Unit 2: Project Integration Management

The Key to Overall Project Success: Good Project Integration Management

- Project managers must coordinate all of the other knowledge areas throughout a project's life cycle.

- Many new project managers have trouble looking at the **"big picture"** and want to focus on too many details (Jotor and Moses experience).

- Project integration management is the **HEART** of project management and is made up of the day-to-day processes the project manager relies on to ensure that all of the parts of the project work together.

Project Integration Management

- Put simply, project integration management is the way the gears of the project work together.

- Within any project there are many moving parts: time management, cost management, schedule conflicts, human resource issues, iterative planning, and much, much more.

- Project integration management is the art and science of ensuring that your project moves forward, and that your plan is fully developed and properly implemented.

Project Integration Management

- Project integration management requires finesse /diplomacy

- It requires the ability to accomplish your project plan.

- It requires leadership, record keeping, and political know-how, given you'll have to deal with potential changes throughout your project implementation.

- And, perhaps most importantly, it requires flexibility and adaptability throughout the project plan execution.

Project Integration Management Processes

2.1 Develop Project Charter—The process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.

2.2 Develop Project Management Plan—The process of defining, preparing, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan. The project's integrated baselines and subsidiary plans may be included within the project management plan.

2.3 Direct and Manage Project Work—The process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.

Project Integration Management Processes (cont'd)

2.4 Monitor and Control Project Work—The process of tracking, reviewing, and reporting project progress against the performance objectives defined in the project management plan.

2.5 Perform Integrated Change Control—The process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating their disposition/nature, character/.

2.6 Close Project or Phase—The process of finalizing all activities across all of the Project Management Process Groups to formally complete the phase or project.

2.1 Develop Project Charter

Inputs:

- **Project statement of work** (product scope description, strategic plan: strategic vision, goals, and objectives and a high-level mission statement)

- **Business case:** a justification for the proposed project

- **Agreements** (Agreements are used to define initial intentions for a project. Agreements may take the form of contracts, memorandum of understanding (MOU), service level agreements (SLA), letter of agreements, letters of intent, verbal agreements, email, or other written agreements.

- **Enterprise environmental factors (**Governmental standards, industry standards, or regulations e.g. codes of conduct, quality standards, or worker protection standards; organizational culture and structure,)

- **Organizational process assets** (templates, historical information, policies & process definition)

Tools and Techniques: Expert judgment and Facilitation techniques (brainstorming, conflict resolution, problem solving)

Output: Project Charter

Chartering the Project

- The project charter is the project's "license to do business."
- It is the document that formally authorizes/approve/ a project.
- Key project stakeholders should sign a project charter to acknowledge agreement on the need and intent of the project.
- The project charter provides the project manager with the authority to apply organizational resources to project activities.

Components of a Charter

- Project purpose or justification,
- Measurable project objectives,
- High-level requirements,
- Assumptions and constraints,
- High-level project description and boundaries,
- Summary milestone schedule,
- Summary budget,
- Stakeholder list,
- Project approval requirements (i.e., what constitutes project success, who decides the project is successful, and who signs off on the project),
- Assigned project manager, responsibility, and authority level, and
- Name and authority of the sponsor or other person(s) authorizing the project charter.

2.2 Develop Project Management Plan

- Developping Project Management Plan is the process of defining, preparing, and coordinating all subsidiary/minor/ plans and integrating them into a comprehensive project management plan.
- The key benefit of this process is a central document that defines the basis of all project work.
- A **Project Management Plan** is a document used to coordinate all project planning documents and help guide a project's execution and control.
- Developing Project Management Plan process includes the actions necessary to define, integrate, and coordinate all subsidiary plans into project management plan.

2.2 Develop Project Management Plan

Inputs:

a. Project Charter

b. Organizational Process Assets

c. Enterprise Environmental Factors

d. Outputs of Planning Processes

Tools:

- Expert Judgment and facilitation techniques

- Earned value management: a tool to integrate the project scope, schedule, resource and to measure and report project performance

- Project management methodology: any structured approach to guide the project team, like scheduling software

Output: The Project Management Plan

2.2 Develop Project Management Plan

- Details of the decisions specified by the project management plan team are as follows:

  - Project management processes selected by the project management team,

  - Level of implementation for each selected process,

  - Descriptions of the tools and techniques to be used for accomplishing those processes, and

  - Description of how the selected processes will be used to manage the specific project, including the dependencies and interactions among those processes and the essential inputs and outputs.

- Description of how work will be executed to accomplish the project objectives;

2.2 Develop Project Management Plan

- Change management plan that documents how changes will be monitored and controlled;

- Description of how the integrity of the project baselines will be maintained;

- Requirements and techniques for communication among stakeholders; and

- Key management reviews for content, the extent of, and timing to address, open issues and pending decisions.

Attributes of Project Plans

- Just as projects are unique, so are project plans.

- Plans should be:
  - Dynamic
  - Flexible
  - Updated as changes occur

- Plans should first and foremost guide project execution by helping the project manager lead the project team and assess project status.

2.3 Direct and Manage Project Execution

Inputs:

a.   Approved Change Request

b.   Project Management Plan

c.   Enterprise Environmental Factors

d.   Organizational Process assets

Tools:

a.   Expert Judgment

b.   Project Management Information System: tools used to gather, integrate and disseminate the outputs of a project management process

c.   Meetings

Outputs:

a.   Work Performance Data

b.   Deliverables

c.   Change Requests

d.   Project Document Updates

e.   Project Management Plan Updates

2.3 Direct and Manage Project Execution

- Direct and Manage Project Work is the process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.

- The key benefit of this process is that it provides overall management of the project work.

- Direct and Manage Project Work activities include, but are not limited to:

  - • Perform activities to accomplish project objectives;

  - • Create project deliverables to meet the planned project work;

  - • Provide, train, and manage the team members assigned to the project;

  - • Obtain, manage, and use resources including materials, tools, equipment, and facilities;

2.3 Direct and Manage Project Execution

- Implement the planned methods and standards;

- Establish and manage project communication channels, both external and internal to the project team;

- Generate work performance data, such as cost, schedule, technical and quality progress, and status to facilitate forecasting;

- Issue change requests and implement approved changes into the project's scope, plans, and environment;

- Manage risks and implement risk response activities;

- Manage sellers and suppliers;

- Manage stakeholders and their engagement; and

- Collect and document lessons learned and implement approved process improvement activities.

2.3 Direct and Manage Project Execution

- The project manager, along with the project management team, directs the performance of the planed project activities, and manages the various technical and organizational interfaces that exist within the project.

- The direct and manage project execution processes is most directly affected by the project application area.

- Deliverables are produced as outputs from the processes performed to accomplish the project work planed and scheduled in the project management plan.

- Work performance information about the completion status of the deliverables, and what has been accomplished, is collected as part of the project execution and is fed into the performance reporting process.

2.3 Direct and Manage Project Execution

- Direct and Manage Project Work also requires review of the impact of all project changes and the implementation of approved changes:

- **Corrective action**—An intentional activity that realigns/readjust/ the performance of the project work with the project management plan;

- **Preventive action**—An intentional activity that ensures the future performance of the project work is aligned with the project management plan; and/or

- **Defect repair**—An intentional activity to modify a nonconforming product or product component.

2.4 Monitor and control project work

- Monitor and Control Project Work is the process of tracking, reviewing, and reporting the progress to meet the performance objectives defined in the project management plan.

- The key benefit of this process is that it allows stakeholders to understand the current state of the project, the steps taken, and budget, schedule, and scope forecasts.

- Monitoring collecting, measuring and disseminating performance information, and assessing measurements and trends to effect process improvements.

- Continuous monitoring gives the project management team insight into the health of the project, and identifies any areas that can require special attention.

2.4 Monitor and Control Project Work

Inputs:

a. Project Management Plan

b. Schedule Forecasts

c. Cost Forecasts

d. Validated Changes

e. Work Performance Information

f. Enterprise Environmental Factors

g. Organizational Process Assets

Tool: Expert Judgment, Analytical Techniques, PMIS, meetings

Outputs:

a. Change Requests

b. Work Performance Reports

c. Project Management Plan Updates

d. Project Document Updates

2.4 Monitor and Control Project Work

- Perform Integrated Change Control is the process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating their disposition/nature/.

- It reviews all requests for changes or modifications to project documents, deliverables, baselines, or the project management plan and approves or rejects the changes.

- The key benefit of this process is that it allows for documented changes within the project to be considered in an integrated fashion while reducing project risk, which often arises from changes made without consideration to the overall project objectives or plans.

2.4 Monitor and Control Project Work

- Comparing actual project performance against the project management plan and the baselines indicated therein.

- Assessing performance to determine whether any corrective or preventive actions are indicated, and then recommending those actions are necessary analyzing, tracking, and monitoring project risks to make sure the risks are identified, their status is reported, and that appropriate risk response plans are being executed.

- Maintaining an accurate, timely information base concerning the project's product and their associated documentation through the project completion

- Providing information to support status reporting, progress measurements, and forecasting

2.5 Perform Integrated Change Control

Inputs:

- Project management plan
- Work performance reports
- Change requests
- Enterprise environmental factors
- Organizational Process Assets

Tools: Expert Judgment, Meetings and Change Control Tools

Outputs:

- Approved change requests
- Change log/record
- Project management plan updates
- Project documents updates

2.6 Close project

Inputs:

- Project management plan
- Accepted deliverables
- Organizational process assets

Tool: Expert Judgment, Meetings, Analytical Techniques

Outputs:

- Final product, service, or result transition
- Organizational process assets updates

2.6 Close project

- The close project process involves performing the project closure portion of the project management plan.

- In the multi-phase projects the close project process closes out the portion of the project scope and associated activities applicable to a given phase.

- This process includes finalizing all activities completed across all project management process groups to formally close the project or a project phase, And transfer the completed or canceled project as appropriate.

- The close project process also establishes the procedures to coordinate activities needed to verify and document the project deliverables, to coordinate the interact to formalize acceptance of those deliverables by the customer or sponsor, and to investigate and document the reasons of actions taken if a project is terminated before completion.

2.6 Close project

- Two procedures are developed to establish the interactions necessary to perform the closure activities across the entire project or for the project phase.

- **1. Administrative closure procedure.** This procedures details all the activities, interactions, and related roles and responsibilities of the project team members and other stakeholders involved in executing the administrative closure procedures for the project

- Performing the administrative closure process also includes the integrated activities needed to collect project records, analyze project success or failure, gather lessons learned, and archive project information for further use by the organization.

2.6 Close project

- **2. Contract closure procedures.** Includes all activities and interactions needed to settle and close any contract agreement established for the project, as well as define those related activities supporting the formal administrative closure of the project.

- This procedure involves both products verification (all work completed correctly and satisfactorily) and administrative closure (updating of contract records to reflect final result and archiving that information for further use).

- The contract terms and conditions can also prescribe specifications for contract closure that must be part of this procedure.

- Early termination of a contract is a special case of contract closure that could involve, for example, the inability to deliver the product, a budget overrun, or lack required resources.

- This procedures is an input to the close contract process.

Unit 3: Project Scope Management

Unit 3: Project Scope Management

- Project scope management includes the processes required to insure that the project includes all the work required, and only the work required, to complete the project successfully.

- Project scope management is primarily concerned with defining and controlling what is and is not included in the project.

3.1 Plan Scope Management

- It documents how the project scope will be defined, validated, and controlled.

- The key benefit of this process is that it provides guidance and direction on how scope will be managed throughout the project life cycle.

Unit 3: Project Scope Management…

3.2 Collect Requirements- we find out all of the stakeholders' needs and write them down so that we know what we build.

3.3 Define Scope- developing a detailed project scope statement as the base for future project decisions.

3.4 Create WBS- subdividing the major project deliverables and project work into smaller more manageable components.

3.5 Control Scope - controlling changes to the project scope. These processes interact with each other and with processes in the other knowledge areas as well.

3.6 Validate Scope: The process of formalizing acceptance of the completed project deliverables.

Unit 3: Project Scope Management…

In the project context, the term scope can refer to:

- **Product scope**- The features and functions that characterize a product, service, or result

- **Project scope:**The work that needs to be accomplished to deliver a product, service, or result including the work that will not be done.

3.1 Plan Scope Management

Inputs:

a. Project Management Plan

b. Project Charter

c. Enterprise Environmental factors

d. Organizational Process Assets

Tools:

a. Expert Judgment

b. Meetings

Outputs:

a. Scope Management Plan

b. Requirements Management Plan

3.2 Collect Requirements

- Gathering requirements is all about sitting down with all of the stakeholders for your project and working out what their needs are, and that's what you do in the **Collect Requirements process.**

- **If your project is going to be** successful, you need to know what it will take for all of your stakeholders to agree that your project has met its goals.

- You need to have a good idea of what's required of your project up front, or you'll have a tough time knowing whether or not you're doing a good job as you go.

- That's why you need to write down all of your project and product requirements with enough detail that you can measure your team's progress.

3.2 Collect Requirements

Inputs:

a. Stakeholder Management Plan
b. Project Charter
c. Requirements Management Plan
d. Stakeholder Management Plan: stakeholder comm. requirements
e. Stakeholder Register

Tools

a. Interviews
b. Facilitated Workshops
c. Focus Groups Discussion
d. Group creativity techniques (brainstorming, nominal group technique, mind/idea mapping, affinity diagram, multi-criteria decision analysis)
e. Observation,
f. Surveys

Output: Requirements Documentation

Requirements Traceability Matrix

3.2 Collect Requirements …

- In collecting requirements, we follow three steps:

a. **You start with the stakeholders for your project.** They've a **need** that your project can meet

b. **Next you figure out how these needs benefit your company** and write a business case for them

c. When you write down your requirements, you're saying exactly how these needs will be met.

- The **requirements traceability matrix** is a tool that you use to trace each requirement back to a specific business case, and then forward to the rest of the scope deliverables (like specific WBS work packages), as well as other parts of the project: the product design (like specific levels) *or test strategy (like test plans).*

3.2 Collect Requirements …

- Explanation of the tools

a. **Mind Maps**: visualizing our ideas and developing a map as to how we get there

b. **Delphi Technique**: letting everyone in the group give their thoughts and let them hand the response to the moderator. The groups are kept anonymous. We share only these ideas

c. **Affinity Diagrams**: posting ideas in walls and moving them around in order to regroup them

d. **Brainstorming**: to think of new ideas

e. **Nominal Group Technique**: write the ideas as you find them and have the group vote on which ones they like the most. Use the vote to rank all of the ideas

f. **Using Prototype**: models of the product you want to produce

3.3 Define Scope

- The Define Project Scope Process contains everything you need to know before you can begin to break the project down into the work that the team members will do.

Inputs

a. Project Charter
b. Requirements Document
c. Organizational Process Assets

Tools:

a. **Facilitated Workshops**:
b. **Product Analysis**: turn product elements to project work
c. **Alternative Identification**: to think of different ways how to do the work
d. **Expert Judgment**: bring in an expert to help you figure out what work needs to be done

Output: Scope Statement

3.4 Create WBS

- The **Create WBS** process is the most important process in the Project Scope Management Knowledge area because it is where we actually figure out all the work we're going to do.

Inputs

a. Requirements Document
b. Project Scope Statement
c. Organizational Process Assets

Tool: Decomposition

Outputs

a. Work Breakdown Structure
b. Scope Baseline
c. WBS Dictionary
d. Project Document Updates

3.4 Create WBS …

- **WBS**: shows the name of each work package. It is created by decomposing large work products into work packages.

- A *product-oriented, hierarchical structure* that defines all work required for the hardware, software, data services, and process activities to be provided or performed by the project.

- Each descending level represents an increasingly detailed definition of a project component.

- **WBS Dictionary**: brings along all of the details we need to do the project work. It is a description of each work package listed in the WBS. It is a *definition of the scope* of each WBS element

- **Scope Baseline**: is a snapshot of the plan we use to compare against

- **Project Document Updates**: changes to the project management plan and other project documents

WBS

- A WBS is the cornerstone of effective project planning, execution, controlling, statusing, and reporting.

- The WBS is the structure and code that integrates and relates all project work (scope, schedule, and cost). Therefore, the WBS contains the project's scope baseline necessary to achieve the technical objectives of the work described.

- The WBS is used as a management tool throughout the life cycle of a project to identify, assign, and track its total work scope.

3.4 Create WBS …

- **Why Scope Changes?**

Scope can change for several reasons

a. **Good change**: to make the product better: gold plating

b. **Bad change**: due to scope creep

Scope creep: scope gets out of control

Gold plating: making something without talking over with anybody thinking it would bring something good.

WBS - Purpose

❖ **To plan a project, the total scope of work must be:**

- ◦ **identified**

- ◦ **subdivided into manageable segments**

- ◦ **estimated,**

- ◦ **scheduled,**

- ◦ **budgeted**

- ◦ **assigned to individuals responsible to do the work**

- ◦ **documented**

WBS - Guidelines

- **Should reflect how the Project Manager plans to manage the project**

- **Emphasis must be on meeting project objectives**

- **The larger or more complex the project, the more levels in the WBS**

- **If work is needed that requires effort or funding, it should be included in the WBS**

- **It should reflect the total effort**

WBS

- The project manager is to structure the project work into WBS elements (work packages) that are:

- **Definable**—can be described and easily understood by project participants.

- **Manageable**—a meaningful unit of work where specific responsibility and authority can be assigned to a responsible individual.

- **Estimateable**—duration can be estimated in time required to complete, and cost can be estimated in resources required to complete.

- **Independent**—minimum interface with or dependence on other ongoing elements (i.e., assignable to a single control account, and clearly distinguishable from other work packages).

WBS

- **Integratable**—integrates with other project work elements and with higher level cost estimates and schedules to include the entire project.

- **Measurable**—can be used to measure progress; has start and completion dates and measurable interim milestones.

- **Adaptable**—sufficiently flexible so the addition/elimination of work scope can be readily accommodated in the WBS framework.

Guidelines - continued

- **Include three types of project work**

  ○ ## Product

    · **Specifically assigned to a physical product as a unique deliverable**

    · **This subset is sometimes referred to as the product breakdown structure**

  ○ ## Integration

    · **When products are brought together as a unit**

    · **Can be at any level**

  ○ ## Support

    · **Level of Effort, Administration, Expenses**

Scheduling Principles - 1

- Compartmentalization
  - ◦ the product and process must be decomposed into a manageable number of activities and tasks
- Interdependency
  - ◦ tasks that can be completed in parallel must be separated from those that must be completed serially
- Time allocation
  - ◦ every task has start and completion dates that take the task interdependencies into account

Scheduling Principles - 2

Effort validation

- project manager must ensure that on any given day there are enough staff members assigned to complete the tasks within the time estimated in the project plan

Defined Responsibilities

- every scheduled task needs to be assigned to a specific team member

Scheduling Principles - 3

- Defined outcomes
  - every task in the schedule needs to have a defined outcome (usually a work product or deliverable)
- Defined milestones
  - a milestone is accomplished when one or more work products from a task have passed quality review

Your WBS Is Important to Monitoring

- It provides a comprehensive, consistent tool for collecting and reporting status
  - It is the basis for measuring schedule progress against your plan
  - It is the basis for measuring cost progress against your plan
  - It is the basis for reporting status to management

Steps to Creating a WBS

1. Identify all products and services you are required to provide

2. Define the elements of work needed for each product or service

3. Add the work needed

4. Finalize the WBS by iterating until it is complete

2. Define the Work for Your Product

- Identify your make/buy strategy
  - Make it from scratch
  - Modify an existing product
  - Buy it
- Select a life cycle model
- Identify technical work elements needed for each product and sub-product
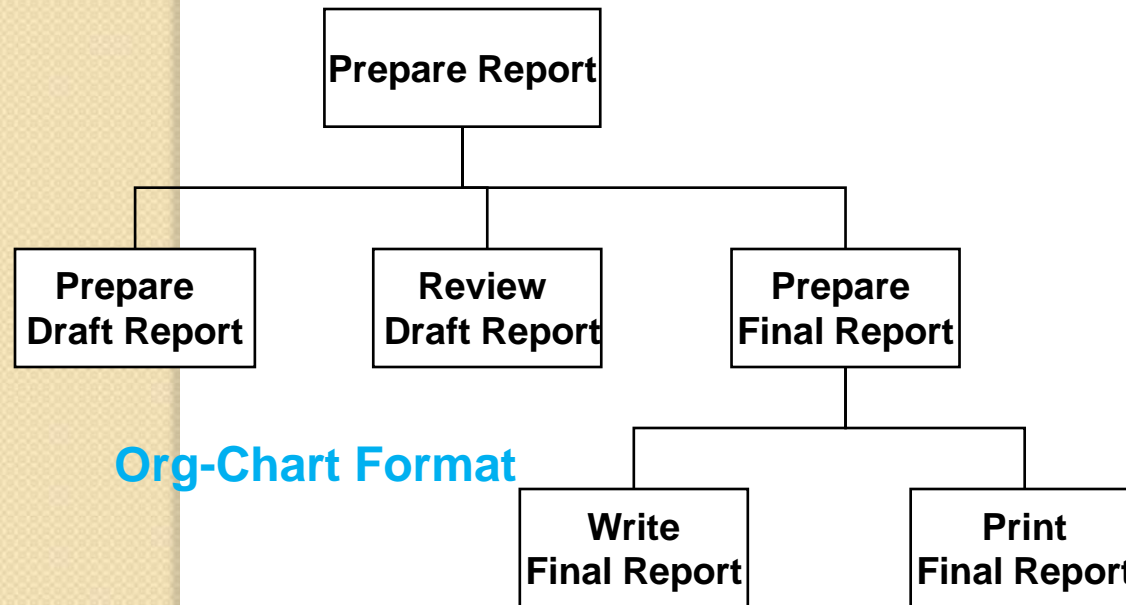
3. Add Management Activities

- Identify additional work elements needed to meet requirements
  - Planning and monitoring activities
  - Reporting activities
  - Acquiring activities
  - Technical monitoring activities (peer reviews, formal reviews, etc.)
  - Risk management activities
  - Measurement activities
  - Stakeholder coordination activities

4. Finalize Your WBS

- Iterate /repeat/ as you refine schedule and cost estimates
  - ◦ Factor in identified risks and mitigation strategies
  - ◦ Group the work elements based on organizational WBS standards or best practices
  - ◦ Keep planned work aligned with budgetary allocations
- WBS activities must result in all required products, sub-products, and services
- Make your WBS product- and service-oriented, not organization-oriented
- Document what each WBS element includes in a WBS dictionary
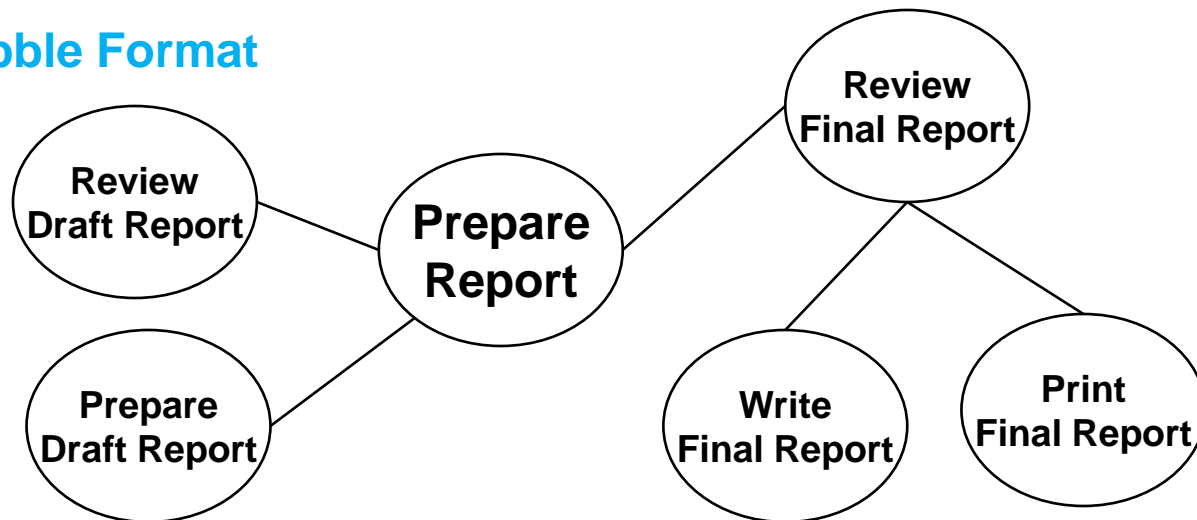
Displaying Work Breakdown Structures

