Chapter 1

Introduction to Project Management

What Is a Project?

- A **project** is a temporary endeavor (effort) undertaken to accomplish a unique product or service.
  - Temporary means that every project has a definite beginning and a definite end.
  - Unique means that the product or service is different in some distinguishing way from all other products or services.
- A software project has two main activity dimensions: ***Engineering*** and ***Project management***.
  - The engineering dimension deals with building the system and focuses on issues such as how to design, test, code, and so on.
  - The project management dimension deals with properly planning and controlling and/or managing the engineering activities to meet project goals for cost, schedule, and quality.

- For a project, the engineering processes generally specify how to perform engineering activities such as requirement specification, design, coding, testing, and so on. The project management, on the other hand specifies how to set milestones (goals), organize personnel, manage risks, monitor progress, and so on.

Attributes of projects

Projects can have many attributes

- Should have a primary sponsor and/or customer
- Involve uncertainty
- They change or improve environments in organizations.
- They get things done.
- They are unique from other work or have unique purpose.
- They are temporary-Have a defined start and end date.
- They require resources and time.
- They solve problems.

What is Project Management?

- **Project management** is the application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements.
- Effective project management centers on the serious business of getting work done on time and within budget while meeting customer expectations.
- Effective project management is about accomplishment, leadership, and owning the project scope.
- Project management involves coordinating people, vendors, and resources.

- Project management is centered on ***nine*** *knowledge areas.*
- This knowledge areas describe the key competencies that project managers must develop.
- Events in each knowledge area affect what happens in the other eight knowledge areas.
  - **4 core knowledge areas** lead to specific project objectives (scope, time, cost, and quality).
  - **4 facilitating knowledge areas** are the means through which the project objectives are achieved (human resources, communication, risk, and procurement management).
  - **1 knowledge area** (project integration management) affects and is affected by all of the other knowledge areas.

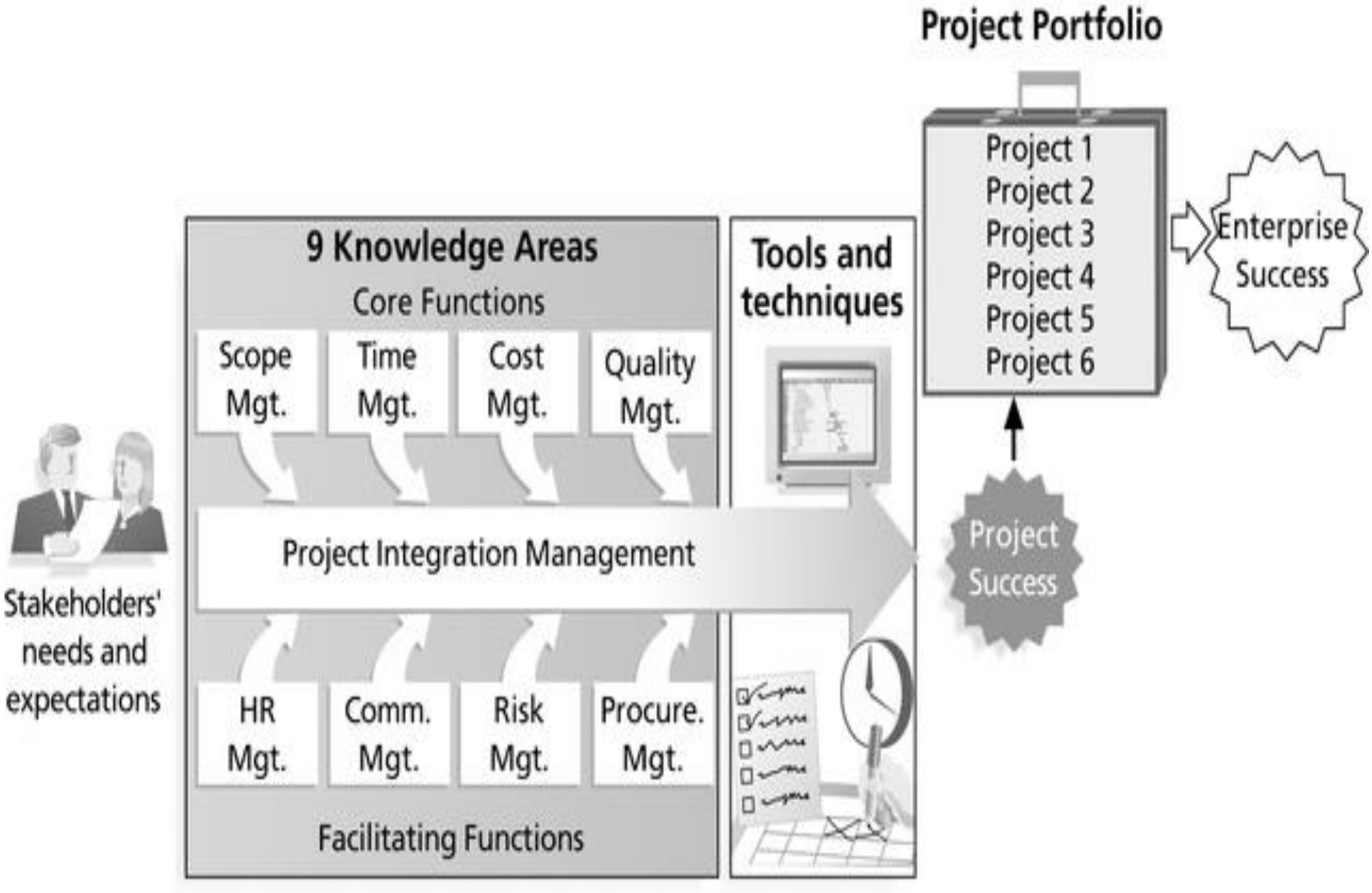


Figure 1-2. Project Management Framework

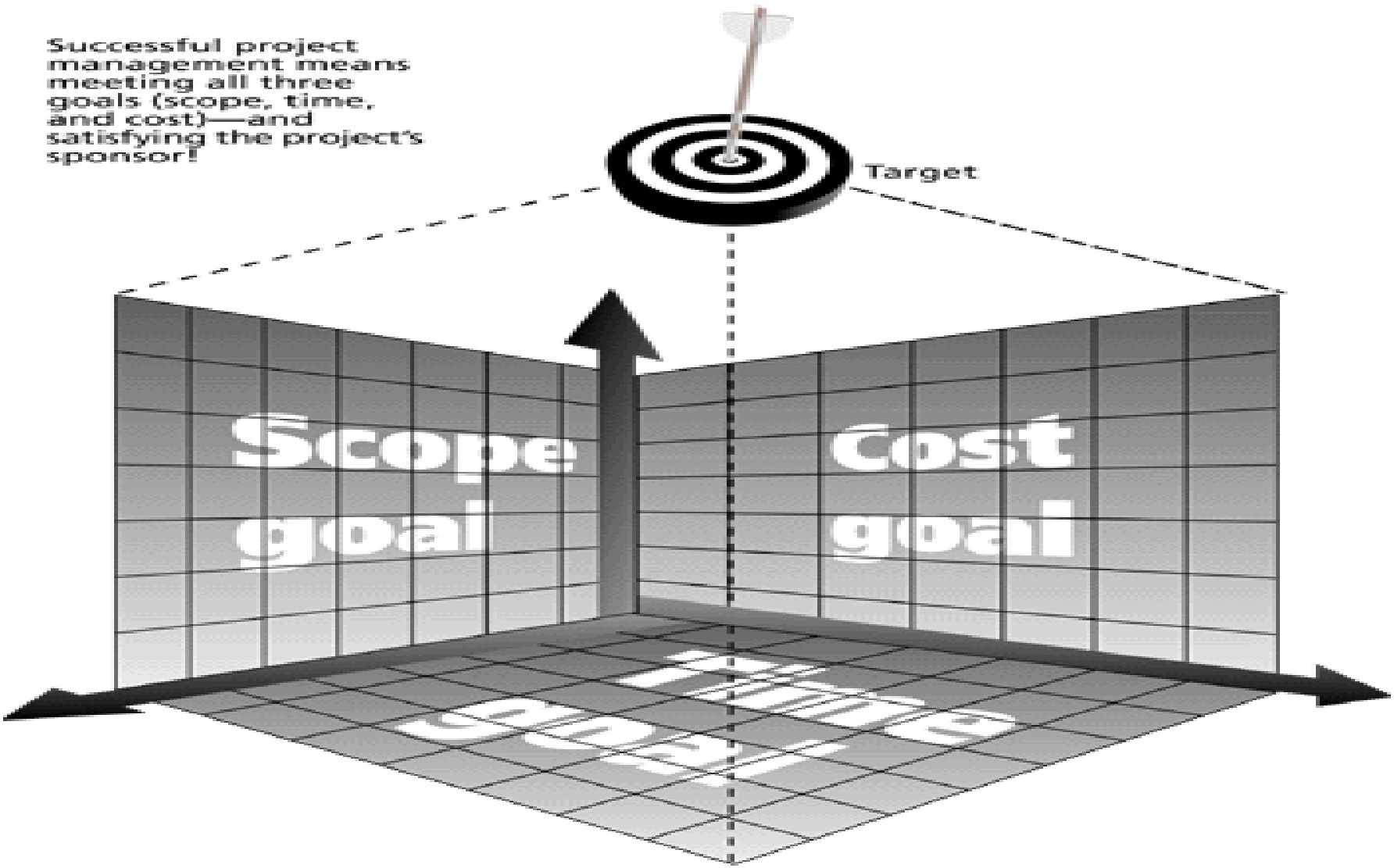
Project Stakeholders

- **Stakeholders** are the people involved in or affected by project activities.
- Stakeholders include
  - The project sponsor and project team
  - Support staff
  - Customers
  - Users
  - Suppliers
  - Opponents to the project
  - Anyone who can directly influence decisions about the project.

Constraints of project management

- **A constraint** is anything that restricts the project manager's options.
- Constraints can include
  - Resource constraints
  - Budgetary limitations
  - Government regulations – Policies
  - Limitations of software and Hardware
  - Scope limitation, such as being required to use a particular existing interface
  - Tight (rigid) deadlines
- Every project is constrained in different ways by its
  - **Scope goals:** What is the project trying to accomplish?
  - **Time goals:** How long should it take to complete?
  - **Cost goals:** What should it cost?
- For a project to be successful, each side must remain in balance with the other two. It is the project manager's duty to balance these three often competing goals

The Triple Constraint of Project Management



What Is a Project Manager?

- The key responsibility of the project manager is to successfully accomplish the project objectives by balancing the demands of quality, scope, time, and cost.
- Derivative responsibilities include identifying the project requirements; establishing clear and achievable objectives; and adapting the specifications, plans, and approach to the different concerns and expectations of the various stakeholders.
- In order to accomplish these multifaceted responsibilities, the roles of the project manager include that of a leader, administrator, entrepreneur, facilitator, arbitrator and mediator, liaison, and coordinator.

- The project manager acts as the key catalyst to stimulate effective communication and coordination between design, procurement and construction activities.
- In order to effectively manage these responsibilities and assume these roles, a project manager must have experience in the following project management knowledge areas: project integration, scope, time, cost, quality, human resources, communications, risk, and procurement management.
- Project manager is a person who is managing a project to be successful. And a good project manager should have the following qualities;
  - Business knowledge
  - People management
  - Knowledge of organizational politics and
  - Technical knowledge

What Is a Project Management Plan (PMP)?

- A project management plan is a fundamental tool for the project manger to deliver the project successfully.
- It is a strategic and formalized roadmap to accomplish the project's objectives by describing how the project is to be executed, monitored and controlled.
  - Which includes creating a project work breakdown structure, identifying and planning to mitigate risk, identifying manners in which to effectively communicate with stakeholders and other project team members, and developing a plan to manage changes.

- This plan is a living document that is updated and revised throughout the project at strategic milestones or significant events to accommodate the progressive, elaborative nature of the project.
- The project management plan will vary based on size, complexity, risk, and/or sensitivity of the project.
- The project management plan (PMP) document is the culmination of all planning activities undertaken by project managers. The outputs of the various planning activities appear in this document, which becomes the baseline document guiding the overall execution of the project.

Project Management Tools and Techniques

- Project management tools and techniques are tools that are used to effectively plan and manage products.
- This tools and techniques assist project managers and their teams in various aspects of project management
- Some specific ones include
  - Project charter, scope statement, and WBS (scope)
  - Gantt charts
  - Network diagrams
  - Critical path analysis (CPM)
  - Critical chain scheduling (time)
  - Cost estimates and earned value management (cost)

Network Diagram

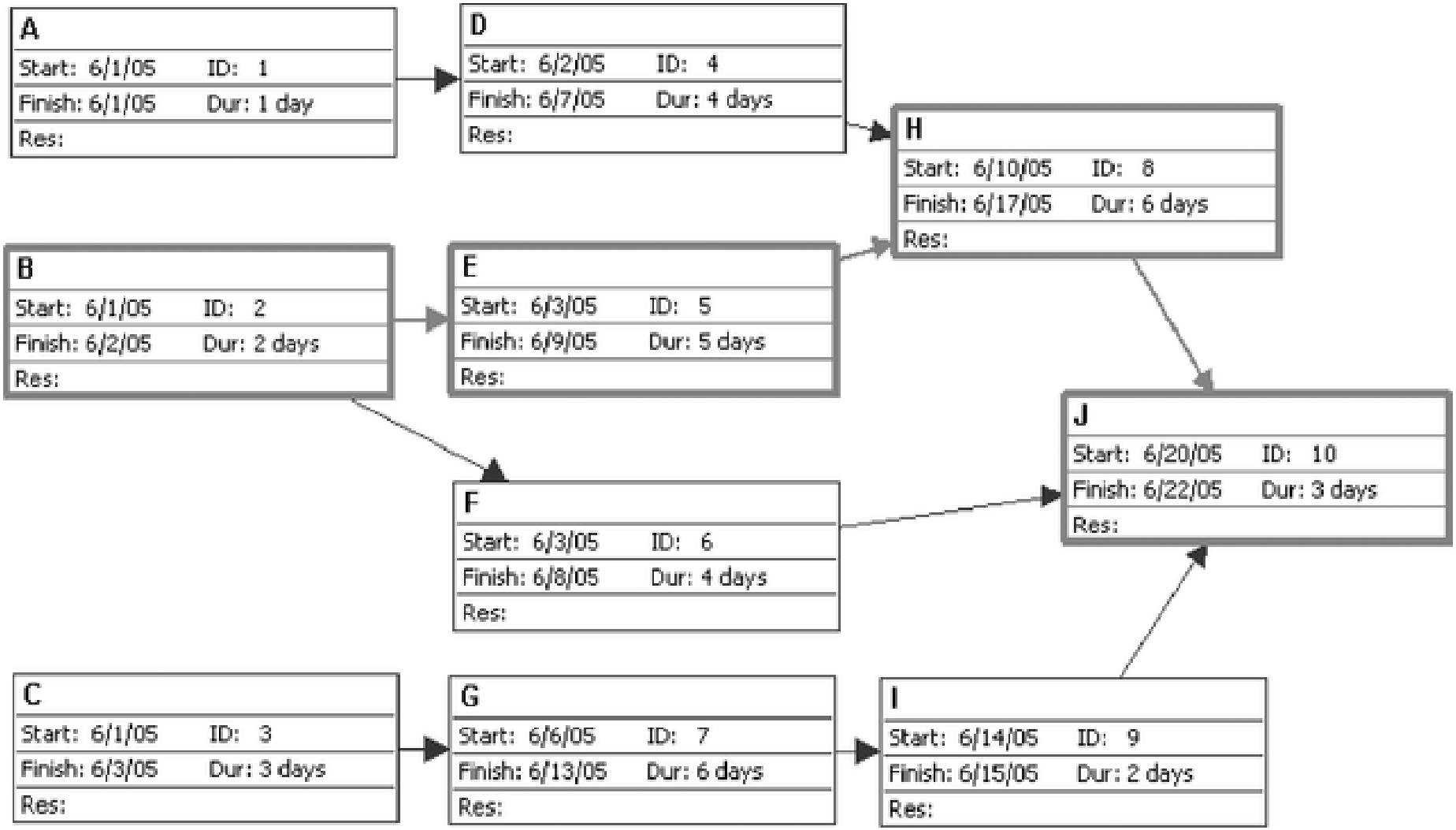


Figure 6-4. Sample Precedence Diagramming Method (PDM) Network Diagram for Project X

Sample Gantt Chart

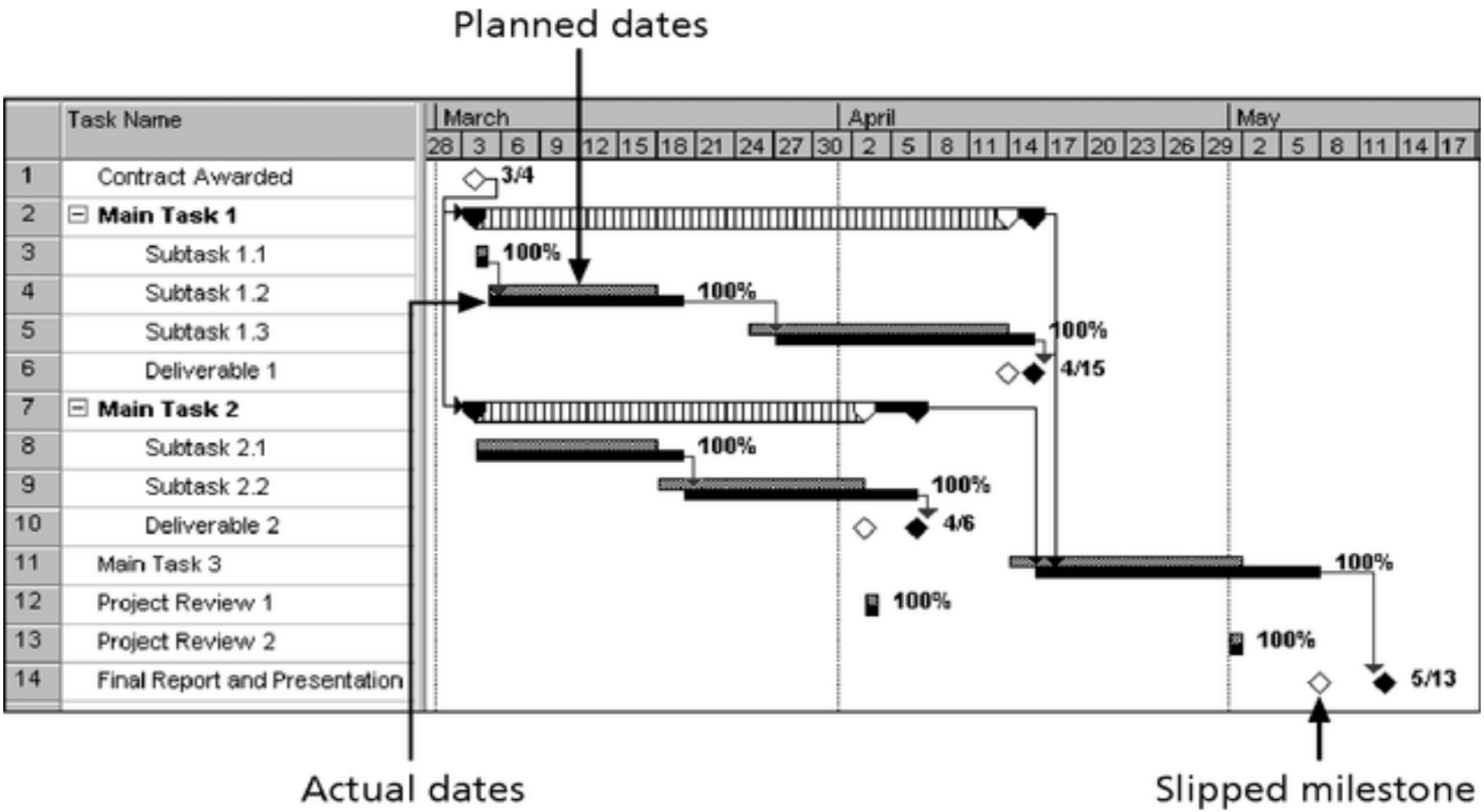
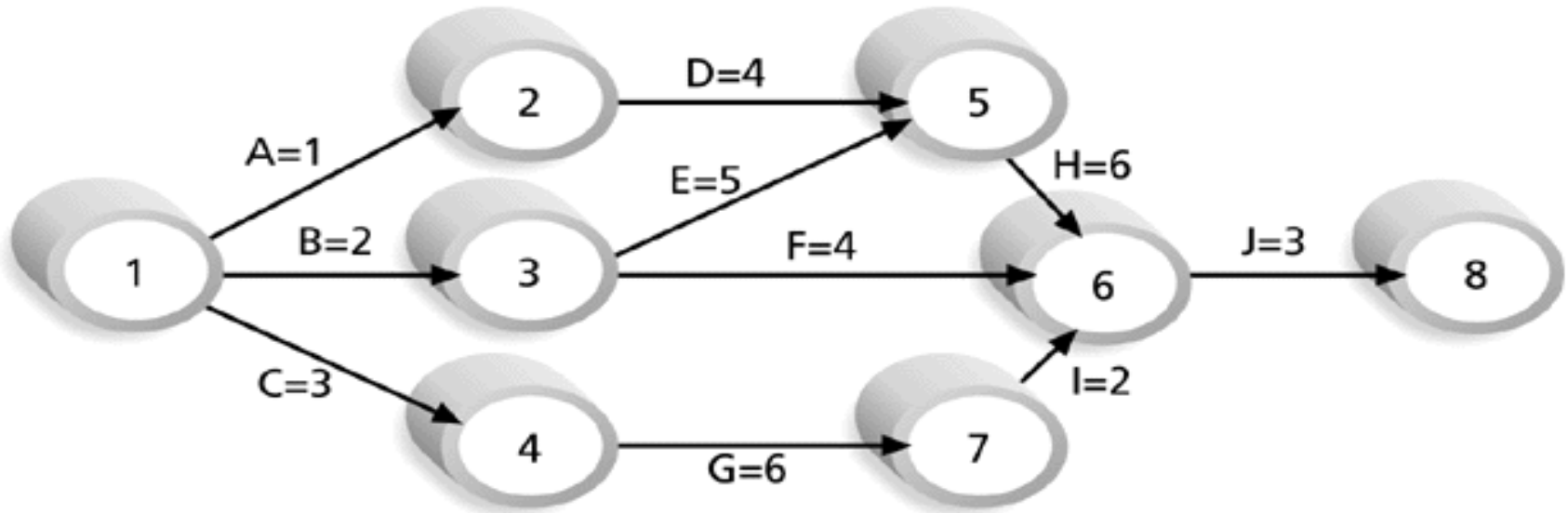


Figure 6-7. Sample Tracking Gantt Chart

Sample of the Critical Path for Project X



Note: Assume all durations are in days.

Path 1:	A-D-H-J	Length = 1+4+6+3 = 14 days
Path 2:	**B-E-H-J**	**Length = 2+5+6+3 = 16 days**
Path 3:	B-F-J	Length = 2+4+3 = 9 days
Path 4:	C-G-I-J	Length = 3+6+2+3 = 14 days

Since the critical path is the longest path through the network diagram, Path 2, B-E-H-J, is the critical path for Project X.

What Makes Software Project Management So Special

- There is nothing special about software project management that changes the Iron Triangle or the five process groups. What is special about project management is the nature of the work.
- The creation of software and IT project has the following characteristics:
  - The product is intangible and uniquely flexible
  - Software development is weird and requires a specialized skill set to do it well.
  - Software creation is tough (hard).
  - Software development can be boring, routine, and mind numbing.
  - Software creation can create challenges within the development of the code.

