Project Cost Management

To ensure that the project is completed within the approved budget

Cost Management

A subset of project management that includes the **processes** required to ensure that the project is completed within the approved budget.

1. **Resource planning**

   – Determining resources and what quantities of each should be used- list of resource req, Here comes **Expert judgments Availability of alternatives**

2. Cost Estimating

   – Developing approximation of the costs of the resources need-cost estimates, supporting details, cost management plan

Here comes , **Rough order of Magnitude (ROM), Budgetary estimate, Definitive Estimate, Analogous, bottom up & Parametric modeling**

Cost Management

3. **Cost budgeting**

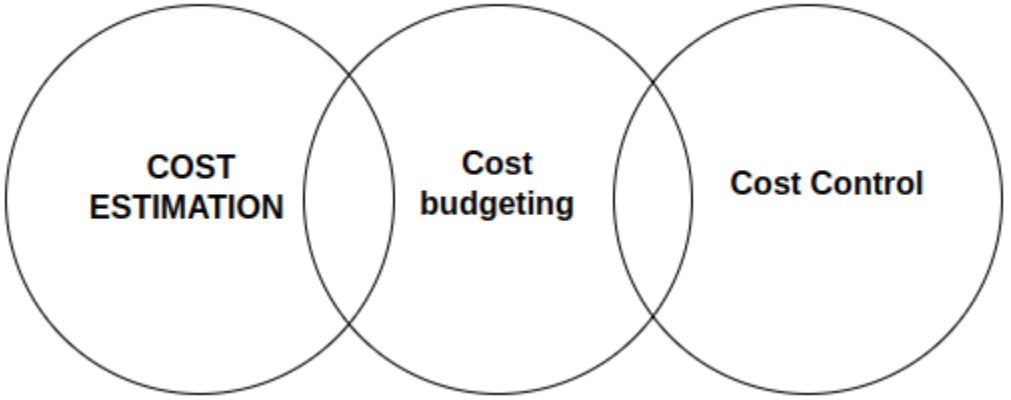
   – Allocating the overall cost estimate to individual work items-cost baseline

4. Cost Control

   - Controlling changes to the project budget-req cost estimates ,estimates at completion and lessons learned.

Cost Management

Project Cost Management Processes are present as discrete processes, with defined interfaces, but in practice they overlap



Project Cost Management

Coincides with PMBOK 7.0

The Project Cost Management Processes are:

Initiating

Planning

- 7.1 Plan Cost Management
- 7.2 Estimate Costs
- 7.3 Determine Budget

Executing

Monitoring and Controlling

- 7.4 Control Costs

Closing

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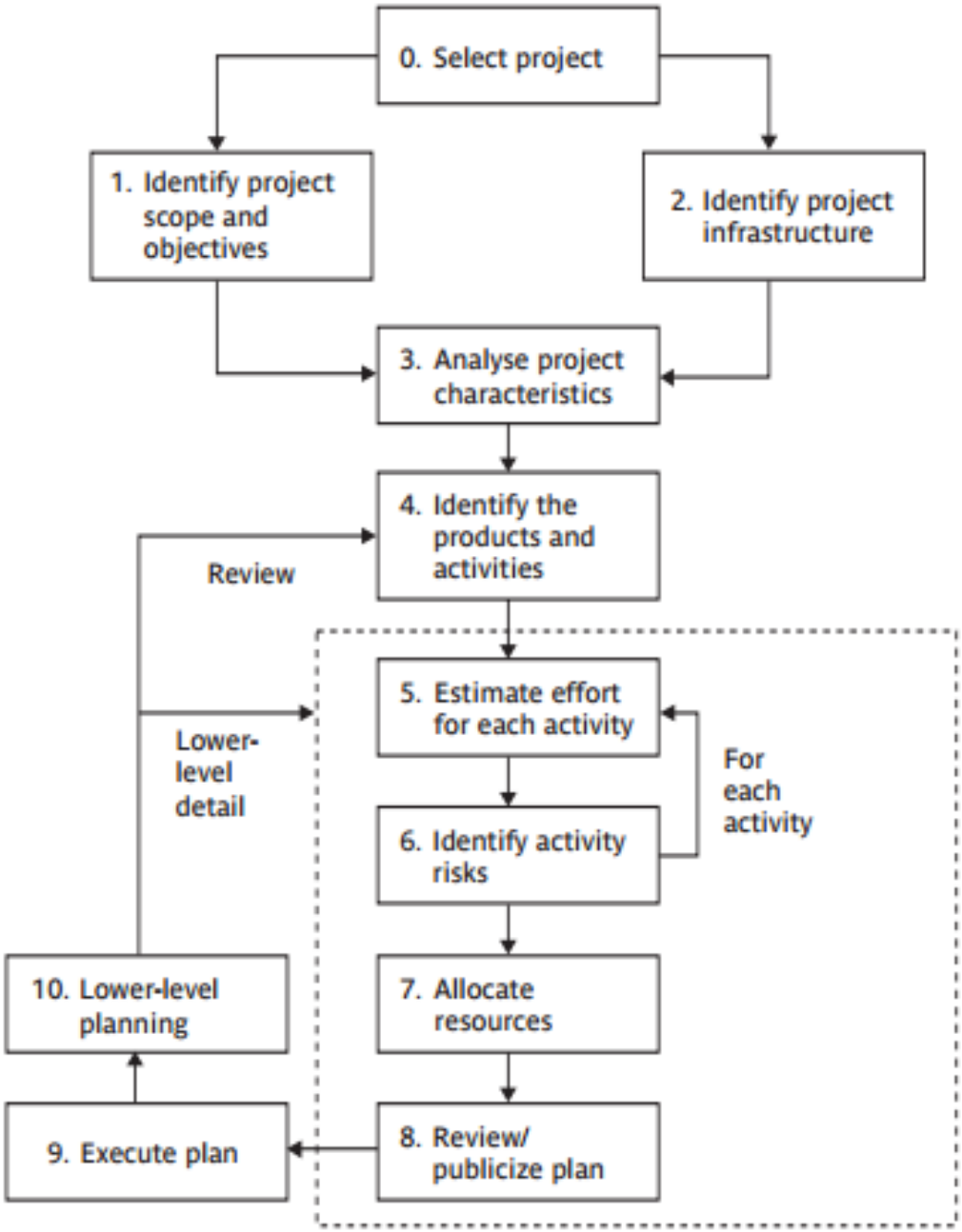
Project Cost Management Overview – Planning

