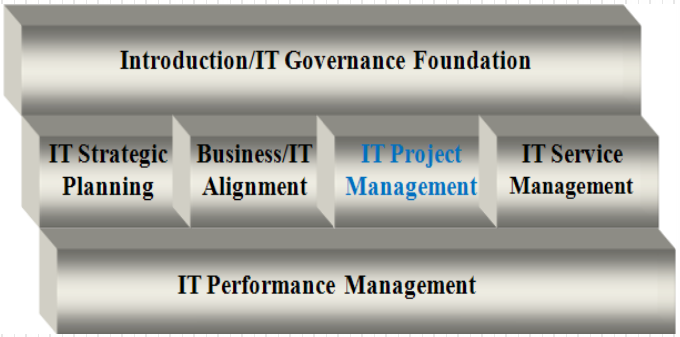
University of Dar es Salaam Computing Centre

Strategic Management of ICT in the Public Sector (SMICT)

Module 5: IT Project Management



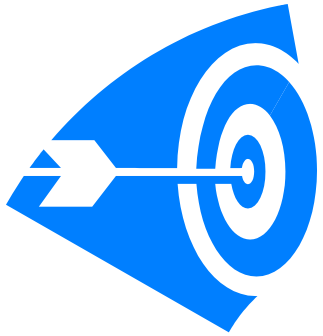
In collaboration with

L.I.F.E ACADEMY

IT Project Management

Module Objectives

- Understand Basic concept of Project management
- Understand and explain Managing Projects Using the Triple Constraint
- Explain the concepts of WBS and its application in IT Project management
- Understanding of Key project management Knowledge areas
- Apply PRINCE2 Project management Framework in IT project management



Food for Thought

The Standish Research Group in Boston:

High Tech Projects

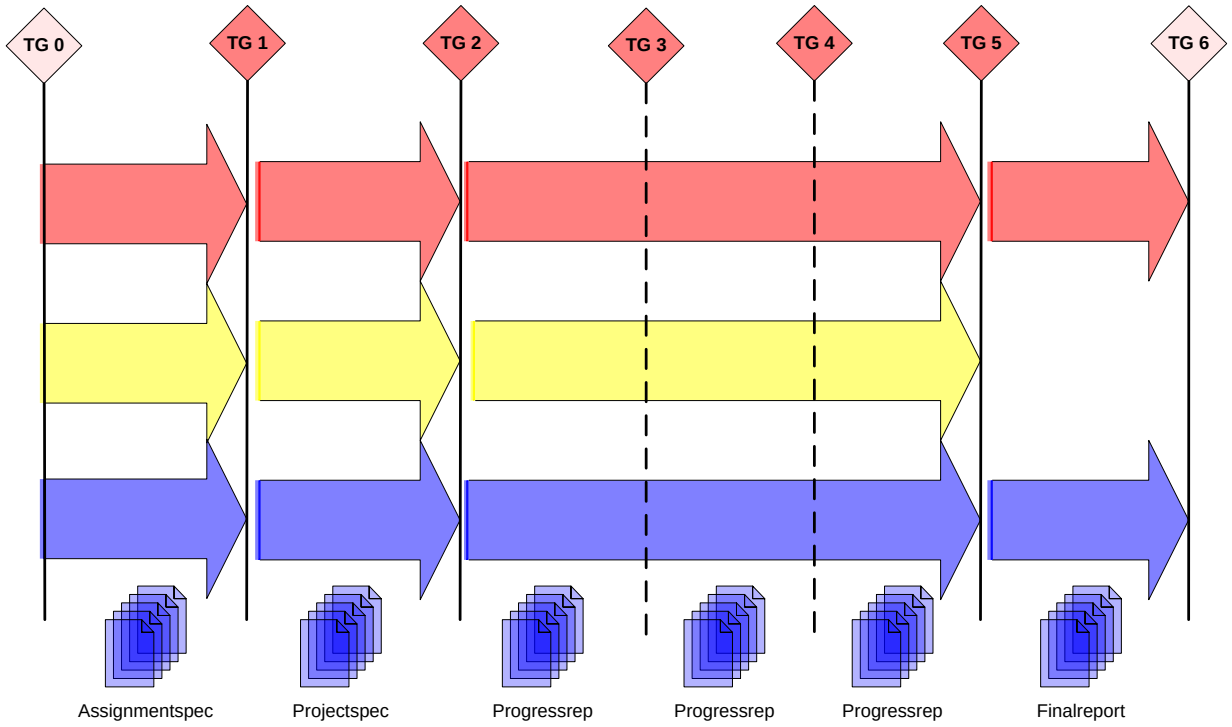
- 75% will not meet budget and time plan
- 20% will break the target by 100 – 200%
- 10% will break the target by more than 200%
- 20% will never make it

COURSE INTRODUCTION

Project Management Institute -PMI

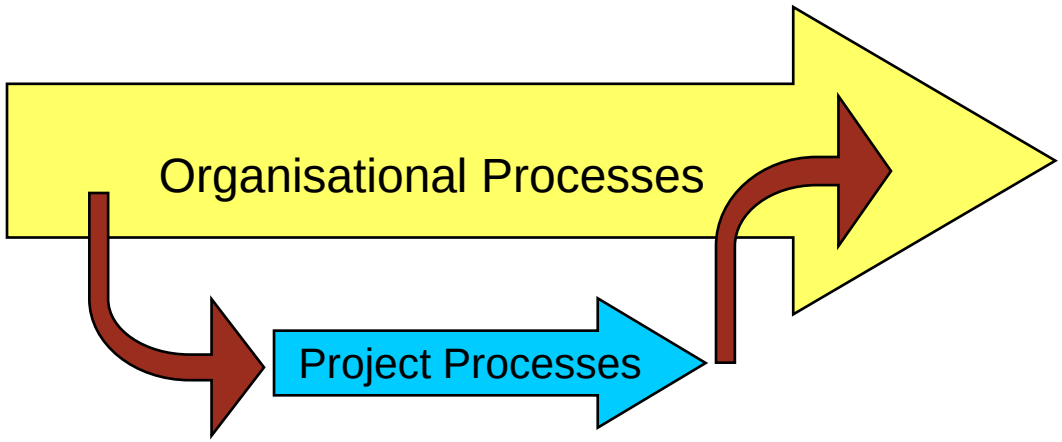
A guide to the Project Management Body of Knowledge - PMBoK

Project Definition

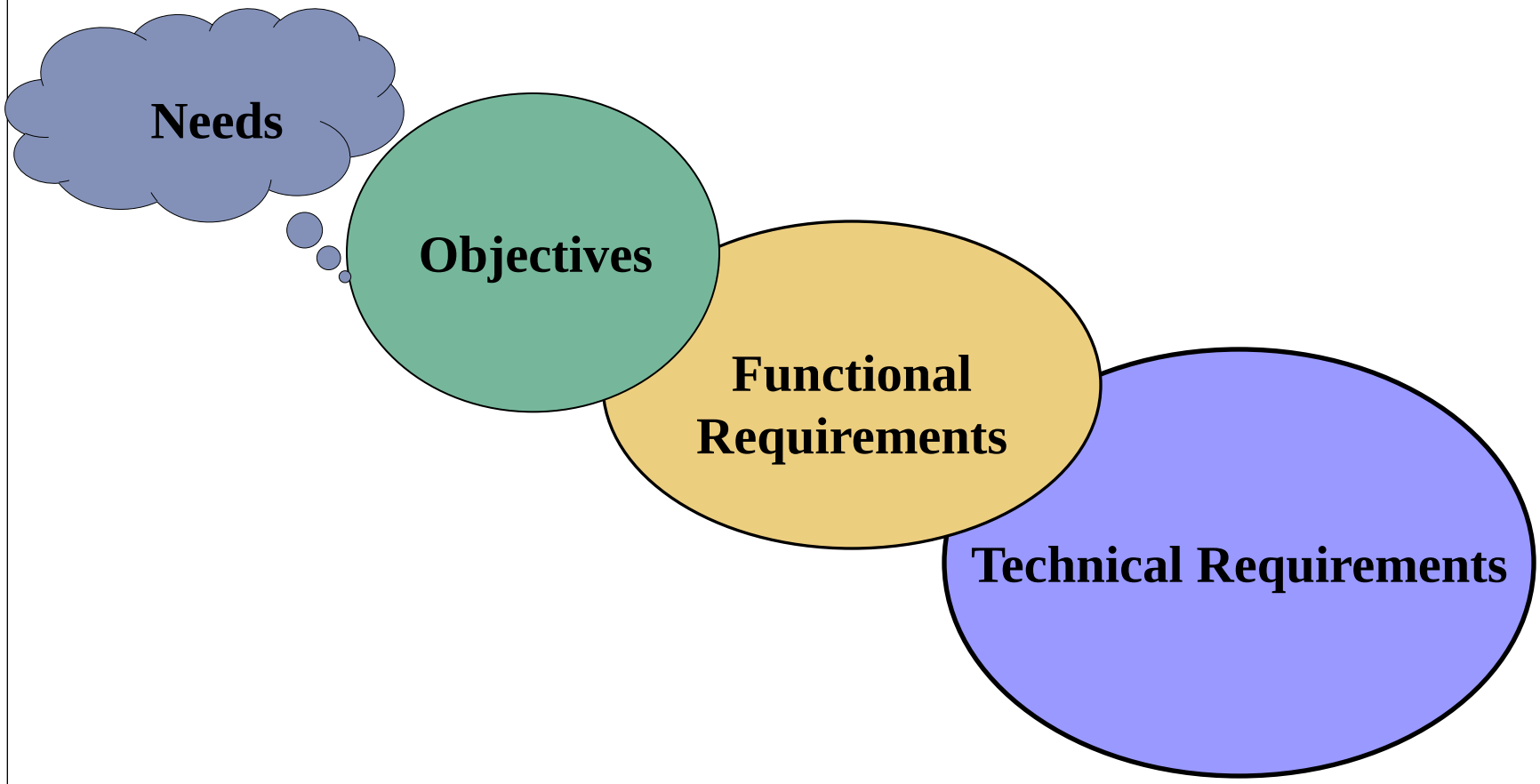


What is a Project?