Chapter 2
Project Management Processes

- To understand the integrative nature of project management, and to emphasize the importance of integration.
  - Project management has been defined in terms of the various component processes and their interactions.
  - Thus, project management defined as a number of interlinked processes.
- For a project team to successfully execute a project, it must perform hundreds of tasks, many of them interdependent.
- Effectively managing this process is extremely important for success. And the set of activities executed by a project manager is specified in the ***project management process.***

- Projects are composed of processes.
- A process is a series of actions bringing about a result.

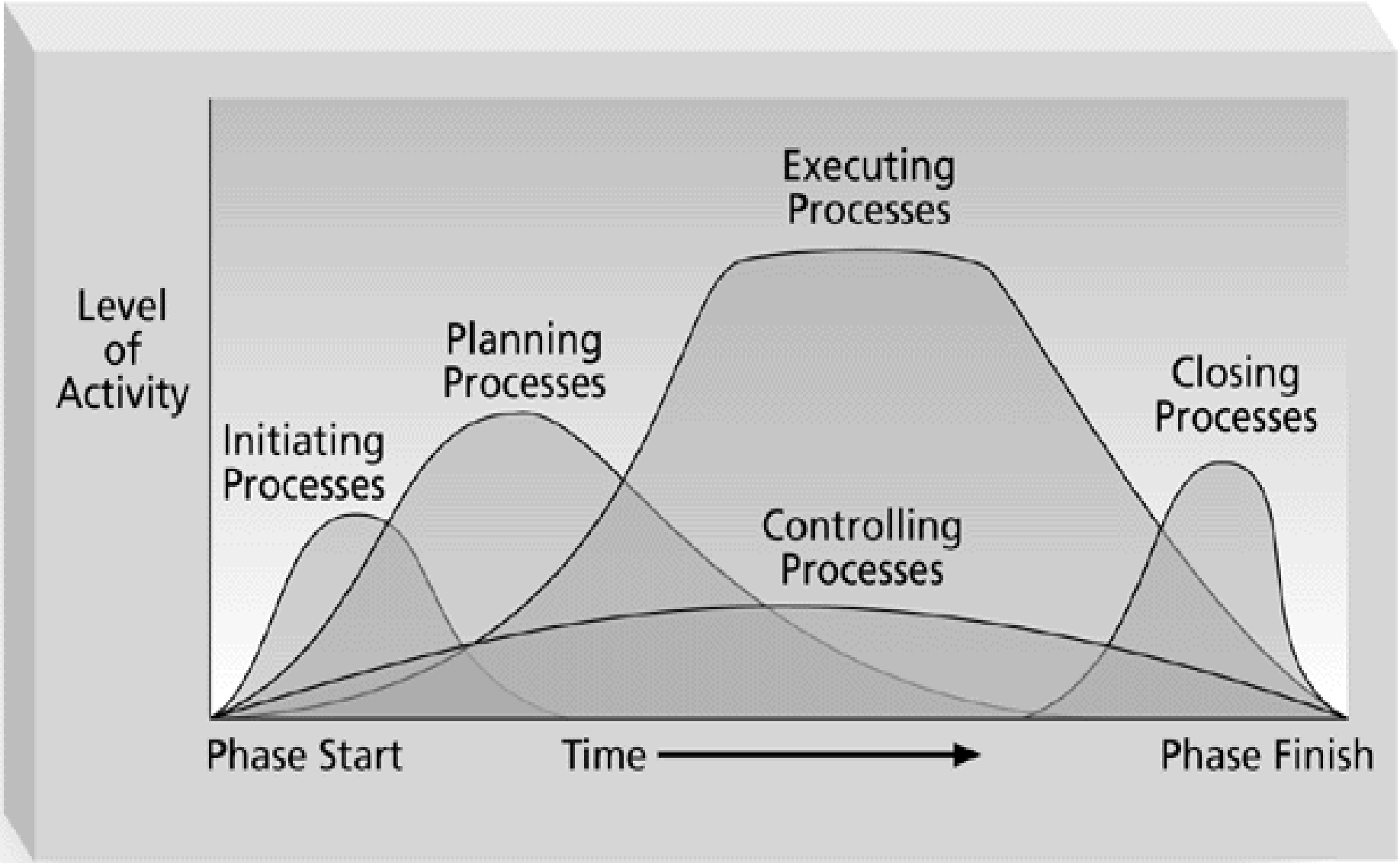
2 Project processes are performed by people and generally fall into one of two major categories:

- Project management processes - describe, organize, and complete the work of the project.
- Product oriented processes - specify and create the project's product.
  - Product oriented processes are typically defined by the project life and vary by application area.
- Both processes overlap and interact throughout the project.
  - For example, the scope of the project cannot be defined in the absence of some basic understanding of how to create the product.

Project management process groups

- Project Management processes organize and describe the work of the project.
- The project management process groups can be organized into five process groups.
  - Initiating processes
  - Planning processes
  - Executing processes
  - Monitoring and controlling processes
  - Closing processes
- In other words, Project management is accomplished through the use of the 5 processes groups.

Figure below illustrates Overlap of Process Groups in a Phase



Initiating processes

- Defines and authorizes the project or a project phase.
- ✓ Initializing the project requirements.
- ✓ The initiation processes determine the nature and scope of the project.
- ✓ The initiation stage includes following areas.
  - Analyzing the business needs/requirements.
  - Reviewing of the current operations.
  - Financial analysis of the costs and benefits.
  - Stakeholder analysis including users, and support personnel for the project.

Planning processes

- Defines and refines objectives and plans the course of action required to attain the objectives and scope that the project undertaken to address.
- In this stage, the project manager reviews contractual commitments and creates a plan to meet them.
  - Creating a project plan involves defining a life cycle process to be followed, estimating the effort and schedule, preparing a detailed schedule of tasks, and so on. It also includes planning for quality and configuration management as well as risk management.
- In this phase, the major activities of the project manager are as follows:
  - Perform startup and administrative tasks.
  - Project plan development.

- Create a project plan and schedule.
  - Define the project objectives.
  - Identify a suitable standard process for project execution.
  - Tailor the standard process to meet project requirements.
  - Define a process for managing changes in requirements.
  - Estimate the effort (activity sequencing, activity duration estimation, and schedule development).
  - Resource Planning.
  - Plan team organization.
  - Identify risks and make plans to mitigate them.
  - Define a measurement plan for the project.
- Perform a review of the project plan and schedule.
- Obtain authorization or approval from senior management.
- Define and review the configuration management plan.
- Orient the project team to the project management plan.
  - This phase also involves the customer, the business manager for the project and others.

Executing processes

- Executing consists of the processes used to complete the work defined in the project management plan to accomplish the projects requirements.
- This process integrates (coordinates) people and other resources to carry out the project management plan for the project.

Monitoring and controlling processes

- Regularly measures and monitors ongoing project progress to identify variances from the project management plan.
- Identify corrective actions to address issues and risks properly to meet project objectives.

Closing processes

- This process involves formalizes acceptance of the product, service, or result and brings the project or a project phase to an orderly end.
- **Mapping of Project Management Processes**
  - The table below reflects the mapping of the project management processes to the five project management process groups of initiating, planning, executing, controlling, and closing and the nine project management knowledge areas.

	Initiating	Planning	Executing	Controlling	Closing
Project Integration Management		Project Plan Development	Project Plan Execution	Integrated Change Control	
Project Scope Management	Initiation	Scope Planning Scope Definition		Scope Verification Scope Change Control	
Project Time Management		Activity Definition Activity Sequencing Activity Duration Estimation Schedule Development		Schedule Control	
Project Cost Management		Resource Planning Cost Estimating Cost Budgeting		Cost Control	
Project Quality Management		Quality Planning	Quality Assurance	Quality Control	
Project Human Resource Management		Organizational Planning Staff Acquisition	Team Development		
Project Communications Management		Communications Planning	Information Distribution	Performance Reporting	Administrative Closure
Project Risk Management		Risk Management Planning Risk Identification Qualitative Risk Analysis Quantitative Risk Analysis Risk Response Planning		Risk Monitoring and Control	
Project Procurement Management		Procurement Planning Solicitation Planning	Solicitation Source Selection Contract Administration		Contract Closeout

Project Phases versus Process Groups

- Project management process groups are not project phases.
  - In fact, the process groups may need to be repeated for each phase, such as study, programming, engineering, procurement, construction, and commissioning.
  - A process group or project phase is not discrete; they are interdependent and require integration.
  - Also, project management must ensure continuity as a project progresses through processes and phases.
- Each project phase is marked by completion of one or more deliverables. A *deliverable* is a tangible, verifiable work product such as a feasibility study, a detail design, or a working prototype.

Project phases

The Planning phase

The primary objectives of the planning phase are :

- Define the problem
- Confirm project feasibility
- Produce the project schedule
- Launch the project

The Analysis Phase

-Gather information

- Define system requirements
- build prototypes for discovery of requirements
- Prioritize requirements
- Generate and evaluate alternatives
- Review recommendations with management

The Design Phase

The objective of the design phase is to design the Solution system

- Design and integrate the network
- Design the application architecture
- Design the user interface and system interfaces
- Design and integrate the database and system controls
- Prototype for design details

The implementation Phase

During the implementation phase, the final system is built, tested and installed

- Construct software components
- Verify and test
- Develop prototypes
- Train and document
- Install the system

The Support Phase

Activities fall into two categories

- Providing support to end users
  - Helpdesk
  - Training Programs
- Maintaining and enhancing the computer system
  - Program error corrections (bug fixes)
  - Comprehensive enhancements and upgrades

Project Life Cycle

- Serves to define the beginning and the end of a project.
- Project life cycles generally define:
  - What technical work should be done in each phase?
  - Who should be involved in each phase?

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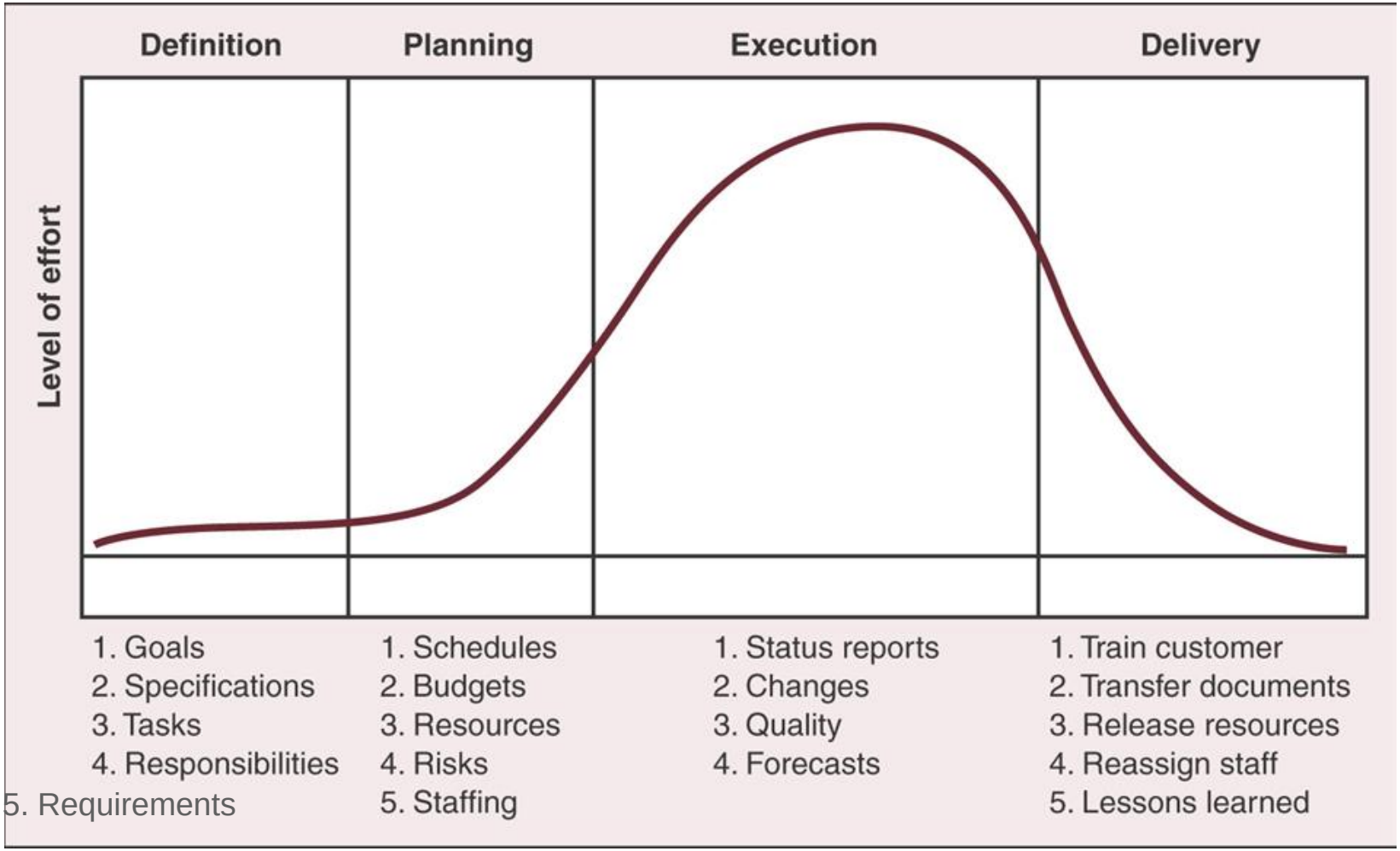
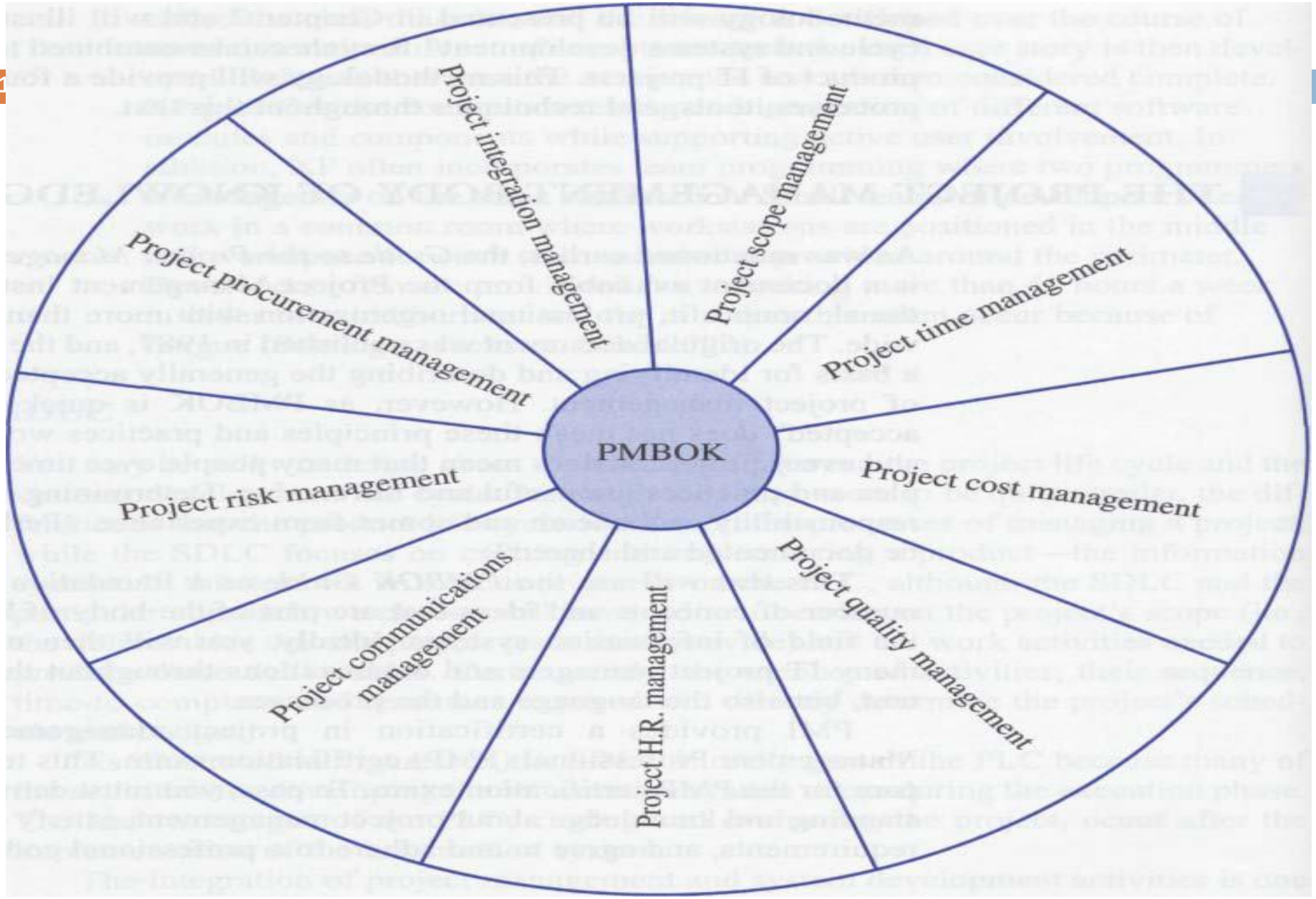

Definition
Planning
Execution
Delivery
Level of effort
1. Goals
2. Specifications
3. Tasks
4. Responsibilities
5. Requirements
1. Schedules
2. Budgets
3. Resources
4. Risks
5. Staffing
1. Status reports
2. Changes
3. Quality
4. Forecasts
1. Train customer
2. Transfer documents
3. Release resources
4. Reassign staff
5. Lessons learned

Project management knowledge area



- ***Project Integration Management :-*** *Integration focuses on coordinating the* project plan's development, execution, and control of changes.
- ***Project Scope Management:-*** *A project's scope is the work to be completed* by the project team.
- ***Project Time Management:-*** *Time management is important for developing,* monitoring, and managing the project's schedule.
- ***Project Cost Management:-*** Cost *management assures that the project's* budget is developed and completed as approved.

Project Quality Management:- *focuses on planning,* developing, and managing a quality environment.

Project Human Resource Management:- People *are the most important* resource on a project.

Project Communications Management:- *Communication management*

entails communicating timely and accurate information about the project to the project's stakeholders.

Project Risk Management:- Project risk management is concerned with identifying the risks that can impact the project.

Project Procurement Management*:-Projects often require resources (people,* hardware, software, etc.) that are outside the organization..

Summary

Project Management Body of Knowledge

4 Project Integration Management
4.1 Develop Project Charter
4.2 Develop Preliminary Project Scope Statement
4.3 Develop Project Management Plan
4.4 Direct & Manage Project Execution
4.5 Monitor & Control Project Work
4.6 Integrated Change Control
4.7 Close Project

5 Project Scope Management
5.1 Scope Planning
5.2 Scope Definition
5.3 Create WBS
5.4 Scope Verification
5.5 Scope Control

6 Project Time Management
6.1 Activity Definition
6.2 Activity Sequencing
6.3 Activity Resource Estimating
6.4 Activity Duration Estimating
6.5 Schedule Development
6.6 Schedule Control

7 Project Cost Management
7.1 Cost Estimating
7.2 Cost Budgeting
7.3 Cost Control

8 Project Quality Management
8.1 Quality Planning
8.2 Perform Quality Assurance
8.3 Perform Quality Control

9 Project Human Resource Management
9.1 Human Resource Planning
9.2 Acquire Project Team
9.3 Develop Project Team
9.4 Manage Project Team

10 Project Communications Management
10.1 Communications Planning
10.2 Information Distribution
10.3 Performance Reporting
10.4 Manage Stakeholders

11 Project Risk Management
11.1 Risk Management Planning
11.2 Risk Identification
11.3 Qualitative Risk Analysis
11.4 Quantitative Risk Analysis
11.5 Risk Response Planning
11.6 Risk Monitoring and Control

12 Project Procurement Management
12.1 Plan Purchases & Acquisitions
12.2 Plan Contracting
12.3 Request Sellers Response
12.4 Select Sellers
12.5 Contract Administration
12.6 Contract Closure

What helps project to succeed?

- A standard must be established to define and measure project success.
- project success is the delivery of the required product, service, or result on time and within budget.
- To meet these objectives is to deliver a quality project.
- Project quality is affected by balancing the three interrelated factors.(??)

Factors for the success and failure of project

- **Factors for the success of project**
  - Clear statement of requirements
  - Proper planning
  - Realistic expectations
  - Competent staff
  - Clear vision and objective
  - Hard working and focused team
  - Good Leadership Skills
  - Finding the Correct Sponsor
  - Recognizing Failure
  - Establishing Project Rules

- **factors for project failure**
  - Failing to Plan
  - Ignoring Risk Management
  - Hiding from the Project Team
  - Unrealistic Schedules
  - Doing Nothing
  - Incomplete requirements
  - Lack of resources
  - Unclear objective
  - Changing requirements and specifications

THANK YOU!!

QUESTIONS??

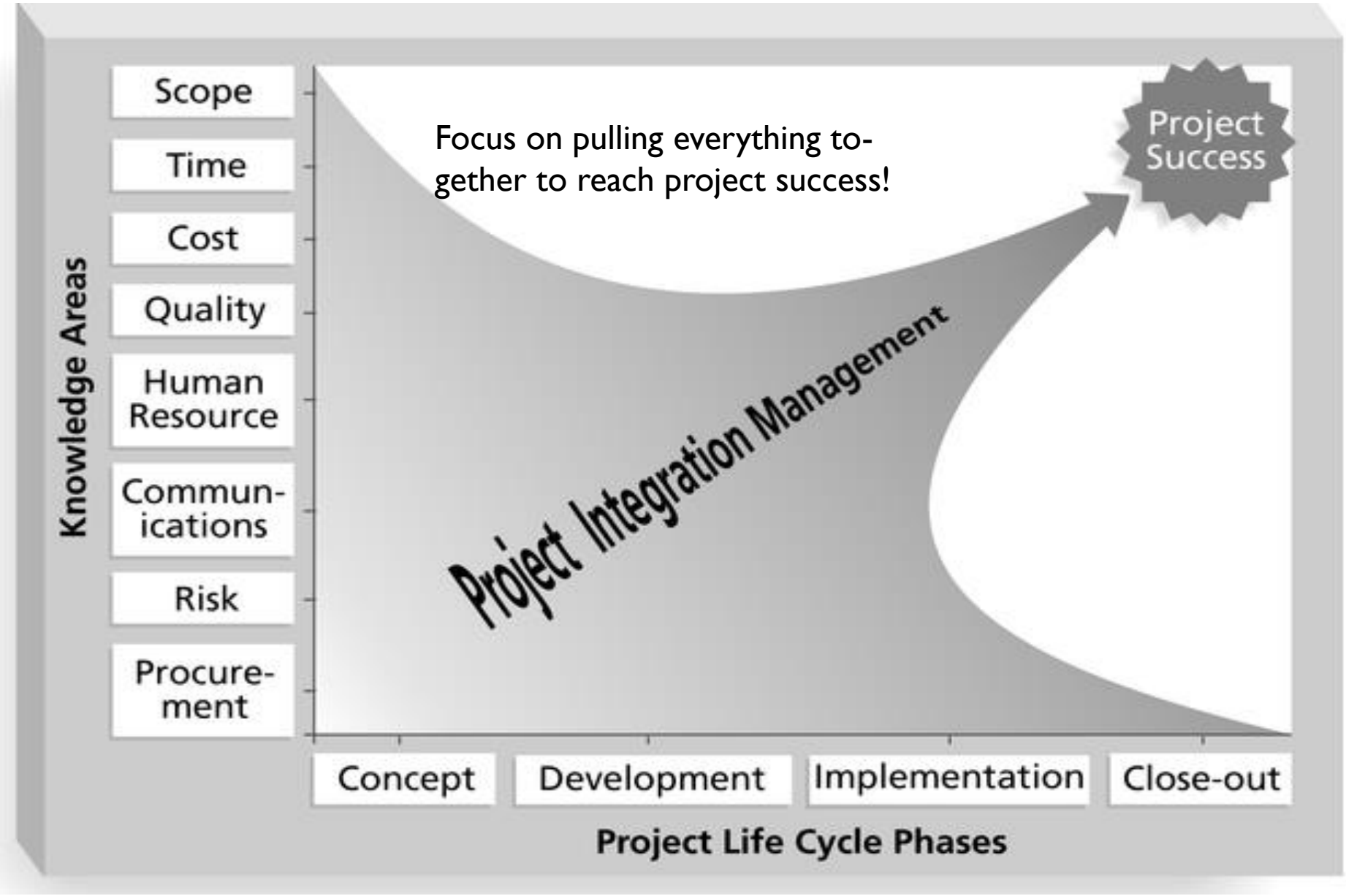
Chapter 3

Project Integration Management

What is Project Integration Management?

