Project Management Institute.

LESSON 2

STARTING THE PROJECT

- Determine Appropriate Project Methodology/ Methods and Practices
- Plan and Manage Scope
- Plan and Manage Schedule
- Plan and Manage Budget and Resources
- Plan and Manage Quality of Products and Deliverables
- Integrate Project Planning Activities
- Plan and Manage Procurement
- Establish Project Governance Structure
- Plan and Manage Project/Phase Closure

Determine Appropriate Project Methodology/Methods and Practices

TOPIC A

Deliverables and Tools

- Surveys
- Project business case/needs document
- Project Overview Statement
- Project Implementation Plan
- Agile practice guidelines

- Expert judgement
- Meetings
- Focus groups
- Workshops
- SMART objectives
- Knowledge of classic PM and agile practice
- Project Integration

Business Case and Business Needs Documents

Business case:

- ✓ Documented economic feasibility study
- ✓ Establishes benefits of project components
- ✓ Provides a basis for authorization of further project activities

Business needs documents:

- ✓ Provide high-level deliverables
- ✓ Prerequisite of formal business case
- ✓ Describe requirements - what needs creating and / or performing

Project Implementation Plan

Consider all stakeholders, schedules, risks, budgets, and quality standards.

Identify deliverables - due at the end of the project.

Identify project outputs - delivered throughout the project.

When delivering outputs, are we:

- ✓ Implementing them in a new or existing business environment?
- ✓ Transitioning them into a live environment?
- ✓ Decommissioning or removing old systems, processes, or materials?
- ✓ Ensuring training and knowledge transfer is complete / satisfactory?

Rolling Wave Planning

DEFINITION

An iterative planning technique in which the work to be accomplished in the near term is planned in detail, while work further in the future is planned at a higher level.

Rolling Wave Planning

- ✓ Used in agile or predictive approaches
- ✓ A form of progressive elaboration applied to work packages, planning packages, and release planning
- ✓ Decompose work down to the known level of detail during strategic planning
- ✓ Decompose work packages into activities as work progresses

Progressive Elaboration

DEFINITION

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

Agile

- Team works collaboratively with the customer to determine the project needs.
- The coordination of the customer and the team drives the project

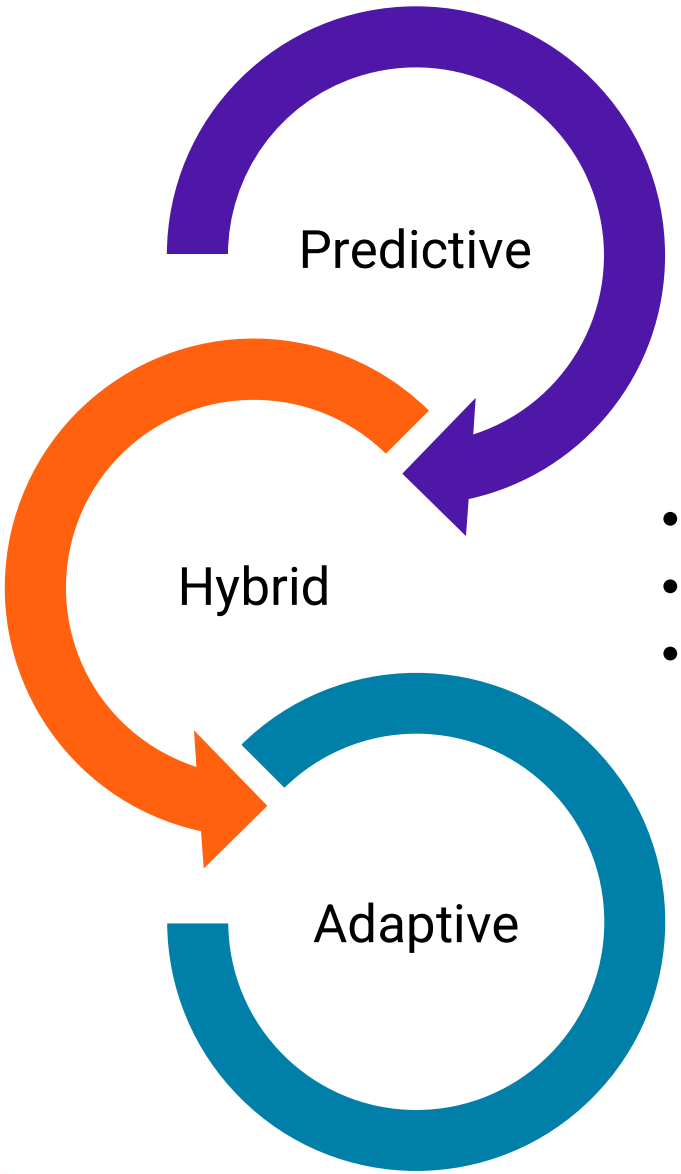
Predictive / Plan-Driven

- Project needs, requirements, and constraints are understood, and plans are developed accordingly.
- Plans drive the project forward.

Hybrid

- Combines strategies from agile or predictive as required.
- Can switch approaches based on need, changing work requirements, or circumstances.

Types of Life Cycles



- Iterative
- Incremental
- Agile

Predictive Life Cycle

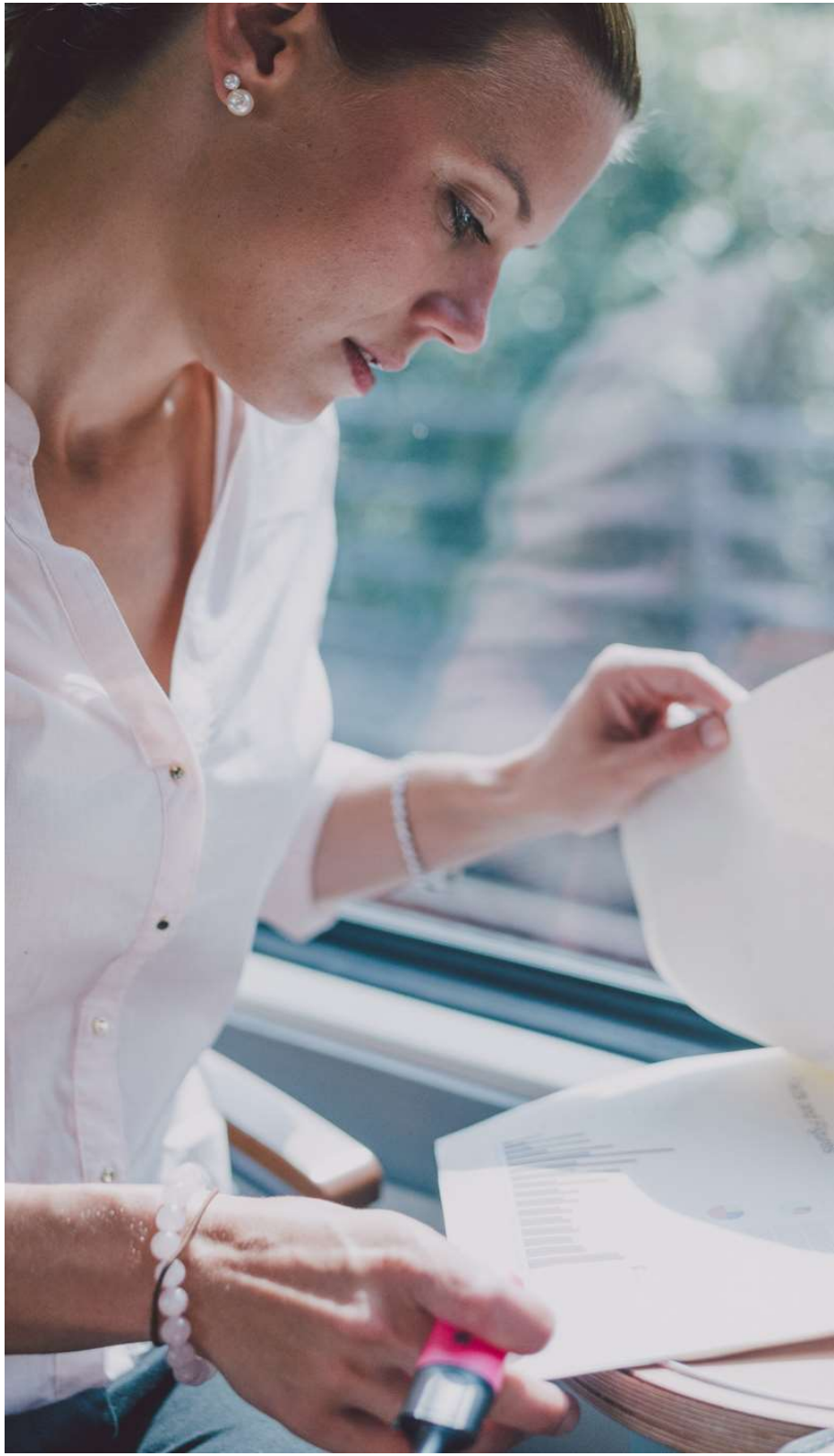
DEFINITION

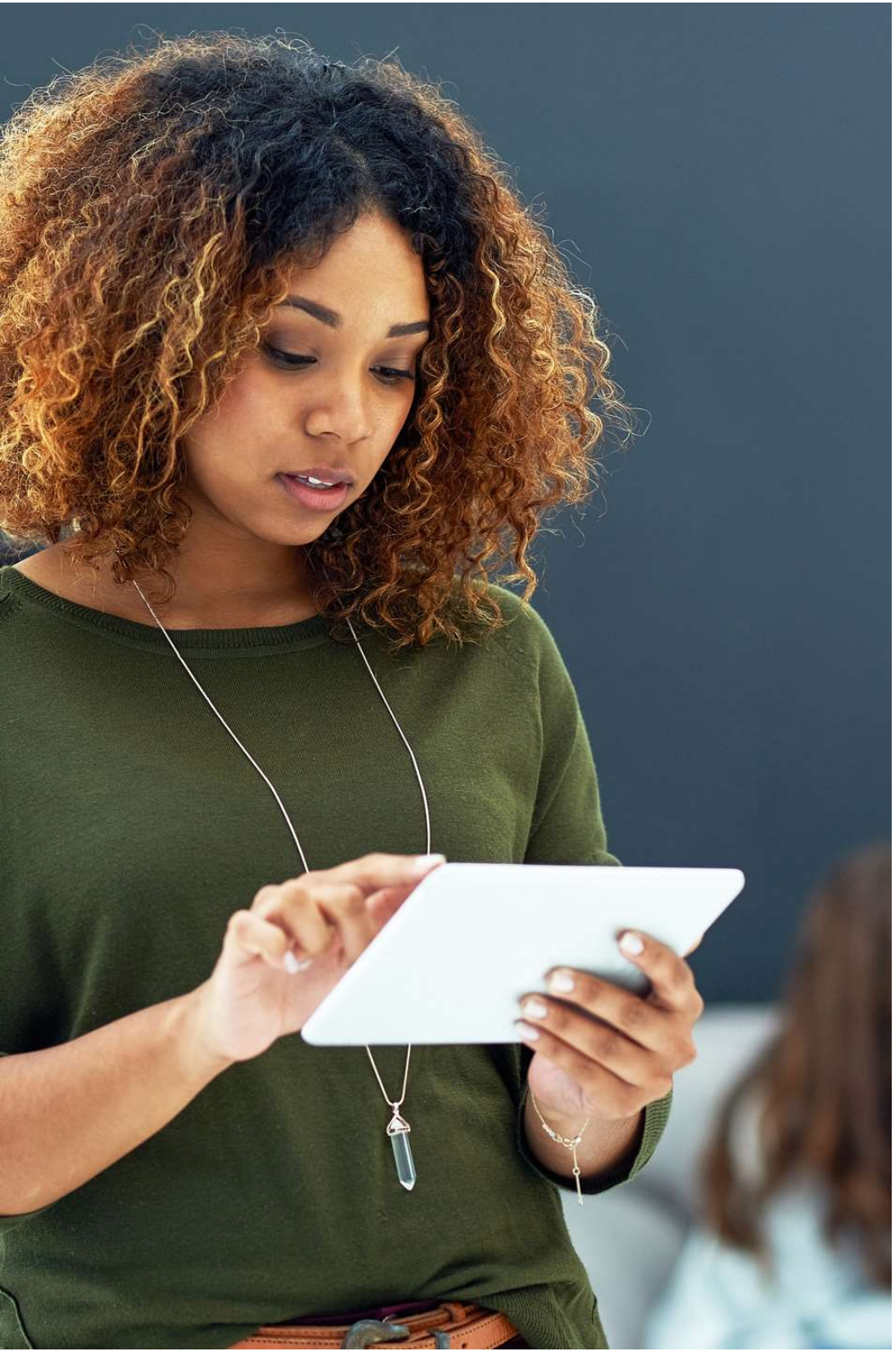
Determine project scope, time, and cost in the early phases of this life cycle.

Predictive Life Cycle

Also known as **Traditional** or **Waterfall** approach:

- ✓ Requirements are typically fixed, but can be changed using the change control process
- ✓ Activities and work culminate in final output, always a deliverable





Adaptive and Hybrid Life Cycles

Use these methods in dynamic and complex environments, where change is a constant.

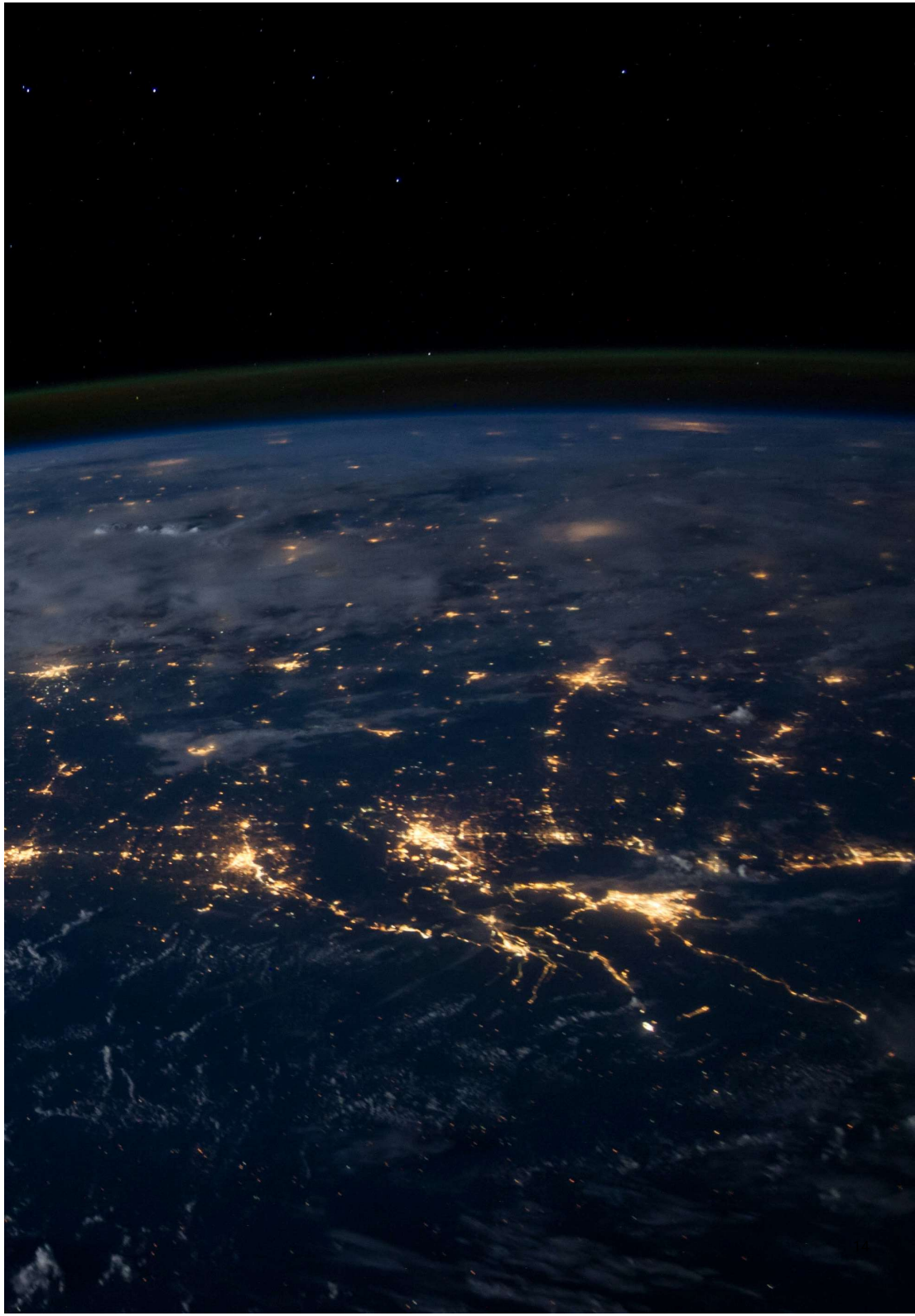
Let’s learn more about these methods next.

Hybrid Methods

Combine predictive and adaptive approaches to offer flexibility to teams.

Great for projects:

- ✓ Seeking or willing to learn new methods or techniques.
- ✓ With a mix of resources and experience levels
- ✓ With shorter, iterative time frames.
- ✓ With high stakeholder involvement
- ✓ With in-depth requirements



Adaptive Life Cycles

Iterative

- Dynamic requirements
- Activities repeated until correct
- Single delivery

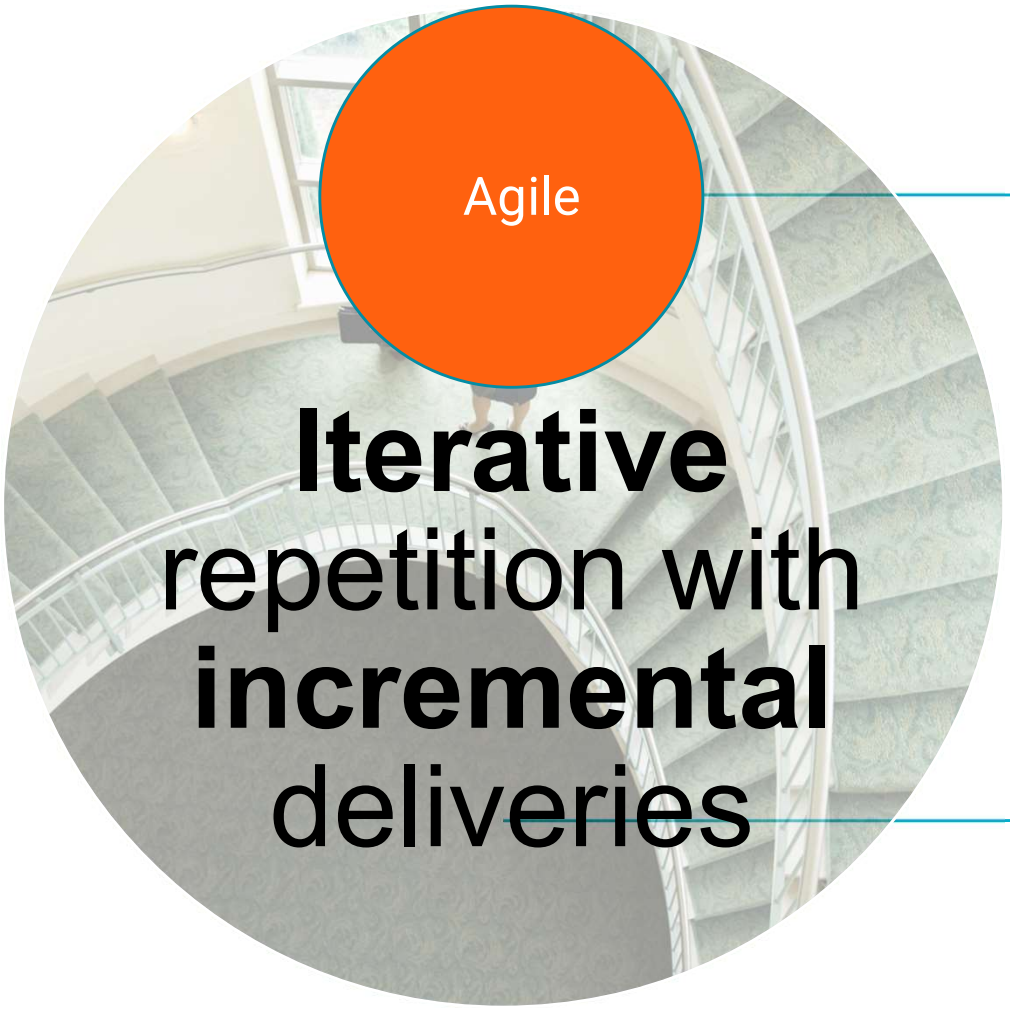
Incremental

- Dynamic requirements
- Activities performed once per increment
- Frequent small deliveries

Agile

- Iterative or incremental -change-driven/adaptive.
- Dynamic requirements
- Combines iterative repetition of activities with incremental deliveries

Adaptive Life Cycles



Incremental

Determine project scope early in this project life cycle.

Continuously assess and modify time and cost estimates as the team's understanding of the product increases.

Iterative

Uses series of iterations to add functionality to deliverables within a predetermined time frame.

The deliverable is considered complete only after the final iteration.

Typical Use Cases

Methodology	Typical Use Cases
Agile	• Software projects • Intellectual property projects • Research projects
Predictive / Plan Driven	• Construction projects • Projects with many physical assets • “Repeats” of similar, completed projects
Iterative	Projects where learning and correction is expected to eventually reach the ideal solution.
Incremental	Customers or business wants or expects to see outputs or partial outputs early and often.
Hybrid	• Mix of resources and experience levels • Those seeking or willing to learn new methods or techniques.

Plan and Manage Scope

TOPIC B

Deliverables and Tools

Requirements Documentation
Work performance reports
Requirements Traceability Matrix

Agile estimating
Product backlog
Change requests
Product backlog
Scope management plan and
Requirements management plan

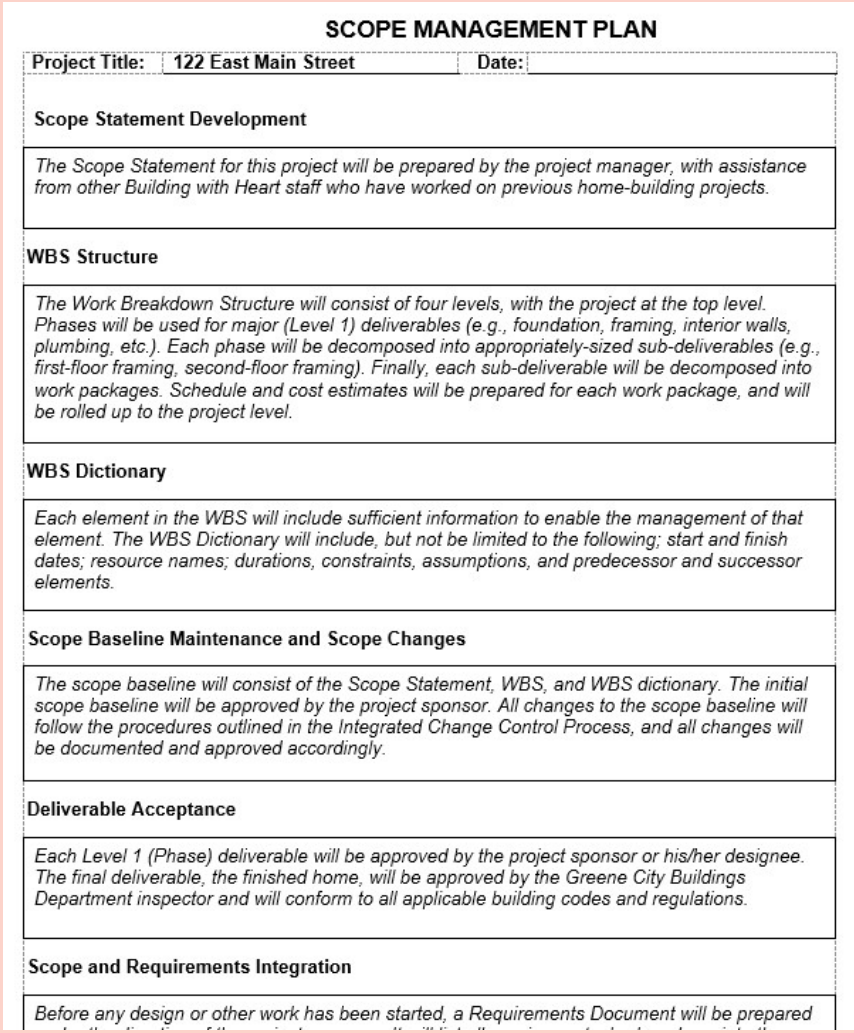
Scope Management Plan

DEFINITION

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

Scope Management Plan

- ✓ Should include processes to prepare a project scope statement
- ✓ Enables the creation of the WBS from the detailed project scope statement
- ✓ Establishes how the scope baseline will be approved and maintained
- ✓ Specifies how formal acceptance of the completed project deliverables will be obtained.
- ✓ Can be formal or informal, broadly framed or highly detailed.



SCOPE MANAGEMENT PLAN

Project Title:	122 East Main Street	Date:	

Scope Statement Development

The Scope Statement for this project will be prepared by the project manager, with assistance from other Building with Heart staff who have worked on previous home-building projects.

WBS Structure

The Work Breakdown Structure will consist of four levels, with the project at the top level. Phases will be used for major (Level 1) deliverables (e.g., foundation, framing, interior walls, plumbing, etc.). Each phase will be decomposed into appropriately-sized sub-deliverables (e.g., first-floor framing, second-floor framing). Finally, each sub-deliverable will be decomposed into work packages. Schedule and cost estimates will be prepared for each work package, and will be rolled up to the project level.

WBS Dictionary

Each element in the WBS will include sufficient information to enable the management of that element. The WBS Dictionary will include, but not be limited to the following; start and finish dates; resource names; durations, constraints, assumptions, and predecessor and successor elements.

Scope Baseline Maintenance and Scope Changes

The scope baseline will consist of the Scope Statement, WBS, and WBS dictionary. The initial scope baseline will be approved by the project sponsor. All changes to the scope baseline will follow the procedures outlined in the Integrated Change Control Process, and all changes will be documented and approved accordingly.

Deliverable Acceptance

Each Level 1 (Phase) deliverable will be approved by the project sponsor or his/her designee. The final deliverable, the finished home, will be approved by the Greene City Buildings Department inspector and will conform to all applicable building codes and regulations.

Scope and Requirements Integration

Before any design or other work has been started, a Requirements Document will be prepared

Scope Management Tools and Techniques

Expert judgment

Internal and external experts

Alternatives analysis

Used to evaluate identified options in order to select the options or approaches to use to execute and perform the work of the project.

Meetings

Team members help create the scope management plan

Project Requirements

DEFINITION

The actions, processes, or other conditions the project needs to meet e.g. milestone dates, contractual obligations, constraints, etc.

Product Requirements

DEFINITION

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

Project and Product Requirements

- ✓ High-level requirements might be documented in the project charter.
- ✓ Verify that all requirements are determined and documented.
- ✓ Provide the foundation for building the WBS.

