times. Activities on the critical path have a total float of zero.



Use the Critical Path Method

Here is a very simple example of a critical path diagram. Let's look at how we use it:

- Sequence activities to represent the longest path through a project
- Goal is to determine the shortest possible project duration.
- Use early start (ES); early finish (EF); late start (LS); and late finish (LF) dates for all activities.
- Do not factor in resource limitation.



About Float

- Float** is also called slack. It is known as the amount of time an activity can be delayed from its ES without delaying the project finish date or the consecutive activities. Float occurs only in activities that are not on the critical path. There are two types: total float and free float.
- Total float** is the amount of time that a schedule activity can be delayed or extended from its early start date without delaying the project finish date or violating a schedule constraint. Total float for an activity can be calculated by subtracting its EF from its LF or its ES from its LS.
- Free float** is the amount of time that a schedule activity can be delayed without delaying the early start date of any successor or violating a schedule constraint. It allows flexibility of the start or finish time within that activity only.

If there is a string of activities with float, free float will be available for the activity only at the end of the string. Free float on the activity is calculated by subtracting the EF of an activity from the ES of its successor activity.



Agile Release Planning

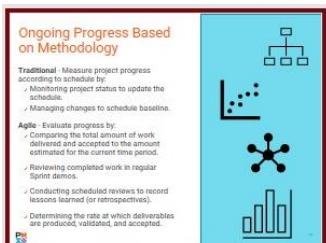
The Agile methodology focuses on creating a number of product releases, each containing completed features that are ready for customer use.

Each release consists of iterations, in which a piece of the product is designed, developed, and tested.

Release planning focuses on creating the summary timeline for the project's product release.

In the Agile release planning process, you determine the number of iterations or Sprints that are needed to complete each release, the features that each iteration will contain, and the target dates of each release.

This enables customers to see the dates when the features that they want are expected to be available.



Ongoing Progress Based on Methodology

Measuring the project's progress with respect to the schedule consists of monitoring the status of the project to update the project schedule and managing changes to the schedule baseline.

During this process, the project manager continually monitors schedule performance by comparing actual work completed to the amount of work that was planned to be completed.

In addition, the project manager and the Change Control Board (CCB) monitors, coordinates, and implements changes to the project schedule and evaluates the impact of those changes on other performance baselines and the original scope definition.

Schedule performance measurement is any technique used to determine how the project is performing in terms of time as compared to its planned performance.

Schedule performance measurement tells the project

manager how much variance exists between the actual work completed and the work scheduled.

Performance measurement techniques such as Earned Value Management (EVM), trend analysis, and variance analysis are used to help determine if the schedule variance is potentially detrimental to the project and if corrective actions are needed to ensure on-time deliverables.

By using the approved schedule baseline as the standard for measuring progress, the project manager collects reporting information for each activity and uses a bar chart to summarize the data.

If an agile approach is used to manage the project, progress can be evaluated with the following steps:

- Compare the total amount of work delivered and accepted with the estimate of the work to be completed for the current time period.
- Review the completed work in the regular Sprint demos.
- Conduct scheduled reviews to record lessons learned (also known as retrospectives) for correcting and improving processes.
- Determine the rate at which deliverables are produced, validated, and accepted in the given time per iteration.



Resource Optimization Techniques

You need to make sure that your project uses its resources as efficiently as possible. This means aligning resource contributions with the schedule to ensure their use is optimized. Consider their own schedules, the project's schedule, EEFs such as holidays, time off, and any mandated working-time directives that apply.



Smoothing and Levelling

In general, these are the main ideas:

- Use Resource Optimization to adjust the start and finish dates of activities.
- Adjust planned resource use so that it's equal to or less than resource availability.
- Adjust the schedule model due to demand and supply of resources.

- Use smoothing and levelling techniques.



Smoothing/Levelling

So, what are these techniques for smoothing and levelling resources?

Smoothing –

- Adjusts the activities of a schedule model to keep resource requirements within predefined resource limits and within free and total floats.
- Does not change the critical path is not changed nor delay the completion date.
- This method may not be able to optimize all resources.

Levelling –

- Adjusts start and finish dates based on resource constraints.
- Goal is to balance demand for resources with available supply.
- Use when shared or critically required resources have limited availability or are over- allocated.
- Can change the critical path.

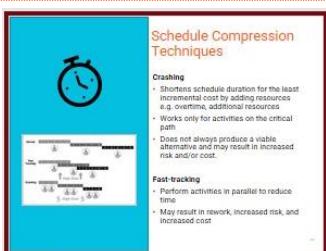


Schedule Compression Techniques

Another approach to optimize delivery times is to compress the entire schedule.



Idea: Can you think of suitable uses of schedule compression? What problems might arise when you use it?



Schedule Compression Techniques

Schedule compression does not come without significant risks and cautions. You can do one of two things to compress the schedule: crash it or fast-track.

Crashing – In this scenario, you add resources to shorten schedule duration. But the negative factors or cautions are that crashing:

- Results in increased risk or cost
- Only works for activities on the critical path
- Does not always produce a viable result

Fast-tracking – In this scenario, you perform activities in parallel to reduce total time on the project. However, this

depends on resource availability and also carries some negative factors. Fast-tracking can result in:

- Rework
- Increased risk
- Increased cost



Coordination with Other Projects

If the project is part of a program or a portfolio, the schedule status of the project should be evaluated for any effect it has on the other components of the program or portfolio.

In some situations, a delay (or acceleration) of a project may not impact other projects.

However, if the delay or acceleration is caused by activities on the project's critical path and that project is critical to the schedule of other projects, the overall effect can be significant.

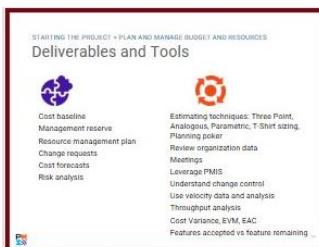
Topic D: Plan and Manage Budget and Resources

Without proper management of project costs, expenses can get out of control quickly. You must be prepared to make adjustments and apply the correct costs to resources, activities, and services that align with your budget. The cost management plan helps you plan, react to, and update project costs when issues or changes arise throughout the life cycle of a project.



Plan and Manage Budget and Resources

In this topic, we look at how to plan and manage a project budget and resources. In this case, by ‘resources’, we mean all of the tangible and intangible requirements needed to do project work.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Cost Estimates

- Estimating costs consists of developing an approximation of the cost for each activity in the project.
- That cost should include direct labor, materials, equipment, facilities, services, information technology, contingency reserves, and indirect costs.
- Logical estimates provide a basis for making sound decisions about projects, and they establish baselines against which the success of the projects can later be measured.
- Whether your organization or project uses traditional or Lean funding models, cost estimates are a requirement.



Estimating Techniques - Advantages and Disadvantages

In the graphic - “Thumbs up” indicates a benefit and “thumbs down” is a drawback.

Analogous estimating

- Uses the cost of a previous project with similar scope or activities to predict the cost of future activities.

- Can ensure no work is inadvertently omitted from work estimates.
- Can sometimes be difficult for lower-level managers to apportion cost estimates.

Parametric estimating

- Relies on the statistical relationship that exists between historical information and variables so as to arrive at an estimate for parameters such as duration and cost.
- Is not time consuming.
- May be inaccurate, depending on the integrity of the historical information used.

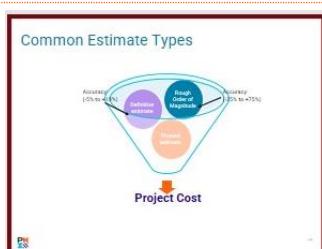
Bottom-up estimating

- Estimates the cost of individual activities then "rolls up" to higher levels.
- Is accurate and gives lower-level managers more responsibility.
- May be time consuming and can be used only after the WBS has been well-defined.

Three-point estimating (not on this slide, but you should also know it)

Incorporates three types of estimates into a singular cost estimate scenario:

- most likely
- optimistic
- pessimistic



Common Estimate Types

This graphic describes some common estimate types and their associated degrees of accuracy.

Rough Order of Magnitude (ROM)

Generally made early in the project. Developed without basis of detailed data and often based on high-level historical data, expert judgment, or a costing model. Accuracy: -25% to +75%.

Definitive estimate (or "control" or "detailed")

Based on detailed information about the project work. Developed by estimating the cost for each work package in the WBS. Accuracy: -5% to +10%.

Phased estimate (or "rolling wave" or "moving window")

Allows the use of a less-detailed estimate (perhaps ROM) for some later parts of the work, whereas work that must be done earlier in the project life cycle is estimated more accurately (perhaps at the definitive level).



Project Governance

Governance, as applied to cost estimates, can be described as managing project phases.

A different type of cost estimate and level of accuracy may be required for different phases of the project life cycle.

A cost estimating method might be chosen due to:

- Software availability
- Team member experience
- Project life cycle phase
- Time constraints
- Project definition
- Personal preference



Compliance

This topic is covered fully in Lesson 5, so this is a quick note about compliance and how it affects the budget.

With regards to budget, you need to factor in the cost of compliance. These are budget items that are often underestimated. Think about the actual cost, but also the allocation and cost of resources to ensure compliance.



Lessons Learned Register

Lessons learned from earlier in the project can be applied to later work, to take advantage of knowledge previously acquired.

Experiences gleaned from previous projects is also an important component of the budgeting process.

Lessons-Learned registers contain valuable information about cost-estimating successes and shortcomings that can be used to develop cost estimates for activities and work packages in similar projects.



GUIDELINES: Estimate Costs

Accurately estimating project costs will avoid overruns and unforeseen expenditures. Making good cost estimates will help you to create a strong cost baseline, which will ultimately be used for measuring project cost performance. Here are some guidelines for estimating costs:

- When possible, the cost figures that go into the cost estimates for individual work packages should be provided by those who will actually provide the resources. As always, it is the people who will do the work, provide the service, or supply the material that can best estimate what the associated costs will be. It is the project manager's responsibility to compile these cost figures into realistic estimates.
- For some projects, though, the project manager will be solely responsible for generating the cost estimates.
- Even in such cases, the project manager may want to do a reality check with the resource supplier to make sure no incorrect assumptions have been made.
- Gather any relevant input information that may help you prepare the estimates such as estimating publications and resource rates.
- Determine which estimating technique to use.
- Look for alternative costing options such as using stock components versus custom-made, stretching the duration of an activity to eliminate overtime charges, leasing versus purchasing of capital equipment, and outsourcing as opposed to handling the work in-house.
- Determine the units of measure that will be used.
- Consider possible risks that may impact cost.
- Ensure that all cost estimates are assigned to the appropriate account, according to the chart of accounts.
- Make sure your cost estimates include the following key elements:
 - Estimated costs for all resources that will be charged to the project. Use the WBS and resource requirements document to develop the estimates.
 - The level of estimate (degree of certainty).
 - A list of assumptions made when developing the estimates.



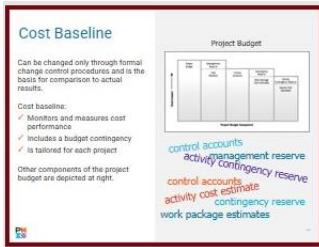
GUIDELINES: Estimate Budget

- Aggregate the estimated costs of individual activities or work packages to establish an authorized cost baseline.
- Ensure budget contains funding needed to complete the project as defined in the scope baseline and the project schedule.
- Measure project cost performance against this cost baseline



Cost Baseline (Definition)

A cost baseline is the approved version of the time-phased project budget, excluding any management reserves*, which can be changed only through formal change control procedures and is used as a basis for comparison to actual results.

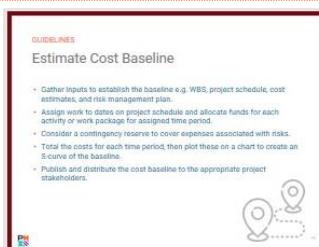


Cost Baseline

Cost baseline is developed by adding the estimated costs of project components by period.

The cost baseline typically includes a budget contingency to accommodate the risk of incurring identifiable, but not normally occurring, costs within the defined scope.

Cost baselines will vary from project to project, depending on each project's unique budget and schedule.



GUIDELINES: Estimate Cost Baseline

- You can estimate a cost baseline to assist in the monitoring and measuring of cost performance throughout the project life cycle.
- You can use the following guidelines to estimate the cost baseline:
 - Gather the inputs you will need to establish the baseline, such as the WBS, the project schedule, the cost estimates, and the risk management plan.
 - Use the project schedule to determine when work will take place.
- Using one of the methods for assigning costs, allocate funds for each work package for the time period in which it will take place.
- Consider adding a contingency reserve to

accommodate the risk of incurring extra expenses.

- Avoid adding contingency reserves for work packages with low-risk values.
- Total the costs for each time period.
- Plot the costs for each period on a chart to create an S-curve of the baseline.
- Publish and distribute the cost baseline to the appropriate project stakeholders.



Budget Challenges

Ideally, a budget is set during project planning and does not change. However, most projects do not exist in a perfect world and one of several things can happen to pose a challenge to the project manager:

- New or changed project requirements, which can be based on data collected by the organization regarding how the organization intends to use the project's deliverables.
- New risks, or changes to the probabilities or impacts of existing risks.
- Changes to cost estimates resulting from economic factors, procurement contract modifications, resource costs, etc.



Response to Budget Challenges

When any of these things occur, one or more of the following must change:

- The project budget.
- The project cost.
- The project schedule.
- The scope.

If the budget remains fixed and additional funds are not available, then the project must change.

However, **agile budgeting** and **Lean-based funding** methods offer flexibility to projects prone to change. Agile budgeting happens in shorter intervals—quarters, instead of years, for example. And Lean, which is about just-in-time delivery, enables you to allocate budgeted funds just in time for use.



Funding Limit Reconciliation (Definition)

The process of comparing the planned expenditure of project funds against any limits on the commitment of funds for the project to identify any variances between the funding limits and the planned expenditures.

Funding Limit Reconciliation

Most budgets are created on the premise of steady incoming and outgoing flows.

Large, sporadic expenditures are usually incompatible with organizational operations.

Therefore, funding limits are often in place to regulate the outgoing capital flow and to protect against overspending.

Budgets must be reconciled with such limits. This will affect the scheduling of project work and possibly reshuffle WBS work packages entirely.

The schedule, in turn, can affect the distribution or acquisition of resources.



For example: Customers set funding limits for large projects based on internal considerations such as when their fiscal years begin and end, and how healthy their cash flows are. A customer who wants to spread the costs of a project over two quarters might authorize \$250,000 in spending during Quarter 1 and \$350,000 during Quarter 2. In response, the project manager would need to align the resources, schedules, and activities so that the project work does not exceed those limits on funding.



GUIDELINES: Anticipate Future Budget Challenges

While you cannot plan for all eventualities, here are a few guidelines to help you plan for future budget challenges:

- Keep the stakeholder register current and be aware of changes to project requirements if new

stakeholders are added to the project.

- Monitor risks frequently to look for new risks and changes to existing ones.
- Monitor the performance of suppliers and vendors.
- Monitor all changes to the project and follow the Change Management System to try to keep them within budget.



GUIDELINES: Determine a Budget

To determine a project budget effectively:

- Review the cost management plan* for information on how project costs will be managed and controlled, and the method used and level of accuracy for estimating activity cost.
- Review the resource management plan for staffing attributes, personnel rates, and reward and recognition information.
- Review the scope baseline for the project scope statement, WBS, and WBS dictionary.
- Check the project schedule for type, quantity, and duration of resources needed for project activities.
- Review the risk register to consider any risks that may impact cost estimation.
- Review the OPAs that can influence this process such as cost estimating policies, cost estimating template, historical information, and lessons learned.
- Use tools and techniques such as cost aggregation, reserve analysis, expert judgment, historical information, and funding limit reconciliation to determine a budget for the project.
- Document the project budget and create a cost baseline.
- Understand project funding requirements. This includes ensuring that project expenses are not incurred faster than project income is received.
- Update project documents, as needed.

Topic E: Plan and Manage Quality of Outputs and Deliverables

All projects must be of a certain quality. What that level of quality is, the expectations around the quality, how the project's quality is to be measured, how it will be aligned to the project's objective, and how the quality is to be tracked and reported are a few important aspects of managing project quality. There is a lot to do and consider when it comes to assuring and delivering quality deliverables and products.



Plan and Manage Quality of Outputs and Deliverables

This is the fifth topic in lesson 2. We've looked at methods, scope, schedule, and resources. Now it's time to turn our attention to deliverables.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Quality (Definition)

Quality is the degree to which a set of inherent characteristics fulfills requirements.

Remember that quality represents what the stakeholders expect from the project.

The stated and implied quality needs are inputs for devising project requirements. In business, quality should be feasible, modifiable, and measurable.

The quality standards that need to be met must be managed throughout the life of the project. At the beginning of the project, you should plan quality policies and procedures that can then be managed and controlled throughout the project using the organization's quality management system.

Continuous process improvement activities also need to be considered for the benefit of the project. Project quality may be affected by applicable standards and regulations.



Quality Standards and Regulations

- A **standard** is a document established by an authority, custom, or general consent as a model or example. Standards are typically voluntary guidelines or characteristics that have been approved by a recognized body of experts such as the International Organization for Standardization (ISO). In some cases, the standards body will provide certification that suppliers conform to the requirements of their standards. Often, the conformance to standards is a customer requirement.
- Regulations** are requirements imposed by a governmental body. These requirements can establish product, process, or service characteristics, including applicable administrative provisions that have government-mandated compliance. Standards often start out as accepted or **de facto** best practices describing a preferred approach and may later become **de jure** regulations such as using the critical path method in scheduling major construction projects.



Verified Deliverables

- Project team **verifies** deliverables based on quality standards and requirements
- The verified deliverables are **presented to and accepted** (or validated) by the customer – resulting in accepted deliverables.
- Measure** products and outputs against the project's quality standards.
- Implement** corrections and controls when quality standards are neither met nor within acceptable ranges.



Quality Management Plan (Definition)

A component of the project management plan that describes how applicable policies, procedures, and guidelines will be implemented to achieve the quality objectives.



Quality Management Plan

Describes the **activities and resources** necessary for the project management team to achieve the quality objectives.

May be formal or informal, detailed, or broadly framed.

Style and level of detail are determined by project requirements.

For example, physical products will require different details about expected quality than will service or process improvement products.

Review the quality management plan early in the project.
Benefits:

- Decisions based on accurate information
- Sharper focus on the project's value proposition
- Cost reductions
- Mitigate schedule overruns from rework



Cost of Quality (CoQ)

CoQ is all costs incurred over the life of the product by investment in preventing nonconformance to requirements, appraisal of the product or service for conformance to requirements, and failure to meet requirements.



Quality Metrics

You need to ensure a description of the project or product that is measurable. Then, the team needs to decide how that quality will be measured and what kind of tolerances should be set for quality.



Quality Audit (Definition)

A structured, independent process to determine if project activities comply with organizational and project policies, processes, and procedures.



Quality Audit

Quality audits, whether conducted regularly, on a schedule, or in ad hoc fashion, improve quality performance of a project.

Topics that can and should be audited include:

- ✓ Quality management policy
- ✓ Collection and use of information
- ✓ Analytical methods
- ✓ Cost of quality
- ✓ Quality process design



GUIDELINES: Manage Quality

- Ensure that random and/or scheduled quality audits are conducted by qualified auditors.
- Use one or more of the quality assurance tools and techniques to determine the causes of quality problems of the project's product, service, systems, or processes.
- Identify and implement the appropriate actions to take to increase the effectiveness and efficiency of the project team's work results.

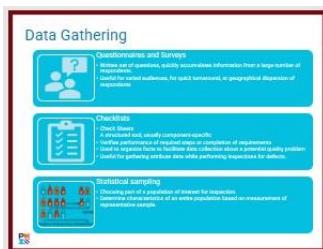


Control Quality Tools

These are presented here as an opportunity for an overview and compare and contrast. They are discussed at length over the next 6 slides.

Let's take a look at the tools project managers use to control quality on a project:

- Data gathering
- Data analysis
- Data representation



Data Gathering

Questionnaires and surveys, checklists, and statistical sampling are three commonly used data gathering methods.

Let's look at what they are and their use cases.

Questionnaires and Surveys

- Written set of questions, quickly accumulates information from a large number of respondents.
- Useful for varied audiences, for quick turnaround, or geographical dispersion of respondents

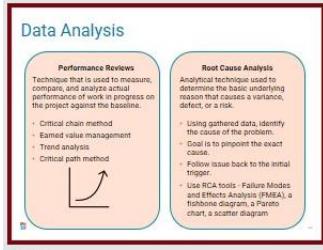
Checklists

- Check Sheets
- A structured tool, usually component-specific
- Verifies performance of required steps or completion of requirements
- Used to organize facts to facilitate data collection about a potential quality problem
- Useful for gathering attribute data while performing inspections for defects.

Statistical sampling

- Choosing part of a population of interest for inspection.

- Determine characteristics of an entire population based on measurement of representative sample.



Data Analysis

Performance Reviews

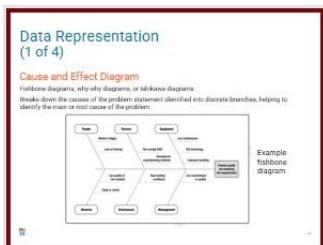
Technique that is used to measure, compare, and analyze actual performance of work in progress on the project against the baseline.

- Critical chain method
- Earned value management
- Trend analysis
- Critical path method

Root Cause Analysis

Analytical technique used to determine the basic underlying reason that causes a variance, defect, or a risk.

- Using gathered data, identify the cause of the problem.
- Goal is to pinpoint the exact cause.
- Follow issue back to the initial trigger.
- Use RCA tools - Failure Modes and Effects Analysis (FMEA), a fishbone diagram, a Pareto chart, a scatter diagram

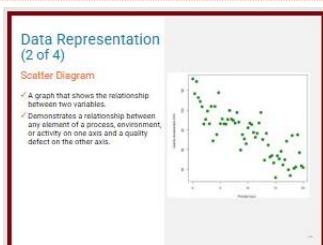


Data Representation (1 of 4)

We need to be able to see work. Gaining visibility means greater transparency on projects.

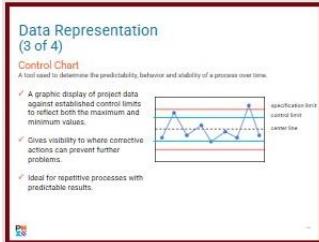
Cause and effect diagrams break down the causes of a problem statement , helping to identify the main or root cause of a problem.

These are also called 'fishbone'. 'Ishikawa', or 'why-why' diagrams.



Data Representation (2 of 4)

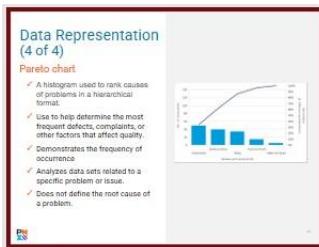
Scatter diagrams use a traditional graph to represent the relationship between any element of a process, environment, or activity on one axis and a quality defect on the other axis.



Data Representation (3 of 4)

A control chart is a tool used to determine the predictability, behavior, and stability of a process over time.

- ✓ A graphic display of project data against established control limits to reflect both the maximum and minimum values.
- ✓ Gives visibility to where corrective actions can prevent further problems.
- ✓ Ideal for repetitive processes with predictable results.



Data Representation (4 of 4)

A Pareto chart is a histogram used to rank causes of problems in a hierarchical format.

- ✓ Use to help determine the most frequent defects, complaints, or other factors that affect quality.
- ✓ Demonstrates the frequency of occurrence
- ✓ Analyzes data sets related to a specific problem or issue.
- ✓ Does not define the root cause of a problem.



