

Construction Project Management, COTM 6101

MSc program in Construction Technology and Management

Addis College

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Chapter 1

**Introduction to project and
Construction Project body of
knowledge**

1. Introduction

- ✚ A project is a series of activities(Group of tasks) aimed at bringing about clearly specified objectives within a defined
 - Time-period
 - Project budget.
- ✚ It has specific set of objectives and characteristics.
 - It is likely to be a one-time program.
 - It has a life cycle, with a specific start and end.
 - It has a work scope that can be categorized into define tasks.
 - It has a start and end period with specific budget
- ✚ A routine work is different from a project.
- ✚ The same activity can be a project or a routine work

Project Management:

- ✚ Is the application of various **knowledge, skills and techniques** on projects to ensure both the **pre determined objectives** and **the intended purpose** of the larger business to met.
- ✚ Is accomplished through 5 major process groups: **Initiating, Planning, Executing, Monitoring & Evaluation, and Closing.**
- ✚ Includes:
 - Identifying, Recognizing and Articulating Needs/requirements
 - Considering Stakeholders concerns, expectations, etc
 - Dealing with the following six competing constraints: Scope, Quality, Schedule, Budget, Resources and Risk.

Construction Projects: Main features

1. Predetermined Objectives

- Components of a certain business
- Often the first phase

2. Constrained Schemes

- Schedule, Budget, Resources and Results / Scope Constraints

3. Too Fragmented

- In processes,
- In financial sources when co financed, and
- In responsible bodies

4. Investment

- Accelerates economic growth of a nation
- Cost Extensive, and
- Slow & Low business return on investment

5. Human Resources

- Involves large number

6. Construction Equipment

- Short life time, and
- Highly cost extensive both to own and increase their life time

7. Reports and Monitoring disparity

- Exhibits Financial & Engineering Reports disparity during implementations unless committed and compensation events are not clearly considered

Objectives of Construction Management

✚ The main objectives of the construction management team should include:

- Project completion within the allocated budget and duration,
- Ensure that the production of construction works satisfy the client's functional requirements,
- Construction to specified standards,
- Provision of safe and satisfactory working condition.

✚ Accordingly, construction project management may be defined as the overall control of the total management process to optimize the three attributes of the process: **Quality, Schedule** and **Cost**.

Functions of Construction Management

- ✚ The functions of construction management are:
Planning, Organizing, Staffing, Motivating,
Communication, Measuring (Correcting), and
Coordinating.

i. Planning

- ✚ Planning is a function of devising the cause for the future with a vision, formulated for the future state of the organization or the project.
- ✚ Planning also involves preparation of alternatives for achieving specified objectives.

 In preparation of plans the following questions should be addressed:

- What to do?
- How to do?
- Where to do?
- How much does it cost?

 The detailing of the plan depends on:

- Size of the project
- Degree of difficulty
- Knowledge and experience
- Degree and extent of indeterminate operations
- Extent of internal and external constraints

Scheduling:

- ✚ Scheduling is timing of the work activities.
- ✚ During scheduling questions like when to do it and how long it takes should be addressed.

ii. Organizing

- ✚ Organizing is required to achieve effective utilization of the people, facilities, equipment and money available to the Organization.
- ✚ Organizing also involves establishing a workable organizational structure

iii. Staffing:

- ✚ Staffing involves assigning (employing) people to fill the posts created within the organizational structure.
- ✚ Staffing also involves matching the organization's needs with each employee's goals and desires, and it requires adherence to equal opportunity regulations.

iv. Motivating:

- ✚ Motivation can be defines as follows:
 - Motivation is the set of processes that moves a person towards a goal.
 - Motivation is the internal or external forces that act on a person to pursue a certain course of action.

v. *Communication:*

+ Communication is a multifaceted management responsibility.

+ Communication can be **formal** and **informal**; it is both **written** and **oral**.

