#### 82 Planning Forms

* 1. Cost Management Plan

The cost management plan is a part of the project management plan. It specifies how the project costs will be estimated, structured, monitored, and controlled. The cost management plan can include the following information:

* + - Level of accuracy for cost estimates
    - Units of measure
    - Variance thresholds
    - Rules for performance measurement
    - Cost reporting information and format
    - Process for estimating costs
    - Process for developing a time-phased budget
    - Process for monitoring and controlling costs

In addition, the cost management plan may include information on the level of authority associated with cost and budget allocation and commitment, funding limitations, and options and guidelines on how and when costs get recorded for the project.

The cost management plan can receive information from the:

* + - Project charter
    - Schedule management plan
    - Risk management plan It provides information to:
    - Activity cost estimates
    - Cost baseline
    - Risk register

The cost management plan is an output from the process 7.1 Plan Cost Management in the *PMBOK*® *Guide –* Sixth Edition. It is developed once and does not usually change.

#### tailoring tips

Consider the following tips to help tailor the cost management plan to meet your needs:

* + - On smaller projects, often the project manager does not manage the budget. In those cases you would not need this form.
    - Units of measure for each type of resource may be indicated in the cost management plan or the resource management plan.
    - For projects that use earned value management, include information on rules for establishing percent complete, the EVM measurement techniques (fixed formula, percent complete, level or effort, etc.). For those that don’t, delete this field.

#### alignment

The cost management plan should be aligned and consistent with the following documents:

* + - Project charter
    - Schedule management plan

#### Planning Forms 83

Description

You can use the descriptions in Table 2.17 to assist you in developing a cost management plan.

table 2.17 elements of a cost Management Plan

Document element Description

Units of measure Indicate how each type of resource will be measured. For example, labor units may be measured in staff hours, days, or weeks. Physical resources may be measured in gallons, meters, tons, or whatever is appropriate for the material. Some resources are based on a lump sum cost each time they are used.

Level of precision Indicate whether cost estimates will be rounded to hundreds, thousands, or some other measurement.

Level of accuracy Describe the level of accuracy needed for estimates. The level of accuracy may evolve over time as more information is known (progressive elaboration). If there are guidelines for rolling wave planning and the level of refinement that will be used for cost estimates, indicate the levels of accuracy required as time progresses.

Organizational procedure links

Cost estimating and reporting should follow the numbering structure of the WBS. It may also need to follow the organization’s code of accounts or other accounting and reporting structures.

Control thresholds Indicate the measures that determine whether an activity, work package, or the project as a whole is on budget, requires preventive action, or is over budget and requires corrective action. Usually indicated as a percent deviation from the baseline.

Rules of performance measurement

Cost reporting information and format

Identify the level in the WBS where progress and expenditures will be measured. For projects that use earned value management indicate whether costs will be reported at the work package or control account level. Describe the measurement method that will be used, such as weighted milestones, fixed-formula, percent complete, etc. Document the equations that will be used to forecast estimates to complete (ETC) and estimates at completion (EAC).

Document the cost information required for status and progress reporting. If a spe- cific reporting format will be used, attach a copy or refer to the specific form or tem- plate. Indicate the reporting frequency.

Additional details Describe variables associated with strategic funding choices, such as make or buy, buy or lease, borrowing funds versus using in-house funding, etc.



# COST MANAGEMENT PLAN

Project title: Date Prepared:

|  |  |  |
| --- | --- | --- |
| units of Measure: | level of Precision: | level of accuracy: |
|  |  |  |

organizational Procedure links:

control thresholds:

rules of Performance Measurement:

cost reporting and Format:

additional Details:

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#### Planning Forms 85

* 1. coSt eStiMateS

Cost estimates provide information on the cost of resources necessary to complete project work, including labor, equipment, supplies, services, facilities, and material. Estimates can be determined by developing an approximation for each work package using expert judgment or by using a quantitative method such as:

* + - Parametric estimates
    - Analogous estimates
    - Three-point estimates

Cost estimates should include at least:

* + - ID
    - Labor costs
    - Physical resource costs
    - Reserve
    - Estimate
    - Basis of estimates
    - Method
    - Assumptions
    - Range
    - Confidence level

Cost estimates can receive information from:

* + - Cost management plan
    - Scope baseline
    - Project schedule
    - Quality management plan
    - Resource requirements
    - Risk register
    - Lessons learned register They provide information to:
    - Cost baseline
    - Resource requirements
    - Risk register

Cost estimates are an output from the process 7.2 Estimate Costs in the *PMBOK*® *Guide –* Sixth Edition. Cost estimates are developed and then refined periodically as needed.

#### tailoring tips

Consider the following tips to help tailor the cost estimates to meet your needs:

* + - Cost estimates may include contingency reserve to account for risks related to uncertainty in the Cost estimates or ambiguity in the scope or resource availability.
    - If considerations for the cost of quality, cost of financing, or indirect costs were included, add that information to your cost estimate.