GUIDELINES: Control Product Quality

- Conduct inspections to detect quality errors during project work.
- Use Pareto diagrams to focus corrective actions on the problems with the greatest effect on quality.
- Use control charts to analyze and communicate the variability of a process or project activity over time.
- Identify ways to eliminate causes of unsatisfactory results.
- Use flowcharts to identify redundancies, missed steps, or the source of quality performance problems.
- Initiate process adjustments by implementing corrective or preventive actions.
- Continue to monitor, measure, and adjust quality throughout project life cycle.

Topic F: Integrate Project Planning Activities

This is where it all starts coming together. Project teams need to merge or integrate all of the planning activities we've been discussing into a cohesive plan.



Integrate Project Planning Activities

In the sixth topic, we turn our attention into integrating planning activities, aligning scope, budget and resources, timelines along with any other necessary plans.



Integration Management

In this step, the team assesses and coordinates all plans and activities that are built, maintained, and executed throughout a project.

A holistic, integrated view ties plans together, aligns efforts, and highlights how they depend on each other.

An integrated view of all plans can identify and correct gaps or conflicts.

A consolidation of the plans encapsulates the overall project plan and its intended business value.



Project Management Plan

This is the document that describes how the project will be executed, monitored, controlled, and closed.



Project Integration Management Processes

We are looking at a graphic from the PMBoK 6th edition (Figure 4-1, page 71). It is a visual representation of Project Integration Management processes.

You do not need to memorize the 7 processes listed here. But you should understand the general sequence, and that these processes will overlap each other. Also expect that iterations will include activities in more than one process.



Project Management Information System (PMIS)

How will you integrate these processes? Managing so much information and keeping it visible is a challenge.

Microsoft Project is one product that offers the capability of managing process integration.



Project Management Plan Components

Project management plan components are a combination of essential and supporting—or subsidiary—processes used to run a project.

Ensure the essential plans and processes are in place. These are scope, schedule, and cost, which we have already discussed.

Next, you adapt and tailor the supporting plans and processes to your project. Consider the needs of the project to determine which components of the project management plan are needed.



Project Management Plan Tools and Techniques

Rely on expert judgment, meetings, data gathering, and interpersonal and team skills to create an effective project management plan.



Managing Change

We just saw that a change management plan can be a supporting plan in your project. Rarely will projects be completed without any change. But often, this is one of the gravest challenges for projects. Change, if not managed, can derail your project irreparably.

Managing change effectively begins with good leadership and communication, as it hinges directly on organizational culture and the capacity or tolerance for change.

Finally, project managers also play critical roles in enterprise-level change, or transformations. These are organizational-level, multi-layered, complex, and holistic change projects.



Configuration Management Plan/ Change Management Plan

Let's understand the difference between the configuration and change management plans.

- Configuration management plans identify and account for project artifacts under configuration control and how to record and report changes to them.
- Change management plans provide direction for managing the **change control process** and documents the roles and responsibilities of the change control board (CCB).



Change Management Plan

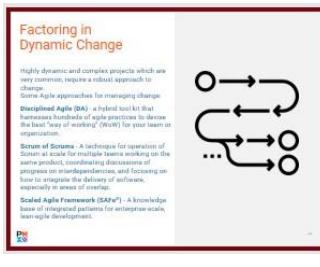
A change management plan answers the following questions:

- Who can propose a change?
- What exactly constitutes a change?
- What is the impact of the change on project objectives?
- What are steps to evaluate a change request before approving or rejecting it?
- When a change request is approved, what project documents will record the next steps (actions)?
- How will you monitor these actions to confirm completion and quality?



GUIDELINES: Develop a Project Management Plan

- Review:
 - Project charter - for the high-level boundaries of the project
 - Outputs from other processes
 - EEFs and OPAs
- Use tools and techniques.
- Use facilitation techniques.
- Document the project management plan.
- Assess incremental delivery options.



Factoring in Dynamic Change

In a growing number of cases, a traditional project management plan will not cope with the degree and type of change impacting a project.

In this case, let's look at a few agile approaches for

managing change:

- **Disciplined Agile (DA)** - a hybrid tool kit that harnesses hundreds of agile practices to devise the best “way of working” (WoW) for your team or organization.
 - **Scrum of Scrums** - A technique for operation of Scrum at scale for multiple teams working on the same product, coordinating discussions of progress on interdependencies, and focusing on how to integrate the delivery of software, especially in areas of overlap.
 - **Scaled Agile Framework (SAFe®)** - A knowledge base of integrated patterns for enterprise-scale, lean-agile development.
-

Topic G: Plan and Manage Procurement

While procurement is not the primary responsibility of the project manager, we do need to understand why and how a project manager needs to plan and manage for procurement of goods and services for a project.



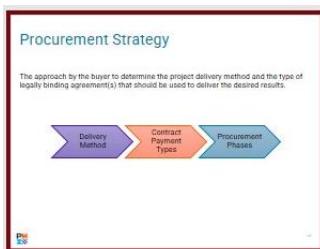
Plan and Manage Procurement

Procurement is the process by which organizations endeavor to contract or outsource products or services. Though this is not typically the responsibility of the project manager, we need to cover the points related to procurement planning and management.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Procurement Strategy

The procurement strategy is the approach by the buyer to determine the project delivery method and the type of legally binding agreement(s) that should be used to deliver the desired results.

Think about how you can best acquire the product or service, then what sort of legal agreement is most suitable for provision of said goods and services, and then how you will navigate the phases of procurement.



Delivery Solution

The goal of procurement is to deliver goods or services to the project. Let's take a closer look at what happens in each phase.

1. Planning and analysis – Document your requirements
2. Detailed design – Document the solution
3. Implementation/installation – Implement or install the solution
4. Testing – Test the solution
5. Training – Ensure those who need training to use the solution have it.
6. Handover – Conduct formal handoff of the product

- or service from vendor to supplier
7. Support and maintenance – Ensure ongoing support is ready and available for the solution

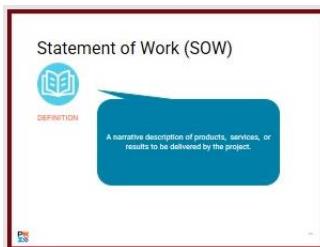


Make or Buy?

When you consider your team's requirements against budget and timeline, you can make choices about how a required product or service can be procured.

Do we buy it? Or should we try to make it in house?

Other approaches include borrowing **a resource** from another team or **outsourcing a product or service temporarily**, rather than buying.



Statement of Work (SOW) – (Definition)

Error in the slides: This should say “to the project by a vendor”

An SOW is a narrative description of products, services, or results to be delivered to the project by the vendor.



Procurement SOW

A procurement SOW describes the item in sufficient detail to allow prospective vendors to determine if they can provide the product or service.

Use information from the project scope baseline to create the procurement SOW.



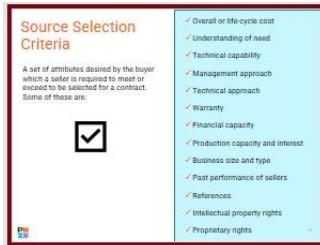
Procurement Management Plan (Definition)

A component of the project or program management plan that describes how a project team will acquire goods and services from outside of the performing organization.



Procurement Management Plan

- Specifies the types of contracts that will be used
- Describes the process for obtaining and evaluating bids
- Mandates standardized procurement documents
- Describes how providers will be managed



Source Selection Criteria

Source selection criteria are a set of attributes desired by the buyer which a seller is required to meet or exceed to be selected for a contract. Some of these are:

- ✓ Overall or life-cycle cost
- ✓ Understanding of need
- ✓ Technical capability
- ✓ Management approach
- ✓ Technical approach
- ✓ Warranty
- ✓ Financial capacity
- ✓ Production capacity and interest
- ✓ Business size and type
- ✓ Past performance of sellers
- ✓ References
- ✓ Intellectual property rights
- ✓ Proprietary rights



Qualified Vendors

Most organizations have a working list of qualified vendors. This does not mean you can't opt for using someone new, but ensure that any new vendors are fully vetted and set up with your organization.



Bidder Conferences

A way of attracting top talent is to ask vendors to compete for work. Once you have given a clear understanding of the procurement requirements and terms and conditions, bidders can prepare a competitive bid to provide the service.



External Resource Requirements and Needs

We mentioned outsourcing earlier. Contract workers or services are a means of outsourcing work on a short-term basis, or to fill temporary gaps.

Outsourcing to external vendors enables your project or organization to focus on your core competencies.



For example: Training is often outsourced, especially in specialized knowledge areas.

Supplier and Contracts



Contract: A mutually binding agreement that obligates the seller (supplier) to provide the specified project or service or result and obligates the buyer to pay for it.

- ✓ Customized for each agreement
- ✓ Contract types:
 - Fixed price
 - Cost-reimbursable
 - Time-and-materials (T&M)
- ✓ Agile contract types
 - Capped Time and Materials Contracts
 - Target Cost Contracts
 - Incremental Delivery Contracts

Supplier and Contracts

Contract types are explained in a few slides, so just mention them here!

A contract is a mutually binding agreement that obligates the seller (supplier) to provide the specified project or service or result and obligates the buyer to pay for it.

Contracts are:

- Customized for each agreement
- Contract types:
 - Fixed-price
 - Cost-reimbursable
 - Time-and-material (T&M)
- Agile contract types
 - Capped Time and Materials Contracts
 - Target Cost Contracts
 - Incremental Delivery Contracts

Communicating with Suppliers and Vendors



Critical component of the procurement process due to the people involved.

Consult the Communication Plan for provisions for working with vendors or suppliers, such as:

- Periodic progress reports of the work performed.
- Advance notification of potential supplier cost overruns or schedule delays to allow time for the project manager to the supplier.
- Formal acceptance by the project manager of supplier's contract deliverables.

Communicating with Suppliers and Vendors

Communicate with project suppliers and vendors during negotiations and during the contract period.

Your organization may require formal progress reports—typically this is documented in the SOW. In case formal reports are not required, you should check in with the supplier to ensure work is proceeding as expected, on time, and within cost parameters.

When work is complete you will need to arrange a formal acceptance of the deliverables from the supplier.

Components of Contracts



- ✓ Description of the work being procured for the project, its deliverables, and scope
- ✓ Delivery date and schedule information
- ✓ Identification of authority, where appropriate
- ✓ Responsibilities of both parties
- ✓ Management of technical and business aspects
- ✓ Price and payment terms
- ✓ Provisions for termination
- ✓ Applicable guarantees and warranties

Components of Contracts

When you are negotiating and creating the contract for your vendor, you'll need to include the following information:

- Description of the work being procured for the project, its deliverables, and scope
- Delivery date and schedule information
- Identification of authority, where appropriate
- Responsibilities of both parties
- Management of technical and business aspects
- Price and payment terms
- Provisions for termination
- Applicable guarantees and warranties

Traditional Contract Types	
Contract Type	Description
Fixed-price	<ul style="list-style-type: none"> An agreement that sets the fee that will be paid for a defined scope of work regardless of the cost or effort to deliver it. Provides maximum protection to buyer but requires a lengthy preparation and bid evaluation. Provides maximum protection to buyer but requires a lengthy preparation and bid evaluation. Suited for projects with a high degree of certainty about their parameters.
Cost-reimbursable	<ul style="list-style-type: none"> A contract involving payment to the seller for the seller's actual costs, plus a fee. Includes incentives for meeting certain objectives, such as costs, schedule, or technical performance. Suited for projects when parameters are uncertain.
Time and Material (T&M)	<ul style="list-style-type: none"> Includes incentives for meeting certain objectives, such as costs, schedule, or technical performance. Includes not-to-exceed values and time limits to prevent unlimited cost growth. Suited for projects when a precise statement of work cannot be quickly prescribed.

Traditional Contract Types

These are our traditional types of contracts.

A fixed-price contract:

- Is an agreement that sets the fee that will be paid for a defined scope of work regardless of the cost or effort to deliver it.
- Is also known as a lump sum contract.
- Provides maximum protection to buyer but requires a lengthy preparation and bid evaluation.
- Is suited for projects with a high degree of certainty about their parameters.

A cost-reimbursable contract:

- Involves payment to the seller for the seller's actual costs, plus a fee typically representing the seller's profit.
- Includes incentives for meeting certain objectives, such as costs, schedule, or technical performance targets.
- Is suited for projects with uncertain parameters.

A time-and-material (T&M) contract:

- Is a hybrid contractual arrangement containing aspects of both cost-reimbursable and fixed-price contracts?
- Combines a negotiated hourly rate and full reimbursement for materials.
- Includes not-to-exceed values and time limits to prevent unlimited cost growth.
- Is suited for projects when a precise statement of work cannot be quickly prescribed.

Agile Contract Types	
Contract Type	Description
Capped Time and Materials Contracts	<ul style="list-style-type: none"> Works like traditional Time and Materials contracts. Includes not-to-exceed values and time limits. Customers pay up for the capped cost limit. Suppliers benefit in case of early time-frame changes.
Target Cost Contracts	<ul style="list-style-type: none"> Supplier and customer agree on the final price during project cost negotiation. Includes not-to-exceed values and time limits. Contract cost savings if contract value ends below budget. Target cost contracts may allow both parties to face additional costs if it exceeds budget.
Incremental Delivery Contracts	<ul style="list-style-type: none"> Customers review contracts during the contract life cycle at pre-specified points of the contract. Customers can make required changes, continue or terminate the project at these points.

Agile Contract Types

If your project or team is agile, these types of contracts may be prevalent:

A capped time and materials contract works like the traditional time and materials contracts. However:

- An upper limit is set on customers' payment.
- Customers pay up for the capped cost limit.
- Suppliers benefit in case of early time-frame changes.

In **target cost contracts**, the supplier and the customer agree on the final price during project cost negotiation.

These contracts:

- Are primarily for mutual cost savings, if contract

value runs below budget.

- Allow both parties to face additional costs if it exceeds budget.

Finally, in **incremental delivery contracts**:

- Customers review contracts during the contract life cycle at pre-negotiated designated points of the contract lifecycle.
- Customers can make required changes, continue, or terminate the project at these points.



Control Procurements Process (Definition)

The process of managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate, and closing out contracts



Accounts Payable

Suppliers and vendors are given instructions on how to submit invoices for payment—usually in the SOW. However, project managers need to notify the appropriate entity when work has been fulfilled, or, typically, authorize payment of the invoice.



Contract Change Control System

This is the system used to collect, track, adjudicate, and communicate changes to a contract. It:

- Might be a component of the integrated change control system or a separate system.
- Specifically dedicated to control contract changes.
- Specifies the process by which project contract changes can be made.
- Includes the documentation, dispute-resolution processes, and approval levels to authorize the changes to contract specifications.

Next, let's look at the types of contract changes.



Types of Contract Changes

- Administrative** changes are non-substantive and are usually about the way the contract is administered.
- Contract modification** is a substantive change to the contract requirements, such as a new or different deadline or change in product requirements.

- A **supplemental agreement** is an addendum to the contract which is negotiated separately.
- **Constructive changes** are caused by the buyer through action or inaction.
- **Termination of contract** happens when the vendor defaults or for the customer's convenience.



For example: Defaults are due to either non-performance, such as late deliveries and poor quality, or non-performance of some or all project requirements.

Legal Concepts when Managing Disputes

Seek legal advice if the terms of a contract have not been met.
Negotiate settlements to arrive at a final equitable settlement of all outstanding issues, claims and disputes by negotiation.

Legal Issue	Description
Warranty	A promise, explicit or implied, that goods or services will meet a predetermined standard. To understand cover reliability, fitness for use, and safety.
Waiver	The giving up of a contract right, even inadvertently.
Breach of contract	Failure to meet some or all of the obligations of a contract. It may result in damages paid to the injured party, litigation, or other ramifications.
Cease and desist (C&D) letter	A letter sent to an individual or a business to stop (cease) allegedly illegal activities and to not undertake them again (desist). Often used as a warning of impending legal action if it is ignored.

Legal Concepts when Managing Disputes

When a change leads to a dispute, you'll need to seek legal advice to ensure the terms of the contract are observed. Remember to use your negotiation skills to reach a final, equitable settlement of all issues, claims, and disputes.

Briefly, here are the legal concepts you should know, as they relate to contracts:

- **Warranty** – This is the promise, explicit or implied, that goods or services will meet a pre-determined standard. The standard may cover reliability, fitness for use, and safety.
- **Waiver** - The giving up of a contract right, even inadvertently.
- **Breach of Contract** - Failure to meet some or all of the obligations of a contract. It may result in damages paid to the injured party, litigation, or other ramifications.
- **Cease and Desist Letter** - A letter sent to an individual or a business to stop (cease) allegedly illegal activities and to not undertake them again (desist). Often used as a warning of impending legal action if it is ignored.

GUIDELINES

Handle Disputes

- Be aware of important legal terms e.g. 'warranty', 'waiver', and 'breach of contract' that can, if ignored, have a significant impact on the project.
- Consult with the legal department or an outside legal expert so you thoroughly understand any contracts that affect your project.
- If your contract isn't written specifically to exclude inadvertent waivers, avoid waiving your contract rights by:
 - Accepting a product that fails to meet standards for quality or performance.
 - Accepting late deliveries.
 - Overlooking an aspect of nonconformance to contractual obligations.



GUIDELINES: Handle Disputes

- Be aware of important legal terms e.g., 'warranty', 'waiver', and 'breach of contract' that can, if ignored, have a significant impact on the project.
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for quality or performance.

- Accepting late deliveries.
- Overlooking an aspect of nonconformance to contractual obligations.



GUIDELINES: Manage Suppliers and Contracts

- Index and store all contract correspondence for ease of retrieval.
- Develop and implement an effective contract change control system.
- Evaluate the risk of each contract change request.
- Document all contract changes and incorporate any effects of the changes into the project plan.
- Develop and implement an effective performance reporting system for the seller.
- Specify any performance reporting criteria to the seller.
- Set performance milestones to monitor project progress.
- If work is performed at another site, conduct site visits to determine how the seller's work is progressing.
- Submit approved invoices for payment in accordance with the contract and the project's payment system.

Topic H: Establish Project Governance Structure

Project governance is the realm of experienced or senior project managers, but it's important to know how your projects are supported by the organization.



Establish Project Governance Structure

Project governance is mostly likely in place before you begin work. It's often a function of the PMO and in the purview of senior project managers. But let's make sure you know how it works.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Project Governance

Effective project governance helps to ensure that every project team can function as they are intended to. So, let's have a closer look at what underpins successful project management teams.



Project Governance (Definition)

The framework, functions, and processes that guide project management activities in order to create a unique product, service, or result to meet organizational, strategic, and operational goals.

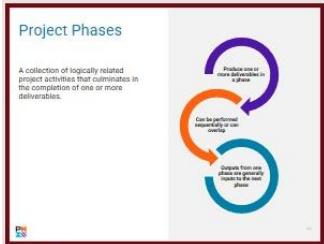


Project Governance

Project governance covers:

- Project success and deliverable acceptance criteria
- Processes to identify, escalate, and resolve issues
- Relationships between project team, organizational groups, and external stakeholders
- Project organization chart with project roles
- Communication processes and procedures
- Processes for project decision-making
- Guidelines for aligning project governance and organizational strategy
- Project life cycle approach

- Process for stage gate or phase reviews
- Process for review and approval of changes above the project manager's authority
- Process to align internal stakeholders with project process requirements



Project Phases

We just learned that project governance enables the process for phase reviews. Before we take a look at how governance is applied to the project life cycle, we need to understand project phases.

Project phases are a collection of logically related project activities that culminates in the completion of one or more deliverables.

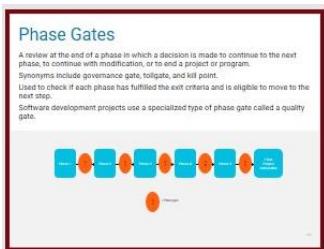
- Produce one or more deliverables in a phase
- A phase can be sequential or overlapping with another
- Outputs from one phase are generally inputs to the next phase



Apply Governance to the Project Life Cycle

Think of governance as the exterior workings of every project in your organization.

- At the beginning of a phase, verify and validate the former assumptions made to the project, analyze risks, and provide detailed explanation of the phase's deliverables.
- After the phase's key deliverables are produced, a review ensures completeness and acceptance.
- A phase can be closed, or the project terminated when huge risks are involved for the project or when the objectives are no longer required.



Phase Gates

A phase gate is a review at the end of a phase in which a decision is made to continue to the next phase, to continue with modification, or to end a project or program.

We use phase gates to verify fulfillment of exit criteria and eligibility to move to the next phase.



Note: Phase gates are also known as 'governance gate', 'tollgate' or 'kill point'.

Software development projects use a

specialized type of phase gate called a 'quality gate'.



Phase-to-Phase Relationships

We just mentioned that phases can be sequential and/or overlap with one another. Let's take a closer look at how that works.

Sequential relationships contain consecutive phases that start only when the previous phase is complete. This relationship reduces the level of uncertainty, which may eliminate the option for shortening a project's schedule.

Overlapping relationships contain phases that start prior to the previous phase ending. This relationship increases the level of risk and may cause rework if something from the previous phase directly affects the next phase.

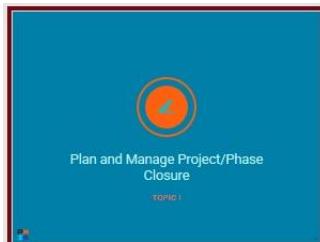


GUIDELINES: Determine Appropriate Governance for a Project

- Involve the organization's decision managers, i.e., senior managers.
- Choose the most appropriate governance goals and try to keep them simple.
- Select a group of experienced individuals to be responsible for all governance activities.
- Practice governance for projects, programs, and portfolios.
- Keep the governance process transparent to the project stakeholders.
- Remember that governance is an evolutionary process and take advantage of the lessons you have learned during it.

Topic I: Plan and Manage Project/Phase Closure

This is about how we wrap it all up and close down a project.



Plan and Manage Project/Phase Closure

This is the final topic in this lesson about starting a project. Closing phases or a project is a set of measured steps.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Close Project or Phase

During project closeout, several important activities occur:

- The planned work is completed.
- Project or phase information is archived.
- Project team resources are released to pursue other endeavors.



Close Project or Phase Criteria

Closure Reasons:

- The project or phase successfully met its completion objectives.
- Requirements changed during execution and the project is no longer feasible.
- Funding is no longer available to complete the requirements.
- Significant risks make the successful completion of the project impossible.
- The organization no longer needs the project deliverables.
- External factors eliminate the need for the project.

Examples of these factors include:

- Change in laws or regulations.
- Merger or acquisition that affects the organization.
- Global or national economic



changes.



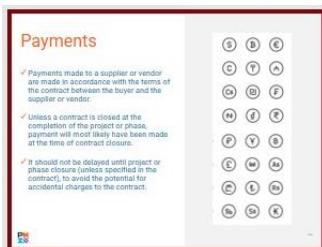
Close Procurements

- Close procurements when the contract terms of a procurement have been satisfied by both buyer and seller.
- This occurs throughout the life of the project, not during project closure.
- Keep contracts open only for the necessary period, to avoid erroneous or unintentional charges against the contract.



Acceptance of Project Deliverables

- Project deliverables are deemed accepted when acceptance criteria have been met.
- These criteria generally refer to some or all of the requirements that were established at the beginning of the project (and which might have been modified during the project's life cycle).
- Deliverables that meet these acceptance criteria are formally signed off and approved by the customer or sponsor.



Payments

- Payments made to a supplier or vendor are made in accordance with the terms of the contract between the buyer and the supplier or vendor.
- Unless a contract is closed at the completion of the project or phase, payment will most likely have been made at the time of contract closure.
- It should not be delayed until project or phase closure (unless specified in the contract), to avoid the potential for accidental charges to the contract.



Knowledge Management

This is a key business focus of project management. Though its major activities traditionally occurred during the close-down phase of projects, knowledge management is an ongoing function in projects.

It includes how we prioritize and take care of learning points and capture data formally and informally—through lessons learned, retrospectives, and information logs.



Use the Lessons-Learned Register

Types of data to capture:

- Scheduling
- Conflict management
- Sellers
- Customer
- Strategic
- Tactical
- Any other aspects of the project life cycle



Knowledge Management (Definition)

A store of historical information about lessons learned in projects.