+ It utilizes paper, telephone, face-to-face, and electronic means.

vi. Measuring and Correcting:

 Measuring and Correcting involves:

- Measuring the actual performance
- Identify plan and schedule
- Compare plan against performance
- If there is discrepancy, identify the reasons
- Analyze the costs incurred
- Take remedial measures
- Observe quality of work

 ***NB: - “People work for what you inspect, not for what you expect.”***

vii. Coordinating:

✚ Coordinating – conduct regular departmental and section heads meeting for discussion.

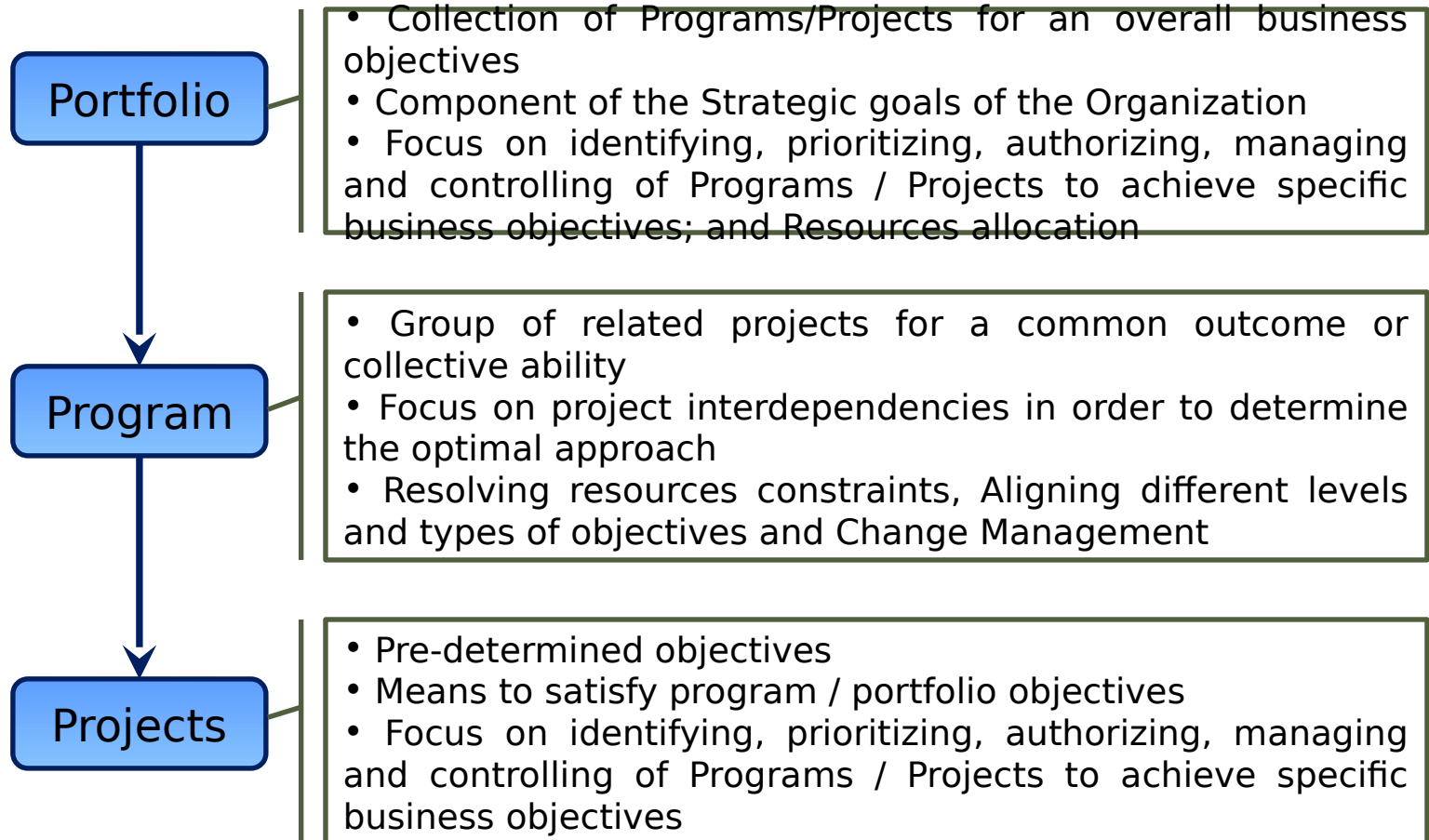
2. Essential elements of Construction Project Management