Project Scope

DEFINITION

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

Project and Product Scope

- ✓ **Predictive** - The scope baseline for the project is the approved version of the project scope statement, work breakdown structure (WBS), and associated WBS dictionary.
- ✓ **Agile - Backlogs** (including product requirements and user stories) reflect current project needs.
- ✓ **Measure completion** of **project scope** against the project management plan.
- ✓ **Measure completion** of the **product scope** against product requirements.

Tolerances

Tolerance levels enable you to effectively manage an issue without needing to escalate it every time.

Areas of tolerance might include:

- ✓ Budget
- ✓ Schedule
- ✓ Quality
- ✓ Accepted or baselined requirements, including:
  - Solution – functional/non-functional
  - Business and Stakeholder
  - Quality

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.

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.

EEFs and OPAs

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

Enterprise Environmental Factors (EEFs)

Internal	External
✓ Organizational culture, structure, and governance ✓ Geographic distribution of facilities and resources ✓ Infrastructure ✓ Resource availability ✓ Employee capability	✓ Marketplace conditions ✓ Social and cultural influences and issues ✓ Legal restrictions ✓ Commercial databases ✓ Academic research ✓ Government or industry standards ✓ Financial considerations ✓ Physical environmental elements

Organizational Process Assets (OPAs)

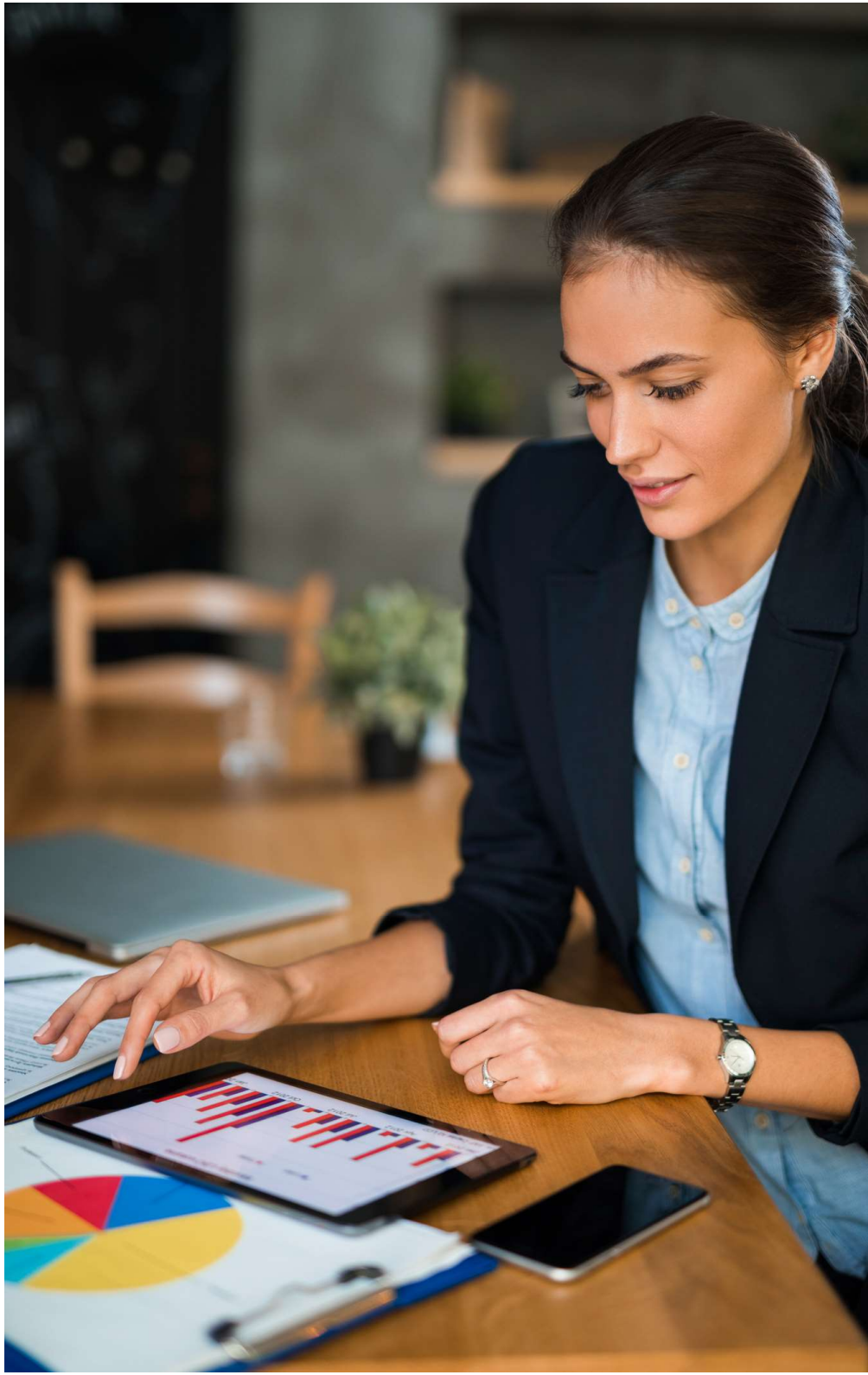
Processes, **policies**, and **procedures** are:

- ✓ Established by the project management office (PMO) or another function outside of the project.
- ✓ Not updated as part of project work

- ✓ **Templates**, **lifecycles**, and **checklists** can be tailored, but not updated, for a project.

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.



Document Analysis

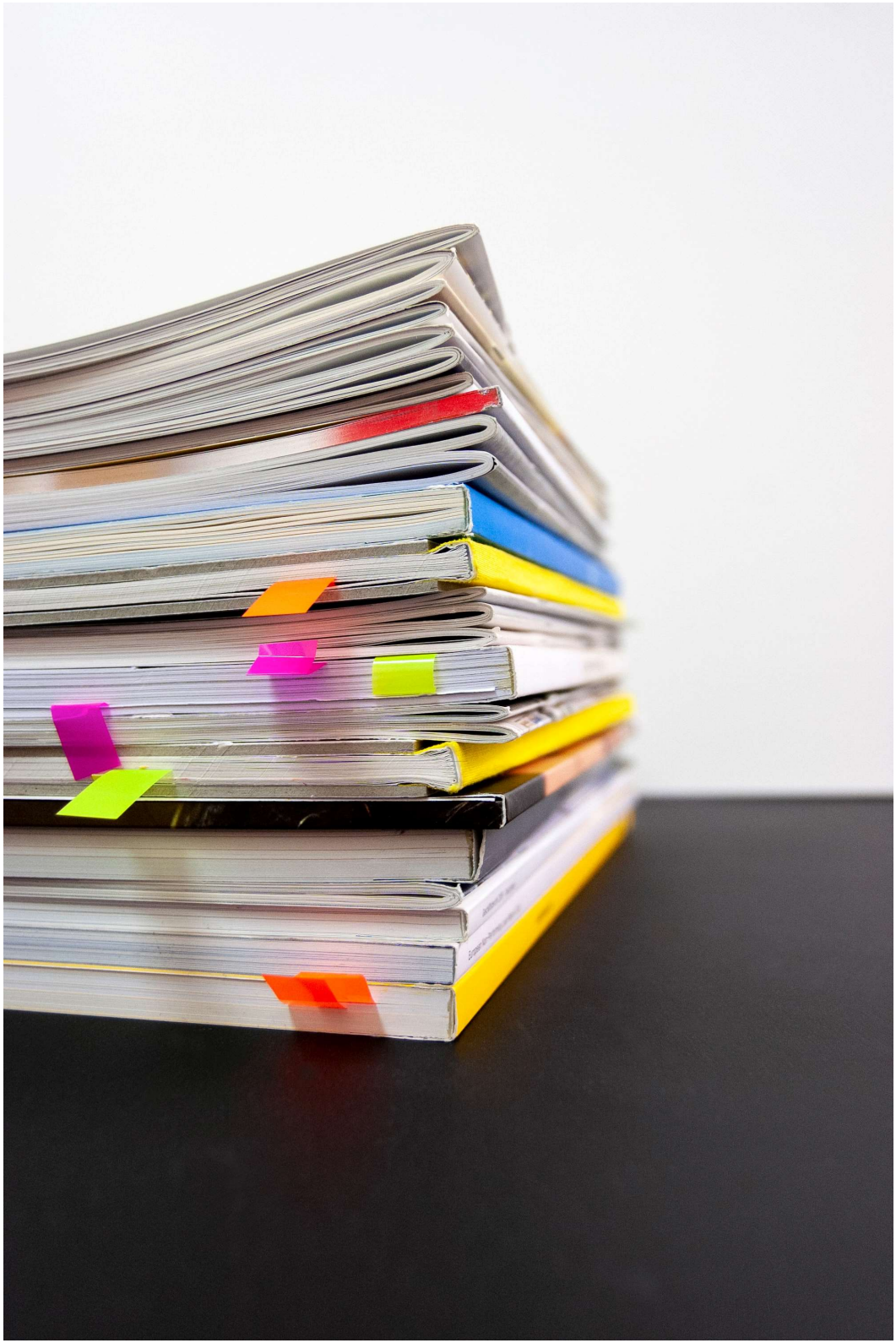
DEFINITION

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

Document Analysis

Derive new project requirements from existing documents such as:

- ✓ Business plans
- ✓ Service agreements
- ✓ Marketing materials
- ✓ Current process diagrams
- ✓ Application software documentation



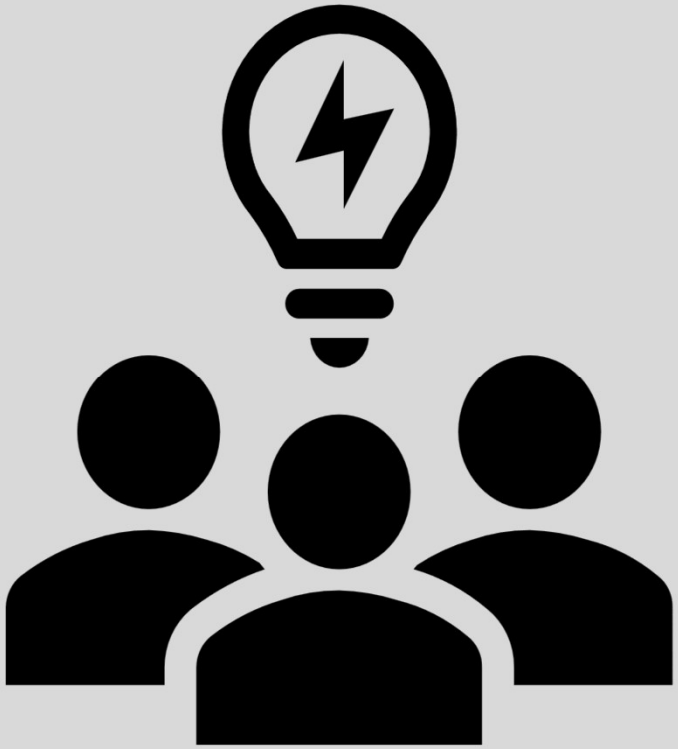
Focus Groups

DEFINITION

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

Focus Groups

- ✓ Loosely structured, information-sharing sessions
- ✓ Moderator-guided, interactive
- ✓ Includes stakeholders and SMEs
- ✓ Qualitative research



Questionnaires and Surveys

DEFINITION

Written format of questions designed to quickly capture information from many respondents.

Questionnaires and Surveys

Often used data gathering technique:

- With varied audiences
- When a quick turnaround is needed
- When respondents are geographically dispersed
- Where statistical analysis could be appropriate.

Benchmarking

DEFINITION

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

- ✓ **Evaluates** and **compares** a business' or project's practices with others.
- ✓ Identifies **best practices** in order to meet or exceed them.

Interviews

DEFINITION

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

Interviews

- ✓ Helps to identify a stakeholder's requirements, goals, or expectations for a project.
- ✓ Use to identify/define features and functions of desired project’s deliverables.

Group Decision-Making Techniques

Voting

Collective decision-making and assessment

Determines several alternatives, with future actions as the expected outcome

Use to generate, classify, and prioritize product requirements

Autocratic decision making

One team member makes the decision for the group.

Multicriteria decision analysis

Method - Establish criteria in decision matrix *e.g. risk levels, uncertainty, and valuation*

Uses a systematic, analytical approach

Evaluate and rank many ideas

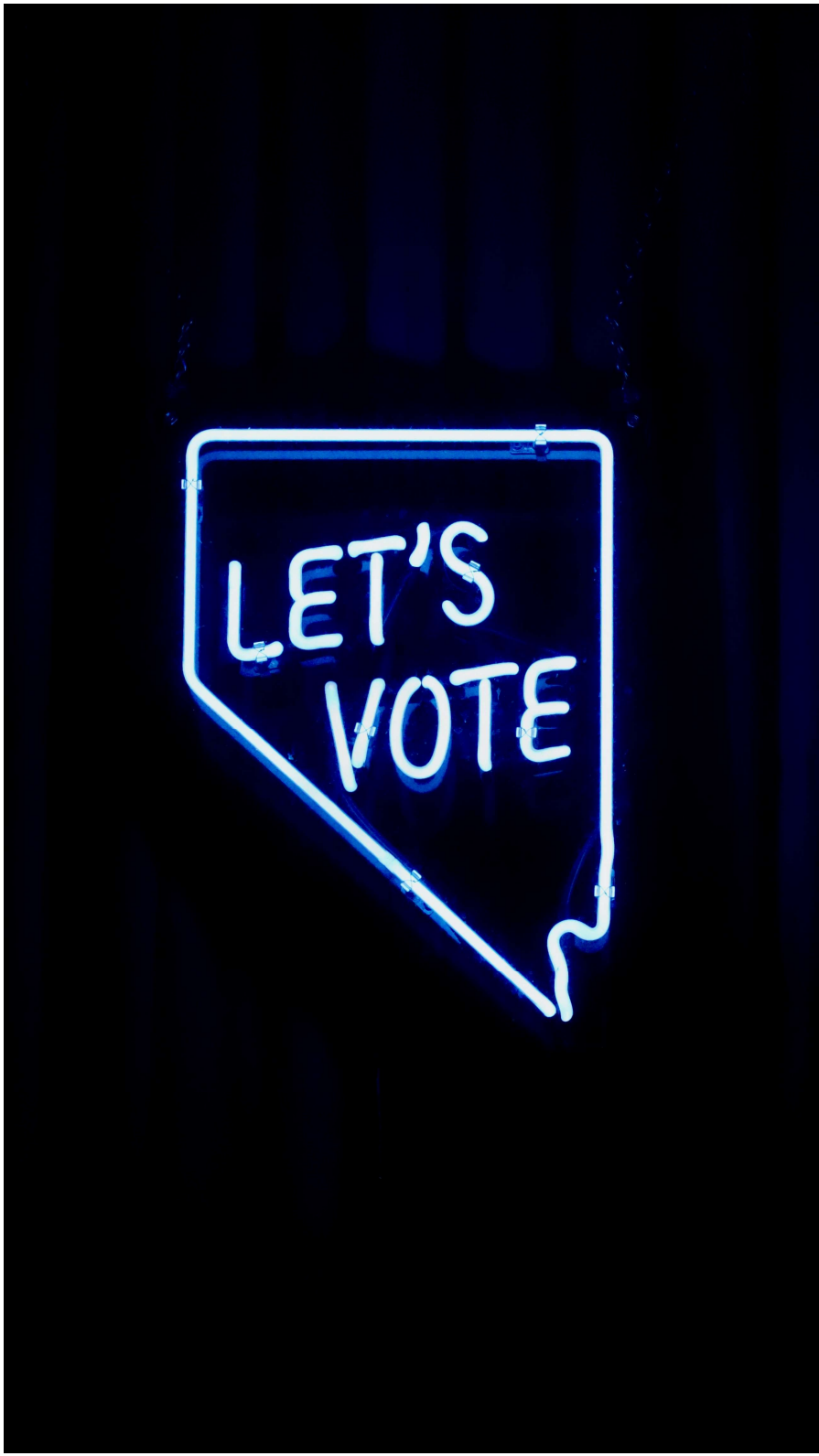
Types of Voting

Unanimity
Everyone agrees on a single course of action.
Useful in project teams with great cohesion.
Example: Delphi technique

Majority
Decision reached with > 50% of group support
Tip: Create groups of an uneven number of participants to ensure decisions are made and tie votes avoided.

Plurality
Decision reached with largest block in a group deciding, even if majority is not achieved.
Use this method when more than 2 options are nominated.

Agile Methods
Thumbs up/down/sideways
Fist of Five

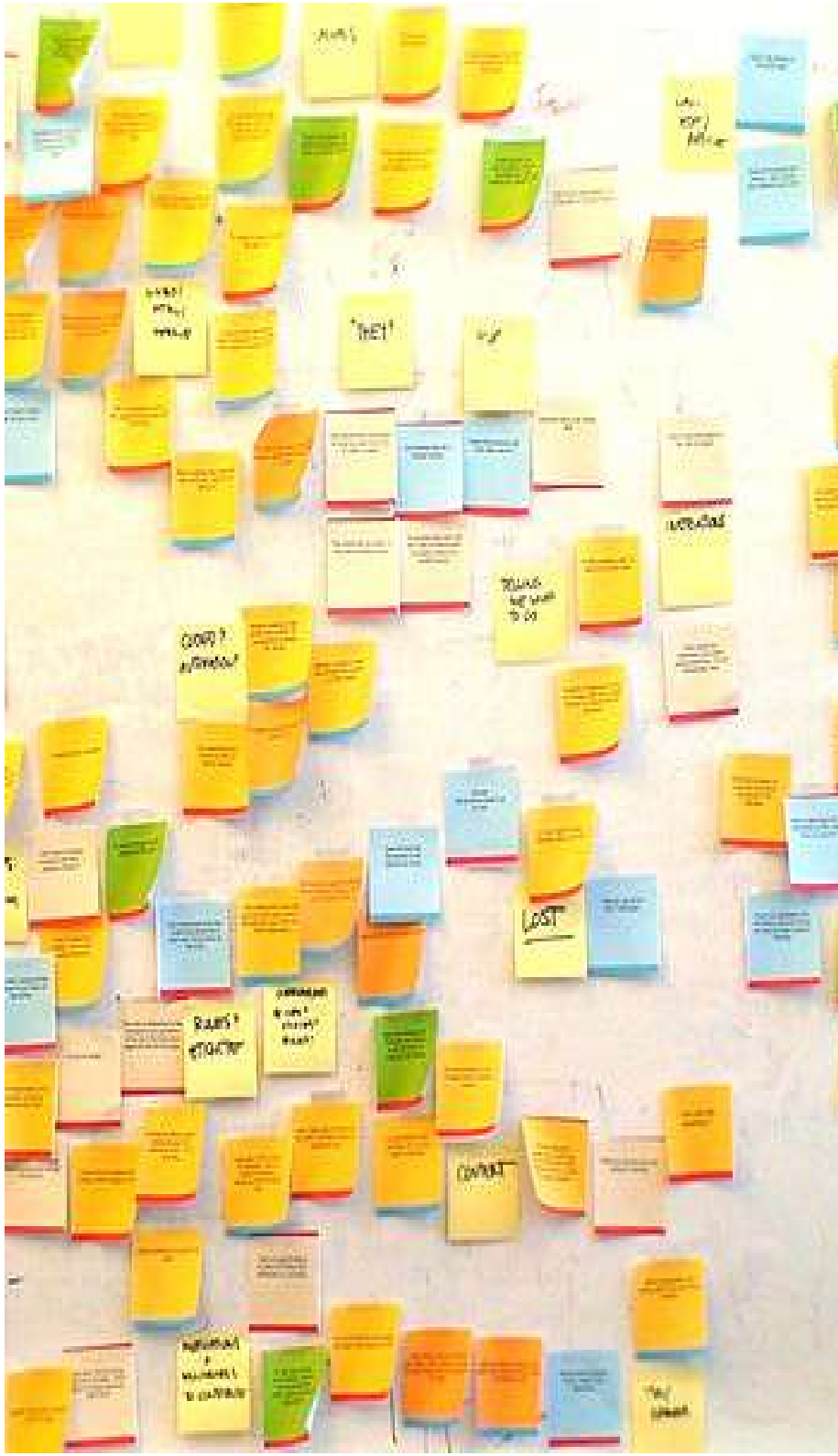


Data Representation

Tailor to project context and decision-making criteria.

- ✓ **Mind Mapping** – Consolidate ideas created through individual brainstorming sessions into a single map to reflect commonality and differences in understanding and to generate new ideas

- ✓ **Affinity Diagram** – Allows large numbers of ideas to be classified into groups for review and analysis



Observations

DEFINITION

A technique used to gain knowledge of a specific job role, task, or function in order to understand and determine project requirements.

Facilitated Workshops

DEFINITION

Organized working sessions led by qualified facilitators to determine project requirements and to get all stakeholders together to agree on project outcomes.

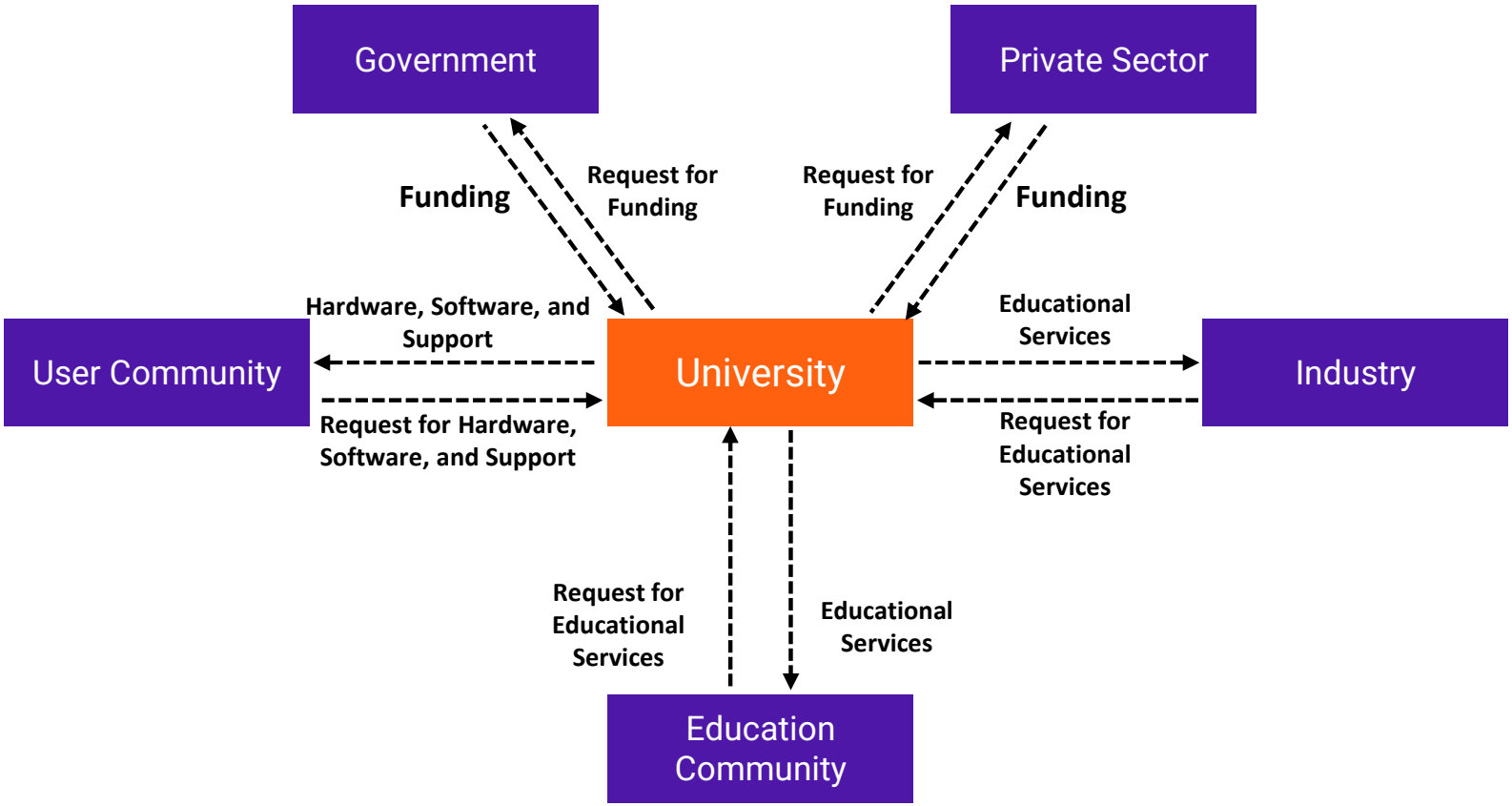
Context Diagrams

DEFINITION

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

Context Diagrams

Business Context Diagram Sample



Storyboarding

DEFINITION

A prototyping method using visuals or images to illustrate a process or represent a project outcome.

Prototyping

DEFINITION

Assists in the process of obtaining early feedback on requirements by providing a working model of the expected product before building.

Requirements Documentation

- ✓ Describes how individual requirements meet project business need.
- ✓ Starts at a high level before providing details.
- ✓ Requirements need to be unambiguous (measurable and testable), traceable, complete, consistent, and acceptable to key stakeholders.
- ✓ Format can be simple (document listing all requirements, categorized by stakeholder and priority) or more elaborate (executive summary, detailed descriptions, attachments).

Types of Requirements

Business

Higher-level needs of the organization e.g. business issues or opportunities, and reasons why a project has been undertaken.

Stakeholder

Stakeholder or stakeholder group needs. Reporting requirements.

Transition and Readiness

Temporary capabilities
e.g. data conversion and training requirements needed to transition from the current as-is state to the desired future state.

Quality

Condition or criteria needed to validate the successful completion of a project deliverable or fulfilment of other project requirements e.g. tests, certifications, validations.

Project

Actions, processes, or other conditions the project needs to meet e.g. milestone dates, contractual obligations, constraints.

Solutions (Functional and Non-functional)

Describe features, functions, and characteristics of the product, service, or result that will meet the business and stakeholder requirements.

Functional requirements - Describe the behaviors of the product
e.g. actions, processes, data, and interactions that the product should execute.

Non-functional requirements - Supplement functional requirements to describe environmental conditions or qualities required for the product to be effective
e.g. reliability, security, performance, safety, level of service, supportability, retention/purge, etc.

Nonfunctional Requirements

Type	Considerations
Availability	• How and when is the service available? • If the service were to become unavailable, how quickly can it be restored to working?
Capacity	• What level of service performance, speed, and throughput is required? • Given the number of stakeholders using the service, is there enough supply to meet demand?
Continuity	• If there were a disaster of some kind, how quickly could the service be recovered to support operations.
Security	• How well is the service and its information protected from security risks and threats? • How do you guarantee the confidentiality, integrity, and availability of the information?