Knowledge Management

During project or phase closure, knowledge management activities consist of finalizing the lessons-learned register, which is compiled throughout the project life cycle.

This document should then be added to the lessons-learned repository, which is a database of lessons learned from multiple projects.

At the close of the project, the lessons learned should be added to the Knowledge Management/Lessons Learned repository.



Transition Planning Artifacts

Coordination and strategy about how to best deliver and transition the product and other deliverables is needed.

Releasing and deploying deliverables in the most suitable manner ensures end-user awareness and increases the proper usages and adoption of outputs.

Preparation artifacts related to:

- Training
- Documentation
- Communication
- Support

Transition Readiness

Releasing, Delivering, and Deploying the project's work into an environment that is not ready may negate its value.

Examine the readiness of all parties and prepare them for delivery, including:

- End users
- The business
- The physical resources
- The project team

Most critical in situations where there is an upgrade or improvement to an existing product or service.

Assess the readiness of all parties, implement the transition plans, methodology, and capture lessons learned for the next release or project.



Transition Readiness

Releasing, delivering, and deploying the project's work into an environment that is not ready may negate its value. This includes physical as well as soft infrastructure such as budget and training.

Examine the readiness of all of the following parties and prepare them for delivery:

- End users
- The business
- The physical resources
- The project team

Readiness is most critical in situations where an existing product or service is getting an upgrade or improvement.

Assess the readiness of all parties, implement the transition plans accordingly, and capture lessons learned for the next release or project.

GUIDELINES

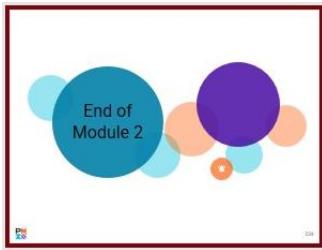
Close Out a Project or Phase

- Review the project management plan.
- If applicable, use a project termination checklist.
- Gather and organize performance measurement documentation, product documentation, and other relevant project records.
- Confirm project's products meet compliance requirements.
- Release project resources.
- Update records to ensure that they reflect final specifications.
- Be sure to update the resource pool database to reflect new skills and increased levels of proficiency.
- Analyze project success and effectiveness and document lessons learned.
- Obtain project approval and formal project acceptance.
- Archive a complete set of indexed project records.
- Celebrate the success of the project with the team and other stakeholders.



GUIDELINES: Close Out a Project or Phase

- Review the project management plan.
- If applicable, use a project termination checklist.
- Gather and organize performance measurement documentation, product documentation, and other relevant project records.
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- Release project resources.
- Update records to ensure that they reflect final specifications.
- Be sure to update the resource pool database to reflect new skills and increased levels of proficiency.
- Analyze project success and effectiveness and document lessons learned.
- Prepare lessons-learned reports and a final project report.
- Obtain project approval and formal project acceptance.
- Archive a complete set of indexed project records.
- Celebrate the success of the project with the team and other stakeholders.



End of Lesson 2

In the next lesson, “Doing the Work,” we continue learning about work in the project life cycle.



Student Edition

PMI Project
Management
Institute.

Lesson 3 Doing the Work

PMI® Authorized PMP® Exam Prep

Doing the Work

Lesson Time: 8 hours

Lesson Introduction

Now that you have a project plan and have determined the requirements for managing the project from initiation to closure, you are ready to execute the project. The time and effort spent on planning will come to fruition as the project team starts doing the work of the project. During project execution, the ultimate goal is to deliver business value to the customer.

This lesson addresses tasks from the Process domain of the PMP® Exam Content Outline.

Lesson Objectives

In this lesson, you will learn how project managers and teams:

- Assess and manage the risk landscape inherent in every project.
- Execute a project to deliver business value.
- Manage the communications in a project.
- Engage all project stakeholders.
- Create project artifacts.
- Manage project changes.
- Manage project issues.
- Ensure knowledge transfer to ensure project continuity.

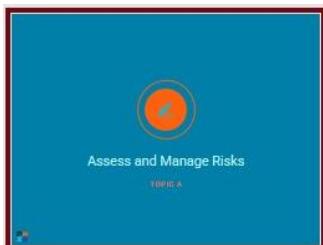
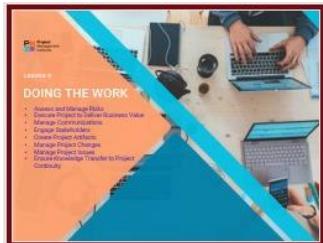
Lesson Topics

	Title	Slides
Topic A	Assess and Manage Risks	2-31
Topic B	Execute Project to Deliver Business Value	32-48
Topic C	Manage Communications	49-63
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Topic A

Assess and Manage Risks

Up to this point, you have laid out all your project activities, developed a schedule, and planned a project budget. Now what will you do when something unforeseen happens that affects all the plans you have made? How will you react? Risk management provides you with specific actions to take for responding to project risks.



Assess and Manage Risks

Risk assessment and management is a major project management function or task. In general, the project manager takes care of the risks, issues, blockers, impediments, and so on so that the team can be free to do their work unhindered. Additionally, sometimes risks can turn into opportunities, giving you a chance to optimize or even transform your project's results.

There's quite a bit of nuance involved here, so you will need to use technical as well as soft skills.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Risk (Definition)

An uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.

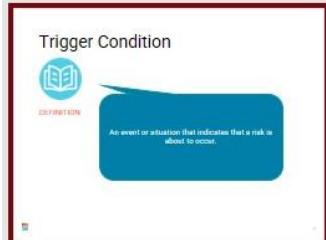


Risk

All risks are not equal.

- Positive risks, or **opportunities**, produce a positive project outcome.
- Negative risks, or **threats**, have a negative impact on the project.

Let's look at a few useful definitions first.



Trigger Condition (Definition)

An event or situation that indicates that a risk is about to occur.



Project Risk Management (Definition)

The project management knowledge area that includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.



Defining Risk Management Approach

When defining your risk management approach, you'll need to consider:

- The likelihood that the risk event will occur and
- The potential impact of the risk.



Risk Management Plan (Definition)

A component of the project, program, or portfolio management plan that describes how risk management activities will be structured and performed.



Risk Management Plan

These are some of the concepts that need to be factored into a risk management plan.



Risk Management Plan

This is a list of what you'll need to include in a risk management plan:

- Risk strategy
- Methodology
- Roles and responsibilities
- Funding
- Timing
- Risk categories
- Stakeholder risk appetite
- Definition of risk probability and impact
- Probability and impact matrix
- Reporting formats
- Tracking documents



Risk Identification Techniques

Use the following techniques to identify risks in your project environment:

- Expert judgment
- Data gathering
- Data analysis
- Interpersonal and team skills
- Prompt lists
- Meetings



Risk Classification Approaches (Effect-Based)

An effect-based approach to risk classification involves classifying risks according to their effects on schedule, cost, quality, and scope.

It typically also includes identifying causes of risks and developing redress or improvement measures.



Risk Classification Approaches (Sourced-Based)

It's also possible to classify risks based on their sources. Here are some possible categories for a source-based risk classification:

- Internal
- External
- Technical
- Non-technical
- Industry-specific

- Generic



Risk Classifications

Let's look at the four types of risk classifications:

- **Known known** - Information that is fully studied and well understood
- **Known unknown** - Information that is understood to exist but is not in the possession of the person seeking it
- **Unknown unknown** - Something unforeseeable
- **Unknown known** - Information that an individual or organization has in its possession but whose existence, relevance or value has not been realized



Idea: Think of some examples of project risks and ask you to classify and discuss them.

Here is a list to get you started:

- Covid-19
- Key team member resignation
- Supply chain disruption
- Vendor under contract goes out of business



Risk Threshold (Definition)

The maximum amount of risk, and the potential impact that risk occurring, that a project manager or key stakeholder is willing to accept



Risk Appetite (Definition)

The degree of uncertainty an organization or individual is willing to accept in anticipation of a reward.



Risk Tolerance (Definition)

The level of risk exposure above which risks are addressed and below which risks may be accepted.

GUIDELINES: Iteratively Identify, Assess, and Prioritize Risks

- Identify risks in every project segment and work package before the project begins.
- Perform a structured review with key stakeholders of documentation from other planning processes to ensure understanding.
- Identify risks and triggers using risk identification techniques.
- Be consistent with risk approach but be mindful of emerging special circumstances.
- Consult relevant historical information for problems and resolutions—e.g., risk response plans, final reports, and lessons learned from previous, similar projects.
- Group identified risks into categories reflecting common, relevant risks.
- Use analysis results to initiate the risk register.

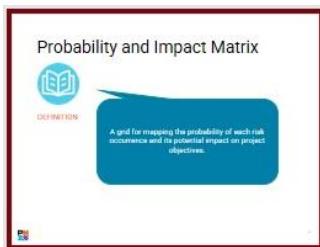
Qualitative Risk Analysis (Definition)

The process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics.

Qualitative Risk Analysis

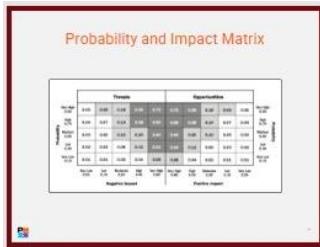
This analysis focuses on high-priority risks, is subjective, and is based on a team's perception of risks.

The qualitative risk analysis enables you to make a prioritized list of risks, so that you can take further actions.



Probability and Impact Matrix (Definition)

A grid for mapping the probability of each risk occurrence and its potential impact on project objectives.



Probability and Impact Matrix

This text and graphic are taken from the PMBoK Guide, 6th edition, page 408. The example shows a possible numeric risk scoring scheme.

- Opportunities and threats are represented in a common probability and impact matrix using positive definitions of impact for opportunities and negative impact definitions for threats.
- Descriptive terms—such as very high, high, medium, low, and very low.
- Numeric values can be used for probability and impact. Where numeric values are used, these can be multiplied to give a probability-impact score for each risk, which allows the relative priority of individual risks to be evaluated within each priority level.



Quantitative Risk Analysis (Definition)

The process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives.



Quantitative Risk Analysis

As you'd expect, quantitative risk analysis quantifies overall project risk exposure. It does this by providing additional quantitative, or data-based, risk information to support risk response planning.

This type of analysis is costly, so it is best suited for:

- Large or complex projects
- Strategically important projects
- When required by contract or a key stakeholder



Risk Response (Definition)

An action to address a risk.

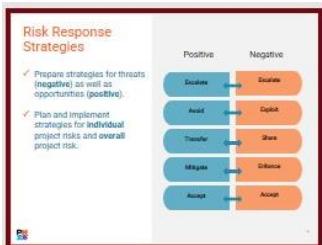


Risk Response

After you've identified, classified, qualified, and possibly quantified risks, you need to take some sort of action.

The following are possible actions you will take to address a risk:

- Assign a person to implement an action.
- Develop options, select strategies, and agree on actions to address overall risk exposure and response.
- Address risks by priority—greatest to least.
- Add resources and activities to the budget, schedule, and project management plan to support risk responses. Assign a response to each risk.
- Choose from various risk response strategies to determine a response for each risk.
- Develop a fallback plan in case the primary strategy is not effective.
- Review secondary risks - These are risks that could occur as a result of implementing a risk response.



Risk Response Strategies

Prepare strategies for threats (negative) as well as opportunities (positive).

You can make the most of an opportunity presented by a positive risk by following this action pathway:

Escalate > Exploit > Share > Enhance > Accept

Conversely, you can avoid the fallout that a negative risk threatens to make by following this action pathway:

Escalate > Avoid > Transfer > Mitigate > Accept

Remember that you need to plan and implement strategies for individual project risks and overall project risk.



Idea: Each of these action pathways begin and end with the same action. Think of a scenario for each type of risk and then try to think of what the steps in the action pathway might look like.



Contingency Response Strategies

DEFINITION

Responses which may be used in the event that a specific trigger occurs. Also known as "contingency plan" or "fallback plan".

Contingency Response Strategies (Definition)

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Contingency Response Strategies

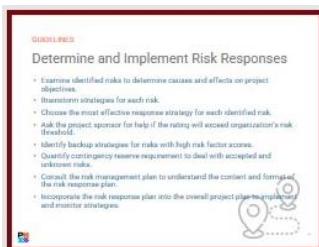
- Develop strategies in advance, before things go wrong.
- Use if and when identified risks become issues.
- Allow you to react quickly and appropriately to the risk event, mitigating its negative impact or increasing its potential benefits.
- Strategies should be holistic, including time, cost, and impact estimates.

Contingency Response Strategies

Effective project managers develop strategies in advance, before things go wrong. You need to use them if, and when, identified risks become issues.

Your strategy should allow you to react quickly and appropriately to the risk event, mitigating its negative impact or increasing its potential benefits.

Strategies should be holistic, including time, cost, and impact estimates.



GUIDELINES

Determine and Implement Risk Responses

- Examine identified risks to determine causes and effects on project objectives.
- Brainstorm strategies for each risk.
- Choose the most effective response strategy for each identified risk.
- Ask the project sponsor for help if the rating will exceed organization's risk threshold.
- Identify backup strategies for risks with high risk factor scores.
- Quantify contingency reserve requirement to deal with accepted and unknown risks.
- Consult the risk management plan to understand the content and format of the risk response plan.
- Incorporate the risk response plan into the overall project plan and monitor strategies.

GUIDELINES: Determine and Implement Risk Responses

- Examine identified risks to determine causes and effects on project objectives.
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-

Topic B

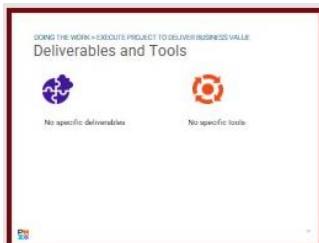
Execute Project to Deliver Business Value

Projects exist to deliver business value—whether that is monetary value, an improvement on a product or service, or otherwise.



Execute Project to Deliver Business Value

Project managers essentially work in a value-based delivery system. All of the planning and work that we do in our teams is converted into something of value to the customer or organization.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Lead on Value Delivery

This is just a brief mention of a leadership element. Lesson 3 focuses on process elements—lessons 1 and 4 focus on leadership. But it's correct to say that stronger leaders can act in more effective ways!

It's no surprise that communication is at the top of this short list, and along with servant leadership. You need to ensure the team knows the value of the project to the organization—How this work helps it to achieve its strategic vision. That will help the team feel motivated that their work is making a direct and positive impact on the organization.

Your leadership style should focus on modelling positive behaviors for the team. Aim to encourage productivity and help the team to align their efforts with the organization's vision.

We will discuss this in greater depth in the next lesson on leadership.



Create a Culture of Urgency for Value Delivery

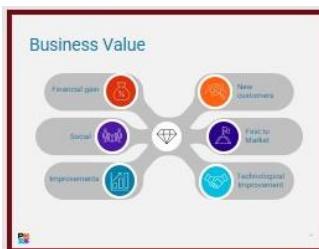
You need to help your team to cultivate and establish a sense of urgency in your team culture. This is an ongoing task.

There are a few ways to do this. For one, lead by communicating the project's importance and vision, as we just discussed. But also represent the voice of the customer to the team. Show them why the project matters. This will create relevancy and personalize the value.



Business Value (Definition)

The net quantifiable benefit derived from a business endeavor. The benefit may be tangible, intangible, or both.



Business Value

Let's take a look at some of the different kinds of value we can derive from projects. This isn't an exhaustive list, but it should get you thinking about the kinds of outcomes that projects can produce.

Here are some types of business value:

- Financial gain
- Social
- Improvements
- New customers
- First to market
- Technological improvement



Example: Use this mini case study of a successful project. Review the different types of business value that project management brought to Global Green Books. (5 minutes)

Link to "[Global Green Books](#)" mini case study on PMI.org



Examine Business Value

We use critical thinking and analysis to determine what is of value to the business. Think beyond the primary value benefits and really try to understand how else your project imparts value to the business

Let's look at a few ways of deriving value or showing how the project delivers value.



Product Roadmap (Definition)

[Further information follows on the next slide.](#)

A strategic document and plan which guides why the product will be delivered and how the product will meet objectives and the product vision.



Product Roadmaps

This is also a tool of the product manager. In it, we should see a clear and deliberate value proposition.

Product roadmaps:

- Vary in appearance and presentation.
- Display the strategy and direction of the product and the value it will deliver.
- Lead with the overarching vision of the product.
- Are progressively elaborated over time with information and work inputs and refinement of vision.
- Use themes (goals) to provide structure and associations.
- Provide short-term and long-term visualizations of the product.



Incremental Delivery

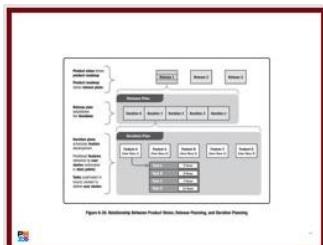
Long production cycles ending in a perfect product are a thing of the past. Businesses want to start obtaining value from projects before the end of the project.

Incremental delivery enables the project to deliver value sooner than the end of the project. Following on from that, we can also consider the following benefits:

- Higher customer value and increased market share.
- Partial delivery (or previews) to customers—this often creates excitement for the product and can build customer loyalty.

- Enables early feedback for the project team allowing for adjustments to the direction, priorities, and quality of the product.

Let's look at an example of what incremental delivery looks like next.



Untitled Graphic – Figure 6-20 Relationship between Product Vision, Release Planning, and Iteration Planning

This is from the PMBoK 6th edition, page 216, "Agile Release Planning"



Idea: Review the relationships in the graphic.



Minimum Viable Product (MVP) (Definition)

Further information is on the next slide.

The smallest collection of features that can be included in a product for customers to consider it functional ("bare bones" or "no frills" functionality in Lean).



Minimum Viable Product (MVP)

The MVP is a vehicle for quick value release on a project. If perfection is not required, there are a good many advantages to consider:

- Allows stakeholders to see and experience project outcomes during the project
- Channels feedback and idea generation
- Seeing results quickly provides inspiration to the team and models urgency



Minimum Business Increment (MBI) (Definition)

A term used in Disciplined Agile approaches, an MBI is the smallest amount of value that can be added to a product or service that benefits the business.

Minimum Business Increment (MBI)



MBI is more viable when an MVP might disrupt the users and business, especially when a basic preliminary product, to gauge interest, is not necessary.

Optimize use of MBIs by:

- ✓ Ensuring the product and functions are understood.
- ✓ Pinpointing an incremental value increase.
- ✓ Enable project team to deliver value sooner.
- ✓ Help team validate improvements.
- ✓ Enable team to incrementally build on success or pivot as needed.

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Cycles and Timeboxes



Benefit:

- ✓ Timeboxes allow for better telemetry over time.
- ✓ Timeboxes create a sense of urgency.
- ✓ Cycling the project through similar timeboxes provides progress measurements from one timebox to the next.
- ✓ Teams gain more predictable measurements that can communicate expectations of cycle times, throughput, and velocity.
- ✓ Organize work into release cycles and working time blocks.

Cycles and Timeboxes

Following up with planning the project schedule, which we did in the last lesson, let's introduce agile release planning methods.

Working this way, we organize work into release cycles and work in time blocks. Making better use of the project schedule also is a clear business value or benefit.

Here are the benefits:

- Timeboxes allow for better telemetry over time—so your time is used more efficiently.
- Timeboxes create a sense of urgency.
- Cycling the project through similar timeboxes provides progress measurements from one timebox to the next.
- Teams gain more predictable measurements that can communicate expectations of cycle times, throughput, and velocity.

GUIDELINES: Measure Ongoing Progress



Measure Ongoing Progress

- Define value from the customer's, business, and/or user's perspective.
- Determine value expectations.
- Set targets and baselines based on expectations.
- Employ metrics that communicate progress towards value expectations.
- Use efficient data collection metrics and methods.
- Collect data at regular intervals.
- Present progress data to stakeholders.
- Compare progress with baselines and expectations.
- Improve on success or correct areas where progress does not meet expectations.

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-

Topic C

Manage Communications

To keep the team working in high-performance mode, your communications strategy, plan, and management—not to mention skills!—need to be sharp.



Manage Communications

Information, relationships, progress—everything depends on successful communication. Let's learn how to make a successful project communications plan.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Communications

It's a skill—both personal and strategic. How will you manage the volume of informal and formal conversations, emails, documents, and so on?



Project Communications

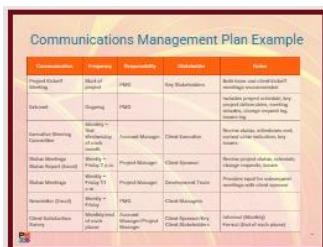
Consider these dimensions:

- Internal and external stakeholders
- Formality or informality - content and format
- Hierarchy – adjust tone upward, downward, or horizontally
- Official or unofficial need e.g., annual reports or governance related vs. project team communication
- Written or verbal – remember tone, inflection, and nonverbal gestures are influential!



Communications Management Plan (Definition)

A component of the project, program, or portfolio management plan that describes how, when, and by whom information about the project will be administered and disseminated.



Communications Management Plan Example

Let's have a look at an example communications management plan.



Communications Management Plan – Components

A communications management plan includes:

- Stakeholder communications requirements
- Information to be communicated, including language to be used
- Reason
- Time frame and frequency
- Responsible person – i.e., release of confidential information
- Receivers
- Methods or technologies of conveyance
- Time and budget allocation
- Escalation process for issues that need visibility
- Update method for the plan
- Glossary of common terminology
- Flowcharts depicting flow of information
- Constraints due to regulation or policies



Communication Requirements Analysis

We mentioned stakeholder communications requirements at the top of the list of components in the communications management plan.

How do you know what these requirements are?

Quite simply, you'll need to ask them directly. Doing so leads to a clear articulation of the stakeholder's communication needs and enables you to make the right choice of how you'll communicate with them, including the kind of technology that will work best.

This analysis takes the form of a grid, questionnaire, or survey that documents the communications and technology requirements for each stakeholder.



Communication Types

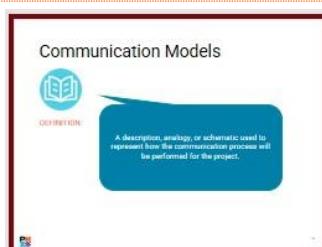
Think of the diversity of communication methods available for use on projects. With technology factored in, you need to think about suitability of use in addition to security and encryption matters for communication of project work.

Here's our list:

- Face-to-face meetings
- Email
- Fax
- Instant Messaging – using third-party apps
- Text Messaging – direct phone to phone
- Print media and documents
- Video and voice conferencing (virtual meetings)
- Social media
- Company website

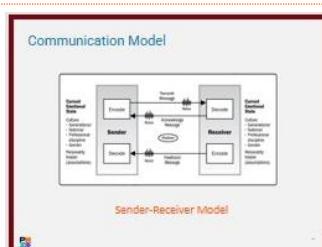


Idea: Can you think of other ways we communicate on projects?



Communication Models (Definition)

A description, analogy, or schematic used to represent how the communication process will be performed for the project.



Communication Model

Let's look at a communication model diagram that uses the sender-receiver model. Notice that it includes technical as well as personal data. 'Soft' skills such as interpersonal communication and emotional intelligence are essential in healthy communication models.



Communication Methods (Definition)

A systematic procedure, technique, or process used to transfer information among project stakeholders



Communication Methods

Communicating using the **push** method entails telling and being direct and forthcoming with information.

The **pull** method, on the other hand, puts the onus of learning information on the recipient.

Interactive communication is a democratic method.



Examples:

A person giving a presentation is using the **push** method because they are giving information.

When that person asks questions of participants, they are employing the **pull** method to obtain information.

A free discussion period is **interactive**, because everyone contributes.



Feedback

- Communication is a two-way street.
- Both critical and affirming feedback are key.
- Feedback can be positive if received and understood as intended.
- Feedback can be negative because of misunderstanding.
- No feedback provides an implicit acceptance of the message by the receiver.
- Effective feedback is clear, specific, and offered in a timely manner.