 The **Essential Elements** of Project Management include:

1. Project, Program & Portfolio Management relationships
2. Projects and Strategic Planning
3. Project Life Cycle / Phases; PM Process Groups
4. Project Stakeholders and Organization
5. Project Management Office & The Project Manager Role
6. Project Management Skills, Tools and Techniques

CPM: Essential Elements

Project, Program & Portfolio Management



CPM: Essential Elements

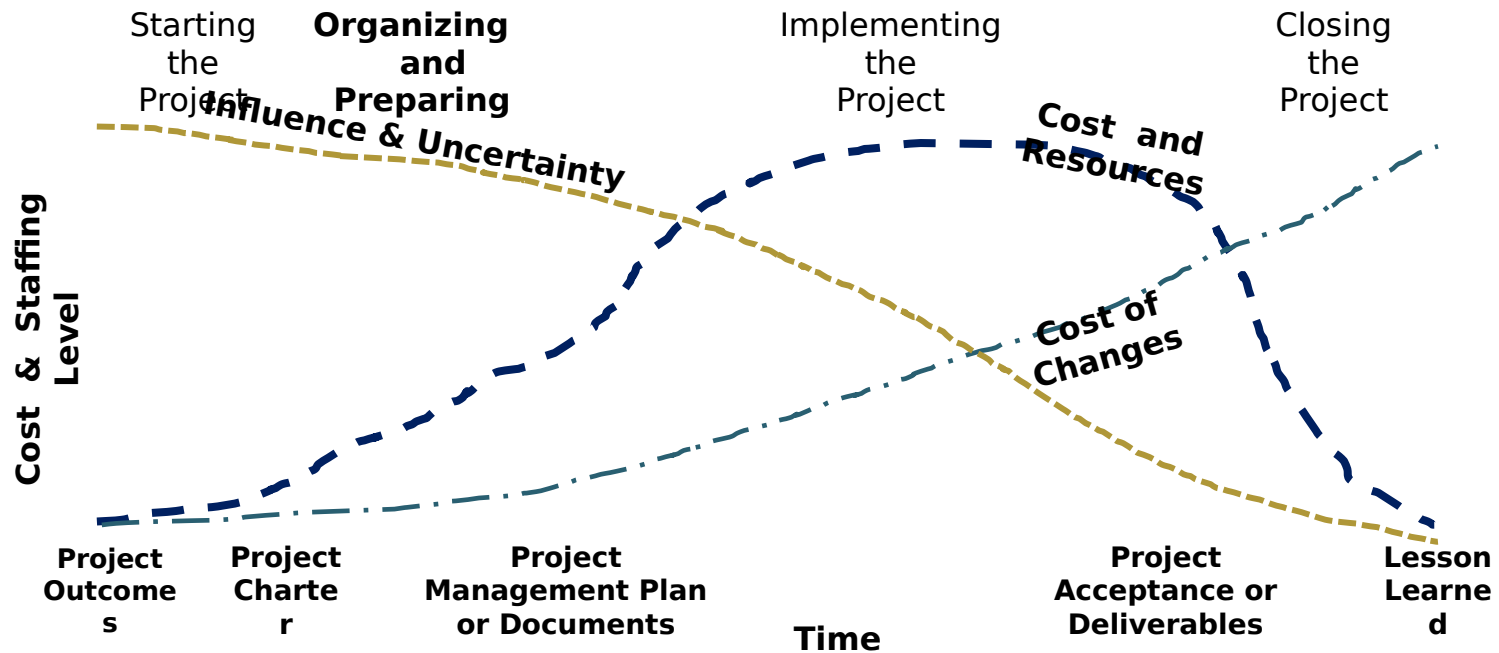
Projects and Strategic Planning

- Projects are often utilized as a means of achieving an organization's strategic plan.
- Projects are typically authorized as a result of one or more of the following strategic considerations:
 - Market demand,
 - Strategic Opportunity,
 - Customer requirement,
 - Technological advancement, and
 - Regulatory or Legal Requirements.
- Projects, within programs or portfolios, are a means of achieving organizational goals and objectives as part of its Strategic Plan