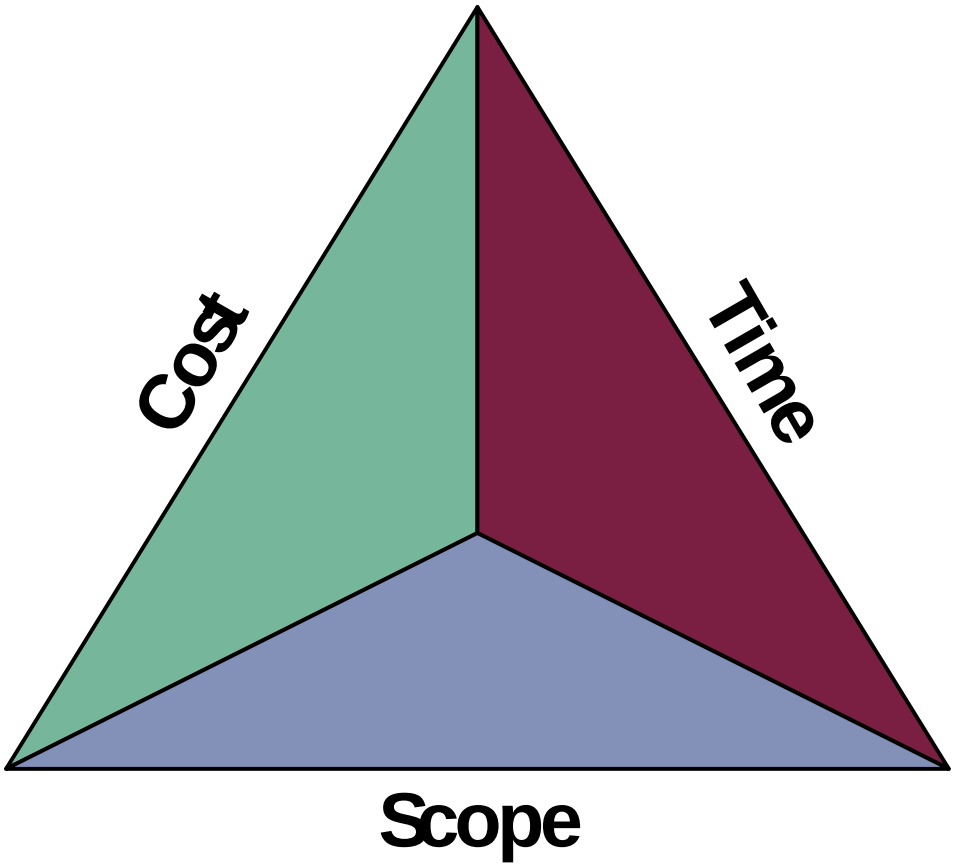
- "A temporary endeavor undertaken to create a unique product, service, or result"
  - —PMBOK® Guide



The Right Start (What?)



The Triple Constraint (What?)



Managing Projects Using the Triple Constraint

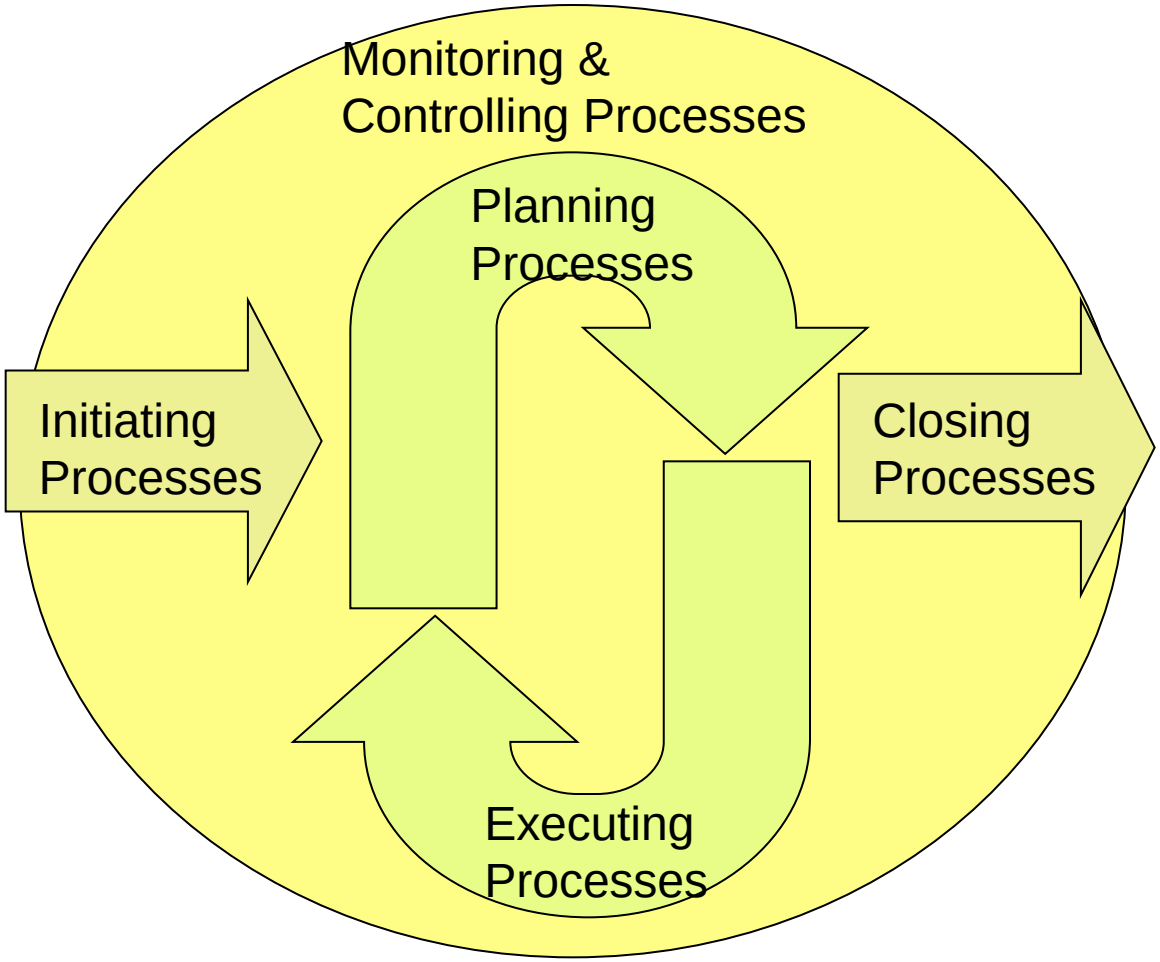
- Balancing the three "sides" to complete the project
- Combining art and science (Interrelationship-Team/technical tools-WBS)
- Defining and refining the project on an ongoing basis
- Please note that there are other important constraints. PMBoK mentions:
- Resources
- Quality
- Risk

Project Life Cycle (When)

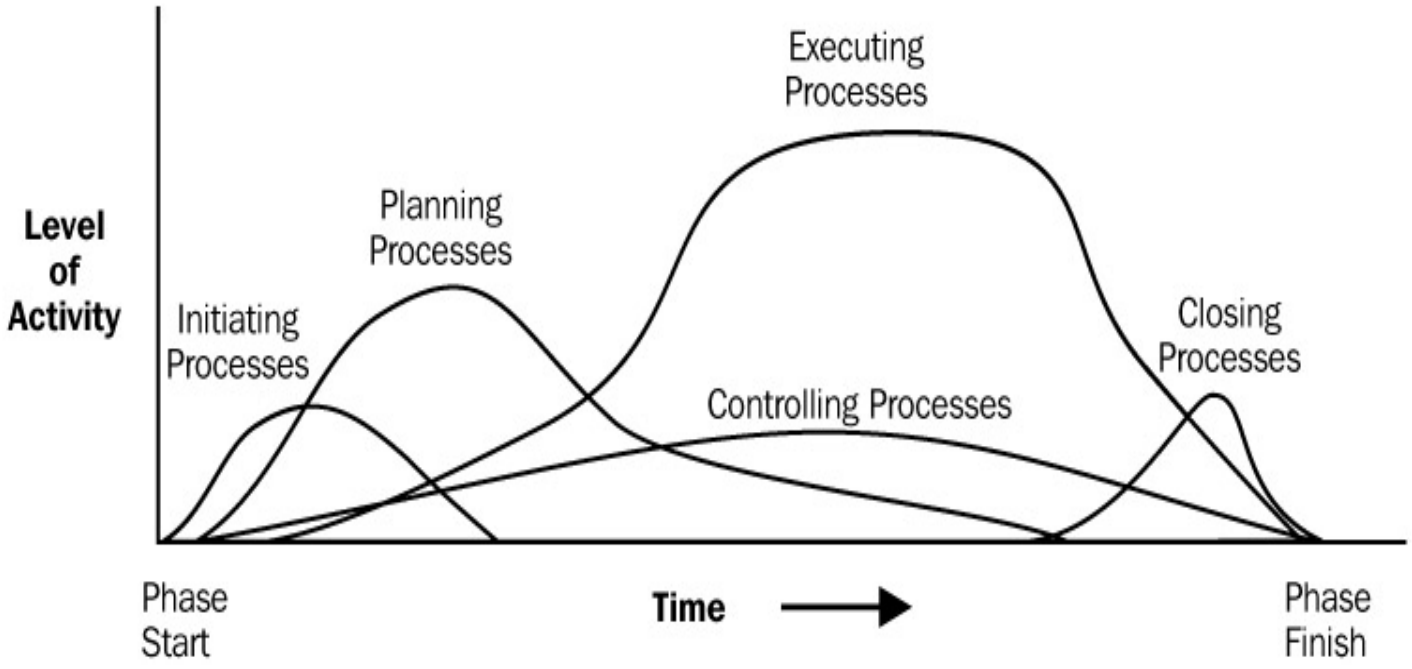
- Projects are usually divided into phases
- Collectively, these phases make up the *project life cycle*

I Initiation	P Planning	I Implementation	C Closeout

Project Management Processes (How?)



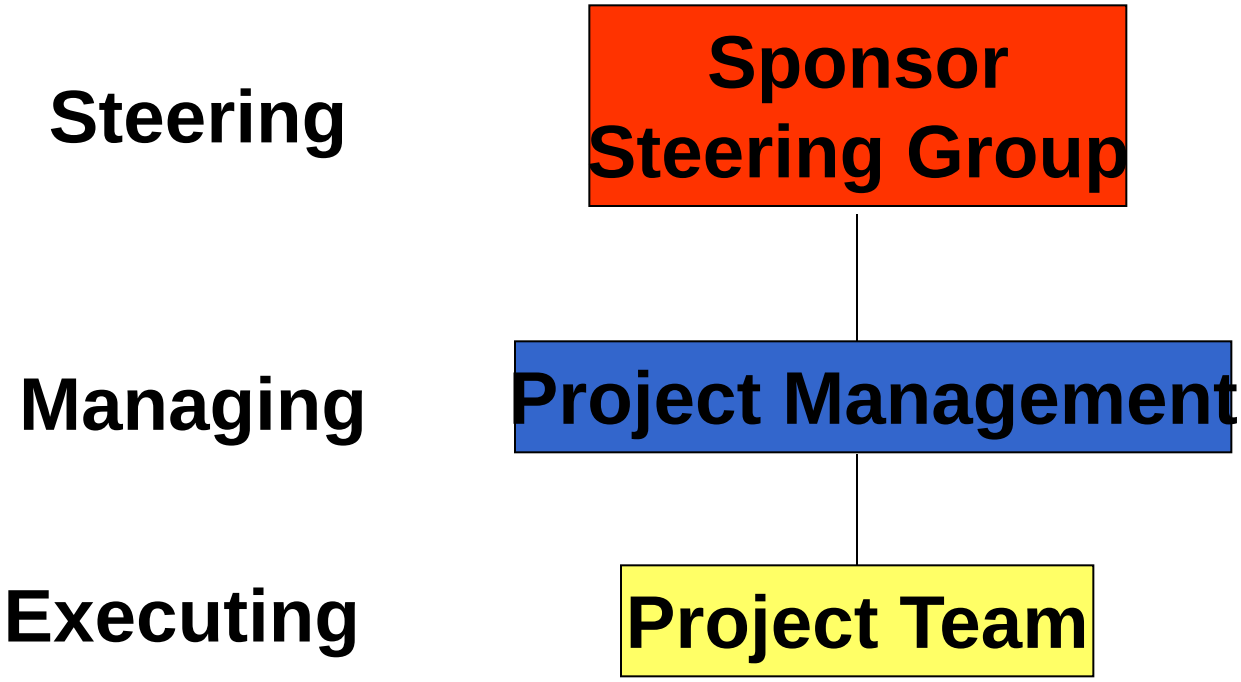
Overlap of Process Group Within a Project Phase