- Describes the processes required to ensure that the various elements of the project are properly coordinated.
- Project integration management is the heart of project management and is made up of the day-to-day processes.
- Coordinate, combine and unify properly the project management activities.
- The project managers takes responsibility for coordinating all the people, plans and work required to complete a project.
- Good project integration management is critical to providing stakeholder satisfaction.

Framework for Project Integration Management



Time Management
1. Activity Definition
2. Activity Sequencing
3. Activity Resource Estimating
4. Activity Duration Estimating
5. Schedule Development
6. Schedule Control

Cost Management
1. Cost Estimating
2. Cost Budgeting
3. Cost Control

Scope Management
1. Scope Planning
2. Scope Definition
3. Create WBS
4. Scope Verification
5. Scope Control

Project Integration Management
1. Develop Project Charter
2. Develop Preliminary Project Scope Statement
3. Develop Project Management Plan
4. Direct and Manage Project Execution
5. Monitor and Control Project Work
6. Integrated Change Control
7. Close Project

Quality Management
1. Quality Planning
2. Perform Quality Assurance
3. Perform Quality Control

Human Resource Management
1. Human Resource Planning
2. Acquire Project Team
3. Develop Project Team
4. Manage Project Team

Communications Management
1. Communications Planning
2. Information Distribution
3. Performance Reporting
4. Manage Stakeholders

Risk Management
1. Risk Management Planning
2. Risk Identification
3. Qualitative Risk Analysis
4. Quantitative Risk Analysis
5. Risk Response Planning
6. Risk Monitoring and Control

Procurement Management
1. Plan Purchases and Acquisitions
2. Plan Contracting
3. Request Seller Responses
4. 4 Select Sellers
5. Contract Administration
6. Contract Closure

Project Integration Management Processes

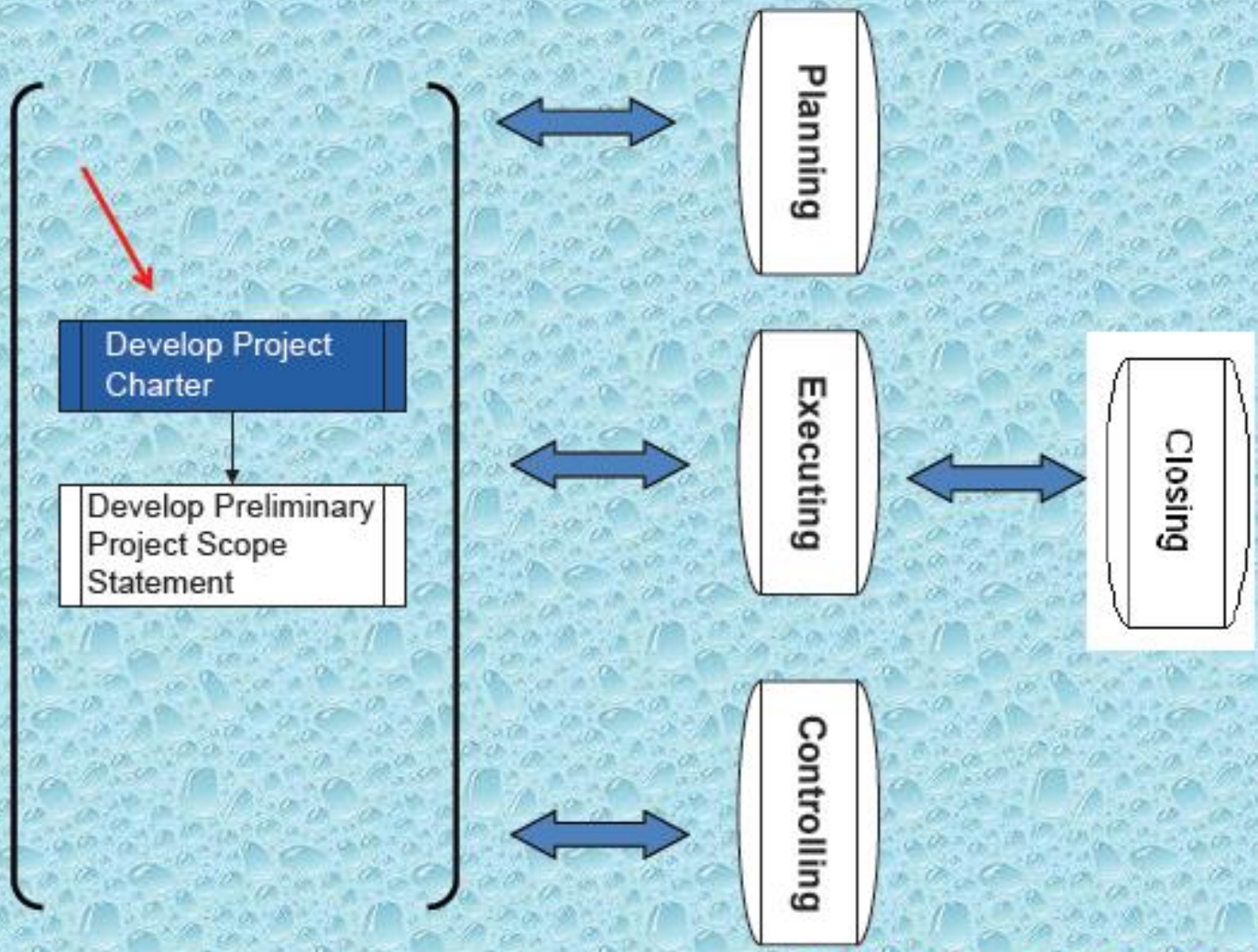
A. Develop Project Charter
B. Develop Preliminary Project Scope
C. Develop Project Management Plan
D. Direct and Manage Project Execution
E. Monitor and Control Project Work
F. Integrated Change Control
G. Close Project

Developing Project Charter

- The project charter is the document that formally authorizes a project.
- It is a document that formally recognizes the existence of a project and provides direction on the project's objectives and management.
- A project manager is identified and assigned in the document, as early as feasible.
- The project manager should always be assigned prior to the start of planning.
- The project charter provides the project manager with the authority to apply organizational resources to project activities.

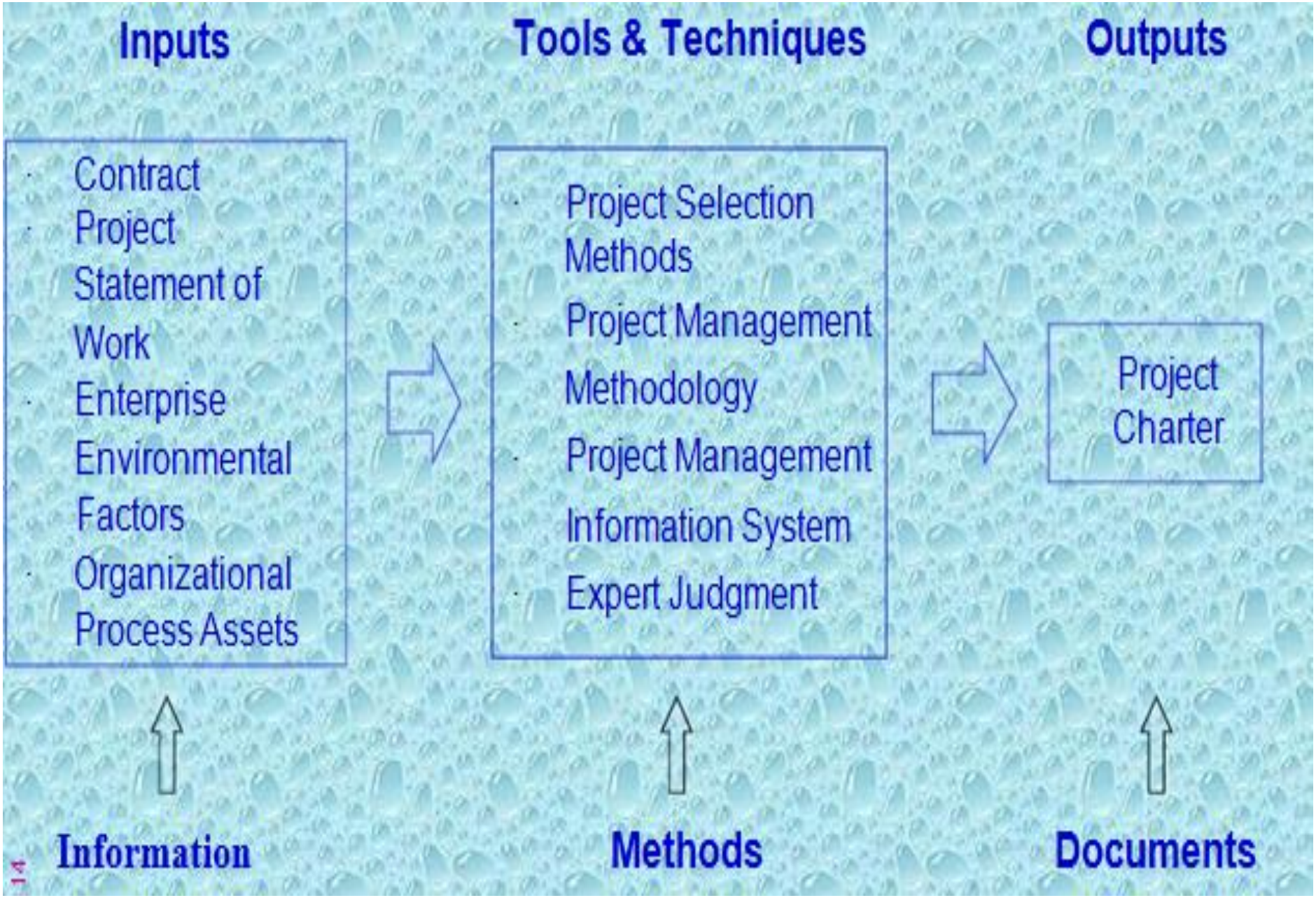
- The project charter should address the following information
  - Requirements that satisfy customer, sponsor, and other stakeholder needs, wants and expectations.
  - Business needs, product description or product requirements that the project is undertaken to address.
  - Project purpose or justification.
  - Assigned Project Manager and authority level.
  - Organizational, environmental and external assumptions.
  - Organizational, environmental and external constraints.
  - Summary budget.

Initiating process group



2 processes

Process of Develop Project Charter

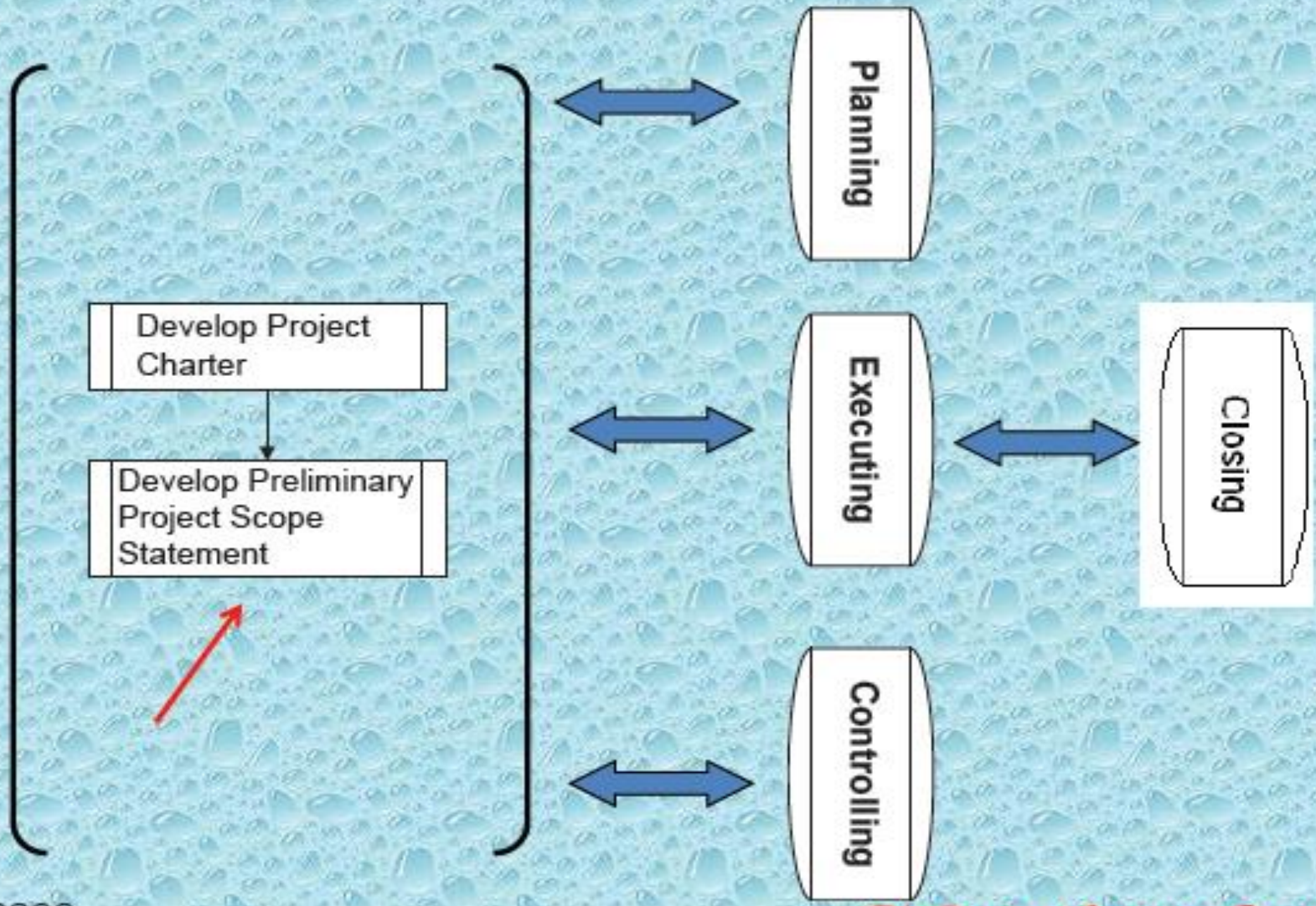


Developing Preliminary Scope Statements

- Project scope : The work that needs to be accomplished to deliver a product, service, or result with the specified features and functions.
- Once the existence of the project has been formally recognized via the project charter, the next step is preparing a preliminary scope statement.
- A **scope statement** is a document used to develop and confirm a common understanding of the project scope.
- It's important for preventing **scope creep**
  - The tendency for project scope to keep getting bigger.
- The project scope statement content will vary depending on the application area and complexity of the project.

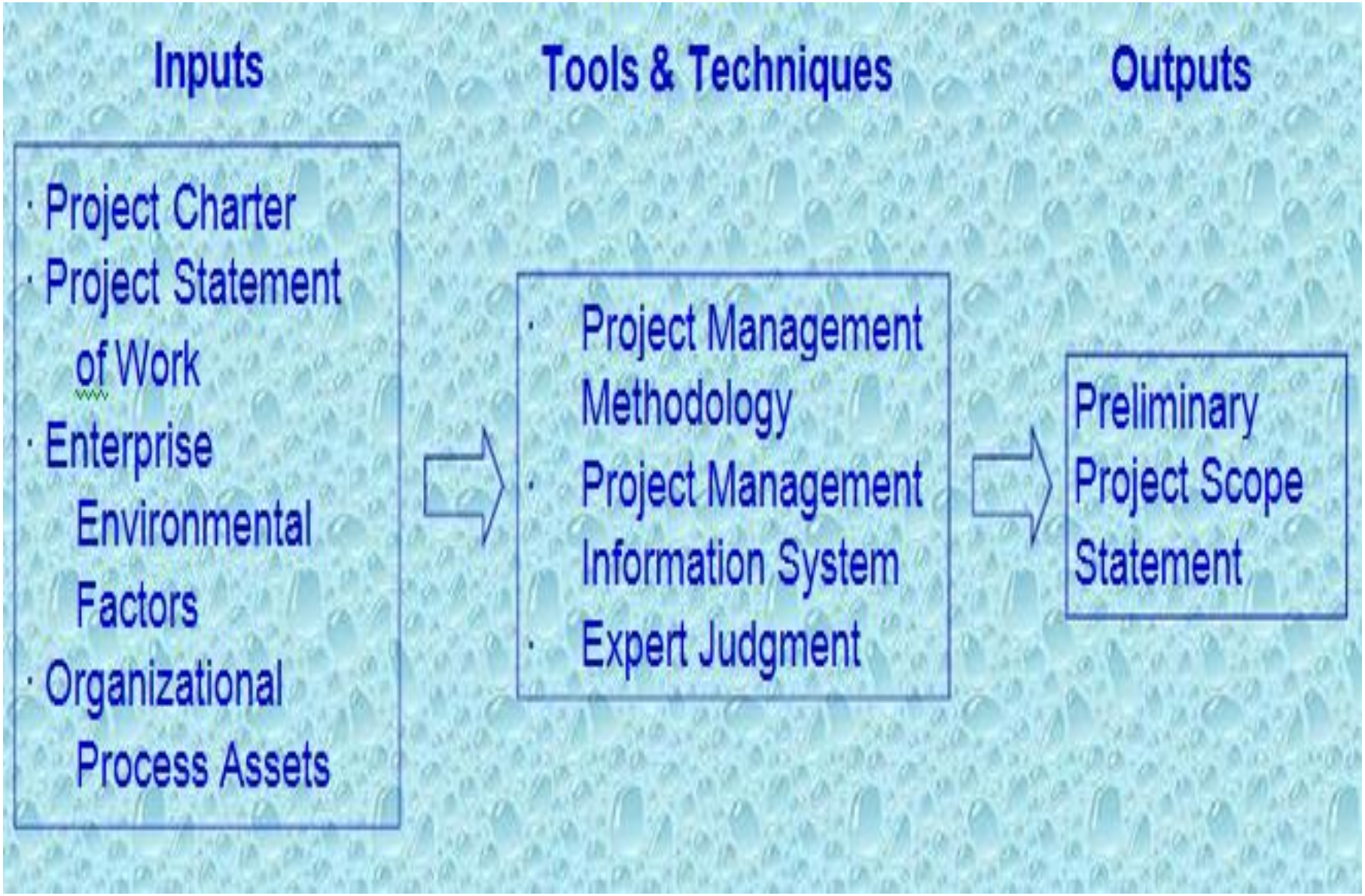
- A project scope statement includes:
  - Project and product objectives.
  - Product or service requirements and characteristics.
  - Product acceptance criteria.
  - Project boundaries.
  - Project requirements and deliverables.
  - Project constraints.
  - Project assumptions.
  - Initial defined risks.
  - Approval requirements.

Initiating process group



2 processes

The process of Developing Preliminary Project Scope Statement



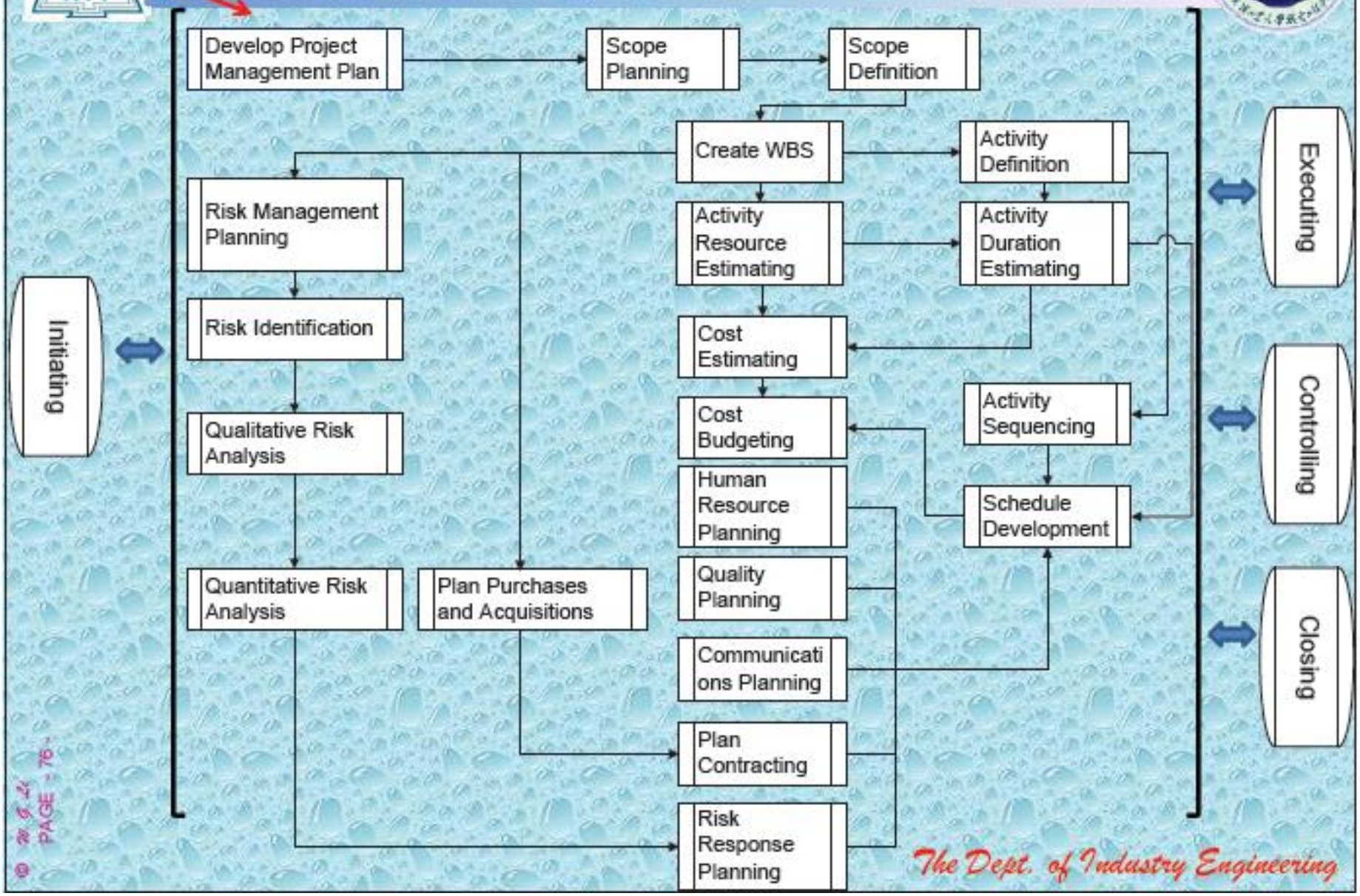
Develop Project Management Plan

- The project management plan defines how the project is executed, monitored, controlled, and closed.
- A project plan must provide documentation of the assumptions and constraints influencing the project plan development.
- The project management plan serves as a source of communication among stakeholders, the project team, and management on how the project plans will be controlled.

