

A photograph of an outdoor patio area. In the center, there is a round glass table supported by a large, ornate, light-colored ceramic vase. On the table, there are several books, a glass of orange juice, and a small basket. Two ornate metal chairs with green cushions are positioned around the table. The background shows a stone wall and some greenery.

**4th
Lecture**

**Project Cost
Management**



Topics Today:

Estimate Cost Process. (Inputs, Tools, Output)

7-2 (Estimate Process)



The process of developing an APPROXIMATION of the monetary resources needed to complete project activities.



Activity1



Resource



Cost



Activity2



Resource



Cost

Approximation

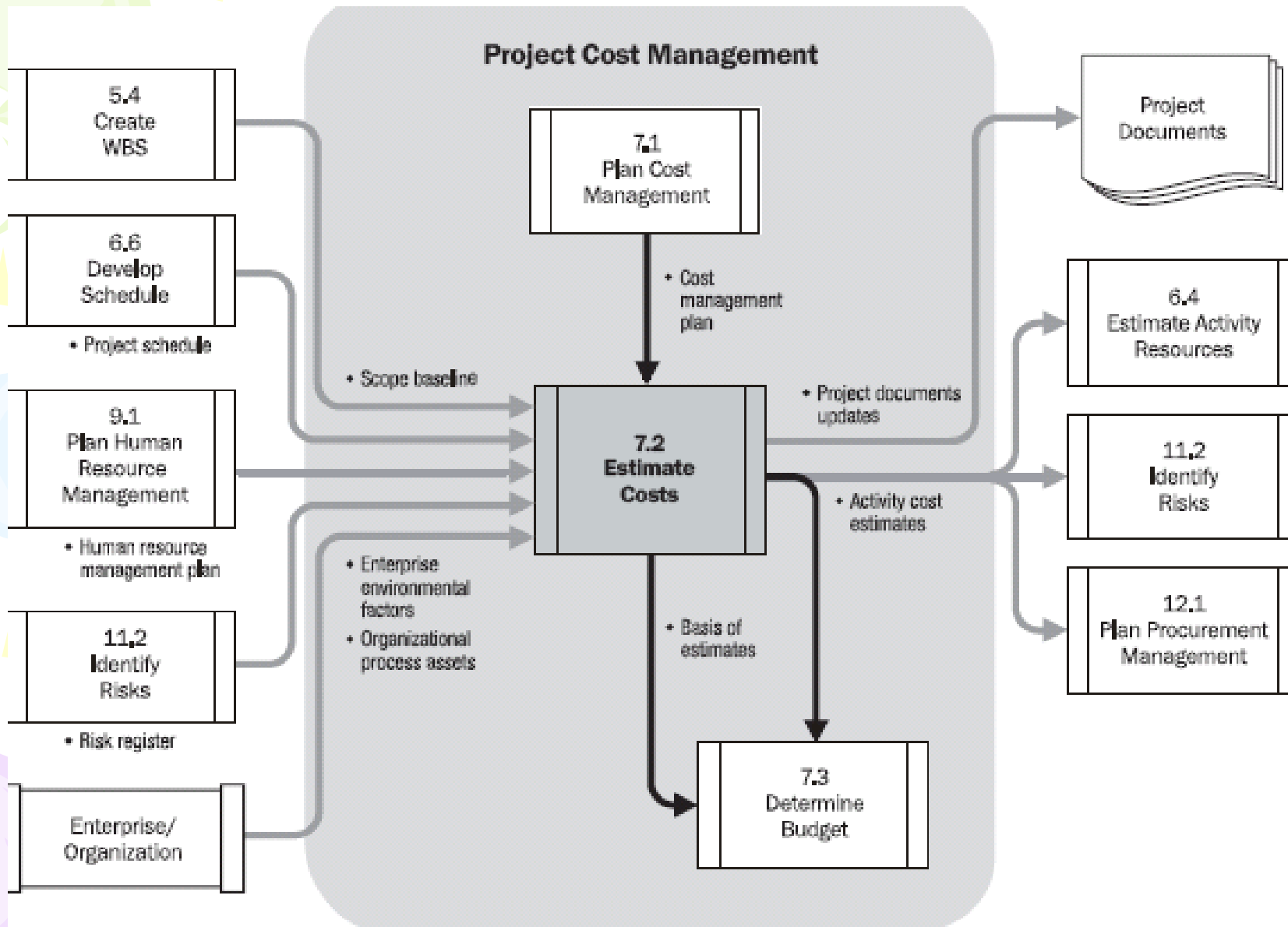


Project Cost



It determines the amount of cost required to complete project work.

Estimate Cost Process



7-2-3 (Inputs Estimate Process)



(WBS Dictionary)

Where work component descriptions are documented.

- Code of accounts identifier.
- Description of the work of the component .
- Organization responsible for completing the component.
- List of schedule milestones.
- Schedule activities associated with the schedule milestones.
- Required resources.
- Cost estimates.
- Quality requirements.
- Criteria for acceptance.
- Technical references.
- Contract information.

Project Schedule



Project
Schedule

Project schedule is output of develop schedule process.

Cost estimation is linked to the estimate activity resources process

Cost is always time bound.