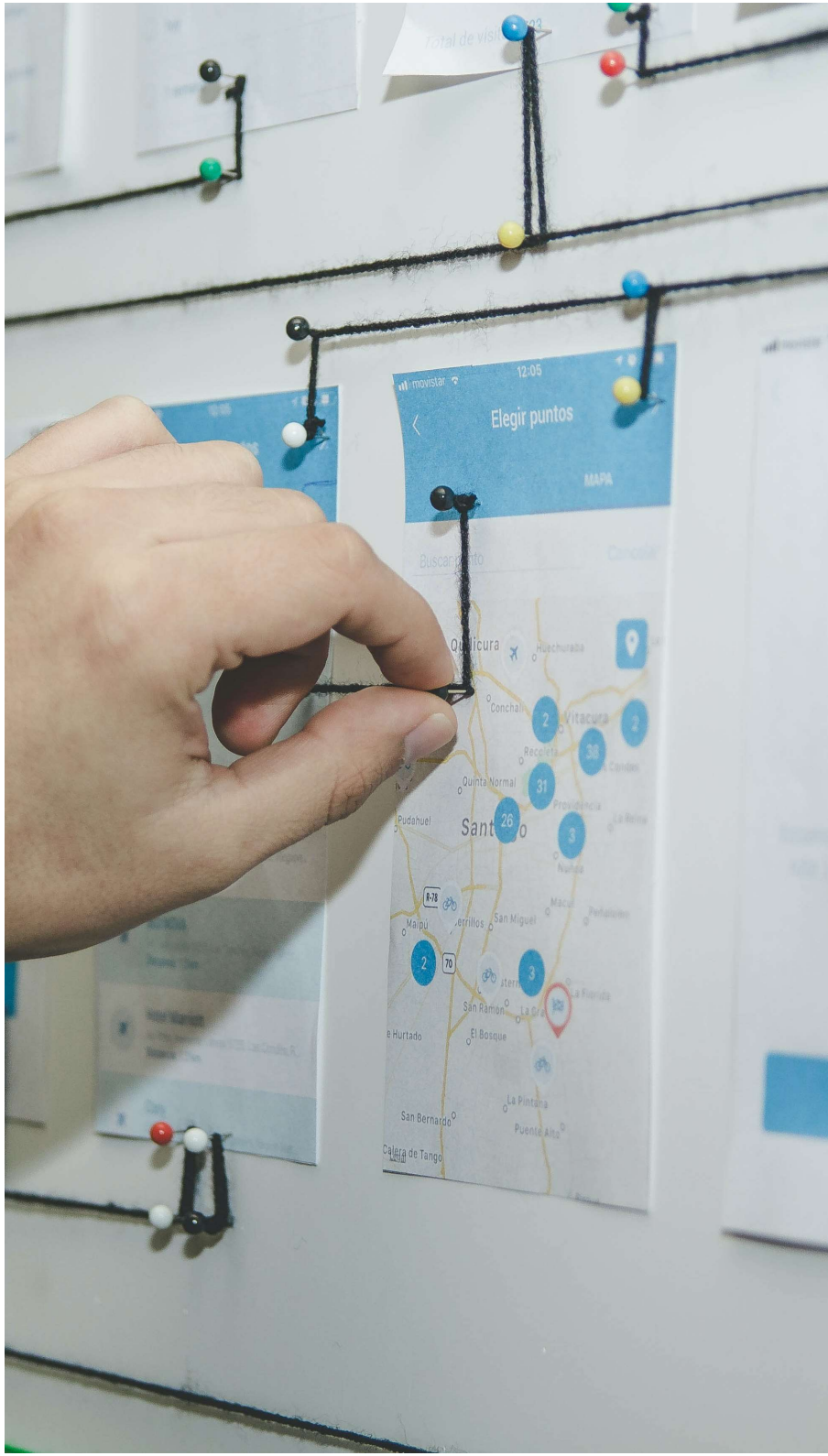
Requirements Management Plan

DEFINITION

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

Requirements Management Plan

- ✓ Planning, tracking, and reporting information for requirements activities.
- ✓ Configuration management activities:
  - Version control rules
  - Impact analysis
  - Tracing, tracking, and reporting
- ✓ Required authorization levels for change approval
- ✓ Prioritization criteria / process
- ✓ Product metrics and accompanying rationale
- ✓ Traceability structure, including requirement attributes



Requirements Traceability Matrix

DEFINITION

Links product requirements from their origin to the deliverables that satisfy them.

Requirements Traceability Matrix

Requirements Traceability Matrix								
Project Name:								
Cost Center:								
Project Description:								
ID	Associate ID	Requirements Description	Business Needs, Opportunities, Goals, Objectives	Project Objectives	WBS Deliverables	Product Design	Product Development	Test Cases
001	1.0							
	1.1							
	1.2							
	1.2.1							
002	2.0							
	2.1							
	2.1.1							
003	3.0							
	3.1							
	3.2							
004	4.0							
005	5.0							

GUIDELINES

Collecting Project Requirements

- Review:
  - Scope management plan
  - Requirements management plan
  - Stakeholder engagement plan
  - Project charter
  - Stakeholder register
- Use tools and techniques such as interviews, focus groups, facilitated workshops, group creativity techniques.

Project Scope Statement

DEFINITION

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

Project Scope Statement

Project Scope Statement

Project Name: _____ Date: _____

Project Manager: _____

Prepared By

Document Owner(s)	Project/Organization Role
<Name>	Project Manager

Version History

Version	Date	Author	Change Description
1.0	*<Today's Date>*	*<Name>*	Created document

Project Description:

A building project conducted by *My Organization* that will construct a single-family home for the Andrews family. The building site is located at 234 West Adams Street. The project manager will provide consistent project status reports to senior management as well as the project sponsor.

Acceptance Criteria:

_____

Scope Tools and Techniques

Expert Judgment

Judgment provided by a group or person, based upon expertise in an application area, Knowledge Area, discipline, industry, etc.

Facilitation

Effective guidance of a group to a successful decision, solution, or conclusion.

Product Analysis

Defines products and services. Includes asking questions about a product/service, forming answers to describe the use, characteristics, and other relevant aspects of what is going to be delivered

Multi-criteria decision analysis

Technique of organizing decision factors in a matrix to evaluate options

Alternatives analysis

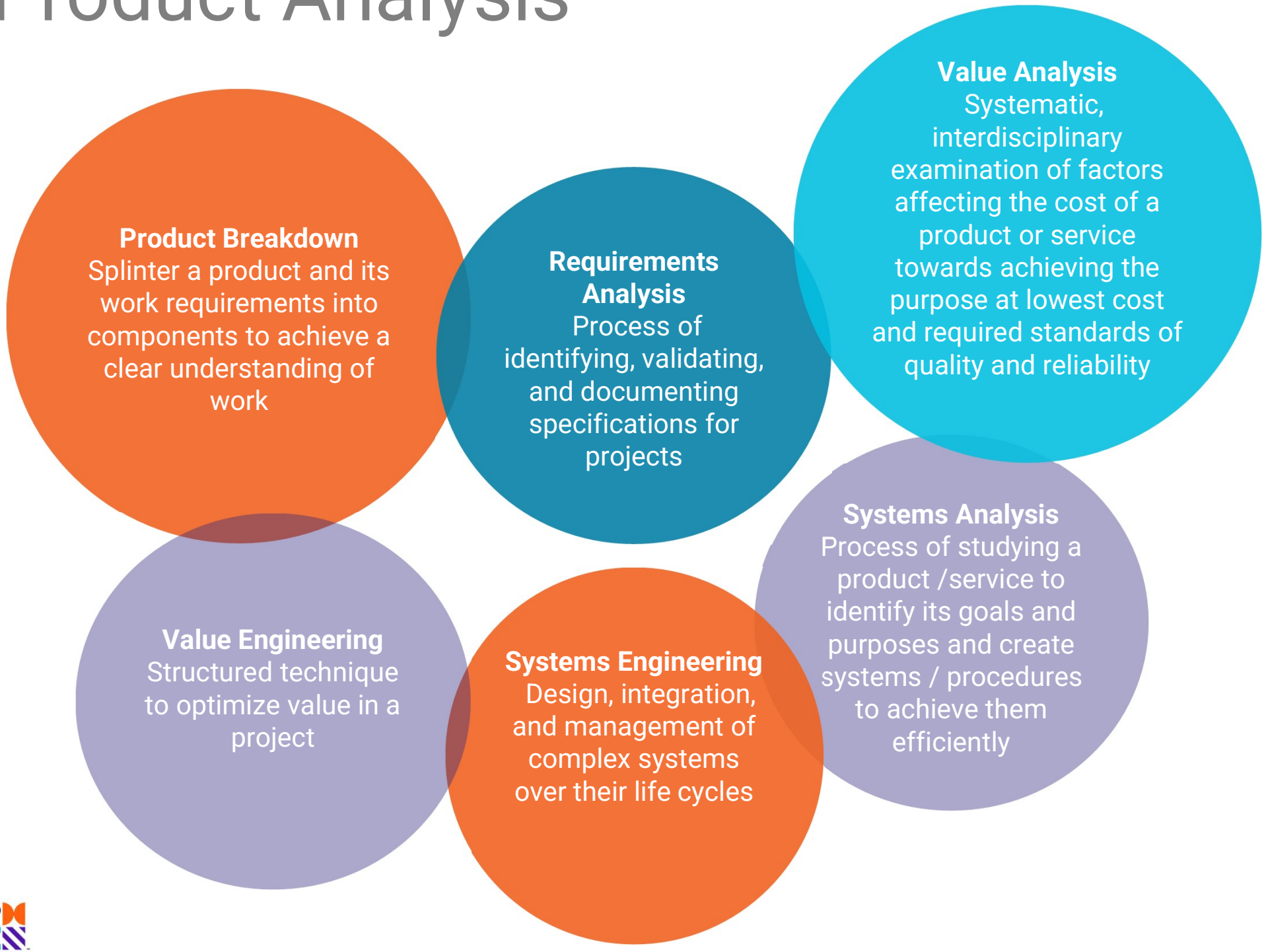
Evaluation of choices available to reach an objective.

Product Analysis

DEFINITION

A tool to define scope by asking questions about a product and forming answers to describe the use, characteristics, and other relevant aspects of the product.

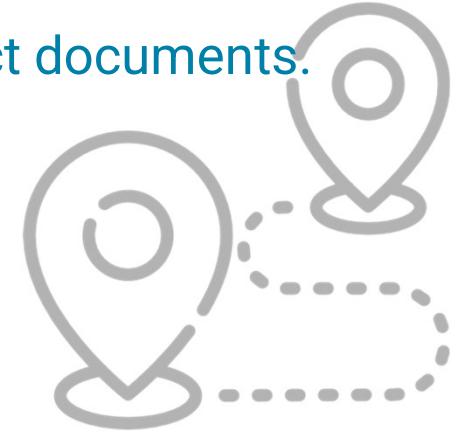
Product Analysis



GUIDELINES

Develop a Project Scope Statement

- Review:
  - Scope management plan (developing, monitoring, and controlling project scope activities)
  - Project charter (high-level project description and product characteristic and project approval requirements)
- Requirements documentation
- OPAs – templates, processes, and procedures
- Use tools and techniques to define the project scope (expert judgment, product analysis, alternatives generation, and facilitated workshops).
- Document the project scope statement and update project documents.

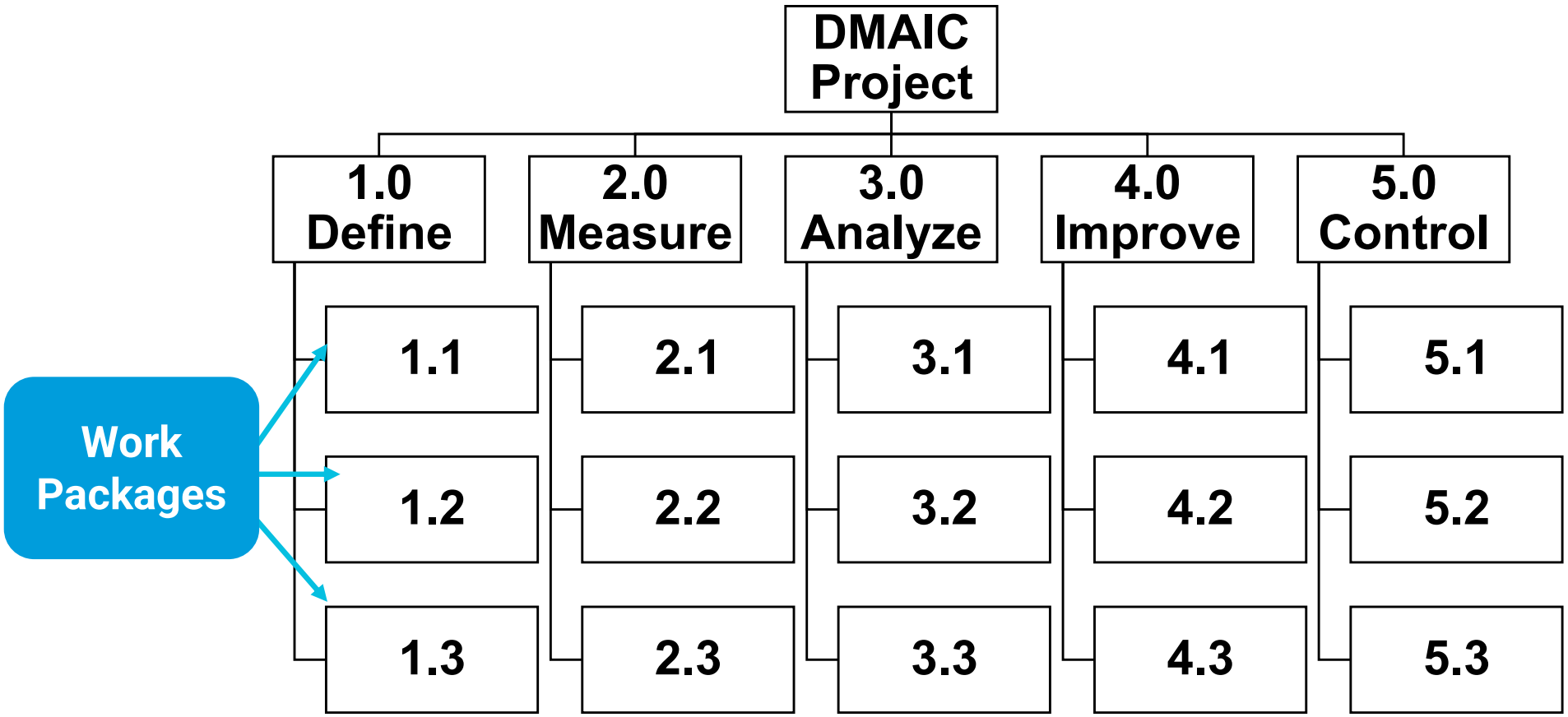


Work Breakdown Structure

DEFINITION

A hierarchical decomposition of a project's total scope of work to accomplish project objectives and create the required deliverables.

Work Breakdown Structure



Code of Accounts

DEFINITION

Numbering system that uniquely identifies each component of the WBS.

WBS Dictionary

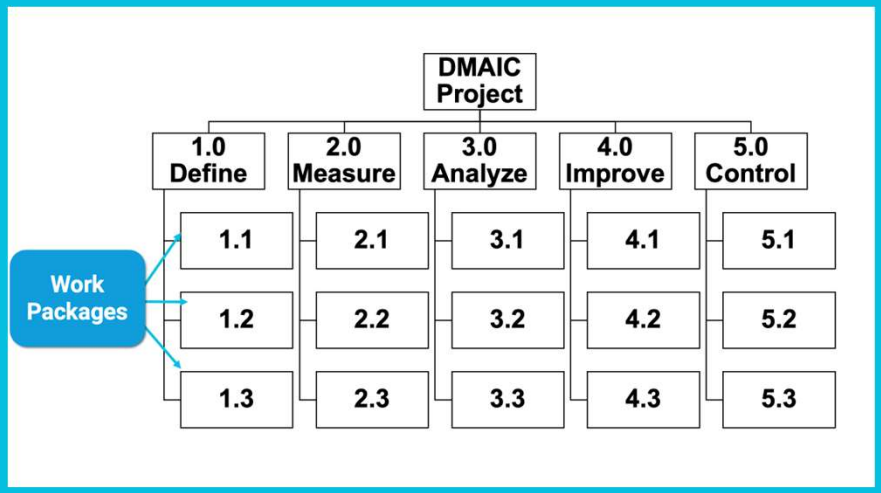
DEFINITION

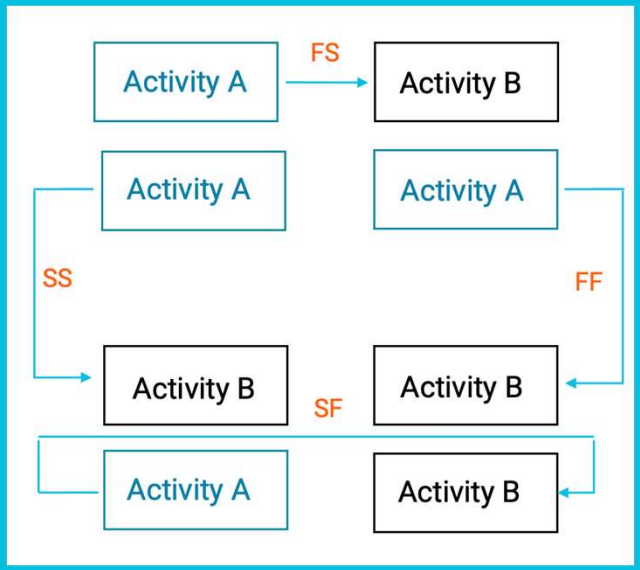
Provides detailed deliverable, activity, and scheduling information about each component in the WBS.

WBS Dictionary

Can include:

- ✓ 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

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

Decomposition - Example

1.0 Value Management System Project
- 1.1 Needs Assessment
  - 1.1.1 Current System Audit
    - 1.1.1.1 Components Identification
    - 1.1.1.2 Components Analysis
  - 1.1.2 Requirements Determination
    - 1.1.2.1 Gap Assessment
    - 1.1.2.2 Requirements Changes Identification
  - 1.1.3 Alternatives Development
    - 1.1.3.1 Alternatives Identification
    - 1.1.3.2 Alternatives Analysis
  - 1.1.4 Systems Requirements Development
- 1.2 Standards Development
- 1.3 Systems Engineering
- 1.4 Project Management

Control Accounts, Work and Planning Packages

Let’s explore the units of work in a project WBS.

Control Account

DEFINITION

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

Planning Package

DEFINITION

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

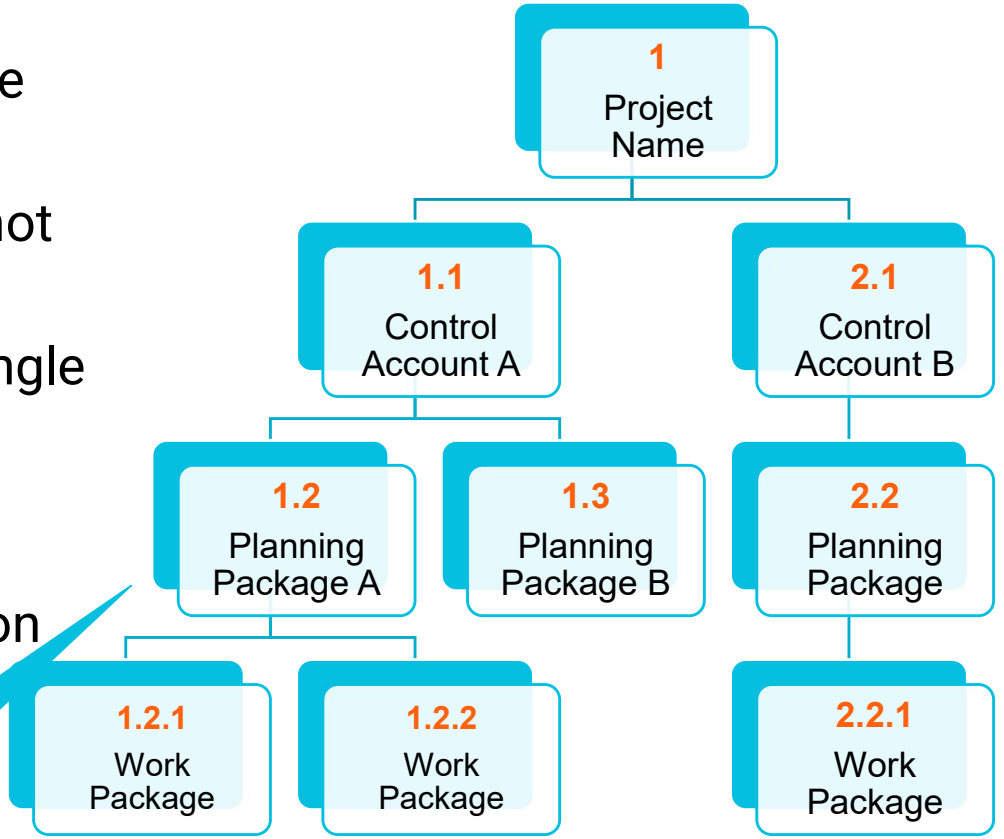
Work package

DEFINITION

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

Planning Work Using a WBS

- ✓ A control account has two or more work packages.
- ✓ A planning package may or may not be used.
- ✓ Each work package is part of a single control account.
- ✓ Identifiers provide a structure for hierarchical summation of costs, schedule, and resource information and form a code of accounts.



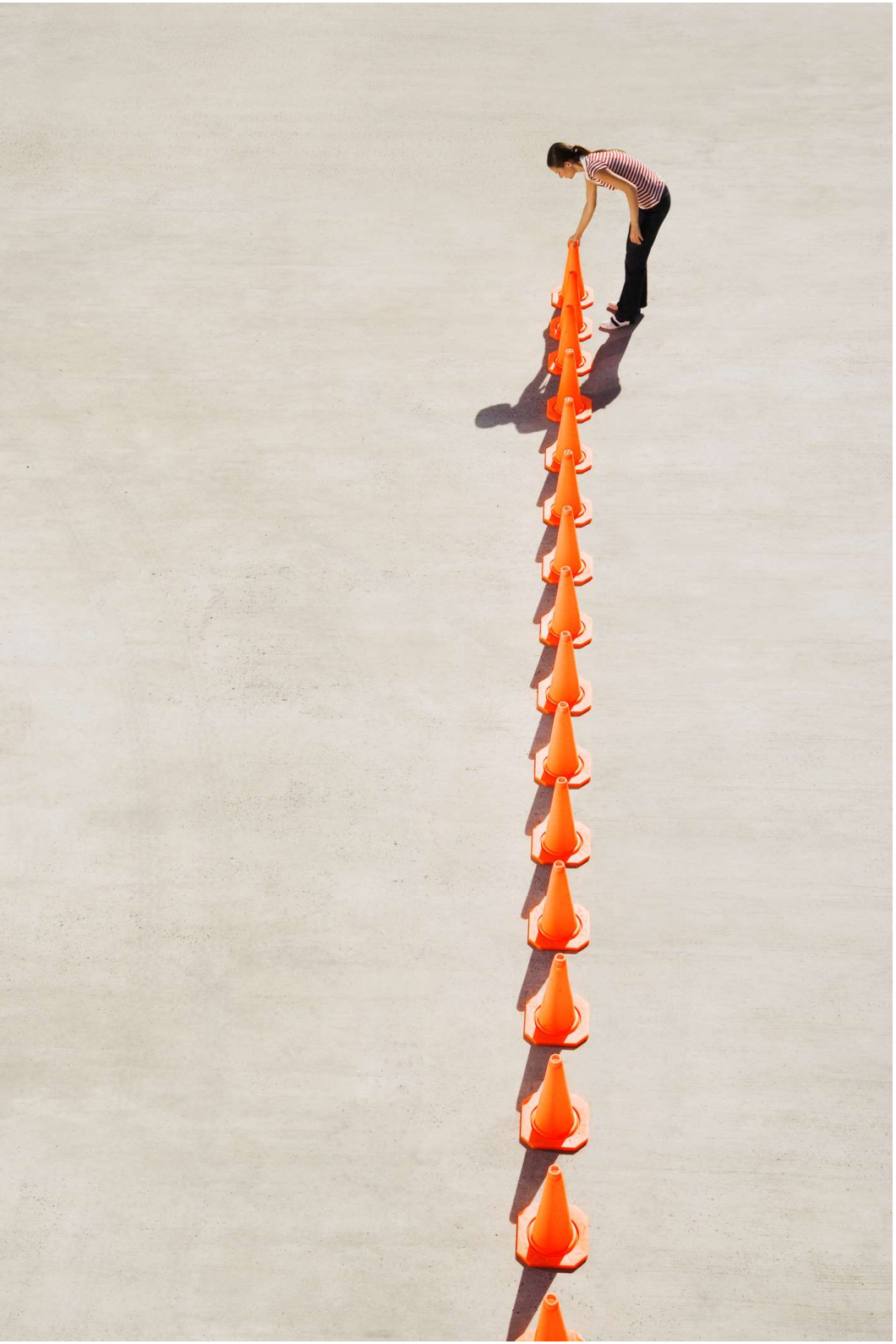
Planning package (optional layer) houses work content, but no schedule or details.

Lowest level - a work package with a unique identifier; contains detailed schedule and cost information.

Scope Baseline

DEFINITION

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

Components include:

- ✓Project scope statement
- ✓WBS
- ✓Work packages
- ✓Planning package
- ✓WBS dictionary

GUIDELINES

Create a WBS

- Review:
  - Scope management plan
  - Project scope statement
  - Requirements documentation
- EEFs and OPAs
- Use tools and techniques e.g. decomposition
- Use expert judgment
- Include notes on work products that might be delivered incrementally
- Document the scope baseline

Product and Iteration Backlogs

Product backlogs

- ✓ Change throughout the project.
- ✓ Groom and refine the product backlog continually; weekly or monthly intervals are typical.
- ✓ Remove product backlog items (PBIs) as work is completed.
  - Edit and clarify PBIs as more becomes known or as product requirements change.
  - Add PBIs when more work must be done.

A product backlog is a list of the expected work to deliver the product.

Iteration backlog

- ✓ Teams must estimate effort and understand business priorities.

Iteration backlogs include items from the product backlog that can conceivably be completed within the time period based on the team's capacity.