- Three different formats are usually used
- Organization-chart format: most common
  - Effectively portrays an overview of your project and the hierarchical relationships of different activities and tasks.
- Outline format
  - Sub-activities and tasks are indented
- Bubble format
  - The bubble in the center represents your project
  - Lines from the center bubble lead to activities
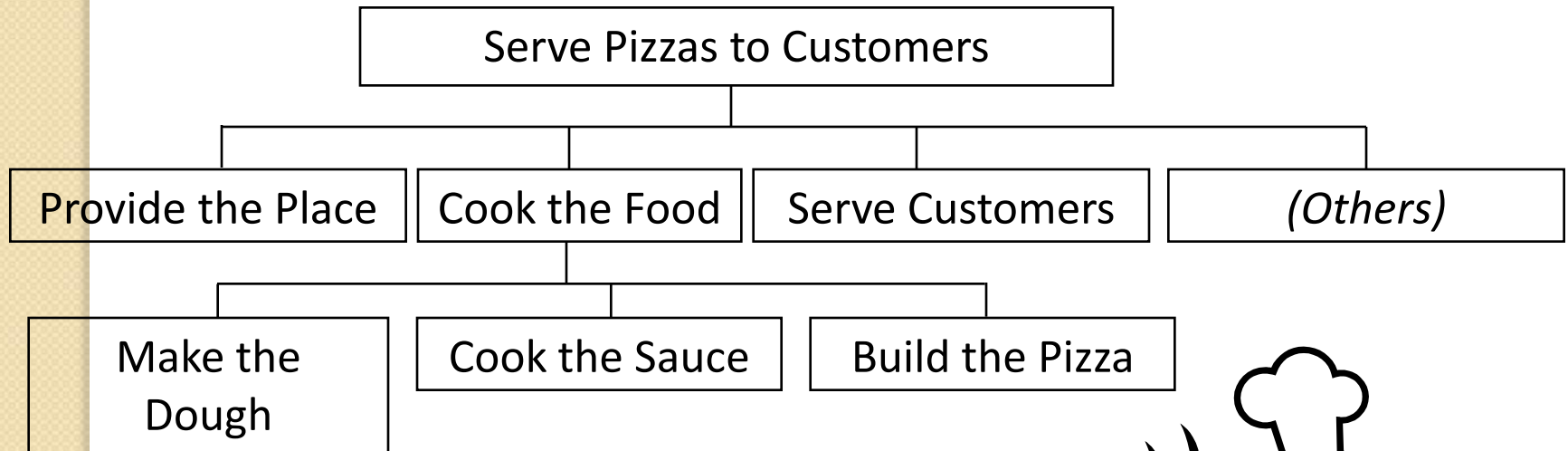 - Lines from activities lead to tasks

Prepare Report

Prepare Draft Report

Review Draft Report

Prepare Final Report

Org-Chart Format

Write Final Report

Print Final Report

Prepare Report
1.0 Prepare draft report
2.0 Review draft report
3.0 Prepare final report
    3.1 Write final report
    3.2 Print final report

Outline Format

Bubble Format

Review Final Report

Review Draft Report

Prepare Report

Prepare Draft Report

Write Final Report

Print Final Report

A sample Work Breakdown Structure

```
                    ┌─────────────────────────────┐
                    │  Serve Pizzas to Customers   │
                    └─────────────────────────────┘
        ┌──────────────┬───────┴────────┬──────────────┐
┌───────────────┐ ┌──────────────┐ ┌──────────────┐ ┌──────────┐
│Provide the Place│ │ Cook the Food │ │Serve Customers│ │ (Others) │
└───────────────┘ └──────────────┘ └──────────────┘ └──────────┘
            ┌──────────┼──────────┐
    ┌──────────────┐ ┌──────────────┐ ┌──────────────┐
    │  Make the    │ │Cook the Sauce│ │Build the Pizza│
    │   Dough      │ │              │ │              │
    └──────────────┘ └──────────────┘ └──────────────┘
```

3.5 Control Scope

- Somewhere along the way, you or someone else will realize that a change needs to happen, and that change will affect the scope baseline

- That's why you need the control scope process

Inputs

a. Project Management Plan

b. Requirements Documents

c. Traceability Matrix

d. Work Performance Information

e. Organizational Process Assets

Tools: Variance Analysis

Outputs:

a. Work Performance Measurements

b. Updates to Organizational Process Assets

c. Project Document Updates

d. Updates to the Project Management Plan

3.5 Control Scope

- Project scope control is concerned with influencing the factors that crate project scope changes and controlling the impact of those changes

- Scope control assures all requested changes and recommended corrective actions are processed through the project inter grated change control process

- Project scope control is also used to manage the actual changes when they occur and is integrated with the other control processes

- Uncontrolled changes are often referred to as the project scope creep

3.6 Validate Scope

Inputs

a. Project Management Plan

b. Requirements Documents

c. Traceability Matrix

d. Deliverables

Tools: Inspection (stakeholders look closely at what the team did)

Outputs:

a. Accepted Deliverables

b. Change Requests

c. Project Document Updates

If things are not done properly, there could be some change

3.6 Validate Scope

- Scope validation is the process of obtaining the stakeholders` formal acceptance of the completed project scope and associated deliverables.

- Validating the project scope includes reviewing deliverables to ensure that each is completed satisfactorily.

- If the project is terminated early, the project scope verification/validation process should establish and document the level and extent of completion.

- Scope validation differs from quality control in that the former is primarily concerned with acceptance of the deliverables, while quality control is primarily concerned with meeting the quality requirements specified for the deliverables.

Unit 4: **Project Schedule/Time Management**

Some challenges of schedule management

- **Role of deadlines**
  - *"LIKE most professional writers, Karl Marx worked best up against a deadline. The "Manifesto of the Communist Party" was written in a few days of round-the-clock creative inspiration in Brussels in January 1848. This intensive, adrenalin-fuelled, intellectual focus produced what was to become the world's best-selling political pamphlet."* (The Economist, Dec. 23, 1999).

    …. **But**: It's not a smart idea to always work against tight deadlines

- **Realistic planning**: How long does it really take to complete task x? ("Double the time" rule)

- **Procrastination/delay**: Replacing high-priority tasks with tasks of low priority - evasion
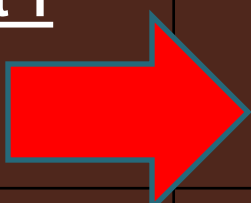
Where do you spend most of your time?

	Urgent	Not Urgent
Important	**Quadrant 1** *Fire fighting*	**Quadrant 2** *Quality time*
Not Important	**Quadrant 3** *Distraction*	**Quadrant 4** *Wasting time*

Source – The Seven Habits of Highly Effective People, by Stephen Covey, 1989

An ideal mix

	Urgent	Not Urgent
Important	**Quadrant 1** **5%**	**Quadrant 2** **80%**
Not Important	**Quadrant 3** **10%**	**Quadrant 4** **5%**

Strategies

	Urgent	Not Urgent
Important	**Do it now**	**Decide when to do it**
Not Important	**Delegate it**	**Dump it**

Further principles and tips

- Concentrate on results, and not on being busy!
- Make a list with tasks, and classify them according to the quadrant
- Break down big tasks into smaller units, and make a time plan for milestones
- Spend your most productive time of the day on the most important tasks! (varies individually)
- Reduce interruptions
- Use the help of a "time coach" (e.g., a friend, who helps you monitor your time plans)

Strategies against procrastination

- What is procrastination?
  - "you procrastinate when you put off things that you should be focusing on right now, usually in favor of doing something that is more enjoyable or that you're more comfortable doing."
- Strategies
  - Recognize that you're procrastinating and find out why you are
    - Finding tasks unpleasant or overwhelming
    - Being unorganized; Perfectionism/Refusal to accept
  - Approaches
    - Think about the consequences of procrastinating
    - Break down overwhelming or unpleasant tasks into smaller units – do them step by step over a period of time
    - Reward yourself for achievements
    - Keep priority lists (see matrix above)

Processes in Project Time Management

4.1 Plan Schedule Management—The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.

4.2 Define Activities—The process of identifying and documenting the specific actions to be performed to produce the project deliverables.

4.3 Sequence Activities—The process of identifying and documenting relationships among the project activities.

4.4 Estimate Activity Resources—The process of estimating the type and quantities of material, human resources, equipment, or supplies required to perform each activity.

Project Schedule Management

4.5 Estimate Activity Durations—The process of estimating the number of work periods needed to complete individual activities with estimated resources.

4.6 Develop Schedule—The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.

4.7 Control Schedule—The process of monitoring the status of project activities to update project progress and manage changes to the schedule baseline to achieve the plan.

- The Project Time Management processes and their associated tools and techniques are documented in the schedule management plan.

- The schedule management plan is a subsidiary plan of, and integrated with, the project management plan through the Develop Project Management Plan process.

- The schedule management plan identifies a scheduling method and scheduling tool and sets the format and establishes criteria for developing and controlling the project schedule.

- The selected scheduling method defines the framework and algorithms used in the scheduling tool to create the schedule model.

- Some of the better known scheduling methods include critical path method (CPM) and critical chain method (CCM).

4.1 Plan Schedule Management

Inputs:

a. Project Management Plan

b. Project Charter

c. Enterprise Environmental factors

d. Organizational Process Assets

Tools:

a. Expert Judgment

b. Analytical Techniques

c. Meetings

Output: Schedule Management Plan

4.2   Define Activities

- Defining the schedule activities involves identifying and documenting the work that is planned to be performed.

- The activity definition process will identify the deliverables at the lowest level in the work breakdown structure (WBS), which is called the work package.

- Project work packages are planned (decomposed) into smaller components called schedule activities to provide a basis for estimating, scheduling, executing, and monitoring and controlling the project work.

- Implicit in this process is defining and planning the schedule activities such that the project objectives will be met.

4.2 Define Activities

Inputs

- Schedule management plan
- Scope baseline
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Decomposition
- Rolling wave planning
- Expert judgment

Outputs

- Activity list
- Activity attributes
- Milestone list

4.3 Sequence Activities

- Activity sequencing involves identifying and documenting the logical relationships among schedule activities.

- Schedule activities can be logical sequenced with proper precedence relationships, as well as leads and lags to support later development of a realistic and achievable project schedule.

- Sequencing can be performed by using project management software or by using manual techniques.

4.3 Sequence Activities: PERT and CPM

Inputs

- Schedule management plan
- Activity list
- Activity attributes
- Milestone list
- Project scope statement
- Enterprise environmental factors
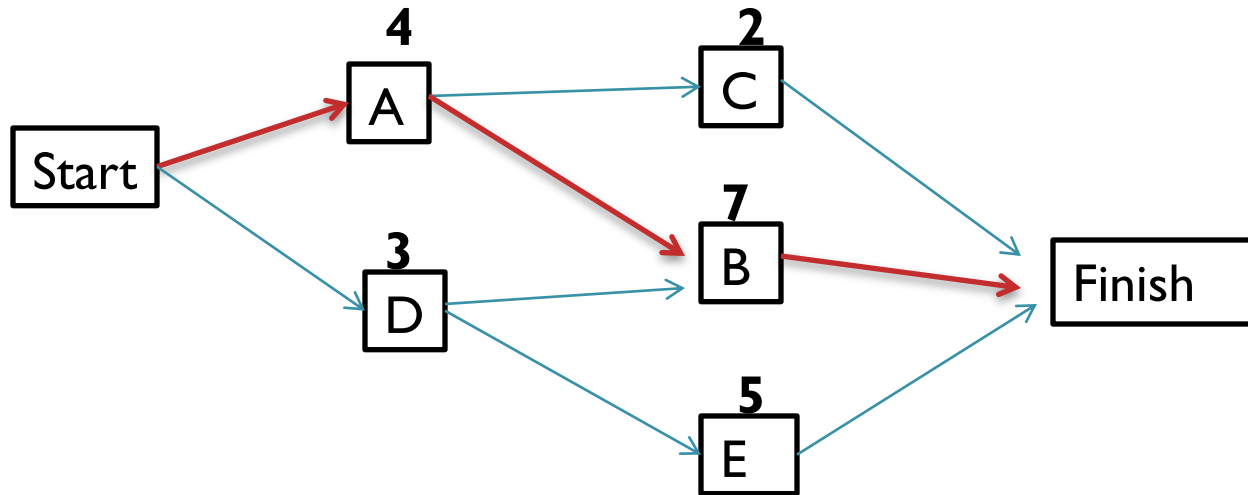- Organizational process assets

Tools & Techniques

- Precedence diagramming method (PDM)
- Dependency determination
- Leads and lags

Outputs

- Project schedule network diagrams
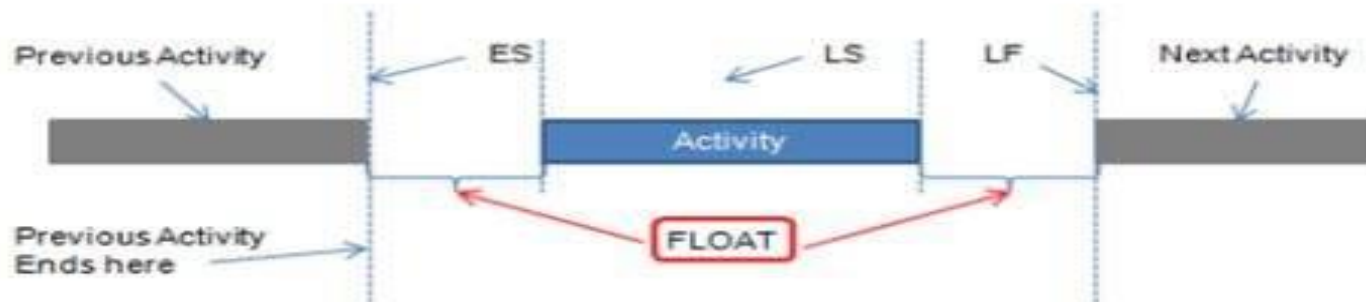- Project documents updates

PDM: How to find the Critical Path

1. Start with an activity network diagram

2. Find all of the paths in the diagram. A path is any string of activities that goes from the start of the project to the end.

3. Find the duration of each path by adding up the durations of each of the activities on the path.

- The critical path is the one with the longest duration

PDM: How to find the ES, S, LS, EF & LF

PDM: How to find the ES, S, LS, EF & LF

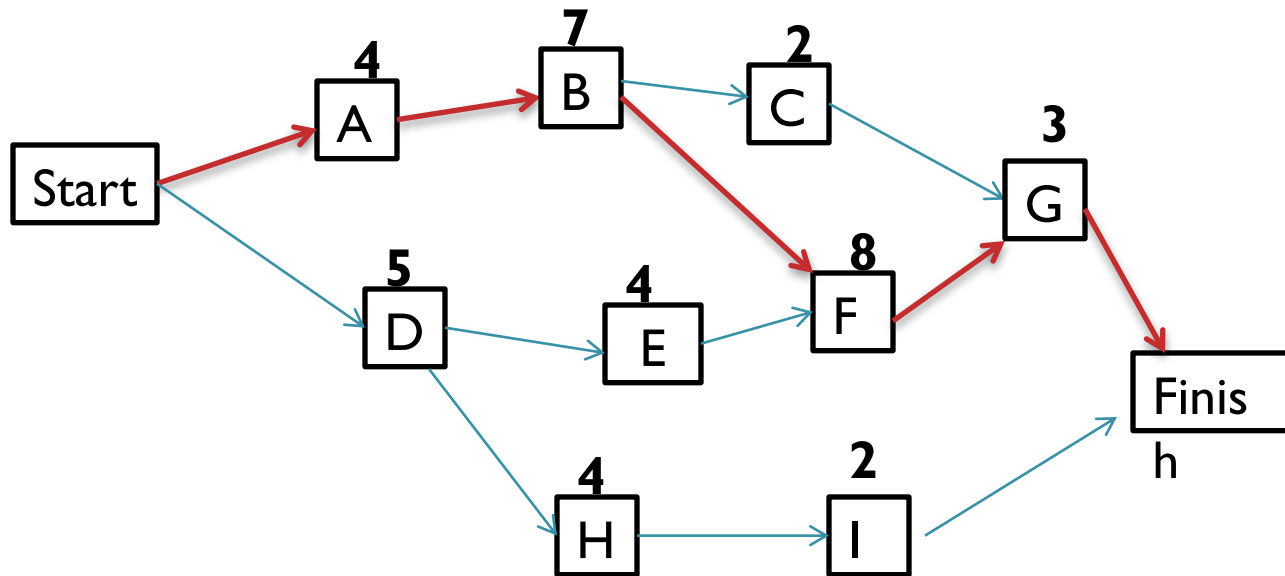| ES	Activity	EF
Slack		
LS	Duration	LF

PDM: How to find the Critical Path

- The float for each of the activities on the critical path is zero.

- Find the **next longest path. Subtract its duration from the duration** of the critical path, and that's the float for each activity on it.

- You can use this method to find the float for every activity in a network diagram.

- Another word for float is slack.

- Do the same for the **next longest path, and so on through the** rest of the network diagram.

- Float tells you how much extra time you have

- Once you know the float, you know how much play you have in your schedule.

Self-check Exercise 1
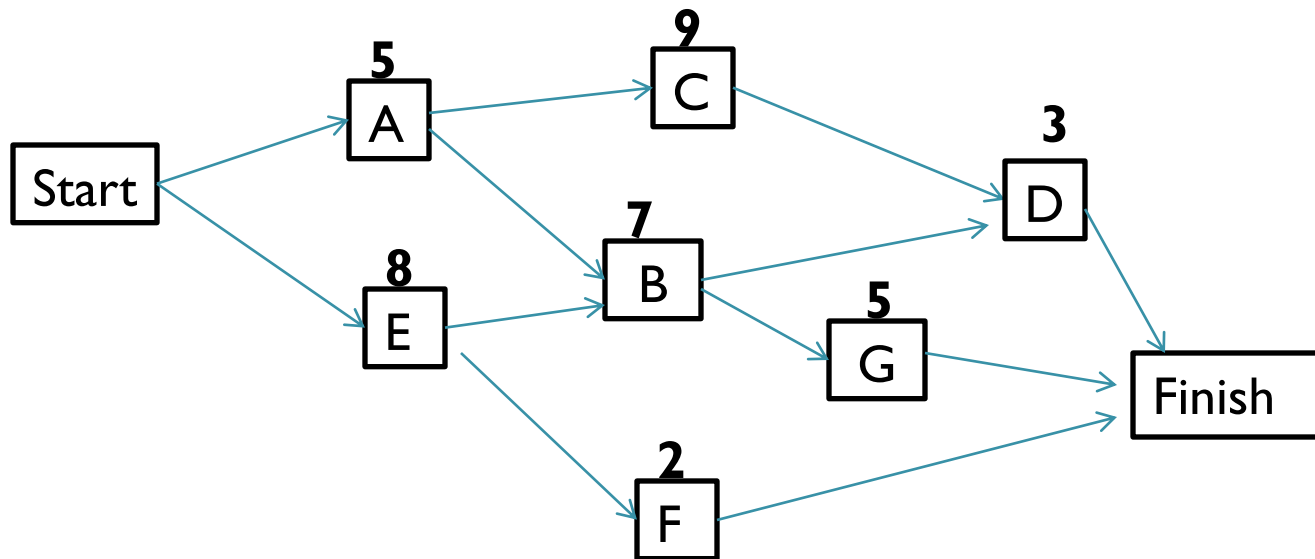
Find the critical path

a) Critical Path: _____
b) Duration of the Critical Path: _____
c) Total Number of Paths: _____
d) Find the float for each path

Self-check Exercise 2

Find the critical path

a) Critical Path: _____
b) Duration of the Critical Path: _____
c) Total Number of Paths: _____
d) Find the float for each path