Estimate Activity
Cost

- Who will work on the ach activities
- Type & Quantity



Estimate Activity
Duration

- How long activities will take
- Duration



Estimate Cost

- How much Project will cost (By combining all activities)

Risk Management-Define Risk

According to the 5th Edition of the PMBOK® Guide, project risk is “an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost, or quality.”



Risk Register.

It is a document in which the results of risk analysis and risk response planning are recorded.

Expert Judgment Estimates

- Use somebody who has recent experience on a similar project
- You get a “guesstimate” (estimation)
- Accuracy depends on their ‘real’ expertise
- Comparable application (s) must be accurately chosen
- Can use a weighted-average of opinions

Tools & Techniques

- .1 Expert judgment
- .2 Analogous estimating
- .3 Parametric estimating
- .4 Bottom-up estimating
- .5 Three-point estimating
- .6 Reserve analysis
- .7 Cost of quality
- .8 Project management software
- .9 Vendor bid analysis
- .10 Group decision-making techniques

Analogues



Analogues
estimation



Think "Analogy":

- Something similar

Uses values:

- Cost, budget/measures (size, weight) & complexity

Relies on:

- The actual cost of previous, similar projects

Adjusted for:

- Known differences in project complexity.

Used when:

- There is a limited amount of detailed information

Uses historical information:

- For expert judgment.

Everything is less:

- Less costly, less time consuming, but less accurate.

Can be applied to:

- A total project or segments of a project

Parametric



Parametric
estimation



It is technique in which Algorithm is used to calculate Cost or duration based on Historical data & project parameters.

Uses statistical
relationship:

- Between historical data & other variables

Can produce higher
levels of accuracy

- Depending upon the sophistication
- Underlying data built into the model.

Can be applied to:

- A total project
- To segments of a project
- In conjunction with other estimating methods

For example: If the assigned resource is capable of installing 25 meters of cable per hour, the duration required to install 1,000 meters is 40 hours. (1,000 meters divided by 25 meters per hour).

Bottom Up



Bottom up
estimate



Estimating project cost by aggregating the estimates of the lower-level components of the WBS.

When an activity cannot be estimated with a reasonable degree of confidence, the work within activity is decomposed into more detail

These estimates are then aggregated into a total cost for each of the activity (Summarised or Rolled-up to higher level)

Tools and Techniques Estimate Cost Process

7.2.2.5 Three-Point Estimating

The accuracy of single-point activity cost estimates may be improved by considering estimation uncertainty and risk and using three estimates to define an approximate range for an activity's cost:

- **Most likely** (cM). The cost of the activity, based on realistic effort assessment for the required work and any predicted expenses.
 - **Optimistic** (cO). The activity cost based on analysis of the best-case scenario for the activity.
 - **Pessimistic** (cP). The activity cost based on analysis of the worst-case scenario for the activity.
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- **Triangular Distribution.** $cE = (cO + cM + cP) / 3$
 - **Beta Distribution** (from a traditional PERT analysis). $cE = (cO + 4cM + cP) / 6$

7.2.2.6 Reserve Analysis

Cost estimates may include contingency reserves (sometimes called contingency allowances) to account for cost uncertainty. Contingency reserves are the budget within the cost baseline that is allocated for identified risks, which are accepted and for which contingent or mitigating responses are developed. Contingency reserves are often viewed as the part of the budget intended to address the “known-unknowns” that can affect a project. For

Management reserves are an amount of the project budget withheld for management control purposes and are reserved for unforeseen work that is within scope of the project. Management reserves are intended to address the “unknown unknowns” that can affect a project. The management reserve is not included in the cost baseline but is part of the overall project budget and funding requirements. When an amount of management reserves is used to fund unforeseen work, the amount of management reserve used is added to the cost baseline, thus requiring an approved change to the cost baseline.

7.2.2.8 Project Management Software

Project management software applications, computerized spreadsheets, simulation, and statistical tools are used to assist with cost estimating. Such tools can simplify the use of some cost-estimating techniques and thereby facilitate rapid consideration of cost estimate alternatives.

7.2.2.9 Vendor Bid Analysis

Cost estimating methods may include analysis of what the project should cost, based on the responsive bids from qualified vendors. When projects are awarded to a vendor under competitive processes, additional cost estimating work may be required of the project team to examine the price of individual deliverables and to derive a cost that supports the final total project cost.

7.2.2.10 Group Decision-Making Techniques

Team-based approaches, such as brainstorming, the Delphi or nominal group techniques, are useful for engaging team members to improve estimate accuracy and commitment to the emerging estimates. By involving a structured group of people who are close to the technical execution of work in the estimation process, additional information is gained and more accurate estimates are obtained. Additionally, when people are involved in the estimation process, their commitment towards meeting the resulting estimates increases.

Outputs of Cost Estimate Process

1. Activity Cost Estimates.

Quantitative assessment of **probable costs** required to complete project work. Costs of **all resources** that are applied to activity are considered. It includes **direct costs**, inflation allowance and contingency reserves. **Indirect cost** can be included at activity or at higher level.

2. Basis of Estimates.

Details and documents like basis of estimates, constraints and assumptions, constraints, Range of estimates, Confidence level of final estimates.

Outputs

- .1 Activity cost estimates
- .2 Basis of estimates
- .3 Project documents updates

3. Project Documents Updates.

Risk register and other documents must be updated.