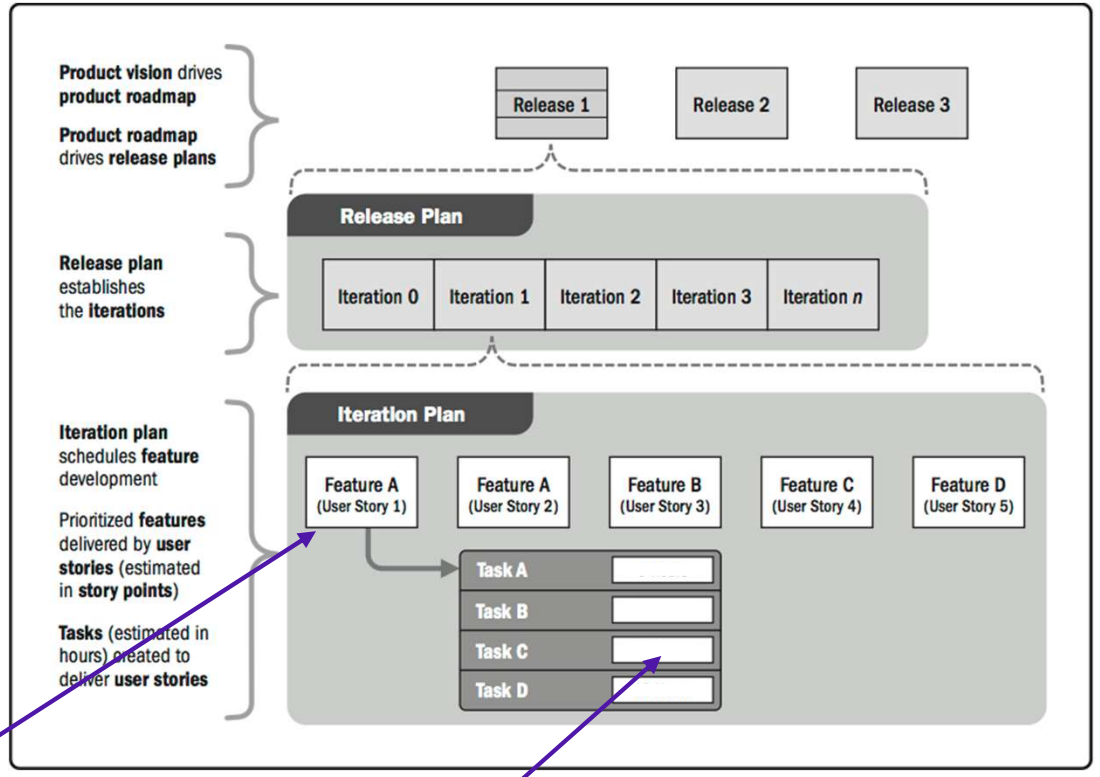
User Stories

DEFINITION

Short descriptions of required functionality; told from user's point of view

User Stories

- ✓ Help teams focus on that value provided to the user.
- ✓ Suggest who will benefit from the work and how.
- ✓ Driven by description instead of technical specifications to give holistic view



User Story

Story Points

Tools and Techniques for Verifying Scope

Tool and Technique	Description
Definition of Done	Checklist of required criteria for a deliverable to be considered ready for customer use.
Definition of Ready	Checklist for a user-centric requirement with all required information to begin work.
Acceptance Criteria	A set of conditions to meet before acceptance of deliverables.
Iteration Reviews	Interval at or near the conclusion of a timeboxed iteration when the project team shares and demonstrates the work produced during the iteration with stakeholders.
Variance Analysis	A technique for determining the cause and degree of difference between the baseline and actual performance.
Trend Analysis	An analytical technique that uses mathematical models to forecast future outcomes based on historical results.

Plan and Manage Schedule

TOPIC C

Deliverables and Tools

- Activity cost estimates
- Activity duration estimates
- Task estimates
- Story estimates
- Feature estimates
- Updated documentsBacklog
- Velocity data
- Project schedule
- Release plan
- Product Roadmaps
- Earned Value
- Updated schedule
- Updated release plan
- Updated product backlog
- Network diagram
- Planning meetings
- Negotiations

Tools, Activities & Processes

Top-Down Estimating: Expert, Analogous, Parametric

Bottom Up Estimating: Roll up WBS packages

T-Shirt sizing

Estimating using Fibonacci sequences

Story points

Relative estimating

Affinity estimates

PMIS

Process assets

Backlog management

Release planning

Iteration planning

Burndown / Burnup charts

Cumulative flow diagrams

Throughput analysis

Velocity analysis

Retrospectives

Review work produced

Backlog reprioritization

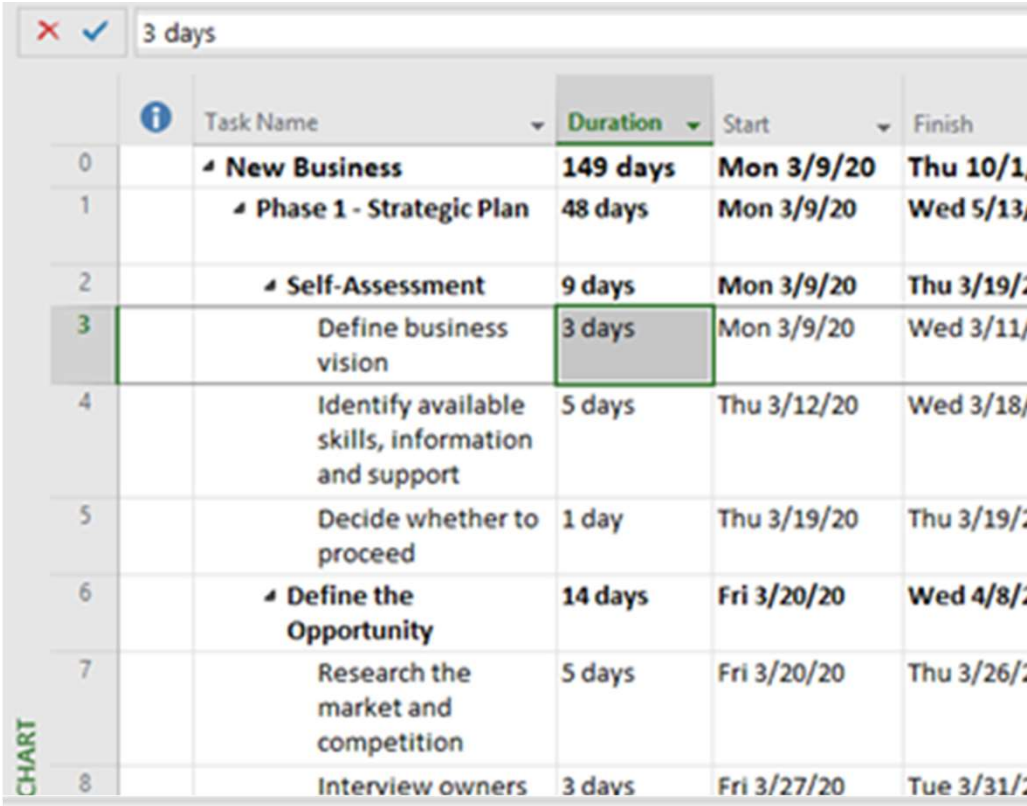
Scaling projects

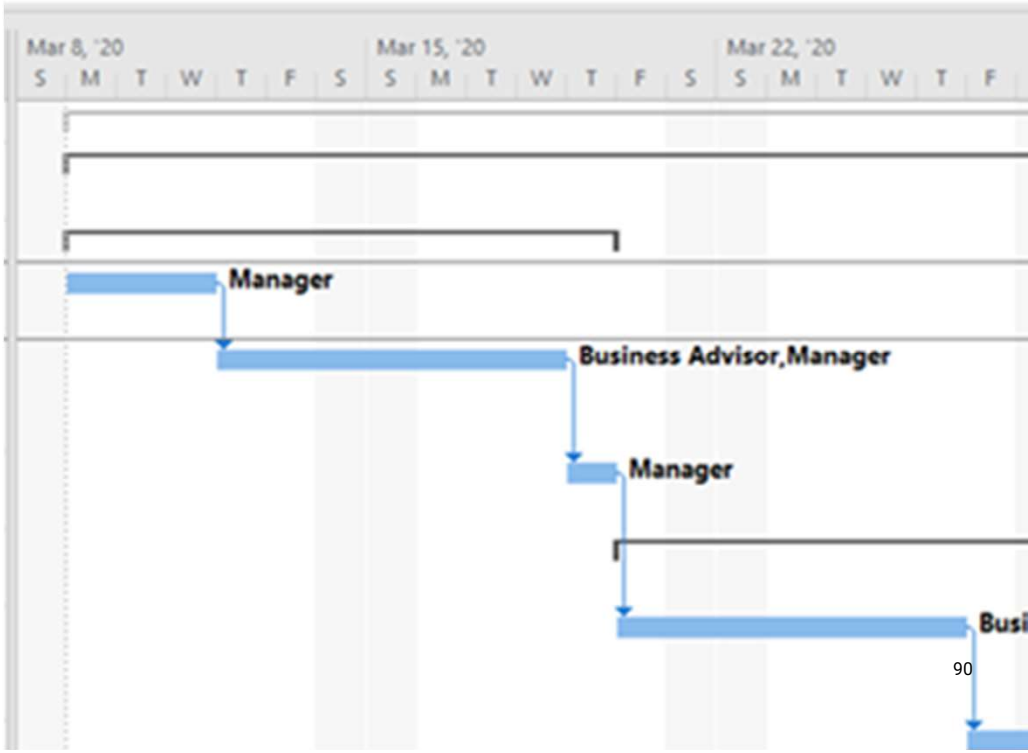
Meetings

Procurement negotiations

Project Schedule

- ✓ Includes start and finish activities
- ✓ Uses specific dates and in a certain sequence
- ✓ Sets dates for project milestones
- ✓ Coordinates activities to ensure on-time project completion
- ✓ Tracks schedule performance and provides visibility of project status to upper management and project stakeholders



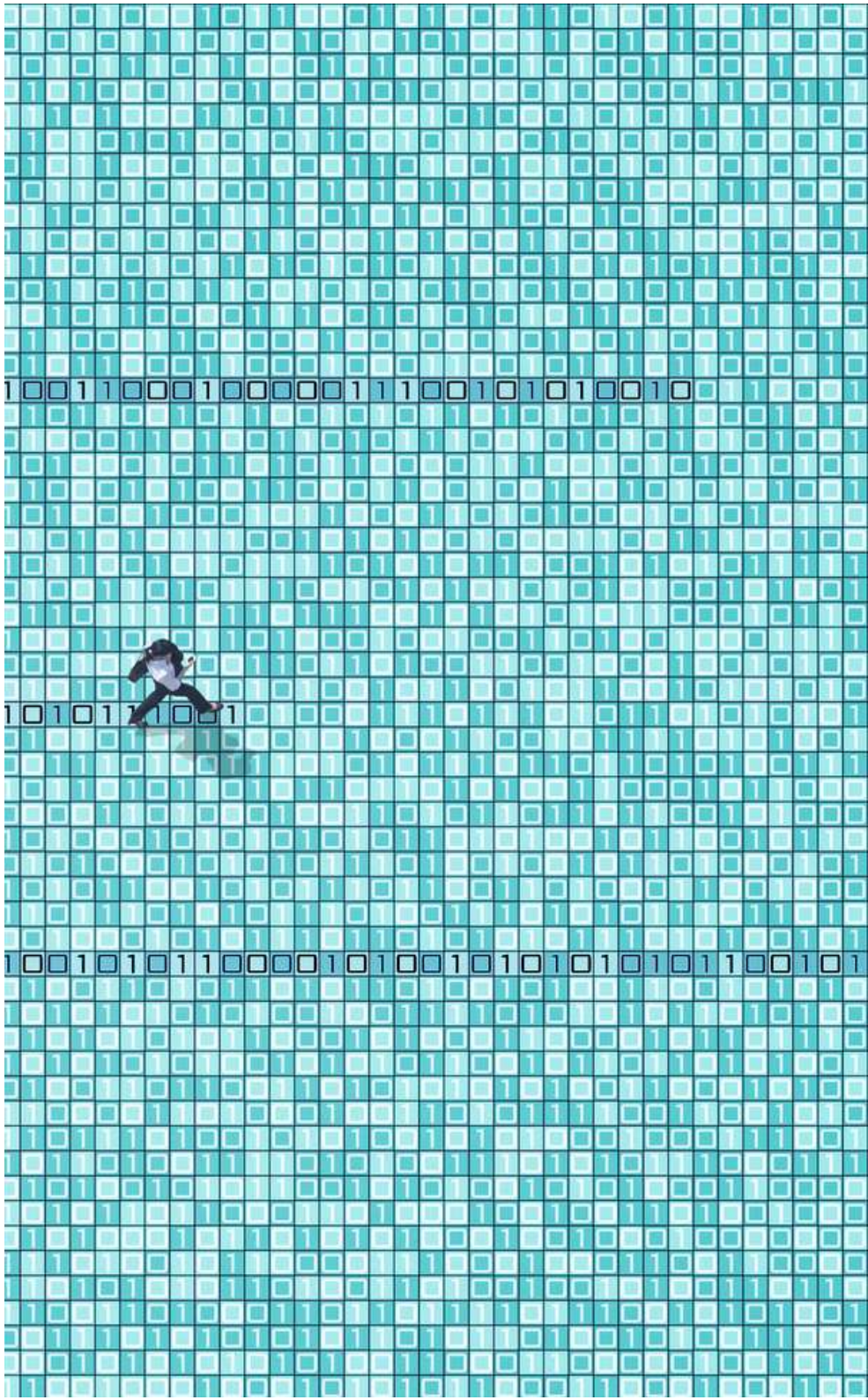


Benchmarks and Historical Data

Benchmarking is the comparison of a project schedule to another, similar product/service schedule to **provide a good "starting point" for estimation before detailed analysis.**

Benchmarks can be useful in the initial stage of scheduling to help assess the feasibility of a project.

Historical data can come from other projects completed within an organization for which detailed information is available.



Schedule Management Plan

DEFINITION

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

Schedule Management Plan

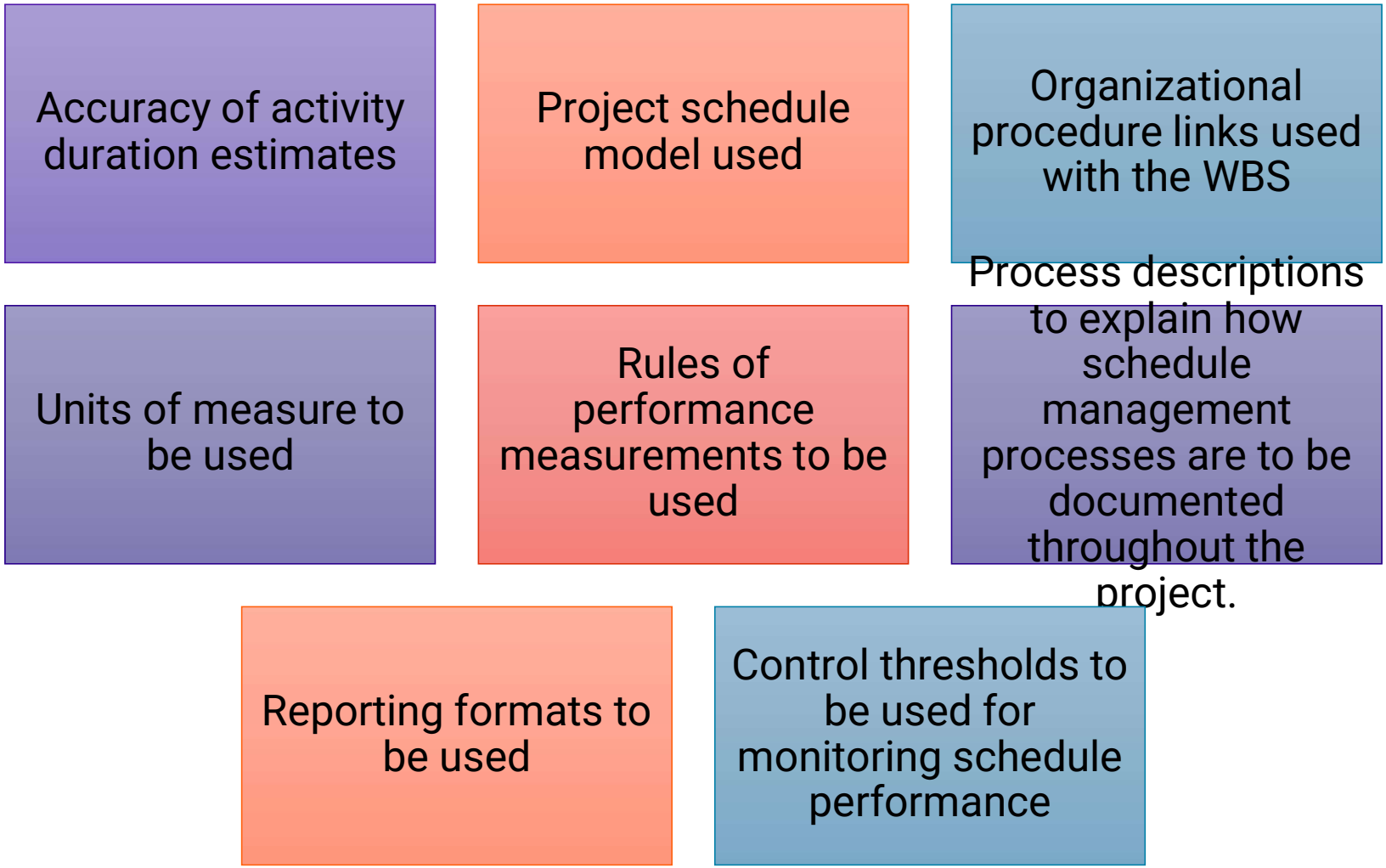
Describes how activities will be defined and progressively elaborated.

Identifies a scheduling method and scheduling tool to be used.

Determines the format of the schedule.

Establishes criteria for developing and controlling the project schedule.

Components of the Schedule Management Plan



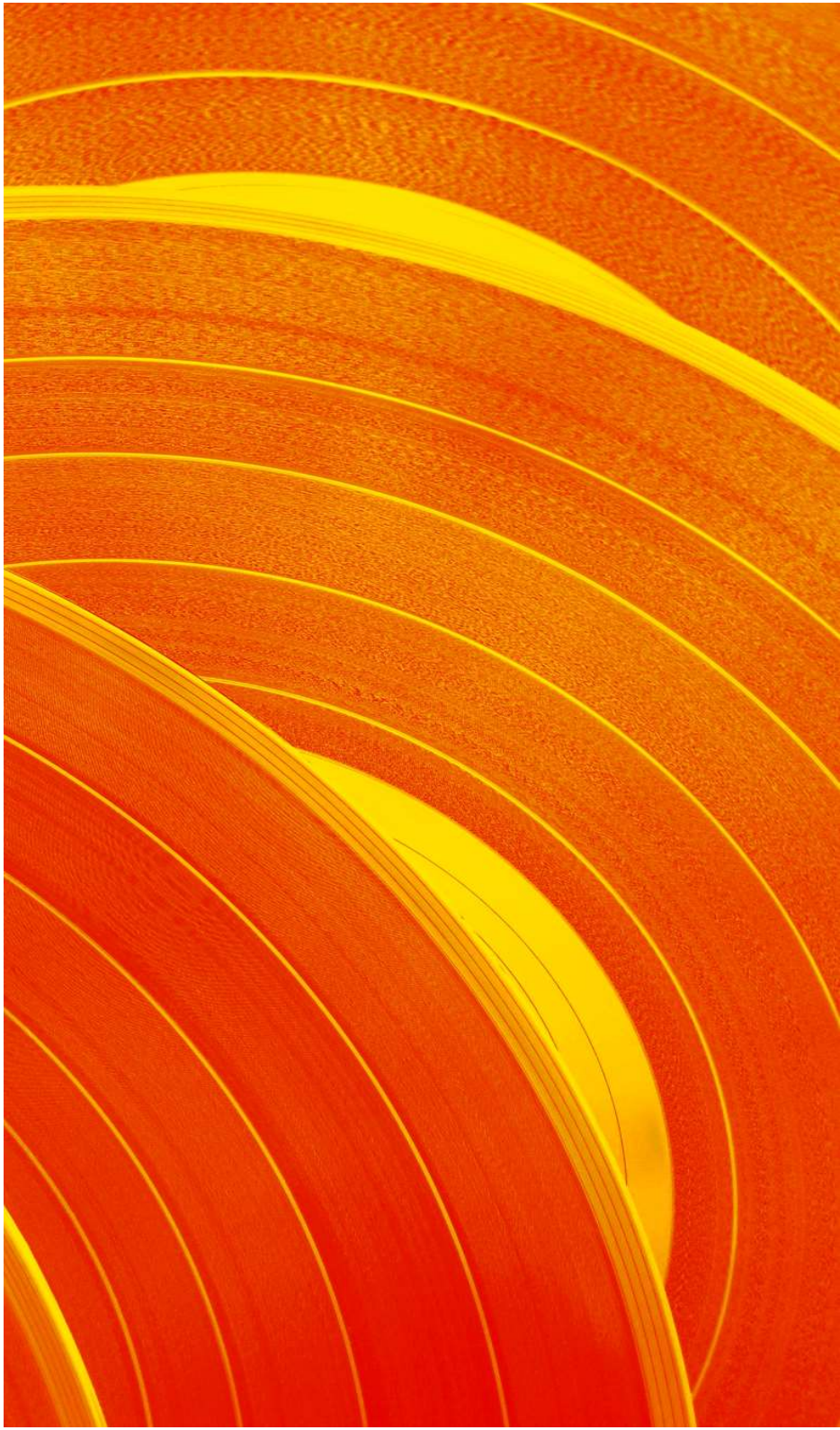
Schedule Management Considerations for Agile/ Adaptive Environments

Consider developing project roadmap.

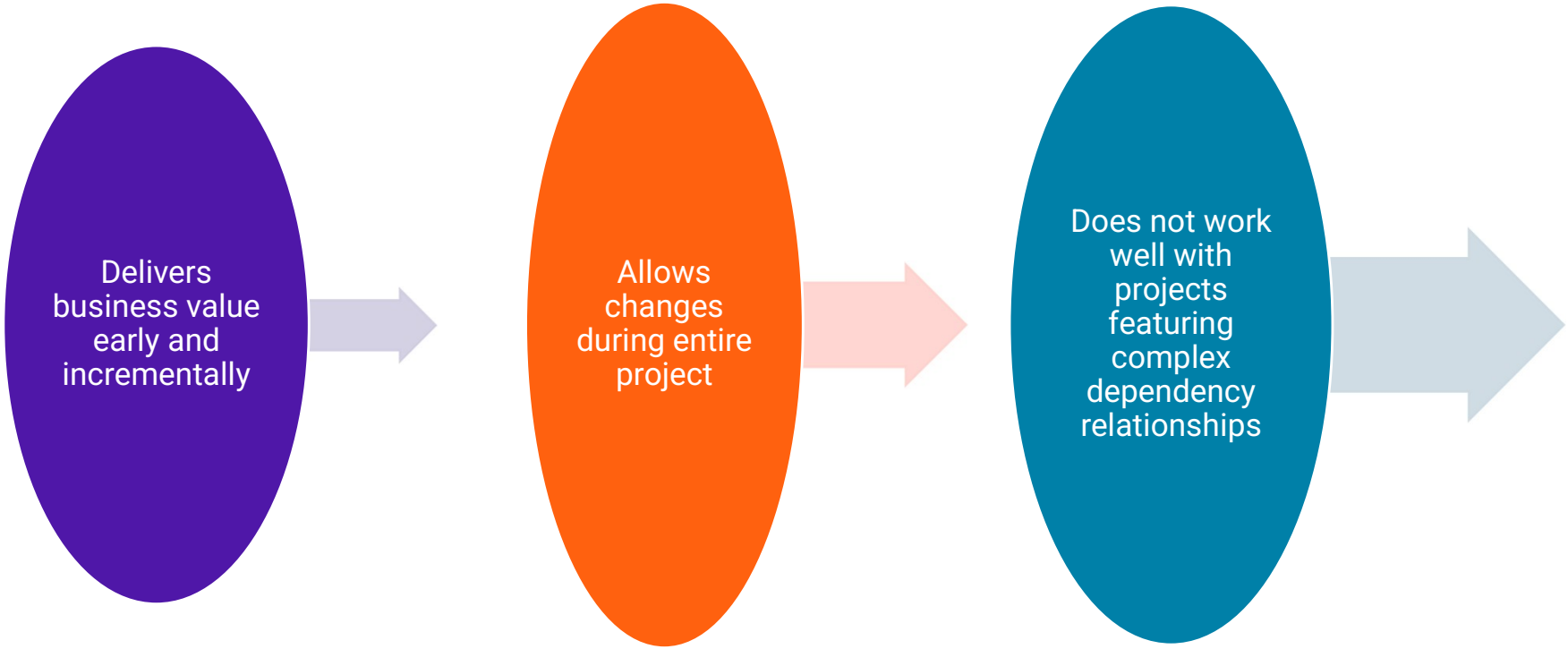
Schedule individual activities iteratively.

Choose an iterative approach:

- ✓ Iterative scheduling with backlog
- ✓ On-demand scheduling



Iterative Scheduling with Backlog



Iterative Scheduling with a Backlog Process

- ✓ Use progressive elaboration (rolling wave) to schedule activities
- ✓ Use a specific time window e.g. two weeks
- ✓ Define requirements in user stories
- ✓ Prioritize stories
- ✓ Select based on priority and time box
- ✓ Add remaining stories to backlog
- ✓ Construct later based on their priority

On-Demand Scheduling

- ✓ Does not use traditional schedules
- ✓ Team members “pull” work from a queue when available
- ✓ Based on Kanban and Lean methodologies
- ✓ Provides incremental business value
- ✓ Levels out work of team members
- ✓ Works best when activities can be divided into equal amounts
- ✓ Does not work well with projects comprised of complex dependency relationships

GUIDELINES

Develop a Schedule Management Plan

- Review the following:
  - Project management plan (for information to develop the schedule)
  - Project charter (for a summary, high-level milestone schedule)
  - EEFs
  - OPAs
- Use tools and techniques such as expert judgment and historical information.
- Use meetings to develop the schedule management plan.
- Document the schedule management plan for the project.

Project Activity

DEFINITION

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

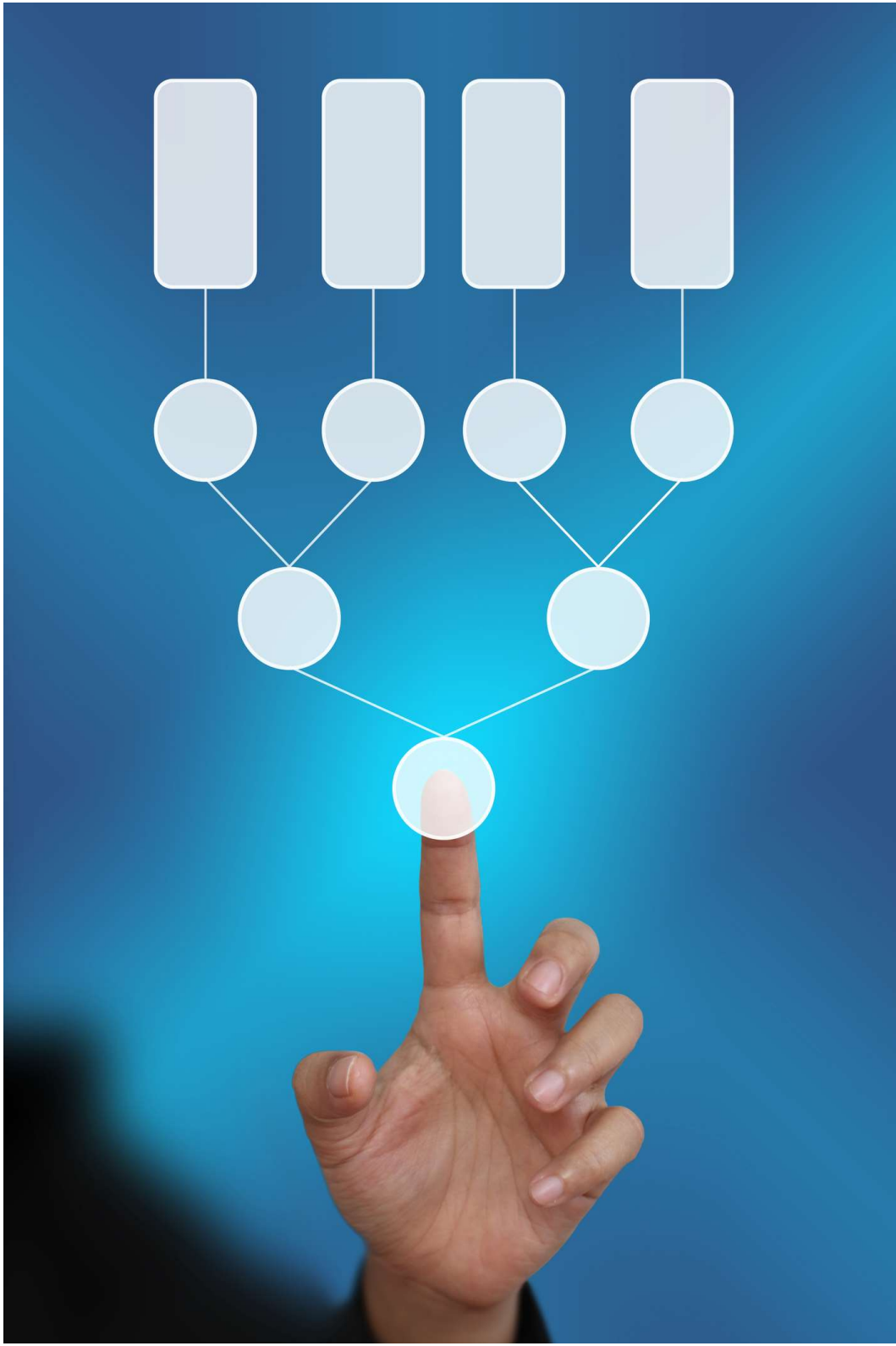
Project Activities

An **activity** is a component of a decomposed work package.