Self-check Exercise 3

Find the critical path

a) Critical Path: _____
b) Duration of the Critical Path: _____
c) Total Number of Paths: _____
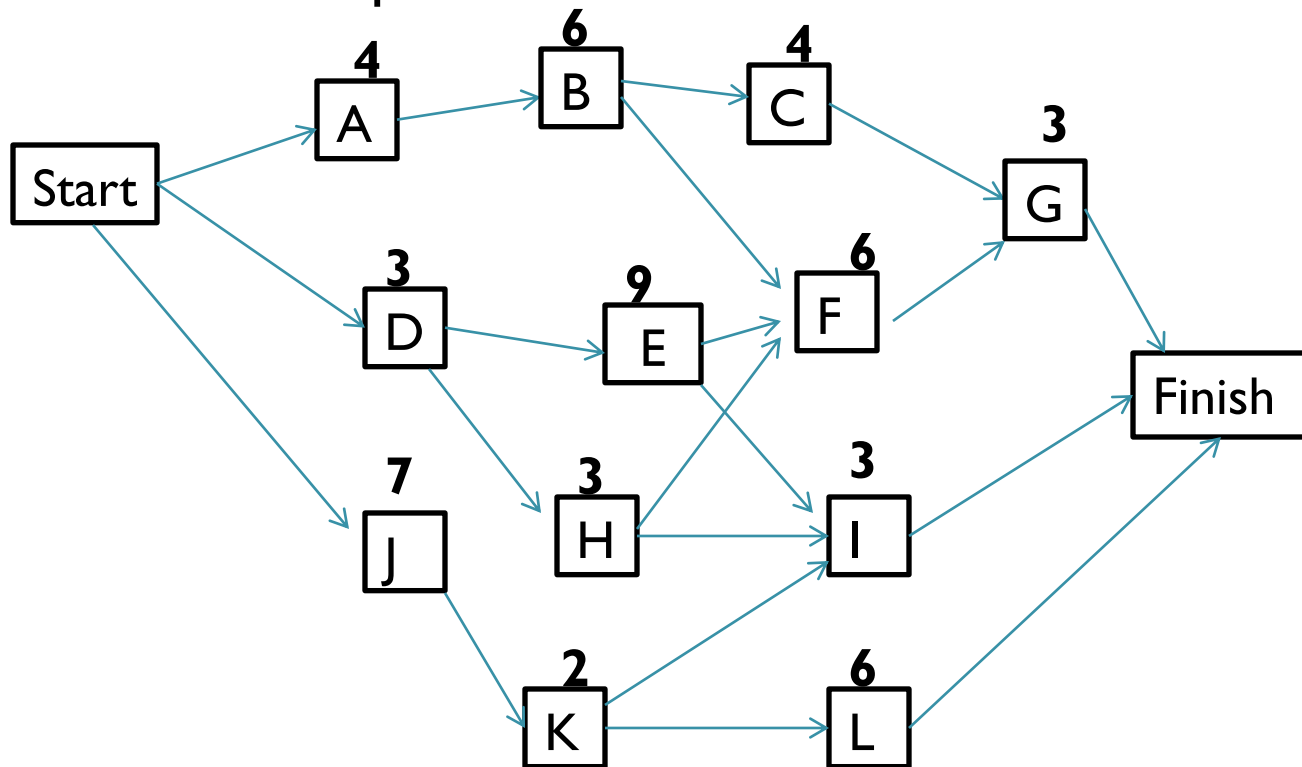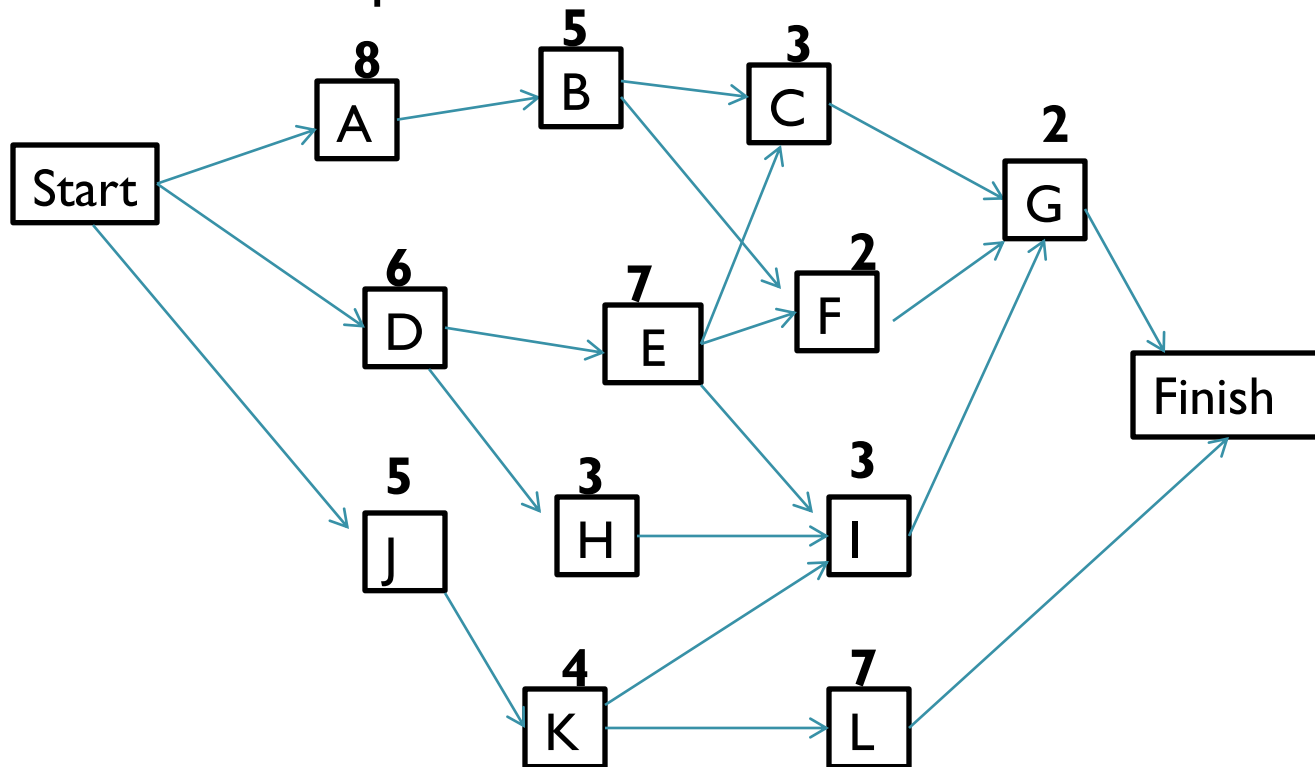d) Find the float for each path

Self-check Exercise 4

Find the critical path

a) Critical Path: _____
b) Duration of the Critical Path: _____
c) Total Number of Paths: _____
d) Float of each path and activities

4.4 Estimate Activity Resources

- Estimating schedule activity resources involves determining what resource (persons, equipment, or material) and what quantities of each resources will be used, and when each resources will be available to perform project activities.

- The activity resource estimating process is closely coordinated with the cost estimating process

4.4 Estimate Activity Resources

Inputs

- Schedule management plan
- Activity list
- Activity attributes
- Resource calendars
- Risk register
- Activity cost estimates
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Expert judgment
- Alternative analysis
- Published estimated data
- Bottom-up estimating
- Project management software

Outputs

- Activity resource requirements
- Resource breakdown structure
- Project documents updates

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4.5 Activity Duration Estimation

- The process of estimating schedule activity durations uses information on schedule activity scope of work, required resource types, estimated resources quantities, and resource calendars with resource availabilities.

- The inputs for the estimates of schedule activity duration originate from the person or group on the project team who is most familiar with the nature of work content is the specific schedule activity.

- The duration estimate is progressively elaborated, and the process considers the quality and availability of the input data.

- For example , as the project engineering and design work evolves, more detailed and precise data is available, and the accuracy of the duration estimates improves.

- Thus, the duration estimate can be assumed to the progressively more accurate and of better quality.

4.5 Activity Duration Estimation

Inputs

- Schedule management plan
- Activity list
- Activity attributes
- Activity resource requirements
- Resource calendars
- Project scope statement
- Risk register
- Resource breakdown structure
- Enterprise environmental factors
- Organizational process assets

Outputs

- Activity duration estimates
- Project documents updates

Tools & Techniques

- Expert judgment
- Analogous estimating
- Parametric estimating
- Three-point estimating (PERT)
- Group decision-making techniques
- Reserve analysis

Activity Duration

(1) The deterministic/knowable/ approach (CPM), which ignores uncertainty thus results in a point estimate (e.g. The duration of task 1 = 23 hours, etc.)

(2) The stochastic/guesing/ approach (PERT), which considers the uncertain nature of project activities by estimating the expected duration of each activity and its corresponding variance.

◦ To analyse the past data to construct the probabilistic distribution of a task.

- Example: An activity was performed 40 times in the past, requiring a time between 10 to 70 hours. The figure below shows the frequency distribution.

Activity Duration

Fig 1. Frequency distribution of activities

Activity Duration

Fig 2. Beta distribution fitted to the data

Activity Duration

Fig 3. Beta Distribution of Activity Times

Activity Duration

- Three key values we use in the time estimate for each activity:

  a = <u>optimistic time</u>, which means that there is little chance that the activity can be completed before this time;

  m = <u>most likely time</u>, which will be required if the execution is normal;

  b = <u>pessimistic time</u>, which means that there is little chance that the activity will take longer.

Activity Duration

- The expected or mean time is given by:

- $T_e = (a+4m+b)/6$

- The variance is:

- $$V = ((b\text{-}a)/6)^2$$

- The standard deviation is $(b - a)/6$

- For our example (Figure 1), we have $a=10, b=70, m=35$.

- Therefore $T_e = 36.6$, and $\sigma^2 = 100$.

Determining Expected Time

Activity	o	m	p	t	variance
A	1	2	3		
B	2	3	4		
C	1	2	3		
D	2	4	6		
E	1	4	7		
F	1	2	9		
G	3	4	11		
H	1	2	3		

Expected time (t) = (o+(4*m)+p)/6

Variance = $((p-o)/6)^2$

Basic Assumption: the Critical Path is: A-C-E-G-H
We want to know the project variance: The square of the sum of the variances along the critical path

Determining Expected Time

Activity	a	m	b	t	variance
A	1	2	3	2	.11
B	2	3	4	3	.11
C	1	2	3	2	.11
D	2	4	6	4	.44
E	1	4	7	4	1
F	1	2	9	3	1.78
G	3	4	11	5	1.78
H	1	2	3	2	.11

Expected time (t) = (a+(4*m)+b)/6   Variance = ((b-a)/6)²

Basic Assumption: the Critical Path is: A-C-E-G-H
We want to know the project variance: The square of the sum of the variances along the critical path, which is 3.11
Standard deviation is the square root of the variance = $\sqrt{3.11}$ = 1.76

Project Description

- Project: about …..
- Project standard deviation = +- 1.76 weeks
- Due date: 16 weeks
- Project duration: 15 weeks
- Z-score = (due date-expected date)/std.dev
- Z = (16-15)/1.76 = 0.57
- Go to normal z distribution statistics table and take 0.5 from the rows and .07 from the columns.

Probability of Project Success

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389

The intersection of the two is **0.7157**

This means the probability of finishing in time is **71.2%**

Summary of PERT

- **Step 1: Calculate the expected completion time (T_E) using PERT**

- **Step 2: Calculate the variance of the project by calculating the variance of each task**

- **Step 3: Calculate the standard deviation**

- **Standard Deviation = $\sqrt{}$ Task Variance1 + Task Variance2 + Task Variance3… .**

- **Step 4: Calculate the Z-Score**

- To calculate the Z-Score use the equation:

- **Z = (T-T_E)/σ**

- The Z-Score (z) is the difference between the desired completion time and the project's expected time divided by the standard deviation for the project.

- **Step 5: Calculate the probability of success now that you have figured out the Z-Score.**

Critical Path vs Critical Chain

- Usually, the critical path goes from start of the project to the end of the project.

- Instead, the critical chain ends at the start of the buffer /barrior/ assigned to the project.

- This buffer is called "project buffer."

- This is the fundamental difference between the critical path and the critical chain.

- When it comes to critical path, activity sequencing is performed.

- But with critical chain, critical chain scheduling is performed.

Critical Path vs Critical Chain

- When it comes to the project schedule, the critical path is more subjective towards the milestones and deadlines.

- In critical path, not much of emphasis is given to resource utilization.

- Therefore, many experts believe that the critical path is what you get before you level the resources of the project.

- One other reason for this is, in critical path, hands-off dependencies are given the precedence.

- When it comes to critical chain, it is more defined as a resource-levelled set of project tasks.

- In critical chain scheduling, dependencies are used to determine the critical chain.

Critical Path vs Critical Chain

- Two types of dependencies are used; hands-off dependencies and resource dependencies.

- **Hands-off Dependencies**

- This simply means that output of one task is the input for another. Therefore, the latter task cannot be started until the first task is completed.

- **Resource Dependencies**

- In this case, one task is utilizing a resource, so the other task cannot be started until the first task is completed and the resource is freed.

- The critical chain can be explained as the "resource constrained critical path".

4.6 Schedule Development

- Most project management software for scheduling will handle this situation by using a project calendar and alternative work-period resource calendars that are usually identified by the resources that require specific work periods.

- The schedule activities will be worked according to the project calendar, and the schedule activities to which the resource are assigned will also be worked according to the appropriate resource calendars.

- Project schedule development, an iterative process, determines planned start and finish dates for project activities.

- Schedule development can require that duration estimates and resource estimates are reviewed and revised to create an approved project schedule that can serve as a baseline against which progress can be traced.

Activity schedules

- An activity schedule is a format for analyzing and graphically presenting project activities

- It helps identify their logical sequence, expected duration, and dependencies that exist between activities

- It provides a basis for allocating management responsibility

- With the activity schedule prepared, further specification of resources and scheduling of costs can be undertaken

Activity schedules…

- Once the logframe matrix is complete, it is then possible to use the identified activities to further analyze issues of timing, dependency and responsibility

  Steps

  1. List the main activities: the LF matrix has a summary only that serve as basis
  2. Break activities down into manageable tasks (WBS): the main skill is getting the level of detail right.
  3. Clarify sequence and dependencies
  4. Estimate start-up, duration and completion of activities: consult experts. Do not underestimate the time required
  5. Summarize scheduling of main activities: put all together as a summary
  6. Define milestones: key events; dates could be important milestones
  7. Define expertise: when tasks are known, it is possible to specify experts
  8. Allocate tasks among team: responsibility allocation taking into account capability, skills and experience of each member of the team

Activity Schedule

Ref no.	Results and activities	Responsibility	Year 1				Year 2			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.1	**Results**									
	Activities									
1.1.1										
1.1.2										
1.1.3										
1.2										
1.2.1										
1.2.2										
1.2.3										
1.2.4										

4.6 Schedule Development

Inputs

- Schedule management plan
- Activity list
- Activity attributes
- Project schedule network diagrams
- Activity resource requirements
- Resource calendars
- Activity duration estimates
- Project scope statement
- Risk register
- Project staff assignments
- Resource breakdown structure
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Schedule network analysis
- Critical path method
- Critical chain method
- Resource optimization techniques
- Modeling techniques
- Leads and lags
- Schedule compression
- Scheduling tool

Outputs

- Schedule baseline
- Project schedule
- Schedule data
- Project calendars
- Project management plan updates
- Project documents updates

4.7 Control Schedule

- Schedule control is concerned with:
  - Determining the current status of the project schedule
  - Influencing the factors that create schedule changes
  - Determining that the project schedule has changed
  - Managing the actual changes as they occur.

4.7 Control Schedule

Inputs

- Project management plan
- Project schedule
- Work performance data
- Project calendars
- Schedule data
- Organizational process assets

Tools & Techniques

- Performance reviews
- Project management software
- Resource optimization techniques
- Modeling techniques
- Leads and lags
- Schedule compression
- Scheduling tool

Outputs

- Work performance information
- Schedule forecasts
- Change requests
- Project management plan updates
- Project documents updates
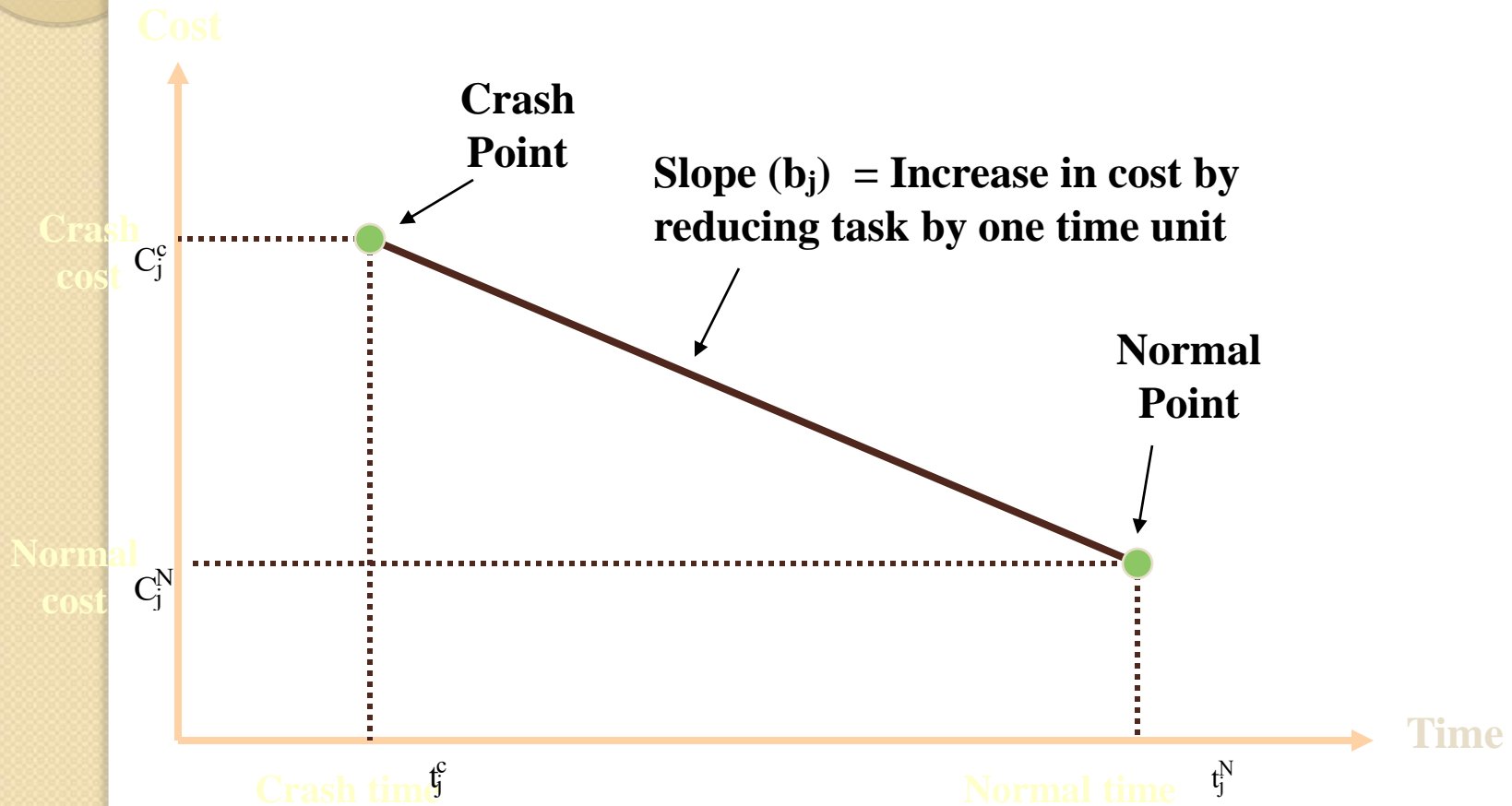- Organizational process assets updates

Schedule Compression

- **Fast Tracking: is a schedule compression technique to perform activities in parallel (partial or in whole**) in order to save time

- the activities to be performed in parallel should be analyzed for logical relationship and that the two activities in question can really be carried out in parallel (i.e. overlapping of part or the whole activities)

- normally no extra resources are needed

- additional risks may be created

- *Fast Tracking is the preferred method for schedule compression*

Schedule Compression

- **Crashing:** crashing is a schedule compression technique to shorten the activity duration by adding

  - extra resources (money and/or human resources)

  - Improving the productivity of existing resources

  - involves additional costs as extra resources are needed for

    - ➢ overtime

    - ➢ extra manpower

    - ➢ Outsourcing

  - Project Manager needs to judge which activities can be "crashed" with the lowest cost for the maximum effectiveness

  - May create risks for rework/defects

Linear Time-Cost Tradeoff

In theory, the normal or expected duration of a task can be reduced by assigning additional resources to the task

Cost

Crash Point

Slope (b_j) = Increase in cost by reducing task by one time unit

Crash cost C_j^c

Normal Point

Normal cost C_j^N

Crash time t_j^c

Normal time t_j^N

Time

Selecting Activities to Crash

- Cost Slope = Rise / Run
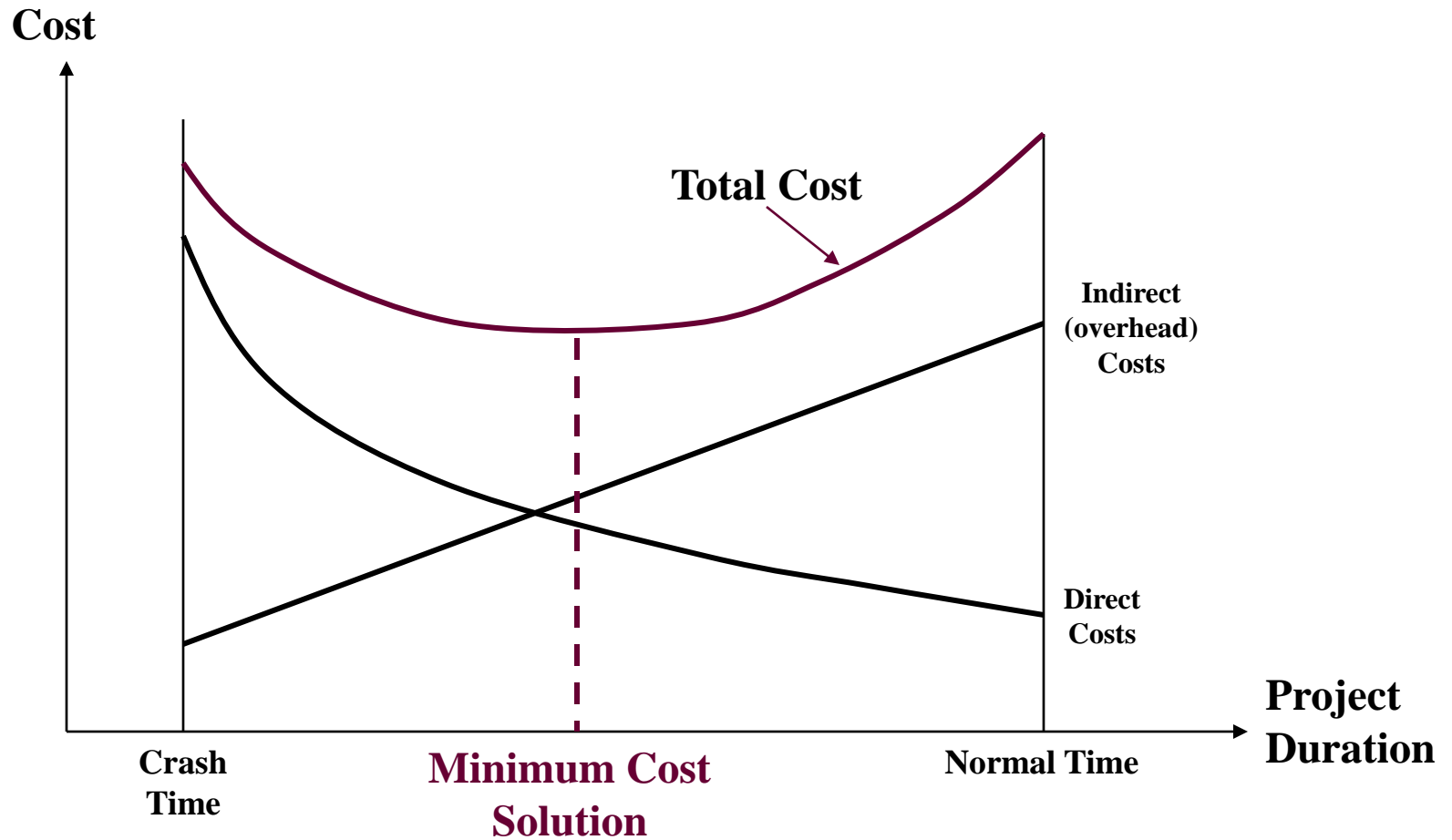
$$= \frac{CC - NC}{NT - CT}$$