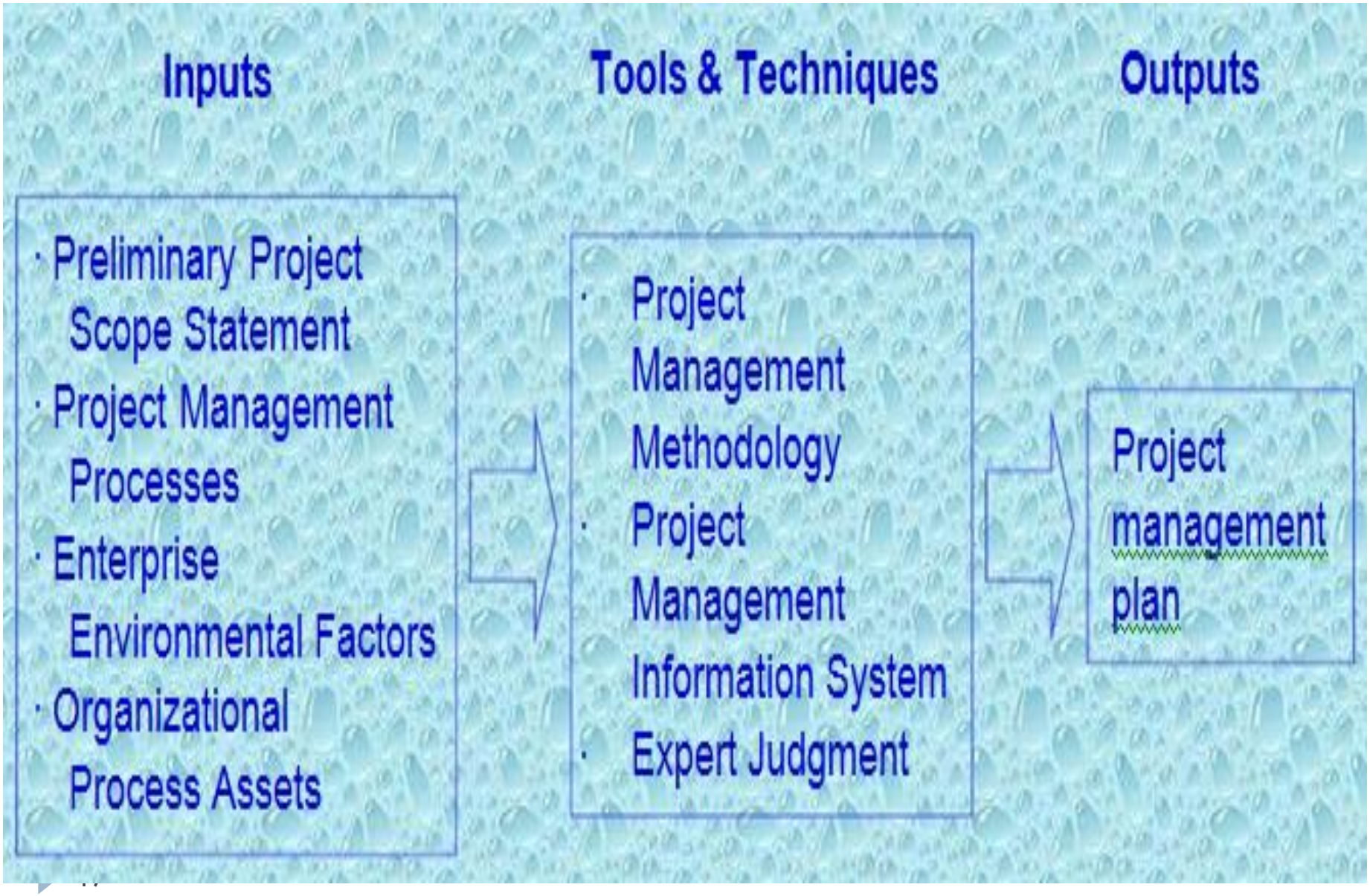
Common Elements of a Project Management Plan

- Introduction or overview of the project.
- Description of how the project is organized.
- Management and technical processes used on the project.
- Work to be done, schedule mgt plan, staffing mgt plan, risk mgt plan, quality mgt plan, budget information and so on.
- Many government agencies.

Planning process group



Process of Develop Project Management Plan



Attributes of Project Plans

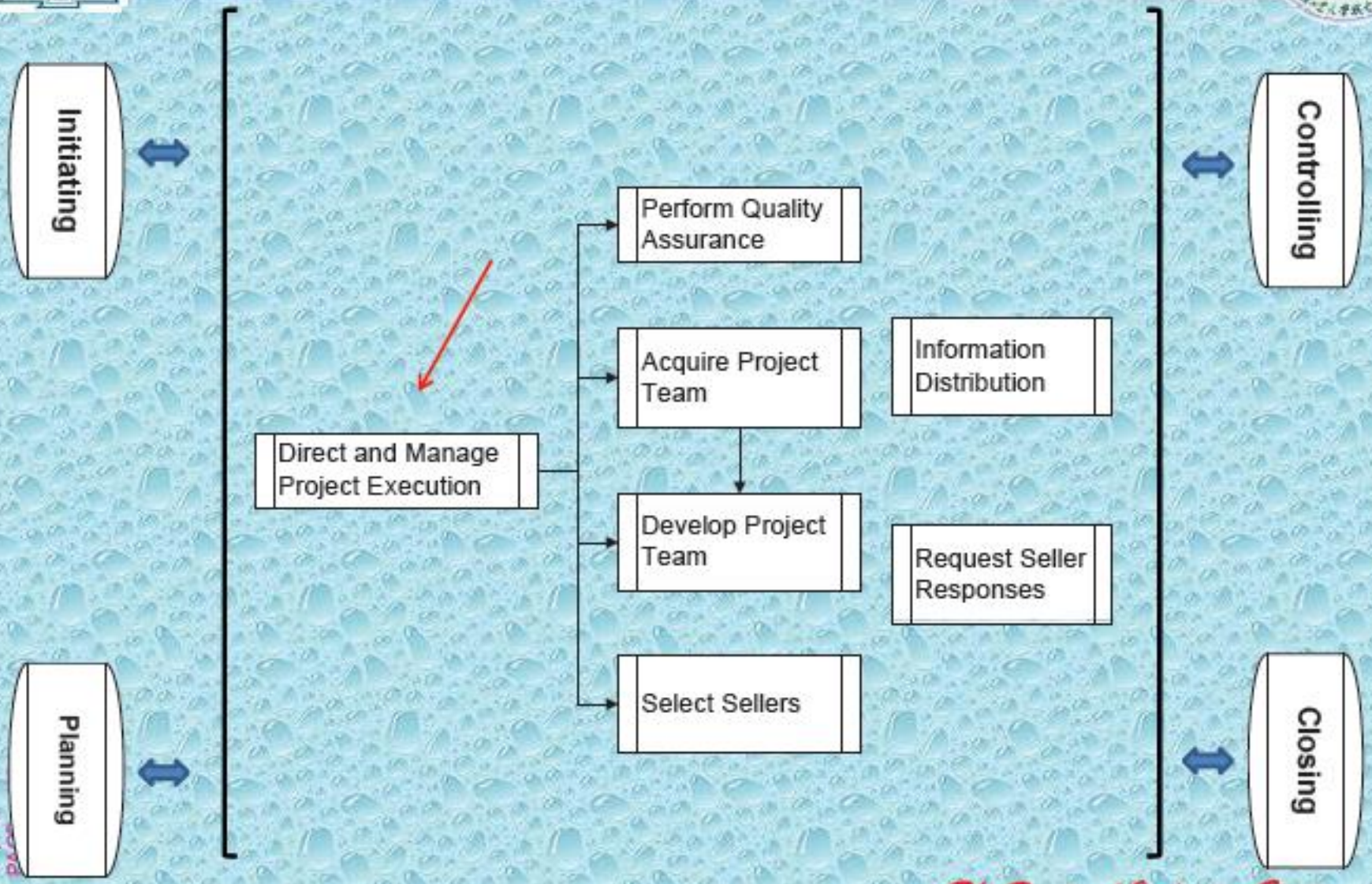
Just as projects are unique, so are project plans

- Plans should be dynamic.
- Plans should be flexible.
- Plans should be updated as changes occur.
- Plans should first and foremost guide project execution.

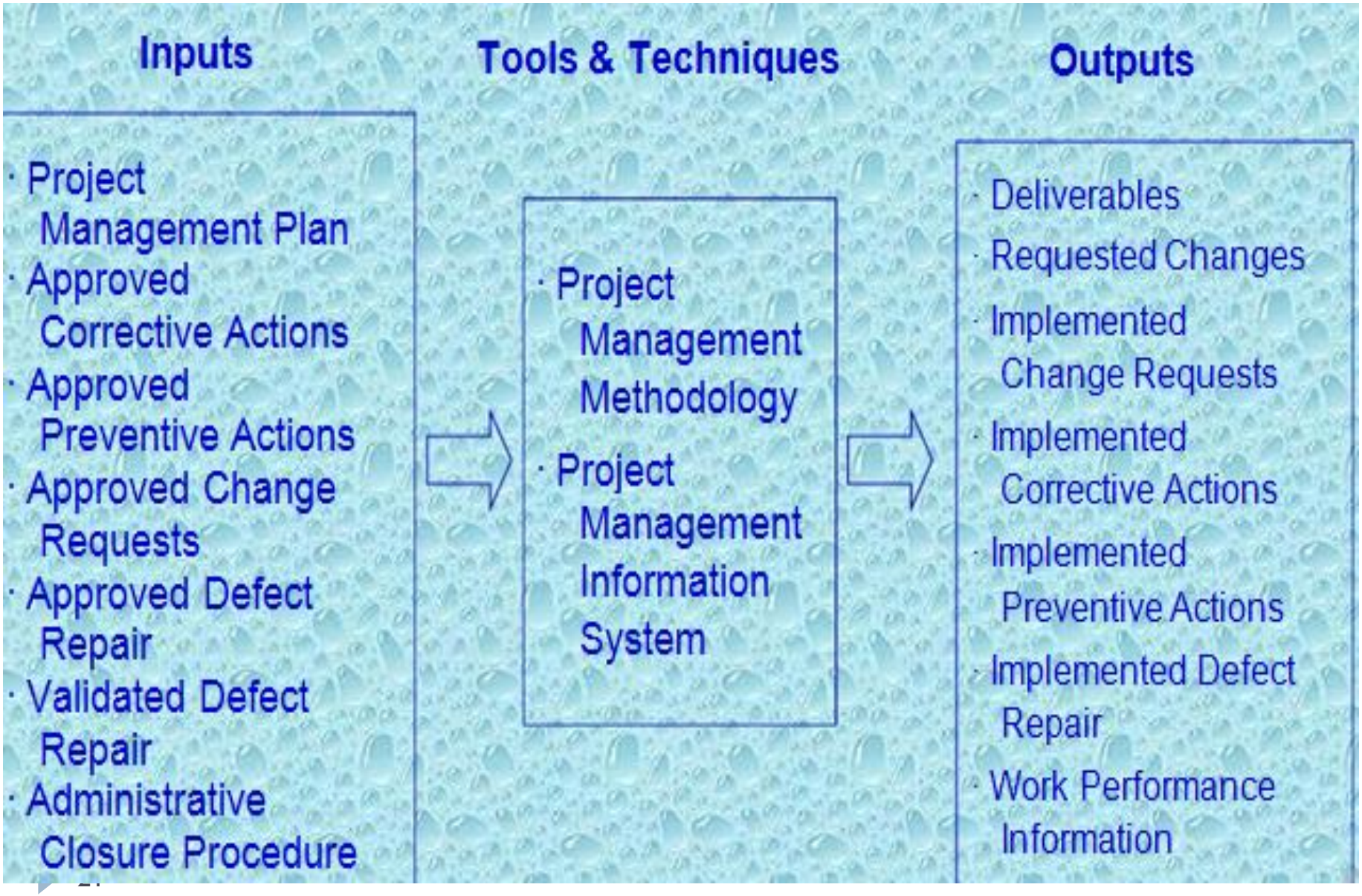
Direct and Manage Project Execution

- The product of the project is created during these execution processes.
- The largest percentage of the project budget will be spent during the project execution processes.
- Some of those actions are:
  - Perform activities to accomplish project objectives.
  - Expend effort and spend funds to accomplish the project objectives.
  - Staff, train, and manage the project team members assigned to the project.
  - Manage risks and implement risk response activities.
  - etc

Executing Process Group



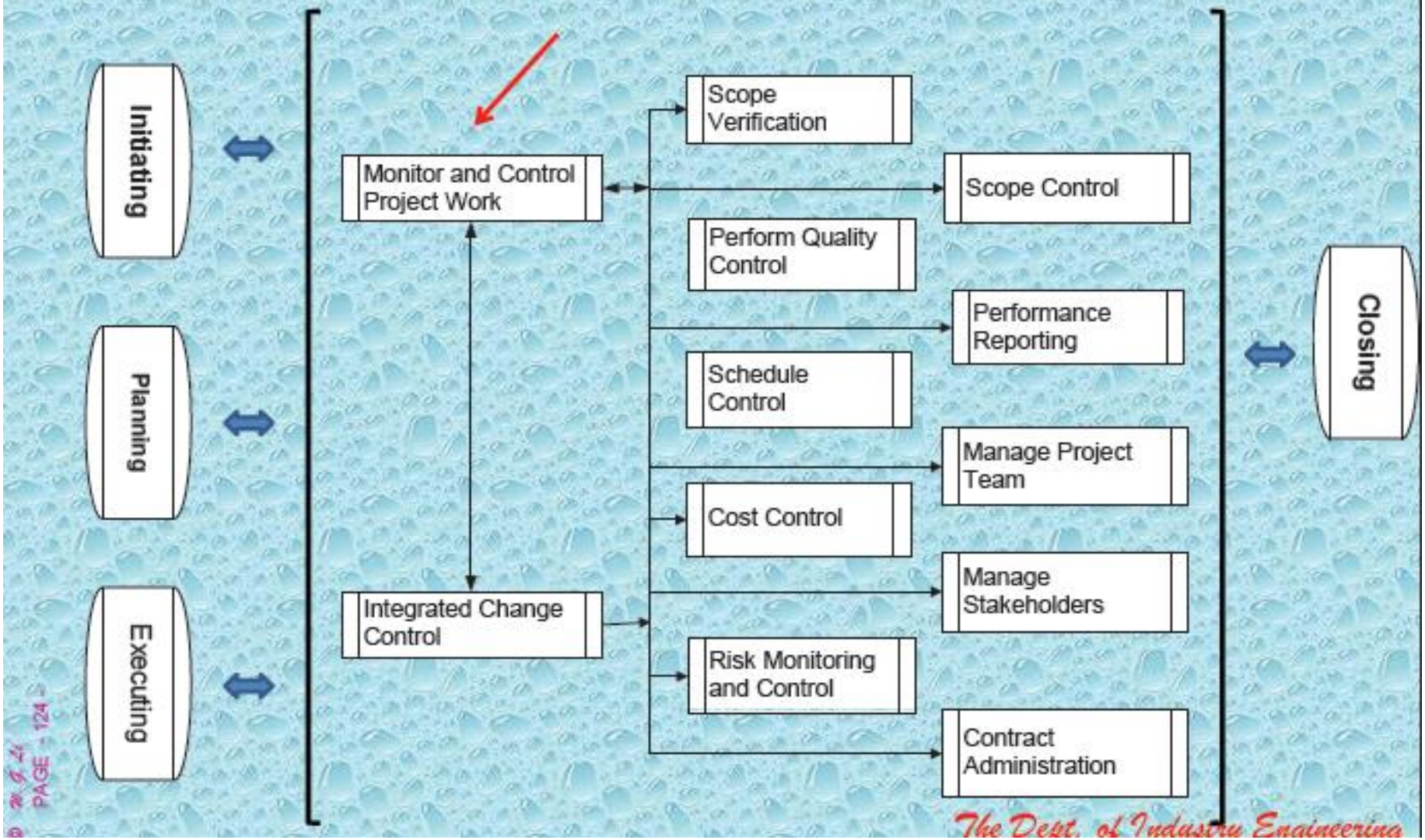
Process of Direct and Manage Project Execution



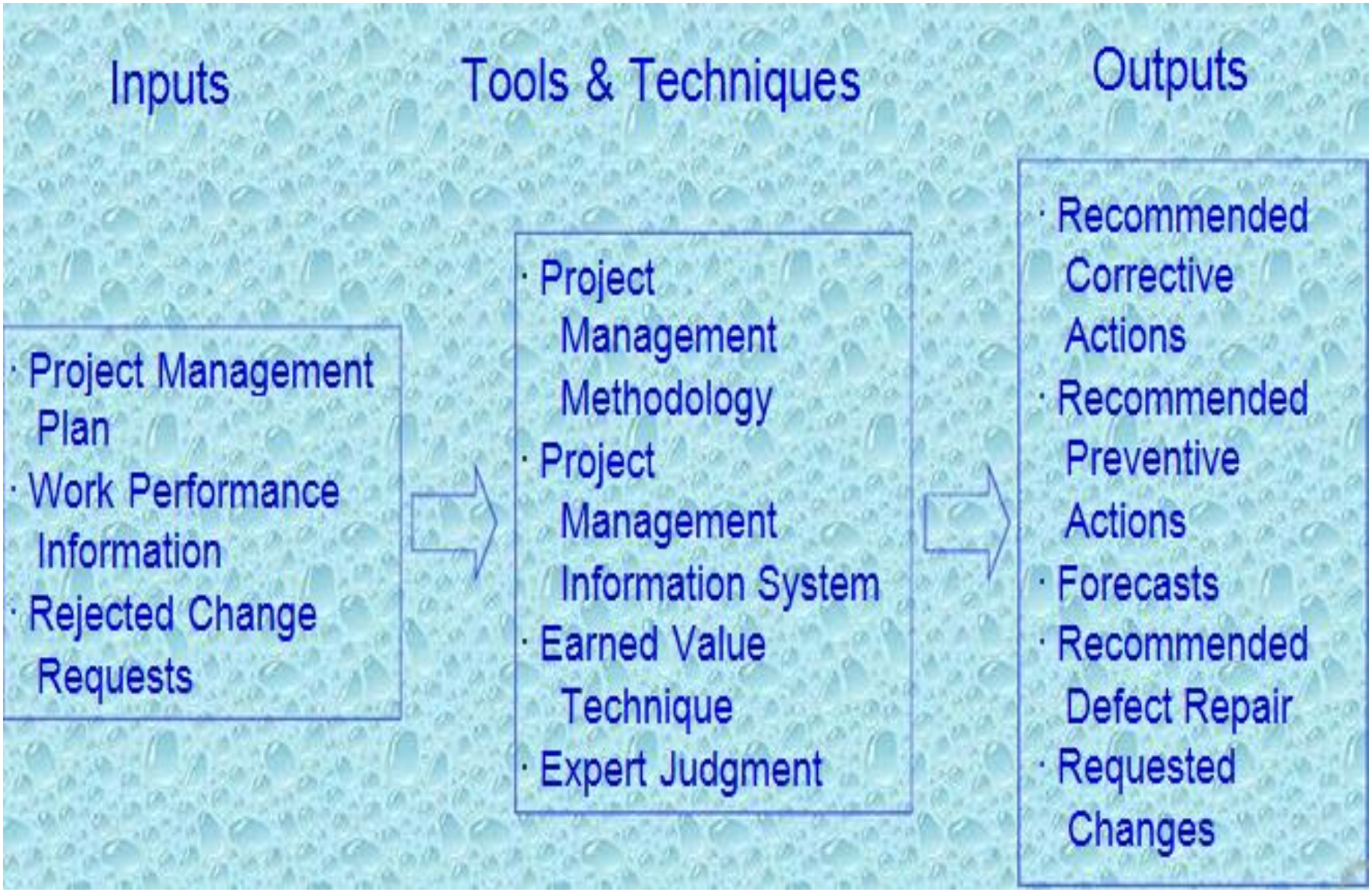
Monitor and Control Project Work

- Oversee project work to meet the performance objectives of the project.
- The Monitor and Control Project Work process is performed to monitor project processes associated with initiating, planning, executing, and closing.
- Monitoring includes collecting, measuring, and disseminating performance information (scope, cost, schedule, quality).
- Monitoring and controlling process concerned with comparing actual project performance against the project mgt plan.
- Some project managers hate change requests.
- Change requests can mean additional work, adjustments to the project, or a reduction in scope.

Monitor and Control Project Work



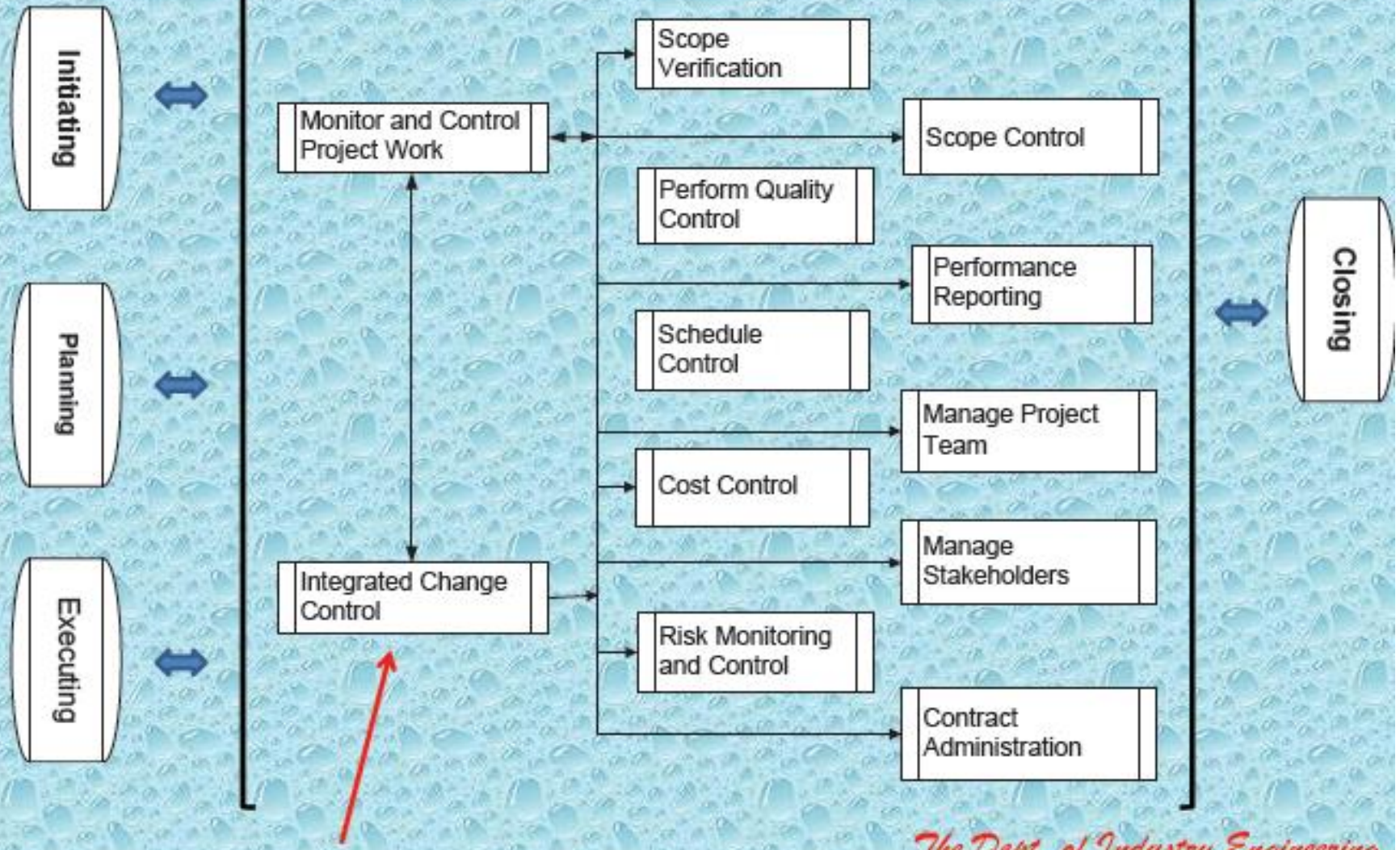
The process of Monitor and Control Project Work