- Activities are not the same as work packages or ‘tasks’.

A **work package** is the lowest level of the WBS.

A **task** refers to project management software.



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

- ✓ Usually described as a short phrase. This term groups related functionality together to deliver business value.
- ✓ Includes activities and efforts such as documentation, bug fixes, testing, and quality/defect repairs.
- ✓ Delivers the capability that can be estimated, tracked, and managed as a set.
- ✓ Epics are responsible for producing a major deliverable, which may include various Agile features, for example.

Working with Features

- ✓ Scheduling aligned to features ensures associated work is coordinated.
- ✓ Estimating features offers visibility to when blocks of functionality can be released to the business and end users.
- ✓ Progress can be measured by drawing a ratio of accepted to remaining features.

Milestones

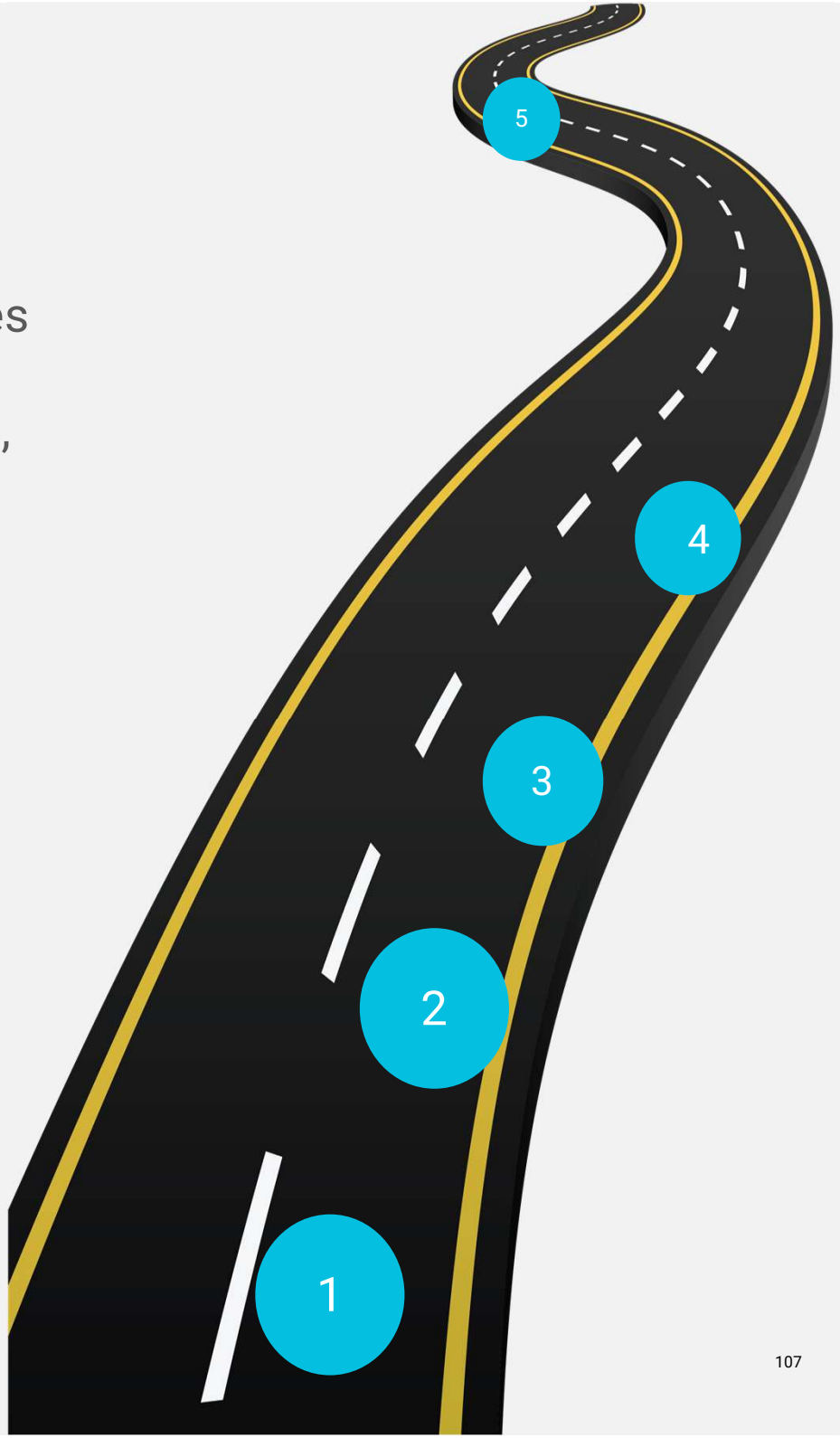
DEFINITION

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

Milestones

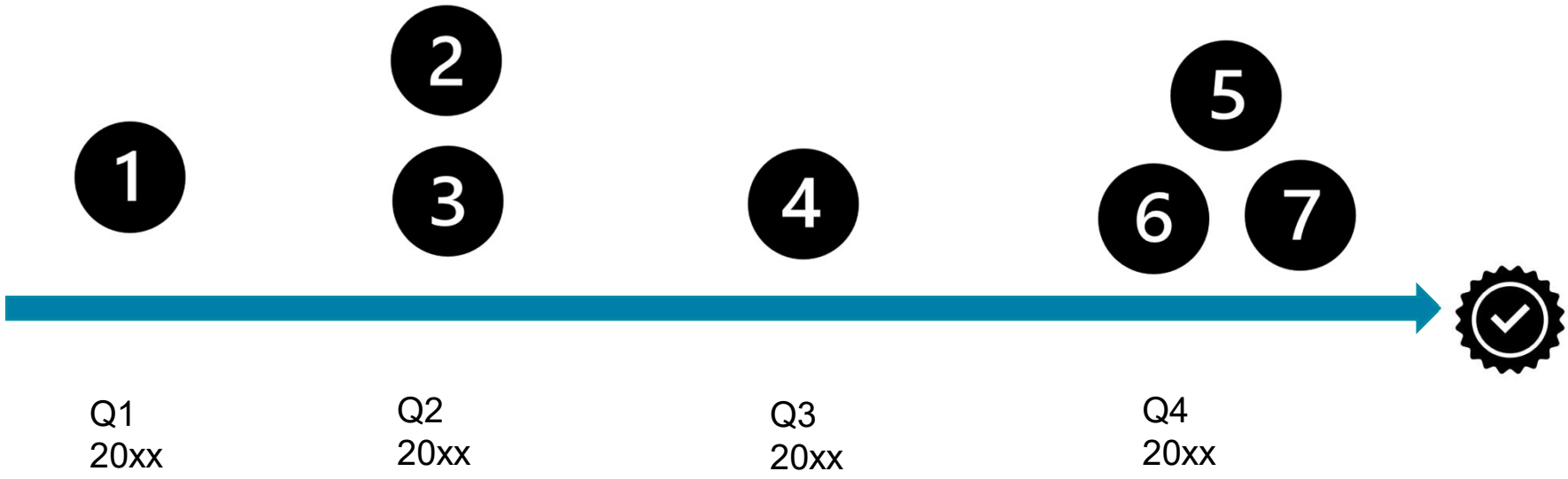
A **milestone list** identifies all project milestones and indicates whether the milestone is mandatory, such as those required by contract, or optional, such as those based on historical information.

Milestones have zero duration because they represent a significant point or event.



Milestone Chart

- ✓ Provides the summary level view of a project's milestones.
- ✓ Uses icons or symbols.
- ✓ Useful for upper management who only require an overview.



GUIDELINES

Estimating Project Activities

- Review:
  - Schedule management plan
  - Scope baseline for WBS, deliverables, assumptions, and constraints
  - EEFs
  - OPAs
- Analyze and decompose each work package of the WBS into activities that will be required to produce the deliverable.
- Consult SMEs about unfamiliar material.
- Evaluate all constraints and assumptions for their possible impact on activity definition.
- After decomposing each work package into activities, evaluate the activity list.

Activity Dependency

DEFINITION

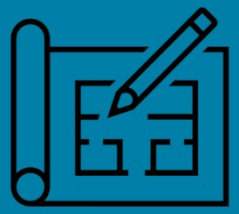
A logical relationship that exists between two project activities.

Activity Dependency

Relationship indicates whether the start of an activity is **contingent on an event** or **input from outside the activity**.

Activity dependencies determine the precedence relationships.

Example activity:
Designing Room Layouts



- Architect needs to assess the functionality of a room design.
- Assessment **cannot start until** workers finish framing the walls, windows, and roof.
- **After** structure is in place, **then** architect can reassess design plans to determine if modifications are necessary.

Types of Activity Dependencies

Mandatory

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

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.

External

A relationship between project activities and non-project activities.

Internal

Contingent on inputs within the project team's control.

Precedence Relationships

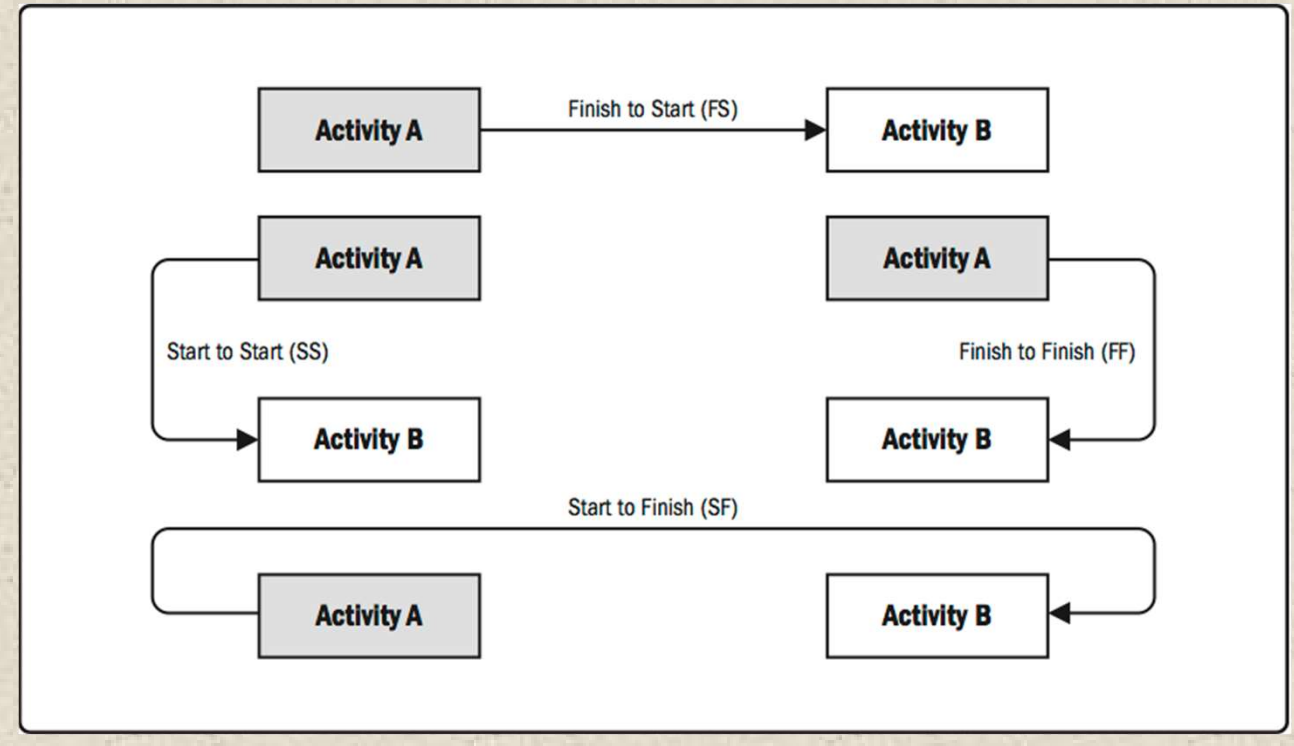
Precedence relationships express a logical dependency in precedence diagramming methods.

It is a logical relationship between activities that describes what the activity sequence should look like.

Precedence relationships are always assigned to activities based on the dependencies of each activity:

- ✓ Predecessor activity drives the relationship; most often, it occurs first.
- ✓ Successor activity is driven by the relationship.

Types of Precedence Relationships

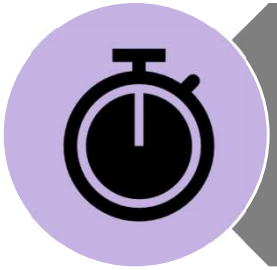


GUIDELINES

Sequence Project Activities

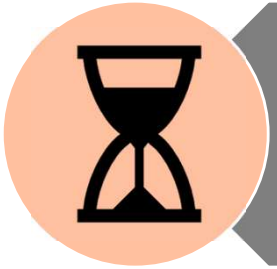
- Review:
  - Schedule management plan (for information on the scheduling method and tool, and information on how activities may be sequenced)
  - Activity list for all project schedule activities
  - Activity attributes for each activity
  - Milestone list for the dates for specific schedule milestone events
  - Project scope statement
  - EEFs
  - OPAs
- Use tools and techniques such as the 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



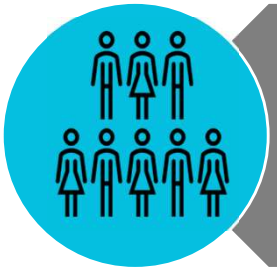
Activity duration estimate

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



Elapsed time

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



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.

GUIDELINES

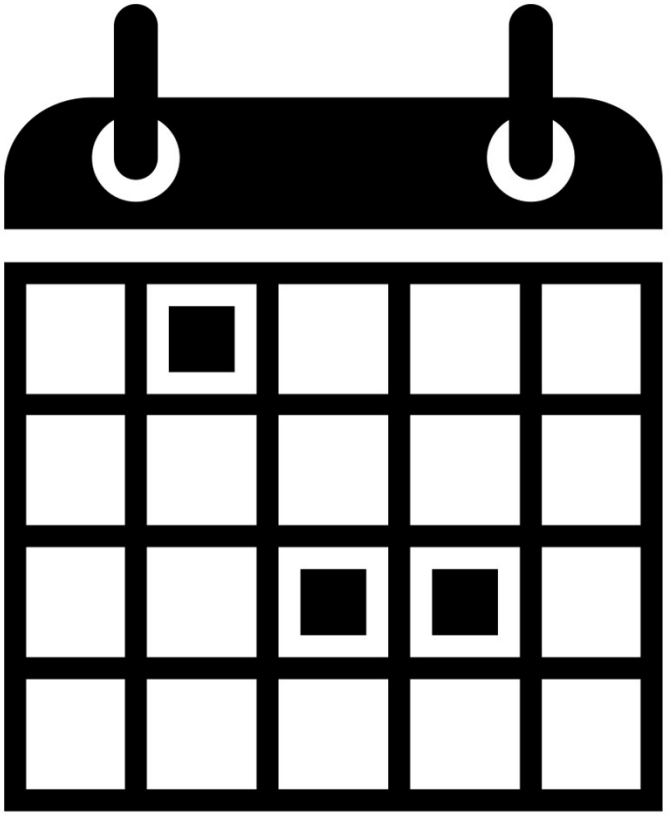
Estimate Activity Durations

- 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.
- Consider resource requirements and capabilities.
- 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.
- Review the resource breakdown structure.
- Document the activity duration estimates.

Schedule Presentation Formats

Select the type of schedule to suit your project.

- ✓ Gantt Chart
- ✓ Milestone Chart
- ✓ Project Schedule Network Diagram with Dates
- ✓ Roadmap
- ✓ Task board
- ✓ Kanban board
- ✓ Burndown chart



Gantt Chart

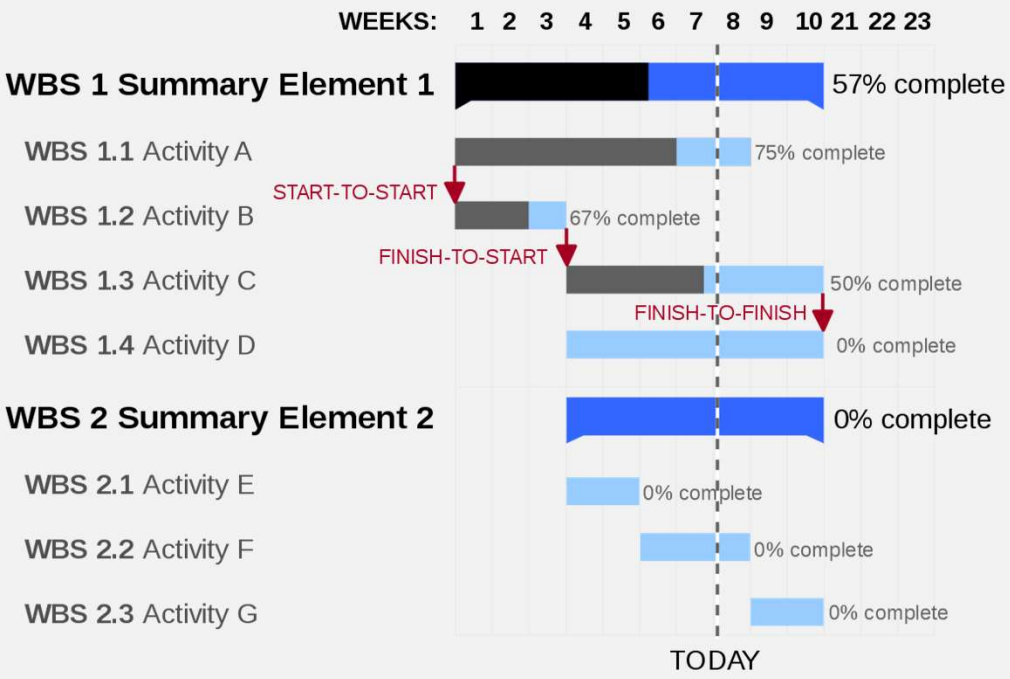
DEFINITION

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

Useful for:

- ✓ Start and end dates, duration, and order
- ✓ Precedence relationships
- ✓ Percentage completion and actual progress
- ✓ Presentation of project status to the team and management



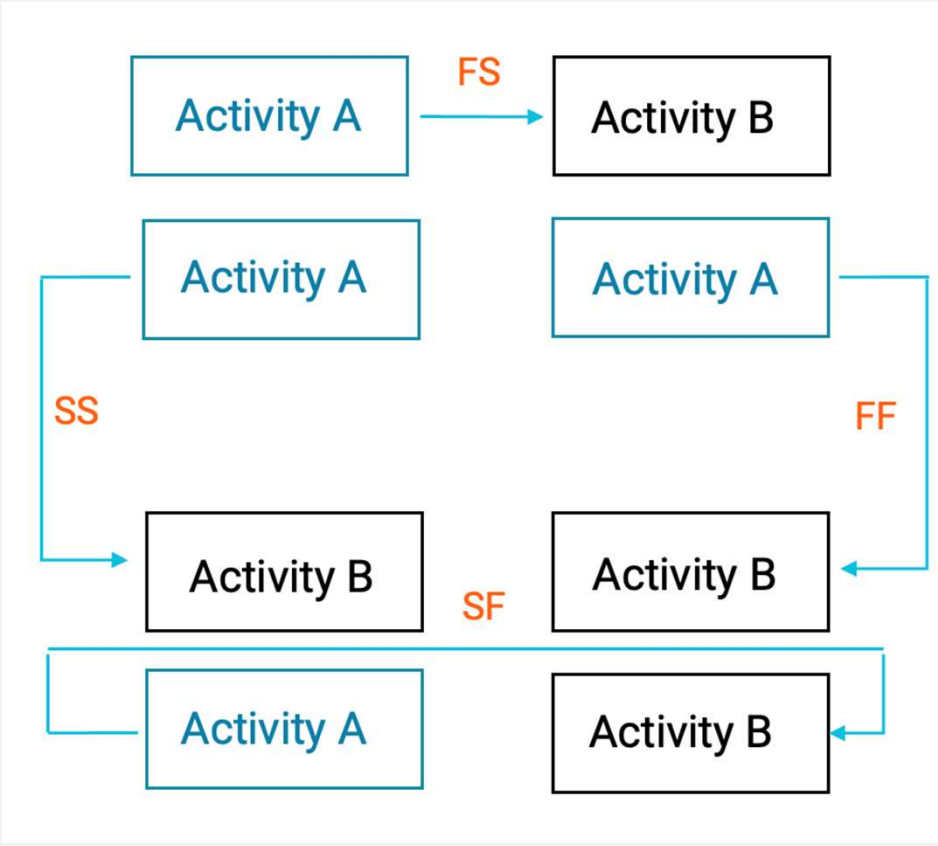
Project Schedule Network Diagram with Dates and Dependencies

Project schedule can be shown with or without dependencies.

Network diagrams have clear advantages, they assign start and finish dates to activities and show the interrelationship of activities with arrows.

Further benefits:

- ✓ **Clear visual** of project progress, workflow, and interdependencies of activities.
- ✓ **Justification** of time estimate for the project.
- ✓ **Planning** and **organizational** aid.
- ✓ **Schedule compression opportunities** are more easily identifiable.



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.

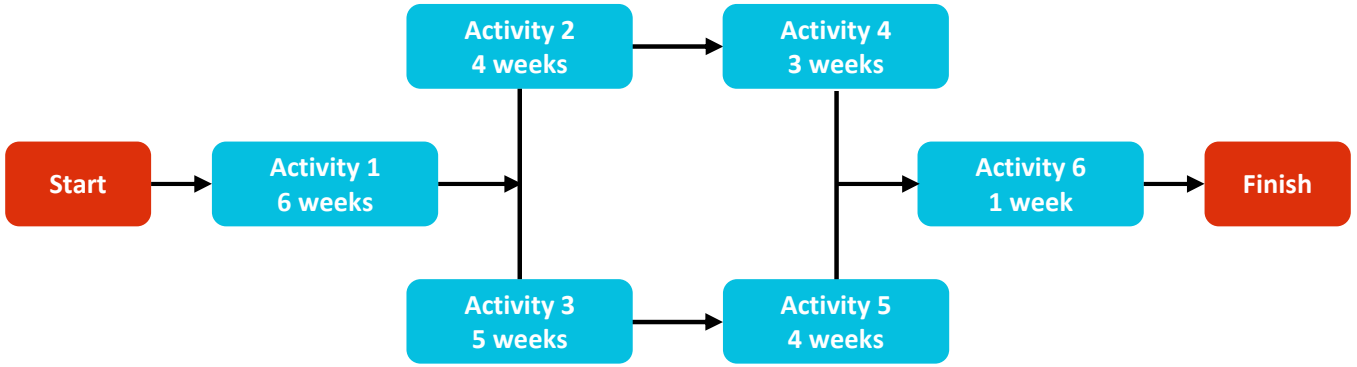
Critical Path Activity

DEFINITION

Any activity on the critical path in a project schedule.

Use the Critical Path Method

- 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.



1[6w] + 2[4w] + 4[3w] + 6[1w] = 14 weeks

1[6w] + 3[5w] + 5[4w] + 6[1w] = 16 weeks Critical Path

About Float

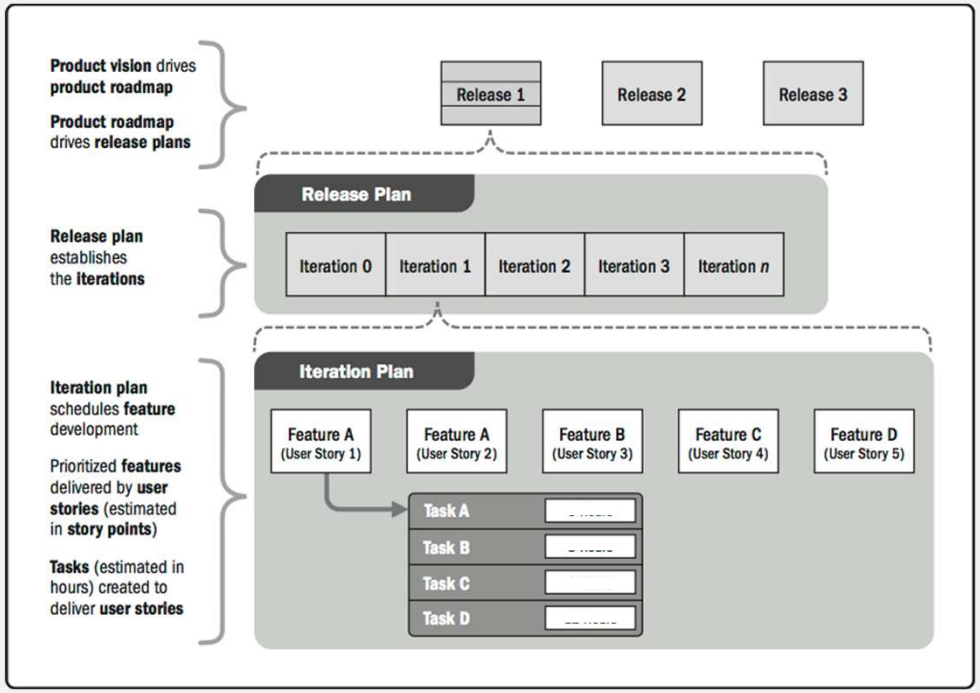
Float is the amount of time an activity can be delayed from its early start date without delaying the project finish date or consecutive activities.

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.