- where,
  - CC = Crash Cost
  - NC = Normal Cost
  - NT = Normal Time
  - T = Crash Time

$$= \frac{CC - NC}{NT - CT} = \frac{\$800 - \$400}{10 - 5}$$

$$= \$400/5 = \$80 \text{ per unit of time}$$

- Calculate for each activity on Critical Path
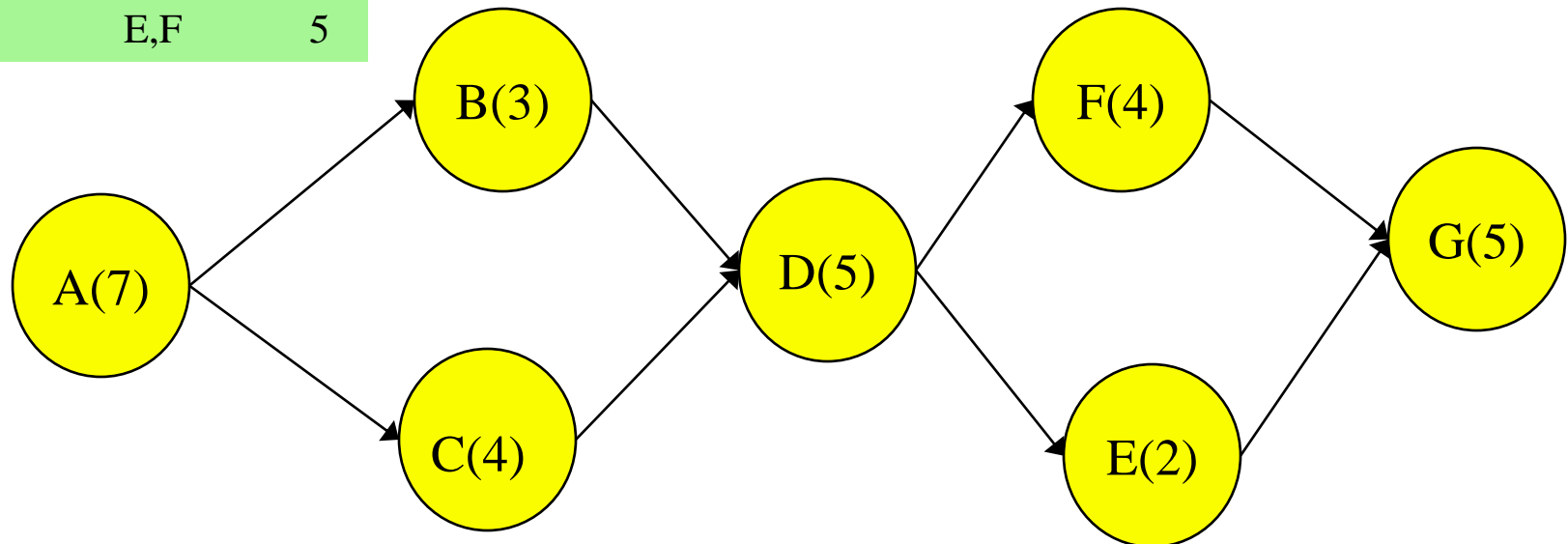
Balancing Overhead & Direct Costs

Act.	Imed. Pred.	Time
A	None	7
B	A	3
C	A	4
D	B,C	5
E	D	2
F	D	4
G	E,F	5

Crash the project by 4 days

Time – Cost Analysis: Crashing the Project

Activity	Normal Time	Crash Time	Normal Cost	Crash Cost	Cost/Day
A	7	6	$7,000	$8,000	$1,000
B	3	2	5,000	7,000	2,000
C	4	3	9,000	10,200	1,200
D	5	4	3,000	4,500	1,500
E	2	1	2,000	3,000	1,000
F	4	2	4,000	7,000	1,500
G	5	4	5,000	8,000	3,000

			Action		
Path	Length	Crash A	Crash C	Crash F (or D)	Crash F (or D)
ABDFG	24	23	23	22	21
ABDEG	22	21	21	21	21
ACDFG	25	24	23	22	21
ACDEG	23	22	21	21	21

Action	Marginal Cost
Crash A	$1,000
Crash C	$1,200
Crash D	$ 1,500
Crash F	$1,500
Crash G	$3,000

Unit 5: Project Cost Management

5.1 Plan Cost Management—The process that establishes the policies, procedures, and documentation for planning, managing, expending, and controlling project costs.

5.2 Estimate Costs—The process of developing an approximation of the monetary resources needed to complete project activities.

5.3 Determine Budget—The process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.

5.4 Control Costs—The process of monitoring the status of the project to update the project costs and managing changes to the cost baseline.

5.1 Plan Cost Management

Inputs

- Project management plan
- Project charter
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Expert judgment
- Analytical techniques
- Meetings

Outputs

- Cost management plan

5.1 Plan Cost Management

- In Plan Cost Management Process, you need to plan out all of the processes and methodologies you'll use for Cost Management up front.

- When you've got your project charter written and you're starting to put together your Project Management plan, you need to think about all of the processes and standards you'll follow when you estimate your budget and track to that estimate.

- So, the Plan Cost Management process is where you plan out all the work you'll do to make sure your project doesn't cost more than you've budgeted.

5.2 Estimate Costs

Inputs

- Cost management plan
- Human resource management plan
- Scope baseline
- Project schedule
- Risk register
- Enterprise environmental factors
- Organizational process assets

5.2 Estimate Costs

Tools & Techniques

- ◦ Expert judgment
- ◦ Analogous estimating
- ◦ Parametric estimating
- ◦ Bottom-up estimating
- ◦ Three-point estimating
- ◦ Reserve analysis
- ◦ Cost of quality
- ◦ Project management software
- ◦ Vendor bid analysis
- ◦ Group decision-making techniques

Outputs

- ◦ Activity cost estimates
- ◦ Basis of estimates
- ◦ Project documents updates

5.2 Estimate Costs

- This means figuring out exactly how much you expect each work activity you are doing to cost. So each activity is estimated for its time and materials cost, and any other known factors that can be figured in.

- **Activity cost estimates**. This is the cost estimate for all of the activities in your activity list. It takes into account resource rates and estimated duration of the activities.

- **Basis of estimates**. Just like the WBS has a WBS dictionary, and the activity list has activity attributes, the cost estimate has a supporting detail called the **basis of estimates.** Here is where you list out all of the rates and reasoning you have used to come to the numbers you are presenting in your estimates.

- **Updates to project documents**. Along the way, you might find that you need to change the way you measure and manage cost. These updates allow you to make changes to the Project Management plan to deal with those improvements.

5.3 Determine Budget

Inputs

- Cost management plan
- Scope baseline
- Activity cost estimates
- Basis of estimates
- Project schedule
- Resource calendars
- Risk register
- Agreements
- Organizational process assets

Tools & Techniques

- Cost aggregation
- Reserve analysis
- Expert judgment
- Historical relationships
- Funding limit reconciliation

Outputs

- Cost baseline
- Project funding requirements
- Project documents updates

5.3 Determine Budget

- Here's where all of the estimates are added up and baselined. Once you have figured out the baseline, that's what all future expenditures are compared to.

- Here's where you take the estimates that you came up with and build a budget out of them. You'll build on the activity cost estimates and basis of cost estimate that you came up with in Estimate Costs.

- This means that you use the outputs from the last process where you created estimates as inputs to this one. Now you can build your budget.

5.4 Control Costs

Inputs

- Project management plan
- Project funding requirements
- Work performance data
- Organizational process assets

Tools & Techniques

- Earned value management
- Forecasting
- To-complete performance index (TCPI)
- Performance reviews
- Project management software
- Reserve analysis

Outputs

- Work performance information
- Cost forecasts
- Change requests
- Project management plan updates
- Project documents updates
- Organizational process assets updates

Earned Value Analysis

- Knowing where you are on schedule?

- Knowing where you are on budget?

- Knowing where you are on work accomplished?

Earned Value Analysis

- **Budget at Completion (BAC)=** The amount of money a project consumes when it is finished

- **Planned % Complete**= How much is expected to be performed in terms of percentage

- **Planned value (PV)** = BAC X Planned % Complete

- **Actual % Complete**= How much is actually performed in terms of percentage.,

- **Earned value (EV)** = BAC X Actual % Complete; BCWP
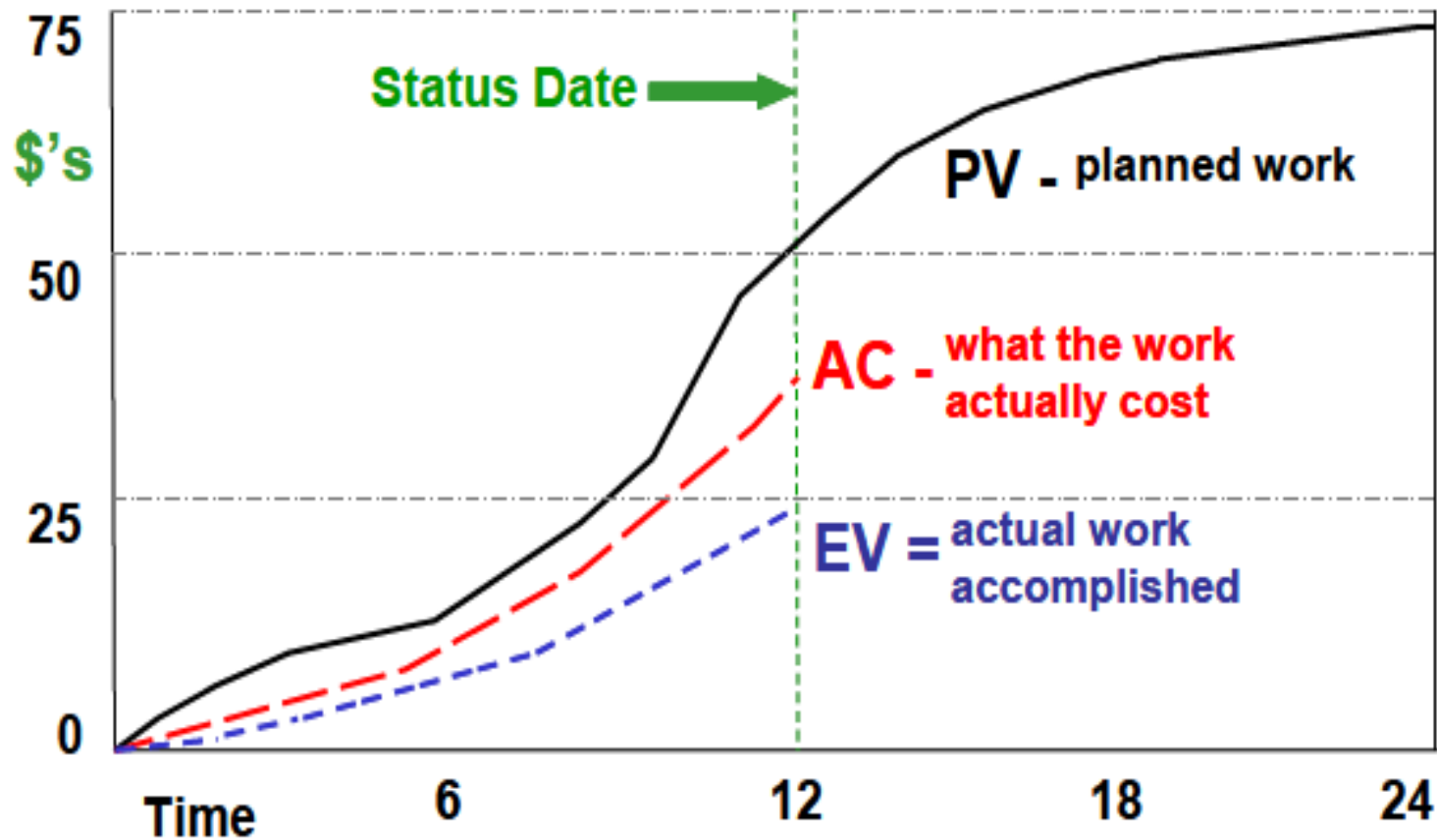
Earned Value Analysis

Fig 1. Typical curve showing PV, AC, EV

Earned Value Analysis

- Schedule and cost variances and performance indicators are defined mathematically as follows:

- Schedule variance (SV) = Earned value (EV) – Planned value (PV)

- Cost variance (CV) = Earned value (EV) – Actual cost (AC)

- Schedule performance index (SPI) = Earned value (EV) / Planned value (PV)

- Cost performance index (CPI) = Earned value (EV) / Actual cost (AC)

- The final step when assessing task performance to date is to update what you expect your total expenditures will be upon task completion. Specifically, you want to determine the following:

- **Estimate at completion (EAC)**: Your estimate today of the total cost of the task

- **Estimate to complete (ETC):** Your estimate of the amount of funds required to complete all work still remaining to be done on the task
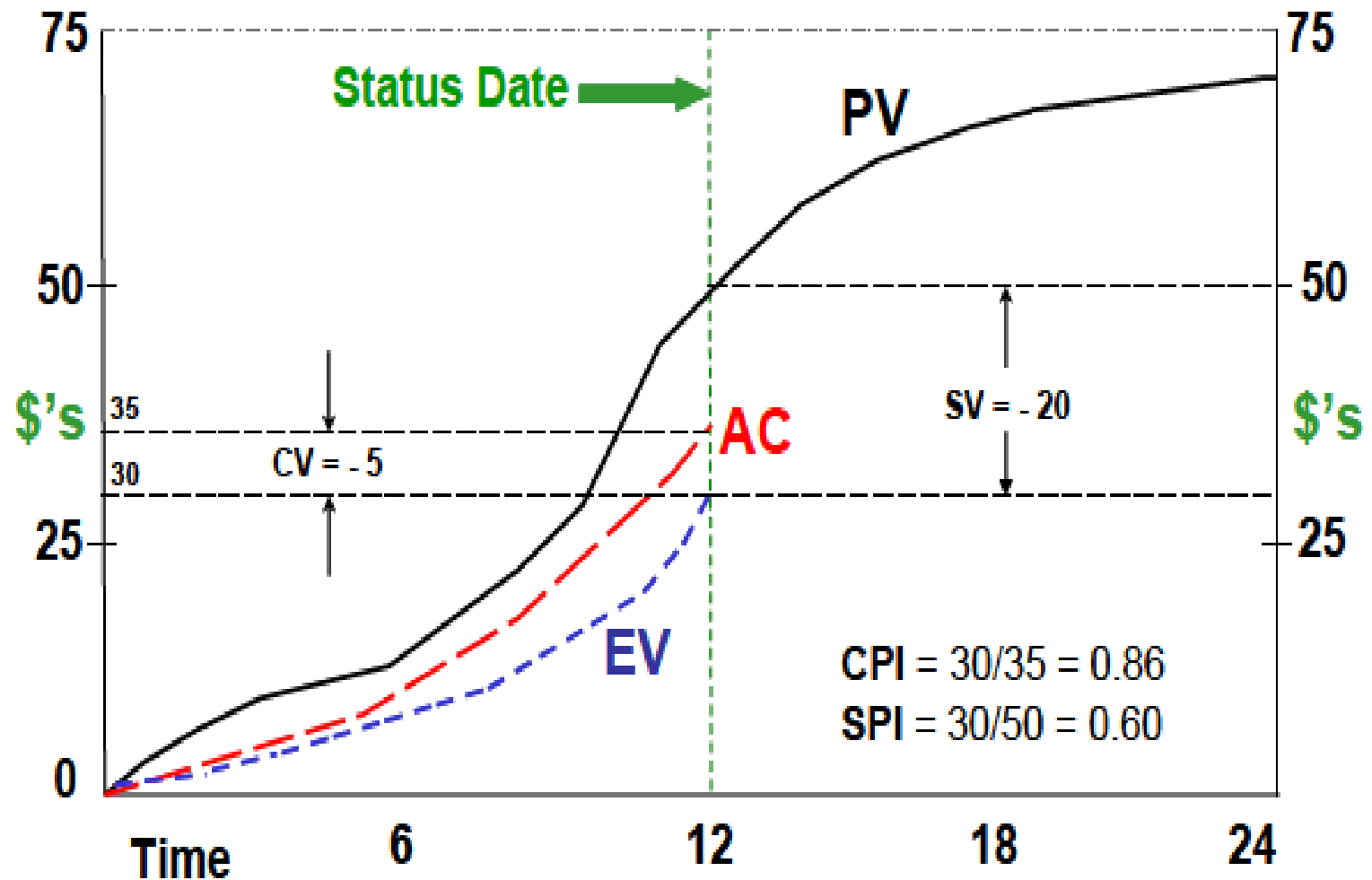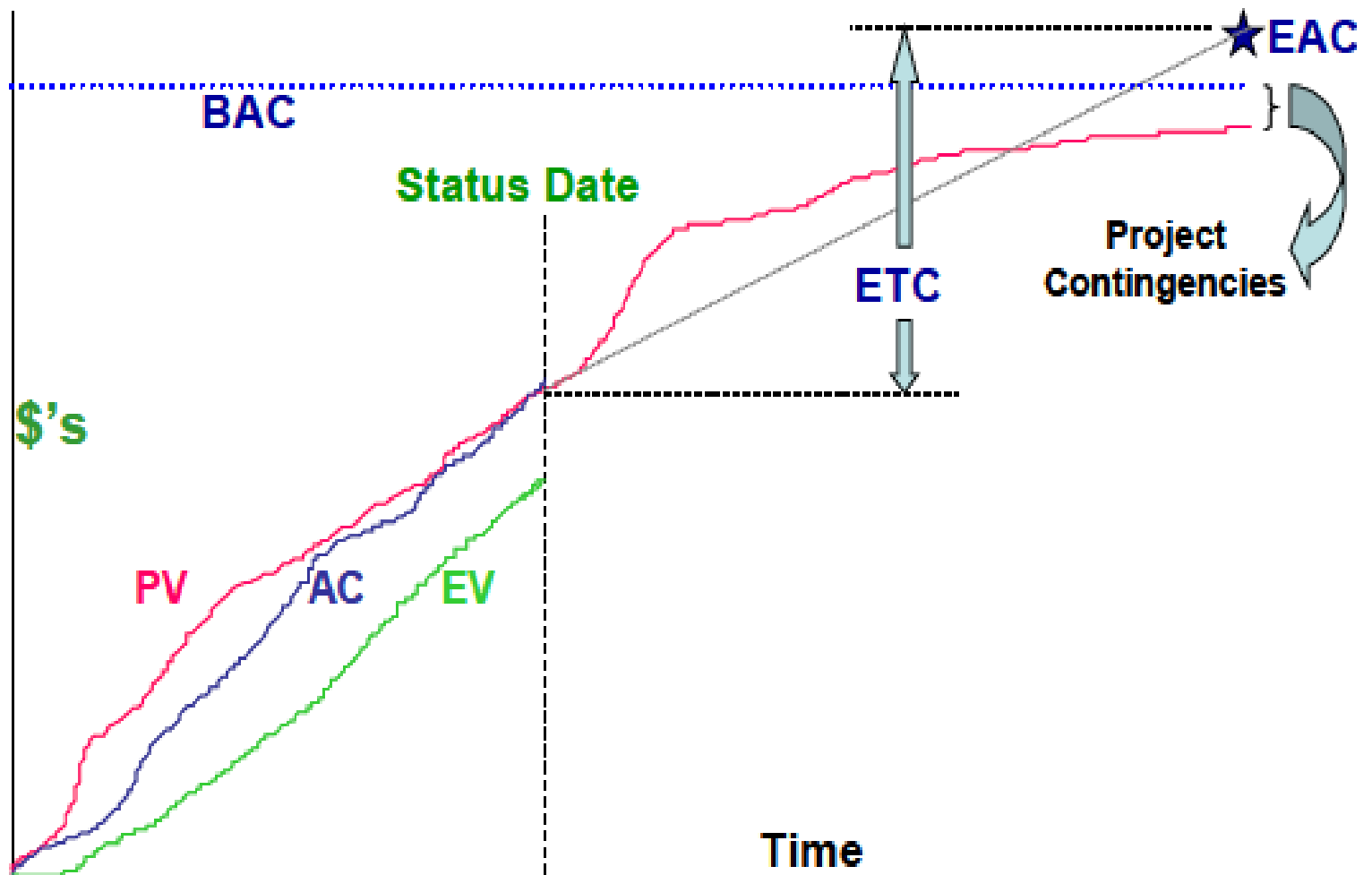
Earned Value Analysis

Fig. 2: Earned Value Analysis

Earned Value Analysis

- You can use the following two approaches to calculate the EAC:

- **Method 1:** Assume that the cost performance for the remainder of the task will revert to what was originally budgeted.

- EAC = Approved budget for the entire task – Cost variance for the work done to date on the task

  = Budget at completion (BAC) + Actual cost (AC) – Earned value (EV)

- **Method 2:** Assume that the cost performance for the remainder of the task will be the same as what it has been for the work done to date.

- EAC = Budget at completion (BAC) / Cumulative cost performance index (CPI)

- Method 3: very pessimistic scenario considering the impact of both cost and schedule on EAC

- EAC =BAC/(CPI*SPI)

Earned Value Analysis

Earned Value Analysis

- You're managing a project to install 200 windows in a new skyscraper and need to figure out your budget. Each week of the project costs the same: your team members are paid a total of $4,000 every week, and you need $1,000 worth of parts each week to do the work. The project is scheduled to last 16 weeks:

1. What's the BAC for the project?

- BAC =

2. What will the planned % complete be four weeks into the project?

- Planned % complete =

3. What should the PV be four weeks into the project?

- PV =

4. What is the earned value if you find out that the work performed is 20%?

- EV=

Earned Value Analysis

- You're managing a project to install 200 windows in a new skyscraper and need to figure out your budget. Each week of the project costs the same: your team members are paid a total of $4,000 every week, and you need $1,000 worth of parts each week to do the work. The project is scheduled to last 16 weeks:

1. What's the BAC for the project?

- BAC = 5,000 x 16 = 80,000

2. What will the planned % complete be four weeks into the project?

- Planned % complete = 25%

3. What should the PV be four weeks into the project?

- PV = 80,000 x 25% =20,000

4. What is the earned value

- EV= 80,000 x 20% =16,000

Self-check Exercise

- Your project has a total budget of $300,000. You check your records and find that you've spent $175,000 so far. The team has completed 40% of the project work, but when you check the schedule it says that they should have completed 50% of the work.

- **Calculate the following:**
  - **PV**
  - **EV**
  - **AC**
  - **CV**
  - **SV**

5.4 Control Costs

- This just means tracking the actual work according to the budget to see if any adjustments need to be made.

- Controlling costs means always knowing how you are doing compared to how you thought you would do.

5.4 Control Cost Process

- Project cost control includes:
  - Influencing the factors that create changes to the project baseline
  - Ensuring requested changes are agreed upon
  - Managing the actual changes when and as they occur
  - Assuring that potential cost overruns do not exceed the authorized funding periodically and in total for the project
  - Monitoring cost performance to detect and understand variance from the cost baseline
  - Recording all appropriate changes accurately against the cost baseline
  - Preventing incorrect, inappropriate, or unapproved changes from being included in the reported cost or resource usage
  - Informing appropriate stakeholder of approved changes
  - Act to bring expected cost overruns within acceptable limits

Group Assignment

Try to prepare:

1. **Collect requirements/Needs Assessment**
2. **WBS**

Unit 6: Project Quality Management

- Project Quality Management processes include all the activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken.

- It implements the quality management system through the policy, procedures, and processes of quality planning, quality assurance, and quality control, with continuous process improvement activities conducted throughout, as appropriate.

- Quality is "the degree to which a set of inherent characteristics fulfill requirements".

- Quality is the measurement of how closely your product meets its requirements.

Quality Management

- ***Customer satisfaction*** *is about making sure that the people* who are paying for the end product are happy with what they get.

- When the team gathers requirements for the specification, they try to write down all of the things that the customers want in the product so that you know how to make them happy.