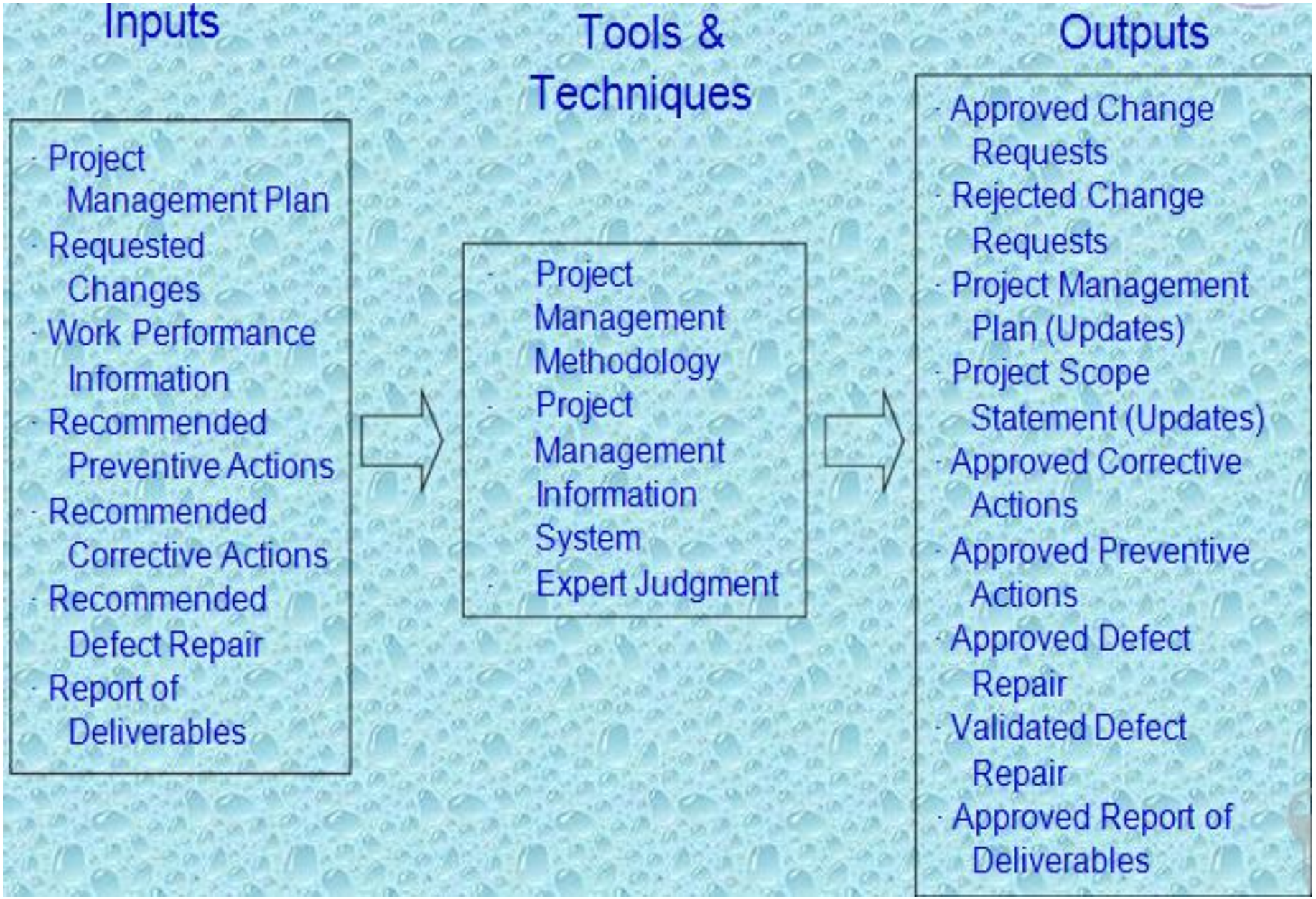
Integrated Change Control

- Integrated Change Control is a process of reviewing all change requests, approving changes and controlling changes according to the change control system (organizational process assets).
- Coordinate changes that affect the project's deliverables and organizational process assets.
- It is performed from project inception through completion.

Monitor and Control Process Group



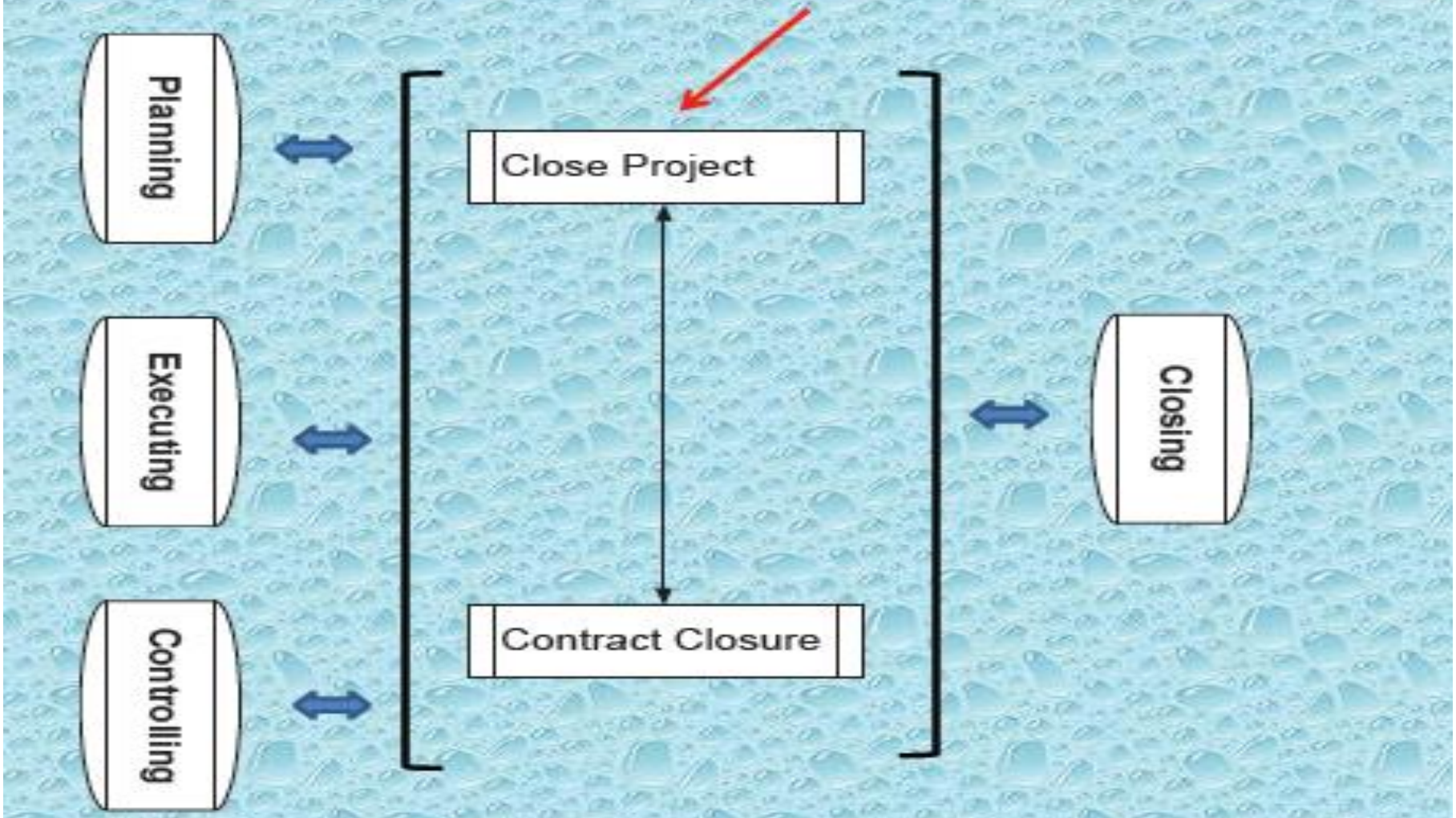
The process of Integrated Change Control



Close Project

- The end of each project phase and the end of the project need a closure process.
- This process includes finalizing all activities completed across all Project Management Process Groups.
- Two procedures are developed
  A. Administrative closure procedure
  B. Contract closure procedure

Closing process group



The process of closing project

Inputs

11. Project Management Plan
2. Contract Documentation
3. Enterprise Environmental Factors
4. Organizational Process Assets
5. Work Performance Information
6. Deliverables

Tools & Techniques

1. Project Management Methodology
2. Project Management Information System
3. Expert Judgment

Outputs

1. Administrative Closure Procedure
22. Contract Closure Procedure
3. Final Product, Service, or Result
4. Dismiss the project team
5. Organizational Process Assets (Updates)

Tools and Techniques for Project Execution

- **Work Authorization System:** a method for ensuring that qualified people do work at the right time and in the proper sequence.
- **Status Review Meetings:** regularly scheduled meetings used to exchange project information.
- **Project Management Software:** special software to assist in managing projects.

Change Control on Information Technology Projects

- Former view: The project team should strive to do exactly what was planned on time and within budget.
- Problem: Stakeholders rarely agreed up-front on the project scope, and time and cost estimates were inaccurate.
- Modern view: Project management is a process of constant communication and negotiation.
- Solution: Changes are often beneficial, and the project team should plan for them.

Using Software to Assist in Project Integration Management

- Several types of software can be used to assist in project integration management
  - Documents can be created with word processing software.
  - Presentations are created with presentation software.
  - Tracking can be done with spreadsheets or databases.
  - Communication software like e-mail and Web authoring tools facilitate communications.
  - Project management software can pull everything together and show detailed and summarized
  - information.

THANK YOU!!

QUESTION???

Chapter 4
Project Scope Management

- Scope refers to all the works involved in creating the **products of the project and the processes** used to create them.
- Project scope management includes the processes involved in defining and controlling ***what is*** or ***is not*** included in the project.
- **Deliverables** are products produced as part of a project, such as hardware or software, planning documents, or meeting minutes.
- Product Scope – requirements related e.g. functionality
- The project team and stakeholders must have the same understanding of what products will be produced as a result of a project and what processes will be used in producing them.

Project Scope Management Processes

- ***Initiation***: Beginning a project or continuing to the next phase.
- ***Scope planning***: Developing documents to provide the basis for future project decisions.
- ***Scope definition***: Subdividing the major project deliverables into smaller, more manageable components.
- ***Scope verification***: Formalizing acceptance of the project scope.
- ***Scope change control***: Controlling changes to project scope.

Scope Planning and the Scope Statement

- Project scope planning involves developing documents to provide the basis for future project decisions.
- It includes ***criteria*** for checking the successful completion of a project or its phases.
- Its inputs include the *project charter*, description of products, project constraints, and project assumptions.
- A scope statement is a document used to develop and confirm a common understanding of the project scope. It should include
  - A project justification—describing the business need for initiating the project.
  - A brief description of the project's products.

- a summary of all project deliverables—list of the products or deliverables of the project
- a statement of what determines project success—lists the quantifiable criteria to accept the project as a success including cost, schedule and quality measures

- In fact, scope statements vary from one project to the other

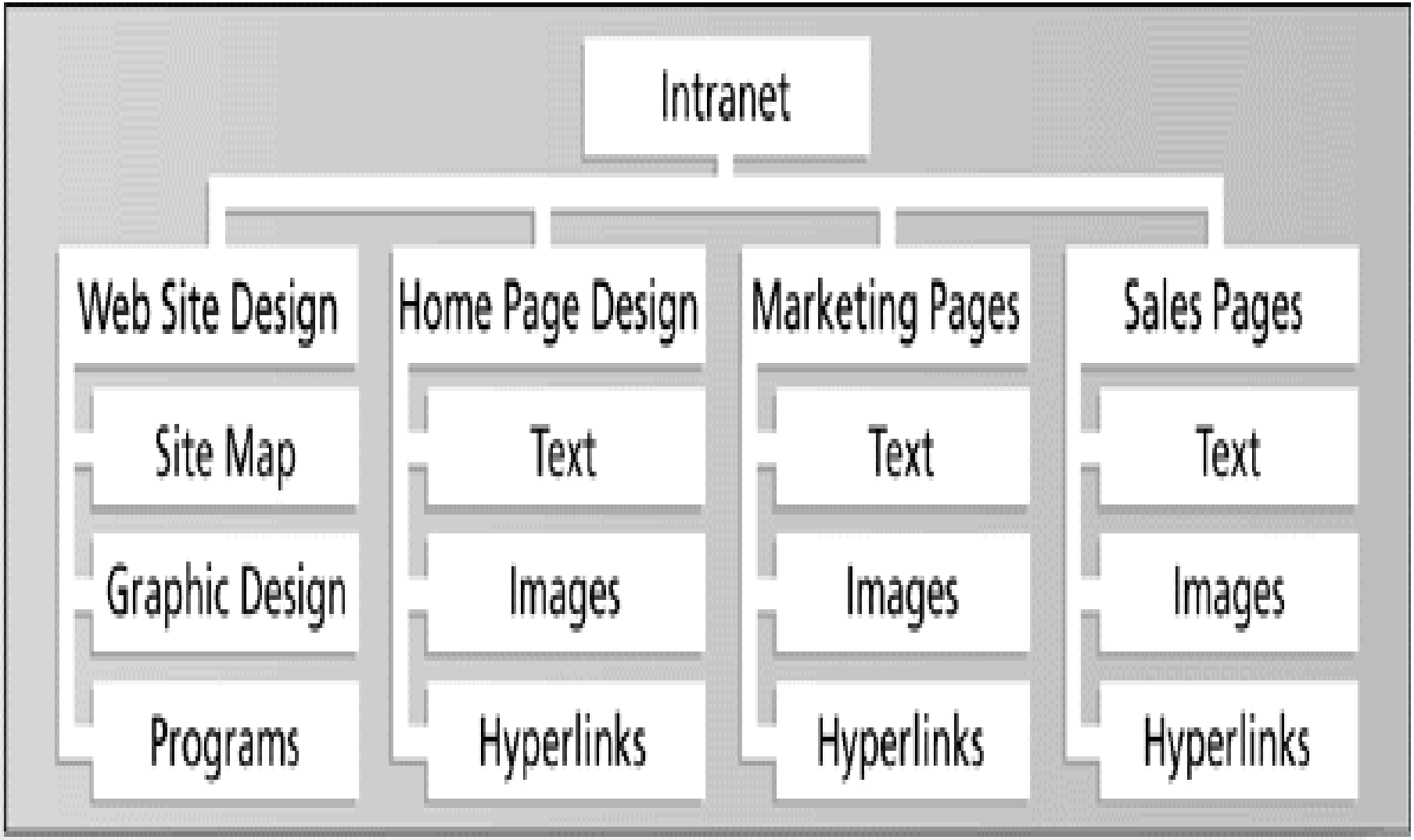
Scope Definition and the Work Breakdown Structure

- After completing scope planning, the next step is to further define the work by breaking it into manageable pieces.
- Scope definition is breaking works/activities into manageable pieces.
- Good scope definition
  - Helps improve the accuracy of time, cost, and resource estimates.
  - Defines a baseline for performance measurement and project control.
  - Aids in communicating clear work responsibilities.

The Work Breakdown Structure

- A work breakdown structure (WBS) is an outcome-oriented analysis of the work involved in a project that defines the total scope of the project.
- It is a foundation document in project management because it provides the basis for planning and managing project schedules, costs, and changes.

Sample Intranet WBS Organized by Product



Approaches to Developing WBSs

- ***Using guidelines***: Some organizations, like the DOD, provide guidelines for preparing WBSs.
- ***The analogy approach***: It often helps to review WBSs of similar projects.
- ***The top-down approach***: Start with the largest items of the project and keep breaking them down.
- ***The bottom-up approach***: Start with the detailed tasks and roll them up.

Principles to Create Good WBS

- A unit of work should appear at only one place in WBS.
- The work content of a WBS item is the sum of the WBS items below it.
- A WBS item is the responsibility of one person.
- The WBS should be consistent with the actual work performance.
- Involvement of project team members is necessary in creating WBS.
- Document each WBS item for clear understanding of the scope of work included.
- The WBS needs to be flexible tool to accommodate inevitable changes while maintaining control.

Scope Verification and Scope Change Control

- It is very difficult to create a good scope statement and WBS for a project.
- It is even more difficult to verify project scope and minimize scope changes.
- Many IT projects suffer from scope creep and poor scope verification.
- Scope creep is the tendency to keep the project scope bigger and bigger.
- **Scope Verification** involves formal acceptance of the project scope by all stakeholders. Clear documentation is required for scope verification.
- **Scope change control** is controlling changes to the project scope.

Project Initiation: Strategic Planning and Project Selection

- The first step in initiating projects is to look at the big picture or strategic plan of an organization.
- Strategic planning involves determining long-term business objectives.
- IT projects should support strategic and financial business objectives.

Identifying Potential Projects

- Many organizations follow a planning process for selecting IT projects.
- First ***develop an IT strategic plan*** based on the organization's overall strategic plan.
- Then ***perform a business area analysis.***
- Then ***define potential projects.***
- Then ***select IT projects*** and ***assign resources.***

Methods for Selecting Projects

- There are usually more projects than available time and resources to implement them.
- It is important to follow a logical process for selecting IT projects to work on.
- Methods for selecting IT projects include focusing on
  - *Broad needs*,
  - *Categorizing projects*,
  - *Financial methods*, and
  - *Weighted scoring models*

Focusing on Broad Organizational Needs

- It is often difficult to provide strong justification for many IT projects, but everyone agrees they have a high value.
- Three important criteria for projects:
  - There is a ***need*** for the project.
  - There are ***funds*** available.
  - There's a strong ***will*** to make the project succeed.

Categorizing IT Projects

- One categorization is whether the project addresses
  - A problem
  - An opportunity, or
  - A directive
- Another categorization is how long it will take to do and when it is needed.
- Another is the overall priority of the project.

Financial Analysis of Projects

- Financial considerations are often an important consideration in selecting projects.
- Three primary methods for determining the projected financial value of projects:
  - Net present value (NPV) analysis
  - Return on investment (ROI)
  - Payback analysis

Net Present Value Analysis

- Net present value (NPV) analysis is a method of calculating the expected net monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time.
- Projects with a positive NPV should be considered if financial value is a key criterion.
- The higher the NPV, the better.

Return on Investment

- Return on investment (ROI) is income divided by investment.

  ROI = (Gain from investment – Cost of investment) / Cost of investment

- The higher the ROI, the better.
- Many organizations have a required rate of return or minimum acceptable rate of return on investment for projects.

Payback Analysis

- Another important financial consideration is payback analysis.
- The payback period is the amount of time it will take to recoup, in the form of net cash inflows, the net dollars invested in a project.
- Payback analysis determines the time needed for accrued benefits to overtake accrued and continuing costs.
- Payback occurs when the cumulative discounted benefits and costs are greater than zero.
- Many organizations want IT projects to have a fairly short payback period.

Weighted Scoring Model

- A weighted scoring model is a tool that provides a systematic process for selecting projects based on many criteria.
  - First identify criteria important to the project selection process.
  - Then assign weights (percentages) to each criterion so they add up to 100%.
  - Then assign scores to each criterion for each project.
  - Multiply the *scores* by the *weights* and get the total weighted scores.
- The higher the weighted score, the better.

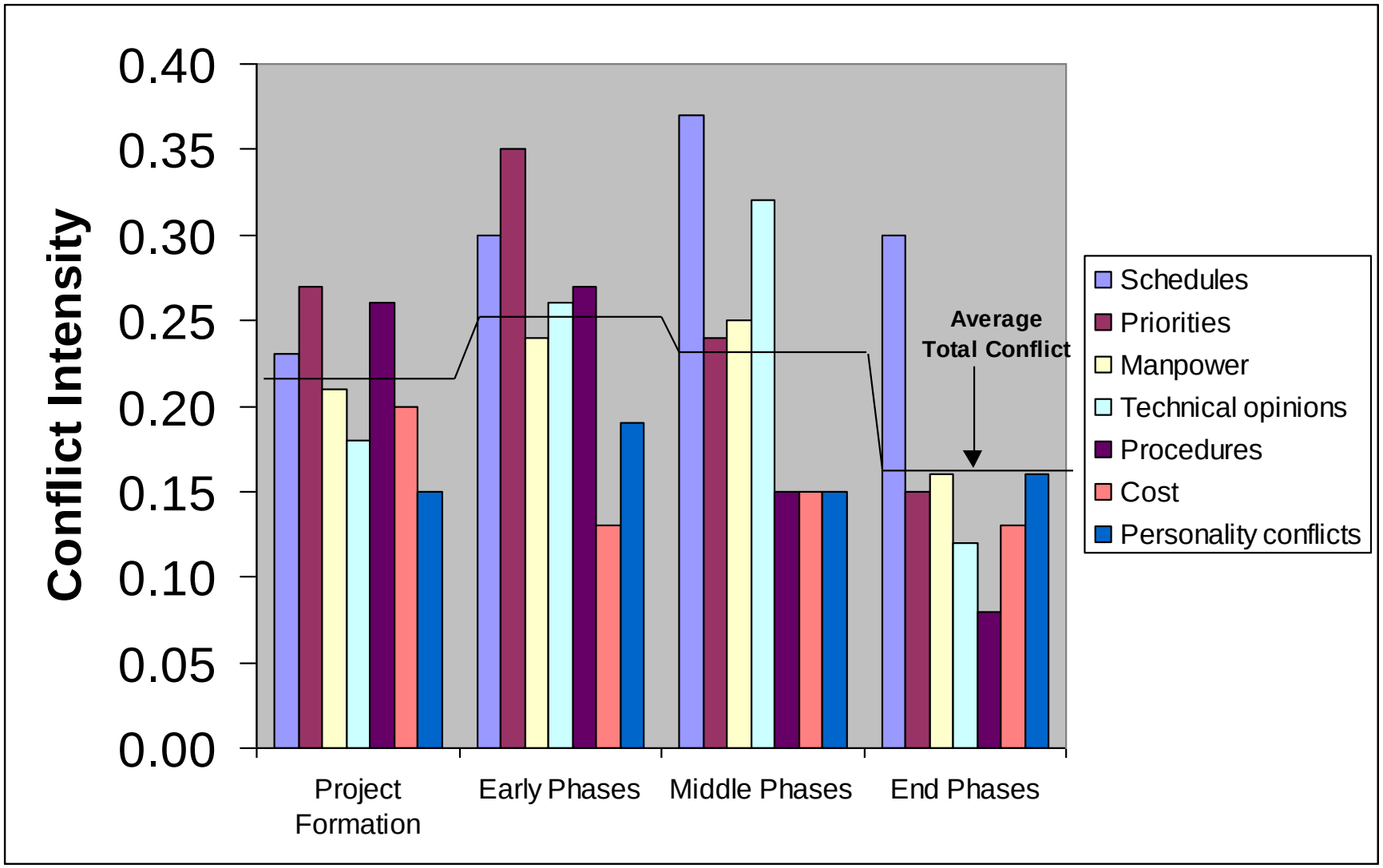
THANK YOU!!

QUESTION???

Chapter 5
Project Time Management

- Project time management involves the process required to ensure timely completion of a project.
- Managers often cite delivering projects on time as one of their biggest challenges.
- Schedule issues are the main reason for conflicts on projects, especially during the second half of projects.
- Time has the least amount of flexibility; it passes no matter what happens on a project.

Conflict Intensity Over the Life of a Project



- Individual Work styles and Cultural Differences Cause Schedule Conflicts.
  - Some people prefer to follow schedules and meet deadlines while others do not.
  - Different cultures and even entire countries have different attitudes about schedules.

Project Time Management Processes

- **Activity definition**: Identifying the specific activities that the project team members and stakeholders must perform to produce the project deliverables.
- **Activity sequencing**: Identifying and documenting the relationships between project activities (activities of a project).
- **Activity resource estimating**: Estimating how many resources a project team should use to perform project activities.
- **Activity duration estimating**: Estimating the number of work periods that are needed to complete individual activities.
- **Schedule development**: Analyzing activity sequences, activity resource estimates, and activity duration estimates to create the project schedule.
- **Schedule control**: Controlling and managing changes to the project schedule.