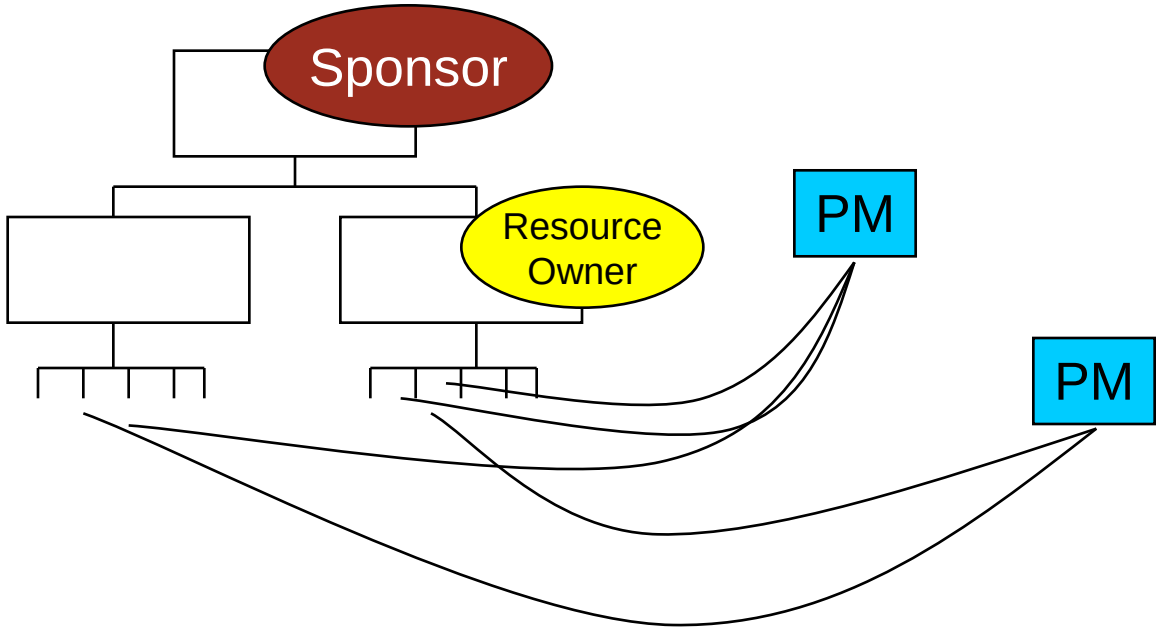
Project Management Knowledge Areas (How?)

- **Project Integration Management**
- **Scope Management**
- **Quality Management**
- **Schedule Management**
- **Budget Management**
- **Human Resource Management**
- **Communication Management**
- **Risk Management**
- **Procurement management**

Project Organization (Who?)



Project Organization (Who?)



IT Project Management in the Public Sector

Typical issues that must be taken into account

•Managing Multiple Stakeholders:

The project manager in the public sector usually works with several stakeholders from other agencies. They lack governance in their projects, they need to use a lot of negotiation, conflict resolution, communication and leadership skills

IT Project Management in the Public Sector

Typical issues that must be taken into account

•Dealing With Public Scrutiny:

There is a great deal of interest in what you do, because it affects a lot of people. Failures get a lot of attention because they harm a lot of people. Open records and open government laws mean governments can't conceal information the same way private entities can, and your successes don't necessarily get trumpeted to the same level.

Typical issues that must be taken into account

- **Dealing With a Pay Cut:**

Public sector project managers (and staff) will rarely get paid as well as private sector counterparts, and this can contribute to frequent turnover of skilled people..

Keys to Project Success

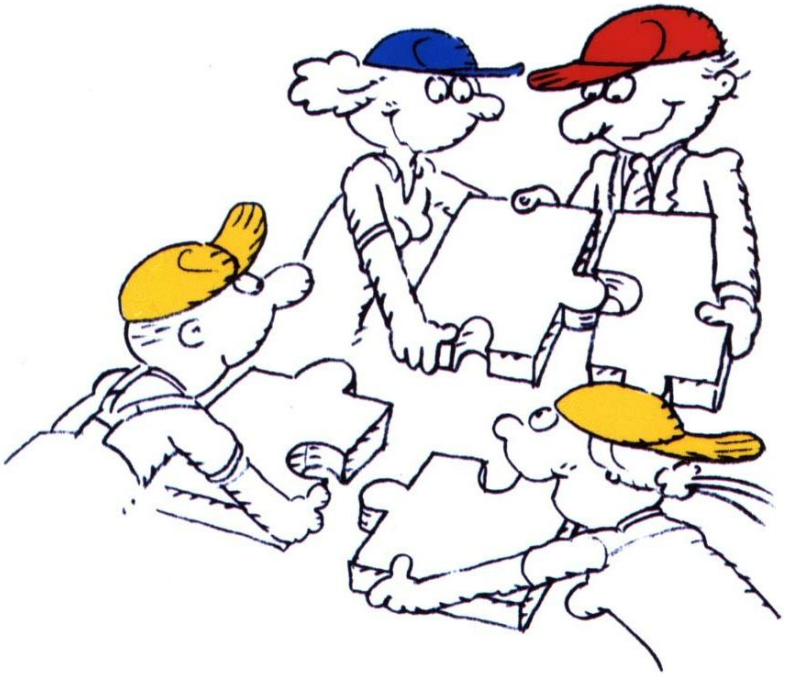
- Project success is based on—
  - Starting right
    - Planning
    - Monitoring and controlling
    - Conclusion

Identifying The Context

- What is the project environment? Consider—
  - Political situation
  - Economical situation
  - Social factors
  - Other factors

- SWOT Analysis -

STRUCTURING



Identifying key Stakeholders

- Who are the stakeholders? Consider—
  - Who is affected by the project or its result?
  - Who influences the project or its result?

Formulating Good Objectives

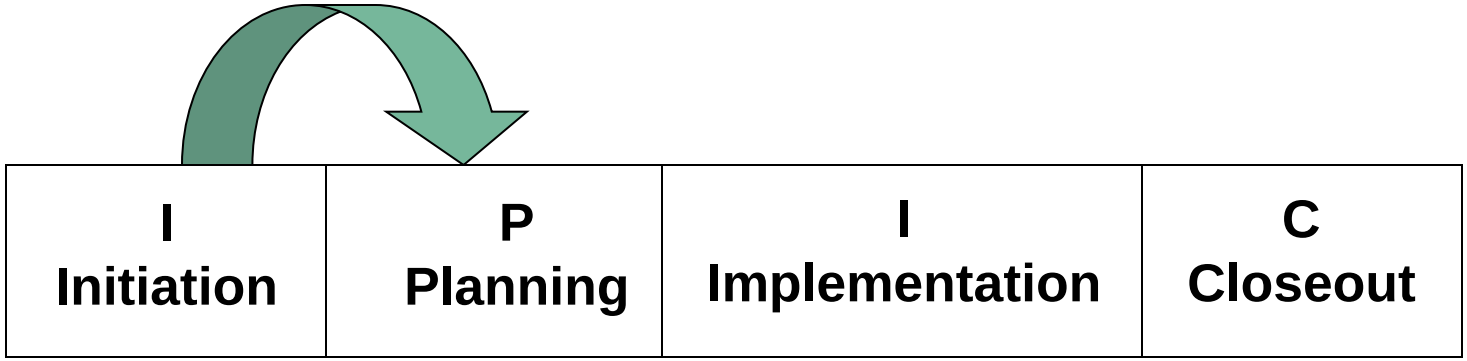
- Objective
  - An understanding between someone who needs something and someone who can provide it
  - Exists at all levels (corporate, project, work team, specific task)
  - Uses the SMART model
    - S = Specific
    - M = Measurable
    - A = Agreed-upon
    - R = Realistic
    - T = Time-constrained

CASE STUDY

1 Defining the project

From Initiation to Planning

Project Charter
Project Requirements Document



Scope Planning

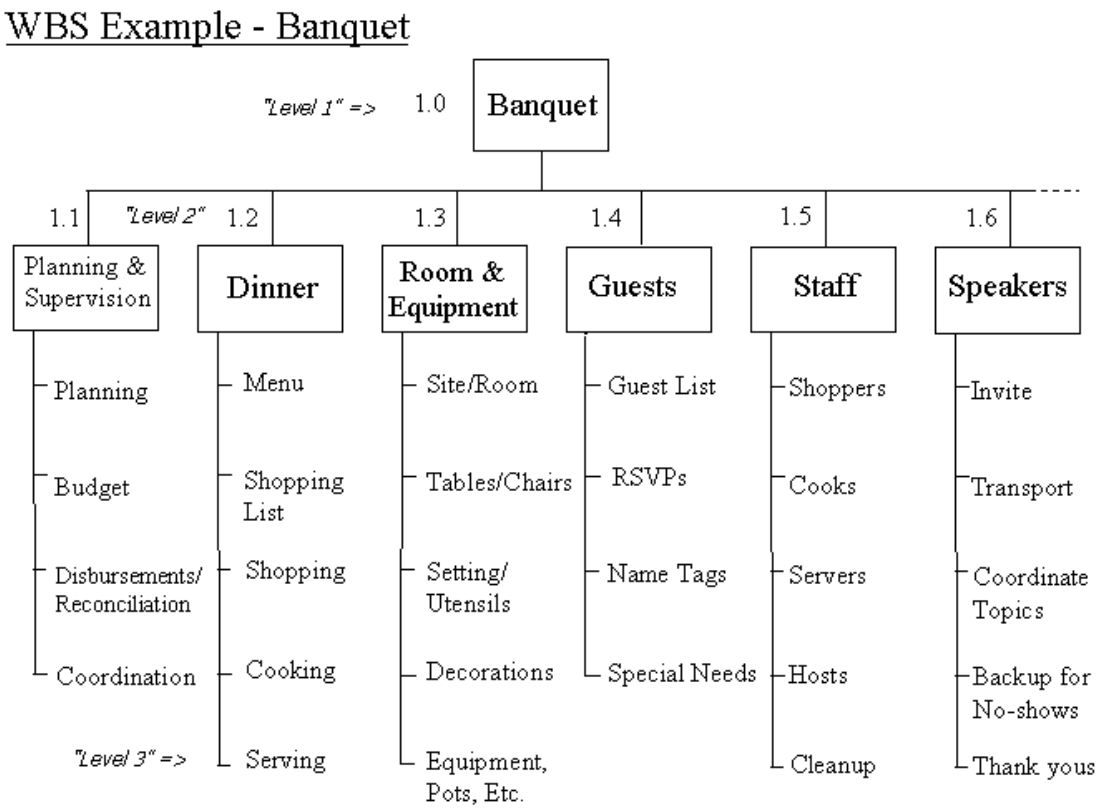
- ***Scope:*** *The sum of the products, services, and results to be provided as a project**
- ***Scope planning:*** *The process [to create] a project scope management plan**
- Scope was outlined in the project initiation phase and documented in the Assignment Specification; now it is time to focus on project details