GUIDELINES: Effectively Manage Communication

- Gather and distribute contact information for all involved parties.
- Determine the communication needs of project stakeholders.
- Tailor amount of detail and frequency to recipient needs; project team members may require more detail on a more frequent basis. Senior management typically requires summary information on a less frequent basis.
- Analyze the value to the project of providing the information.
- Evaluate any constraints and assumptions to determine their possible impact on the communication plan.
- Determine the appropriate communications technologies to use for communicating project information.
- Ensure your communications management plan includes all key requirements.
- Integrate the communications management plan into the overall project plan.
- Distribute the plan to project stakeholders.

determine their possible impact on communication planning.

- Determine the appropriate communications technologies to use for communicating project information.
 - Ensure your communications management plan includes all key elements.
 - Integrate the communications management plan into the project plan.
 - Distribute the plan to project stakeholders.
-

Topic D

Engage Stakeholders

Back to the stakeholders now, we need to ensure that they stay committed to the project.



Engage Stakeholders

How are the stakeholders performing? From customers to experts, you need to be able to get the most from each stakeholder to ensure work stays on track and of high quality. In this topic, we explore how project managers can encourage stakeholders to stay focused and give their best effort to a project.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Stakeholder Categories

Let's start with a quick reminder of our stakeholder types or categories.

- Sponsors
- Customers and users
- Seller
- Functional managers
- Organizational groups
- Business partners
- Other stakeholders



Stakeholder Register

And a quick look at the stakeholder register. This is the main output of the Identify Stakeholders process we discussed in Lesson 1.

The stakeholder register includes:

- Identification information - Name, position, contact details, etc.
- Assessment information - Major requirements, expectations, influence on project outcomes, primary involvement
- Stakeholder classification -

- Internal, external
- Impact/influence/power/interest
- Upward/downward/outward/sideways



Stakeholder Engagement Strategy

A strategy drives your connection with the project stakeholders. Your strategy should do three things:

- Involve each project stakeholder based on needs, expectations, interests, and potential impact on the project.
- Enable development of appropriate management strategies to engage stakeholders.
- Create and maintain relationships between the project team and stakeholders.



Stakeholder Engagement Assessment Matrix (Definition)

A matrix that compares current and desired stakeholder engagement levels.



Stakeholder Engagement Assessment Matrix - Example

An easy way of keeping track of engagement levels is use of the matrix. In very simple and visible terms, assess each stakeholder's current state of engagement and then indicate your desired level of engagement.

Then you can easily see who needs motivating and by how much.



GUIDELINES: Develop, Execute, and Validate a Strategy for Stakeholder Engagement

- Review the Project management plan, Stakeholder register, EEFs and OPAs
- Use tools and techniques such as expert judgment.
- Hold meetings with experts and the project team.
- Use analytical techniques to classify stakeholder engagement levels.
- Document the stakeholder engagement plan.

Topic E

Create Project Artifacts

We are all familiar with the copious amounts of data generated by projects. Let's take a closer look now at project artifacts.



Create Project Artifacts

Now it's time to understand what project work looks like—these are your artifacts. And just like an archaeologist, they are physical pieces of your project that you produce and then can use to conduct research or further work, or even on other projects.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Artifacts vs. Deliverables and Project Documents

On slide 82, “Version Control” – the third bullet wrongly identifies some project documents as artifacts.

Artifacts are created by project teams during project work. **Artifacts** facilitate management of the project.



Examples:

Spreadsheets, emails, and meeting minutes are project artifacts. We'll see a longer list in a few slides.

Project documents are integral documents for a project; they define and support the work of the project. They are regularly updated by project management processes.



Examples:

A scope management plan is a project document.

A **deliverable** is any unique and verifiable product,

result, or capability (tangible or intangible) to perform a service, that is required to be produced to complete a process, phase, or project.

Examples:



A planned software improvement is a deliverable.



Project Artifact

Artifacts are like historical artifacts; in that they can show us what work was done and how it was done. It's a historical repository that can be useful for future projects.

Your work will be largely creating and maintaining these key pieces of work.



Project Artifact Examples

This is a list of typical project artifacts used on projects. Artifacts unique to agile projects are on the next slide.

- Acceptance Criteria
- Assumptions
- Business Case
- Change Requests
- Constraints
- Lessons learned
- Minutes of status meetings
- Project Charter
- Slide decks
- Requirements
- Scope
- Scope Baseline
- Subsidiary project management plans



Project Artifact Examples – Agile

- Product Backlog
- Product Increment
- Product Roadmap
- Product Vision Statement
- Release Plan
- Sprint Backlog



Configuration Management (Definition)

A tool used to manage changes to a product or service being produced as well as changes to any project documents.

This is important to know, as it's the means by which we manage and organize project artifacts.



Configuration Management System (Definition)

A collection of procedures used to track project artifacts and monitor and control changes to these artifacts.



Configuration Management

We discussed this briefly in Lesson 2, as a separate entity from the change management plan. Let's take a closer look.

Configuration management is applied to a product, not the project.

This process:

- Controls product iterations.
- Controls the steps for reviewing and approving product prototypes, testing standards, and drawings or blueprints.
- Ensures that product specifications are current.

In terms of project artifacts, remember that this is how we track, monitor, and control the changes to artifacts.



Version Control (Definition)

A system that records changes to a file in a way that allows you to retrieve previous changes made to it.

Version Control

- ✓ Each time a file is updated, give it a **new version number**.
- ✓ Include a **date/time stamp** and the name of the user who made the changes, providing a digital “paper trail” of the document’s history.
- ✓ Use version control for **important artifacts** such as the project management plan, subsidiary project management plans, the scope and other documents.



Version Control

Please see the correction to this slide noted, below.

- Each time a file is updated, give it a **new version number**.
- Include a **date/time stamp** and the name of the user who made the changes, providing a digital “paper trail” of the document’s history.



Note: The third bullet on this slide incorrectly identifies the project management plan as a project artifact.

- Use version control for **important artifacts** such as the ~~project management plan~~, subsidiary project management plans, the scope and other documents.

Storage and Distribution of Artifacts

- ✓ Store artifacts in an accessible location for users.
- ✓ Use a storage and distribution system that matches the complexity of the project –
- ✓ Use cloud-based document storage and retrieval systems for larger projects, especially where team members are geographically distributed.
- ✓ Typical systems may include:
 - Built-in version control
 - Document check-out and check-in
 - User-based document security
 - Automatic email notification to specified users when a document is created or edited



Storage and Distribution of Artifacts

Here are some good practices for storage and distribution of artifacts:

- Store artifacts in an accessible location for users.
- Use a storage and distribution system that matches the complexity of the project –
- Use cloud-based document storage and retrieval systems for larger projects, especially where team members are geographically distributed.
- Typical systems may include:
 - Built-in version control
 - Document check-out and check-in
 - User-based document security
 - Automatic email notification to specified users when a document is created or edited

Project Artifact Management

An effective archive management system includes:

- ✓ A simple way to produce and control documents
- ✓ Standardized formats and templates
- ✓ A structured process for the review and approval of documents
- ✓ Version control and security
- ✓ Timely distribution of documents



Project Artifact Management

An effective archive management system includes:

- A simple way to produce and control documents
- Standardized formats and templates
- A structured process for the review and approval of documents
- Version control and security
- Timely distribution of documents

Topic F

Manage Project Changes

Managing project changes can be one of the greatest challenges for even a veteran project manager. Let's look at key techniques and leadership attitudes that will help you manage change effectively.



Manage Project Changes

Change is inevitable, but it is rarely insurmountable. Let's look at strategies, tools, and techniques for managing project changes!



Deliverables and Tools

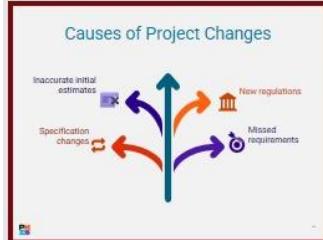
This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Projects are about Change

Your project itself is a change to the organization.

But how do you deal with changes to the project? Let's have a look at how to keep abreast of project changes in this lesson.



Causes of Project Changes

First, let's consider causes of changes to projects.

Typically, these are:

- **Inaccurate initial estimates** – Arise from lack of experience, lack of information, or precedents to inaccurate data, excessive optimism, technological difficulties, and unreliable resources. Getting those original estimates to be as realistic and accurate as possible makes the control process more manageable.
- **Specification changes** - Project work can open up new avenues of development and design that were not considered during the initial planning of the project work and scope. As new options for a

product or service become apparent, customers, sponsors, or the project manager may broaden the project's scope to include new specifications and deliverables.

- **New regulations** - As project work progresses, new governmental or industry-specific regulations may be enacted. This can be especially true for lengthy projects. If the new regulations are related to the ongoing project, project change becomes necessary. Accommodating new regulations or legislation can also mean revisiting the planning process to determine the effect the new regulations will have on resource needs, schedule durations, and quality specifications.
- **Missed requirements** - Many times the requirements are understood by reviewing the documentation and interviewing the end users and policy makers. However, there are times when complete and comprehensive understanding may not be possible. The interviewer feels that he/she has understood the point, and the interviewee feels that he has expressed all that matters. Although a Requirements Traceability Matrix (RTM) is prepared, the same confusion might arise in a written document. Prototyping is used where a demonstration of functional and/or technical requirements is done. Although all these techniques reduce the chances of missing any requirements, it cannot guarantee that every requirement is captured.



Change Control Systems (Definition)

A set of procedures that describes how modifications to the project deliverables and documentation are managed and controlled.



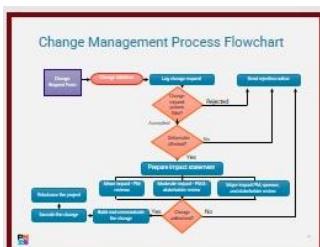
Change Control Systems

An effective change control system includes the forms, tracking methods, processes, and approval levels required for authorizing or rejecting requested changes.



Change Control Board (Definition)

A formally chartered group responsible for reviewing, evaluating, approving, delaying, or rejecting changes to the project, and for recording and communicating such decisions.



Change Management Process (Flowchart)

Let's take a look at the process that all project changes will go through. Every change ends in one of two ways—either it is rejected, or the project is rebalanced.



Approved Change Requests (Definition)

Requests that have been received and approved in accordance with the integrated change control plan and are ready to be scheduled for implementation.



Change Requests

The four types of change requests are:

- **Corrective action** – Adjusts the performance of the project work with the project management plan.
- **Preventive action** – Ensures future performance of the project work with the project management plan.
- **Defect repair** – Modifies a non-conformance within the project.
- **Update** – Modifies a project document or plan.

Topic G

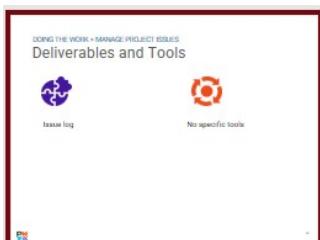
Manage Project Issues

Projects do not always go smoothly, and situations can arise which have the potential to affect the scope, schedule, or cost if left unattended. Risks in a project can become issues, which require resolution. This topic addresses how to handle them.



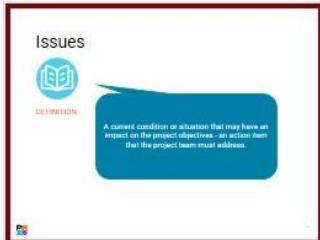
Manage Project Issues

Risks are not always negative, but if they become project issues, then you need to take action and resolve them. We learn how in this section.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Issues (Definition)

Further discussion on next slide.

A current condition or situation that may have an impact on the project objectives - an action item that the project team must address.



Issues

Issues can arise in many project management processes, most often during monitoring and controlling—or in an agile project, at any moment. Areas prone to issues include:

- Scope change control
- Schedule control
- Cost control
- Project variance analysis
- Quality
- Risk
- Procurement
- Communications



Risks and Issues

There is a big difference between risks and issues. A risk is generally defined as an event that might impact a project, whereas an issue is a risk that has happened and will impact the project.

Example:



Risk
A supplier
might go on
strike.

Issue
A supplier has gone
on strike.



Issue Log (Definition)

An example follows on the next slide.

A document where information about issues is recorded and monitored.

It is used to track problems, inconsistencies, or conflicts that occur during the life of the project and require investigation in order to work toward a resolution.



Issue Log

The due date represents the date by which the issue should be resolved. Your goal is to close every issue before the project is closed, but this might not always happen—the issue might be outside of your control.

An issue should be assigned to only one person, who will act as the focal point for resolving it. In this case, think of the issue owner as similar to a work package owner.

An issue log is not a to-do list. If in doubt about whether something belongs in the issue log, re-visit the definition of an issue and confirm if it applies to the situation at hand.

Issue Resolution



You need to add every issue to the issue log as it arises. Each issue should have an owner who is responsible for tracking the progress of the workaround and reporting back to the project manager. The due date should be realistic, and every

reasonable attempt should be made to meet it.

Issues should be a regular topic of every status meeting, with the goal to keep the number of open issues to a manageable number. Don't hesitate to escalate an issue to the project sponsor if it begins to have a major effect on the project.



GUIDELINES: Resolving Issues

- Use your organization's Issue Log template; in the absence of one, create an Issue Log.
- Train project team members to promptly report potential issues.
- Enter the issue into the Issue Log and assign an owner and a due date.
- Monitor progress and discuss each open issue at every project status meeting.
- Develop a response (also known as a workaround) to the issue.
- Assess the impact of the response.
- Approve the response.
- Close the issue.

Topic H

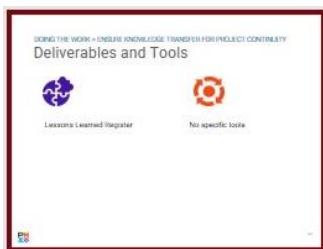
Ensure Knowledge Transfer for Project Continuity

It is important for project team members to obtain the right knowledge at the time when they need it to do their job. Knowledge is an asset to project teams and this lesson is about how to optimize it.



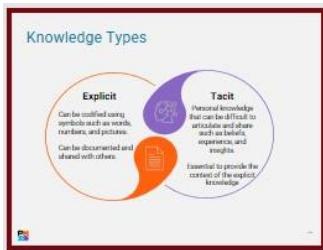
Ensure Knowledge Transfer for Project Continuity

You need to know how to collect and manage knowledge so that your team can use it. You should also know how to transfer this knowledge to other projects, so they can benefit from it.



Deliverables and Tools

Under review - Deliverables and tools should include Lessons Learned and Retrospective meetings; meetings; active listening; training plan, among others.



Knowledge Types

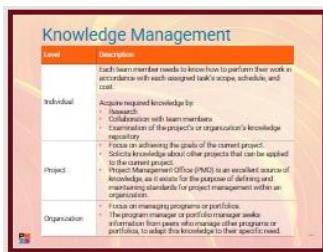
Knowledge can be divided into two main types: explicit and tacit.

- **Explicit knowledge** - Can be codified using symbols such as words, numbers, and pictures.
- **Tacit knowledge** - Is personal knowledge that can be difficult to articulate and share such as beliefs, experience, and insights.

You need to know how to manage both types of knowledge to take advantage of the knowledge, skills, and experiences that your project team members have gained throughout the project.

Although collecting and gathering explicit knowledge is relatively easy to do, there is the risk of capturing only the facts and not the context surrounding the facts. Both are important to know.

To manage tacit knowledge, you'll need to create and maintain trust among those involved in the project so they are willing to share their experiences with everyone else. By obtaining those personalized experiences of the project, the team is able to more fully understand and leverage the knowledge.



Knowledge Management

Think of knowledge management as a three-level system: individual, project, and organization.

- At the **individual** level, each team member needs to know how to perform their work in accordance with each assigned task's scope, schedule, and cost—all while maintaining an acceptable level of quality. If a person does not possess the required knowledge for a particular task, they must acquire it by one of three methods:
 - Research the topic to learn what they do not know.
 - Collaborate with other team members to fill in the knowledge gap.
 - Examine the project's or organization's knowledge repository.
- At the **project** level, the focus is on achieving the goals of the current project. The project manager will solicit knowledge from project managers or project leaders involved with other projects. Their experience can then be applied to the current project. The Project Management Office (PMO) is also an excellent source of knowledge, as it exists for the purpose of defining and maintaining standards for project management within an organization.
- The **organizational** level of knowledge is about managing programs or portfolios. The program manager or portfolio manager can seek information from peers who manage other programs or portfolios, in an effort to adapt this knowledge to their specific need.



Lessons Learned (Definition)

The knowledge gained during a project which shows how project events were addressed or should be addressed in the future for the purpose of improving future performance.



Lessons Learned

Knowledge gained during a project can be useful to subsequent phases of a project and to other projects, and this knowledge is referred to as lessons learned.

It can take the form of both positive and negative experiences that occur throughout the project life cycle.

"Reinventing the wheel" is both time-consuming and costly. The amount of time and effort used to document what went well and what did not happen as planned can pay big dividends long into the future.



Considerations for Lessons Learned

Here are some typical topics covered in lessons learned:

- **Scheduling** - Include any relevant scheduling problems or issues. They also document the management strategies implemented to deal with schedule or resource constraints. These capture beneficial approaches to implement as new best practices.
- **Conflict management** - Include any issues that arose within the team or between the team and customers. They include documentation of the nature and source of the conflict and the impact the conflict had on the project. The documentation should also specify how management intervened in response to the conflict.
- **Customers and vendors** - If a vendor or customer is excessively litigious or unreasonable to work with, that information should be conveyed to the sales and legal departments and documented in the lessons learned repository. If the customer or vendor experience is positive, then capture the potential for future sales or working together.
- **Strategic** – These typically affect some aspect of the organization's project management methodology or significantly improve a template, form, or process. These address the questions: Can we reuse this project's artifact to get more done with the same resources and deliver work sooner?

- **Tactical** – These answer the question: If you were to do this type of project again, what should you stop, start, and continue so you can execute the project flawlessly? These types of lessons learned focus on developing recommendations, reviewing recommendations with other managers in other departments, developing implementation plans, and implementing those plans



Lessons Learned Register (Definition)

Since we covered this topic in Lesson 2 also, take note here about the **continued** use of the register during the project and how it helps with ensuring knowledge continuity.

As the project progresses, you will continuously add information to the lessons-learned register to help identify specific strengths as well as areas of improvement.

At the conclusion of the project, a team member can edit and compile the information into a cohesive document. It can be discussed in the project closure meeting and archived for future reference, as a means of ensuring retention and continuity of knowledge.



Lessons Learned Repository (Definition)

Create a register for each project and then put the register into your Lessons Learned Repository. This repository will become an organizational process asset for current and future project teams. They will be able to capitalize on the organization's knowledge base about work that has already been done and avoid repeating mistakes, and also leverage the ongoing organizational learning.



Project Responsibilities within the Team

This is an overview of the interpersonal skills that you can use to manage knowledge

- **Leadership** - To communicate the organization's vision and inspire the project team to focus on the goals of the project.
- **Facilitation** - To effectively guide a group to a successful solution to a problem.
- **Political awareness** - To keep the project manager aware of the organization's political environment.

- **Networking** - To facilitate relations among project stakeholders so that knowledge is shared at all levels.

Project team members also should use these same interpersonal skills to various degrees, as they are assigned by the project manager to manage tasks, lead meetings, etc.

All project team members should be skilled at active listening, to reduce misunderstandings, and improve communication and knowledge sharing.



Working Environment Expectations

The project manager is responsible for the successful sharing and transfer of project knowledge. Early in the project, the project manager should set expectations of how this is to occur. The project kickoff meeting is an excellent venue for this to take place, because key members of the project team will be present—either in-person or virtually.

Typical expectations for sharing and transferring project knowledge at the kickoff meeting include the following:

- Knowledge is not constant: what you knew yesterday can change based on what you did today.
- Continuously evaluate the project environment for new risks and follow the risk management plan to proactively address them before they become issues that will affect the project objectives.
- Don't hoard knowledge; follow the communications management plan and inform stakeholders when something changes that might affect their work.
- Use appropriate tools to share knowledge with stakeholders:
 - Face-to-face during formal meetings
 - Face-to-face during informal meetings and discussions
 - Telephone
 - Email
 - Wikis
 - Intranet
 - Printed documents



Knowledge Transfer Approach

Knowledge transfer consists of connecting individuals, in person or virtually, to share tacit knowledge and collaborate together.



Knowledge Transfer Techniques

Keep your team invigorated about learning. Knowledge transfer opportunities can be among the most exciting moments at work.

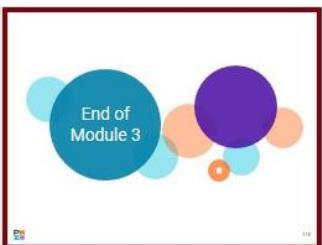
Try one of these techniques:

- Networking
- Facilitating special interest groups
- Meetings, seminars, and various other types of in-person and virtual events that encourage people to interact and exchange ideas and knowledge
- Training that involves interaction between attendees
- Work shadowing and reverse shadowing provide a more individualized method to the exchange of specialized knowledge



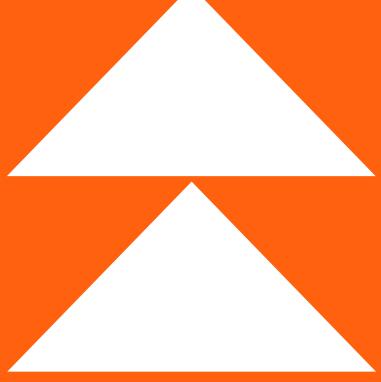
GUIDELINES: Maintain Team and Knowledge Transfer

- Follow your PMO's guidelines on documenting new knowledge.
- Be alert to new sources of project knowledge and follow the communications management plan to convey that knowledge to stakeholders.
- Proactively seek new knowledge.
- Compile a lessons-learned register throughout the project's lifecycle and add it to a lessons-learned repository with registers from other projects.



End of Lesson 3

That wraps up the “Process” section of the course. The next lesson takes us back to the “People/Leadership” aspect of project management.



Student Edition



Lesson 4

Keeping the Team on Track

PMI® Authorized PMP® Exam Prep

Keeping the Team on Track

Lesson Time: 8 hours

Lesson Introduction

Now that the project team has been assembled and is doing the work of the project, you need to ensure that the team stays on track. As the project manager, you need to demonstrate the type of leadership that facilitates collaboration among the team and stakeholders, manages conflict, removes obstacles, and supports the team's performance. In this lesson, you will keep your project team on track.

This lesson addresses tasks from the People domain of the PMP® Exam Content Outline (ECO).

Lesson Objectives

In this lesson, you will learn how project managers and teams:

- Inspire, motivate, and influence team members and stakeholders.
- Appraise team performance against key performance indicators.
- Determine, prioritize, and remove impediments, obstacles, and blockers for the team.
- Investigate and interpret the source and stage of a conflict and recommend an appropriate conflict resolution solution.
- Evaluate stakeholder engagement needs and influence stakeholders to accomplish project objectives.
- Recognize mentoring opportunities and mentor relevant stakeholders.
- Promote team performance through the application of emotional intelligence.

Lesson Topics

	Title	Slides
Topic A	Lead a Team	2-16
Topic B	Support Team Performance	17-49
Topic C	Address and Remove Impediments, Obstacles, and Blockers	50-64
Topic D	Manage Conflict	65-74
Topic E	Collaborate with Stakeholders	75-85
Topic F	Mentor Relevant Stakeholders	86-96
Topic G	Apply Emotional Intelligence to Promote Team Performance	97-117

Topic A

Lead A Team

There are many ways to lead a team. No one approach is perfect for every situation. The appropriate leadership style depends on the situation, the project, the stakeholders, your skills, and many other factors. A project manager must be astute in various leadership styles to apply the most suitable technique for the moment.



Lead A Team

Teams are made up of individuals with different skill sets, backgrounds, experiences, and attitudes.