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

Agile Release Planning

- ✓ High-level summary timeline of the release schedule based on product roadmap and vision for the product's evolution.
- ✓ Determines the number of iterations or sprints in the release
- ✓ Allows product owner and team to decide:
  - how much needs to be developed
  - how long it will take to have a releasable product based on business goals, dependencies, and impediments.



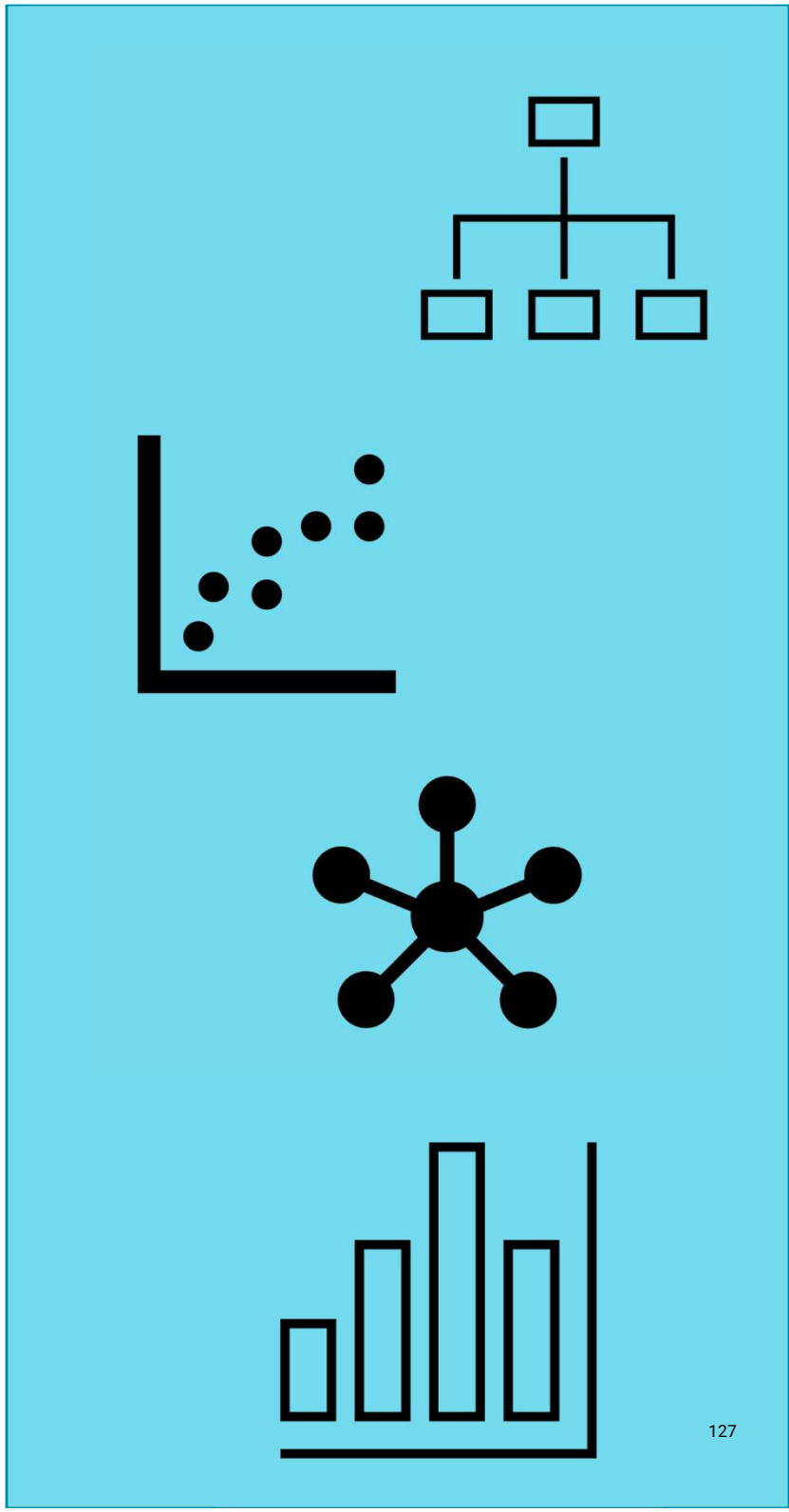
Ongoing Progress Based on Methodology

Traditional - Measure project progress according to schedule by:

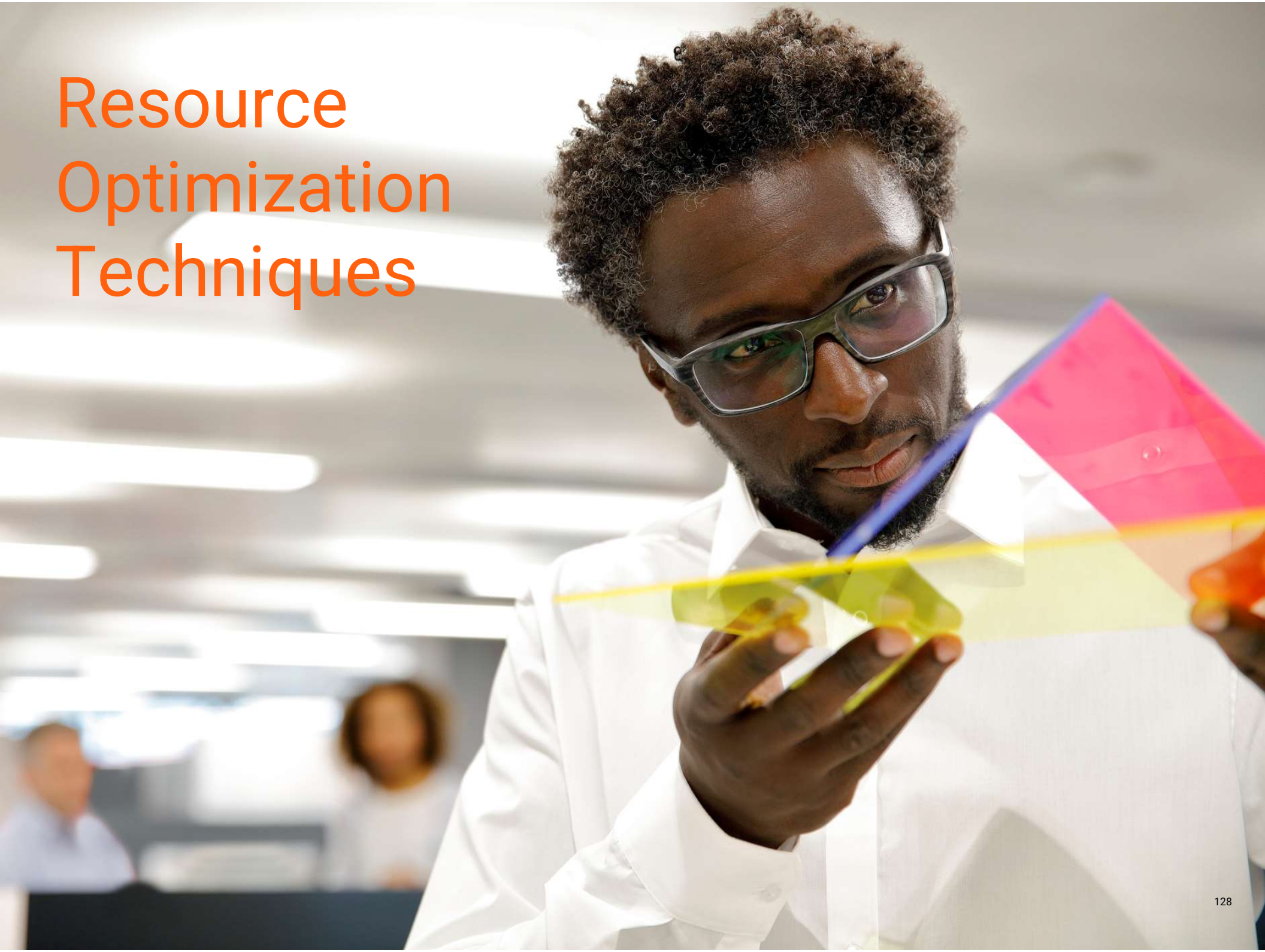
- ✓ Monitoring project status to update the schedule.
- ✓ Managing changes to schedule baseline.

Agile - Evaluate progress by:

- ✓ Comparing the total amount of work delivered and accepted to the amount estimated for the current time period.
- ✓ Reviewing completed work in regular Sprint demos.
- ✓ Conducting scheduled reviews to record lessons learned (or retrospectives).
- ✓ Determining the rate at which deliverables are produced, validated, and accepted.



Resource Optimization Techniques



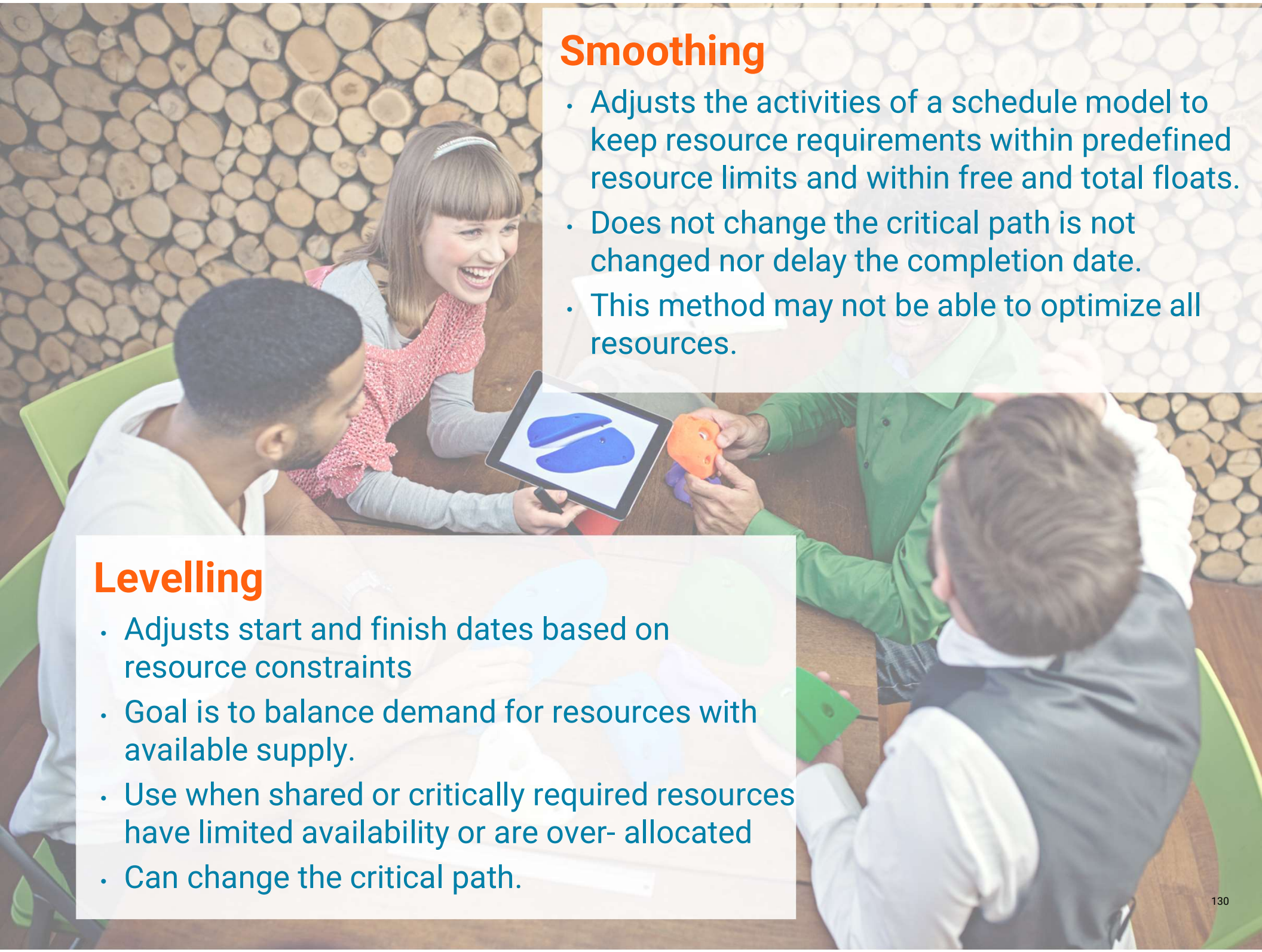
Smoothing and Levelling

Use Resource Optimization to adjust the start and finish dates of activities.

You need to 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.



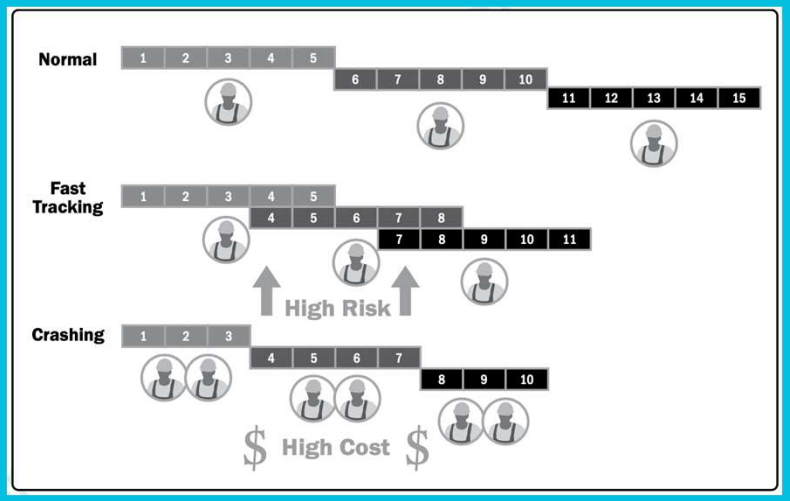
Smoothing

- 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



Schedule Compression Techniques

Crashing

- Shortens schedule duration for the least incremental cost by adding resources e.g. overtime, additional resources
- Works only for activities on the critical path
- Does not always produce a viable alternative and may result in increased risk and/or cost.

Fast-tracking

- Perform activities in parallel to reduce time
- May result in rework, increased risk, and increased cost

Coordination with Other Projects

- ✓ If the project is part of a program or a portfolio, evaluate the schedule status for effects on other program or portfolio components.
- ✓ A delay (or acceleration) of a project may not necessarily 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.

Plan and Manage Budget and Resources

TOPIC D

Deliverables and Tools

- Cost baseline
- Management reserve
- Resource management plan
- Change requests
- Cost forecasts
- Risk analysis

- Estimating techniques: Three Point, Analogous, Parametric, T-Shirt sizing, Planning poker
- Review organization data
- Meetings
- Leverage PMIS
- Understand change control
- Use velocity data and analysis
- Throughput analysis
- Cost Variance, EVM, EAC
- Features accepted vs feature remaining

Cost Estimates

Develop an approximation of the cost for each activity in a project.

Use logical estimates to provide a basis for making sound decisions and they establish baselines.

Estimating Techniques – Advantages and Disadvantages

Analogous Estimating

Can ensure no work is inadvertently omitted from work estimates.

Can sometimes be difficult for lower-level managers to apportion cost estimates.

Parametric Estimating

Is not time consuming

May be inaccurate, depending on the integrity of the historical information.

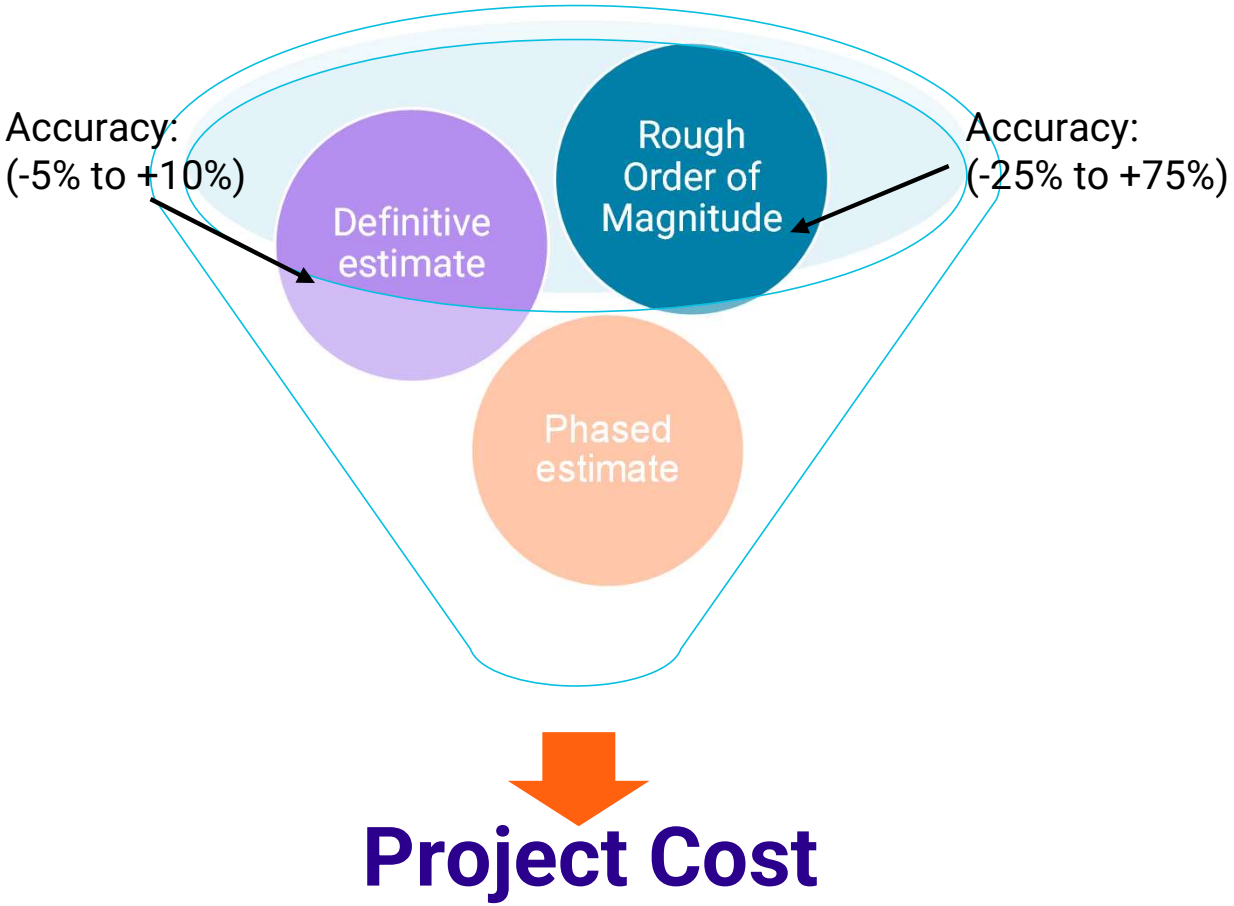
Bottom-up Estimating

Is very accurate and gives lower-level managers more responsibility.

May be very time consuming

Can be used only after the WBS has been well-defined.

Common Estimate Types



Project Governance

- ✓ Budget management is a critical project oversight and within the purview of project governance.
- ✓ Deviations in budget, scope, schedule, resources or quality, will impact the project.
- ✓ Project governance tells you whom these issues would impact and how to deal with them.
- ✓ Tailor cost estimation approach to phases of the project life cycle.

Compliance

Projects must be compliant with internal and external standards, such as:

- ✓ Appropriate government regulations
- ✓ Corporate policies
- ✓ Product and project quality
- ✓ Project risk

The Project Compliance Plan is a sub-plan of the project management plan.

In this step, you:

- ✓ Classify compliance categories
- ✓ Determine potential threats to compliance
- ✓ Analyze the consequences of noncompliance
- ✓ Determine necessary approach and action to address compliance needs

Lessons Learned Register

- ✓ Use during and after projects.
- ✓ Start with budgets from previous, similar projects.
- ✓ They contain valuable cost-estimating information - both successes and shortcomings.

GUIDELINES

Estimate Costs

- Gather estimates for individual work packages.
- Check with the resource supplier to validate assumptions.
- Choose a suitable estimating technique according to context.
- Look for alternative costing options.
- Determine which units of measure to use.
- Consider impact of risks on cost.
- Ensure that cost estimates are assigned to the right account.
- Ensure estimates include resource costs, level of estimate, and a list of assumptions.

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

The cost baseline is the approved version of the time-phased project budget, excluding any management reserves.

Cost Baseline

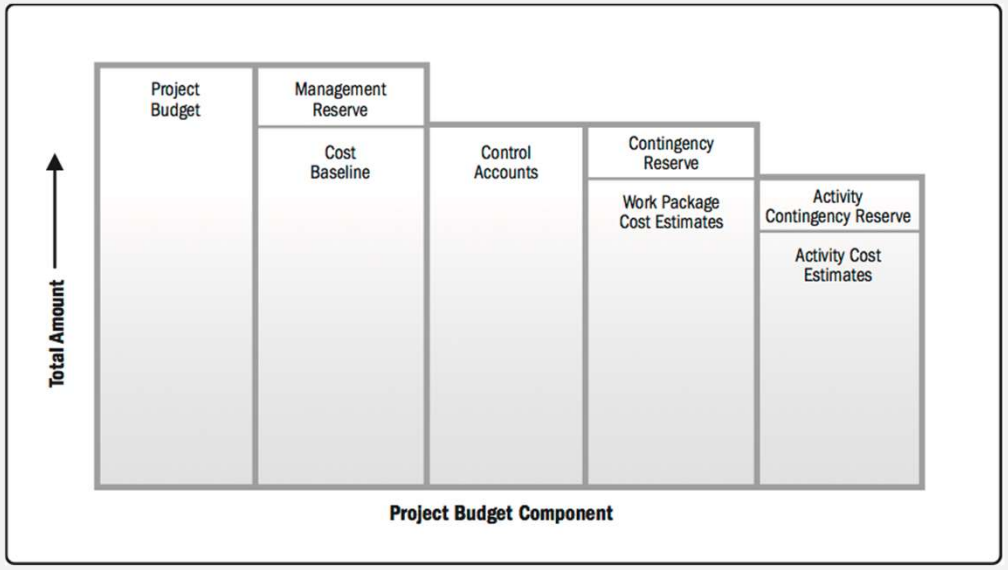
Can be changed only through formal change control procedures and is the basis for comparison to actual results.

Cost baseline:

- ✓ Monitors and measures cost performance
- ✓ Includes a budget contingency
- ✓ Is tailored for each project

Other components of the project budget are depicted at right.

Project Budget



control accounts
management reserve
activity contingency reserve
control accounts
activity cost estimate
contingency reserve
work package estimates

GUIDELINES

Estimate Cost Baseline

- Gather inputs to establish the baseline e.g. WBS, project schedule, cost estimates, and risk management plan.
- Assign work to dates on project schedule and allocate funds for each activity or work package for assigned time period.
- Consider a contingency reserve to cover expenses associated with risks.
- Total the costs for each time period, then plot these 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, budget is set during project planning and does not change.
- ✓ However, the following changes can pose a challenge:
  - New/changed project requirements.
  - 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 changes or challenges occur, you must tailor:

- ✓ Budget or funding
- ✓ Cost
- ✓ Schedule
- ✓ Scope

If the budget remains fixed and additional funds are not available, then the project must change.

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

Keep in mind:

- ✓ Most budgets assume steady incoming and outgoing flows.
- ✓ Large, sporadic expenditures are usually incompatible with organizational operations.
- ✓ Funding limits help regulate the outgoing capital flow to protect against overspending.

GUIDELINES

Anticipate 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

- Review:
  - Cost management plan
  - Human resource management plan
  - Scope baseline for project scope statement, WBS, and WBS dictionary
  - Risk register to consider any risks that may impact cost estimation
  - EEFs and OPAs
- Check the project schedule for type, quantity, and duration of resources.
- Use appropriate tools and techniques.
- Document the project budget, creating a cost baseline.
- Understand project funding requirements or cash flow to enable the project.
- Update project documents, as needed.

Plan and Manage Quality of Deliverables

TOPIC E

Deliverables and Tools

Quality Management Plan

Quality Metrics

Quality Assurance

Quality Control

Cost benefits analysis

Cost of Quality

Benchmarking

Quality audit

Process analysis

Measure quality

Verify deliverables

Quality measurement tools

Quality

DEFINITION

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

Quality Standards and Regulations

Standards - Documents established as a model by an authority, custom, or by general consent.

Regulations - These requirements can establish product, process, or service characteristics, including applicable administrative provisions that have government-mandated compliance.

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.

ISO 9000 Series - A quality system standard that can be applied to any product, service, or process in the world.

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.
- ✓ I**mplement** corrections and controls when quality standards are neither met nor within acceptable ranges.

Quality Management Plan

DEFINITION

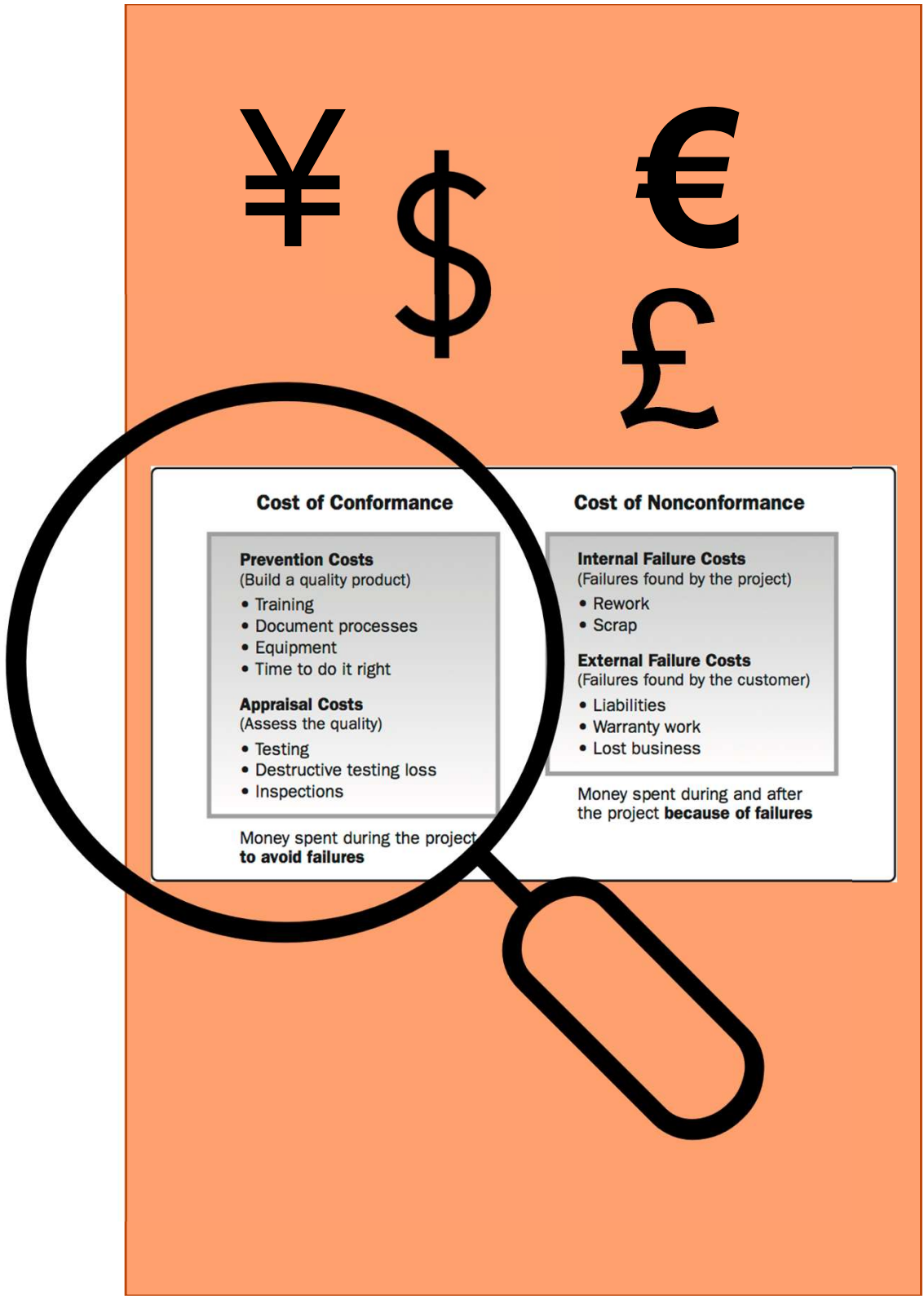
A component of the project management plan that describes how applicable policies, procedures, and guidelines will be implemented to achieve the quality objectives.