CPM: Essential Elements

Project Life Cycle / Phases

- The Four Structure of Project Life Cycle / Phases
 - Starting the Project,
 - Organizing and Preparing,
 - Implementing the Project, and
 - Closing the Project.

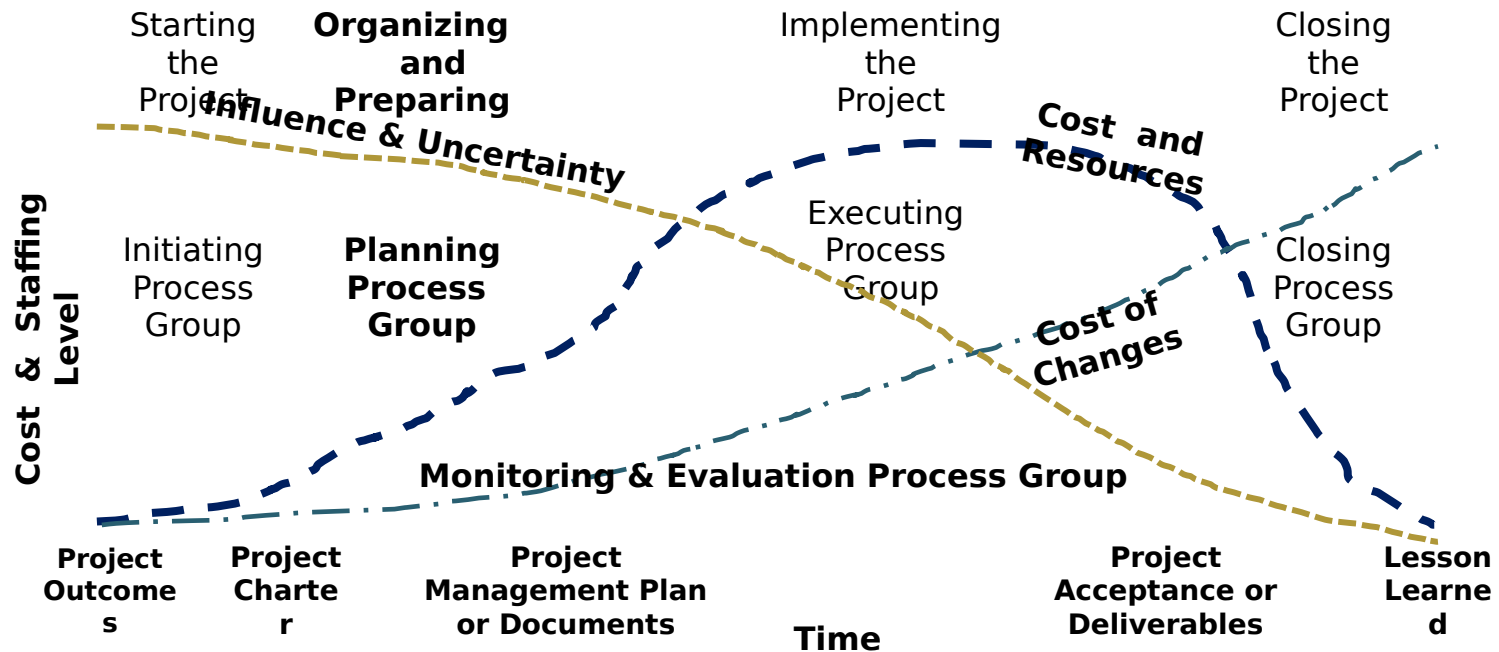


CPM: Essential Elements



Project Management Process Group

- The Five Project Management Process Group
 - Initiating Process Group,
 - Planning Process Group,
 - Executing Process Group,
 - Monitoring & Evaluation Process Group; and
 - Closing Process Group.