Cohesive, collaborative teams typically are productive and effective. Leadership is a trait required of everyone on the project team. If you are the project lead, then you also need to lead on leadership!



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Leadership

There is no one in the project better suited to convey the vision and goals of the project, while also speaking about the team's progress toward those goals, than the project manager.

A project manager serves as a visionary leader who helps by educating the team and other stakeholders of the value achieved or targeted, promoting teamwork and collaboration, assisting with project management tools and techniques, removing roadblocks, and articulating the project's mission.

Promoting the project's mission and value inspires the team to remain focused and feel pride. Seeing and guiding the project towards near- and long-term goals keeps the project moving forward and aligned to the end users' and customers' expectations.



Leadership Skills

As a project manager, you must possess and apply leadership skills that enable a good working environment and guide your project team toward accomplishing the desired result.

This requires a balance of ethical, interpersonal, and conceptual skills that help you analyze situations and interact appropriately. Project managers work with and communicate with a number of different people throughout the life cycle of a project, so having strong people and leadership skills is critical.

Qualities and skills necessary in an effective leader include the abilities to:

- Manage relationships
- Build trust
- Collaborate with others
- Solve problems
- Exhibit integrity, and
- Guide the team toward a successful project close.

Depending on the project manager's personality and a project's environment, the leadership style that is used can vary from servant leadership style to a more direct approach.



Diversity Awareness and Cultural Competencies

Cultural and diversity aspects are important elements to implementing effective leadership modes. The motivations and working styles of individuals and groups vary greatly based on their experiences, age, culture, job roles, and many more influencers.

Communication and openness to learn from others builds trust and improves the optimal options to lead various team members and stakeholders.

Some general guidelines to develop leadership competencies include:

- Be mindful of individual and team aims and working

relationships. It is a skillful balancing act to keep people engaged while moving the team forward at the same time.

- Use a leadership approach and style that best suits the situation and the stakeholders. This means observing and acknowledging different capabilities, lifestyle and working requirements, cultural norms, language and translation needs, and so on.
- Understand that motivations and working styles of individuals and groups vary based on experiences, age, culture, job roles, and other influences.
- Projects with diverse locations, industries, stakeholders, and cultures require communication and openness to build trust



Leadership ≠ Management

Leadership is not the same as management.

Leadership refers to guiding the team by using discussion and an exchange of ideas, whereas **management** refers to directing actions using a prescribed set of behaviors.

Not all team members and other stakeholders are motivated and inspired the same way. Recognize and act upon the most suitable and reasonable approach to lead the project team.

Whether that approach is to take charge or quietly work behind the scenes, a project manager must adapt leadership style to the situation and the stakeholders. This demands awareness of individual and team aims and working relationships, or **emotional intelligence**.

Lead and Manage	
Let's reflect on two of the project manager's roles to understand the difference.	
Management	Leadership
Direct using positional power	Guide, influence, and collaborate using relational power
Maintain	Develop
Administrate	Innovate
Focus on systems and structure	Focus on relationships with people
Rely on control	Inspire trust
Help us understand tasks and problem solving	

Lead and Manage

Consider the difference between the management action on the left side of this table and the leadership action on the right:

Management	Leadership
Direct using positional power	Guide, influence, and collaborate using relational power
Maintain	Develop
Administrate	Innovate
Focus on systems and structure	Focus on relationships with people
Rely on control	Inspire trust

Focus on near-term goals	Focus on long-range vision
Ask how and when	Ask what and why
Focus on bottom line	Focus on the horizon
Accept status quo	Challenge status quo
Do things right	Do the right things
Focus on operational issues and problem solving	Focus on vision, alignment, motivation, and inspiration



Idea: Think about how leading and managing are two distinct actions by comparing and contrasting the examples in the management and leadership columns.



Leadership Traits

These are the traits that are typical of leaders.

- Strong personal ethics, integrity, and trustworthiness
- Interpersonal skills
- Conceptual and analytical skills

However, everyone on a project needs to develop leadership skills, not just the project leader.



Servant Leadership (Definition)

The practice of leading through service to the team, by focusing on understanding and addressing the needs and development of team members in order to enable the highest possible team performance.



Servant Leadership

Rather than manage projects and teams, trying to keep the project on plan and the team in line, servant leaders help teams develop and grow as a group and as individuals.

They facilitate the team's work by providing coaching and training, remove blocks that impede work progress, either from people or processes, and focus on team accomplishments rather than team misfires. To help reflect this change in orientation, many organizations use the term project leader rather than project manager.

Servant leadership means leading by supporting the team and addressing their needs. This style aims to understand the team's needs and take action to enable the team to perform and deliver.

Support the team so they can accomplish objectives in a conducive environment. Lead with communication by removing distractions or roadblocks.

You are working for the team; therefore, you must focus on their needs. Being a servant leader requires skills such as active listening, coaching, awareness, and facilitation.



Challenge the Status Quo

Challenging the status quo can open new ideas and perspectives. Challenging the way things were done, or are being done, at the present time assures all involved that this is the best approach and the best product. It also breaks complacency and blind acceptance.

Encouraging healthy skepticism on all aspects of the project and its vision helps stakeholders not overlook anything and assume too much.

Here are some guidelines:

- Let past experiences and processes provide guidance to but not dictate your actions.
- Commit to a growth mindset to continuously improve and innovate, to find new ideas and perspectives.
- Discover the best approach through challenge and introspection.
- Avoid complacency and blind acceptance.



360 View of Stakeholders

- Good leadership is based partially on your influence and the influence of the other project stakeholders.
- Use tools and techniques to ensure that you understand your stakeholders. Some examples:



Team Building

Project teams perform better when there is increased cohesion and solidarity. Good project leadership facilitates the bonding between project team members.

Facilitating team building activities builds unity, but also

builds trust, empathy, and focus on the team over the individual.



Team Building

A reward and recognition plan is a formalized way to reinforce performance or behavior. Reward and recognition plans are generally standardized throughout an organization and approved through corporate channels. The purpose is to motivate the team to perform well.

Rewards can include monetary gifts, additional vacation time or other perks, company plaques or trophies, or small gifts. Although it is common for the terms “reward” and “recognition” to be used interchangeably, they are different.

- You can recognize a person without giving them a reward.
- However, you should never reward a person without recognizing them.

Reward - A tangible, consumable item that is given to a person based on a specific outcome or an achievement. Rewards can also have a defined start and finish, or fixed time, and are usually expected when the specified goal is achieved or attained; for example, receiving a bonus after a successful year is a reward.

Recognition - A more personalized, intangible, and experiential event that focuses on behavior rather than outcome. Recognition is not restricted to a set time, is usually unexpected by the receiver, and is intended to increase an individual's feeling of appreciation.



GUIDELINES: Lead a Team

To effectively lead a project team, follow these guidelines:

- Use emotional intelligence and other leadership methods to motivate the team.
- Adapt your leadership style to work best with each stakeholder.
- Establish good communication among team members, internally and externally.
- Monitor performance of team members on an ongoing basis.
- Manage conflict by using the appropriate approach

based on the circumstances and the individuals involved.

Topic B

Support Team Performance

You want to get the most from your team. In this topic, we will explore a few practices to provide support for the team.



Support Team Performance

Supported team members perform better and are motivated to do their best work. You'll need strategies to maintain support to individual as well as for the whole team.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Key Performance Indicators (KPIs) (Definition)

Metrics used to evaluate an organization's progress toward meeting its goals and objectives. Usually defined by organizational leadership.

To match team performance with the project vision and objectives, you can use key performance indicators (KPIs). Performance evaluation measured with KPI metrics can help team members to see how well they are doing and where they can make improvements.

The KPI metric uses a few core examples to let the team and others know that what they are doing is feeding into project success.

Use the **SMART** acronym to define good KPIs: specific, measurable, achievable, relevant, and time-bound.

Specific - Means the goal is appropriately focused and targeted, not overly general or vague. The target must be specific to the objective at hand; many targets that are too general could be affected by dozens of factors not associated with the improvement.

Measurable - Means the change can be quantified and

assessed on that basis. You must be able to measure the target; this means figuring out how to get accurate data to assess current and future performance.

Achievable - Means that it is plausible and realistic. Ensure the target is a realistic one; you need to be able to achieve it within the size and scope of proposed improvement.

Relevant - Ensures that the KPI is meaningfully related to its associated critical success factor(s). The target needs to be relevant in the context of the larger objectives and critical success factors.

Time-bound - Means the goal is not open-ended but can be assigned a specific target duration. The timescale used needs to assess whether the improvement has achieved the desired results.



Supporting your Team

Strive to shape a team with a **healthy culture** of working **autonomy** and a shared **sense of responsibility** for their work.

Beyond sharing relevant performance data with team members, effective team leaders foster a culture of autonomous working, where people contribute their best because they feel proud of their work.



Idea: Think about positive team environments where you've felt supported. How do you think the team leader and the workplace environment help to foster that feeling?



Team Structure and Workspaces

The environment and location of a project team are extremely important elements to leading and managing projects.

In agile projects, meaningful interaction is a core tenet. To encourage frequent, free flowing interaction, the team structure and workspaces must be conducive to this need. You need a team that can contribute everywhere and at any time. If the team feels involved and engaged, their interactions will be more meaningful.

Give people autonomy in their work so that they are

empowered to take initiative when they need to. Your KPIs will help you detect and monitor sub-par performance easily.



Open Workspaces

Setting up the physical environment supports the whole team engagement. Co-locating all involved in a shared workspace fosters more informal and immediate collaboration and exchange of information. Ensure private spaces for those who need to work in solitude.

Even the passive information that is absorbed from the surroundings—such as ad hoc discussions, side conversations, whiteboard drawings, physical body language have value. Being immersed in the team physically and mentally improves the team's ability to work faster, more collaboratively, and more unified.



Virtual Teams

We discussed virtual teams in the first lesson. It's easy to feel disconnected in a virtual environment, so check in with people individually as often as possible and encourage positive network-building activities.



Empowerment and Unity

In projects, the team is the most important part. Without a good, unified team, the project falls apart and project management becomes insufficient.

The team needs to be empowered to make decisions without burden and in a timely manner. This increases the team's responsibility to deliver a product with complete ownership.

Another important aspect of team empowerment is that the team should be a part of clarifying and prioritizing requirements, splitting requirements into tasks, and estimating the effort. This is essential to ensure the commitment of the entire team even at the beginning of the project.

In case of any challenges during the course of the project, this involvement leads to an increased sense of ownership among team members.



Autonomy and Teamwork

Use a light management touch. Any interference with the team is disruptive, and it can reduce the members' motivation to work.

Encourage the team to foster team collaboration and decision making. The team does not depend on heavy-handed discipline. The team must recognize the power and influence they possess. As an empowered cohesive unit, they depend on each other to make decisions and solve problems to deliver targeted value quickly.



Keep the Tone Positive and Fluid

Establishing a culture of fluid communication and engagement in a workspace that promotes those positive interactions makes leading and managing teams much easier.



Team Building Activities

To foster team building within a project team, a project manager might ask each of the veteran employees on the team to partner with a less experienced team member, offering coaching as needed and sharing knowledge, information, and expertise.

But it does not need to be a formal event. Consider short, regular activities as well as longer ones. Your participation is a signal



Team Building

Team building activities unify. Working collaboratively toward a shared goal is a great way for team members to help each other reach a higher level of performance.

Team-building activities are the specific functions or actions taken to help the team to develop into a mature, productive team. They can be formal or informal, brief or extended, and facilitated by the project manager or a group facilitator.



Team Performance Assessments

All project team members have their own areas of expertise that, if identified and used appropriately, can help in completing the project successfully. Team performance assessments help to identify the potential of each team member in order to help improve interaction between team members, solve issues, and deal with conflicts.

A team's technical success is measured on the basis of meeting the project objectives and finishing the project on time and within the decided budget. Continual formal or informal evaluations of the team's performance is an effective way to improve the skills and competencies of project team members and increase team cohesiveness.

You can follow these guidelines to assess team performance:

- **Ask key questions of the team members** - Questions may include their work experience, likes and dislikes about the projects assigned to them, tasks that they are confident about, and project tasks they will prefer to do.
- **Speak to team members frequently** – Communicate through one-to-one meetings and regular project meetings wherein the team may talk about project cost and schedule adherence, milestones, deliverables, change management, risk management, and quality management.
- **Provide constructive criticism and acclaim to team members, as necessary** - Team successes should be announced publicly while coaching or addressing negative performance should be done in private.
- **Encourage knowledge transfer** - Provide team members with convenient, reliable methods for storing and accessing project knowledge and assess them on how well they provide and retrieve that information.
- **Evaluate individual performance** - Project managers must listen to the team members before responding and must be objective and flexible when necessary.
- **Removal** - In situations where a team member is not performing at the desired level, it may be necessary to remove them from the team and reassign his or her work to another resource. If this is not possible due to the workload and expertise of the other team members, it may be necessary to replace the under-performing resource and to assign his or her work to the new resource.



Performance Assessment Tasks

You can use performance assessment to accomplish a number of tasks, including:

- Comparing performance to goals.
- Re-clarifying roles and responsibilities.
- Delivering positive as well as negative feedback.
- Discovering unknown or unresolved issues.
- Creating and monitoring individual training plans.
- Establishing future goals.



Team Development

Commit time and effort to developing your team, as a team. Though people will come and go, having a strong group identity is essential.

Your team will naturally progress and regress. This is normal. Focus on acknowledging diversity—both cultural and of personal characteristics. Promote trust, communication, and respect.



Team Development Stages (Tuckman ladder)

When it comes to managing the dynamics of your project team, refer to “Tuckman’s Stages of Group Development.”



Teams might occasionally get stuck in a particular stage, or even revert to an earlier one.

1. Forming

Team members are wondering whether the decision to join the team was a wise one. They are making initial judgments about the skills and personal qualities of their teammates, as well as worrying about how they personally will be viewed by the rest of the team. During this stage, conversations tend to be polite and noncommittal, as people hesitate to reveal too much about their personal views. In addition, team meetings tend to be confusing, as the team tries to figure out who is in charge.

2. Storming

Team members begin to assert themselves and control issues as they emerge. Personality differences begin to arise. Conflicts result as team members differ on the way

they want to do the project work, or the way they want to make decisions.

3. Norming

The team begins to work productively, without worrying about personal acceptance or control issues. There are still conflicts; however, they tend to be focused on process issues rather than personality differences. The team begins to operate off mutual dependence and trust.

4. Performing

The team is working at optimum productivity. It is collaborating easily, communicating freely, and solving its own conflict problems. Team members feel safe in reporting problems, trusting their fellow team members to help them create the best solution for the team as a whole.

5. Adjourning

The team members complete their assigned work and shift to the next project or assigned work. This phase is sometimes known as "mourning."

The process of forming, storming, norming, performing, and adjourning is not done in a "lock step" fashion by the team. Team members keep coming in and going out of the team. Whenever a new member joins, forming takes place, even if the rest of the team has already crossed the forming stage. So, these stages are not followed one after the other but rather are situational.



Manage with Objectives

Teams are typically more productive and driven when they have clear objectives to meet. Project managers can support the team by setting objectives collaboratively with the team.

Project managers and the team can determine joint objectives that are challenging, yet attainable.

Objective setting can be conducted at the start of a project or phase, but is commonly done throughout the project life cycle, such as in an Iteration Planning session in which the team sets the targets and commitments for the upcoming time period.



Feedback

We mentioned this earlier in the course, but it's an important point. Feedback is crucial communication, and it should be done regularly, and in both directions—giving and receiving. Asking for feedback from your team means they know you are willing to listen to them.



Performance Tracking Techniques

Tools can track performance and render visualizations. This is a powerful method of showing work contributions.

Scrum/Agile/Kanban boards - Based on the Kanban management method of using cards, physical or electronic boards can track work as it progresses across various stages or categories.

Throughput Metrics - Measurement of the team's work that has moved from one stage to another stage over a certain time.

Cycle Time - Measurement of work that has progressed all the way from plan to completed or delivered.

Quality Metrics - Various measurements to track quality deliverables, defects, and acceptable output.

Earned Value - Tracking cost and effort performance against a planned value.

Bar Charts (Gantt) - Using the project schedule to track performance over time.

Velocity - Measurement of total output from an iteration to attempt to predict future iteration outputs.



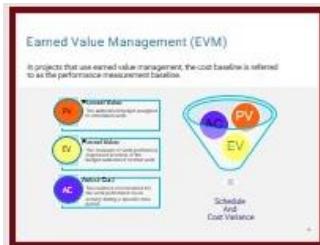
Work Performance by the Numbers

The monetary value of the work contribution is another way of supporting and measuring performance.



Earned Value Management (EVM) – (Definition)

A methodology that combines scope, schedule, and resource measurements to assess project performance and progress.



Earned Value Management (EVM)

You can measure project progress by comparing actual schedule and cost performance against planned performance as laid out in the schedule and cost baselines.

Assessing the value of work requires first determining what work has actually been performed and therefore what value it has contributed to the project. These performance reviews are usually included in each project status review meeting.

During planning, project work is broken down into work packages and activities. Each work package is assigned a budget and a schedule.

Because each increment of work is time-phased, a schedule variance results when work is not completed when it was scheduled to be completed.

Cost and Schedule Performance

The EVM approach to monitoring cost and schedule performance provides metrics that show variances from the baselines. Armed with this information, the project manager can identify appropriate corrective actions.

When cost and schedule variance analysis is conducted at the appropriate time intervals and levels, it can be effective in controlling against further cost and schedule problems.

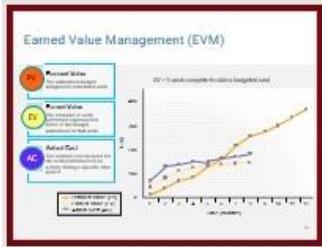
EVM Variables

EVM involves determining three independent variables to assess and monitor project cost and schedule performance progress. These three variables are used to provide measures of whether or not work is being accomplished as planned and to forecast project cost at completion. The variables are:

- Planned Value (PV)
- Earned Value (EV)

- Actual Cost (AC)

Let's look at those next.



Earned Value Management (EVM)

Planned Value

Planned Value (PV) is the authorized budget assigned to scheduled work. This amount is specified in the project's cost baseline. In simpler terms, PV indicates the value of work scheduled to be done during a particular time period.

Earned Value

Earned Value (EV) is the measure of work performed expressed in terms of the budget authorized for that work. In other words, EV is a composite measurement of both cost and time performance in relation to scheduled or planned cost and time performance.

EV is calculated by multiplying the percentage of work completed by the budgeted cost for the activity as laid out in the cost baseline.

$$\text{Earned Value (EV)} = \% \text{ completed} \times \text{Planned Value (PV)}$$

In order to determine the EV of the project work to date, you will have to look back at the cost baseline to determine how costs were assigned originally. If the PV was determined by the percentage completed to date method, you will apply the same method of assessing the EV. In other words, EV indicates the value of work actually performed during a particular time period.

Actual Cost

Actual Cost (AC) is the realized cost incurred for the work performed on an activity during a specific time period. AC refers to the total amount of costs incurred while performing work, either during completion of a schedule activity or during the completion of a WBS component.

Actual cost is calculated and documented once the work is complete. In other words, AC indicates the actual money that has been spent for work that has been completed.



EVM Measures for Schedule Control

The most commonly used EVM measures for schedule control are:

- **Schedule Variance (SV)** is a measure of schedule performance expressed as the difference between the earned value and the planned value. ($SV = EV - PV$)
 - A positive SV indicates that the project is ahead of schedule.
 - A zero SV indicates that the project is on schedule.
 - A negative SV indicates that the project is behind schedule.
- **Schedule Performance Index (SPI)** is a measure of schedule efficiency expressed as the ratio of earned value to planned value. ($SPI = EV / PV$)
 - An SPI number greater than 1.0 indicates that the project is ahead of schedule.
 - An SPI of 1.0 means the project is on schedule.
 - An SPI number less than 1.0 indicates that the project is behind schedule.



EVM Measures for Cost Control

The most commonly used EVM measures for cost control are:

- **Cost Variance (CV)** is the amount of budget deficit or surplus at a given point in time, expressed as the difference between the earned value and the actual cost. ($CV = EV - AC$)
 - A positive CV indicates that the project is performing under budget.
 - A zero CV indicates that the project is on budget.
 - A negative CV indicates that the project is performing over budget.
- **Cost Performance Index (CPI)** is a measure of the cost efficiency of budgeted resources expressed as the ratio of earned value to actual cost. ($CPI = EV / AC$)
 - A CPI number greater than 1.0 indicates that the project is under budget.
 - A CPI of 1.0 means the project is on budget.
 - A CPI number less than 1.0 indicates that the project is over budget.

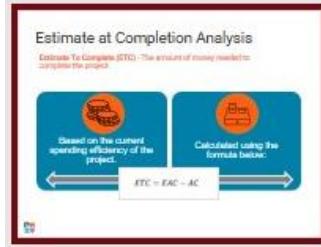


Estimate at Completion Analysis (EAC)

The current projected final cost of the project is referred to as the **Estimate at Completion (EAC)**.

It is based on the current spending efficiency (the CPI), and is calculated from the following formula, where **Budget at Completion (BAC)** is the sum of all budgets established for the work to be performed.

$$EAC = \frac{BAC}{CPI}$$



Estimate to Complete Analysis (ETC)

During execution, you might need to know how much more money you will need to complete the project. This amount is called the **Estimate to Complete (ETC)**.

It is based on the current spending efficiency of the project and is calculated from the following formula.

$$ETC = EAC - AC$$



Performance Report Types

Reporting and displaying team progress and what the team is accomplishing is extremely important for the team, but also for communicating to others about the great work of the team.

Information Radiators - Big visual boards to display in high traffic public locations about the project and the advancement of the project. The aim is to radiate information to all about the project work.



Example: Posters on a hallway wall showcasing team progress and printed out examples of work.

Burndown Chart - A graph to show the progress by plotting the burning down of work during an iteration or

other time period.

Burnup Chart - A graph to show the progress and gains made by the project team over time.

(not pictured) Velocity chart - Graphs the completion rate of the team over time and helps predict future iterations.

(not pictured) Iteration Cumulative Flow Diagram - Graphs the throughput of work in the various defined stages during a timeboxed period.

Earned Value Management Reports - Graphs and values based on the earned value management (EVM) equations.

Variance Analysis Reports - Graphs and their analysis comparing actual results to planned or expected results.

Work Performance Reports - The physical or electronic representation of work performance information* compiled in project documents, intended to generate decisions, actions, or awareness.



Example: Status reports, memos, justifications, information notes, recommendations, and updates.

Quality Reports - Charts and reports based on the quality metrics collected.



Example: Control charts, Pareto diagrams, run charts, and histograms.

Dashboards (Physical or electronic) - Summaries of the progress, usually with visuals or graphics to represent the larger data set.

Task Boards (Physical or electronic) - Depictions of the work that must be done and their current state.

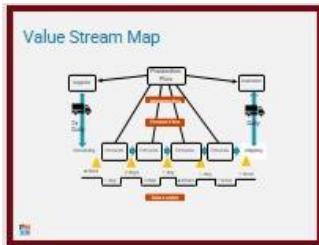


Example: Kanban boards, To-Do lists, procedure checklists, and Scrum boards.



Value Stream Map (Definition)

A Lean enterprise technique used to document, analyze, and improve the flow of information or materials required to produce a product or service for a customer.



Value Stream Map

Work must flow and be fluid. Bottlenecks, slowdowns, delays, or other forms of non-value effort creates waste and distraction. Anything not delivering or attributing to value is wasteful.

Producing a Value Stream Map can call out how information and materials in the project and between team members may be diluted, clogged, or otherwise wasted of its value.

The Value Stream Map presents visual representation of a process and the actions in each step to spot efficiencies as well as wasteful efforts.

Value stream is an organizational construct that focuses on the flow of value to customers through the delivery of specific products or services.