Activity Definition

- An **activity** or **task** is an element of work normally found on the Work based system that has an expected duration, a cost, and resource requirements.
- Project schedules grow out of the basic documents that initiate a project.
  - The project charter includes start and end dates and budget information.
  - The scope statement define what will be done.
- Activity definition involves developing a more detailed Work Based System and supporting explanations to understand all the work to be done, so you can develop realistic cost and duration estimates.

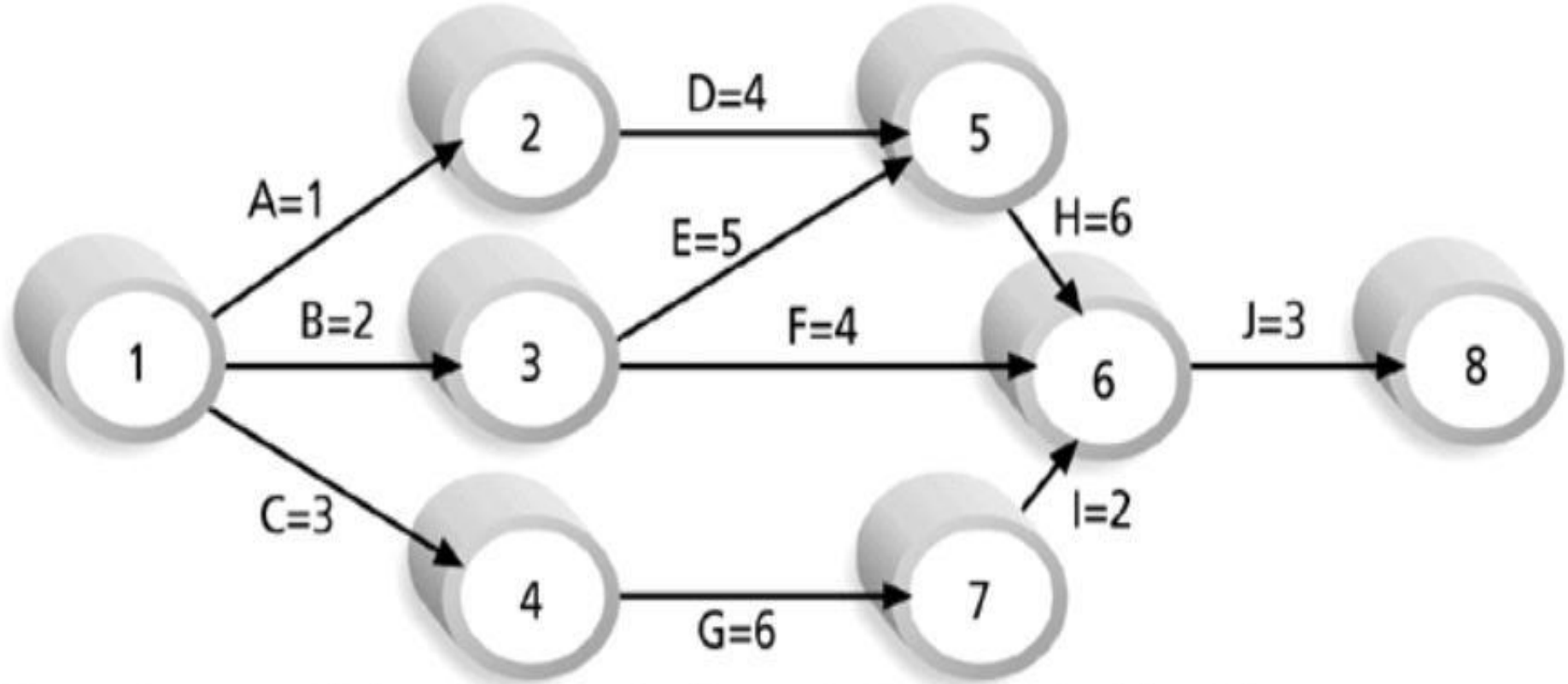
Activity Lists and Attributes

- An **activity list** is a tabulation of activities to be included on a project schedule. The list should include:
  - The activity name
  - An activity identifier or number
  - A brief description of the activity
- **Activity attributes** provide more information about each activity, such as predecessors, successors, logical relationships, leads and lags, resource requirements, constraints, imposed dates, and assumptions related to the activity.

Activity Sequencing

- Involves reviewing activities and determining dependencies.
- A **dependency** or **relationship** relates to the sequencing of project activities or tasks.
- We *must* determine dependencies in order to use critical path analysis.
- Network diagrams are the preferred technique for showing activity sequencing.
- A **network diagram** is a schematic display of the logical relationships among, or sequencing of, project activities.
- Two main formats are the *arrow* and *precedence* diagramming methods.

Sample Activity-on-Arrow (AOA) Network Diagram for Project X



Note: Assume all durations are in days; A=1 means Activity A has a duration of 1 day.

Activity Resource Estimating

- Before estimating activity durations, you must have a good idea of the quantity and type of resources that will be assigned to each activity.
- Consider important issues in estimating resources:
  - How difficult will it be to complete specific activities on this project?
  - What is the organization's history in doing similar activities?
  - Are the required resources available?

Activity Duration Estimating

- **Duration** includes the actual amount of time worked on an activity *plus* the elapsed time.
- **Effort** is the number of workdays or work hours required to complete a task/activity.
- Effort does not normally equal duration.
- People doing the work should help create estimates, and an expert should review them.

- Instead of providing activity estimates as a discrete number, such as four weeks, it's often helpful to create a ***three-point estimate:***

  - An estimate that includes an optimistic, most likely, and pessimistic estimate, such as three weeks for the optimistic, four weeks for the most likely, and five weeks for the pessimistic estimate.

Schedule Development

- Uses results of the other time management processes to determine the start and end dates of the project.
- Ultimate goal is to create a realistic project schedule that provides a basis for monitoring project progress for the time dimension of the project.
- Important tools and techniques to develop schedule include
  - Gantt Charts,
  - Critical Path Analysis,
  - Critical Chain Scheduling, etc.

Gantt Charts

- **Gantt charts** provide a standard format for displaying project schedule information by listing project activities and their corresponding start and finish dates in a calendar format.
- Symbols include:
  - **Black diamonds**: Milestones
  - **Thick black bars**: Summary tasks
  - **Lighter horizontal bars**: Durations of tasks
  - **Arrows**: Dependencies between tasks

Adding Milestones to Gantt Charts

- Many people like to focus on meeting milestones, especially for large projects.
- Milestones emphasize important events or accomplishments in projects.
- You typically create milestone by entering tasks that have a zero duration, or you can mark any task as a milestone.
- Milestones should be SMART
  - **S**pecific
  - **M**easurable
  - **A**ssignable
  - **R**ealistic
  - **T**ime-framed

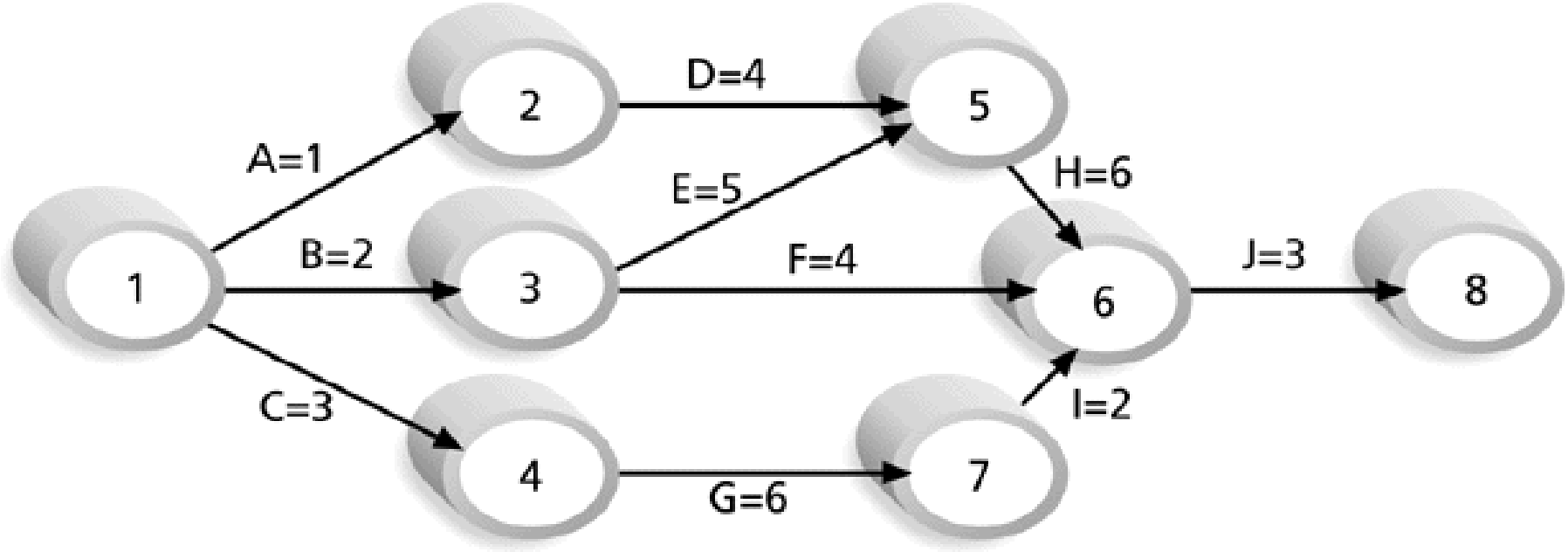
Critical Path Method (CPM)

- **CPM** is a network diagramming technique used to predict total project duration.
- A **critical path** for a project is the series of activities that determines the *earliest time* by which the project can be completed.
- The critical path is the *longest path* through the network diagram and has the least amount of slack or float.
- **Slack** or **float** is the amount of time an activity can be delayed without delaying a succeeding activity or the project finish date.

Calculating the Critical Path

- Develop a good network diagram.
- Add the duration estimates for all activities on each path through the network diagram.
- The longest path is the critical path.
- If one or more of the activities on the critical path takes longer than planned, the whole project schedule will slip *unless* the project manager takes corrective action.

Example: Determining the Critical Path for Project X



Note: Assume all durations are in days.

Path 1:	A-D-H-J	Length = 1+4+6+3 = 14 days
Path 2:	**B-E-H-J**	**Length = 2+5+6+3 = 16 days**
Path 3:	B-F-J	Length = 2+4+3 = 9 days
Path 4:	C-G-I-J	Length = 3+6+2+3 = 14 days

Since the critical path is the longest path through the network diagram, Path 2, B-E-H-J, is the critical path for Project X.

- The critical path does *not* necessarily contain all the critical activities; it only accounts for time.
- There can be more than one critical path if the lengths of two or more paths are the same.
- The critical path can change as the project progresses.

Using the CPM to Shorten a Project Schedule

- Three main techniques for shortening schedules:
  - **Shortening** the duration of critical activities or tasks by *adding more resources* or *changing their scope*.
  - **Crashing** activities by obtaining the greatest amount of schedule compression for the least incremental cost.
  - **Fast tracking** activities by doing them in *parallel* or *overlapping* them.

Program Evaluation and Review Technique (PERT)

- PERT is a network analysis technique used to estimate project duration when there is a high degree of uncertainty about the individual activity duration estimates.

- PERT uses *probabilistic time estimates:*

  - Duration estimates based on using optimistic, most likely, and pessimistic estimates of activity durations, or a three-point estimate.

PERT Formula and Example

- PERT weighted average **=**

$$\frac{\text{optimistic time} + 4 \times \text{most likely time} + \text{pessimistic time}}{6}$$

- Example:

PERT weighted average =

$$\frac{8 \text{ workdays} + 4 \times 10 \text{ workdays} + 24 \text{ workdays}}{6} = \mathbf{12\ days}$$

where:

optimistic time= 8 days

most likely time = **10 days**

pessimistic time = 24 days

Schedule Control

- Perform reality checks on schedules.
- Allow for contingency.
- Don’t plan for everyone to work at 100 percent capacity all the time.
- Hold progress meetings with stakeholders and be clear and honest in communicating schedule issues.
- Tools and techniques include:
  - Progress reports.
  - A schedule change control system.
  - Project management software, including schedule comparison charts, such as the tracking Gantt chart.
  - Variance analysis, such as analyzing float or slack.
  - Performance management, such as earned value.

Using Software to Assist in Time Management

- Software for facilitating communication helps people exchange schedule-related information.
- Decision support models help analyze trade-offs that can be made.
- Project management software can help in various time management areas.

THANK YOU!!

QUESTION???

Chapter 6
Project Cost Management

What is Cost and Project Cost Management?

- **Cost** is a resource sacrificed or foregone to achieve a specific objective, or something given up in exchange.

- Costs are usually measured in monetary units, such as dollars.

- **Project cost management** includes the processes required to ensure that the project is completed within an approved budget.

Project Cost Management Processes

- **Cost estimating**: Developing an approximation or estimate of the costs of the resources needed to complete a project.

- **Cost budgeting**: Allocating the overall cost estimate to individual work items to establish a baseline for measuring performance.

- **Cost control**: Controlling changes to the project budget.

Basic Principles of Cost Management

- Most members of an executive board have a better understanding and are more interested in financial terms than IT terms, so IT project managers must speak their language.
  - **Profits** are revenues minus expenses.
  - **Life cycle costing** considers the total cost of ownership, or development plus support costs, for a project.
  - **Cash flow analysis** determines the estimated annual costs and benefits for a project and the resulting annual cash flow.

Basic Principles of Cost Management

- **Tangible costs** or **benefits** are those costs or benefits that an organization can easily measure in dollars.
- **Intangible costs** or **benefits** are costs or benefits that are difficult to measure in monetary terms.
- **Direct costs** are costs that can be directly related to producing the products and services of the project.
- **Indirect costs** are costs that are not directly related to the products or services of the project, but are indirectly related to performing the project.
- **Sunk cost** is money that has been spent in the past; when deciding what projects to invest in or continue, you should *not* include sunk costs.

Cost Estimating

- Project managers must take cost estimates seriously if they want to complete projects within budget constraints.

- It's important to know the types of cost estimates, how to prepare cost estimates, and typical problems associated with IT cost estimates.

Cost Management Plan

- A **cost management plan** is a document that describes how the organization will manage cost variances on the project.

- A large percentage of total project costs are often labor costs, so project managers must develop and track estimates for labor.

Cost Estimation Tools and Techniques

- Basic tools and techniques for cost estimates:
  - **Analogous** or **top-down estimates**: Use the actual cost of a previous, similar project as the basis for estimating the cost of the current project.
  - **Bottom-up estimates**: Involve estimating individual work items or activities and summing them to get a project total.
  - **Parametric modeling**: Uses project characteristics (parameters) in a mathematical model to estimate project costs.
  - **Computerized tools**: Tools, such as spreadsheets and project management software, that can make working with different cost estimates and cost estimation tools easier.

Typical Problems with IT Cost Estimates

- Developing an estimate for a large software project is a complex task that requires a significant amount of effort.
- People who develop estimates often do not have much experience.
- Human beings are biased toward underestimation.
- Management might ask for an estimate, but really desire a bid to win a major contract or get internal funding.

Cost Budgeting

- Cost budgeting involves allocating the project cost estimate to individual work items over time.

- The WBS is a required input for the cost budgeting process because it defines the work items.

- Important goal is to produce a **cost baseline**:
  - A time-phased budget that project managers use to measure and monitor cost performance.

Cost Control

- Project cost control includes:
  - Monitoring cost performance.
  - Ensuring that only appropriate project changes are included in a revised cost baseline.
  - Informing project stakeholders of authorized changes to the project that will affect costs.
- Many organizations around the globe have problems with cost control.

Earned Value Management (EVM)

- **EVM** is a project performance measurement technique that integrates scope, time, and cost data.
- Given a **baseline** (original plan plus approved changes), you can determine how well the project is meeting its goals.
- You must enter actual information periodically to use EVM.
- More and more organizations around the world are using EVM to help control project costs.

Earned Value Management Terms

- The **planned value (PV)**, formerly called the budgeted cost of work scheduled (BCWS), also called the budget, is that portion of the approved total cost estimate planned to be spent on an activity during a given period.
- **Actual cost (AC)**, formerly called actual cost of work performed (ACWP), is the total of direct and indirect costs incurred in accomplishing work on an activity during a given period.
- The **earned value (EV)**, formerly called the budgeted cost of work performed (BCWP), is an estimate of the value of the physical work actually completed.
- EV is based on the original planned costs for the project or activity and the rate at which the team is completing work on the project or activity to date.

Project Portfolio Management

- Many organizations collect and control an entire suite of projects or investments as one set of interrelated activities in a portfolio.
- Project portfolio management has five levels:
  1. Put all your projects in one database.
  2. Prioritize the projects in your database.
  3. Divide your projects into two or three budgets based on type of investment.
  4. Automate the repository.
  5. Apply modern portfolio theory, including risk-return tools that map project risk on a curve.

Using Software to Assist in Cost Management

- Spreadsheets are a common tool for resource planning, cost estimating, cost budgeting, and cost control.
- Many companies use more sophisticated and centralized financial applications software for cost information.
- Project management software has many cost-related features, especially enterprise PM software.

THANK YOU!!

QUESTION???

CHAPTER 7

PROJECT QUALITY MANAGEMENT

What Is Quality?

- The International Organization for Standardization (ISO) defines **quality** as "**the degree to which a set of inherent characteristics fulfils requirements**".

- Other experts define quality based on:
  - **Correspondence to requirements:** The project's processes and products meet written specifications.
  - **Fitness for use:** A product can be used as it was intended.

What Is Project Quality Management?

- Project quality management ensures that the project will satisfy the needs for which it was undertaken.
- Processes include:
  - **Quality planning:** Identifying which quality standards are relevant to the project and how to satisfy them.
  - **Quality assurance:** Periodically evaluating overall project performance to ensure the project will satisfy the relevant quality standards.
  - **Quality control:** Monitoring specific project results to ensure that they comply with the relevant quality standards an identifying ways to eliminate causes of unsatisfactory performance.

Quality and Grade

- What is Quality and Grade?
  - Grade is "a category or rank given to entities having the same functional use but different requirements for quality"
  - Low quality is always a problem; low grade may not be.
    - Software product may be of high quality (no obvious bugs, good manual) and low grade (a limited no. of features)
    - Software product may be of low quality (many bugs, poorly organized user documentation) and high grade (numerous features)

- Modern quality management concepts complements modern project management.
- Both discipline recognize the importance of:
  - **Customer satisfaction:** understanding, managing and influencing needs so that customer expectations are met or exceeded.
  - **Prevention over inspection:** the cost of avoiding mistakes is always less than the cost of correcting them.
  - **Management responsibility:** success requires the participation of all team members, but it remains the responsibility of management to provide the resources needed to succeed.

Quality Planning

- Involves identifying which quality standards are relevant to the project and determining how to satisfy them.
- Implies the ability to anticipate situations and prepare actions to bring about the desired outcome.
- Key part of the project planning process
- Important to prevent defects by:
  - Selecting proper materials.
  - Training and indoctrinating people in quality.
  - Planning a process that ensures the appropriate outcome.

Design of Experiments

- **Design of experiments** is a quality planning technique that helps identify which variables have the most influence on the overall outcome of a process.

Quality Assurance

- Quality assurance includes all the activities related to satisfying the relevant quality standards for a project.
- Planned and systematic activities implemented within the quality system to provide confidence that the project will satisfy the relevant quality standards.
- Another goal of quality assurance is **continuous quality improvement.**

- **Benchmarking** generates ideas for quality improvements by comparing specific project practices or product characteristics to those of other projects or products within or outside the performing organization.
- A **quality audit** is a structured review of specific quality management activities that help identify lessons learned that could improve performance on current or future projects.

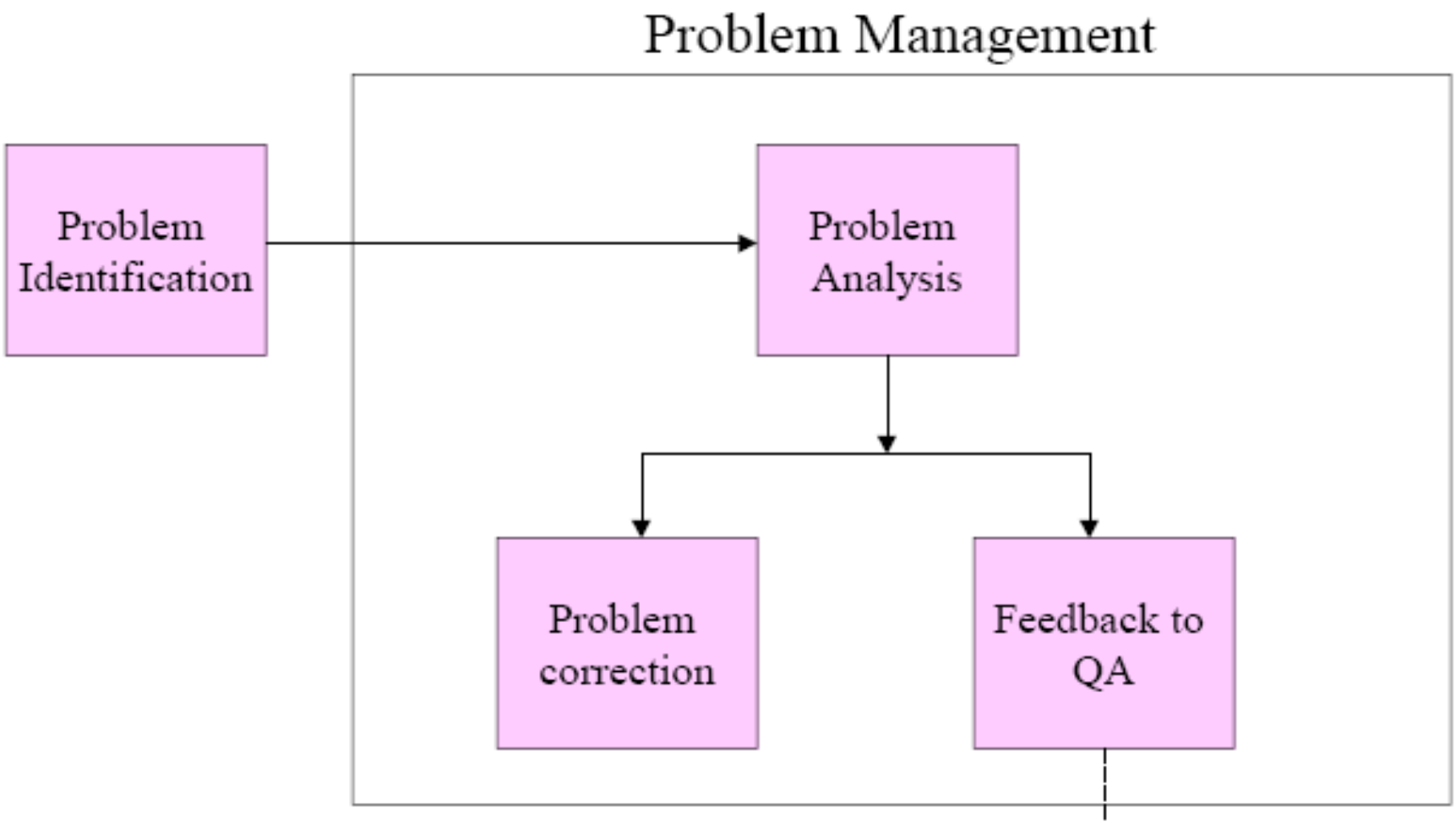
Table of Contents for a Quality Assurance Plan*