CPM: Essential Elements

Project Management Process Groups

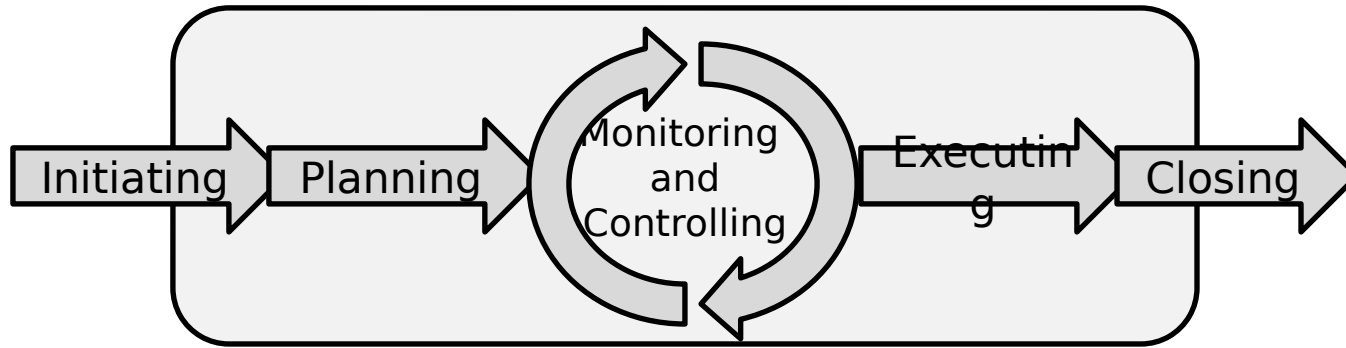
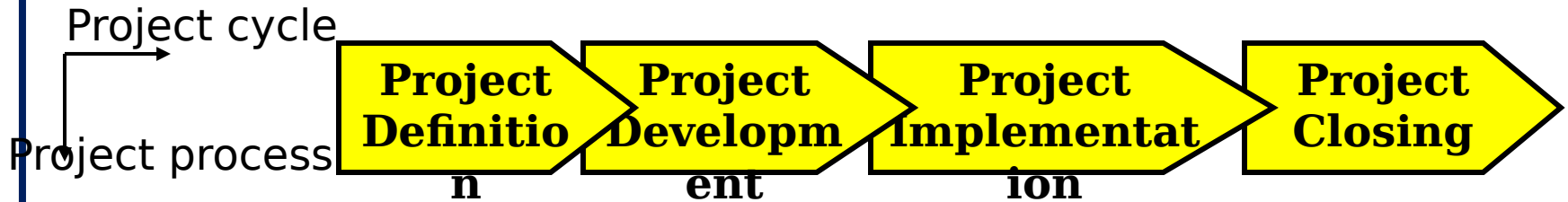