Retrospectives and Lessons Learned

Supporting the team's performance also extends beyond the measurement tools and feedback forums and methods. Gather lessons learned constantly and/or at set times throughout the project. Apply that learning into supporting actions to improve the performance and project environment.

In agile projects, retrospectives are the most important practice for gathering lessons learned from the team on how to improve and recognize success. Retrospectives occur after every iteration and at the end of every project.

Conducting a retrospective encourages the team to review what went well and what could have been done better. This assessment includes the work on the product, but also the processes, team dynamics, and other areas that influence the effectiveness of the team.



Implement Results of Retrospectives/Lessons Learned

Retrospectives are not just about capturing those lessons learned; retrospectives are also about how to take those lessons learned and analyze and apply them moving forward.

To do this productively, in the spirit of agile, you can involve everyone and respect everyone's input. These sessions are not blame games; they are learning and growth opportunities. The output of the retrospective is a plan on how to make improvement in the ensuing iteration and beyond.

You must facilitate the retrospectives to seek improvements and recognize successes. Often there are more lessons learned that can be implemented.

Stack rank the opportunities by importance and urgency. Then incorporate tasks to realize these improvements in the ensuing iterations or apply some of the ideas to the team environment where appropriate.



GUIDELINES: Conduct a Retrospective

Here are some suggested steps to conduct a retrospective and address improvements and changes:

- Prepare mentally or prepare some notes with some ideas or areas of focus in case the team needs some inspiration or ideas.
- Place two large sheets marked “What Went Well” and “What Could Be Improved” on a board.
- Ask the attendees to identify items that went well in the iteration and add them to the first sheet.
- Ask them to identify items that could be improved and add them to the second list.
- Allow each participant to identify the reason for the improvement.
- Ask the moderator to look for common items that need improvement and mark them.
- Narrow the list down to one or two areas to improve upon and bring value in the next Sprint.
- Get team consensus on the plan improvement.
- Update these tasks to the Product Backlog after a discussion with the Product Owner.
- Implement changes.

Topic C

Address and Remove Impediments, Obstacles, and Blockers

Throughout the project, you will encounter impediments, obstacles, or constraints. These elements will restrain, slow down, or block the team's progress towards the project's objectives. The interference can range from minor to catastrophic. In minor cases, the team may experience inconvenience, but sometimes a hindrance threatens to stop work completely.



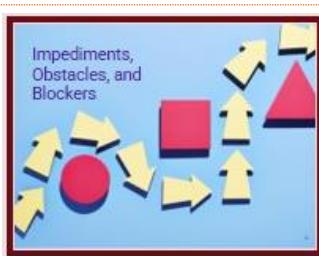
Address and Remove Impediments, Obstacles, and Blockers

In this topic, you learn how to keep the project path clear of hindrances by employing project management strategies and skills.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Impediments, Obstacles, and Blockers

These are the main enemies of project success. We will learn the differences between them in a moment, but this is the main point: Any hindrance on the project team or any member of the team reduces productivity and ability for the project to meet its objectives.

Any actions a project manager can take to address and remove the conditions or causes restricting the team's productivity helps the team and the project produce value. The speed of action, as well as efficacy are important.



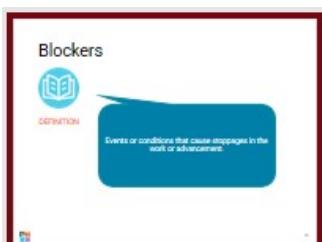
Impediments (Definition)

Situations, conditions, and actions that slow down or hinder progress.



Obstacles (Definition)

Barriers that should be able to be avoided or overcome with some effort or strategy.



Blockers (Definition)

Events or conditions that cause stoppages in the work or advancement.



Impediments, Obstacles, and Blockers

Let's consider some examples of impediments, obstacles, and blockers.

Projects can be blocked for many reasons. The type of hindrances varies greatly based on industry, stakeholders, the project and business environment, and the project itself.

Impediments reference situations, conditions, and actions that slow down or hinder progress.



For example: The team cannot agree on a file-saving solution.

This disagreement should not stop work from happening, but it will slow it down. In this case, an analytic decision-making technique or even an autocratic decision could work.

Obstacles reference barriers that should be able to be moved, avoided, or overcome with some effort or strategy.



For example: The construction crew is unable to arrive at the work site before permits are signed.

This will slow down progress until someone makes the effort to obtain the permit.

Blockers reference events or conditions that cause

stoppages in the work or any further advancement.



For example: The company has halted the use of any products in a certain firm until a new contract is signed.

In this case, someone needs to intervene and get the contract signed, or work will stop.

The number and weight of impediments may vary throughout a project. The variation may even fluctuate throughout the day.

As the team identifies an impediment, they need to alert others on the team. The project manager assists in facilitating the evaluation of the impediments and how they could or could not impact the team's ability to work. Based on those judgements, the team figures out how to address the impediments. Often, the resolution, or occasionally the research, is performed by the project manager to enable the team to focus on more meaningful, productive tasks.

Over time, the obstacles may become more or less cumbersome. The blockage may become unblocked. Due to the dynamic nature of projects, the impediments, obstacles, and blockers, as well as any effort undertaken by you and the team to address them, must be re-assessed continually throughout the project. This also includes recognizing new impediments, such as those that emerged because of the actions and efforts used to address other impediments.



Assess Product Backlog

Impediments and obstacles may block work or planned efforts from moving forward. As a result, the product backlog, scheduled activities, and other lists of work items must be assessed in reference to the hindrances.

Evaluating the impediments against the pending work forces the team and business stakeholders to assess the backlogged work in terms of value and priority.

Backlog assessment and refinement can also explore alternatives to overcome or avoid the risk; or in some instances, remove the work item or blockage altogether.



Daily Standup (Daily Scrum) - (Definition)

A brief, daily collaboration meeting in which the team reviews progress from the previous day, declares intentions for the current day, and highlights any obstacles encountered or anticipated.



Daily Standup

One practice to assist with uncovering the impediments impacting the team in a timely manner is a Daily Standup meeting.

Also known as a Daily Scrum, the Daily Standup is a short, 15-minute meeting in which the complete team gets together for a quick status update while standing in a circle. Ideally, the standup meetings should be conducted at the start of working hours, and the presence of all team members involved in the Sprint is mandatory.

During the meeting, these questions are answered:

- What has been done since the last meeting?
- What needs to be done before the next meeting?
- What does anyone need help with?



Tracking Impediments

Project teams tracking impediments as they are raised, addressed, and resolved enables increased communication and proper oversight.

Impediments task boards can be as simple as sticky notes denoting impediments, potential causes, responsibilities, and status posted on a whiteboard or wall near the project team's co-location to a sophisticated software capturing greater detail and communication features.

In whatever format works best for the team, the board must convey the status and efforts associated with the identified impediments.

Risk Reviews/Risk Register

✓ Impediments may be due to, or a result of, project risks or issues.

✓ Risks raised formally during the daily standup meetings, iteration reviews, or informally, are added to the risk list.

✓ Newly identified and existing risks are updated based on the current knowledge and situation.



Risk Reviews/Risk Register

Impediments may be due to or result from project risks or issues. Risks that are raised during the daily standup meetings, iteration reviews, and other meetings, as well as everyday conversations, are added to the risk list.

A rigorous review of project risks ensures that risks are identified and documented. Newly identified and existing risks on the project risk list must be updated based on the current knowledge and situation.

Handle Impediments as a Servant Leader

Aim to clear an unobstructed path for the team so they can contribute and Opt for the workplace to be free of obstacles and other impediments.

- ✓ Create the right team space
- ✓ Remove distractions
- ✓ Remove non-value work, and other confusion

Take on most of the burden of addressing and removing impediments so the team can do their peer work.



Handle Impediments as a Servant Leader

As a servant leader, a project manager aims to create an unobstructed path for the project team so they may contribute and deliver.

Project managers want to optimize the workplace to be free of obstacles and other impediments. This extends from the physical team space to shielding the team from non-value activities.

Removing distraction, randomization, and other confusion enables the project team to be more effective and efficient.

Project managers can take on most of the burden of addressing and removing impediments so the team can do their best work on the project to achieve its desired objectives.

GUIDELINES

Working with External Stakeholders, Other Projects, and Work Demands

- ✓ Work with the team to assess and evaluate the impediment.
- ✓ Review previous attempts or efforts to fix the problem.
- ✓ Discuss impact and solutions.
- ✓ Relay the impediment to the external source.
- ✓ Establish a single point of contact (SPOC) within the team, typically the project manager or person with the most subject matter knowledge.
- ✓ Shield the rest of the team to focus on other work.
- ✓ Create action plan and schedule.
- ✓ Follow up and communicate per agreements.
- ✓ Document resolution and lessons learned for future reference.



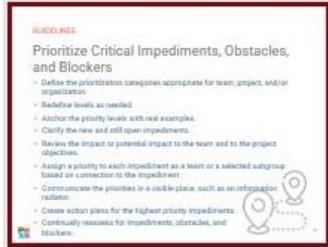
GUIDELINES: Working with External Stakeholders, Other Projects, and Work Demands

Impediments emerge from the internal project team, but also from external sources. Here are guidelines to work with external stakeholders.

- Discuss with the team to assess and evaluate the impediment.
- Review efforts previously attempted or considered.
- Discuss impact and solutions.
- Relay the impediment to the external source.
- Establish a single point of contact (SPOC) within the team, typically the project manager or person with the most subject matter knowledge. Shield the rest of the team as appropriate so they may

focus on other work.

- Create action plan and schedule.
- Follow up and communicate per agreements.
- Document resolution and lessons learned for future reference.



GUIDELINES: Prioritize Critical Impediments, Obstacles, and Blockers

- Define the categories or levels of prioritization appropriate for your team, project, and/or organization. Redefine levels as needed.
- Anchor the priority levels with real examples.
- Clarify the new and still open impediments.
- Review the impact or potential impact to the team and to the project objectives.
- Assign a priority to each impediment as a team or a selected sub-group based on connection to the impediment.
- Communicate the priorities levels in an easily accessible area, such as a software tool, information radiator posted on a wall, or communal message board.
- Begin creating action plans for the highest priority impediments.
- Reassess continually to ensure impediments, obstacles, and blockers for the team are being addressed.

Topic D

Manage Conflict

Working as a team and with a variety of stakeholders, there are bound to be conflicts. Conflict in projects is inevitable. Conflict is natural. Conflict can be a positive benefit to the project and its outcomes, if managed and cultivated properly.



Manage Conflict

An extremely important part of the role is maintaining a peaceful, productive working environment. In this section, we learn how to deal with conflicts, so that when they arise, you can attend to them.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Project Manager's Role

Managing conflict is a responsibility of all stakeholders. The direction and handling of conflict is heavily influenced by the project manager.

In agile projects, the project manager may assist in facilitating conflict resolution sessions or the team is empowered to resolve conflicts as they best see fit.



Skills and Leadership Techniques

As a servant leader, a project manager can assist in the removal of impediments or sources of conflict to support the team's performance.

Your interpersonal and team skills play a major role in ensuring the results of positive aspects of conflict rather than the negative aspects. Skills such as empathy and emotional intelligence are primary examples.

Causes of Conflict

- ✓ Competition
- ✓ Differences in objectives, values, and perceptions
- ✓ Disagreements about role requirements, work activities, and individual approaches
- ✓ Communication breakdowns



Causes of Conflict

Conflict arises in most groups and working situations.

Causes of conflict include:

- Competition
- Differences in objectives, values, and perceptions
- Disagreements about role requirements, work activities, and individual approaches
- Communication breakdowns

You should be aware of certain characteristics of conflict that will help them effectively handle conflicts when they arise.

Conflict is natural and forces the need for exploring alternatives. It is a team aspect, and openness about the situation or opinions can resolve conflicts.

While resolving conflicts, focus should be on the issues and not on individuals. Also attend to the present situation and not on the past.

Conflict Management

DEFINITION

Application of one or more strategies to deal with disagreements.



Conflict Management (Definition)

The application of one or more strategies to deal with disagreements.

Conflict Management

effective conflict management leads to:

- ✓ Improved understanding
- ✓ Better performance
- ✓ Higher productivity

ineffective conflict management leads to:

- ✗ Destructive behavior
- ✗ Animosity
- ✗ Poor performance
- ✗ Reduced productivity



Conflict Management

Effective conflict management can lead to improved understanding, performance, and productivity. Conversely, ineffective or nonexistent conflict management can lead to destructive behavior, animosity, poor performance, and reduced productivity, all of which threaten successful completion of the project's deliverables.

Conflict Management Approaches



Conflict Management Approaches

Your approach to managing conflict will depend on :

- The intensity and importance of the conflict
- The time given to resolve the conflict
- The positions of the conflicting parties, and
- The motivation to resolve conflicts on a short-term or long-term basis.

There are five basic approaches for handling conflicts; each is effective in different circumstances:

1. Smooth/Accommodate

-
2. Withdraw/Avoid
 3. Compromise/Reconcile
 4. Force/Direct
 5. Collaborate/Problem Solve

You will need to use leadership skills and your expert judgment to assess the situation and choose a conflict resolution method. Let's explore each of these in greater depth next.



Conflict Management Approaches (1 of 2)

Smooth/Accommodate

- Emphasize areas of agreement rather than areas of difference.
- Concede your position to the needs of others to maintain harmony and relationships.

Withdraw/Avoid

- Retreat from an actual or potential conflict situation.
- Postpone the issue to be better prepared or to be resolved by others.

Compromise/Reconcile

- Search for solutions that bring some degree of satisfaction to all parties.
- Temporarily or partially resolve the conflict through compromise.



Conflict Management Approaches (2 of 2)

Force/Direct

- Pursue your viewpoint at the expense of others.
- Offer only win/lose solutions, usually enforced through a power position to resolve an emergency.

Collaborate/Problem Solve

- Incorporate multiple viewpoints and insight from differing perspectives.
- Enable cooperative attitudes and open dialogue to reach consensus and commitment.

Topic E

Collaborate with Stakeholders

Project success depends on engagement and appropriate collaboration of project stakeholders. The more collaboration and alignment, the better ability for the project to deliver value and progress towards those ends. Working collaboratively requires constant effort and balance. The tighter the collaboration, the more aligned and accurate the deliverables.



Collaborate with Stakeholders

We've already discussed identifying stakeholders and learning how to best communicate with them. Beyond this is establishing meaningful and collaborative relationships.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Engaging Stakeholders

Keeping stakeholders engaged is crucial to the success of your project. With their support, you can determine a project's requirements quicker and know that they are accurate.

Do they trust you? Do you have their trust?
How do you work together?
Is it productive, or does interaction seem shallow?

These are questions you will need to ask regularly to be an effective project manager and work in collaboration with stakeholders. We learned that collaborative working is the underpinning of agile projects—projects develop in and through this collaboration.



Stakeholder Engagement Plan (Definition)

Identifies the strategies and actions required to promote productive involvement of stakeholders in project or program decision making and execution.

Documenting a stakeholder engagement plan:

- Provides a clear, actionable plan that will be used when interacting with project stakeholders to support the project's interests.
- Documents how the project will interact with the identified project stakeholders for the life of the project.
- Identifies the management strategies required to effectively engage stakeholders.
- Project managers should be aware of the sensitive nature of the stakeholder engagement plan and take appropriate precautions when distributing the plan to other team members.

The stakeholder engagement plan goes further than the stakeholder register, providing additional information such as:

- Desired and current engagement level of key stakeholders.
- Scope and impact of change to stakeholders.
- Identified interrelationships and potential overlap between stakeholders.
- Stakeholder communication requirements.
- Information to be distributed to stakeholders.
- Reason for the distribution of that information and the expected impact to stakeholder engagement.
- Time frame and frequency for the distribution of required information.
- Method for updating and refining the stakeholder engagement plan.



Effective Collaboration

Foster an environment of effective collaboration on your team. In agile teams, the term “psychological safety” is key. It is the ability to speak openly and freely about the work, in the interest of the work. This can seem difficult at first but remember that your team has established clear ground rules of respect. Ensure that team members stay respectful, but open to speak up and offer helpful opinions.



Collaboration

Effective collaboration builds trust between all parties. Open dialogue and meaningful communication optimize the understanding of the aims, as well as the expectations of the results and what needs to be done in order to realize those expectations. Everyone's involvement and engagement in the project may fluctuate or remain constant. That level of

engagement is evaluated and reevaluated throughout the project.

Keeping discussions transparent ensures appropriate stakeholders are knowledgeable and expectations are set. Engagement also builds appreciation for others' needs and constraints.

Communication skills, interpersonal skills, feedback, meeting management, among other management skills, are leveraged to maximize the feedback loop and engagement between stakeholders.



Collaboration Activities

Stakeholders collaborate every day in a project. Some stakeholders may be engaged less frequently; for example, a Project Sponsor who gets updates monthly or a Product Owner who only engages with the development team three or four times during an iteration.

The frequency of engagement is based on mutual needs and expectations. Nearly constant engagement amongst the core project team is common. Encouraging that regular collaboration can be supported by daily stand-up meetings and co-locating teams near each other for more face-to-face communications.

More infrequent collaboration can be supported by scheduled sessions such as milestone reviews, backlog grooming sessions, and project update meetings. Determining and optimizing collaboration activities is an ongoing team effort spearheaded by the project manager.



Develop a Stakeholder Engagement Plan – (Part 1 of 2)

Guidelines to developing, executing, and validating a strategy for stakeholder engagement are as follows:

- Review the project management plan for information such as life cycle selected for the project, description of how work will be executed, description of how resource requirements will be met, how changes will be monitored and controlled, and the need and techniques for communication among stakeholders.
- Review the stakeholder register for information needed to plan appropriate ways to engage project

- stakeholders.
- Review the organizational culture, structure, and political climate to help in determining the best options to support a better adaptive process for engaging stakeholders.
 - Review the lessons-learned database and historical information, as they provide insight on previous stakeholder engagement plans and their effectiveness.



Develop a Stakeholder Engagement Plan – (Part 2 of 2)

- Use expert judgment to decide upon the level of engagement required at each stage of the project from each stakeholder.
- Hold meetings with experts and the project team to define the required engagement levels of all stakeholders.
- Use analytical techniques to classify the level of engagement for stakeholders.
- Document the stakeholder engagement plan.



Maximize Meeting Time

If you want to make the most of meeting times, try these three strategies:

- Be organized
- Timebox
- Collaborate – Though you might be running the meeting, be open to ideation or problem resolution during meetings.



GUIDELINES: Facilitating a Meeting

- Make certain that the meetings are appropriate to the stakeholder's engagement in the project. Appropriateness is determined by an array of variables, such as, but not limited to:
 - timing
 - context
 - stakeholders' experiences, knowledge, input
 - location
 - technology
 - urgency
- Set and distribute an agenda prior to the meeting start.
- Projects are managed with a sense of urgency. Meetings should support that sense of urgency by starting promptly.
- Review the agenda set prior to the meeting and

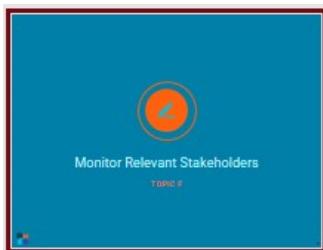
make amends as stakeholders deem necessary.

- Allow others to speak and share as appropriate.
 - Take notes or record the meeting, with permission.
 - Keep the meeting discussions on topic. Save outside discussions for after the meeting or for another scheduled meeting with appropriate stakeholders.
 - Recap the meeting and any action items to follow the meeting.
 - Thank everyone for attending.
 - Adjourn the meeting per the scheduled time or earlier.
 - Distribute the meeting notes or recording as agreed.
-

Topic F

Mentor Relevant Stakeholders

Project management is an art and a science. You improve with practice, learning, and experience. You learn from others every day. You are learning from this course. Likewise, there are plenty of opportunities for you to share your knowledge and experience with others.



Mentor Relevant Stakeholders

Project management is constantly growing and refining the best practices that make us all successful. Increasing the knowledge base and the skill sets of all project stakeholders sets up for more successful and effectively managed projects.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Interacting with Relevant Stakeholders

Here are some examples of ways in which you can mentor relevant stakeholders.

- When refining the backlog, mentor the Product Owner on best practices.
- When onboarding a new project team member, guide them on team processes.
- When a team member must purchase material for the project, show them the procurement best practices and processes for the organization.



Coaching and Mentoring

Coaching and mentoring others helps both parties become more proficient team members. This, in turn, makes for a more proficient team. Raising the abilities of the team increases their output and their value. That increased knowledge spreads throughout the organization and across the discipline.



Make Time for Mentoring and Coaching

Time and resources are limited, so making time for coaching and mentoring activities may seem challenging.

Begin with mentoring relevant stakeholders associated with your project and expand from there.

Let's look at some ways of cleverly working mentoring and coaching into your schedule.



Individual Mentoring and Coaching

Mentoring and coaching relevant stakeholders can come in many forms. The expansive range of project management knowledge – in academic, explicit form and in experience based tacit form – can be passed onto others in various modes.

Process/Task One-on-One Mentoring

- Encouraging others to take the lead on activities
- Facilitating meetings and sessions
- Practice taking on new roles
- Informal opportunities
- Formal opportunities
- Transferring skills
- Modeling behaviors
- Teammates assist each other



Share Explicit Knowledge with an Individual while Performing a Task

Self-organizing teams coach and mentor each other every day in their work. Taking a cue from them, here are a few more ways of sharing knowledge while working:

- Encourage self-organization and initiative
- Facilitate opportunities for others to practice project management tasks
- Coach individuals on how to contribute in other project roles
- Coach an individual with tacit knowledge
- Lead formal training sessions
- Transfer skills
- Demonstrate desired skills and best practices every day



Mentor and Coach as a Group

Mentoring and coaching also occurs in whole team settings. When project managers are demonstrating the best means to complete a project management task, all involved in the activity are learning.

Project managers can call out and explain what is happening and why. Others in the group can contribute and guide the practice. The entire team learns and grows as a unit.



Training and Sharing Plans

When an environment encourages and values learning and knowledge sharing, all stakeholders gain. Setting aside time for sharing and learning can increase the opportunities to capitalize on mentoring.

Formal or informal plans can be established for training and sharing. Setting times during meetings – such as at the end of a status meeting or project review session – can be ideal times for sharing what has been learned.

Retrospectives and lessons learned sessions can be leveraged to call out successes and failures in the management and operation of the project. In projects where the emphasis is on self-organizing and supportive teams, a few minutes every day can be set aside for mentoring and coaching.

Scheduling training sessions formalizes mentoring and coaching. These sessions can be facilitated by anyone. You, as project manager, can train others on the project management best practices. A process owner can guide others on the best practices for that process.



Facilitation

Project managers generally take the lead when it comes to facilitating project management activities. Modeling good project facilitation skills is observed and internalized by all. Encouraging participation from stakeholders in the activities builds their knowledge and comprehension.

Guiding and offering advice provides relevant feedback and confidence in what they are doing. Increasing the abilities of all project stakeholders increases the shared understanding and efficiency of project tasks and practices.



Transformation Skills

The project organization, the business, and the world are constantly changing and evolving. Supporting change as the organization progresses from one way of doing things or understanding to another level requires patience and compassionate mentoring. Making the change to an agile operating system can be frightening for team members who are accustomed to a more deliberate style of planning and delivering.

The most high-performing teams remain adaptable in the face of dynamic change. Remember, the skill set you and your project team hold, or utilize, today may be obsolete or limited tomorrow, especially in a digital world.

Topic G

Apply Emotional Intelligence to Promote Team Performance

Emotional intelligence is essential in working with teams. The human resource is sentient and responsive to emotional triggers. Let's learn about how to use this skill appropriately.