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 detail** are determined by project requirements.
- ✓ **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

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

Tolerance - The quantified description of acceptable variation for a quality requirement.

Quality Audit

DEFINITION

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

Quality Audit

- ✓ Improves quality performance of a project.
- ✓ Can be conducted at scheduled or random intervals.
- ✓ Topics 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

Data Gathering

- Checklists/Check Sheets
- Statistical Sampling
- Questionnaires and Surveys

Data Analysis

- Performance Reviews
- Root Cause Analysis

Data Representation

- Cause-and-Effect Diagram
- Control Charts
- Histograms
- Scatter Diagrams

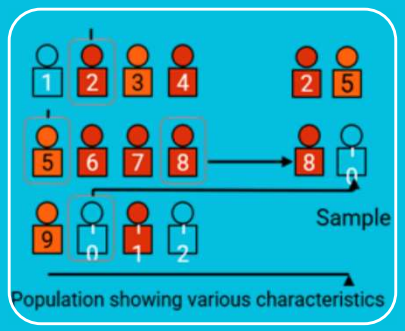
Data Gathering

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

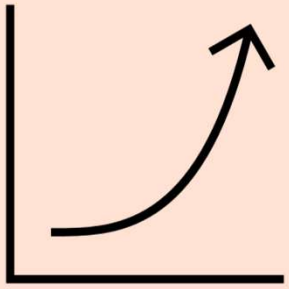
- Choosing part of a population of interest for inspection.
- Determine characteristics of an entire population based on measurement of representative sample.

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.

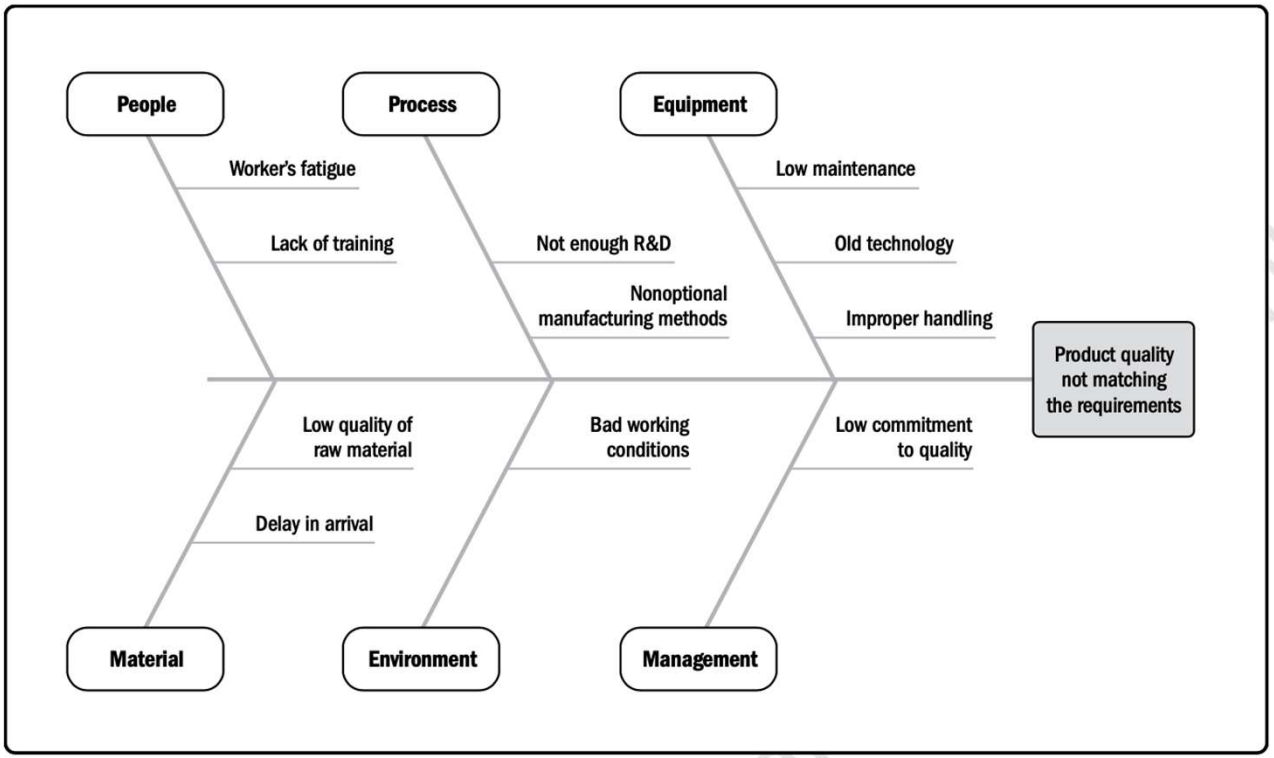
- Using gathered data, identify the cause of the problem.
- Goal is to pinpoint the exact cause.
- Follow issue back to the initial trigger.
- Use RCA tools - Failure Modes and Effects Analysis (FMEA), a fishbone diagram, a Pareto chart, a scatter diagram

Data Representation (1 of 4)

Cause and Effect Diagram

Fishbone diagrams, why-why diagrams, or Ishikawa diagrams

Breaks down the causes of the problem statement identified into discrete branches, helping to identify the main or root cause of the problem.

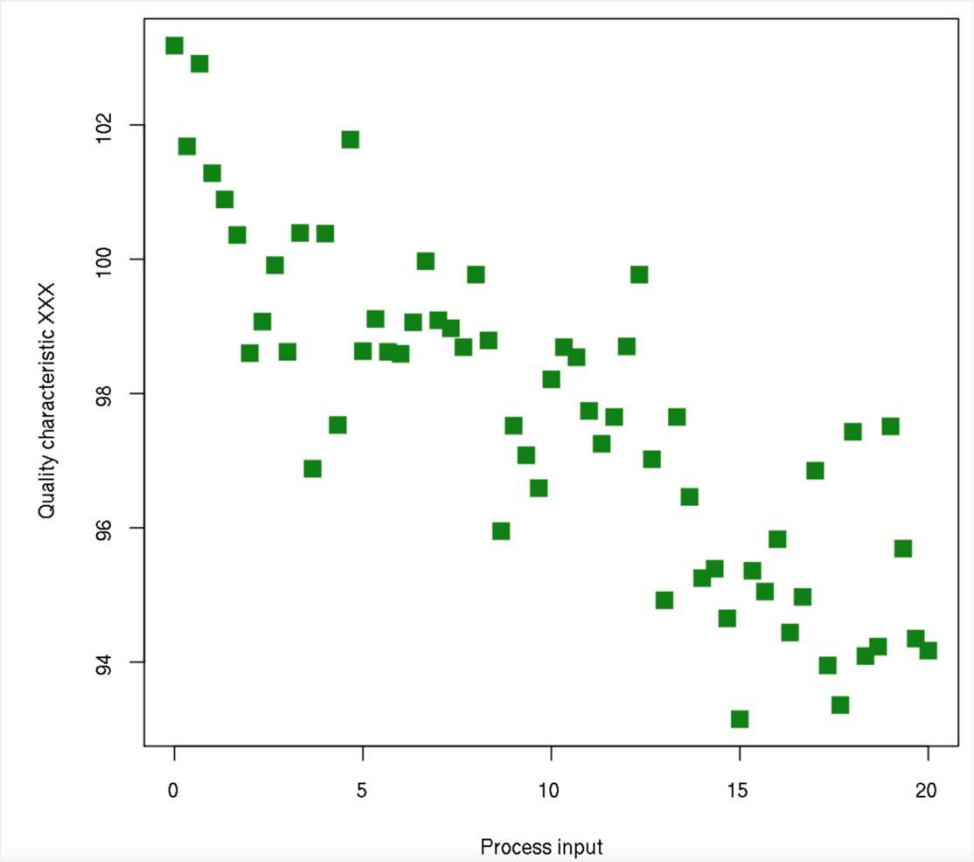


Example fishbone diagram

Data Representation (2 of 4)

Scatter Diagram

- ✓ A graph that shows the relationship between two variables.
- ✓ Demonstrates a relationship between any element of a process, environment, or activity on one axis and a quality defect on the other axis.

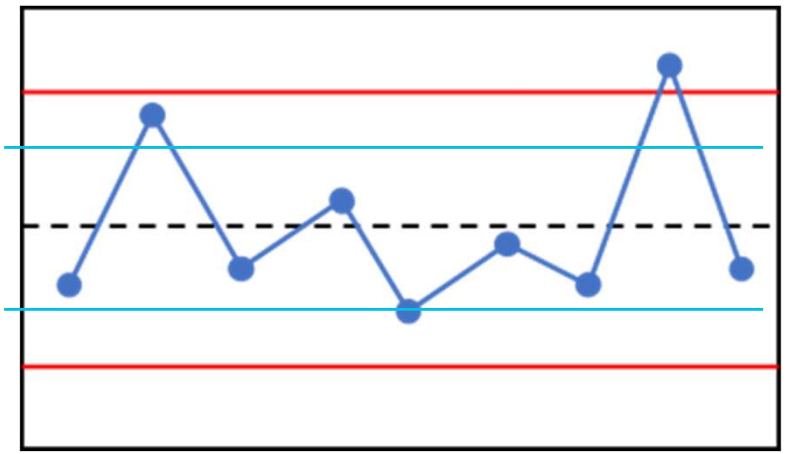


Data Representation (3 of 4)

Control Chart

A tool used to determine the predictability, behavior and stability of a process over time.

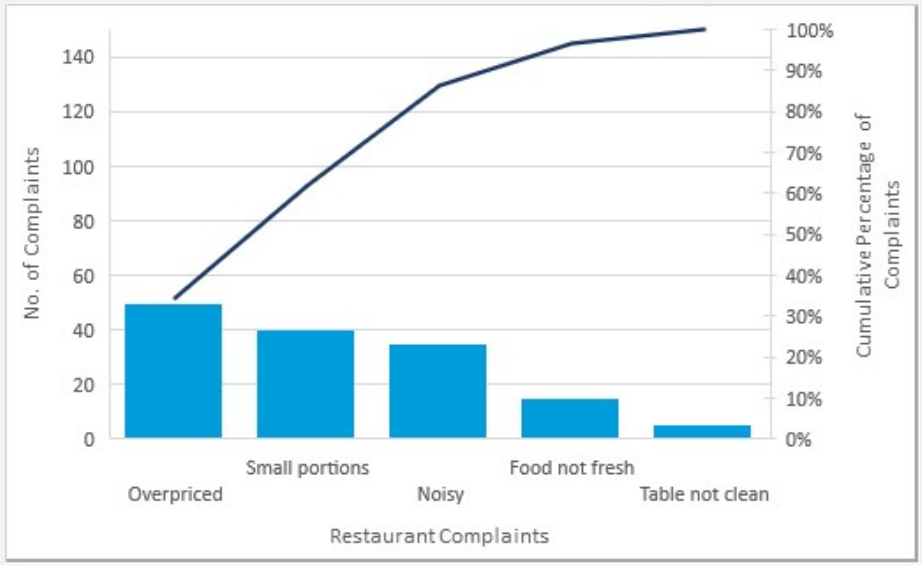
- ✓ A graphic display of project data against established control limits to reflect both the maximum and minimum values.
- ✓ Gives visibility to where corrective actions can prevent further problems.
- ✓ Ideal for repetitive processes with predictable results.



Data Representation (4 of 4)

Pareto chart

- ✓ 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.

Integrate Project Planning Activities

TOPIC F

Integration Management

- ✓ **Assessment and coordination** of 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

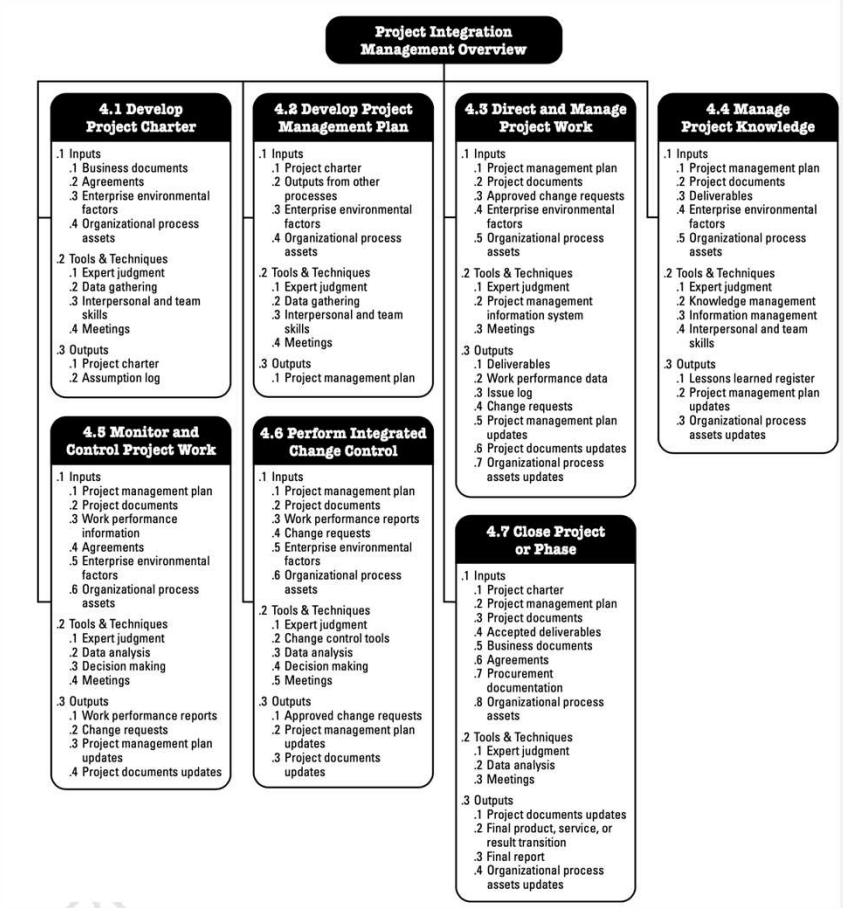
The document that describes how the project will be executed, monitored, controlled, and closed.

Project Integration Management Processes

Projects and project management are integrative by nature. This is an overview of the processes that project managers need to know.

Also know that:

- ✓ These processes overlap and interact with each other.
- ✓ The links among these processes are often iterative.



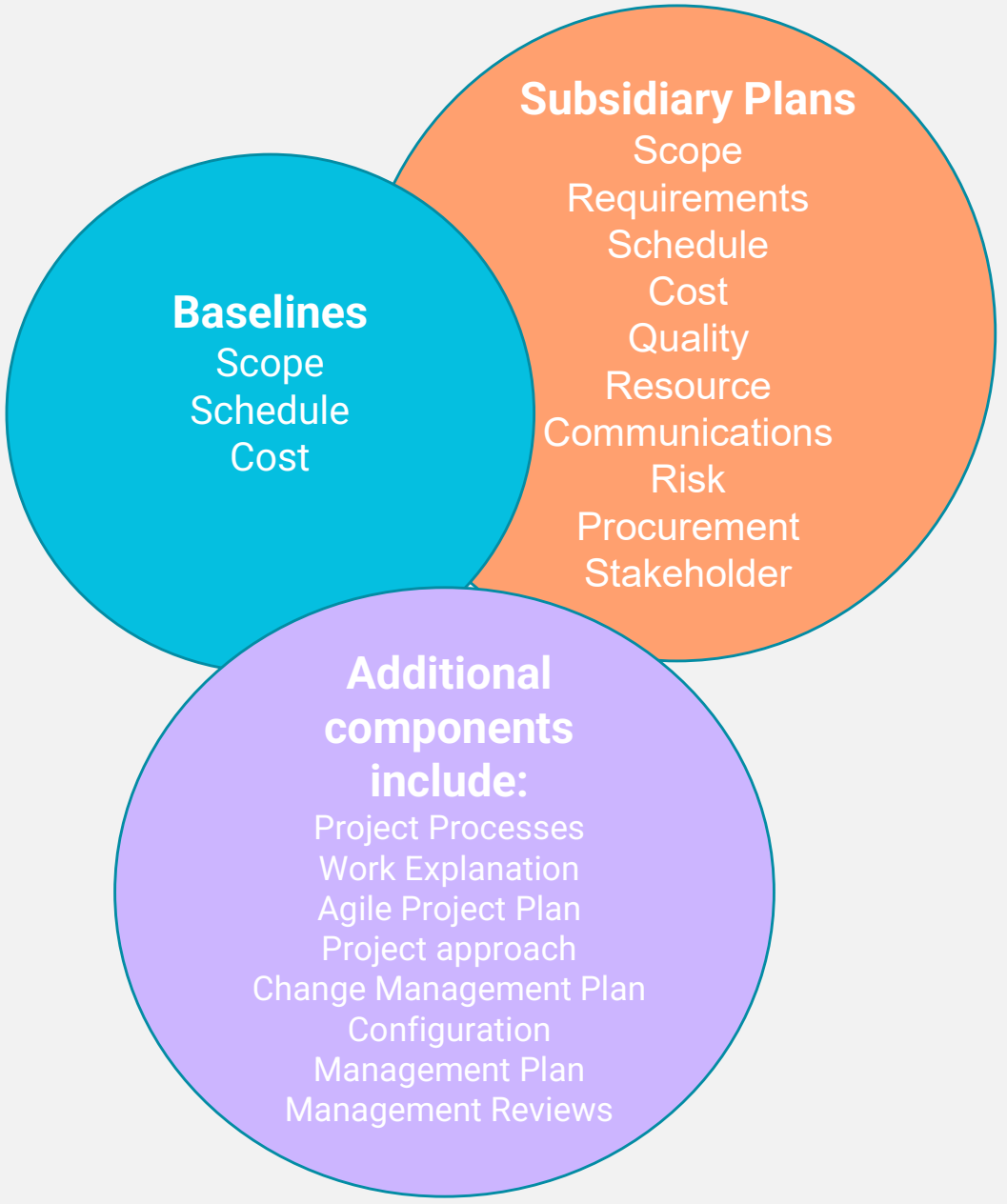
Project Management Information System (PMIS)

An information system e.g. Microsoft Project consisting of the tools and techniques used to gather, integrate, and disseminate the outputs of project management processes.

The PMIS enables quick and efficient work.

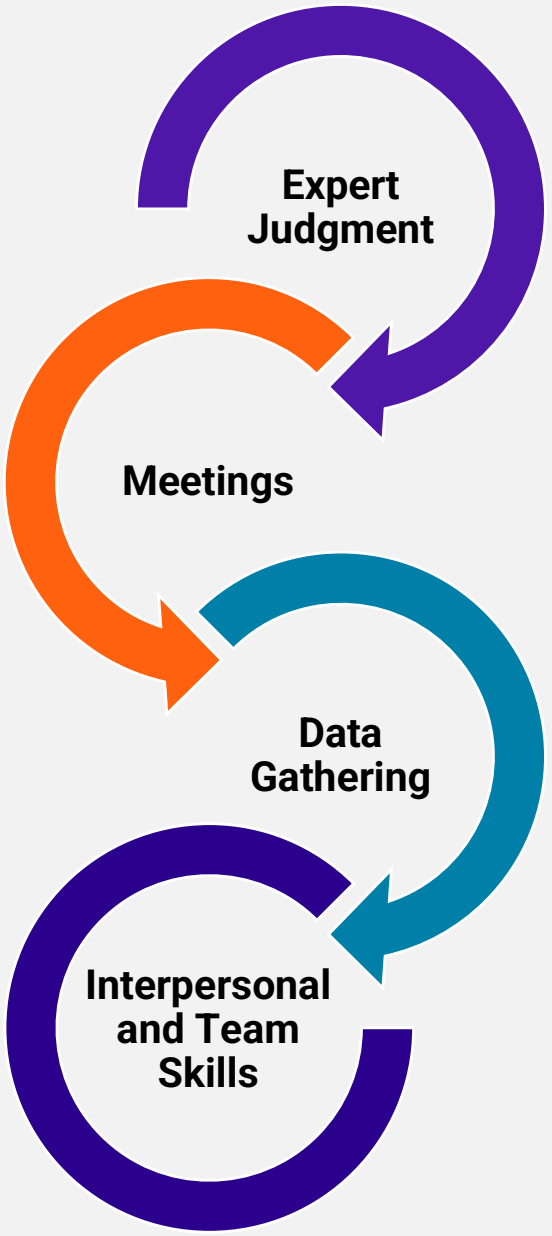
Project Management Plan Components

- ✓ These are a combination of essential and supporting processes used to run a project.
- ✓ Ensure the essential plans and processes are in place.
- ✓ 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

- ✓ Use **expert judgment** to make critical decisions.
- ✓ Use **meetings** to facilitate communication and understanding.
- ✓ **Gather data** to understand the project
- ✓ Leverage **interpersonal and team skills** to be an effective leader.




Managing Change

Configuration Management Plan

Identify and account for project **artifacts under configuration control**, and how to record and report changes to them.

Change Management Plan

Provides direction for managing the **change control process** and documents the roles and responsibilities of the change control board (CCB).

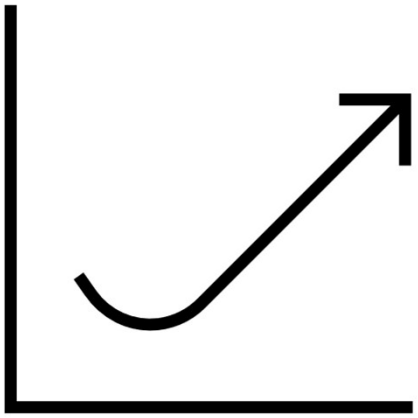
Identification, maintenance, status reporting, and verification of configurable items

Identification, impact analysis, documentation, and approving or rejecting of change requests.

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.

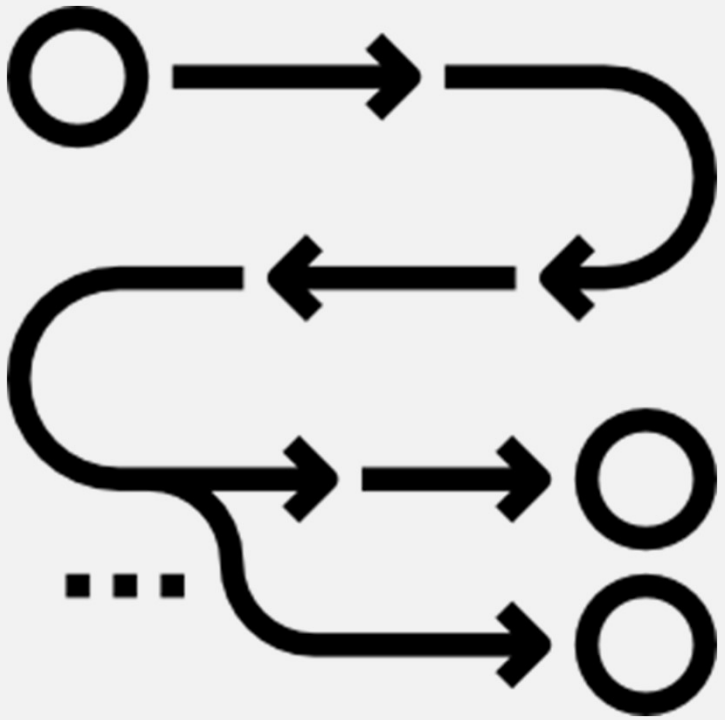
Factoring in Dynamic Change

Highly dynamic and complex projects which are very common, require a robust approach to change.
Some 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.



Plan and Manage Procurement

TOPIC G

Deliverables and Tools

- Statement of Work
- Procurement Management Plan
- Source selection criteria
- Selected sellers
- Change Control Log
- Agreement
- Change Requests

- Make or Buy Analysis
- Market research
- Meetings
- Expert judgment
- Proposal Evaluation Techniques
- Negotiations
- Bidder Conferences
- Change Control Process

Procurement Strategy

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.

Delivery Solution

The goal of procurement is the delivery of procured goods or services by the supplier to the procuring organization.

Solution Delivery Phase	Description
Planning and analysis	Customer requirements are documented
Detailed design	Solution is documented
Implementation or installation	Solution is implemented or installed
Testing	Solution is tested
Training	Training is provided to the customer
Handover	Solution is formally handed over to the customer
Support and maintenance	Solution is transferred to customer support

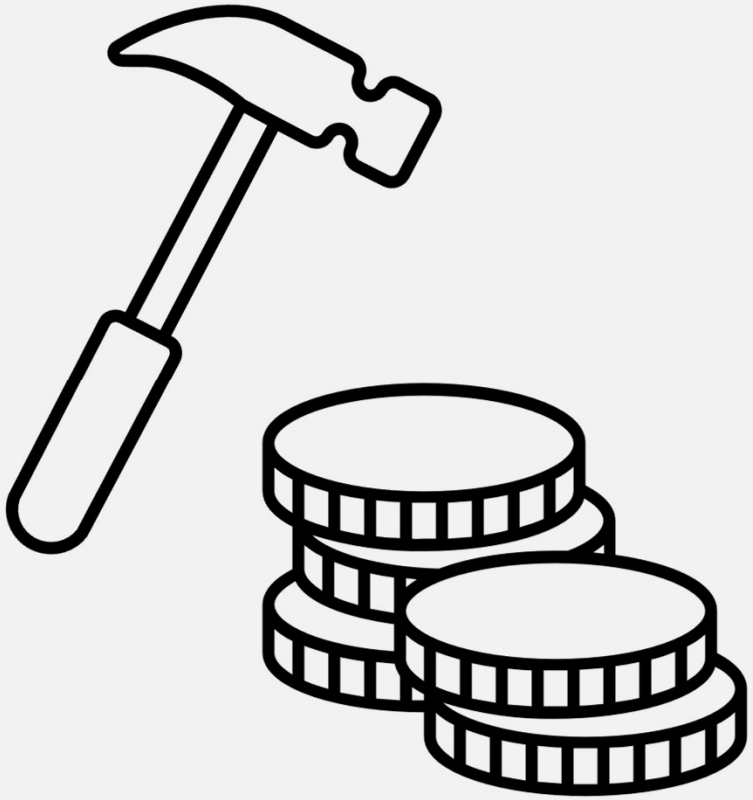
Make or Buy?