	Plan Cost Management	Estimate Costs	Determine Budget
Inputs	1. Project charter 2. Project management plan 3. Enterprise environmental factors 4. Organizational process assets	1. Project management plan 2. Project documents 3. Enterprise environmental factors 4. Organizational process assets	1. Project management plan 2. Project documents 3. Business documents 4. Agreements 5. Enterprise environmental factors 6. Organizational process assets
Tools & Techniques	1. Expert judgment 2. Data analysis 3. Meetings	1. Expert judgment 2. Analogous estimating 3. Parametric estimating 4. Bottom-up estimating 5. Three-point estimating 6. Data analysis 7. Project management information system 8. Decision making	1. Expert judgment 2. Cost aggregation 3. Data analysis 4. Historical information review 5. Funding limit reconciliation 6. Financing
Outputs	1. Cost management plan	1. Cost estimates 2. Basis of estimates 3. Project documents updates	1. Cost baseline 2. Project funding requirements 3. Project documents updates

Cost:

- Accountants usually define cost as a resource sacrificed or forgone to achieve a specific objective.


0. Select project
1. Identify project scope and objectives
2. Identify project infrastructure
3. Analyse project characteristics
4. Identify the products and activities
Review
5. Estimate effort for each activity
Lower-level detail
For each activity
6. Identify activity risks
7. Allocate resources
8. Review/ publicize plan
9. Execute plan
10. Lower-level planning

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Key Concepts

- Project Cost Management should consider the effect of project decisions on the subsequent recurring cost of using, maintaining, and supporting the product, service, or result of the project. Something that reduces the cost of the project might increase the resulting product's operating costs.

- The Project Manager must also recognise that different stakeholders measure project costs in different ways and at different times. For example, the cost of an acquired item may be measured when the acquisition decision is made or committed, the order is placed, the item is delivered, or the actual cost is incurred for project accounting purposes.

RESOURCE PLANNING:

- Determining what resources and what quantities of those resources.

Assist in resource planning:

- Expert judgments
- Availability of alternatives

Expert Judgment

While estimating the project cost, the first step is to take the comments from the experts. The experts are the people who have prior knowledge on similar kind of projects. So they can suggest valuable insight based on their experience. You can also take their advice on various tools and techniques that can be used to estimate similar kind of project.

PROJECT COST MANAGEMENT

7.1 Resource Planning

1. Inputs
    1. Work breakdown structure
    2. Historical information
    3. Scope statement
    4. Resource pool description
    5. Organizational policies
    6. Activity duration estimates
2. Tools and Techniques
    1. Expert judgment
    2. Alternates identification
    3. Project management software
3. Outputs
    1. Resource requirements

Cost Estimation:

- Develop a cost estimation of resources that are needed in a project.

1) Rough order of magnitude (don't takes much time) top down

Rough order of Magnitude (ROM) Cost, A ROM Cost is a general approximation of the cost of providing a stated service. It is based on experience

Rough idea of what project will cost to make schedule decision

Done early even before a project starts(2to3 yrs earlier)

Accuracy:**-25% to +75%** (for IT proj it is almost double)

Types of Cost Estimates:

2 Budgetary estimate (look for similar projects & then estimate) top down estimation approach

The budget allocates the costs over the life of the project to determine the periodic and total funding requirements.