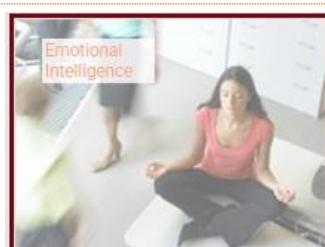
Apply Emotional Intelligence to Promote Team Performance

The interpersonal skills related to emotional intelligence are the topic of this section. Learning how to motivate team members, assess tricky situations, and inspire the team begins with your keenest attention to your human resources.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Emotional Intelligence

Slide may have been omitted (optional).



Idea: Think about how your current workplace supports your emotional health (or not). What programs are in place to attend to employee well-being and emotional health?

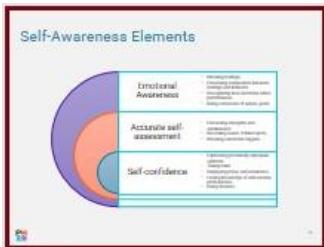


Emotional Intelligence

An important interpersonal skill of all project managers is Emotional Intelligence (EI). EI helps you understand your emotions and those of others to help minimize conflict. The notion of EI evolved in the 1990s and is now recognized as a key set of personal and interpersonal skills.

The personal side includes self-awareness, self-regulation, and motivation, whereas the interpersonal side comprises social skills and empathy.

- Self-awareness measures how well you know your own emotions in a variety of situations.
- Self-regulation defines how well you can control those emotions.
- Motivation describes your intrinsic reasons for achievement.
- Social skills address how well you build relationships and rapport with others.
- Empathy is how well you read and understand the emotions of others.
- Being able to read the emotions and feelings of others, as well as recognizing how your emotions and behaviors positively or negatively affect others, is crucial for effective management and team performance. The following sections describe the elements of the five EI skills.



Self-Awareness Elements

Each emotional intelligence skill is made up of, or influenced by, a number of components. Self-awareness elements include the following.

Emotional Awareness

- Knowing which emotions you're feeling and the root cause, or causes, of those feelings.
- Being aware of the connections between your feelings, thoughts, and behavior.
- Recognizing how your emotions affect your performance.
- Being conscious of, and living by, your guiding values and goals.

Accurate self-Assessment

- Perceiving your strengths and weaknesses.
- Becoming aware of your blind spots.
- Knowing which scenarios trigger your emotional reactions.

Self-Confidence

- Expressing opinions that may not be popular.
- Willing to take risks for what you believe is right.
 - Displaying poise, self-assurance, and charisma.
 - Having a firm knowledge of your self-esteem and proficiencies.
 - Being decisive, even when facing opposition and resistance and resistance



Self-Regulation Elements

Being aware of your feelings and what causes them provides a foundation that enables you to manage and channel your emotions in constructive, positive ways - to practice behavior that will strengthen your relationship with your associates and your company. Here are self-regulation elements.

Self-control

- Remaining cool, calm, and even-tempered under pressure
- Staying focused and quick-witted in a stressful environment.
- Effectively controlling your rash and destructive emotions.

Trustworthiness

- Acknowledging your own errors, and challenging immoral conduct in others.
- Establishing confidence through your reputation for honesty and credibility.
- Standing by your principles, even if others don't share your beliefs.
- Behaving in a morally correct way, above suspicion.

Conscientiousness

- Having a well-ordered, meticulous approach to work
- Being accountable for fulfilling your goals.
- Satisfying obligations and delivering on promises.

Adaptability

- Adjusting your strategies and responses to adapt to changing events.
- Interpreting events in a flexible way.
- Easily handling numerous demands and changing priorities.

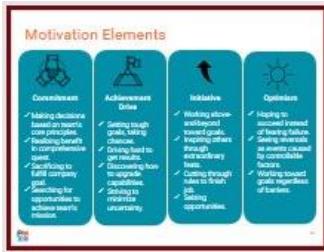


Interpersonal and Team Skills

EI belongs to the larger set of interpersonal and team skills a project leader is expected to have. Let's look at that list quickly:

- Active listening
- Communications styles assessment
- Emotional intelligence
- Influencing

- Motivation
- Nominal group technique
- Political awareness
- Transparency



Motivation Elements

Motivation is the EI skill associated with your personal, internal abilities. It's about raising your ambition to attain peak performance. Let's review this while thinking about how to nurture and grow these factors in yourself and the team.

Achievement drive

- Setting tough goals and taking chances.
- Driving hard to get results and satisfy, or exceed, aspirations and ideals.
- Discovering how to upgrade your capabilities.
- Striving to minimize uncertainty and discovering ways to improve.

Commitment

- Relying on your team's core principles to make decisions.
- Realizing a benefit in a comprehensive quest.
- Gladly sacrificing to fulfill a substantial company goal.
- Enthusiastically searching for opportunities to help achieve the team's mission.

Initiative

- Working toward goals beyond what's essential or anticipated.
- Inspiring others through extraordinary, resourceful feats.
- Cutting through official rules and processes, when required, to finish the job.
- Being prepared to grab opportunities.

Optimism

- Hoping to succeed instead of fearing failure.
- Seeing reversals as caused by controllable factors instead of a personal defect.
- Steadily working toward goals regardless of barriers and glitches.



Empathy

Empathy is a critical emotional intelligence skill that profoundly affects your ability to relate to, and establish a rapport with, others. It expands vision and decision-making beyond the immediate circumstance and your individual priority.



Empathy – Looking Inward

Let's consider some empathetic traits that make individuals more able to contribute to collaborative, high-performing teams:

Understanding others

- Being of service to others based on their particular needs and emotions.
- Readily observing emotional cues and listening carefully.
- Displaying tact and appreciating, or sharing, others' points of view.

Service orientation

- Happily providing proper help.
- Understanding a customer's point of view; serving as a faithful guide.
- Looking for strategies to increase consumers' contentment and loyalty.
- Recognizing consumers' needs and matching them to products or services.



Empathy – Looking Outward

And now let's see how an empathetic culture can help teams.

Developing others – Empathetic teams make this a priority

- Recognizing and rewarding the talents and achievements of others.
- Providing helpful criticism and determining people's development needs.
- Coaching and mentoring, when appropriate, and providing tasks that stretch and nurture a person's abilities.

Leveraging diversity

- Appreciating various life philosophies and being conscious of group contrasts without judging.
- Viewing variety as favorable circumstances,

establishing conditions where different types of groups can thrive.

- Showing consideration for and connecting with people from diverse groups.
- Objecting to discrimination and bigotry.

Political awareness

- Understanding the political truths and realities of companies.
- Grasping the influences that determine opinions and behaviors of clients, consumers, or rivals.
- Recognizing critical social systems.
- Correctly interpreting crucial power connections.



Social Skills - Elements

Social skills draw on other emotional intelligence skill sets to build strong relationships with people and affect change in the organization.

Here are some critical social skills for high-performing teams:

- Communication
- Building Bonds
- Collaboration/Cooperation
- Change Catalyst
- Conflict Management
- Influence
- Leadership
- Team Capabilities

Let's explore them in the next few slides.



Social Skills Elements (Part 1 of 4)

Communication

- Managing tough problems directly.
- Effectively exchanging information, and adjusting your message based on emotional cues you're perceiving.
- Cultivating clear communication and being open to both unfavorable and positive news.
- Achieving a mutual awareness by listening carefully and sharing information without reservation.

Building bonds

- Building and maintaining friendly connections

with colleagues.

- Establishing and maintaining large, casual networks.
- Keeping others informed.
- Searching for mutually rewarding relationships.



Social Skills Elements (Part 2 of 4)

Collaboration and Cooperation

- Fostering an amiable, collaborative environment.
- Recognizing and cultivating options for cooperation.
- Balancing job duties and professional relationships.
- Working together and sharing strategies, knowledge, and assets.

Change catalyst

- Challenging the current situation to appeal to the need for change.
- Advocating for change and recruiting others to strive for the transformation.
- Appreciating the importance of change and doing away with obstacles.
- Exhibiting the change anticipated of others.



Social Skills Elements (Part 3 of 4)

Conflict management

- Detecting possible clashes, moving disputes into the open, and helping to reduce them.
- Managing difficult individuals and stressful scenarios with finesse and sensitivity.
- Urging open discussion of issues.
- Engineering a resolution that is mutually advantageous.

Influence

- Appealing to listeners by polishing presentations.
- Winning people over skillfully.
- Coordinating impressive events to convincingly sell an idea.
- Building solidarity and approval through intricate strategies.

**Social Skills Elements
(Part 4 of 4)**



Leadership

- ✓ Generating interest for collective vision and goal.
- ✓ Modeling effective leadership.
- ✓ Taking on a leadership role regardless of official title.
- ✓ Directing others' performance.

Team Capabilities

- ✓ Building team character.
- ✓ Attracting group members.
- ✓ Displaying team characteristics.
- ✓ Safeguarding team and its good name.

Social Skills Elements (Part 4 of 4)

Leadership

- Expressing and stimulating interest for a collective vision and goal.
- Modeling effective leadership.
- Taking on a leadership role based on necessity, regardless of official title.
- Directing others' performance while maintaining their accountability.

Team capabilities

- Building team character, camaraderie, and dedication.
- Attracting group members into committed and passionate involvement.
- Displaying team characteristics such as civility, supportiveness, and collaboration.
- Safeguarding the team and its good name.

Now let's move on to organizational theory and a few things you need to keep in mind.

Organizational Theory



DURATION

The study of how people, teams, and organizations behave

Organizational Theory (Definition)

Further detail on the next slide.

The study of how people, teams, and organizations behave.

Organizational Theory



- ✓ Purpose of organizational theory
- ✓ Maximize efficiency and productivity
- ✓ Solve problems
- ✓ Motivate people
- ✓ Meet stakeholder requirements
- ✓ Common organizational theorists
- ✓ Maslow's Hierarchy of Needs
- ✓ McGregor's Theory X and Theory Y
- ✓ McClelland's Achievement Theory
- ✓ Herzberg's Motivation Theory

Organizational Theory

We use organizational theory to look for common themes in workplaces for the purpose of:

- Maximizing efficiency and productivity
- Problem solving
- Motivating people
- Meeting the stakeholder requirements of a project.



IDEA: Which of these have you heard of? Which are new? Make a note to do a little research in this area!

Renowned Organizational Theorists

Maslow's Hierarchy of Needs is a popular theory that

places the needs of an individual in a pyramid or triangle. The theory states that a lower-level need must be satisfied before a higher-level one can be addressed.

McGregor's Theory X and Theory Y apply to the management of labor. Theory X states that people generally do not like to work and are not motivated to work. Management feels the need to supervise labor to maintain productivity. Theory Y is essentially the opposite: people want to work and enjoy it, and management does not need to "hover" and constantly supervise. Sometimes, Theory X is called the "old-school" approach, and Theory Y is a more modern approach.

McClelland's Achievement Theory has three components: achievement, power, and affiliation. Achievement relates to success, power to influence other people, and affiliation to belonging to a team.

Herzberg's Motivation Theory says that success in the workplace is based upon two elements. Hygiene factors relate to working conditions, a stable job, and good relationships with management and co-workers. Motivating factors relate to feelings of achievement, recognition, and career advancement. Herzberg said that people are not generally motivated by money.



Active Listening

You will hear this term a lot in project management. Active listening is a communication technique that involves acknowledging what you hear and clarifying the message to confirm that what you heard matches the message that the sender intended.

Let's look at the aspects of active listening that will help you communicate more effectively with your stakeholders.

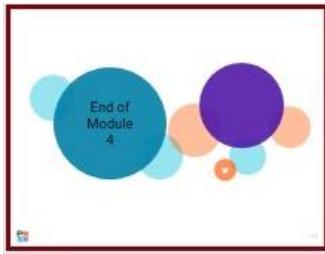
- **Reflecting:** Most people are aware of the reflecting aspects of active listening, which includes repeating the gist of a message to clarify you understood it correctly.
- **Attending:** To show that you are paying attention to the speaker, you can lean slightly toward them, stay at the same eye-level, and maintain eye contact without staring.
- **Following:** To demonstrate your understanding of

the conversation, you can respond with a non-verbal gesture such as nodding your head, or a verbal word or phrase, such as "yes," or "um-hmm." You can also ask occasional open questions or provide silent pauses so the speaker can collect their thoughts.



GUIDELINES: Building Emotional Intelligence with Key Stakeholders

- Recognize your own emotions and behaviors.
- Assess how your emotions, attitudes, actions, behaviors control you.
- Observe how your emotions affect those around you.
- Take note of physical nonverbal cues of others, such as a shrug or smile.
- Interpret those cues against the context, situation, and your emotions.
- Remain mindful of the emotions of others.
- Mirror the behaviors of others when suitable to become better connected.
- Practice controlling or changing your emotions to better suit the situation.



End of Lesson 4

That wraps up the "People" element of the course. Next, we move on to "Strategy and the Business Environment".



Student Edition



Lesson 5

Keeping the Business in Mind

PMI® Authorized PMP® Exam Prep

Keeping the Team on Track

Lesson Time: 6 hours

Lesson Introduction

Projects don't exist in a vacuum. Internal and external business environments can influence and affect the work of a project. As the project manager, you need to manage compliance requirements and ensure that the project is delivering benefits and value. Keeping a handle on the changes in both the internal and external business environments are the project manager's responsibility. Employing a continuous process improvement plan will ensure that the project's success can be consistently repeated within your organization.

In this lesson, you will learn how to keep the business in mind during the life of the project.

Lesson Objectives

In this lesson, you will learn how project managers and teams:

- Determine necessary approach and action to address compliance needs.
- Evaluate delivery options to achieve benefits and value.
- Continually review internal and external business environment for impacts on project scope/backlog.
- Evaluate the impact of the project to the organization and determine required actions.
- Assess the existing continuous improvement framework and execute continuous improvement steps.

Lesson Topics

	Title	Slides
Topic A	Manage Compliance Requirements	2-23
Topic B	Evaluate and Deliver Project Benefits and Value	24-50
Topic C	Evaluate and Address Internal and External Business Environment Changes	51-60
Topic D	Support Organizational Change	61-73
Topic E	Employ Continuous Process Improvement	74-85

Topic A

Manage Compliance Requirements

Compliance requirements are typically related to the political, business, and industry contexts of your project's product or service. Whatever they are, you are in charge of ensuring that your project activity and outcomes are aligned with legal or regulatory standards, as necessary.



Manage Compliance Requirements

Let's look at how project managers meet and maintain these requirements throughout a project.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Compliance Requirements

Most projects have compliance requirements—that is, aspects of their solutions that are subject to legal or regulatory constraints. Your team is responsible for researching, identifying, tracking, and managing compliance requirements throughout the project.



Note: Compliance requirements can include requirements for specific practices, privacy laws, handling of sensitive information, and many other areas.

Lessons learned registers from similar projects are a great starting place for your compliance research.



Use of the Risk Register

During the project, you have tracked and managed risks using a risk register. Some of these risks will relate to compliance with legal and regulatory requirements.

Non-compliance itself is a risk—Waiting until delivery time to ensure compliance or perform a summary check of compliance is a risk. If the team identifies disparities late, you will likely trigger project time and cost overruns.

Compliance management includes creating suitable testing and validation plans during development to ensure that the project's deliverables meet compliance requirements.



Compliance-related Risks

The risk register should provide the following useful information for your compliance checklist:

- The identified risk
- Risk owner
- Impact if the risk is realized
- Risk responses (potentially including avoidance, transfer, mitigation strategies, and acceptance of residual risk)



Configuration Management System

We reviewed the configuration management system in the “Process” lessons. Here, let’s note its relationship to compliance management.

All of the project’s deliverable components should be tracked in a configuration management system, which

describes the deliverable, defined key attributes of the deliverable, and allows for tracking, versioning, and control. This configuration information should be handed over along with project deliverables and will continue to be tracked in the customer's configuration management system.

One of the key attributes you will want to track is compliance information, including proof of validation for each deliverable that it meets the identified compliance requirements.

So, this is where you are able to demonstrate to the customer that the deliverable meets the relevant compliance requirements.



Compliance Categories Classification

Let's take a moment to explore compliance categories. If you are new to a company, country/region, or industry, you will need to do some research to understand the compliance requirements relevant to your project.

Beyond these, organizations often incur tertiary standards or validations for their products, and these will have compliance requirements.

- Environmental Risk
- Workplace Health and Safety
- Ethical/Non-Corrupt Practices
- Social Responsibility
- Quality
- Process Risks



For example: Consumer-facing classifications related to quality and social responsibility would include "b-corp" or "vegan" certifications.



Compliance Reporting

The kinds of information you'll need to record to maintain compliance reporting requirements may include:

- Regular work performance reports – these will provide details of workplace standards and practices
- Checklists with:
 - Project activities and changes
 - Team improvements
 - Deliverable status
 - Overall progress
 - Risk status
- Information about compliance-related risks, such as:
 - Risk management actions
 - Testing and validation activities
 - Audits
 - Other actions to verify deliverable compliance



Variance Analysis

Along with reporting on execution, project managers will regularly report on any project variances, along with actions taken to control the project and keep things on track.

Variances related to compliance are critical as they could potentially impact the usability of the project's deliverables.

The variance analysis should detail the variance identified, plans for bringing the project or deliverable back into compliance, along with any proposed changes required in order to meet compliance requirements.



Potential Threats to Compliance

So, what could be your main threats related to compliance? Some are:

- Identification of new vulnerabilities in your product service.
- Changes in legal or regulatory

requirements.

- Errors in testing and validation to confirm compliance.
- Errors or bugs in deliverables.
- Lack of awareness of compliance requirements.

Hopefully, if you have put the recommended plans in place, the last threat can be avoided. For the rest of the list, you handle them just as you would handle a risk.

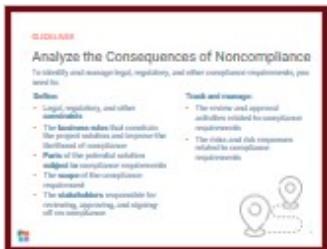


Signoffs and Approvals

A designated stakeholder should be accountable for each compliance requirement in your project. This stakeholder is authorized to sign off and approve compliance. Depending on the requirement and the project, this may be a list of stakeholders who need to approve and sign off.

While many of these approvals may not be possible until shortly before project completion, many others may be subject to ongoing testing and validation during the project.

This can be very helpful as it will provide you with an early warning of potential threats to compliance, allow you to capture the variances, and determine an appropriate course of action to remediate the issue before it impacts the project timeline, causes cost overruns, or creates large project risks.



GUIDELINES: Analyze the Consequences of Noncompliance (Identifying and managing compliance requirements)

- Define the legal, regulatory, and other constraints, and define the business rules based on compliance requirements that will constrain the project solution and improve the likelihood of maintaining compliance.
- Define parts of the potential solution

subject to compliance requirements, the scope of the compliance requirement, and the stakeholders responsible for reviewing, approving, and signing-off on compliance of the component.

- Track and manage the review and approval activities related to compliance requirements.
- Track and manage the risks and risk responses related to compliance requirements.



Next Section: Deliver Benefits and Value

Now let's discuss how projects deliver benefits and value. Your role as project manager in value delivery is to ensure good results for the business. This takes a combination of the technical and soft skills we just learned.

You also should identify how the project aligns with the business's overall strategy. The more you know here, the better you can tailor the project work and outcomes to help to further the growth of the business.



Control Quality to Help Ensure Compliance

A proven method of aiding compliance management on any project is having excellent quality controls. Logically, if attention to quality is high on a project, then it likely is a well-run, high standard project that already has some formal quality requirements.

Let's turn our attention now to the subject of quality.



Quality Management Plan (Definition)

A component of the project management plan that describes how applicable policies, procedures, and guidelines will be implemented to achieve the quality objectives.



Quality Management Plan

The Quality Management Plan describes the resources and activities needed for the project team to achieve the necessary quality objectives and is an appropriate place to set expectations for the project's quality requirements. Quality requirements might include:

- Quality standards to be used.
- Quality objectives of the project.
- Quality roles and responsibilities.
- Project deliverables and processes subject to Quality review.
- Quality Control and Quality Management activities planned for the project.
- Quality tools to use.
- Major procedures relevant for dealing with nonconformance, corrective action procedures, and continuous improvement procedures.



Control Quality Process Outputs

As the project team produces deliverables, your control quality process will review the deliverable, verify that it meets both functional and nonfunctional requirements, and often identify and suggest potential improvements.

This process validates whether the deliverables align with compliance requirements and provides feedback on any variances identified and potential approaches to cure any defects or other noncompliance.

As the project continues, the project manager will want to monitor the quality reporting and recommendations and coordinate with the project team to address defects or manage any identified noncompliance issues.



Escalation Procedures

When the team identifies a noncompliance issue, they should determine whether it is within tolerance. Can the project manager handle it, or will it need to be escalated?

For any noncompliance issue outside of the project manager's purview, identify the stakeholders who are authorized to review it and assign it to them to manage.

This procedure should be defined during project and risk planning.



Quality Audits (Definition)

A process conducted by an external team that confirms the implementation of approved change requests including updates, corrective actions, defect repairs, and preventive actions.



Audits

Quality audits are processes that verify compliance with organizational policies, processes, and procedures. Generally, they are conducted by a team external to the project, such as an internal audit team or PMO.

Audits are generally used to do the following:

- Identify use of good and best practices.
- Identify any nonconformity, gaps, and shortcomings.
- Share good practices from other projects in the organization or industry.
- Proactively offer improvements to improve productivity.
- Highlight contributions to lessons learned.

Any remediation should reduce the overall

cost of quality and increase customer acceptance of the project's deliverables. They may also be used to verify implementation of change requests including updates, corrective actions, defect repairs, or preventive actions.



Sampling

Another process that can help ensure compliance is sampling. Because it may not be viable for quality assurance to inspect every single product or deliverable, the sampling method assists in quality review.

An appropriate sampling approach can provide similar results in identifying quality issues and reducing the costs of quality, thus helping to better align the quality assurance costs with the overall value to the project.



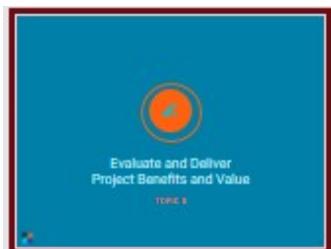
GUIDELINES: Measure Project Compliance

- Use QA outputs to confirm deliverable and process compliance and identify the needs for corrective actions.
- Establish project tolerances and enable the project manager to either initiate corrective actions within tolerances or to quickly escalate any noncompliance outside of the tolerances.
- Establish a clear Quality Management Plan and execute it on an ongoing basis to identify any noncompliance issues as early as possible.
- Establish where external audit teams can confirm and validate use of appropriate processes and procedures and how audit results can enable the team to identify improvements.
- Leverage effective QA tools and techniques to assess quality deliverables and identify improvements, corrective actions, or defect repairs required.

Topic B

Evaluate and Deliver Project Benefits and Value

A project is undertaken to meet the objectives and requirements of its stakeholders, and the project manager is responsible for delivering what these stakeholders expect.



Evaluate and Deliver Project Benefits and Value

Great project managers think strategically. They have their eye on a project's benefit and value to the organization. So, remember to look up from your schedules and data and ensure you understand your project's relationship to the business.

First, we will look at methods of accelerating value delivery in a project and then some ways of measuring it.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Business Value (Definition)

The net quantifiable benefit derived from a business endeavor, the benefit of which may be tangible, intangible, or both.

Components of business value include:

- **Shareholder value**—in a publicly traded company, the part of capitalization that is equity as opposed to debt; for example, the number of outstanding shares multiplied by the current share price.
- **Customer value**—the value received by the customer of a product or service.
- **Employee knowledge**—an asset of the

business, a frequently overlooked component of business value.

- **Channel partner value**—the value of a business's partners.



Benefits Management Plan (Definition)

A document that describes how and when the benefits of a project will be derived and measured.



Benefits Management Plan

A benefits management plan typically includes the following components:

- **Target benefits**—the expected tangible and intangible business value to be realized from the project.
- **Strategic alignment**—how the benefits align with the business strategies of the organization.
- **Timeline**—when the benefits (short-term and long-term) will be realized, usually by project phase.
- **Benefits owner**—the person or group that monitors, records, and reports the benefits.
- **Metrics**—the direct and indirect measurements of the realized benefits.
- **Risks**—the risks associated with achieving the targeted benefits.