**Source:* PMBOK® Guide, *p. 375*

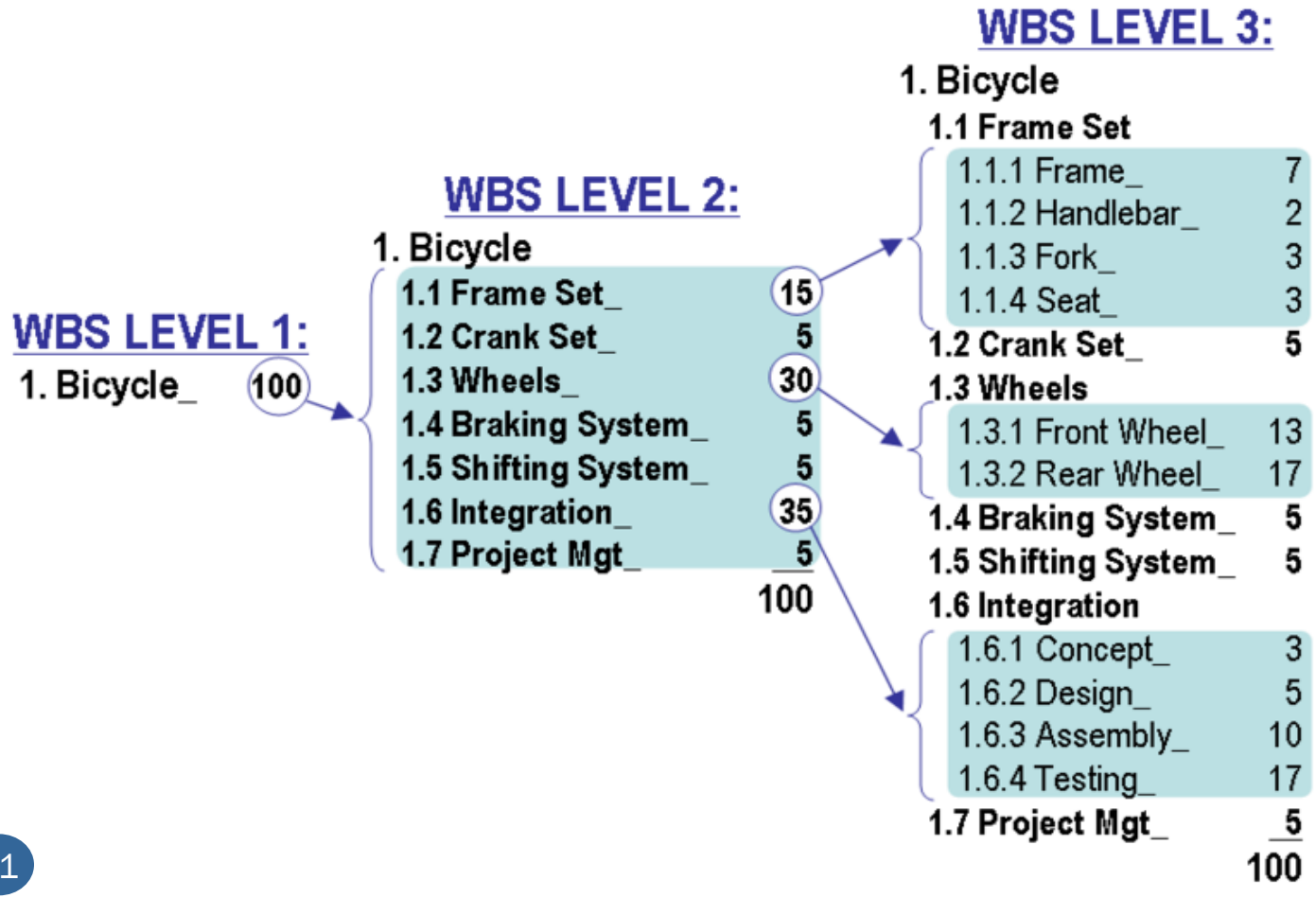
Work Breakdown Structure (WBS)

- The WBS—
  - *a deliverable-oriented hierarchical decomposition of the work to be executed by the project team, to accomplish the project objectives and create the required deliverables*
  - *Defines the total scope of the project*
  - *Divides the project work into smaller, more manageable pieces of work, with each descending level of the WBS representing an increasingly detailed definition of the project work*
- **—PMBOK**

WBS Models (Graphical)



WBS Models List of activities)



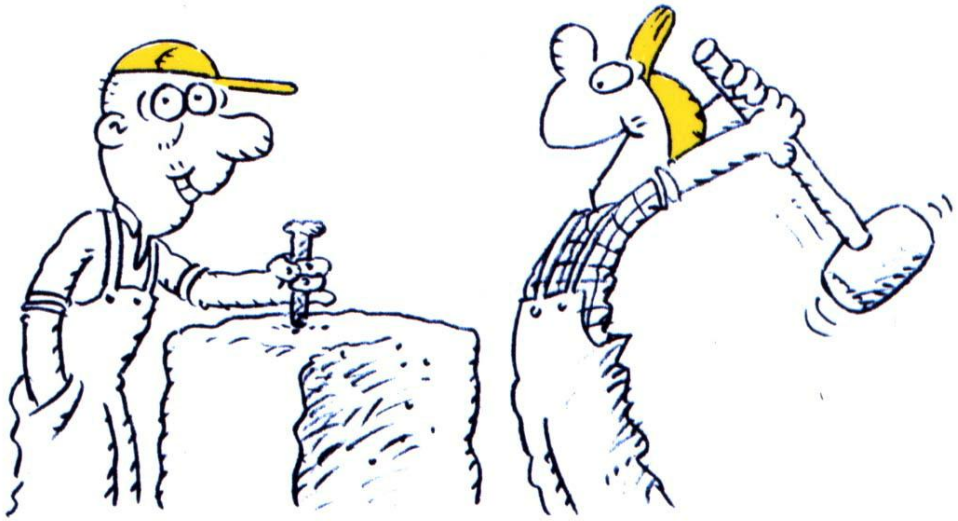
A WBS Dictionary

- Provides detailed background on each work package
- Captures critical information about the activity, such as—
  - Assumptions
  - Specific activities at the work package level
  - Resources
  - Predecessors
  - Successors
- Contents will vary depending on need for information

Using the WBS as a basis for Project Plan

- The WBS identifies the work to be done
- Developing the plan requires that work be quantified
- Quantify by estimating expected—
  - Duration
  - Cost
  - Resources

ESTIMATING



Good Estimating Practices

- Acknowledge the level of accuracy
  - Estimates can be done at varied levels of accuracy
  - Communicate the level of accuracy with the estimate
- Use historical data
  - Have something similar been done before?
  - Can this be compared to earlier work?
- Get input from many sources
  - In-house sources
  - Outside sources
- Professional organizations

Good Estimating Practice (cont)

PERT Estimate

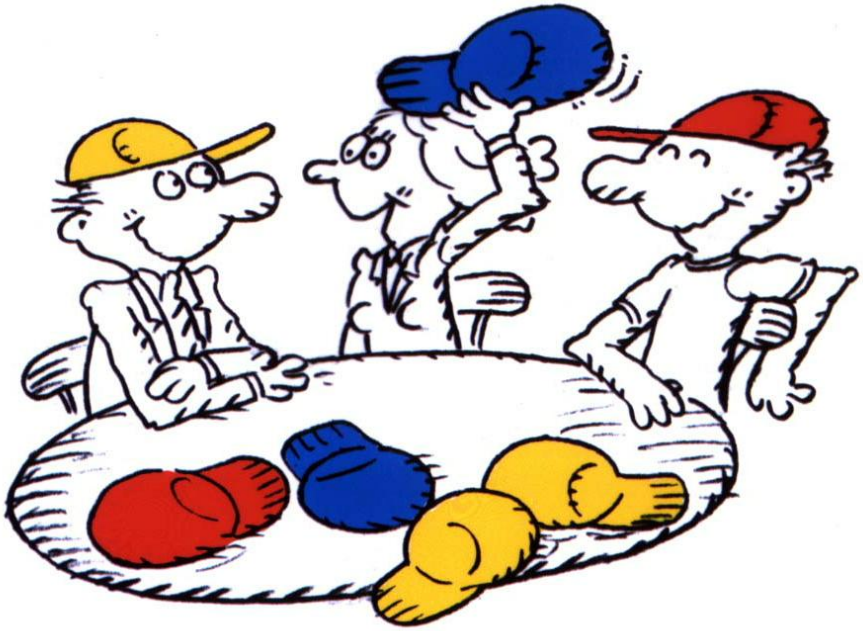
$$E_t = \frac{O + 4ML + P}{6}$$

$$SD = \frac{P - O}{6} \text{ (confidence in estimate)}$$

Where:

E_t = Estimated time
O = Optimistic estimate
ML = Most likely estimate
P = Pessimistic estimate
SD = Standard deviation

RESOURCE ALLOCATION



Resource Planning

- Based on the scope (the WBS), plan for the resources you need to complete the project:
  - People
  - Equipment
  - Facilities
  - Materials

Resource Planning

- Effort – The amount of work (hours) needed to complete the task
- Duration – The calendar time it will take before the task is finished

- Example – A task is estimated to take 80 hours. There are two persons working on the task. The Effort is 80 hours, but the Duration will be 40 hours.

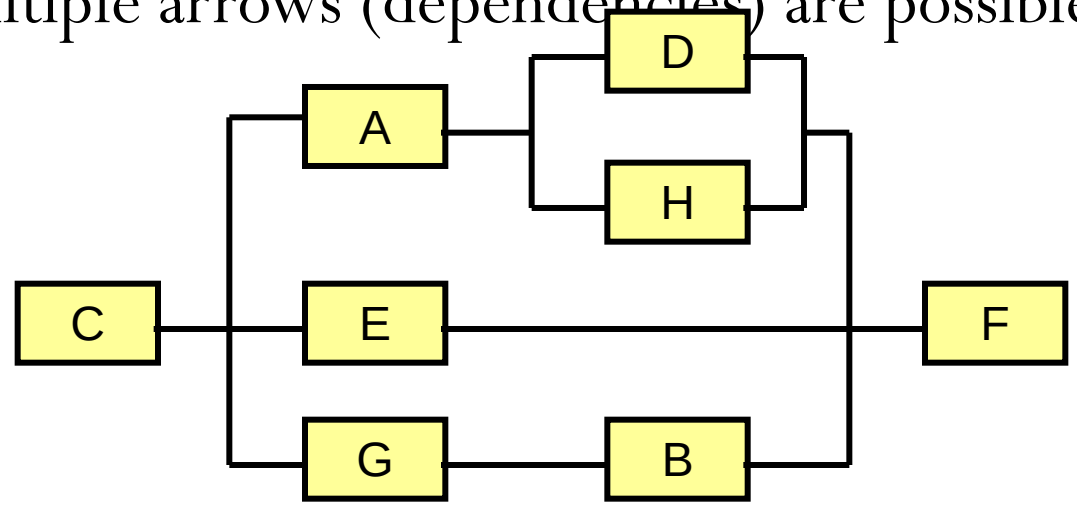
Scheduling & Budget

Schedule Planning

- Clarifies relationships between various work packages
- Determines the time duration to complete the project
- Identifies float in the schedule

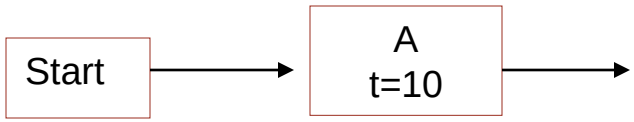
Network Diagramming

- Shows the logical relationship between scheduled activities
- Activities are represented by boxes
- Dependencies are represented by arrows
- Multiple arrows (dependencies) are possible