1.0 Draft Quality Assurance Plan
1.1 Introduction
1.2 Purpose
1.3 Policy Statement
1.4 Scope
2.0 Management
2.1 Organizational Structure
2.2 Roles and Responsibilities
2.2.1 Technical Monitor/Senior Management
2.2.2 Task Leader
2.2.3 Quality Assurance Team
2.2.4 Technical Staff
3.0 Required Documentation
4.0 Quality Assurance Procedures
4.1 Walkthrough Procedure
4.2 Review Process
4.2.1 Review Procedures
4.3 Audit Process
4.3.1 Audit Procedures
4.4 Evaluation Process
4.5 Process Improvement
5.0 Problem Reporting Procedures
5.1 Noncompliance Reporting Procedures
6.0 Quality Assurance Metrics

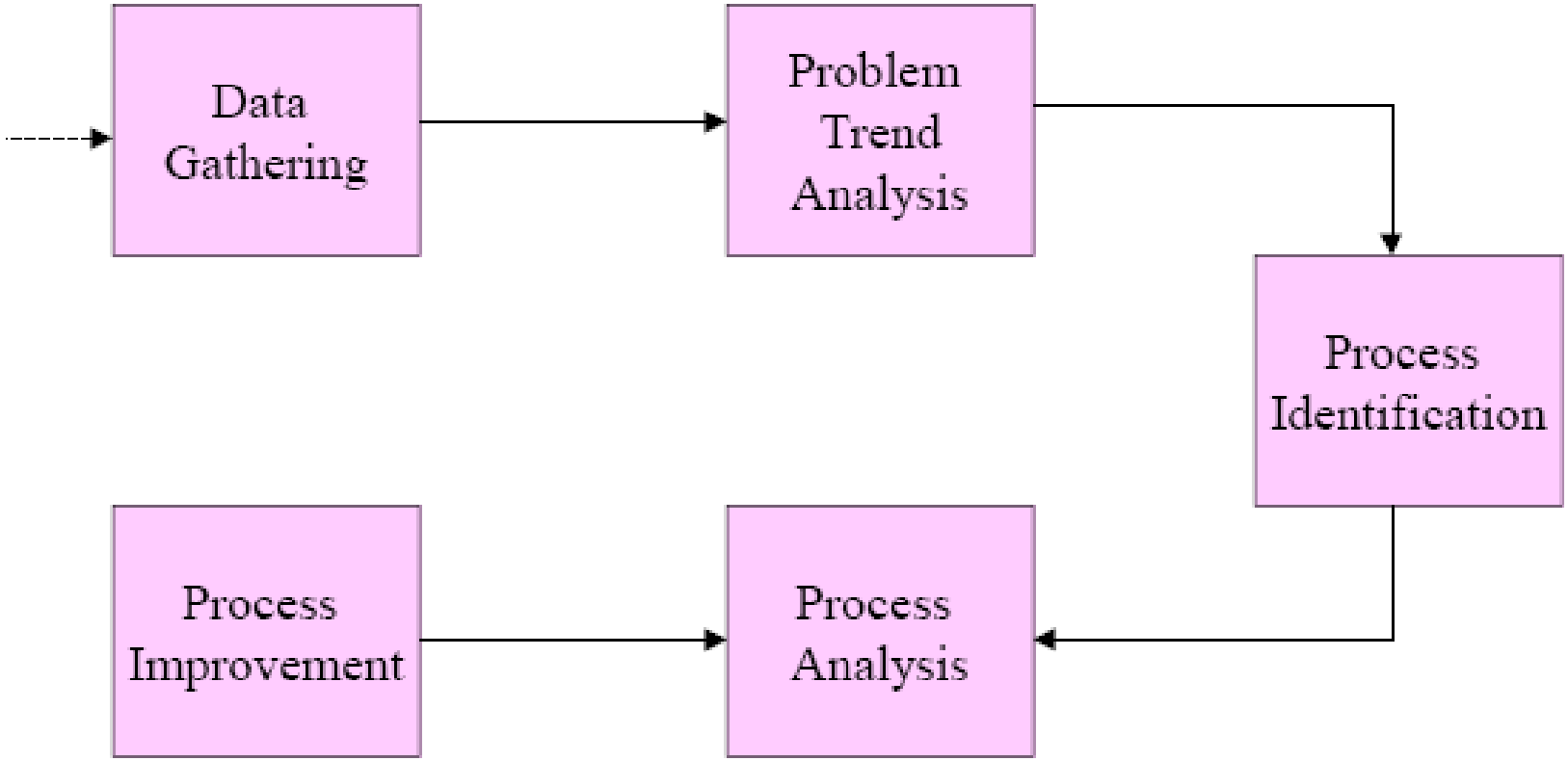
Quality Control

- The main outputs of quality control are:
  - Acceptance decisions
  - Rework
  - Process adjustments
- Some tools and techniques include:
  - Inspection
  - Statistical sampling
  - Quality control charts

Typical Quality Control Steps



Typical Quality Assurance Steps



THANK YOU!!

QUESTION???

Chapter 8

Project Human Resource Management

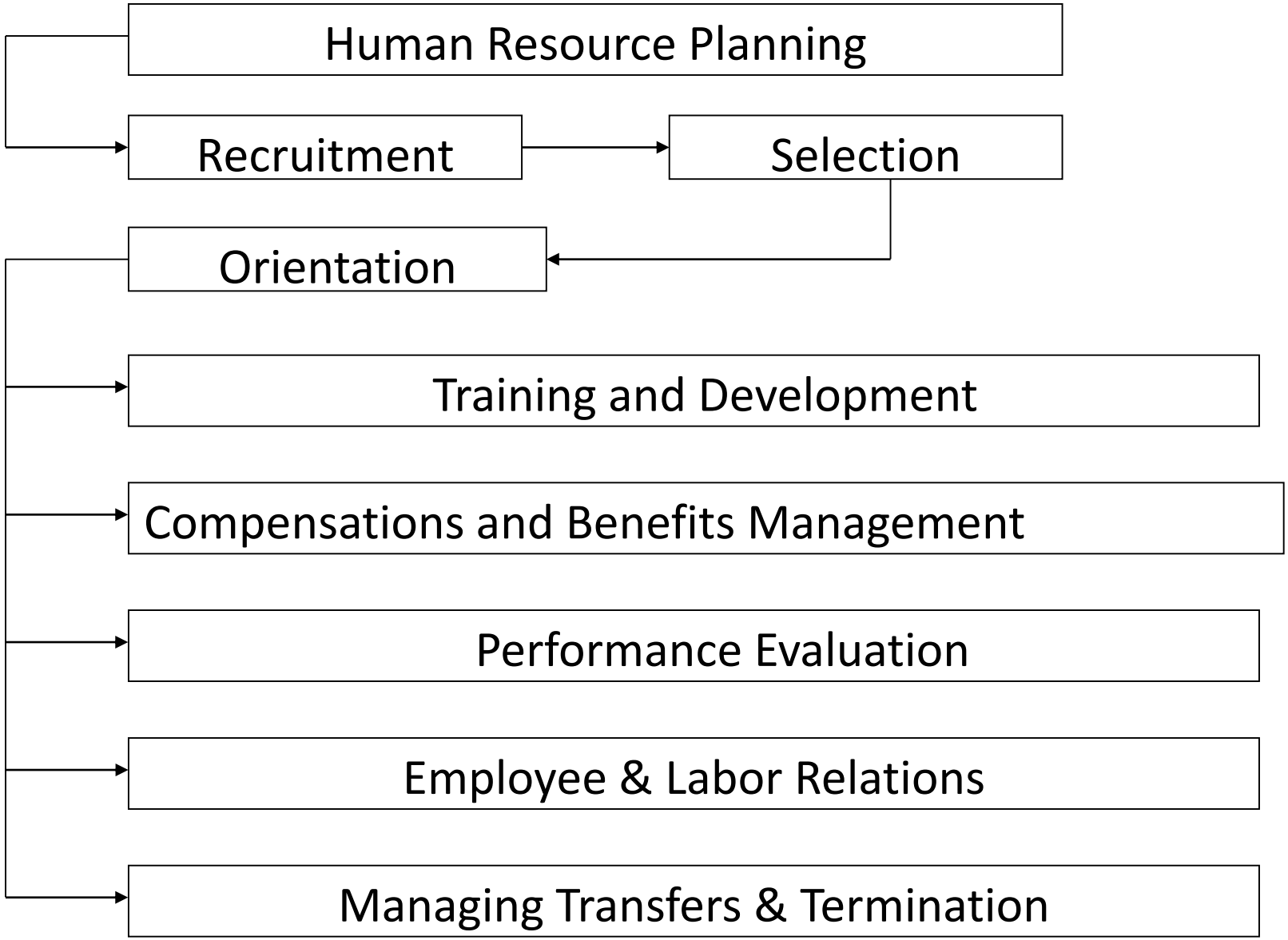
What is Project Human Resource Management?

- Project Human Resource Management is the sum of activities required to attract, develop, and retain people with the knowledge and skills needed to achieve project objectives.
- Project human resource management includes the processes required to make the most effective use of the people involved with a project.

Project HRM

- HRM includes
  - Recruitment
  - Selection
  - Training
  - Compensation Management
  - Labor Relations
  - Benefits Management
  - Performance Evaluation
  - Discipline
  - Complaint handling
  - Counseling
  - Career Development

HRM Activities (Process)



Human Resource Planning

- Focuses on developing and integrated set of personnel policies and programs to achieve the human resource and project objectives.
- The main objective of the HRP is to ensure that the project is neither understaffed not overstaffed.
- Staffing requires that employees with appropriate skills be placed in the right jobs at the right times.

Human Resource planning Dimensions

- Voluntary Quits
- Dismissals
- Retirements
- Demotions
- Transfers out
- Promotions out
- Death
- Layoffs

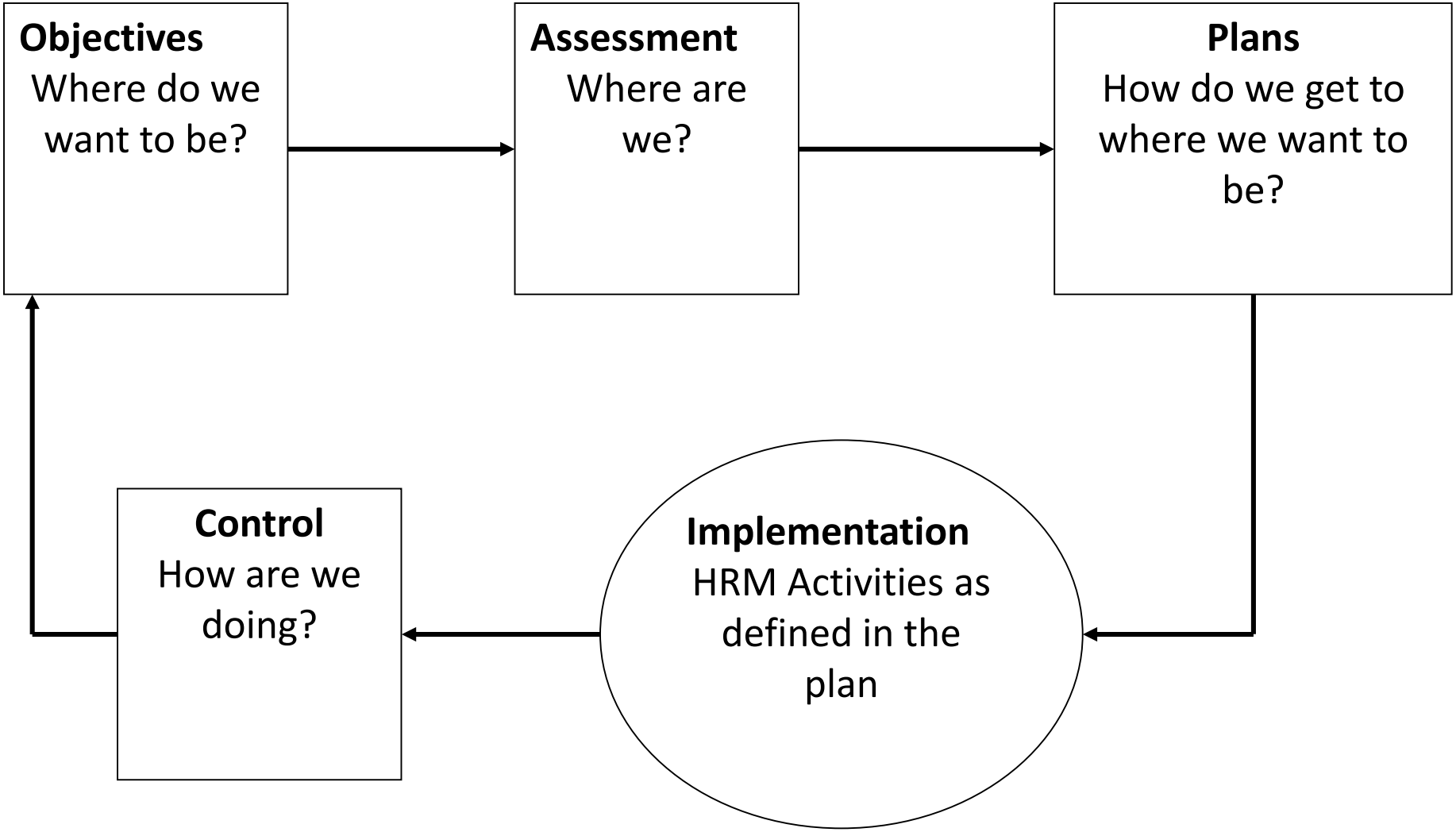
Planning

- Objectives
- Technology
- Expansion
- Economics
- Job Design

New Replacements

- Transfers in
- Promotions in
- New jobs/hires
- Recalls in

The HRM Process



Recruitment and Selection

- **Recruitment** is the process of attracting qualified applicants to an organization through activities such as advertisement and others.
- The purpose of recruitment is to provide sufficient qualified candidates for employment

Selection

- The purpose of **selection** is to fill position with the best people from available candidates.
- It includes
  - Preliminary screening
  - Initial interviews
  - Testing
  - Background investigation
  - In-depth interview
  - Decision to hire
  - Orientation, etc

Interview

- **Direct interview**—with yes or no responses
- **Indirect interviews**—in depth and unstructured
- **patterned Interview**—more than one interviewer, when the applicants are many, uses standard forms
- **Functional interview** comprises a series of job related questions

Orientation

- Is a carefully planned, systematic and effective introduction of new workers to their jobs and the project so they may start work with a minimum of delay, misunderstanding and errors.
- Is a formal program of introduction to introduce new employees to their jobs responsibilities, co-workers, company policies, and work environment.

Purpose of Orientation

- It develops realistic job expectations
- It improves productivity
- It saves time and effort
- It improves employment stability
- It reduces conflict.

Keys to Managing People

- Important areas related to project management include
  - Motivation
  - Influence and power
  - Effectiveness

THANK YOU!!

QUESTION???

Chapter 9
Project Communications Management

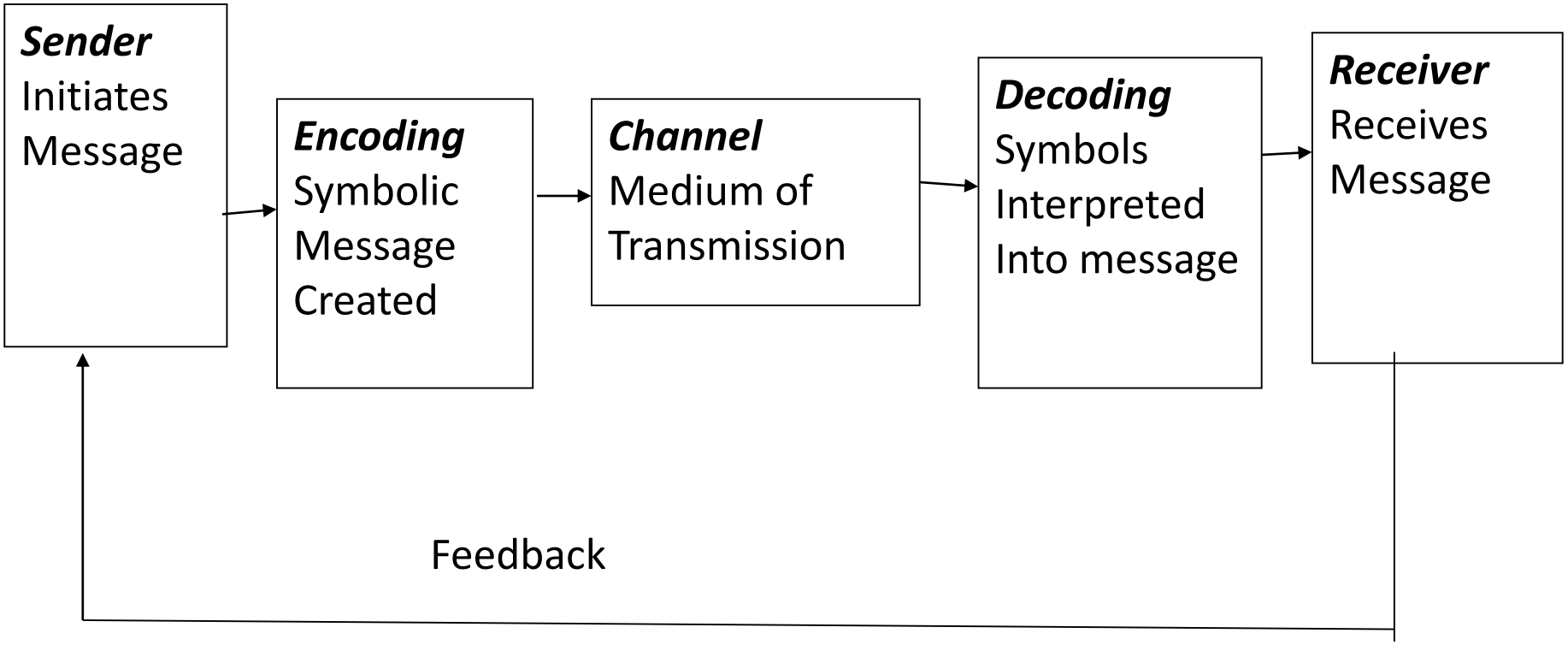
Project Communication

- From a managerial perspective, communication is the process of exchanging information in a way that achieves mutual understanding between two or more people.
- By communication, it means that the individuals have a reasonable understanding of one another's feelings or ideas.
- Hence it is a process of sharing information and meanings to achieve a common objective.
- In the organization, communication is bond that holds business together. Without communication managerial functions of planning, organizing, directing and controlling can not be performed.

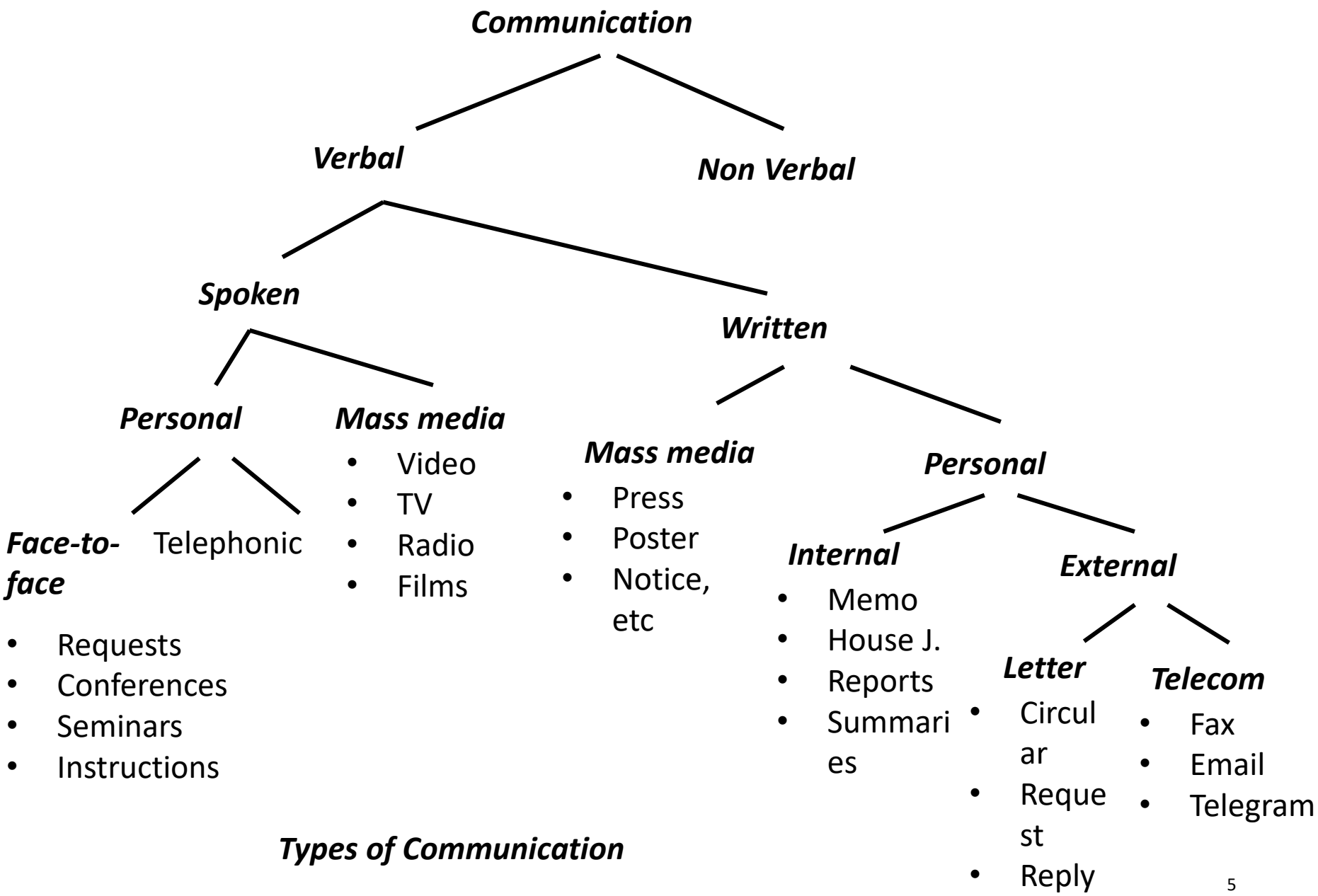
The communication Process

- **Sender**
  - A sender is the source of information who encodes a message by using symbols, words, pictures, or gestures.
- **Encoding**
  - is the process of converting the ideas of the sender into understandable messages.
- **Channel**
  - Is the medium through which information is transmitted. It is the medium of communication between the sender ands the receiver.
- **Decoding**
  - Consists of unraveling (undoing) process.
- **Feedback**
  - Occurs when a receiver responds to a sender's message in the form of reports, performance information, action, etc.

The Communication process



The communications Model



Types of Communication

Formal communication

- It describes the formal reporting systems and prescribes who reports to whom and what forms these communications will take.
- There are three categories of formal communication: downward, upward, and horizontal communication channels.

Types of Formal Communication

Downward Communication

- Message and information initiated by superiors to subordinates, usually in the form of directives.
- Flows from the top of the organization and carries the messages that translate top management planning and decision making in to orders that direct office employees.

Types of Formal Communication

Upward Communication

- Messages and information initiated by subordinates for their superiors, usually in the form of reports.
- Flows vertically from one level in the organization to one or more levels above.
- Employees report on activities, work progress, and problems they are having with their jobs.

Types of Formal Communication

Horizontal Communication

- The process of exchanging information between peers at any organizational level, usually to coordinate activities.
- The ultimate goal of horizontal communication process is to improve coordination.

Informal Communication

- The unofficial, personal network of information among employees fostered by social relationships and friendships.
- Results from informal organization as a shadow network of relationships.

Project Communications Management Processes

- **Communications planning**: determining the information and communications needs of the stakeholders
- **Information distribution**: making needed information available in a timely manner
- **Performance reporting**: collecting and disseminating performance information
- **Administrative closure**: generating, gathering, and disseminating information to formalize phase or project completion

Communications Planning

- Every project should include some type of communications management plan, a document that guides project communications.
- Creating a stakeholder analysis for project communications also aids in communications planning.