This plan is prepared before the project is initiated, and it is referenced after the project has been completed. It is not a subsidiary component of the project management plan, but instead is a business document.



Sprint Reviews/Demos

In an agile project, at the end of each iteration or sprint, the team will host other stakeholders and conduct a sprint review or demo.

Part of the purpose of agile approaches is that the team is focused on completing

whole user stories in each sprint; in other words, everything is done, and the capability is “potentially shippable.”

At an early stage, the team should gain acceptance of the story from the product owner because it should meet all of the defined acceptance criteria and to get early feedback from other stakeholders, which may unearth changes or additional undefined requirements.

The sprint review then is used to review progress on the overall product, and to get feedback early while it’s still relevant if certain aspects of the solution need to be changed or enhanced in certain ways to optimize business value.



Release Management

One of the fundamental benefits of agile projects is the ability to convert high value capabilities into delivered solutions early.

Part of the job of the Product Owner in an agile project is to define the initial capabilities that make up a Minimum Viable Product; in short, enough solutions to start using it, and start generating real value for the business and real feedback for the teams.

In a traditional project, release occurs at the end, when everything is done. In practical terms, virtually all solutions have an ongoing lifecycle so the idea of being forever done with a solution is largely a mirage and work is hardly ever “done”.



Disciplined Agile (Definition)

A hybrid tool kit that harnesses hundreds of agile practices—agile, lean, and traditional sources—to guide you to the best way of working (WoW) for your team or organization.



Disciplined Agile (DA) Approaches

- Use DA approaches to support dynamic work environments.
- A Product Owner creates a minimum business increment (MBI) that defines work requirements to deliver the stated value.
 - The MBI creates value quickly and incrementally, so the business can start using and benefitting from it.

Advantages:

- Feature or capability assessment
- Improve organizational tolerance for change
- A time cadence for subsequent releases



Benefit Cost Analysis (Definition)

[Further information on the next slide.](#)

A systematic approach to estimating the strengths and weaknesses of alternatives used to determine options which provide the best approach to achieving benefits while preserving savings. Also called cost-benefit analysis.



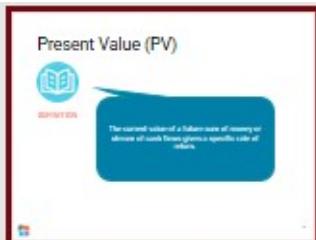
Benefit Cost Analysis

This is one method of measuring or evaluating a project's benefit and value.

Benefit cost analysis is frequently used to compare potential projects to determine which one to authorize, and to compare alternative approaches to the scope.

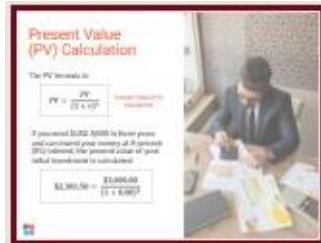
The goal in a benefit cost analysis is to select the alternative whose benefits outweigh its costs by the most amount. An alternative whose cost exceeds its benefit should never be chosen.

The value of a benefit cost analysis depends on the accuracy of the estimates of cost and benefit.



Present Value (PV) (Definition)

The current value of a future sum of money or stream of cash flows given a specific rate of return.



Present Value (PV) Calculation

Although you might not need to memorize how present value is calculated for the exam, seeing the formula will help you put the concept into perspective. "PV" is present value, "FV" is future value, "r" is interest rate, and "n" is number of periods.

$$PV = \frac{FV}{(1 + r)^n}$$

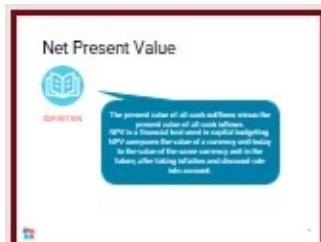


For example, if you need \$3,000 in three years and can invest your money at 8 percent interest, the present value (your initial investment) is calculated as shown.

$$\$2,381.50 = \frac{\$3,000.00}{(1 + 0.08)^3}$$



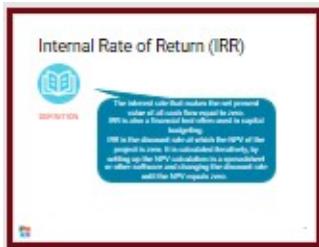
Note: In financial formulas, PV represents present value. In Earned Value Management, PV represents planned value.



Net Present Value (Definition)

The present value of all cash outflows minus the present value of all cash inflows. NPV is a financial tool used in capital budgeting. NPV compares the value of a currency unit today to the value of the same currency

unit in the future, after taking inflation and discount rate into account.



Internal Rate of Return (IRR) (Definition)

The interest rate that makes the net present value of all cash flow equal to zero. IRR is also a financial tool often used in capital budgeting. IRR is the discount rate at which the NPV of the project is zero. It is calculated iteratively, by setting up the NPV calculation in a spreadsheet or other software and changing the discount rate until the NPV equals zero.



Return on Investment (Definition)

A financial metric of profitability that measures the gain or loss from an investment relative to the amount of money invested.

It is sometimes called the "rate of return" and is usually expressed as a percentage. A positive ROI is interpreted as a good investment, and a negative ROI indicates a bad investment.



Net Promoter Score (NPS)

Knowing how the customer or end-user receives the product or service is another excellent indication of value.

The Net Promoter Score (NPS) measures a customer's willingness to recommend a provider's products or services to another. NPS is simply calculated as the % of Promoters - % of Detractors with the resulting index of -100 to 100. Higher scores indicate customer delight and willingness to recommend the solution.

For the calculation, you assign a number to the customer's self-reported satisfaction on a 0-10 scale, with 10 being the most satisfied.

The reporters can be characterized in the

following way.

Detractors (0-6)

Would be very willing to work with another provider, as some aspect of the solution left them less than satisfied.

Passives (7-8)

Somewhat satisfied, but may be willing to try competitive offerings.

Promoters (9-10)

Very satisfied, and would choose to work with the provider again. May choose to evangelize the solution to other people.



A/B Testing

Another way of deriving benefit and value information from the customer or end-user is A/B testing. Feedback from real users before final delivery is extremely valuable during development.

In A/B testing, you might ask about user preferences or desired capabilities. In AB testing, different sets of users are shown similar services with one difference known as the independent variable.

As a result of the AB testing, you can optimize the solution to use the most effective approach based on the results of the experiment.



For example, you might change the color or position of a button in an app you are developing to see if people behave differently based on the different options.



Monte Carlo Simulation (Definition)

An analysis technique in which a computer model is iterated many times, with the input values chosen at random for each iteration driven by the input data, including probability distributions and correlations between variables.

probabilistic branches.



Monte Carlo Simulation

Need to understand your project outcome's "bigger picture" to peruse options?

A Monte Carlo simulation generates outputs to represent the range of possible outcomes for a project. Monte Carlo refers to not one single analysis method but to a wide class of techniques, mostly making use of sophisticated computers and inputs of random numbers, probabilities, and algorithms.

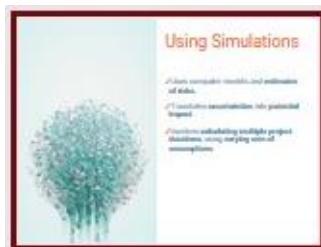
It has a wide range of applications in many fields, including finance and engineering because it works effectively with large inputs of numbers.

It is well suited for complex project management problems in which more than a few inputs such as costs, activity, and duration are unknown.



Simulation (Definition)

An analytical technique that models the combined effect of uncertainties to evaluate their potential impact on objectives.



Using Simulations

While we can't predict the future, simulations provide a means of understanding the possibility of outcomes.

Simulations involve calculating several possible project durations with varying sets of activity assumptions.

A project simulation uses a model that translates project uncertainties into their potential impact on project objectives.

The project model is run many times with

different variables to calculate a probability distribution.



Decision Tree Analysis (Definition)

Further information follows on next slide.

A diagramming and calculation technique for evaluating the implications of a chain of multiple options in the presence of uncertainty.



Use Decision Trees to Find Benefit and Value

Decision trees allow decision makers to evaluate both the probability and impact for each branch of every decision under consideration, making it a useful tool for risk analysis.

Solving the decision tree indicates the decision that will provide the greatest expected value when all the uncertain implications, costs, rewards, and subsequent decisions are quantified.

Expected Monetary Value

Expected Monetary Value (EMV) is a method of calculating the average outcome when the future is uncertain.

Opportunities will have positive values and threats will have negative values.

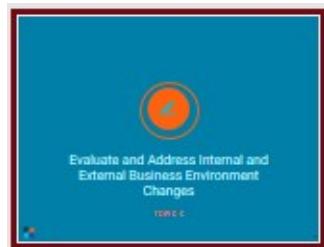
EMV is found by multiplying the monetary value of a possible outcome by the probability it will occur. This is done for all possible outcomes and their figures are added together. The sum is the EMV for that scenario.

This technique is used in decision tree analysis; EMV must be calculated in order for the analysis to find the best outcome. The best outcome is the one resulting in the greatest amount of net gain or the least amount of net loss.

Topic C

Evaluate and Address Internal and External Business Environment Changes

Effective project managers continually assess and evaluate changes in their organization's business environment as well as changes in the industry. Be ready to respond to change to keep your project aligned with the business's strategic direction.



Evaluate and Address Internal and External Business Environment Changes

Projects operate in highly dynamic environments while generating change for that environment. Highly skilled project managers embrace the qualities of adaptability and resilience to navigate these environments and optimize outcomes for their projects and the organizations in which they operate. Let's take a closer look.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Internal Business Environment

Organizational changes can make a dramatic impact on the scope of a project.

The project manager and project sponsor need to have visibility into business plans, reorganizations, process changes, and other internal activities.

Internal business changes might require your project to respond with a:

- Need for new deliverables, or
- Reprioritization or removal of existing deliverables.



Get to Know the External Business Environment

You should have a few tools in your kit for understanding business environments. Here is a quick overview of some helpful ones.

The PESTLE acronym identifies the external business environment factors that can affect the value and desired outcomes of a project. PESTLE considers political, economic, social, technical, legal, and environmental factors as causes or agents of external change.

Others are:

- ✓ **TECOP** (technical, environmental, commercial, operational, political)
- ✓ **VUCA** (volatility, uncertainty, complexity, ambiguity)

These frameworks can help you to better understand external factors that can introduce risk, uncertainty, or provide opportunities.

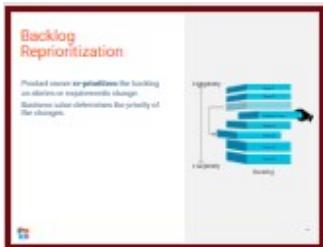


Update Baselines

Now to the question of how to document or facilitate any changes necessary as a result of your changing environments.

In traditional project plans, the completed initial plan is the baseline. As changes occur in the project, you update the baseline to reflect any new requirements.

Agile projects process change continuously, in iterations or increments. Work is prioritized and updated in the product backlog or in the value stream (Disciplined Agile)



Backlog Reprioritization

In agile projects, you work with the product owner to re-prioritize the backlog as stories or requirements change.

Business value—what will derive more value and do so most quickly—determines the priority of the changes.



Recommended Options for Changes

- When change is proposed, the product owner should focus on the intended business value of the change.
- Give the project team discretion to consider the change and identify potential solution options.



Clear Governance Structure

We explored project governance earlier. This was the external context of your project—where it lives, so to speak.

Having a supportive project governance structure in place becomes critical for projects to be able to respond to changes.



Governance Steering Committee

The governance steering committee usually consists of the “Project Board” or overall governance or steering committee that coordinates the project. They are responsible for clarifying the project charter and objectives; and allocating resources to the project.

This committee might include:

- The project sponsor
- A senior user
- PMO resources



GUIDELINES: Assessing the Impact on Project Backlog Based on Business Environment Changes

- Understand the project's organizational context.
- Understand the external factors that

-
- may impact your project.
- How is the project work prioritized?
 - What is the project governance model?
-

Topic D

Support Organizational Change

Project environments are influenced directly by organizational culture, style, and structure. Understanding this broader context helps ensure that work is carried out in alignment with the organization's goals and managed in accordance with the organization's established practices.

In turn, projects can influence the strategic direction of organizations. And enterprise-level change projects—or organizational transformations—are instrumental in orchestrating change.



Support Organizational Change

Envisioning your project as part of the organization in which it “lives” means being part of any change initiative that the organization takes. This will mean adapting your project as well as realigning it with the changing business objectives.

Let’s start by understanding how organizations typically work, then consider a few different project management setups, and finally how project managers and PMOs roll out and support change initiatives in organizations.



Deliverables and Tools

This is a list of the deliverables and tools associated with this topic. These slides are provided to help you match up project tools and deliverables with tasks.



Organizational Cultures and Styles

Organizations are companies or governmental departments that are in place to accomplish a purpose. Every organization develops a unique culture and style that represents its cultural norm and affects how projects are performed. We can think of this as an internal “brand”.

Culture is shaped by people's common experiences such as:

- Shared visions, missions, values, beliefs, and expectations
- Regulations, policies, methods, and procedures
- Motivation and reward systems
- Risk tolerance
- View of leadership, hierarchy, and authority relationships
- Code of conduct, work ethic, and work hours
- Operating environments

As project manager, you should understand that cultures have a strong influence on a project's ability to meet its objectives.



For example, a company that allows employees to work flexible hours versus an 8-to-5 workday can directly affect how a project manager schedules resources, general morale, and how the team interacts.



Organizational Structures

An organizational structure dictates how the various groups and individuals within the organization interrelate. The organizational structure also affects how much authority the project manager has, as well as the availability of resources and how projects are performed.

Organizations will typically be configured in one of the main structural implementations:

Functional

- Each department is responsible for carrying out a specific, similar set of activities.
- Multiple people perform each type of activity.
- Reporting is hierarchical, with each individual reporting to a single manager.

- The project manager's authority is low, relative to the functional manager's authority.

Projectized

- The project manager and a core project team operate as a completely separate organizational unit within the parent organization.
- Core team members are responsible for the work of extended team members in their functional area.
- Team members are often co-located.
- The project manager reports to a program manager and has a significant amount of authority and independence.
- Some projectized organizations may contain their own support systems such as a separate procurement or personnel department or share support systems with the parent organization.

Matrix

- A blend of functional and projectized structures in which individuals report upward in the functional hierarchy, but they also report horizontally to one or more project managers.
- The matrixed reporting scheme may be permanent or temporary.
- This structure may be characterized as weak, balanced, or strong, depending on the relative authority of the project manager to the functional manager. An organization is said to have a strong matrix when the project manager's authority is higher than that of the

functional manager.

Composite

- Most modern organizations involve all these structures at various levels.
- It is a combination of all the other types of organizations.

The structural model used by an organization will have a huge impact on how project managers interact with team members and stakeholders. In many cases, a project manager will interact with various levels in an organization such as middle management, operations, strategic functions, and senior management. Knowing which individuals in the organization are decision-makers or influencers and working with them increases the probability of project success.



Relative Authority in Organizational Structures

Take notes as your instructor guides you through the table on this slide.

Relative authority refers to the project manager's authority relative to the functional manager's authority over the project and the project team. In a purely functional organizational structure, the project manager's authority is low relative to that of the functional manager. Conversely, in the project-based organizational structure, the opposite is true.



Project Management Office (PMO) (Definition)

A management structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques. PMOs are more common in larger organizations because of the number of projects that can be in process at the same time. A PMO can offer assistance and guidance for all projects in progress. PMI® does not provide

official guidelines or standards for a PMO, so large organizations must use PMI principles and best practices to implement their PMO.

There are several types of PMO structures, each varying in the degree of control and influence they have on projects within the organization:

- **Supportive** PMOs provide a consultative role to projects by supplying templates, best practices, training, access to information, and lessons learned from other projects.
- **Controlling** PMOs provide support and require compliance through various means. Compliance may involve adopting project management frameworks or methodologies; using specific templates, forms, and tools; or conforming to governance.
- **Directive** PMOs take control of projects by directly managing the projects. A relatively small number of PMOs fall into this category.



Roll Out Plan

Let's take the context of an organization embarking on a large, internal change initiative. Once that change is approved and built, the project manager needs to plan for its successful implementation.

Roll out plans enable the project manager to define the knowledge transfer, training, and readiness activities required to implement the change. Depending on the size and scope of the change, the affected parties may include both the project team and potentially customer and user stakeholders. Depending on the nature of the change, substantial training and early life support activities may need to be planned to support the stakeholders as the change is adopted.



Project Management Plan Updates

Based on the scope of the change, the project management plan may need to undergo substantial updates. These may include changes in scope, timelines, work packages, and even individual team member assignments.

If the project is agile, the impact may be limited to lower-value deliverables being moved out of scope to make room for the change.



Training Plan

Changes to the project plan likely will impact the training plan. The changes may include changes in the scope of the training and knowledge transfer required, changes in roles and responsibilities of the stakeholders, and changes in the timeline for when training will be provided to the relevant stakeholders.



Training Artifacts

Changes to the plan and deliverable set mean that there will be necessary changes to the training artifacts which may , including:

- Training courseware
- Lab configurations and exercises
- Knowledge requirements and potentially credentials, if certification of skills is expected
- Updates for the trainers to gain the necessary knowledge transfer required to deliver the updated training

Whether in-house or outsourced, you have to ensure these changes to training are made.

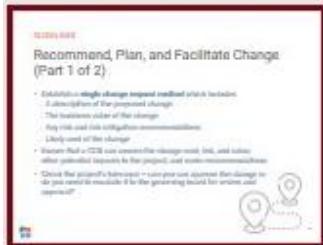


Demos

- Changes to software solutions may require demonstration of changed configurations, processes, workflows, and roles and responsibilities.
- Key customer and user stakeholders

need to review the demo and provide feedback to ensure the changes work as intended and do not impact the workflow of the solution.

- Early feedback allows for adaptation, while the feedback is immediately relevant and should improve the quality of the change while reducing overall cost and risk.



GUIDELINES: Recommend, Plan, and Facilitate Change (Part 1 of 2)

- Establish a single change request method which includes:
 - A description of the proposed change
 - The business value of the change
 - Any risk and risk mitigation recommendations
 - Likely cost of the change
- Ensure that a CCB can assess the change cost, risk, and value, other potential impacts to the project, and make recommendations.
- Check the project's tolerance – Can you approve the change, or do you need to escalate it to the governing board for review and approval?



GUIDELINES: Recommend, Plan, and Facilitate Change (Part 2 of 2)

- Follow organizational change management best practices:
 - Build a compelling case for change
 - Get buy-in and commitment of key stakeholders
 - Communicate the change vision
 - Enable other stakeholders to engage
- Ensure changes are properly aligned and updates are made to relevant project artifacts - i.e. project plan, training plans, training artifacts, and software configurations or demos.

Topic E

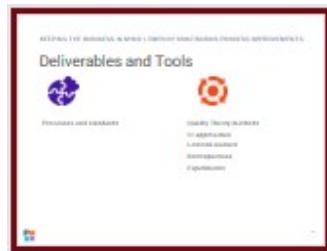
Employ Continuous Process Improvements

Every business wants to be the best and stay ahead of the competition. In your role as project manager, you can make a substantial contribution to this effort by espousing an ongoing, positive attitude towards changing and improving work.



Employ Continuous Process Improvement

Continuous process improvements are, quite simply, a characteristic of organizations that indicates an ongoing, vigilant, and positive response to change. As a project manager, you need to participate in these efforts, as they are a very visible vehicle of strategic organizational change.



Deliverables and Tools

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Continuous Improvement (Definition)

An ongoing effort to improve products, services, or processes.

The Institute of Quality Assurance's definition of continuous improvement includes improving business strategy, business results, and customer, employee, and supplier relationships.



Continuous Improvement

Continuous improvement can include ongoing efforts to improve products, services, or processes—both small, incremental improvements or large “breakthrough” improvements.

Continuous improvement is a business strategy that is developed at the

organizational level for projects to adopt and use. It may also be implemented by an organization's PMO.



Culture of Continuous Improvement

Continuous improvement has been used in business for nearly three-quarters of a century. W. Edwards Deming was an early leader in the field of process improvement, beginning with his work in post-World War II Japan. He taught four concepts that have been the foundation of the continuous process improvement movement:

- Better design of products to improve service
- Higher level of uniform product quality
- Improvement of product testing in the workplace and in research centers
- Greater sales through global markets

Deming's philosophy was about improving quality to reduce expenses, increase productivity, and thus increase market share. His views on quality control and quality management increased worldwide demand for Japanese products and soon gained popularity in the United States and worldwide.



Further Study in Quality Theory Methods

As we approach the end of the course, we encourage you to be guided by your own, personal continuous improvement—study, reading, and research in the project management discipline. Once you achieve your PMP certification, keeping abreast of research can count towards earning PDUs.

Some excerpts from popular theorists follows on the next slide.



Quality Theory Methods - excerpts

Let's look at some popular approaches to quality. These are excerpts from total quality management (TQM) theory. These theories attempt to improve business results through an emphasis on customer satisfaction, employee development, and processes rather than functions.

Do any of these inform your current approach to quality? Which resonate with you?



Continuous Improvement Approaches

Agile is itself a means or process of continuous improvement. Let's look at two other approaches:

Kaizen - A second idea emerging from Japanese business (ca. 1980s). Its key features include:

- Improvements based on many small changes.
- Small changes less likely to require major expenditures of capital.
- Ideas come from workers—not expensive research, consultants, or equipment.
- All employees should continually improve their own performance.
- All are encouraged to take ownership of their work to improve motivation.

PDSA - Plan, Do, Study, Act - This continuous improvement methodology, involves systematically testing possible solutions, assessing the results, and implementing those that work. The cycle is then repeated to further improve a process or product.

The four steps in this methodology are:

1. **Plan** - Define objectives and processes to deliver a set of desired results
2. **Do** - Execute the plan and collect data to determine the effectiveness of the processes.
3. **Study** - Evaluate the data and compare

the results to expected outcomes.

4. **Act** – Identify issues with the process, determine their root causes, and modify the process to improve it. Planning for the next cycle can then proceed.



Note: PDSA is also known as the Deming Cycle, or PDCA (Plan, Do, Check, Act) depending on your region.



Continuous Improvement Tools

Once you've decided on your approach to quality and continuous improvement, you'll need to look into how to implement it. Let's consider a few appropriate tools:

- **Lessons Learned Register** – This important component of each project can be a source of improving the processes in other projects. Avoid filing it away at the end of a project and not referring to it.
- **Retrospectives** – These are common in agile projects at the end of each iteration. They help the team look back at an iteration and plan improvements for the next one.
- **Experiments** – These provide a way to improve team efficiency and effectiveness. Some techniques include A/B testing and team feedback to identify improvements. However you do it, perform experiments one at a time to isolate the results so that you can analyze them and see how they're working.



Update to Process and Standards

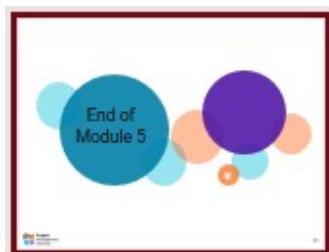
The information from lessons learned at the project level can apply to the organization's continuous improvement process, in addition to the project management processes.

Escalate these lessons and evaluate them for consideration at the organizational level.



GUIDELINES: Execute Continuous Improvement Steps

- Review the organization's continuous improvement strategy.
- Develop a continuous improvement approach for your project, keeping in mind the project goals and the expectations of the stakeholders.
- Use lessons learned from your project and other projects—as sources of continuous improvement.
- For agile projects, use retrospectives to improve the next iteration.
- Use lessons learned at the project level to improve the organization's continuous improvement process.



End of Lesson 5

This is the end of the course. Thank you for your participation and best of luck to you as you continue your preparations to take the PMP® Certification exam!