Transforming a WBS into Network Diagram

Activities	Duration	Predecessors
a. System Requirements	10	Decision to start the project
b. Function design	15	a
c. System test design	20	a
d. Design and Test Objects	30	b
e. Prepare installation	10	b
f. Install new system	5	d, e
g. System test	5	c, f
h. Acceptance test	5	g



Total Float

- *Amount of time an activity may be delayed from its early start without delaying the project finish date*

  - Indicates the amount of flexibility the project manager has to adjust the timing of a particular activity

Source: PMBOK® Guide, *p. 378*

Network Analysis

- Analysis of the network reveals—
  - The duration of the project
  - The float
  - The critical path
    - Longest of all paths through the project
    - Shortest time to complete the project

Milestones

- Significant events or deliverables
  - Major project results (design completed)
  - "Strong" dependencies
  - Funding points (Payments, Budget points)
  - Key dates (Deliveries)
- Check points
- Activities of "zero duration"
  - Takes no time; consume no resources

Cost Planning

- How much will the project cost (in money)?
- Inputs—

  All the cost components related to each Work Packages

- Total cost is the sum of the costs for all Work Packages

Source: PMBOK® Guide, *p. 162*

Cost Components

- Direct
  - Labor
    - Internal
    - Contract
  - Materials and equipment
  - Other direct costs
    - Fees
    - Travel
    - Incidentals
- Indirect (overhead)
  - General administrative
    - HQ expenses
    - Fringe benefits
    - Depreciation
  - Marketing and sales
  - R&D

Cost Example

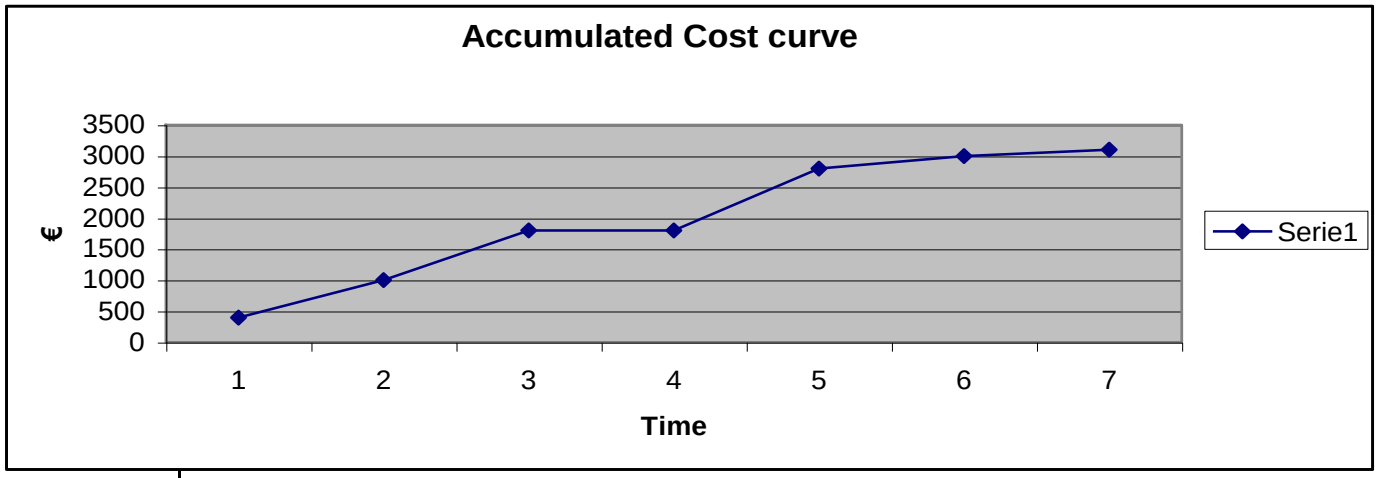
A task is estimated to take 80 hours. There are two persons working on the task. The cost for the resources are $50 per hour per person

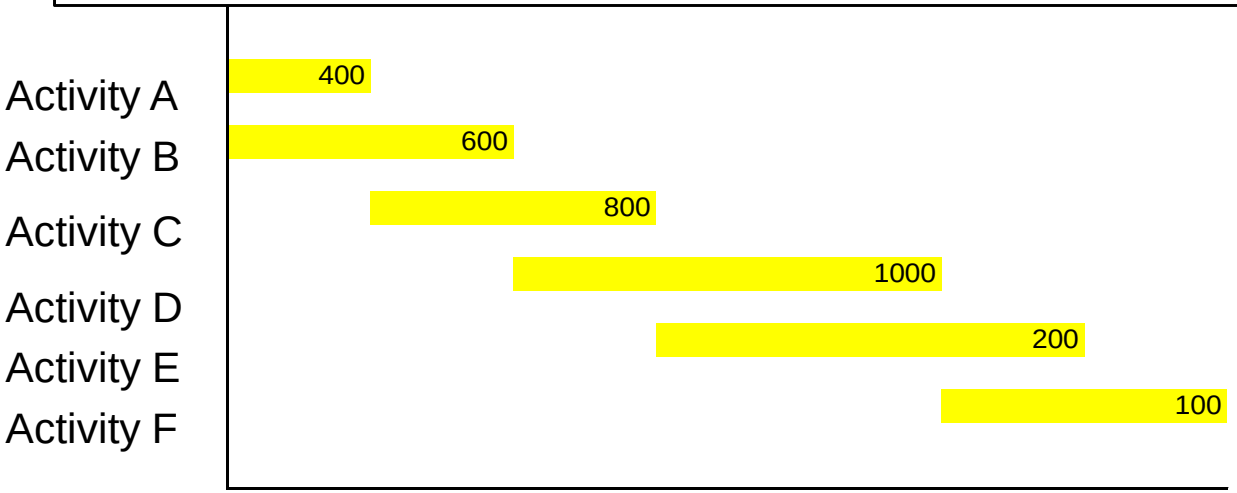
The Duration is 80/2 = 40 hours

The cost is 80 * 50 = $400

Source: PMBOK® Guide, *p. 162*

Cumulative Cost Curve





Risk Management Planning

- Risks are threats or opportunities
- Risk planning is an integral part of project planning
- Risk management consists of six processes:*
  - Risk management planning
  - Risk identification
  - Qualitative risk analysis
  - Quantitative risk analysis
  - Risk response planning
  - Risk monitoring and control

*Source: PMBOK® Guide, *p. 237*

Reserve Planning

- A set-aside of resources to deal with risk events as provided for in the project management plan
  - Reserve has multiple components
    - Cash
    - Time
    - People and equipment
  - Reserve planning—
    - Deals with unexpected events within the original scope
    - Does not deal with changes or additions to the plan

Procurement Planning

- Make-or-buy decision
- Selecting "from the outside":
  - Materials
  - Services
  - People
- Project manager becomes the customer

Communication Planning

- Who needs to know what?
- How will you tell them?
- When and how often?
- What do you make part of a permanent record and how?

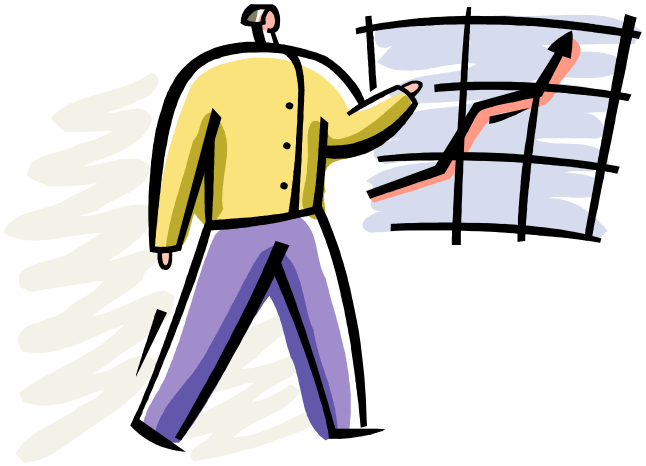
Quality Planning

- *PMBOK® Guide* definition
  - "Plan Quality is the process of identifying quality requirements and/or standards for the project and the product, and documenting how the project will demonstrate compliance."
  - The project manager and team must—
    - Clarify quality policy direction
      - Link to customer's policy
      - Link to organization's strategy
    - Determine project quality objectives and metrics for tasks within standards

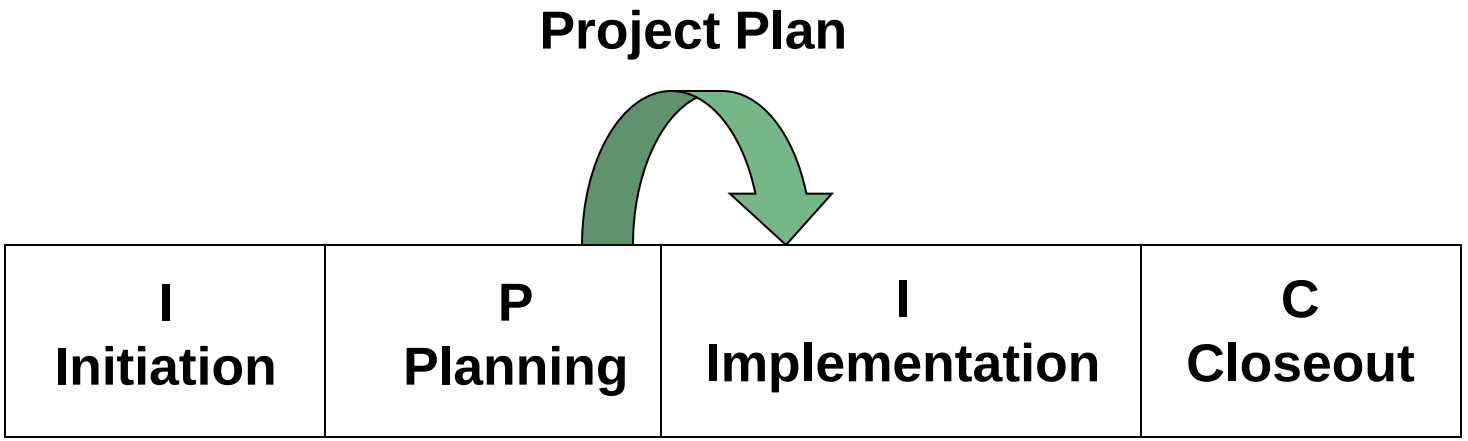
Elements of a Project Plan

- Scope
- Time plan
- Budget
- Resources
- Risks
- Quality
- Communication
- Procurement
- Regulations and standards
- Evaluations
- Supporting plans
- Supporting documentation

2 Project Plan



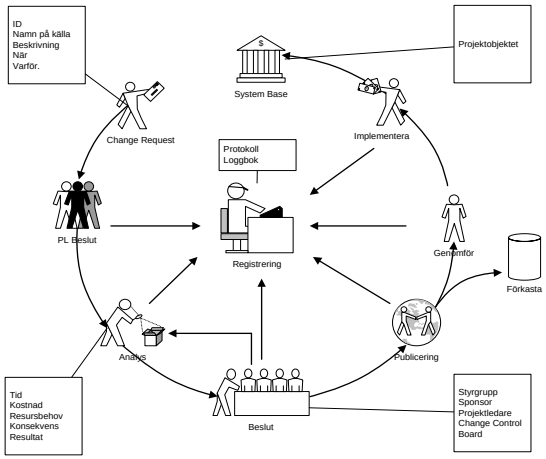
From Planning to Implementation The Project Plan