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 product.

Make-or-buy decisions - Decisions made regarding the external purchase or internal manufacture of a product.

Make-or-buy decision considerations:

- What is the impact on cost, time, or quality?
- Is there an ongoing need for the specific skill set?
- How steep is the learning curve?
- Are required resources readily available within the organization?



Statement of Work (SOW)

DEFINITION

A narrative description of products, services, or results to be delivered by the project.

Procurement SOW

The Statement of Work (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.

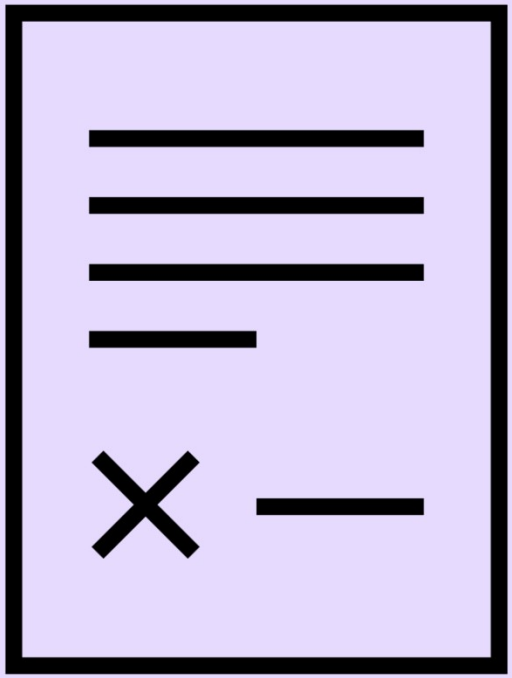
- ✓ Distributed to potential vendors to evaluate their capability to perform the work or provide the services.
- ✓ Serves as a basis to develop the procurement documents during the solicitation process.
- ✓ A project scope baseline is used to create the procurement SOW.

summary

scope

deliverables

fees



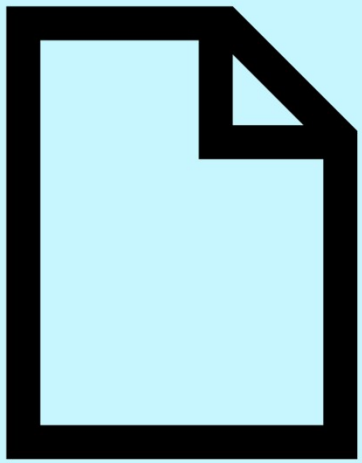
Procurement Management Plan

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

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

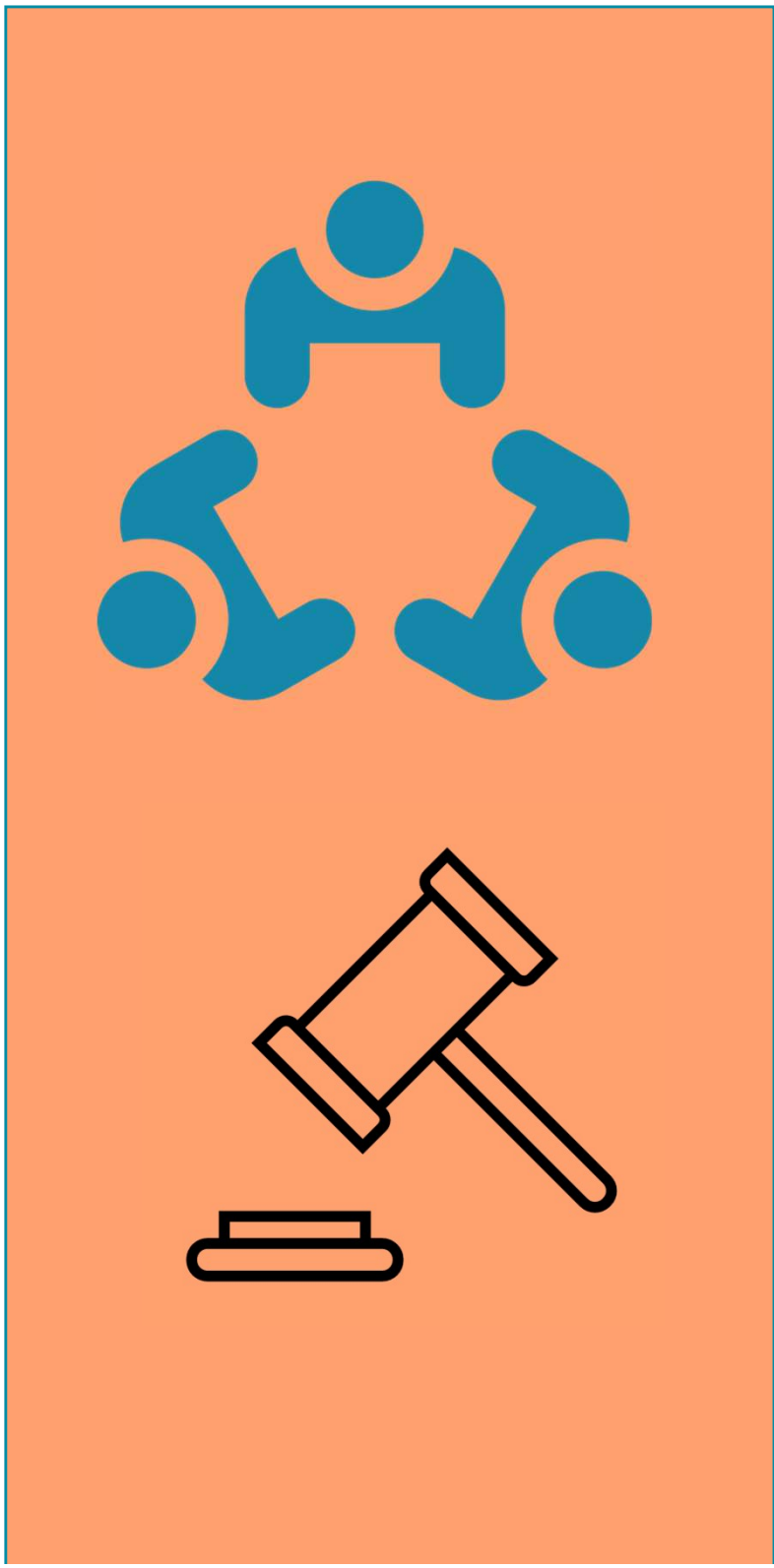
- ✓ Vendors approved to deliver products, services, or results based on the procurement requirements identified for a project.
- ✓ The list of qualified vendors can be based on historical information about the vendors.
- ✓ If the required resources are new to the organization, market research can help to ”vet” them.

Bidder Conferences

These are 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 known as contractor conferences, vendor conferences, or pre-bid conferences.

- ✓ Buyer explains the requirements, proposed terms, and conditions; buyer clarifies the vendors' queries.
- ✓ Buyer ensures all prospective vendors have a clear and common understanding of technical and contractual requirements of the procurement.



External Resource Requirements and Needs

Sometimes you need to move beyond the organization to secure services and expertise from outside sources on a contract or short-term basis.

External resource are used commonly.

It helps businesses to focus more on their core competencies.

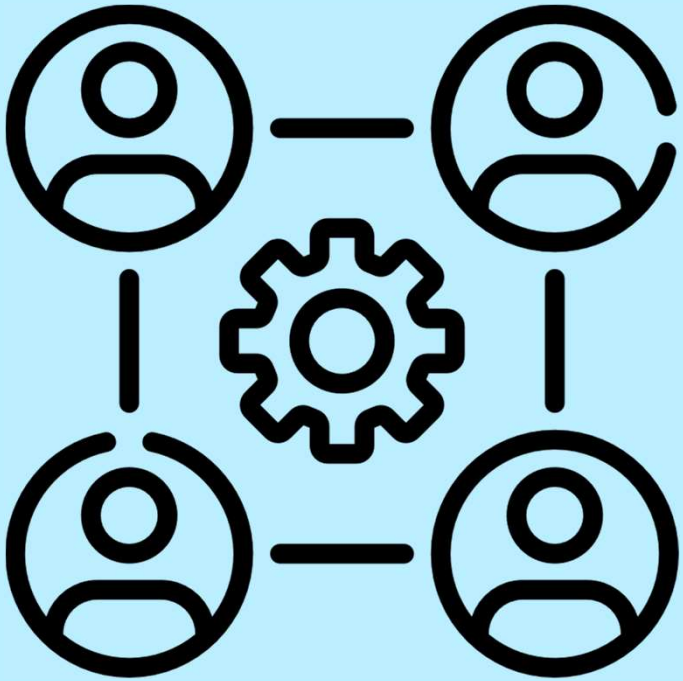
Supplier and Contracts

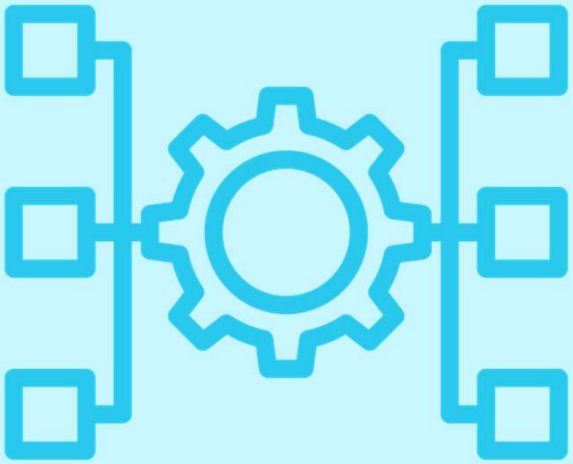
Contract - A mutually binding agreement that obligates the seller (**supplier**) to provide the specified project or service or result and obligates the buyer to pay for it.

- ✓ Customized for each agreement
- ✓ Contract types:
  - Fixed-price
  - Cost-reimbursable
  - Time-and-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 Communications Management Plan for provisions for working with vendors or suppliers, such as:
  - Periodic progress reports of supplier activities.
  - Advance notification of potential supplier cost overruns or schedule delays, and acknowledgement by the project manager to the supplier.
  - Formal acceptance by the project manager of supplier's contract deliverables.





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

Traditional Contract Types

Contract type	Description
Fixed-price	• 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. • Also known as a lump sum contract. • 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	• A contract involving 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. • Suited for projects when parameters are uncertain.
Time and Material (T&M)	• A type of contract that 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. • Include 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.

Agile Contract Types

Contract Type	Description
Capped Time and Materials Contracts	• Works like 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.
Target Cost Contracts	• Supplier and customer agree on final price during project cost negotiation. • Primarily for mutual cost savings if contract value runs below budget. • These contracts may allow both parties to face additional costs if it exceeds budget.
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

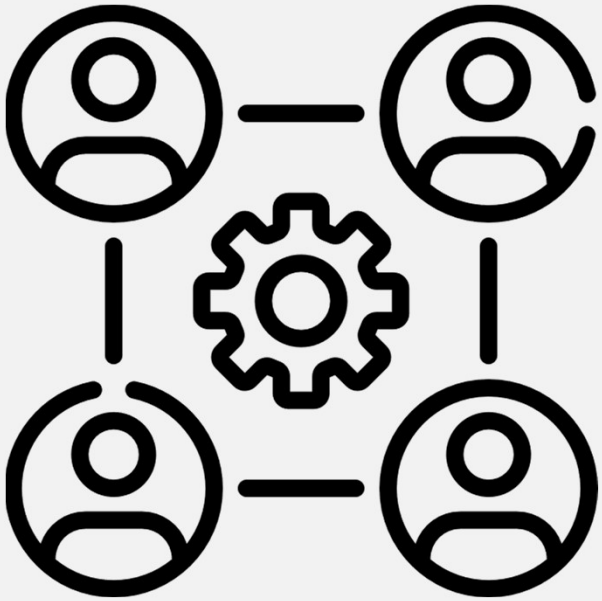
The process of managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate, and closing out contracts.


Notify the appropriate entity (usually Accounts Payable) when work has been fulfilled and contracts can be paid.

Contract Change Control System

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

- ✓ 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.



Types of Contract Changes

Component	Description
Administrative changes	Non-substantive changes, usually about the way the contract is administered.
Contract modification	A substantive change to the contract requirements such as a new deadline or a change to the product requirements.
Supplemental agreement	An additional agreement related to the contract but negotiated separately.
Constructive changes	Changes that the buyer may have caused through action or inaction.
Termination of contract	A contract may be terminated due to vendor default or for customer convenience. Defaults are due to nonperformance, such as late deliveries and poor quality, or nonperformance 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 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 (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.

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

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 apply 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.

Establish Project Governance Structure

TOPIC H

Deliverables and Tools

Stakeholder Artifacts

Meetings

Leverage Organizational Process Assets

PMIS

Update documents

Project Governance

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.

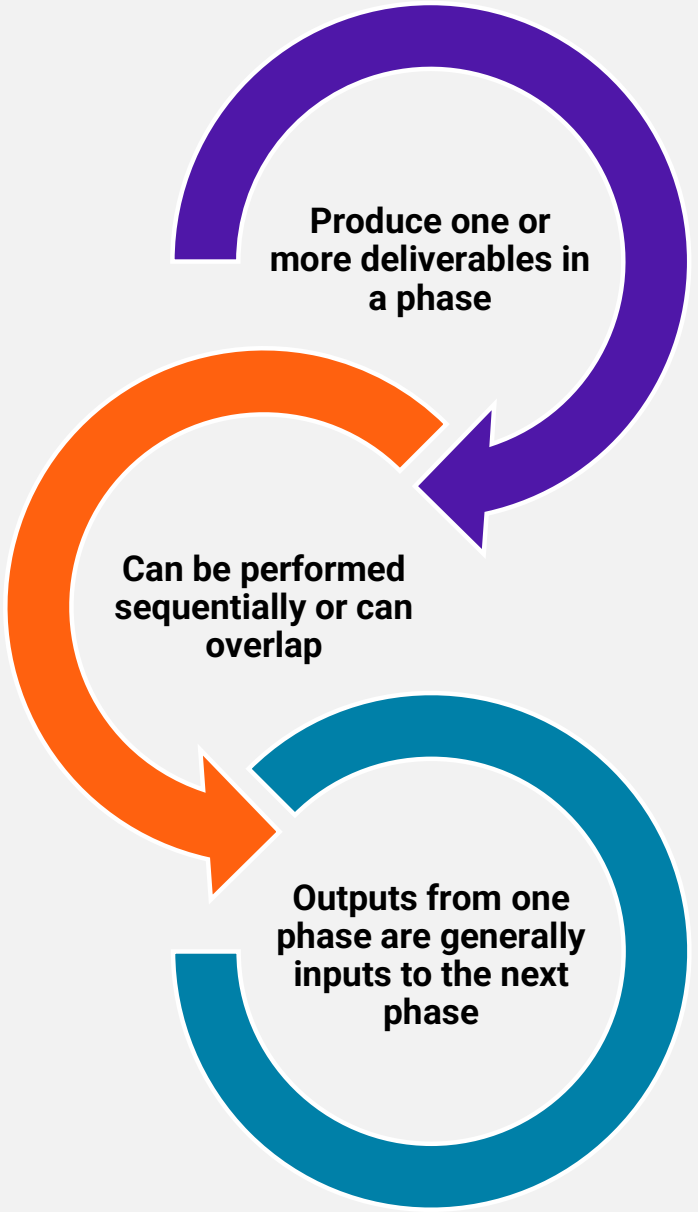
Project Governance

Components:

- ✓ Project success and deliverable acceptance criteria
- ✓ Process to identify, escalate, and resolve issues
- ✓ Relationship 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

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



Apply Governance to the Project Life Cycle

- ✓ 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.

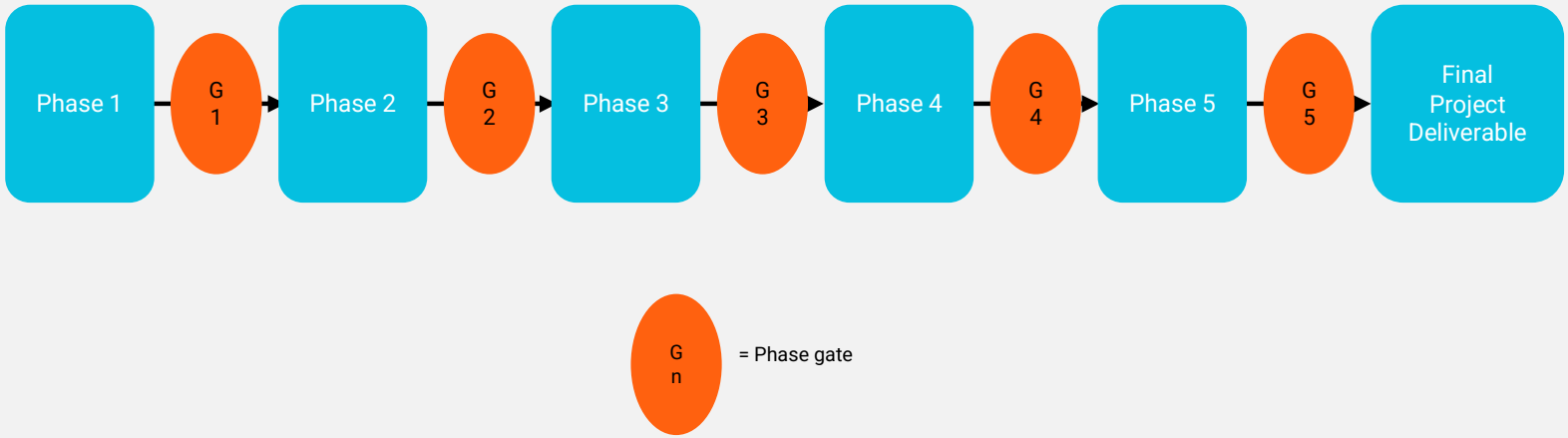
Phase Gates

A 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.

Synonyms include governance gate, tollgate, and kill point.

Used to check if each phase has fulfilled the exit criteria and is eligible to move to the next step.

Software development projects use a specialized type of phase gate called a quality gate.



Phase-to-Phase Relationships

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.

Plan and Manage Project/Phase Closure

TOPIC I

Deliverables and Tools

Definition of Done

Accepted Deliverables

Nil

Close Project or Phase

Several important activities occur during closeout:

- ✓ 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:

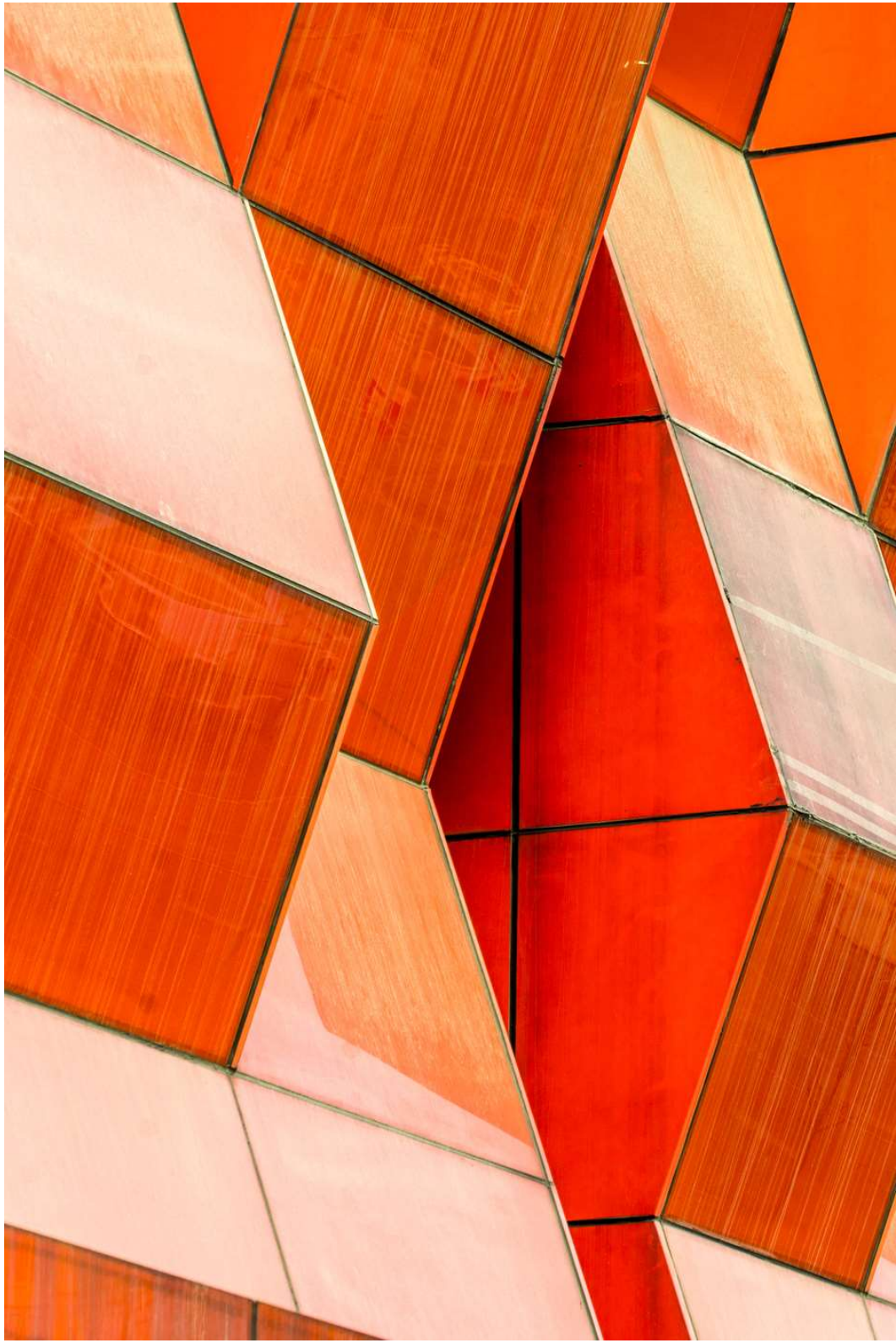
- The project or phase successfully met its completion objectives.
- Requirements changed during execution and the project is no longer feasible.
- Funding is no longer available to complete the requirements.
- Significant risks make the successful completion of the project impossible.
- The organization 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

Use the Lessons-Learned Register

Considerations:

- ✓ Scheduling lessons learned
- ✓ Conflict management lessons learned
- ✓ Sellers lessons learned
- ✓ Customer lessons learned
- ✓ Strategic lessons learned
- ✓ Tactical lessons learned
- ✓ Any other aspects of lessons learned

Knowledge Management

DEFINITION

A store of historical information about lessons learned in projects.

Knowledge Management

- ✓ Knowledge management during project or phase closure consists 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

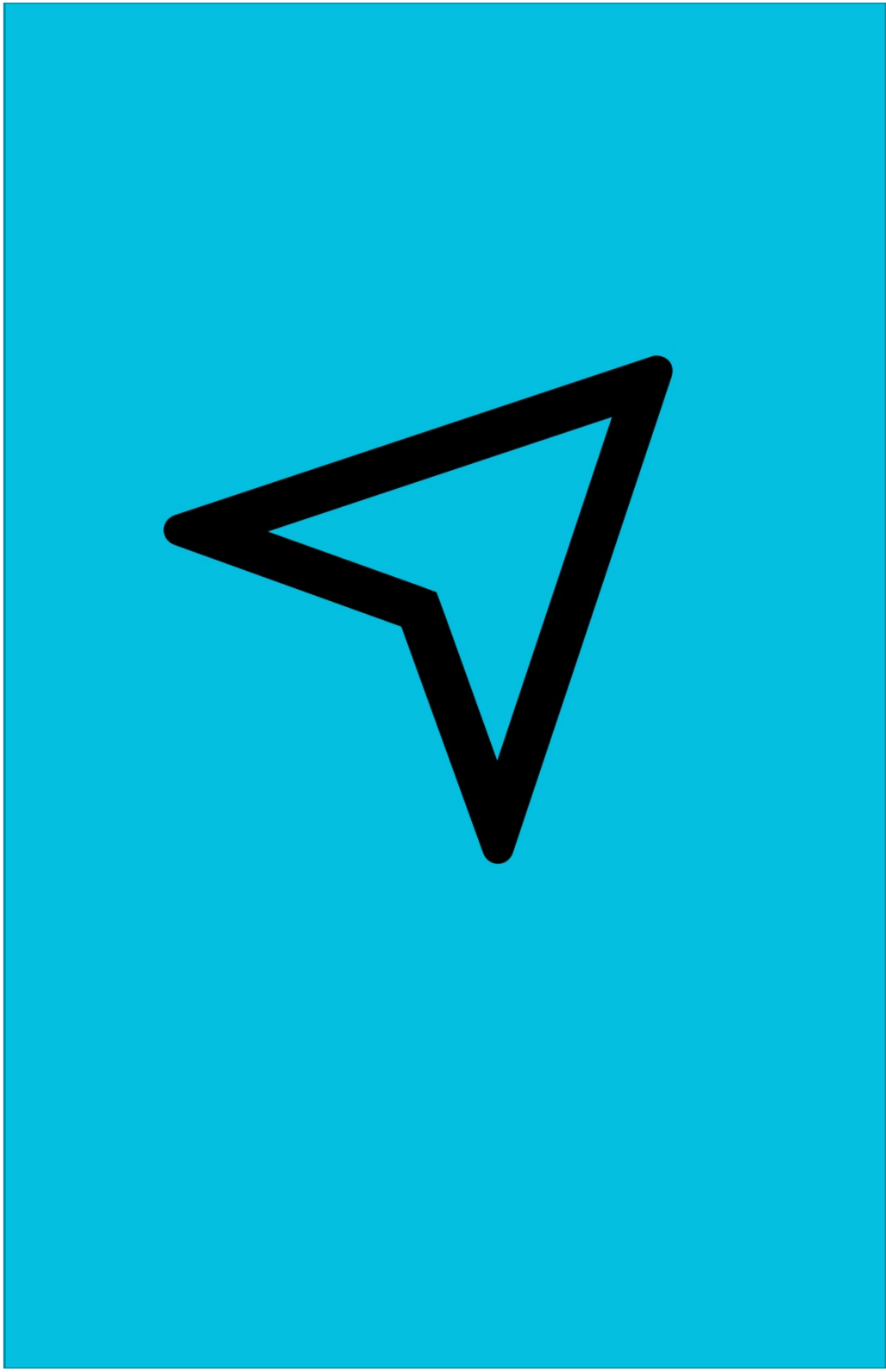
Transition Planning Artifacts

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 of artifacts includes:

- ✓ Training
- ✓ Documentation
- ✓ Communication
- ✓ Support



Transition Readiness

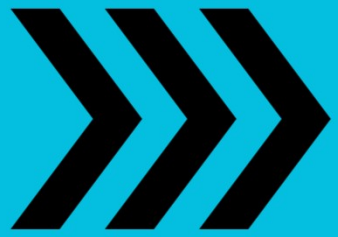
Releasing, delivering, and deploying the project's work into an environment that is not ready may negate its value.

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 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.
- 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 Module 2