Fig. Single phase project life cycle

CPM: Essential Elements

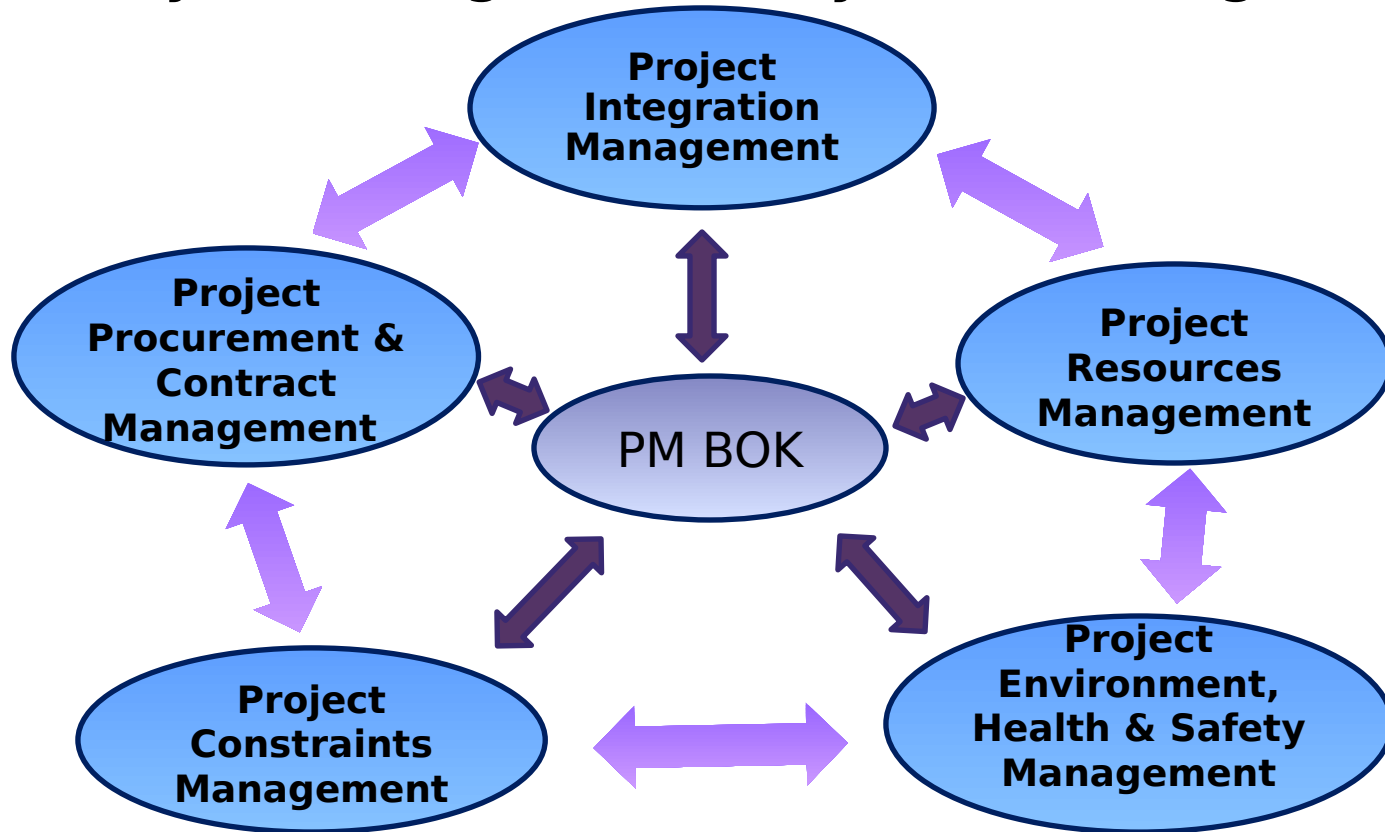
Project Management Process Vs Life Cycle



Core Processes	Concept Definition	Concept Development	Design of buildings, Roads, etc & Physical construction works	Maintenance Period and Defect Remedies
Administrative Processes	Concept Evaluation Project Approval Budget Allocation		Monitoring, Procurement and Other Processes	Acceptance / Hand Over
Public Regulatory Processes	Right-of-way (if necessary) and Regulatory Permits		Tender award and Changes and Variation	Final Approval and User Permit

3. CPM: Body of Knowledge

The **Project Management Body of Knowledge**



Project Management Body of Knowledge:

- ❑ 1. Introduction
- 2. Organizational influences & Project life cycle
- 3. Project Management processes
- 4. Project integration management
- 5. Project scope management
- 6. Project time management
- 7. Project Cost Management
- 8. Project Quality Management
- 9. Project human resource management
- 10. Project Communications Management
- 11. Project Risk Management
- 12. Project Procurement Management
- 13. Project Stakeholder Management