Project Baselines

- The original plan, plus approved changes
- Note: Baselines (plural)
  - Scope
  - Cost
  - Time

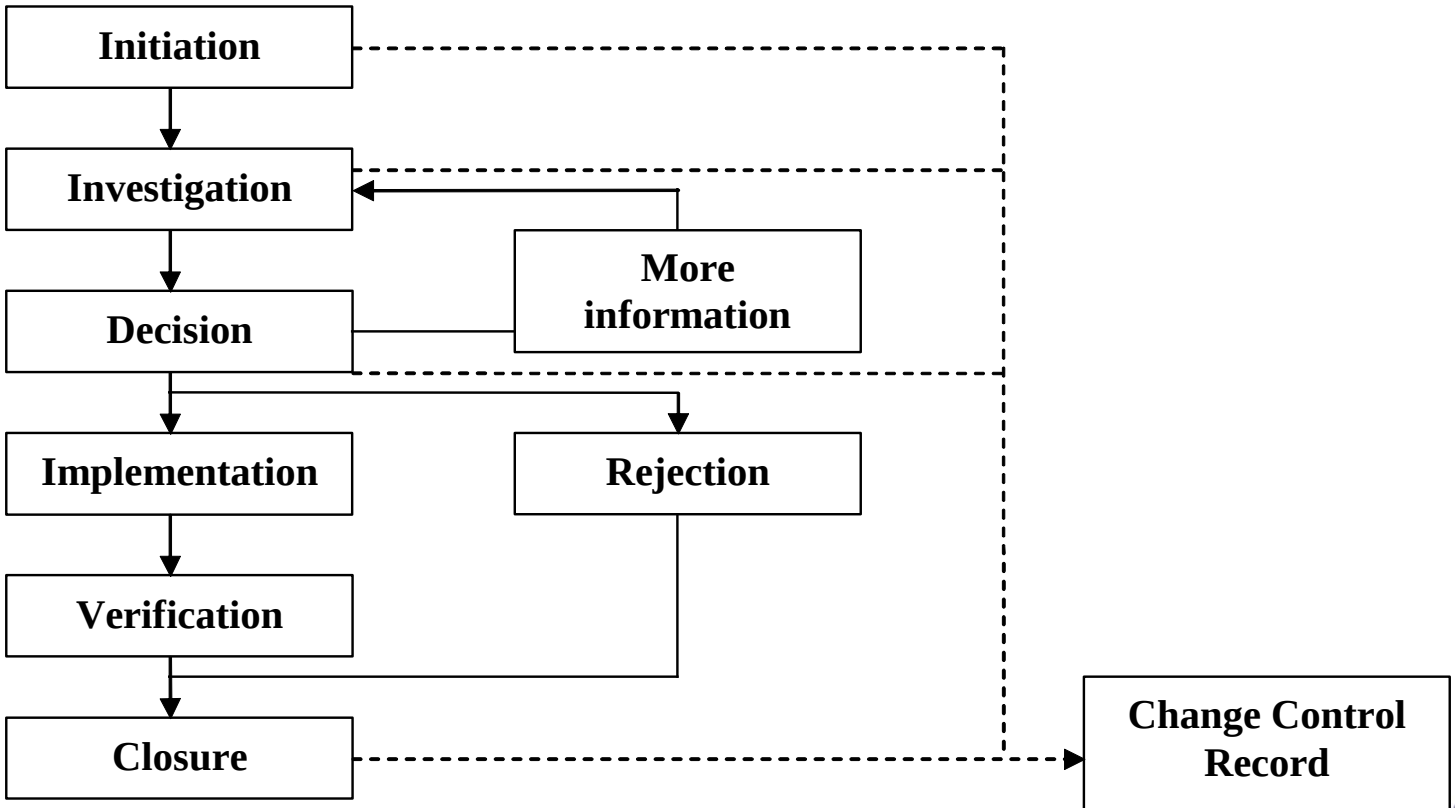
Change Management



Change Control System

- Change happens for many reasons and in many forms:
  - Customer changes
  - New ideas from the Team
  - Business Situation
- An organized, systematic approach is helpful in managing change:
  - Change request form
  - Review and evaluation process
  - Decisions

Change Management

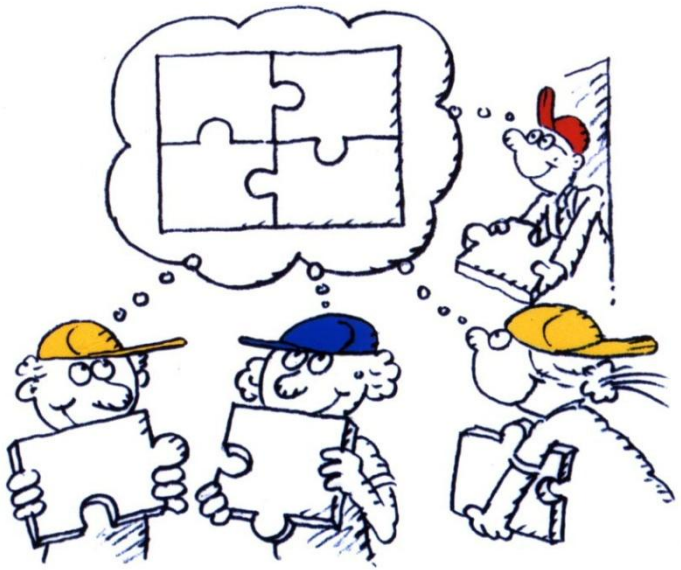


Configuration Management

- Documented procedure to apply technical and administrative direction to—
  - Identify and document functional characteristics of an item or system
  - Control and evaluate any changes to the characteristics
  - Record and report the change and its implementation status
  - Audit the items and system to verify conformance to requirements

Source: PMBOK® Guide, *p. 354*

EVALUATION FORECASTING



Monitoring Project Performance

- Compare against baselines:
  - Scope
  - Cost
  - Time
- Identify variance
  - The difference between a plan and actual time, cost, or performance
- React as appropriate

Earned Value Management

- An objective look at project status
- Assessing schedule, cost, work status
- Three measured values

  PV -What we planned to do

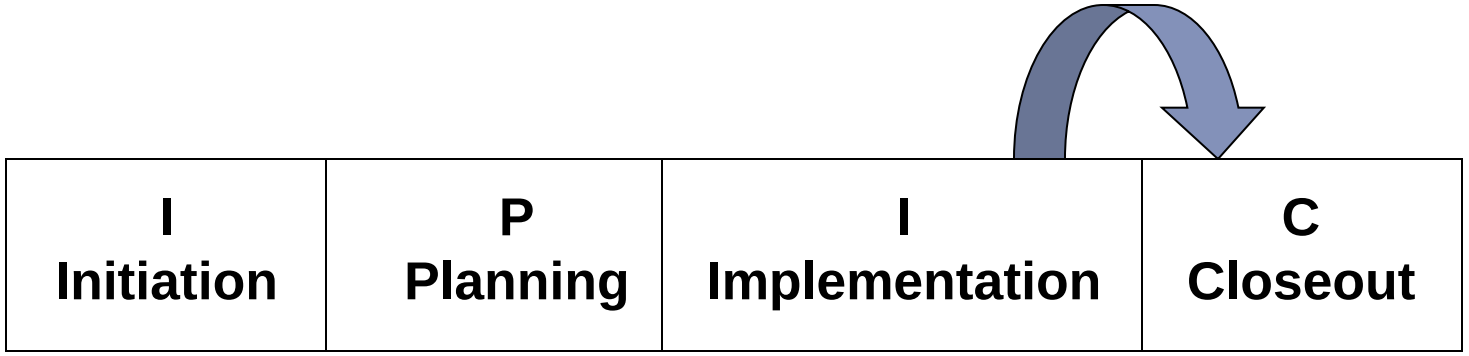
  EV-What we actually have done

  AC-How much we paid for it
- Measuring Schedule and Cost Variances (SV and CV)

Assessing Project Status

- Time
- Cost
- Scope
- Resources
- Quality
- Customer perspective

From Implementation to Closeout



Keys to Project Success

- Project success is based on—
  - Starting right
  - Planning
  - Monitoring and controlling
  - Conclusion

Proper Closeout

- Planned for in the WBS with resources allocated
- Needed for *all* projects—even those that end prematurely or that are otherwise incomplete

Administrative And Contract Closure

- Close out the books
- Set up project archives or files
- Handle equipment, facilities, and so on

Introduction to an IT project management framework case of PRINCE2

Introduction

- PRINCE2 has, in some areas, become the de facto standard for Project Management

- PRINCE2 is a project management methodology adopted by Government for IT projects

Wha is PRINCE2

- Prince2™ is an established method for project management. It covers the management, organization and the control of projects of all shapes and sizes.
- The methodology itself defines a process based approach to project management, with inputs, outputs and objectives clearly identified.
- It also details a stage by stage approach, ensuring that progress can be properly monitored.
- Under Prince2, the whole project is driven by the business requirements, and managers are encouraged to make the process inclusive, often including suppliers and customers.
- The intention is that projects should be properly controlled and defined, but with flexibility and good communication.

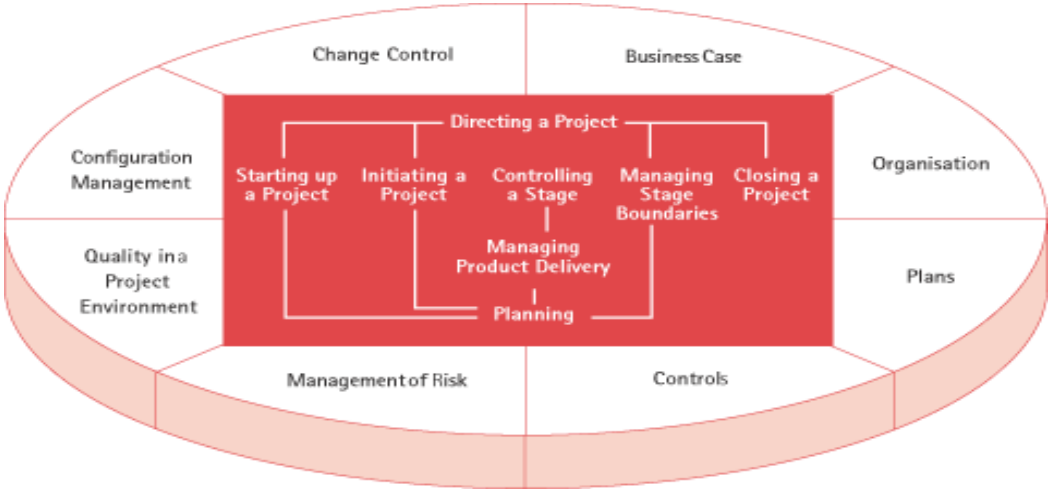
Project Definition

- A Project is a finite process with a definite start and end
- Prince projects:
  - focus on business justification
  - defined organisational structure
  - product based planning approach
  - divides project into manageable, controllable stages
  - flexible to be able to be applied to the scale of the project / investment