- Allocate money into an organization's budget
- Early (2 to 3 yrs into future)
- Accuracy: **-10% to +25%**

Definitive Estimate:

A definitive estimate is made when there are accurate estimates at the work package or activity level. For large and **complex projects**, it can be difficult to determine a firm estimate. Certain estimates are likely to deviate from reality because most factors are unpredictable and subject to certain assumptions.

Accurate estimate of proj cost (purchasing)
Made 1 yr prior to proj completion
Accuracy: **-5% to +10%**

7.2 Cost Estimating

1. Inputs
    1. Work breakdown structure
    2. **Resource requirements**
    3. Resource rates
    4. Activity duration estimates
    5. Estimating publications
    6. Historical information
    7. Chart of accounts
    8. Risks
2. Tools and Techniques
    1. Analogous estimating
    2. Parametric modeling
    3. Bottom-up estimating
    4. Computerized tools
    5. Other cost estimating methods

1. Outputs
    1. Cost estimates
    2. Supporting detail
    3. Cost management plan

Cost Estimation Tools and Techniques:

- Analogous Estimate
- Bottom up estimate
- Parametric modeling
- Three Point Estimating

Analogous Estimation

Normally, at the early stages of your project, you do not have much detail, so taking into account of similar projects previously completed by your organization, the cost of the project can be estimated. Analogous estimation technique uses the parameters such as scope, budget, duration, size, weight and complexity of previous projects having similar nature of works. It measures the current project on that basis and does the estimation.

Analogous Estimate

- Also known as top down approach
- Uses actual cost of previous projects
- Less costly but less accurate also
- Depends on expertise op ppl involved (if new s/w used then not suitable)

Parametric modeling (less costly, less time consuming but better than Analogous)

This technique uses an **algorithm** to calculate the cost of the activity considering the **historical data** and other **project variables**. A **statistical relationship needs to be evaluated between the historical data and other variables**. This technique can be used for the complete project or for some of the activities in conjunction with other estimation techniques. This is one of the most accurate techniques to estimate the cost of the project.

Three Point Estimating

Using a three point estimate helps find an approximate range for an activity duration

Most Likely Time: Mt

This estimate is based on duration of activity, given the resources likely to be assigned, their productivity realistic expectations of availability for activity dependencies participants & interruptions

Optimistic Time: Ot The activity duration based on analysis of best case scenario for the activity

Pessimistic Time Pt: The duration based in analysis of worst case scenario for the activity

Three Point Estimating

Three point estimation: determining 3 points of estimation (optimistic, most likely and pessimistic) and taking the average

Three point Estimation where **T_E is time**

$T_E = (To + Tm + Tp)/3$

To =5

Tm=12

Tp =15

(5+12+15)/3 =10.66

Bottom up Estimates Most costly/ more time consuming

- Involves estimating individual work items and then summing up a total or aggregating
- More accurate as in WBS(work involved calculated by ppl who are doing the work)
- Time consuming and difficult to develop

Bottom up Estimates

Bottom-up estimation technique starts with the estimation from the lower level i.e. the work package level created as per WBS and then rolled up to higher-level. The accuracy of this estimation technique is high as you are doing the estimation from **granular level**

When the activity duration cannot be estimated with a reasonable degree of confidence, the work within the activity is decomposed to more detail, the detail duration are estimated

Parametric modeling

- Uses project characteristics in mathematical model to estimate project costs
- E.g..$ 50 per SLOC (function points)
- Most reliable when historical infor4mation is accurate.
- COCOMO,COCOMOII are examples

Other computerized tools available for cost estimatoion such as spreadsheets, PM software

COST Budgeting:

- Involves allocating cost estimates to individual work items.
- These work items are defined in WBS

- COST BASELINE:
  - It is time phased budget that project managers use to measure and monitor project progress.

7.3 Cost Budgeting

1. Inputs
    1. Cost estimates
    2. Work breakdown structure
    3. Project schedule
    4. Risk management
2. Tools and Techniques
    1. Cost budgeting tools and techniques
3. Outputs
    1. Cost baseline

COST Control:

- Includes monitoring cost performance ensuring only appropriate changes are included in a revised cost baseline and informing stake holders of authorized changes to the project that will affect the costs.
- Tools available for project cost control
- Cost change control is a part of project integration management.
- Projects don’t progress as planned so it is required to calculate alternate course of action.

7.4 Cost Control

1. Inputs
    1. Cost baseline
    2. Performance reports
    3. Change requests
    4. Cost management plan
2. Tools and Techniques
    1. Cost change control system
    2. Performance measurement
    3. Earned value management (EVM)
    4. Additional planning
    5. Computerized tools

7.4 Cost Control

1. Outputs
    1. Revised cost estimates
    2. Budget updates
    3. Corrective action
    4. Estimate at completion
    5. Project closeout
    6. Lessons learned