3. CPM: Body of Knowledge

1. Project Procurement & Contract Management involves:

- ✚ Procurement & Contract Governance System (ServicesVs Works)
 - Construction Law
 - Delivery System
 - Contracting Method
 - Procurement Method
 - Contract Type
- ✚ Procurement and Contract Management Planning
 - Establishing Procurement Team
 - Deciding Proc & Cont Governance Structure

3. CPM: Body of Knowledge

2. Project Constraints Management

 **Project Time Management** involves

- the management of Activities and Resources Dependencies
- PTM processes:
 - Define Activities
 - Sequence Activities
 - Estimate Activities Resources
 - Estimate Activities Durations
 - Develop Schedule
 - Monitor and Evaluate Schedule
- Refer PM BoK / DCE's CW+RPs
- Critical Path Method Vs PERT Vs Critical Chain Method
- MS Project / Primavera

3. CPM: Body of Knowledge

- ✚ **Project Cost Management** involves
 - Cost Estimating, Budgeting and Controlling Costs
 - Budget and Cash Flow Management
 - PCM processes
 - Activities Definition
 - Define Measuring Units and Cost Coverage
 - Estimate Activities Resources
 - Define Crews and CBS
 - Determine Resources Basic Prices
 - Estimate Activity Costs
 - Develop Cash Flows and Budget
 - Monitor and Evaluate Costs
 - Cost Estimate Vs Project Cycle / Phases
 - Refer Cost Estimating Slides and Cases

3. CPM: Body of Knowledge

- ✚ **Project Quality Management** involves
 - Define & Plan Quality Requirements,
 - Perform Quality Assurance & Control Services
 - Project (as temporary organization) Management
 - Product Quality Management
 - Refer PMBoK

3. CPM: Body of Knowledge

3. Project Resources Management

Project Financial Management

- Involves the management of Project finance
- Project Finance involves Project cash flow & liquidity management
- Determine Organization and Project healthiness using Balance sheet, Income Statement and Financial ratios

Project Human Resources Management involves

- the management of Project personnel and Labor workmanship and productivities
- Develop HR plan and Acquire, Manage and Develop Project team
- Develop LBS, Define and Control Productivities and Workmanship requirements

3. CPM: Body of Knowledge

- ✚ **Project Materials Management** involves
 - the management of Materials Quality, Procurement & Handling
 - Develop MBS, Define and Control material quality
- ✚ **Project Machineries and Plants Management** involves
 - the management of Machineries and Plants access, installations, calibrations, productivities, costs and maintenance

3. CPM: Body of Knowledges

4. Project Environment, Health and Safety Management

Project Environment involves

- Environment Impact Assessment, Resettlement Action Plan and Fire Protection; and their Implementation and Control

Project Health involves

- Identifying health hazard work methods, chemicals, working environments; Develop, Implement and Control preventive methods

Project Safety involves

- Identifying accident prone activities; Develop, Implement and Control preventive methods

3. CPM: Body of Knowledges

5. Project Integration Management

Project Portfolio Management / Project - Parent Relationships Management

- the management of Organizational relationships and authorities; and Resources Allocations among Programs and Projects
- Develop Organizational Breakdown Structures (OBS), Implement and Control OBS

Project Communication Management

- the management of Project Management Information System (PMIS)
- Plan communication requirements, Develop communication mechanisms, Implement and Control Communications

3. CPM: Body of Knowledge

Project Uncertainty and Change Management

- **Project Risk Management**

- Plan Risk Management, Identify Risks, Perform Risk Analysis (Qualitative and / or Quantitative), Develop and Plan Risk Responses (Scenario Management), Monitor and Control Risks

- **Project Configuration / Changes / Alterations Management**

- Develop and Plan Changes Management, Monitor and Control Changes and Consequential Impacts
- Includes Requirement Changes Management, Project Completion Time and Project Cost Variations Adjustment System

- **Project Claim and Dispute Management**

- Develop and Plan Claim and Dispute Management, Monitor and Control Claims and Disputes including their Consequential Impacts