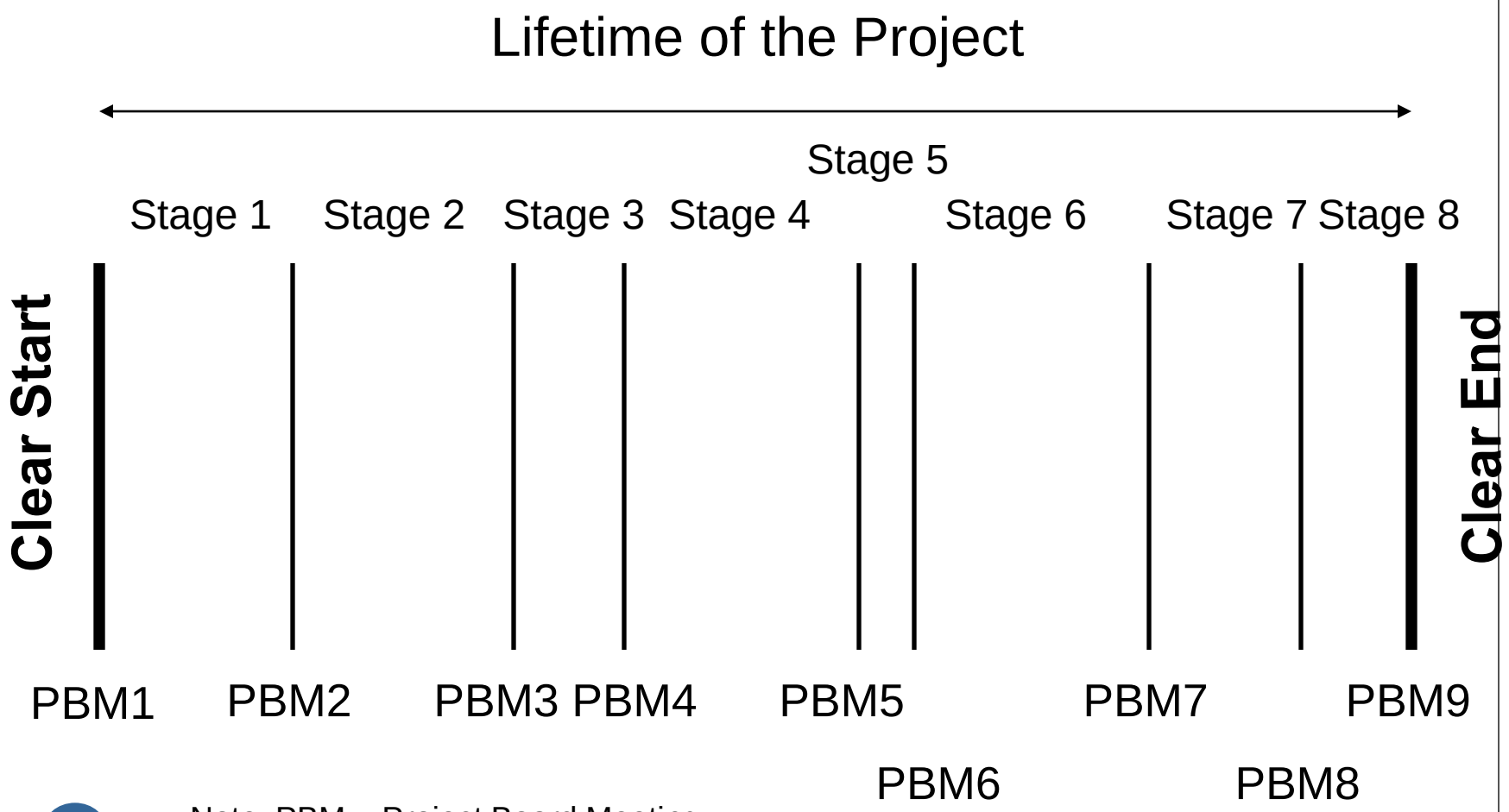
OVERVIEW OF PRINCE2

PRINCE has a process-based approach to project management. The **eight processes** define the management activities to be carried out during the project.

PRINCE2 also describes **eight components** that are applied within the appropriate activities

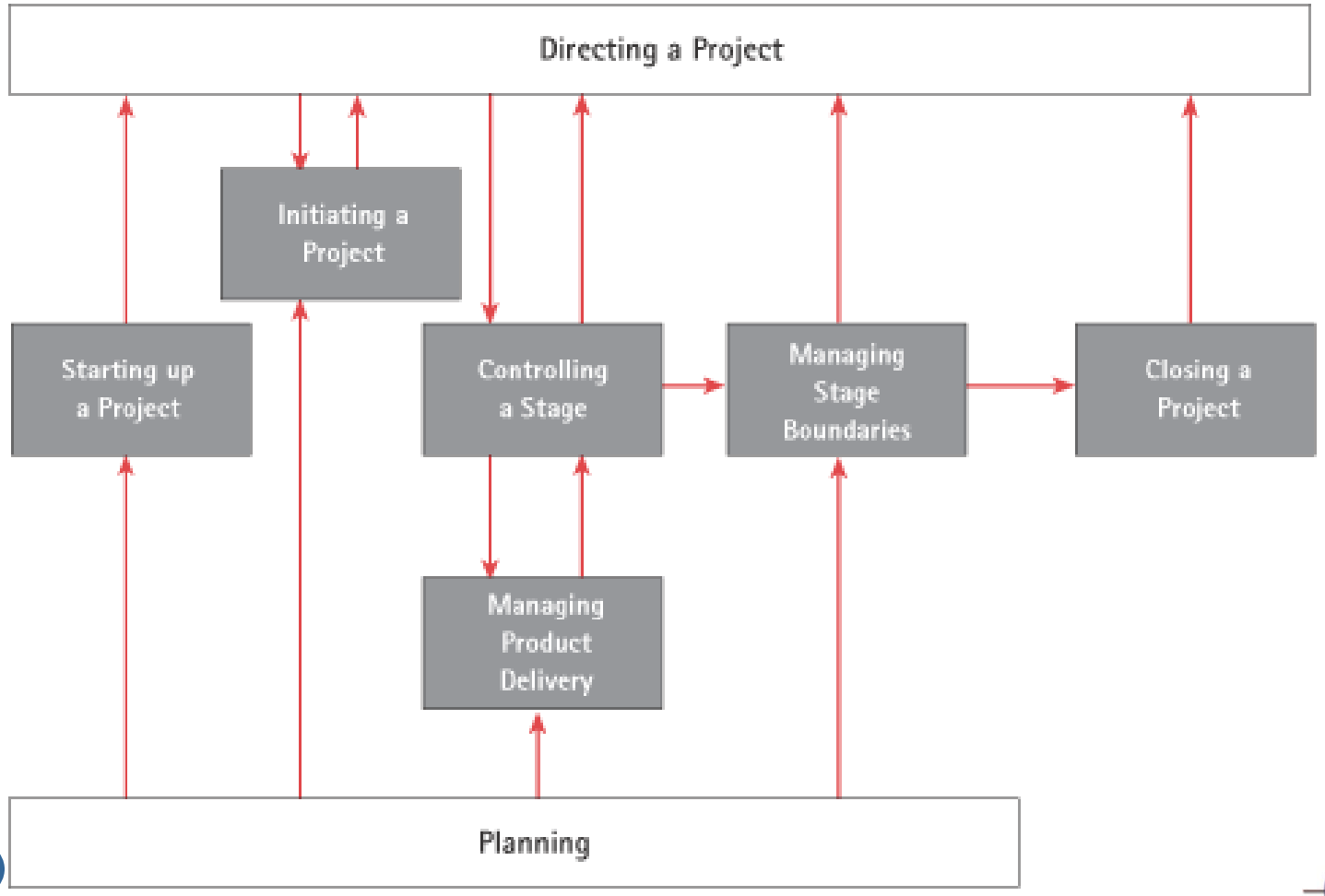


PRINCE2 Project Life Cycle



Note: PBM = Project Board Meeting

The Eight Processes



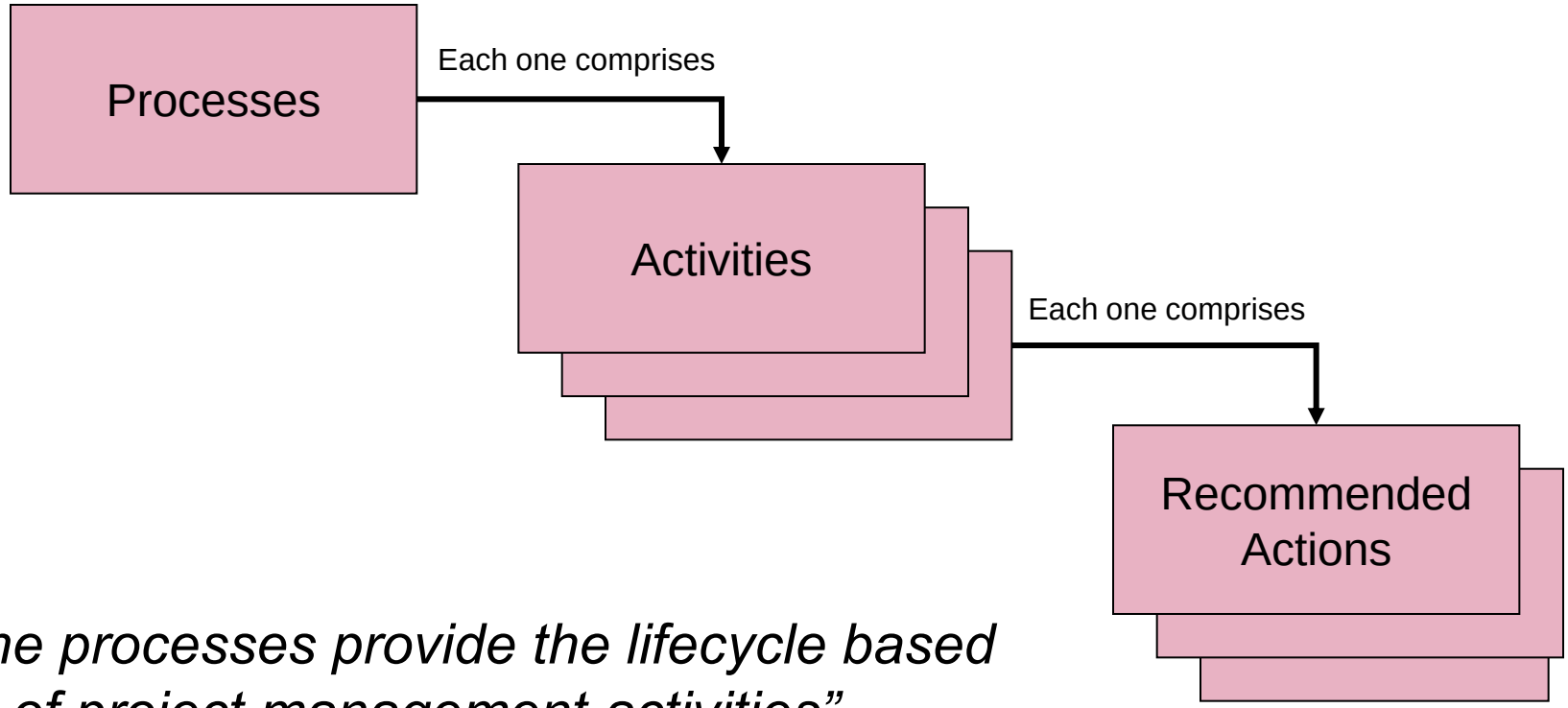
The Eight Processes Cont..