- ***Fitness for use*** *is about making sure that the product you build* has the best design possible to fit the customer's needs.

- ***Conformance to requirements*** *is the core of both customer* satisfaction and fitness for use. Above all, your product needs to do what you wrote down in your requirements specification.

Project Quality Management

6.1 Plan Quality Management—The process of identifying quality requirements and/or standards for the project and its deliverables and documenting how the project will demonstrate compliance with quality requirements.

6.2 Manage Quality—you take all of the outputs from Plan Quality Management and Control Quality and look at them to see if you can find ways to improve your process and take action.

6.3 Control Quality—The process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes.

6.1 Plan Quality Management

Inputs

- Project management plan
- Stakeholder register
- Risk register
- Requirements documentation
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Cost-benefit analysis
- Cost of quality
- Seven basic quality tools
- Benchmarking
- Design of experiments
- Statistical sampling
- Additional quality planning tools
- Meetings

Outputs

- Quality management plan
- Process improvement plan
- Quality metrics
- Quality checklists
- Project documents updates

6.2 Manage Quality

- Quality assurance encompasses all the activities implemented in a quality system to provide confidence that the project will satisfy the relevant quality standards

- Quality assurance is provided by a Quality Assurance dept.

- Quality assurance can be INTERNAL (from the project management team to the performing organization)

- Quality assurance can be EXTERNAL (provided to the customer and other parties actively involved in the work of the project

6.2 Manage Quality

Inputs

- Quality management plan
- Process improvement plan
- Quality metrics
- Quality control measurements
- Project documents

Tools & Techniques

- Quality management and control tools
- Quality audits
- Process analysis

Outputs

- Change requests
- Project management plan updates
- Project documents updates
- Organizational process assets updates

6.3 Control Quality

Inputs

- Project management plan
- Quality metrics
- Quality checklists
- Work performance data
- Approved change requests
- Deliverables
- Project documents
- Organizational process assets

Tools & Techniques

- Seven basic quality tools
- Statistical sampling
- Inspection
- Approved change requests review

Outputs

- Quality control measurements
- Validated changes
- Validated deliverables
- Work performance information
- Change requests
- Project management plan updates
- Project documents updates
- Organizational process assets updates

Nature of PQM

- Project quality management must address both the management of the project and the product of the project.

- Failure to meet quality requirements in either dimension can have serious and negative consequences for any or all of the project stakeholders

Quality Planning Inputs

Quality policy

- The overall intentions and direction of an organization with regard to quality, as formally expressed by the top management

- In the case of a joint venture, a quality policy for the individual project should be developed

- The management team is responsible for dissipating the quality policy to all project stakeholders through appropriate information distribution channels

Quality Planning Inputs

Scope Statement

- The scope statement is a key input to quality planning because it documents major project deliverables as well as project objectives which serve to define important stakeholder requirements

Quality Planning Inputs

Product description

- Although the elements of the product description may be embodied in the scope statement, the product description often contains details of technical issues and other concerns that may affect quality planning

Quality Planning Inputs

Standards and Regulations

- The project management team any application-area-specific standards or regulations that may affect the project

Quality Planning Inputs

Other Process Outputs

- In addition to the scope statement and product description, processes in other knowledge areas may produce outputs that should be considered as part of the quality planning

- **Example**: procurement planning outputs may identify contractor quality requirements that should be reflected in the overall Quality Management Plan

Tools and Techniques for Quality Planning

Benefit / cost analysis

- The planning process must consider benefit/cost tradeoffs/balance/

- The Primary Benefit: Is less work, higher productivity, lower costs, and increased stakeholder satisfaction

- The Primary Cost: Is the expenses associated with PQM activities

Note: it is elementary that the benefit should outweigh the cost

Tools and Techniques for Quality Planning

Benchmarking

- Benchmarking involves comparing actual or planned project practices to those of other projects to:

1- Generate ideas for improvement

2- provide a standard for measurement of performance

Note: other projects compared may be within the same organization or out side and may be within the same application area or in another

Tools and Techniques for Quality Planning

Flow charting

- The flowcharting techniques in quality management generally include
- cause and effect diagram
- System or process flow charts
- Flowcharting can help in anticipating probable quality problems and thus helps to develop approaches for dealing with them

Tools and Techniques for Quality Planning

Design of Experiments

- This is an analytical technique which aims to define variables that have most influence on the overall outcome

- This technique is commonly applicable to the product of the project issues.

- However this technique can also be used in project management issues such as cost and schedule tradeoffs to allow for optimal solutions.

Outputs from Quality Planning

Quality Management Plan

- The quality management plan should describe how a project management team will implement its quality policy

- Also called Quality System, (in ISO terminology), the plan should define :

  - The organizational structure

  - Roles and responsibilities

  - Resources needed for implementation of quality management

Outputs from Quality Planning

Quality Management Plan (continued)

* The Quality Plan should address:
- Quality Control of the project
- Quality Assurance
- Quality Improvement of the project

Note: the project quality plan can be highly detailed or broadly framed based on the needs of the project

Outputs from Quality Planning

Operational Definitions

- An operational definition describes what something is and how it is measured by the quality control process. For example:

- the project management team must indicate the start and end of every activity in a detailed schedule

- Weather the whole activity or certain deliverables are to be measured

Operational definitions are also called *Metrics* in some areas of application

Outputs from Quality Planning

Checklists

- A checklist is a structured tool used to verify that a set of required steps or requirements have been performed.

- Many organizations have standard checklists to ensure consistency of frequently performed activities

Outputs from Quality Planning

Inputs To Other Processes

- The quality planning process may identify need for further activity in another area

Quality Control

- Quality control involves monitoring specific project results to determine if they comply with relevant standards and identifying ways to eliminate causes of unsatisfactory results.

- Project results mentioned include both PRODUCT results such as deliverables and MANAGEMENT results such as cost and schedule performance

- Quality control is often performed by a quality control department

- The project management team should have a working knowledge of statistical quality control especially sampling and probability to help evaluate and control outputs.

Quality Control

- **The project management should be aware of the following among other subjects:**

- *prevention* (keeping errors out of the process)

- *Inspection* (keeping errors out of the customers hand

- *Attribute sampling* (for conformity of results)

- *Variable sampling* (where the results are rated on a continuous scale that measures the degree of conformity or non conformity

- *Special cause* (unusual events)

- *Random causes* (normal process variations)

- *Tolerances* (where results should fall with in a defined tolerance range

- *Control limits* (the process is in control if it falls within these defined limits)

Tools and Techniques for Quality Control
Control Charts

- These charts are graphical representations that display the result of a process over time and are used to determine if the process is "in control"

- When in control the process should *not* be adjusted , however it may be *changed* in order to provide improvements

- Control charts may be used to monitor any type of output variable

- Control charts are most often used to monitor repetitive activity in production but can also be used to monitor cost and schedule variances

Tools and Techniques for Quality Control

Pareto Diagram

- A Pareto diagram is a histogram ordered by frequency of occurrence which shows how many results were generated by what category or identified cause

- The project management team should take action to fix the problems that are causing the greatest number of defects first

- Typically the Pareto diagram reflects that a relatively small number of causes are responsible for the majority of the problems or defects.

Tools and Techniques for Quality Control

Statistical Sampling

- Statistical sampling involves choosing a part of a population of interest for inspection

- Appropriate sampling can effectively reduce the cost of quality control

- There is a vast body of knowledge related to statistical sampling and therefore the management must be aware of the various sampling techniques

Tools and Techniques for Quality Control

Flowcharting

- Flowcharting is used in quality control to help analyze how a problem occurs

Tools and Techniques for Quality Control

Trend Analysis

* The trend analysis involves the use of mathematical techniques to forecast future outcomes based on historical results it is often used to monitor:

  - Technical performance – *how many defects have been identified and how many remain uncorrected*

  - Cost and schedule performance – *how many activities in a certain period were completed with significant variances*

Outputs for Quality Control

- Quality improvement (previously described)
- Acceptance decisions, where the inspected items will either be accepted or rejected and those rejected may be reworked
- Rework, which is an action taken to bring defects or nonconforming items into compliance with requirements and specifications. Rework is a frequent cause of project over-runs and the project management team must make an effort to minimize it .

Outputs for Quality Control

- Completed Checklists, which become a part of a project record when they are used

- Process Adjustments, which involves immediate corrective or preventive action as a result of quality control measurements. In some cases the adjustment may need to be handled according to procedures for overall change control.

Unit 7: Project Resource Management

- There are four processes in this knowledge area. While the first belongs to Planning Process group, the other three are in the Executing Process group.

7.1 Plan Resource Management. The process of identifying and documenting project roles, responsibilities, required skills, reporting relationships, and creating a staffing management plan.

7.2 Acquire Project Team. The process of confirming human resource availability and obtaining the team necessary to complete project activities.

7.3 Develop Project Team. The process of improving competencies, team member interaction, and overall team environment to enhance project performance.

7.4 Manage Project Team—The process of tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance.

7.5 Control Resources: to be added in PMBoK 6th edition

7.1 Plan Human Resource Management

- In the Plan Human Resource Management process, you plan out exactly which resources you'll need, what their roles and responsibilities are, and how you'll train your team and make sure they stay motivated.

- This is where you plan out the staffing needs for your project, and how you'll manage and reward the team.

- The human resource management plan provides project staffing attributes, personnel rates, and related rewards/recognition, which are necessary components for developing the project cost estimates.

- Project Human Resource Management includes the processes that organize, manage, and lead the project team. The project team is comprised of the people with assigned roles and responsibilities for completing the project.

7.1 Plan Resource Management

- Project team members may have varied skill sets, may be assigned full or part-time, and may be added or removed from the team as the project progresses.

- Project team members may also be referred to as the project's staff. Although specific roles and responsibilities for the project team members are assigned, the involvement of all team members in project planning and decision making is beneficial.

- Participation of team members during planning adds their expertise to the process and strengthens their commitment to the project.

7.1 Plan Resource Management

Inputs

- Project management plan
- Activity resource requirements
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Organization charts and position descriptions
- Networking
- Organizational theory
- Expert judgment
- Meetings

Outputs

- Human resource management plan

7.2 Acquire Project Resources

Inputs

- Human resource management plan
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Pre-assignment
- Negotiation
- Acquisition
- Virtual teams
- Multi-criteria decision analysis

Outputs

- Project staff assignments
- Resource calendars
- Project management plan updates

7.2 Acquire Project Team

- Acquiring project team is the process of obtaining the human resources needed to complete the project.

- The project management team may or may not have control over team members selected from the project.

- Acquiring qualified people for teams is crucial.

- The project manager who is the smartest person on the team should do a good job of recruiting people

- Staffing plans and good hiring procedures are important, as are incentives for recruiting and retention.

  ◦ Some companies give their employees one dollar for every hour that a new person who they helped hire works.

  ◦ Some organizations allow people to work from home as an incentive.

7.3 Develop Project Team

- Develop project team improves the competencies and interactions of team members to enhance project performance.

- Objectives include:

- Improve skills of team members in order to increase their ability to complete project activities

- Improve feelings of trust and cohesiveness among team members in order to raise productivity through greater teamwork. Examples of effective teamwork include assisting one another when workloads are unbalanced, communicating in ways that fit individual preferences, and sharing information and resources.

- Team development efforts have greater benefit when conducted early, but should take place throughout the life cycle.

7.3 Develop Project Team

- The main goal of **team development** is to help people work together more effectively to improve project performance.
- It takes teamwork to successfully complete most projects.
- Training can help people understand themselves and each other, and understand how to work better in teams.
- Team building activities include:
  - Physical challenges
  - Psychological preference indicator tools

7.3 Develop Project Team

Inputs

- Human resource management plan
- Project staff assignments
- Resource calendars

Tools & Techniques

- Interpersonal skills
- Training
- Team-building activities
- Ground rules
- Colocation
- Recognition and rewards
- Personnel assessment tools

Outputs

- Team performance assessments
- Enterprise environmental factors updates

Stages of Team Development

- **Forming:** People are still trying to figure out their roles in the group; they tend to work independently, but are trying to get along.

- **Storming:** As the team learns more about the project, members form opinions about how the work should be done. This can lead to temper flare-ups in the beginning, when people disagree about how to approach the project.

- **Norming:** As the team learns more about the other members, they begin to adjust their own work habits to help out one another and the team as a whole. Here's where the individuals on the team start learning to trust one another.

- **Performing:** Once everyone understands the problem and what the others are capable of doing, they start acting as a cohesive unit and being efficient. Now the team is working like a well-oiled machine.

- **Adjourning:** When the work is close to completion, the team starts dealing with the fact that the project is going to be closing soon.

7.4 Manage Project Team

- Manage project team involves tracking team members performance, providing feedback, resolving issues, and coordinating changes to enhance project performance.

- The project management team observes team behavior, manages conflict, resolves issues, and appraises team member performance.

- As a result of managing the project team, the staffing management plan is updated, change requests are submitted, issues are resolved, inputs is given to organizational performance appraisals, and lessons learned are added to the organizations database.

- Management of the project team is complicated when team members are accountable to both a functional manager and a project manager within a matrix organization.

- Effective management of this dual reporting relationship is often critical success factor for the project, and is gradually the responsibility of the project manager.

7.4 Manage the Project Team

- Wouldn't it be great if your team members never had any conflicts? Well, we all know that conflicts are a fact of life in any project.
- A good project manager knows how to handle conflicts so they don't delay or damage the project. And that's what the **Manage Project Team process is about.**
- Project managers must lead their teams in performing various project activities.
- After assessing team performance and related information, the project manager must decide:
  - If changes should be requested to the project.
  - If corrective or preventive actions should be recommended.
  - If updates are needed to the project management plan or organizational process assets.

Reasons of Conflicts

- *Resources are scarce—that's why you have to negotiate for* them. Have you ever been in a situation where there's a "good" conference room, or top-performing team member, or even that photocopy machine that always seems to be in use? Well, that's a scarce resource. No wonder resources cause so many conflicts.

- *Priorities mean one project or person is more important* than another, and gets more budget, resources, time, prestige, or other perks. If the company's priorities aren't crystal clear, then conflicts are definitely going to happen.

- *Schedules decide who gets what, when. Have you ever* had a client, sponsor, or stakeholder get upset because your project won't come in as early as he or she wanted it to? Then you've had a conflict over schedules. These three things are the source of over 50% of all conflicts!

Reasons of Conflicts

- *Personalities are always* clashing. Sometimes two people just don't get along, and you're going to have to find a way to make them work together in order to get your project done.

- *Cost disagreements seem to* come up a lot, especially where contracts are involved. Even when the price is agreed upon up front, buyer's remorse will set in, and it will lead to issues.

- *Technical opinions are* definitely a reason that conflicts happen, because it's really hard to get an expert to change his/her mind…so when two of them disagree, watch out!

Tools and Techniques for Managing Project Teams

Inputs

- Human resource management plan
- Project staff assignments
- Team performance assessments
- Issue log
- Work performance reports
- Organizational process assets

Tools & Techniques

- Observation and conversation
- Project Performance Appraisals
- Conflict management
- Interpersonal skills

Outputs

- Change requests
- Project management plan updates
- Project documents updates
- Enterprise environmental factors updates
- Organizational process assets updates

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General Advice on Teams

- Be patient and kind with your team.
- Fix the problem instead of blaming people.
- Establish regular, effective meetings.
- Allow time for teams to go through the basic team-building stages.
- Limit the size of work teams to few members.

General Advice on Teams (cont'd)

- Plan some social activities to help project team members and other stakeholders get to know each other better.
- Stress team identity.
- Nurture team members and encourage them to help each other.
- Take additional actions to work with virtual team members.

Development

- Developing the employee can be regarded as investing in a valuable asset

  - A source of motivation

  - A source of helping the employee fulfil potential

Why People Leave Their Jobs

- They feel they do not make a difference.
- They do not get proper recognition.
- They are not learning anything new or growing as a person.
- They do not like their coworkers.
- They want to earn more money.

Unit 8: Project Communications Management

- Project communication management is the knowledge area that employs the process required to ensure timely and appropriate generations, collection, distribution, storage, retrieval and ultimate disposition of project information.

- The project communications management process provides the critical links among people and information that are necessary for successful communications.

- Project managers can spend an inordinate amount of time communicating with the project team, stakeholders, customer, and sponsor.

- Everyone involved in the project should understand how communications affect the project as a whole.

Meaning, Concept , & Functions of Communication

● ***Communication*:** -

✓ **helps us belong to a society**

✓ **entails establishing relationships with other people.**

✓ **means sending & receiving info or messages.**

✓ **comes from the Latin word "communis"-to make common.**

✓ **is the process of transmitting meaning b/n individuals, organizations, groups.**

✓ **is the form of interaction that takes place through symbols.**

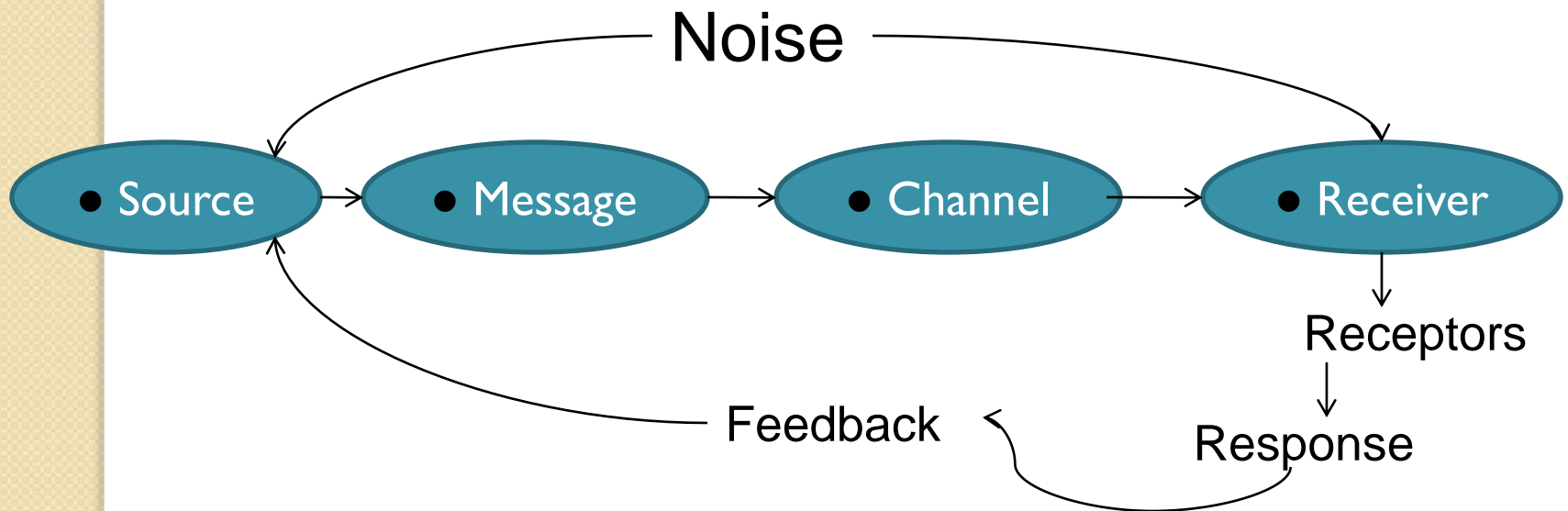✓ **is not simply the verbal, explicit & interaction transmission of messages.**

Communication...

● *Communication involves the following components*:

✓ **is a process of understanding & sharing of ideas, facts, feelings**

✓ **involves interaction & r/nship among members of a social system.**

✓ **is transmission or exchange of info, ideas, emotions, skills.**

✓ **is a mechanism by which power is exercised.**

✓ **is a process by which various people are linked to achieve a common goal.**

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Elements in the communication process

●There are four main elements (green-coloured) and four sub-elements of communication (the rest).

Noise

● Source → ● Message → ● Channel → ● Receiver

Receptors

Feedback ← Response

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Elements in the communication process...

✓ **Source**: the origin of the message (individual or institution)

✓ **Encoding**: translation of ideas into a set of symbols (languages, gestures, and pictures are some of the symbols)

✓ **Message**: stimulus being conveyed.

✓ **Channel**: medium or means by which a message is transmitted.

✓ **Receiver**: one who perceives the sender's message.

✓ **Decoding**: the process by which the receiver interprets & translates the message to get meaning out of it.

✓ **Feedback**: the response of the receiver to the sender's message.

Deriving meaning of communication

Communication:

✓ is not as simple as sending and receiving messages.

✓ there could be a difference between intended and perceived message.

✓ in a face-to-face communication, the outcome is negotiated.

✓ at the interpersonal level, communication is an interactive process.

Deriving meaning of communication...

✓ **Interpersonal communication achieves meaning based on three conditional factors:**

➤ **a base of common experience**

➤ **some system to reference the base**

➤ **a relationship that leads to the achievement of meaning (a sense-making act)**

To achieve meaning, the communicants must recognize the intent of communication.

Characteristics of Communication

Communication has the following four characteristics

❖ **Continuous:** because a person does not stop communicating

❖ **Personal:** because the meaning depends on how we interpret the message.

❖ **Circular:** because it is difficult to identify the point where communication begins and ends.

❖ **Irreversible:** because once something is said or written and reaches the receiver, the act becomes irreversible.

Levels of Communication

There are four levels of communication:

1. **Interpersonal-occurs b/n two or more persons in a face-to-face situation**

2. **Group – occurs b/n individuals as members of a group**

3. **Organization- occurs within an organization which is hierarchically structured**

4. **Mass- consists of transmission of messages from a single organizational point to mass audience who do not have direct access to the sender.**

Media of Organizational Communication

- Organizational communication can take several forms:

- ❖ Oral: helps us get feedback immediately. But very difficult to maintain the consistency & accuracy of a message.

- ❖ Written: provide records and references. Possible to maintain uniformity, & accuracy of the message.

- ❖ Visual: draw the attention of the audience & is effective

- ❖ Non-verbal: facial expressions, gestures & body movements.

Problems in Organizational Communication

- **Barriers in Communication**

1. Problems in Perception: perception problems because of differences in backgrounds, knowledge & experiences.
2. Semantic Problems: problems of encoding & decoding (because of language capacity).
3. Poor expression of Messages: jargons should be avoided
4. Unclarified Assumptions: if a receiver falsely assumes certain things, which are not intended by the sender, confusions will arise.
5. Interpretation Problems: sending messages in all languages understood by all receivers
6. Psychological Barriers: - motivation, fear, love affect how one perceives messages.
7. Poor Credibility of Communication: - perceived credibility of the communicator.
8. Organizational Barriers: organizational structure

Factors influencing perception

- **The target of all communication is the receiver.**

- **Hence, how s/he perceives the message is important.**

- **This is because there can be a differnce in meaning perceived by the receiver (difference b/n intended and perceived messages).**

- **Different people perceive the same stimuli differently.**

- **How we react to stimuli depends on how we perceive them.**

- **Various factors influence our perceptions:**

- **Selectivity : we choose a few stimuli to respond to. Culture, capacity, experience, attitudes matter on how we perceive stimuli.**

Factors influencing perception...