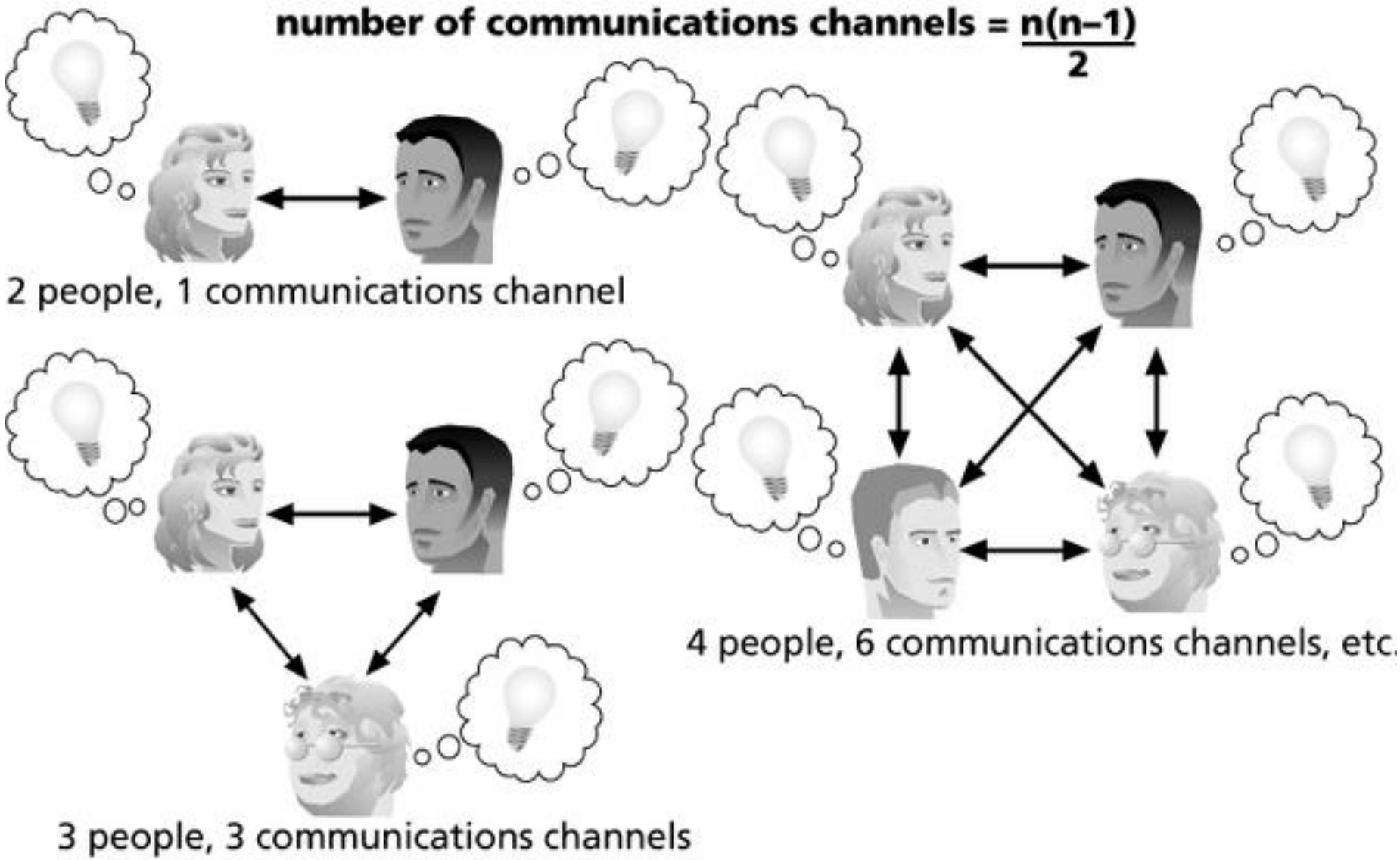
Communications Management Plan Contents

- 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.

Information Distribution

- Getting the right information to the right people at the right time and in a useful format is just as important as developing the information in the first place.
- Important considerations include
  - Using technology to enhance information distribution.
  - Formal and informal methods for distributing information.

The Impact of the Number of People on Communications Channels



Performance Reporting

- Performance reporting keeps stakeholders informed about how resources are being used to achieve project objectives.
  - Status reports describe where the project stands at a specific point in time.
  - Progress reports describe what the project team has accomplished during a certain period of time.
  - Project forecasting predicts future project status.

Administrative Closure

- A project or phase of a project requires closure.
- Administrative closure produces
  - Project archives
  - Formal acceptance
  - Lessons learned

Developing Better Communication Skills

- Companies and formal degree programs for IT professionals often neglect the importance of developing speaking, writing, and listening skills.
- As organizations become more global, they realize they must invest in ways to improve communication with people from different countries and cultures.

Running Effective Meetings

- Determine if a meeting can be avoided.
- Define the purpose and intended outcome of the meeting.
- Determine who should attend the meeting.
- Provide an agenda to participants before the meeting.
- Prepare handouts, visual aids, and make logistical arrangements ahead of time.
- Run the meeting professionally.
- Build relationships.

Developing a Communications Infrastructure

- A communications infrastructure is a set of tools, techniques, and principles that provide a foundation for the effective transfer of information.
  - Tools include e-mail, project management software, groupware, fax machines, telephones, teleconferencing systems, document management systems, and word processors.
  - Techniques include reporting guidelines and templates, meeting ground rules and procedures, decision-making processes,
  - Principles include using open dialog and an agreed upon work ethic.

THANK YOU!!

QUESTION???

Chapter 10
Project Risk Management

What is Risk?

- A dictionary definition of risk is “the possibility of loss or injury”
- Project risk involves understanding potential problems that might occur on the project and how they might impede project success
- Risk management is like a form of insurance; it is an investment

What is Project Risk Management?

The goal of project risk management is to minimize potential risks while maximizing potential opportunities. Major processes include

- **Risk management planning:** deciding how to approach and plan the risk management activities for the project.
- **Risk identification:** determining which risks are likely to affect a project and documenting their characteristics.
- **Qualitative risk analysis:** characterizing and analyzing risks and prioritizing their effects on project objectives.
- **Quantitative risk analysis:** measuring the probability and consequences of risks.
- **Risk response planning:** taking steps to enhance opportunities and reduce threats to meeting project objectives.
- **Risk monitoring and control:** monitoring known risks, identifying new risks, reducing risks, and evaluating the effectiveness of risk reduction.

Risk Management Planning

- The main output of risk management is a risk management plan.
- The project team should review project documents and understand the organization's and the sponsor's approach to risk.
- The level of detail will vary with the needs of the project.

Questions Addressed in a Risk Management Plan

- *Why* is it important to take/not take this risk in relation to the project objectives?
- *What* is the specific risk, and what are the risk mitigation deliverables?
- *How* is the risk going to be mitigated? (What risk mitigation approach is to be used?)
- *Who* are the individuals responsible for implementing the risk management plan?
- *When* will the milestones associated with the mitigation approach occur?
- *How much* is required in terms of resources to mitigate risk?

Risk Identification

- Risk identification is the process of understanding what potential unsatisfactory outcomes are associated with a particular project.
- Several risk identification tools and techniques include
  - Brainstorming
  - Interviewing

Potential Risk Conditions Associated With Each Knowledge Area

Knowledge Area	Risk Conditions
Integration	Inadequate planning; poor resource allocation; poor integration management; lack of post-project review
Scope	Poor definition of scope or work packages; incomplete definition of quality requirements; inadequate scope control
Time	Errors in estimating time or resource availability; poor allocation and management of float; early release of competitive products
Cost	Estimating errors; inadequate productivity, cost, change, or contingency control; poor maintenance, security, purchasing, etc.
Quality	Poor attitude toward quality; substandard design/materials/workmanship; inadequate quality assurance program
Human Resources	Poor conflict management; poor project organization and definition of responsibilities; absence of leadership
Communications	Carelessness in planning or communicating; lack of consultation with key stakeholders
Risk	Ignoring risk; unclear assignment of risk; poor insurance management
Procurement	Unenforceable conditions or contract clauses; adversarial relations

Qualitative Risk Analysis

- Assess the likelihood and impact of identified risks to determine their magnitude and priority
- Risk quantification tools and techniques include
  - Probability/Impact matrixes
  - The Top 10 Risk Item Tracking technique
  - Expert judgment

Top 10 Risk Item Tracking

- Top 10 Risk Item Tracking is a tool for maintaining an awareness of risk throughout the life of a project.
- Establish a periodic review of the top 10 project risk items.
- List the current ranking, previous ranking, number of times the risk appears on the list over a period of time, and a summary of progress made in resolving the risk item.

Expert Judgment

- Many organizations rely on the intuitive feelings and past experience of experts to help identify potential project risks.
- Experts can categorize risks as high, medium, or low with or without more sophisticated techniques.

Quantitative Risk Analysis

- Often follows qualitative risk analysis, but both can be done together or separately.
- Large, complex project involving leading edge technologies often require extensive quantitative risk analysis.
- Analyzing the probability of risk occurrence and consequences.
- Main techniques include
  - Decision tree analysis
  - simulation

Decision Trees and Expected Monetary Value (EMV)

- A decision tree is a diagramming method used to help you select the best course of action in situations in which future outcomes are uncertain.
- EMV is a type of decision tree where you calculate the expected monetary value of a decision based on its risk event probability and monetary value.

Simulation

- Simulation uses a representation or model of a system to analyze the expected behavior or performance of the system.
- Monte Carlo analysis simulates a model's outcome many time to provide a statistical distribution of the calculated results.
- To use a Monte Carlo simulation, you must have three estimates (most likely, pessimistic, and optimistic) plus an estimate of the likelihood of the estimate being between the optimistic and most likely values.

Risk Response Planning

- After identifying and quantifying risk, you must decide how to respond to them.
- Four main strategies:
  - **Risk avoidance:** eliminating a specific threat or risk, usually by eliminating its causes.
  - **Risk acceptance:** accepting the consequences should a risk occur.
  - **Risk transference:** shifting the consequence of a risk and responsibility for its management to a third party.
  - **Risk mitigation:** reducing the impact of a risk event by reducing the probability of its occurrence.

Risk Monitoring and Control

- Monitoring risks involves knowing their status.
- Controlling risks involves carrying out the risk management plans as risks occur.
- Workarounds are unplanned responses to risk events that must be done when there are no contingency plans.
- The main outputs of risk monitoring and control are corrective action, project change requests, and updates to other plans.

Risk Response Control

- Risk response control involves executing the risk management processes and the risk management plan to respond to risk events.
- Risks must be monitored based on defined milestones and decisions made regarding risks and mitigation strategies.
- Sometimes workarounds or unplanned responses to risk events are needed when there are no contingency plans.

THANK YOU!!

QUESTION???

Chapter 11

Project Procurement Management

Project Procurement Management

- Procurement means acquiring goods and/or services from an outside source.
- Other terms include purchasing and outsourcing.
- Experts predict that by the year 2003 the worldwide information technology outsourcing market will grow to over $110 billion.

Why Outsource?

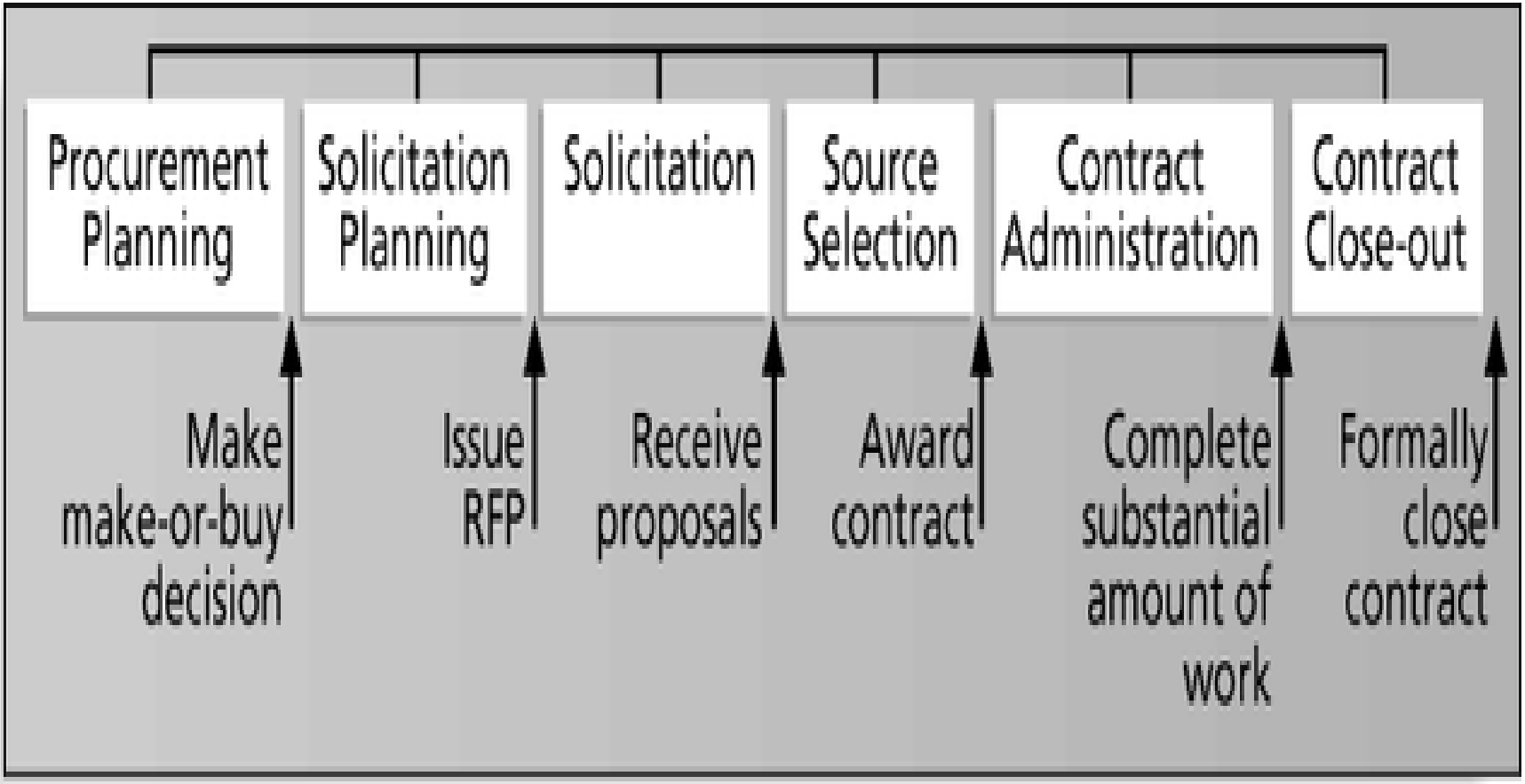
- To reduce both fixed and recurrent costs
- To allow the client organization to focus on its core business
- To access skills and technologies
- To provide flexibility
- To increase accountability

Project Procurement Management Processes

- Project procurement includes the process required to acquire goods and services for a project from outside the performing organization.
- Project procurement management process includes
- ***Procurement planning***: determining what to procure and when.
  - It involves deciding what to outsource and determining the type of contract.
  - Makes make-or-buy decision.

- ***Solicitation planning***: documenting product requirements and identifying potential sources.
- ***Solicitation***: obtaining quotations, bids, offers, or proposals as appropriate.
- ***Source selection***: choosing from among potential vendors.
- ***Contract administration***: managing the relationship with the vendor.
- ***Contract close-out***: completion and settlement of the contract.

Project Procurement Management Processes and Key Outputs



Procurement Planning

- Procurement planning involves identifying which project needs can be best met by using products or services outside the organization. It includes deciding
  - Whether to procure
  - How to procure
  - What to procure
  - How much to procure
  - When to procure

Collaborative Procurement

- Several organizations, even competitors, have found that it makes sense to collaborate on procurement for some projects.
- Kodak worked with several competitors to develop the Advantix Advanced Photo System (see What Went Right?)

Procurement Planning Tools and Techniques

- ***Make-or-buy analysis***: determining whether a particular product or service should be made or performed inside the organization or purchased from someone else. Often involves financial analysis.
- Experts, both internal and external, can provide valuable inputs in procurement decisions.

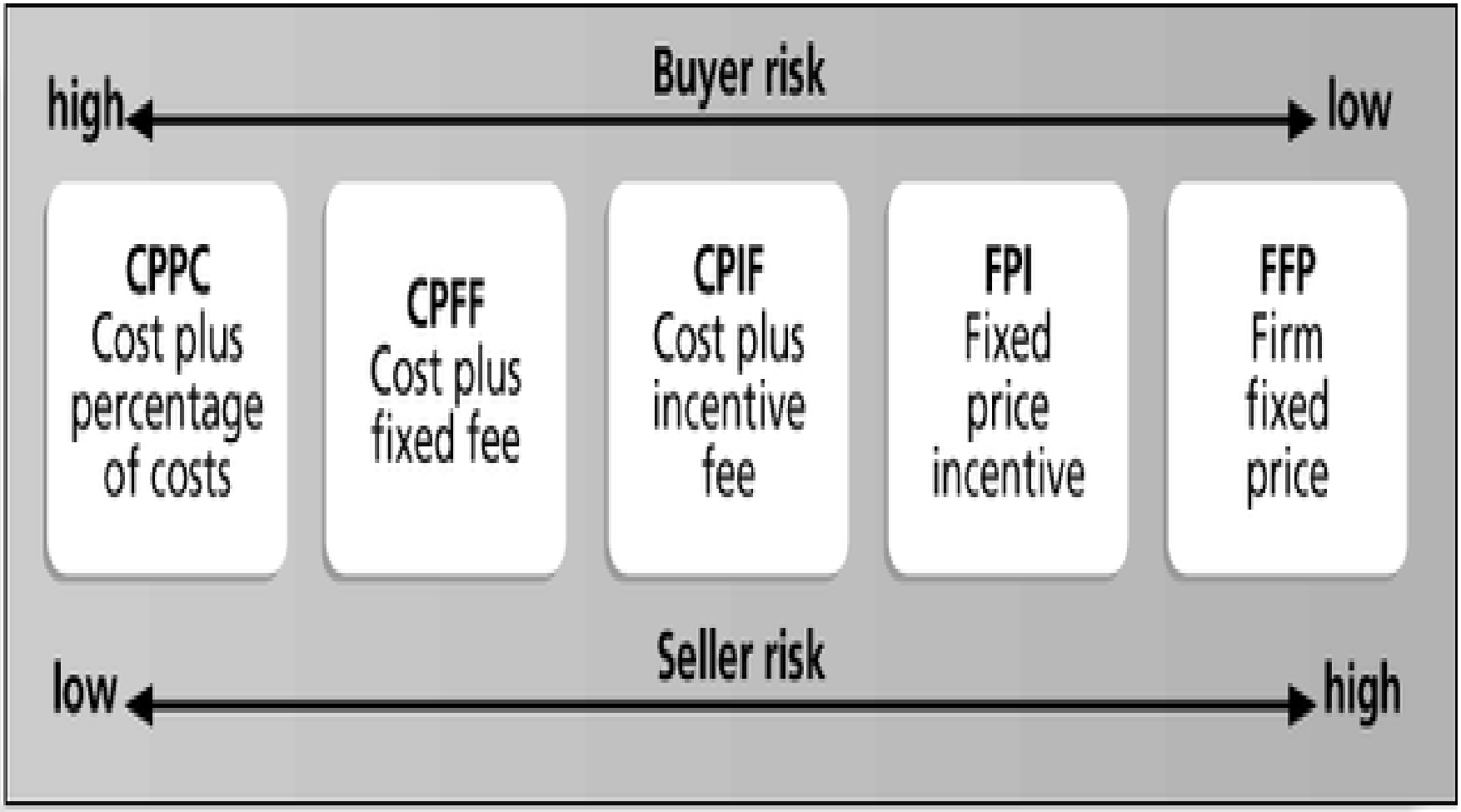
Types of Contracts

- ***Fixed price or lump sum***: involve a fixed total price for a well-defined product or service.
- ***Cost reimbursable***: involve payment to the seller for direct and indirect costs.
- ***Unit price contracts***: require the buyer to pay the seller a predetermined amount per unit of service. Sometimes, it is also known as ***Time and Material Contract.***

Cost Reimbursable Contracts

- ***Cost plus incentive fee (CPIF):*** the buyer pays the seller for allowable performance costs plus a predetermined fee and an incentive bonus.
- ***Cost plus fixed fee (CPFF):*** the buyer pays the seller for allowable performance costs plus a fixed fee payment usually based on a percentage of estimated costs.
- ***Cost plus percentage of costs (CPPC):*** the buyer pays the seller for allowable performance costs plus a predetermined percentage based on total costs.

Contract Types Versus Risk



Statement of Work (SOW)

- A statement of work is a description of the work required for the procurement.
- Many contracts, mutually binding agreements, include SOWs.
- A good SOW gives bidders a better understanding of the buyer's expectations.

Solicitation Planning

- Solicitation planning involves preparing several documents:
  - Request for Proposals: used to solicit proposals from prospective sellers where there are several ways to meet the sellers' needs
  - Requests for Quotes: used to solicit quotes for well-defined procurements.
  - Invitations for bid or negotiation and initial contractor responses are also part of solicitation planning.

Outline for a Request for Proposal (RFP)

I. Purpose of RFP

II. Organization's Background

III. Basic Requirements

IV. Hardware and Software Environment

V. Description of RFP Process

VI. Statement of Work and Schedule Information

VII. Possible Appendices

A. Current System Overview

B. System Requirements

C. Volume and Size Data

D. Required Contents of Vendor's Response to RFP

E. Sample Contract

Solicitation

- Solicitation involves obtaining proposals or bids from prospective sellers.
- Organizations can advertise to procure goods and services in several ways.
  - Approaching the preferred vendor
  - Approaching several potential vendors
  - Advertising to anyone interested
- A bidders' conference can help clarify the buyer's expectations.

Source Selection

- Source selection involves
  - Evaluating bidders' proposals
  - Choosing the best one
  - Negotiating the contract
  - Awarding the contract
- It is helpful to prepare formal evaluation procedures for selecting vendors.
- Buyers often create a "short list"

Sample Proposal Evaluation Sheet

		Proposal 1		Proposal 2		Proposal 3	
Criteria	Weight	Rating	Score	Rating	Score	Rating	Score
Technical Approach	30%						
Management Approach	30%						
Past Performance	20%						
Price	20%						
Total Score	100%						

Detailed Criteria for Selecting Suppliers

Criteria	Possible Points	Supplier 1 Points	Supplier 2 Points	Supplier 3 Points
Project manager s educational background and experience	10	8	6	9
Project manager is PMP certified	5	5	0	5
Presentation on management approach	5	4	3	5
Organization s project management methodology	10	7	4	9
Total Score	30	24	13	28

Contract Administration

- Contract administration ensures that the seller's performance meets contractual requirements.
- Contracts are legal relationships, so it is important that legal and contracting professionals be involved in writing and administering contracts.
- Many project managers ignore contractual issues, which can result in serious problems.

Suggestions on Change Control for Contracts

- Changes to any part of the project need to be reviewed, approved, and documented by the same people in the same way that the original part of the plan was approved.
- Evaluation of any change should include an impact analysis. How will the change affect the scope, time, cost, and quality of the goods or services being provided?
- Changes must be documented in writing. Project team members should also document all important meetings and telephone phone calls.

Contract Close-out

- Contract close-out includes
  - Product verification to determine if all work was completed correctly and satisfactorily.
  - Administrative activities to update records to reflect final results.
  - Archiving information for future use.
- Procurement audits identify lessons learned in the procurement process.

THANK YOU!!

QUESTION???