- Starting up a Project
  A pre-project process. Ensures that the prerequisites for initiating a project are in place.
- Directing a Project
  Aimed at the Project Board. How to manage the project.
- Initiating a Project
  Defines the what, the who, the when, and the how of the project
- Managing Stage Boundaries
  Produces the information on which the Board will take the key decision whether to proceed with the project or not,

The Eight Processes (cont.)

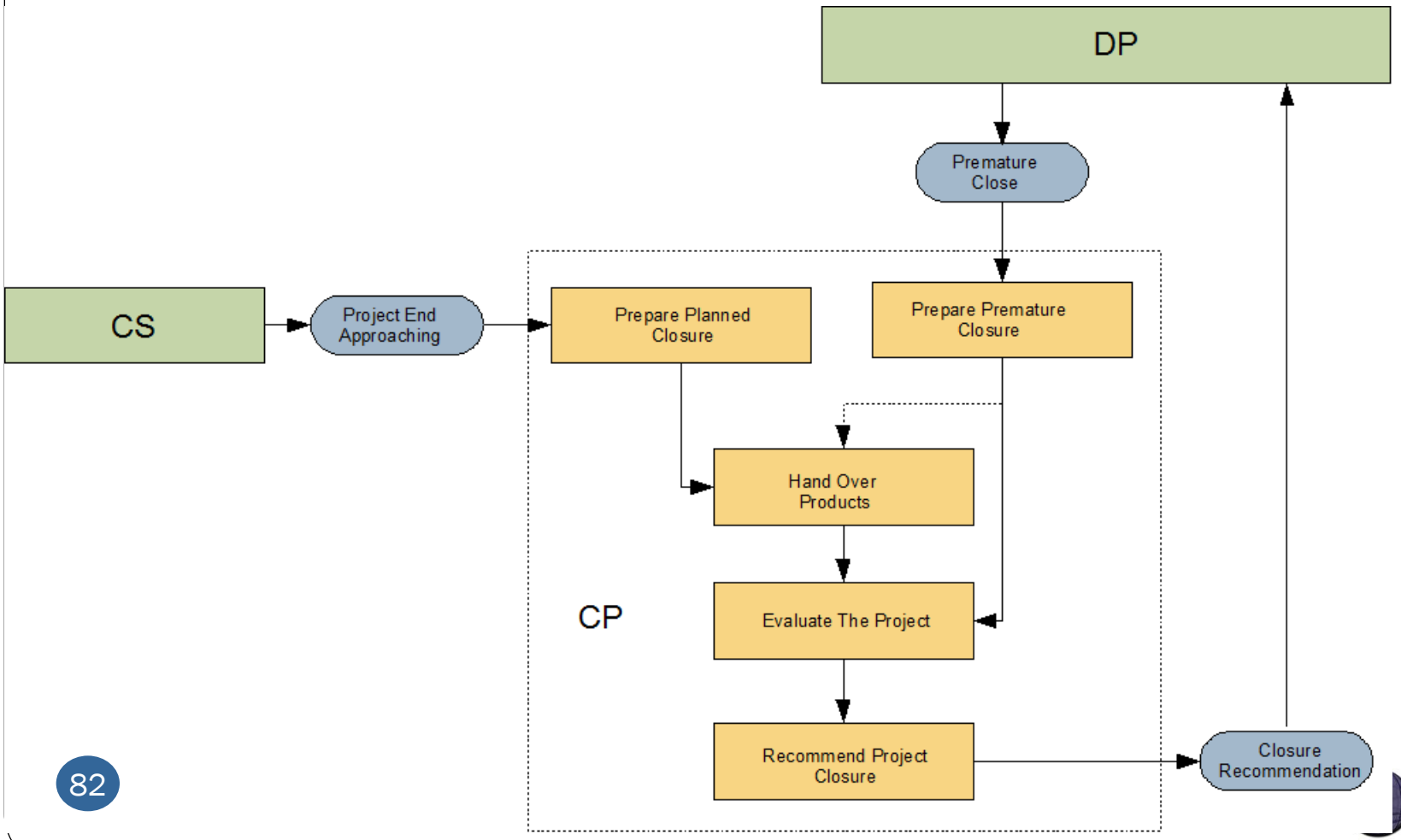
- Controlling a Stage
  Describes the Project Managers monitoring and control activities
- Managing Project Delivery
  Safeguards that the planned products are created and delivered
- Closing a Project
  The Project Managers work to wrap up the project either at its end or at a premature close.
- Planning
  Describes how to produce a plan. Plays an important part in many other processes (e.i. Starting up, Initiating, Managing Stage Boundaries)

PRINCE2 Processes

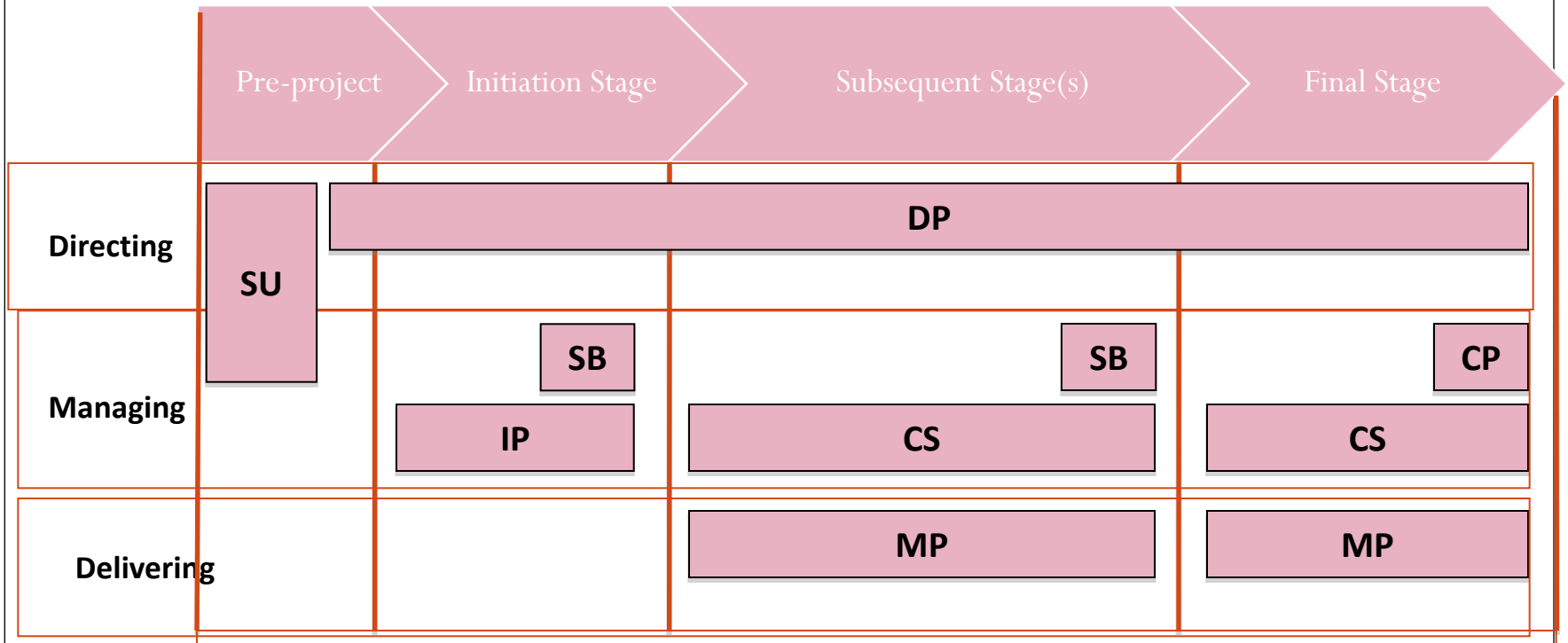


"The processes provide the lifecycle based list of project management activities"

Example Process



PRINCE2 Processes



Key:

- SU = Starting Up a Project
- DP = Directing a Project
- IP = Initiating a Project
- SB = Managing a Stage Boundary
- CS = Controlling a Stage
- MP = Managing Product Delivery
- CP = Closing a Project

Note:

- SU is used by both the directing and managing layers
- There should be at least two management stages, the first of which is the initiation stage.
- SB is first used at the end of the initiation stage and repeated at the end of each subsequent stage except the final Stage . It is also used to prepare exception plans, which can be done at any time including in the final stage.
- For complex or lengthy initiation CS and MP can optionally be used to manage the initiation stage

The Eight Component

- The Business Case

  It is a key philosophy is that it is a Business Case that must drive the project. The Business Case is developed at the beginning of the project and maintained throughout the life of the project, being reviewed by the Project Board each key decision point.

- Organisation

  The project management structure is based on a customer/supplier environment. The structure assumes that there will be a customer who will specify the desired outcome, and a supplier who will provide the resources and skills to deliver the outcome. There are four layer in the organisation:

- Corporate or programme management
- Direction of the project
- Day-to-day management of the project
- Team management.

The Eight Components(cont.)

- Plans

  A plan is a document, framed in accordance with a predefined scheme or method, describing how, when and by whom a specific target or set of targets is to be achieved. A plan is a design of how identified targets for products, timescales, costs and quality can be met.
  Planning is vital to the success of the project. A plan must contain sufficient information and detail to confirm that the targets of the plan are achievable.

- Controls

  Control is all about decision making and is central to project management.
  The purpose of control is to ensure that the project :

- Is producing the required products, which meet the defined quality criteria
- Is being carried out to schedule and in accordance with its resource and cost plans
- Remains viable against its Business Case.

The Eight Component (cont.)

- ## Management of Risk

  The task of risk management is to manage a project's exposure to risk (that is, the probability of specific risks occurring and the potential impact if they did occur). The aim is to manage that exposure by taking action to keep exposure to an acceptable level in a cost-effective way.

- ## Quality in a Project Environment

  Within projects, quality is a question of identifying what it is about the project's products or services that makes them fit for their purpose of satisfying stated needs.
  Quality management is the process of ensuring that the quality expected by the customer is achieved.

The Eight Components (cont.)

- ## Configuration Management

Within the context of project management, the purpose of configuration management is to identify, track and protect the project's products.

Configuration Management gives precise control over the project's products by allowing management to:

- Specify the versions of products in use and in existence and hold information on:
  - their status (e.g. in live use, archived, ready for quality checking)
  - who owns each product (the individual with prime responsibility for it)
  - the relationships between products
- Maintain up-to-date records containing these pieces of information
- Control changes to the products by ensuring that changes are made only with the agreement of appropriately named authorities
- Audit the records to ensure that they contain the authorised products and only these products.

- ## Change Control

The control of change means the assessment of the impact of potential changes, their importance, their cost and a judgmental decision by management on whether to include them or not. Any approved changes must be reflected in any necessary corresponding change to schedule and budget.

SUMMARY

- PRINCE2 is a structured project management methodology applicable to all types of projects
- PRINCE2 comprises of eight components and eight processes to master

CASE STUDY

3 Implementing a Project methodology PRINCE2 at Reading Borough Council

CASE STUDY PRINCE2

3 Implementing a Project methodology PRINCE2 at Reading Borough Council

1. What were the background and the benefits to Reading Borough Council of Implementing a structured project management methodology such as PRINCE2?

2. What are the main barriers to introducing a project management methodology such as PRINCE2 into an organization?

3. Evaluate the article identifying success factors for:
   (a) Moving to a project management methodology such as PRINCE2.
   (b) Any systems development management project.