1. **Psychological set: having a mindset in us about the world because of our experience or hearsay. This is prejuging.**

2. **Sensory organization : we organize the info supplied to us by our sensory organs based on their resemblance and arrangement.**

3. **Form: it is easier to notice what is organized and structured than what is not.**

4. **Closure : refers to our ability to fill up gaps according to the logic of the message. E.g. 500 + 500 = 100. You know that „0" is missing.**

5. **Common-fate : noticing figures sharing common fate (moving in the same direction).**

Effective Communication

- **Issues to consider**

❖ Ensure that all members of organization understand the languages used & explain the difficult technical terms

❖ Properly & timely plan your communication according to the purpose by selecting appropriate media

❖ Eliminate noise in transmission of a message

❖ Be sensitive to the receiver's need & problems

❖ Develop listening skills since it is important for effective communication

❖ Give importance to feedback

❖ Improve your writing by use of simple words, short sentences, active voice

❖ Improve your oral communication skills through constant practice

❖ Develop credibility and sincerity

❖ Create a healthy atmosphere for work

❖ Make use of improved devises

Mass communication theory

According to Mass Communication Theory (Denis McQuail)

- who communicates to whom? (source & receiver)

- why communicate? (functions & purposes)

- how does communication take place? (channels, languages, codes)

- what about? (content, objects of reference, types of information)

- What are the consequences of communication? (intended or
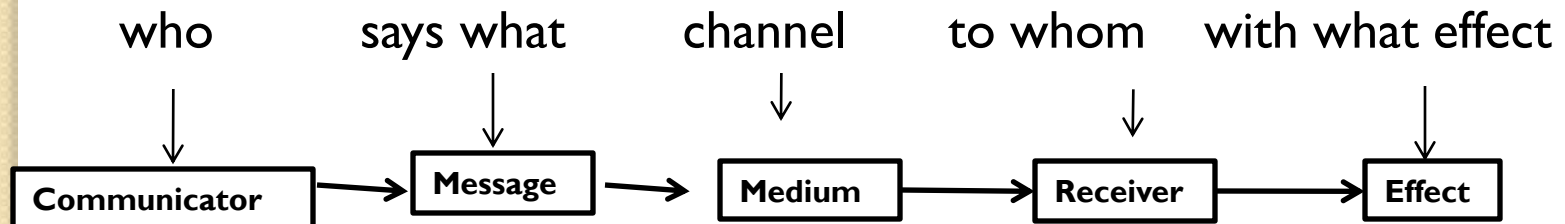
    otherwise)

Communication Models

Models are important for two things:

✓ To know the interrelated behaviour needed for communication

✓ To signle out each part of the communication process

Lasswell Model- one of the earliest models

- 'who says what, in which channel, to whom, with what effect?'

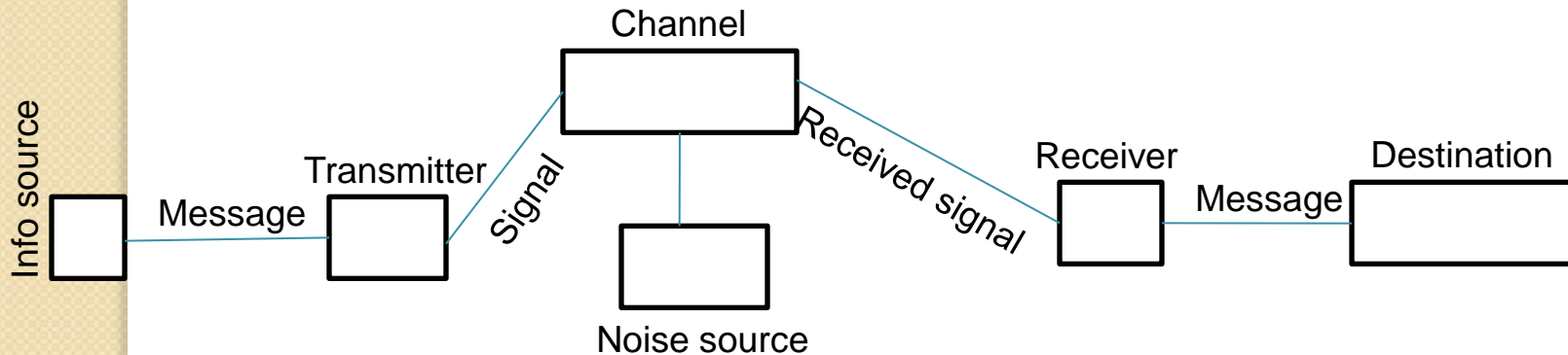- implies that more than one channel carries a message.

who	says what	channel	to whom	with what effect

Communicator → **Message** → **Medium** → **Receiver** → **Effect**
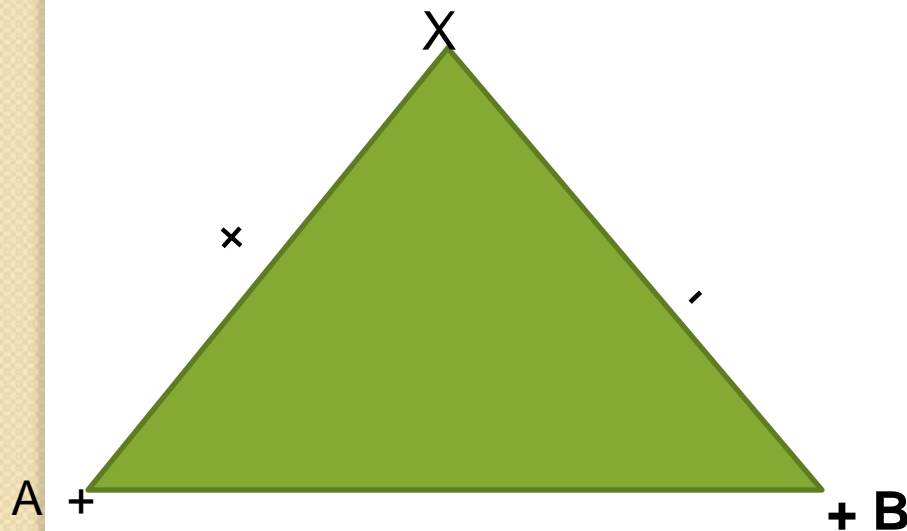
Communication Models...

1. Shannon-Weaver Information Model
❖ Designed by Claude E. Shannon & warren Weaver in 1949
❖ Comunication is a linear one way process-feedback is missing.

Channel

Info source

Transmitter   Received signal   Receiver   Destination

Message   Signal   Message

Noise source

✓ Entropy- uncertainty
✓ Redundancy- certainty
✓ The goal of communication is to reduce entropy
✓ But noise increases entropy.

●207

2. Social-psychological Model

✓ It emphasizes interpersonal aspect of communication, especially on their strain towards symmetry (trying to bring the situation into balance for the sake of the other party).

✓ Symmetry- individual orientations towards an object.

X

✓A likes B

✓B likes A

✓ A likes X

✓B does not like X

A +   + B

✓ **It is developed by Newcomb in 1953.**

Selection of channels

- Selection of channels depnds on:
  - ✓ What is available
  - ✓ How much money can be spent
  - ✓ Interest of the S and R
  - ✓ Which channels are received by most people
  - ✓ Which channels have the most impact
  - ✓ The kind of purpose, type and content of the message

Project Communications Management

- Communications Management makes sure everybody gets the right message at the right time.

- The project communications Management processes include the following;

8.1 Plan Communications Management - determining the information and communication needs of the project stakeholders.

8.2 Manage Communications - making needed information available to project stakeholders in a timely manner

8.3 Monitor Communications – collecting and distribute performance information. This includes status reporting, progress measurement, and forecasting.

8.1 Plan Communications Management

- Every project should include some type of communications management plan, a document that guides project communications

- The communications planning process determines the information and communications needs of the stakeholders; for example, who needs what information, when they will need it, how it will be given to them, and by whom.

- While all projects share the need to communicate project information, the informational needs and methods of distribution vary widely.

- Identifying the informational needs of the stakeholders and determining a suitable means of meeting those needs is an important factor for project success.

- On most projects, the majority off communications planning is done as part of earliest project phases.

8.1 Plan Communications Management…

Inputs

- Project management plan
- Stakeholder register
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Communication requirements Analysis
- Communication technology
- Communication models
- Communication methods
- Meetings

Outputs

- Communications management plan
- Project documents updates

Communications Management Plan Contents

- A description of a collection and filing structure for gathering and storing various types of information

- A distribution structure describing what information goes to whom, when, and how

- A format for communicating key project information

- A project schedule for producing the information

- Access methods for obtaining the information

- A method for updating the communications management plans as the project progresses and develops

- A stakeholder communications analysis

8.2 Manage Communications

Inputs

- Communications management plan
- Work performance reports
- Enterprise environmental factors
- Organizational process assets

Tools & Techniques

- Communication technology
- Communication models
- Communication methods
- Information management systems
- Performance reporting

Outputs

- Project communications
- Project management plan updates
- Project documents updates
- Organizational process assets updates

8.2 Manage Communications

- Manage Communications is in the executing process group, because it happens while the work is being done.

- You need to make sure everybody gets the information they need while they're working, so that they're completely equipped to get their jobs done.

- Here's where you get the information out to the people and make sure that the right people have the info they need.

- 90% of a project manager's job is communication.

Conflict Handling Modes, in Preference Order

- **Confrontation or problem-solving**: directly face a conflict

- **Compromise**: use a give-and-take approach

- **Smoothing**: de-emphasize areas of differences and emphasize areas of agreement

- **Forcing**: the win-lose approach

- **Withdrawal**: retreat or withdraw from an actual or potential disagreement

8.3 Control Communications

Inputs

- Project management plan
- Project communications
- Issue log
- Work performance data
- Organizational process assets

Tools & Techniques

- Information management systems
- Expert judgment
- Meetings

Outputs

- Work performance information
- Change requests
- Project management plan updates
- Project documents updates
- Organizational process assets updates

8.3 Monitor Communications

- Monitor Communications is in the Monitoring and Controlling process group.

- You need to constantly monitor and always stay in control of all of the communication that goes on throughout the project, whether it's to communicate your team's performance, or to keep stakeholders up to date on the project.

- This is where you turn all of that work performance data (like how long it actually took the team to complete tasks, and actual costs of doing the work so far) into work performance information (like forecasted completion dates, and budget forecasts) that your stakeholders will use to stay informed.

Unit 9: Project Risk Management

- Project risk management includes the processes concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on the project; most of these processes are updated throughout the project.

- The objectives of project risk management are to increase the probability and impact of positive events, and decrease the probability and impact of events adverse to the project.

What is Risk?

- A risk is any uncertain event or condition that might affect your project. Not all risks are negative.
- Risk
  - A possible future event if occurs will lead to an undesirable outcome.
- Project Risk
  - The cumulative effect of the chances of an uncertain occurrence that will adversely affect project objectives.
- Risk Management
  - A systematic and explicit approach for identifying, quantifying, and controlling project risk.
  - *Risk = f(event, uncertainty, damage)*
  - *Risk = f(hazard, safeguard)*

Project Risk Management

•Project risk management is the art and science of identifying, assessing, and responding to project risk throughout the life of a project and in the best interests of its objectives

•Project risk is the cumulative effect of the chances of uncertain occurrences adversely affecting project objectives
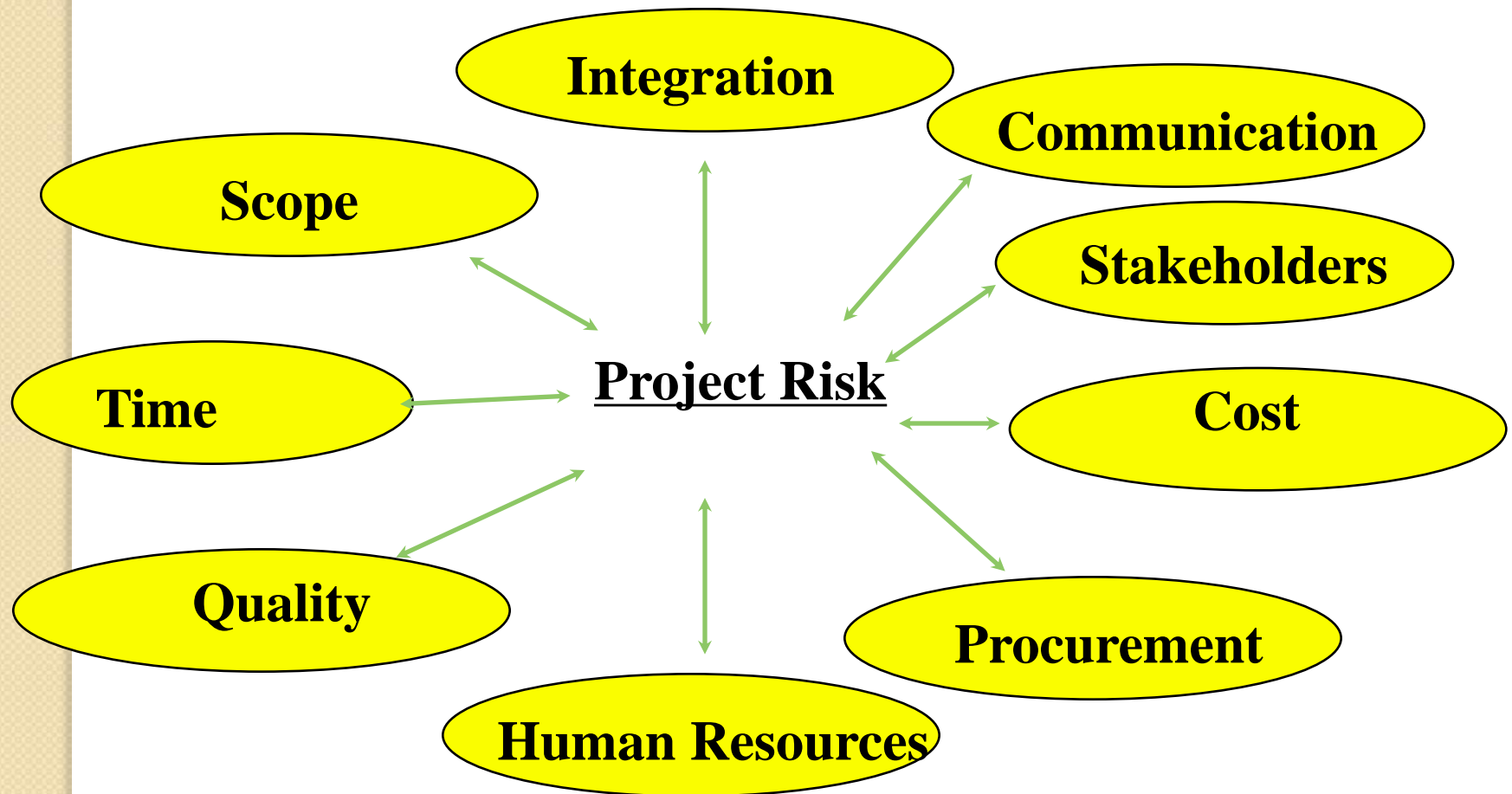
Purpose of Risk Management

1. Identify factors that are likely to impact the project objectives of scope, quality, cost, resources and time

2. Quantify the likely impact of each factor

3. Give a baseline for project non-controllables

4. Mitigate impacts by exercising influence over project controllables

The PMBOK also points out that risk management *includes maximizing the results of positive events and minimizing the consequences of adverse events.*
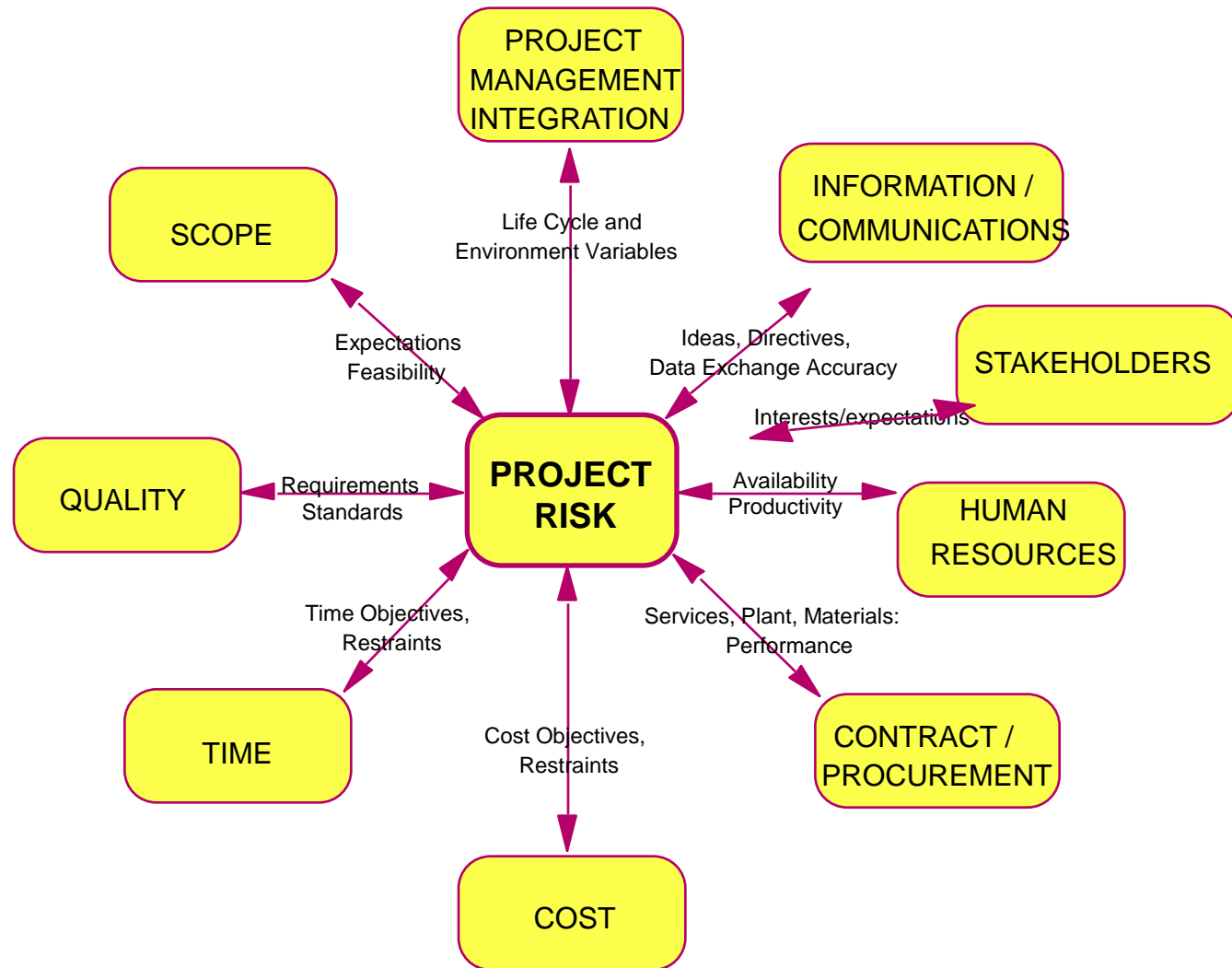
Benefits of Risk Management

- More and better information is available during planning and decision making
- Project objectives are verified
- Improved communications
- Higher probability of project success
- Proactive approach
- Project might be canceled

Project Risk

INTEGRATING RISK

TYPES OF RISK (2)

- **Knowns**
  - ◦ An item or situation containing no uncertainty

- **Known Unknowns**
  - ◦ Things which we know exist but do not know how they will affect us. These can be identified and evaluated.

- **Unknown Unknowns**
  - ◦ Those risks that cannot be identified and evaluated (unexpected needs). These can be handled via contingency allowances.

Project Risk Management

9.1 Plan Risk management: deciding how to approach, plan, and execute the risk management activities for a project.

9.2 Identify Risks: The first thing you need to do when planning for risks is to gather the team together and come up with a list of every possible risk you can think of. The RBS you created during Plan Risk Management will make it a lot easier to do this.

9.3 Perform Qualitative Risk Analysis: Once you've got a list of risks, you'll need to get a good idea of the probability and impact of each risk. Remember the probability and impact guidelines in the Risk Management plan. This is where you use them to assign a probability and impact to each risk! Perform Qualitative Risk Analysis helps you prioritize each risk and figure out its probability and impact.

Project Risk Management

9.4 Perform Quantitative Risk Analysis: By the time you get here, you've got a list of risks, with a probability and impact assigned to each. That's a great starting point, but sometimes you need more information if you want to make good decisions.

- You can make better decisions with more precise information. That's what this process is about—assigning numerical values for the probability and impact of each risk.

9.5 Plan Risk Responses: All that's left now is to plan responses to each risk! This is where you decide whether to avoid, mitigate, transfer, or accept…and how you'll do it! The goal of all of the risk planning processes is to produce the risk register. That's your main weapon against risk.

9.6 Implement Risk Responses: PMBoK 6th edition

9.7 Control Risks: When it comes to risk, the earlier you can react, the better for everybody.

9.1 Plan Risk Management

* Plan Risk Management is the process of defining how to conduct risk management activities for a project.

* The key benefit of this process is it ensures that the degree, type, and visibility of risk management are commensurate with both the risks and the importance of the project to the organization.

* The risk management plan is vital to communicate with and obtain agreement and support from all stakeholders to ensure the risk management process is supported and performed effectively over the project life cycle.

* The Risk Management plan is your guide to identifying and analyzing risks on your project. It tells you who identifies and analyzes the risks, how they do it, and how often it happens.

9.1 Plan Risk Management

- Risk Management Plan tells you how you're going to handle risk on your project—which you probably guessed, since that's what management plans do.

- It says how you'll assess risk on the project, who's responsible for doing it, and how often you'll do risk planning (since you'll have to meet about risk planning with your team throughout the project).

- In planning risk management, all approved subsidiary management plans and baselines should be taken into consideration in order to make the risk management plan consistent with them.

- The risk management plan is also a component of the project management plan.

- The project management plan provides baseline or current state of risk-affected areas including scope, schedule, and cost.

9.1 Plan Risk Management

- The plan has parts that are really useful for managing risk:

- It has a bunch of **risk categories that you'll use to classify** your risks.

- Some risks are technical, like a component that might turn out to be difficult to use. Others are external, like changes in the market or even problems with the weather. Risk categories help you to build a **risk breakdown structure (RBS).**

- You'll need to describe the methods and approach you'll use for identifying and classifying risks on your project.

- It's important to come up with a plan to help you figure out how big a risk's impact is and how likely a risk is to happen.

- The impact tells you how much damage the risk will cause to your project.

- A lot of projects classify impact on a scale from minimal to severe, or from very low to very high.

9.1 Plan Risk Management

- Careful and explicit planning enhances the probability of success for other risk management processes.

- Planning is also important to provide sufficient resources and time for risk management activities and to establish an agreed upon basis for evaluating risks.

- The Plan Risk Management process should begin when a project is conceived and should be completed early during project planning.

- You should build guidelines for risk categories into your Risk Management plan, and the easiest way to do that is to use a **risk breakdown structure (RBS). Notice how** it looks a lot like a WBS? It's a similar idea—you come up with major risk categories, and then decompose them into more detailed ones.

9.1 Plan Risk Management

- The risk management plan is a component of the project management plan and describes how risk management activities will be structured and performed. The risk management plan includes the following:

- **Methodology.** Defines the approaches, tools, and data sources that will be used to perform risk management on the project.

- **Roles and responsibilities.** Defines the lead, support, and risk management team members for each type of activity in the risk management plan, and clarifies their responsibilities.

- **Budgeting.** Estimates funds needed, based on assigned resources, for inclusion in the cost baseline and establishes protocols for application of contingency and management reserves.

- **Timing.** Defines when and how often the risk management processes will be performed throughout the project life cycle, establishes protocols for application of schedule contingency reserves, and establishes risk management activities for inclusion in the project schedule.

- **Risk categories.** Provide a means for grouping potential causes of risk

9.2 Identify Risks

- Identify Risks is the process of determining which risks may affect the project and documenting their characteristics.

- The key benefit of this process is the documentation of existing risks and the knowledge and ability it provides to the project team to anticipate events.

- Identify risks is an iterative process, because new risks may evolve or become known as the project progresses through its life cycle.

9.3 Perform Qualitative Risk Analysis

- Perform Qualitative Risk Analysis is the process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.

- The key benefit of this process is that it enables project managers to reduce the level of uncertainty and to focus on high-priority risks.

- Perform Qualitative Risk Analysis assesses the priority of identified risks using their relative probability or likelihood of occurrence, the corresponding impact on project objectives if the risks occur, as well as other factors such as the time frame for response and the organization's risk tolerance associated with the project constraints of cost, schedule, scope, and quality.

9.3 Perform Qualitative Risk Analysis

- Such assessments reflect the risk attitude of the project team and other stakeholders. Effective assessment therefore requires explicit identification and management of the risk approaches of key participants in the Perform Qualitative Risk Analysis process.

- Where these risk approaches introduce bias into the assessment of identified risks, attention should be paid to identifying bias and correcting for it.

- Perform Qualitative Risk Analysis is usually a rapid and cost-effective means of establishing priorities for Plan

- Risk Responses and lays the foundation for Perform Quantitative Risk Analysis, if required.

- It is performed regularly throughout the project life cycle, as defined in the project's risk management plan.

9.4 Perform Quantitative Risk Analysis

- Perform Quantitative Risk Analysis is the process of numerically analyzing the effect of identified risks on overall project objectives.

- The key benefit of this process is that it produces quantitative risk information to support decision making in order to reduce project uncertainty.

- Perform Quantitative Risk Analysis is performed on risks that have been prioritized by the Perform Qualitative Risk Analysis process as potentially and substantially impacting the project's competing demands.

- The Perform Quantitative Risk Analysis process analyzes the effect of those risks on project objectives. It is used mostly to evaluate the aggregate effect of all risks affecting the project. When the risks drive the quantitative analysis, the process may be used to assign a numerical priority rating to those risks individually.

9.4 Perform Quantitative Risk Analysis

Risk = Probability * Consequence

PROBABILITY CONSEQUENCES	FREQUENT (HIGH)* 0.7<P<1.0	PROBABLE (MEDIUM)* 0.4<P<0.7	IMPROBABLE (LOW)* 0<P<0.4	IMPOSSIBLE P = 0
CATASTROPHIC 1.0 - 0.9	0.9 HIGH	0.7	0.4	0.0
CRITICAL 0.8 - 0.7	0.8	0.6 MEDIUM	0.3	0.0 NONE
MARGINAL 0.6 - 0.4	0.6	0.4	0.2 LOW	0.0
NEGLIGABLE 0.3 - 0.0	0.3	0.2	0.1	0.0

9.4 Perform Quantitative Risk Analysis

- How do you quantitatively prioritize a risk? Would you prioritize the risks with the highest probability of occurrence or the risks with the greatest monetary impact?

- This is where **Expected Monetary Value (EMV)** comes to the rescue in Project Risk Management.

- **Beginning With a Qualitative Risk Analysis…**

- After conducting a Qualitative Risk Analysis, you'll have a list of risks with a priority and urgency assigned.

- By using Expected Monetary Value, you can quantify each risk to determine whether your qualitative analysis is backed by numbers.

- Expected Monetary Value is a recommended tool and technique for Quantitative Risk Analysis in Project Risk Management.

9.4 Perform Quantitative Risk Analysis

Steps to Calculate Expected Monetary Value (EMV)

- To calculate the Expected Monetary Value in project risk management, you need to:

    1. Assign a probability of occurrence for the risk.
    2. Assign monetary value of the impact of the risk when it occurs.
    3. Multiply Step 1 by Step 2.

- The value you get after performing Step 3 is the Expected Monetary Value.

- This value is positive for opportunities (positive risks) and negative for threats (negative risks).

- Project risk management requires you to address both types of project risks.

9.4 Perform Quantitative Risk Analysis

Example:

- Suppose you are leading a construction project. Weather, cost of construction material, and labor turmoil are key project risks found in most construction projects:

  - ❖ **Project Risk 1 - Weather:** There is a 25 percent chance of excessive rainfall that'll delay the construction for two weeks which will, in turn, cost the project $80,000.

  - ❖ **Project Risk 2 - Cost of Construction Material**: There is a 10 percent probability of the price of construction material dropping, which will save the project $100,000.

  - ❖ **Project Risk 3 - Labor Turmoil**: There is a 5% probability of construction coming to a halt if the workers go on strike. The impact would lead to a loss of $150,000.

9.4 Perform Quantitative Risk Analysis

Expected Monetary Value Calculation for Project Risk Management

- In this Expected Monetary Value example, we have two negative project risks (Weather and Labor Turmoil) and a positive project risks (reduction in Cost of Construction Material).

- The Expected Monetary Value for the project risks:

  - **Weather**: 25/100 * (-$80,000) = - $ 20,000
  - **Cost of Construction Material**: 10/100 * ($100,000) = $ 10,000
  - **Labor Turmoil**: 5/100 * (-$150,000) = - $7,500

- The project's Expected Monetary Value based on these project risks is:

$$-(\$20,000) + (\$10,000) - (\$7,500) = -\$17,500$$

9.4 Perform Quantitative Risk Analysis

Exercise

- You are planning modifications to a car assembly line. You have identified particular project risks and assessed them as shown below.

- There is a:

  - ❖ 30% probability that parts will be delayed, costing $90,000

  - ❖ 60% chance that parts could be produced more efficiently saving you $60,000

  - ❖ 45% chance that parts will not be able to be integrated, requiring rework costing $43,500

  - ❖ 30% chance that workflow processes will be more streamlined, saving $92,500

  - ❖ 20% probability that system and design faults will cause rework costing $25,000 in corrections

- What is the EMV?

9.4 Perform Quantitative Risk Analysis

The Monte Carlo Technique

Uses

- Will select input values – pessimistic to most likely to optimistic and all numbers in between

- A probability distribution is calculated from the iterations i.e. total cost or completion date based on what was input – cost estimates or schedule network diagram and duration estimates

Calculates

- Number of times each activity is on the critical path

- How sensitive the output is to a change in the activity and its duration

- Helps to assess and decide on the priority of dealing with the risks depending on the impact on the project

9.4 Perform Quantitative Risk Analysis

- **Journey Times example**

- Your Project requires a journey from A to B which has

- 12 traffic junctions in between, with an average time between junctions of 10 minutes

- And a wait time of 3 minutes at each junction when it is on red

- Worst case is when all the lights are on red

$$= (12 \times 3) + (12 \times 10) = 156 \text{ minutes}$$

- Best case is when all the lights are on green

$$= 12 \times 10 \text{ only} = 120 \text{ minutes}$$

- Most probable is when half are on red and half on green

$$= (12 \times 10) + (6 \times 3) = 138 \text{ minutes}$$

- Need to take other possible combinations into account. This is what Monte Carlo does via software

9.5 Plan Risk Responses

- Plan Risk Responses is the process of developing options and actions to enhance opportunities and to reduce threats to project objectives.

- The key benefit of this process is that it addresses the risks by their priority, inserting resources and activities into the budget, schedule and project management plan as needed.

- The Plan Risk Responses process follows the Perform Quantitative Risk Analysis process (if used). Each risk response requires an understanding of the mechanism by which it will address the risk. This is the mechanism used to analyze if the risk response plan is having the desired effect. It includes the identification and assignment of one person (an owner for risk response) to take responsibility for each agreed-to and funded risk response.

- Risk responses should be appropriate for the significance of the risk, cost-effective in meeting the challenge, realistic within the project context, agreed upon by all parties involved, and owned by a responsible person. Selecting the optimum risk response from several options is often required.

9.5 Plan Risk Responses

- **Strategies for Negative Risks**

- **Avoid.** Risk avoidance is a risk response strategy whereby the project team acts to eliminate the threat or protect the project from its impact. It usually involves changing the project management plan to eliminate the threat entirely.

- **Transfer.** Risk transference is a risk response strategy whereby the project team shifts the impact of a threat to a third party, together with ownership of the response. Transferring the risk simply gives another party responsibility for its management—it does not eliminate it.

- **Mitigate.** Risk mitigation is a risk response strategy whereby the project team acts to reduce the probability of occurrence or impact of a risk.

- **Accept.** Risk acceptance is a risk response strategy whereby the project team decides to acknowledge the risk and not take any action unless the risk occurs. This strategy is adopted where it is not possible or cost-effective to address a specific risk in any other way.

9.5 Plan Risk Responses

- **Strategies for Positive Risks or Opportunities**

- **Exploit.** The exploit strategy may be selected for risks with positive impacts where the organization wishes to ensure that the opportunity is realized. This strategy seeks to eliminate the uncertainty associated with a particular upside risk by ensuring the opportunity definitely happens.

- **Enhance.** The enhance strategy is used to increase the probability and/or the positive impacts of an opportunity. Identifying and maximizing key drivers of these positive-impact risks may increase the probability of their occurrence.

- **Share.** Sharing a positive risk involves allocating some or all of the ownership of the opportunity to a third party who is best able to capture the opportunity for the benefit of the project.

- **Accept.** Accepting an opportunity is being willing to take advantage of the opportunity if it arises, but not actively pursuing it.

Risk Management

A Risk Management Framework

- Correct deviations
- Anticipate what can go wrong
- Track actions
- Decide what is important
- Plan to take action

Control — Identify — Analyze — Plan — Track — Communicate

9.6 Control Risks

- Control Risks is the process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

- The key benefit of this process is that it improves efficiency of the risk approach throughout the project life cycle to continuously optimize risk responses.

- The Control Risks process applies techniques, such as variance and trend analysis, which require the use of

- performance information generated during project execution. Other purposes of the Control Risks process are to determine if:
  - Project assumptions are still valid,
  - Analysis shows an assessed risk has changed or can be retired,
  - Risk management policies and procedures are being followed, and
  - Contingency reserves for cost or schedule should be modified in alignment with the current risk assessment.

Unit 10: Project Procurement Management

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

- The organization can be either the buyer or seller of the products, services, or results of a project.

- Project Procurement Management includes the contract management and change control processes required to develop and administer contracts or purchase orders issued by authorized project team members.

- Project Procurement Management also includes controlling any contract issued by an outside organization (the buyer) that is acquiring deliverables from the project from the performing organization (the seller), and administering contractual obligations placed on the project team by the contract.

Project Procurement Management

10.1 Plan Procurement Management—The process of documenting project procurement decisions, specifying the approach, and identifying potential sellers.

10.2 Conduct Procurements—The process of obtaining seller responses, selecting a seller, and awarding a contract.

10.3 Control Procurements—The process of managing procurement relationships, monitoring contract performance, and making changes and corrections as appropriate.

10.4 Close Procurements—The process of completing each project procurement.

Project Procurement Management

- A procurement contract includes terms and conditions, and may incorporate other items that the buyer specifies as to what the seller is to perform or provide.

- It is the project management team's responsibility to make certain that all procurements meet the specific needs of the project while adhering to organizational procurement policies.

- Depending upon the application area, a contract can also be called an agreement, an understanding, a subcontract, or a purchase order.

- Most organizations document policies and procedures specifically defining the procurement rules and specifying who has authority to sign and administer such agreements on behalf of the organization.

10.1 Plan Procurement Management

- Plan Procurement Management is the process of documenting project procurement decisions, specifying the approach, and identifying potential sellers.

- The key benefit of this process is that it determines whether to acquire outside support, and if so, what to acquire, how to acquire it, how much is needed, and when to acquire it.

- Plan Procurement Management identifies those project needs that can best be met or should be met by acquiring products, services, or results outside of the project organization, versus those project needs which can be accomplished by the project team.

- When the project obtains products, services, and results required for project performance from outside of the performing organization, the processes from Plan Procurement Management through Close Procurements are performed for each item to be acquired.

10.2 Conduct Procurements

- Conduct Procurements is the process of obtaining seller responses, selecting a seller, and awarding a contract.

- The key benefit of this process is that it provides alignment of internal and external stakeholder expectations through established agreements.

- During the Conduct Procurements process, the team will receive bids or proposals and will apply previously defined selection criteria to select one or more sellers who are qualified to perform the work and acceptable as a seller.

- On major procurement items, the overall process of requesting responses from sellers and evaluating those responses can be repeated. A short list of qualified sellers can be established based on a preliminary proposal.

10.3 Control Procurements

- Control Procurements is the process of managing procurement relationships, monitoring contract performance, and making changes and corrections to contracts as appropriate.

- The key benefit of this process is that it ensures that both the seller's and buyer's performance meets procurement requirements according to the terms of the legal agreement.

- Both the buyer and the seller will administer the procurement contract for similar purposes.

- Each are required to ensure that both parties meet their contractual obligations and that their own legal rights are protected.

- The legal nature of the contractual relationship makes it imperative that the project management team is aware of the legal implications of actions taken when controlling any procurement.

- On larger projects with multiple providers, a key aspect of contract administration is managing interfaces among the various providers.

10.3 Control Procurements

- Control Procurements includes application of the appropriate project management processes to the contractual relationship(s) and integration of the outputs from these processes into the overall management of the project.

- This integration will often occur at multiple levels when there are multiple sellers and multiple products, services, or results involved. The project management processes that are applied may include, but are not limited to:

  ◦ **Direct and Manage Project Work.** To authorize the seller's work at the appropriate time.

  ◦ **Control Quality.** To inspect and verify the adequacy of the seller's product.

  ◦ **Perform Integrated Change Control.** To assure that changes are properly approved and that all those with a need to know are aware of such changes.

  ◦ **Control Risks.** To ensure that risks are mitigated.

10.4 Close Contracts

- Close Procurements is the process of completing each procurement.

- The key benefit of this process is that it documents agreements and related documentation for future reference.

- The Close Procurements process also involves administrative activities such as finalizing open claims, updating records to reflect final results, and archiving such information for future use.

- Close Procurements addresses each contract applicable to the project or a project phase. In multiphase projects, the term of a contract may only be applicable to a given phase of the project.

- In these cases, the Close Procurements process closes the procurement(s) applicable to that phase of the project. Unresolved claims may be subject to litigation after closure. The contract terms and conditions can prescribe specific procedures for agreement closure.

- The Close Procurements process supports the Close Project or Phase process by ensuring contractual agreements are completed or terminated.

Unit 11: Stakeholder Management

11.1 Identify Stakeholders—The process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project; and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.

11.2 Plan Stakeholder Engagement—The process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success.

11.3 Manage Stakeholder Engagement—The process of communicating and working with stakeholders to meet their needs/expectations, address issues as they occur, and foster appropriate stakeholder engagement in project activities throughout the project life cycle.

11.4 Monitor Stakeholder Engagement—The process of monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.

11.1 Identify Stakeholders

- Identify Stakeholders is the process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project, analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.

- The key benefit of this process is that it allows the project manager to identify the appropriate focus for each stakeholder or group of stakeholders.

- It is critical for project success to identify the stakeholders early in the project or phase and to analyze their levels of interest, their individual expectations, as well as their importance and influence.

Stakeholder analysis

❖ Stakeholders: are people affected by the impact of an activity & people who can influence the impact of an activity

● Stakeholders are:

  ❖ individuals or groups with a direct, significant and specific stake or interest in a given territory or set of natural resources and, thus, in a proposed project.

  ❖ People affected by the impact of an activity

  ❖ People who can influence the impact of an activity

● Participation or stakeholder analysis seeks to identify the major interest groups involved (all those affected by or involved) in the project.

● Stakeholder groups are made up of people who share a common interest, such as an NGO, and the community.

● Categorizing the stakeholders into different groups is important

Key players

The project manager

- Is responsible for achieving project objectives.
- Manages the project:
    - Planning, organizing, leading, controlling (monitoring progress)
    - Communicating, balancing conflicting requirements, managing stakeholders, building & inspiring the team
    - Sharing success, accepts all blame

Key Players…

- **Sponsor: the person or group that provides the financial resources, in cash or kind, for the project**
    - **Project Initiator**
    - **Ensures project relevance**
    - **Helps in objectives setting**
- **Customer/user/client: the person or organization that will use the project/s product.**
- **Performing organization: the enterprise whose employees are most directly involved in doing the work of the project.**
- **Project team members: the members of the project team who are directly involved in project management activities**
- **Project management team: the group that is performing the work of the project**
- **Potential opponents:** Groups which may oppose or obstruct a project.
- Supplier: Provides resources

Stakeholder Analysis

- Why stakeholder analysis:
  - To identify stakeholders' interests in, importance to, and influence over the operation
  - To identify local institutions and processes upon which to build
  - To provide a foundation and strategy for participation
  - To develop a strategic view of the human and institutional situation, and the relationship between the different stakeholders and the objectives identified.
  - provides a useful starting point for problem analysis.
  - It involves the identification of all stakeholder groups likely to be affected (either positively or negatively) by the proposed intervention.

Stakeholder analysis

It is a four-step process

1. Identify key stakeholders

2. Assess stakeholder interests and the potential impact of the project on these interests (expectations, benefits, willingness to mobilize resources, interests)

3. Assess the stakeholder influence and importance (power, control of strategic resources)

4. Outline stakeholder participation strategy

Stakeholder Analysis

- Particular effort must always be made to ensure their participation.

- The full participation of stakeholders in both the design and implementation of projects is a key (but not a guarantee) to their success.

- Stakeholder participation: gives local people control over how project activities affect their lives. It is essential for sustainability generates a sense of ownership (if initiated early in the design process)

- The basis of the stake: e.g., customary rights, ownership, administrative or legal responsibilities, intellectual rights, social obligations.

Stakeholder Analysis…

- Planning workshop provides opportunities for learning for both the project team and for the stakeholders themselves

- builds capacity and leads to responsibility.

- It is important that stakeholder participation not be exclusive, or controlled by any one group.

- Once the project has found common ground, and has negotiated its goal with partners including local stakeholders, the stakeholder agreement should be recorded in writing.

- This may seem overly formal, but it has been shown time and again to provide clarity, and to help avoid (or resolve) conflict in the future.

Stakeholder Analysis…

- Risks in stakeholder analysis
  - ❖ The analysis is only as good as the information used. Sometimes it is difficult to get the necessary information, and many assumptions will have to be made
  - ❖ Tables can oversimplify complex situations

Ways of stakeholder analysis

- There are a number of ways of doing stakeholder analysis.

- The approach taken vary depending on the type of a project being proposed. For example, for an advocacy project, we would need to consider different aspects of stakeholders than we would for a development project

- Ideally, stakeholder analysis should be carried out with representatives of as many stakeholder groups as possible.

Stakeholder analysis matrix …

Stakeholders and their basic characteristics	Interests and how affected by the problem(s)	Capacity and motivation to bring about change	Possible actions to address stakeholder interests
Stakeholder 1		Keen interest in reducing the problem	Awareness raising?, lobby?
Stakeholder 2			
Stakeholder 3			
Stakeholder 4			

Method of Carrying out a Stakeholder analysis…

Step 1: Stakeholder analysis matrix

- List all the possible stakeholders in the project. Divide these into primary and secondary stakeholders

- In the second column, write down the interests of each stakeholder in relation to the project and its objectives

- In the third column, write down the likely impact of the project on each stakeholder's interests. This   enables you to know how to approach the different stakeholders throughout the course of the project. Use symbols as follows:

+   potential positive impact on interest,

-    Potential negative impact on interest

+/- possible positive and negative impact on interest

?   Uncertain

- In the fourth column, indicate the priority that the project should give to each stakeholder in meeting their interests. Use the scale 1 to 5 , where 1 is the highest priority
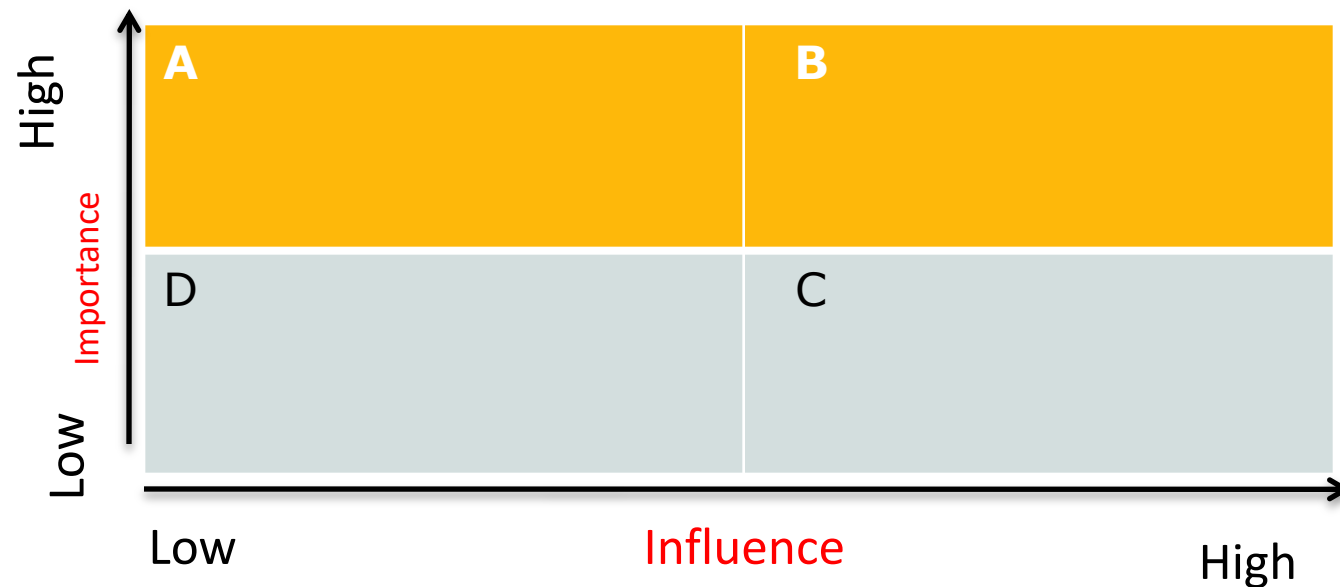
Method of Carrying out a Stakeholder analysis…

- **Example 1:** A community identified their priority need as improved access to safe water and produced the following table
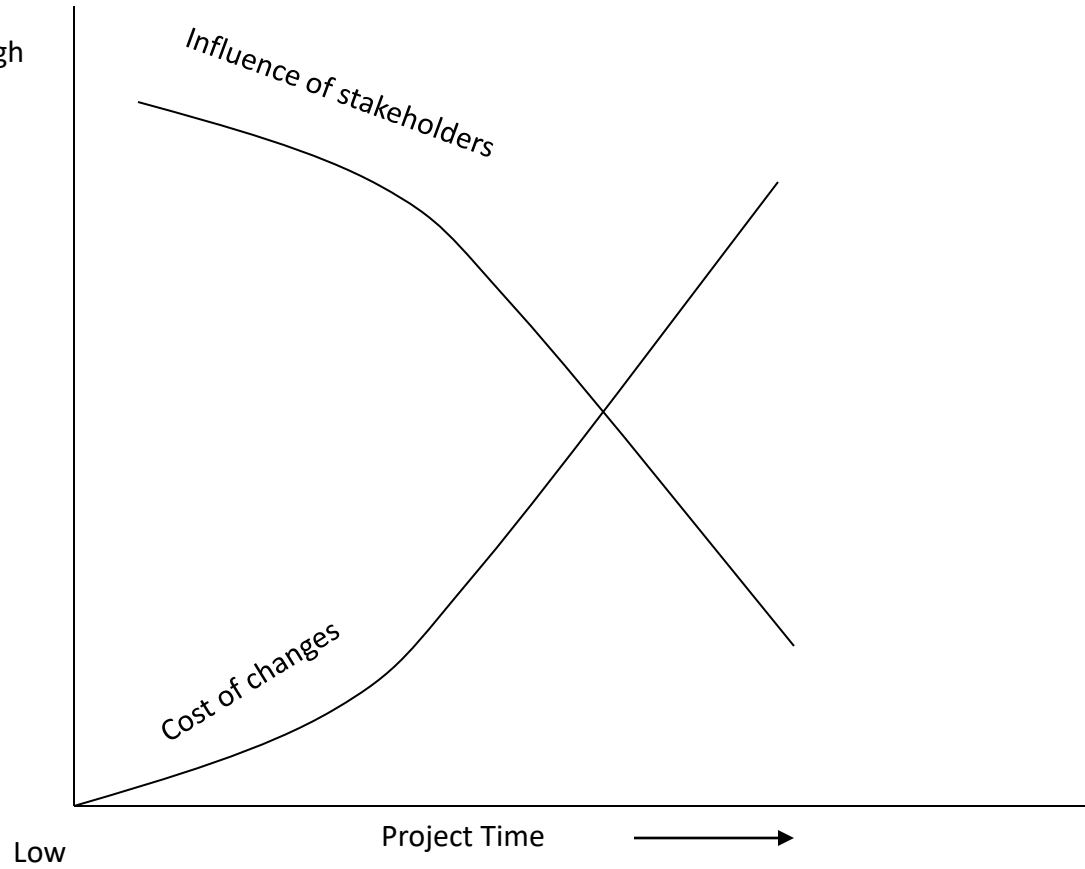
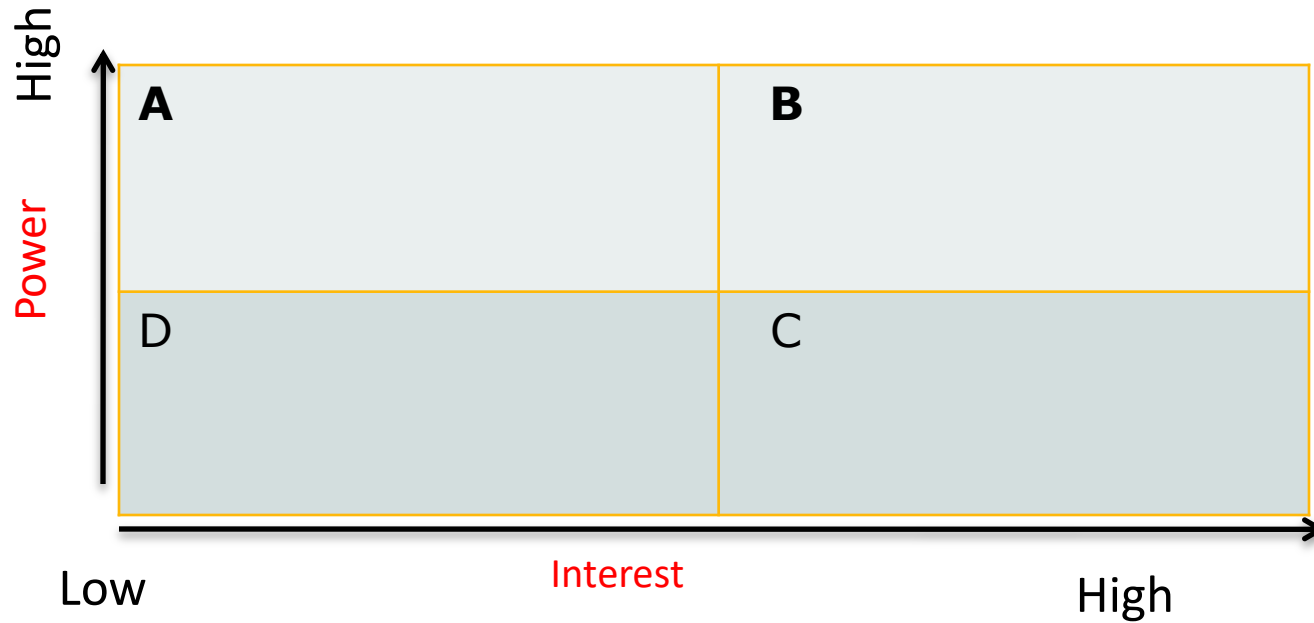| Stakeholders	Interests	Likely impact	Priority
Primary			
Local community	Better health	+	1
Women	Better health, Walk less far to collect water, Opportunity to socialize, Safety while collecting water	+	1
Children	Better health, walk less far to collect water, time to play	+	1
Water sellers	income	-	1
Secondary			
Community health workers	Reduced workload, income	+	2
Health NGOs	Better health	+	3
MoH	Achievement of targets	+	4
Donors	Effective spending of funds, achievement of objectives	+	4

Method of Carrying out a Stakeholder analysis…

Step 2: Table showing influence and importance of stakeholders

- Influence: is the power that stakeholders have over the project
- Importance: is the priority given by the project to satisfy the needs and interests of each stakeholder
- Some stakeholders will have more influence on the project than others
- While some are in a position to influence the project so that it is successful, there might be others who feel threatened by it

Stakeholder Analysis

Method of Carrying out a Stakeholder analysis…

Answers to the exercise

Boxes A, B and C are the key stakeholders of the project. They can significantly influence the project or are most important if project objectives are to be met

Box A: Stakeholders of high importance to the project, but with low influence. They need special initiatives to ensure their interests are protected

Box B: Stakeholders of high importance to the project, who can also influence its success . It is important to develop good working relationships with these stakeholders to ensure adequate support for the project

Box C: Stakeholders with high influence who can affect the project impact, but whose interests are not the target of the project. These stakeholders may be the source of risk. Relationships with these stakeholders are important

Box D: Stakeholders of low priority but who may need limited monitoring and evaluation to check that they have not become high priority
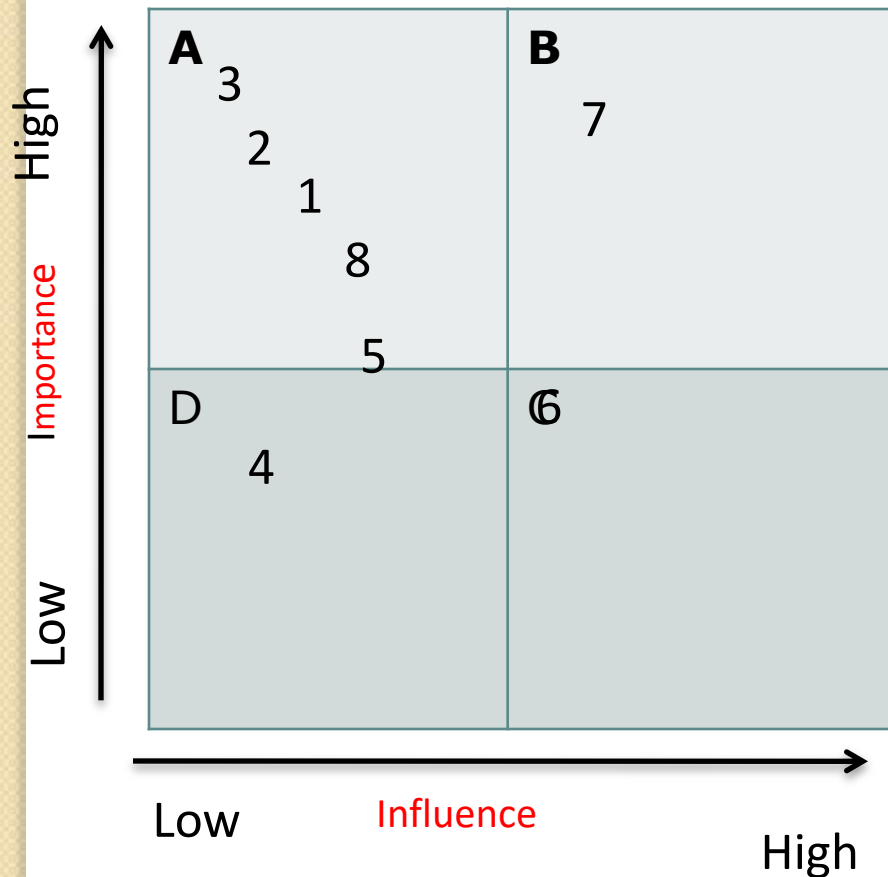
Syndicate Exercise

Exercise 1:

- Go through the list of stakeholders on the stakeholder table completed in example 1.

- Think about the amount of influence they have and the extent to which the project is important to them

- Give each stakeholder a number and put the number in the place on the table above where the stakeholder falls

- If they have high influence, place them towards the right of the table

- If the project is important for them, move the number upwards towards the top of the table

Method of Carrying out a Stakeholder analysis…

Primary Stakeholders

1. Local community

2. Women

3. Children

4. Water sellers

Secondary Stakeholders

5. Community health workers

6. Health NGOs

7. Ministry of Health

8. Donors

Method of Carrying out a Stakeholder analysis…

Step 3: Identify appropriate stakeholder participation

Participation is essential in development work, but in practice it is a concept that has been misused

Participation means different things to different people in different situations

In its widest sense, participation is the involvement of people in development projects

For example, someone can be said to participate by:

- ✓ Attending a meeting, even though they do not say anything
- ✓ Taking part in the decision-making process
- ✓ Contributing materials, money or labor
- ✓ Providing information
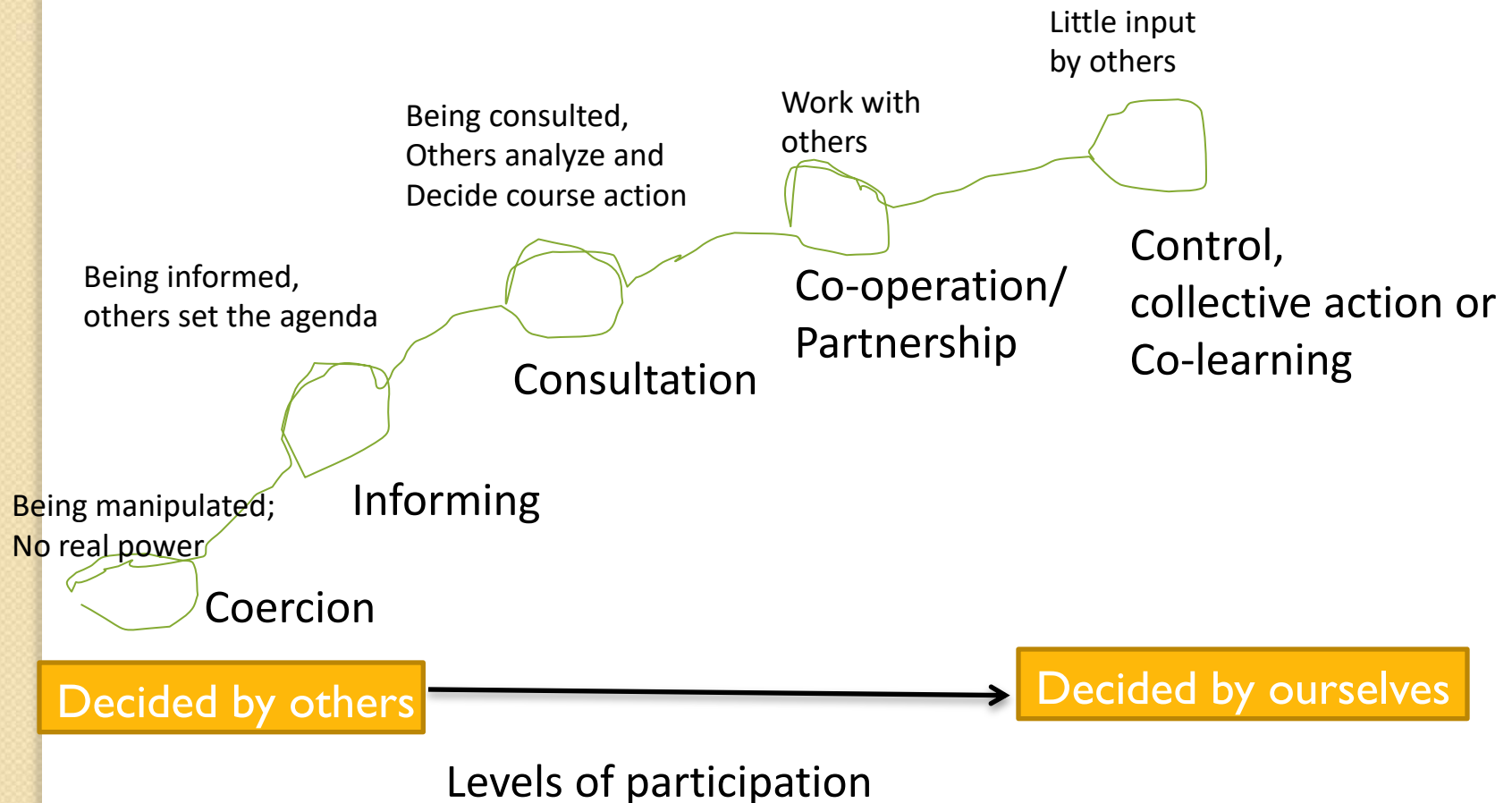- ✓ Answering questions for a survey

Often, so-called participatory projects do not actively involve stakeholders (especially primary stakeholders) in decision-making and development projects

Method of Carrying out a Stakeholder analysis…

- Stakeholder participation in decision-making throughout the whole project cycle is likely to result in:

❖ Improved Effectiveness-increased sense of ownership

❖ Enhanced Responsiveness- project targets effort and inputs at perceived needs

❖ Improved Efficiency- the project is likely to stay within budget and finish on time

❖ Improved Sustainability and Sustainable Impact-more people are committed to carrying on the activity after outside support has stopped

❖ Empowerment and Increased Self-reliance—skills and confidence

❖ Improved Transparency and Accountability-because stakeholders are given information and decision-making power

❖ Improved Equity-if the needs, interests and abilities of all stakeholders are taken into consideration

Method of Carrying out a Stakeholder analysis…

- Active participation is likely to have many benefits, although it is not a guarantee of project success

- Achieving full participation is not easy. It can also take a lot of time, and conflicting interests are likely to come to the surface

Little input
by others

Being consulted,
Others analyze and
Decide course action

Work with
others

Control,
collective action or
Co-learning

Being informed,
others set the agenda

Consultation

Co-operation/
Partnership

Being manipulated;
No real power

Informing

Coercion

Decided by others → **Decided by ourselves**

Levels of participation

Method of Carrying out a Stakeholder analysis…

- Partnership is the type of participation in which two or more stakeholders share in decision-making and the management of the activity

- Ideally, this is partnership between project staff and the beneficiaries.

- However, achieving partnership with primary stakeholders can be challenging

- A number of problems can arise:

  ❖ Partnership may be seen by primary stakeholders as too costly in time and money when compared with the benefit expected

  ❖ Primary stakeholders may lack appropriate information for effective decision-making

  ❖ Some primary stakeholder groups may challenge the right of other groups to participate. E.g., women may be excluded from participating in a village water committee

  ❖ Organizations may have a management structure that does not encourage primary stakeholder participation

Syndicate Exercise

- Is partnership easy?

- How might the challenges of partnership be overcome?

- To identify the level of participation, which is appropriate for different stakeholders, draw a summary participation matrix similar to the one below

- The columns represent the levels of participation and the rows stand for the stages of the project cycle

- Work through the list of stakeholders in the stakeholder matrix

- Think about the extent to which thy should participate for each stage of the project cycle

- Consider the amount of interest or influence they have

- Ensure that primary stakeholders participate as fully as possible to encourage ownership of the project

Method of Carrying out a Stakeholder analysis…

		Type of Participation			
Stage in Project		inform	consult	partnership	control
	Identification				
	Design				
	Implementation and Monitoring				
	Reviewing				
	Evaluation				

During the project cycle we might find that stakeholders, who we thought should participate to a great extent, are actually not interested in participating. Or we might find that to be responsive to how the project is going, we want to encourage some stakeholders to participate more

Method of Carrying out a Stakeholder analysis…

- Example: The rural community identified their priority need as improved access to safe water, and filled in a matrix table with the following information
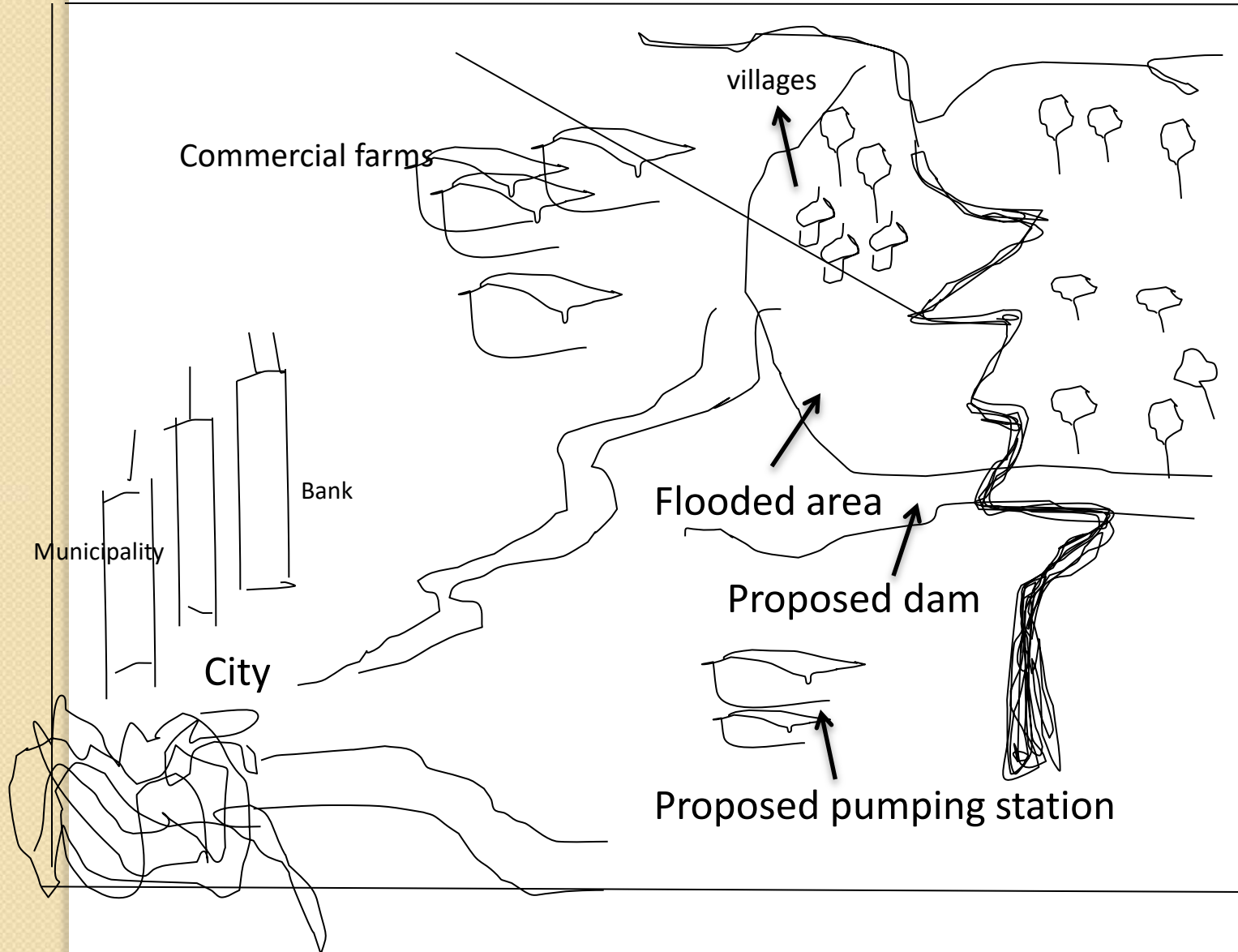
		Type of Participation			
		inform	consult	partnership	control
Stage in Project	Identification		Health NGOs Donor	Cross section of community	
	Design	Donor	Community Women Children Water Sellers Health Workers	Health NGOs MoH Local Church	Project Staff
	Implementation and Monitoring	Donor		Women, Children Water sellers Local church Health workers	Project Staff
	Reviewing	Donor		Women, Children Water sellers Local church Health workers	
	Evaluation	Donor		MoH Health NGOs Community	

Stakeholder Analysis…

Dam Project

- Villagers are concerned about a new dam which has been proposed in their valley.

- The dam will help provide drinking water for the city.

- It is decided that the project should focus on ensuring the views of villagers are listened to so that their livelihoods are not adversely affected.

Stakeholder Analysis…

Exercise

- Complete a summary participation matrix for the dam project

- When the table is completed, think about how participation of stakeholders might actually happen

- For example, if we think a women's group should be consulted at the planning stage, consider how this might be carried out

- We might decide to hold a special meeting

- It is important to consider our options so that we can ensure those who we think should participate in the project respond to our invitation

- The community should select representative members

- Encourage them to ensure a good gender balance

- These members might then require training and discussion of their expected roles and responsibilities in the project

- Identify the different stakeholders of the proposed dam by identifying primary and secondary stakeholders

	List	interest	Likely impact	Priority
1	City dwellers			
2	Villagers			
3	Commercial farms			
4	Donors			
5	MoW			
6	Water sellers			

11.2 Plan Stakeholder Engagement

- Plan Stakeholder Engagement is the process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success.

- The key benefit of this process is that it provides a clear, actionable plan to interact with project stakeholders to support the project's interests.

11.3 Manage Stakeholder Engagement

- Manage Stakeholder Engagement is the process of communicating and working with stakeholders to meet their needs/expectations, address issues as they occur, and foster appropriate stakeholder engagement in project activities throughout the project life cycle.

- The key benefit of this process is that it allows the project manager to increase support and minimize resistance from stakeholders, significantly increasing the chances to achieve project success.

- Manage Stakeholder Engagement involves activities such as:

  ◦ Engaging stakeholders at appropriate project stages to obtain or confirm their continued commitment to the success of the project;

  ◦ Managing stakeholder expectations through negotiation and communication, ensuring project goals are achieved;

  ◦ Addressing potential concerns that have not yet become issues and anticipating future problems that may be raised by stakeholders. Such concerns need to be identified and discussed as soon as possible to assess associated project risks; and

  ◦ Clarifying and resolving issues that have been identified.

11.4 Monitor Stakeholder Engagement

- Control Stakeholder Engagement is the process of monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.

- The key benefit of this process is that it will maintain or increase the efficiency and effectiveness of stakeholder engagement activities as the project evolves and its environment changes.