#### 86 Planning Forms

* Estimate costs at the level of accuracy and precision that suits your project needs. Rolling wave planning is often used for cost estimating; as more information is known about the scope and resources, cost estimates are refined and updated.
* If using vendors, indicate the estimated cost and indicate the type of contract being used to account

for possible fees and awards.

#### alignment

The cost estimates should be aligned and consistent with the following documents:

* Assumption log
* Activity attributes
* Project schedule
* Resource requirements
* Project team assignments

#### Description

You can use the descriptions in Table 2.18 to assist you in developing the cost estimates.

table 2.18 elements of an activity cost estimate

Document element Description

ID Unique identifier, such as the WBS ID or activity ID

Resource The resource (person, equipment, material) needed for the WBS deliverable

Labor costs The costs associated with team or outsourced resources

Physical costs Costs associated with material, equipment, supplies, or other physical resources Reserve Document contingency reserve amounts, if any

Estimate The sum of the cost of labor, physical resources, and reserve costs

Basis of estimates Information such as cost per pound, duration of the work, square feet, etc. Method The method used to estimate the cost, such as analogous, parametric, etc.

Assumptions/constraints Assumptions used to estimate the cost, such as the length of time the resource will be needed

Range The range of estimate

Confidence level The degree of confidence in the estimate



# ACTIVITY COST ESTIMATES

**Project Title: Date Prepared:**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| WBS ID | Resource | Labor Costs | Physical Costs | Reserve | Estimate | Method | Assumptions/ Constraints | Basis of Estimates | Range | Confidence Level |
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#### 88 Planning Forms

* 1. coSt eStiMating WorkSheet

A cost estimating worksheet can help to develop cost estimates when quantitative methods or a bottom- up estimate are developed. Quantitative methods include:

* + - Parametric estimates
    - Analogous estimates
    - Three-point estimates

Parametric estimates are derived by determining the cost variable that will be used and the cost per unit. The number of units is multiplied by the cost per unit to derive a cost estimate.

Analogous estimates are derived by comparing current work to previous similar work. The size of the previous work and the cost are compared to the expected size of the current work. Then the ratio of the size of the current work compared to the previous work is multiplied by the previous cost to determine an estimate. Various factors, such as complexity and price increases, can be factored in to make the estimate more accurate. This type of estimate is generally used to get a high-level estimate when detailed informa- tion is not available.

A three-point estimate can be used to account for uncertainty in the cost estimate. Stakeholders pro- vide estimates for optimistic, most likely, and pessimistic scenarios. These estimates are put into an equa- tion to determine an expected cost. The needs of the project determine the appropriate equation, though a common equation is a beta distribution:

Estimated cost= Optimistic Cost 4 (MostLikelyCost) Pessimistic Cost

6

Bottom-up estimates are detailed estimates done at the work package level. Detailed information on the work package, such as technical requirements, engineering drawings, labor duration, and other direct and indirect costs are used to determine the most accurate estimate possible.

The cost estimating worksheet can receive information from:

* + - Cost management plan
    - Scope baseline
    - Project schedule
    - Quality management plan
    - Resource requirements
    - Risk register
    - Lessons learned register

Cost estimating worksheets are process 7.2 Estimate Costs in the *PMBOK*® *Guide –* Sixth Edition.

Cost estimating worksheets are developed and then refined as periodically as needed.

#### Description

You can use the element descriptions in Table 2.19 to assist you in developing a cost estimating work- sheet and the element descriptions in Table 2.20 to assist you in developing a bottom-up cost estimating worksheet.

#### Planning Forms 89

table 2.19 elements of a cost estimating Worksheet

Document element Description

ID Unique identifier, such as the WBS ID or activity ID

Parametric estimates

Cost variable Enter the cost estimating driver, such as hours, square feet, gallons, or some other quantifiable measure.

Example: Square feet

Cost per unit Record the cost per unit.

Example: $9.50

Number of units Enter the number of units.

Example: 36

Cost estimate Multiply the number of units times the cost per unit to calculate the estimate.

Example: $9.50 x 36 = $342

analogous estimates

Previous activity Enter a description of the previous activity.

Example: Build a 160 square foot deck.

Previous cost Document the cost of the previous activity.

Example: $5,000

Current activity Describe how the current activity is different.

Example: Build a 200 square foot deck.

Multiplier Divide the current activity by the previous activity to get a multiplier.

Example: 200/160 = 1.25

Cost Estimate Multiply the cost for the previous activity by the multiplier to calculate the Cost Estimate for the current activity.

Example: $5,000 x 1.25 = $6,250

three-point estimate (beta distribution)

Optimistic cost Determine an optimistic cost estimate. Optimistic estimates assume all costs were identified and there won’t be any cost increases in material, labor, or other cost drivers. Example: $4,000

Most likely cost Determine a most likely cost estimate. Most likely estimates assume that there will be some cost fluctuations but nothing out of the ordinary.

Example: $5,000

Pessimistic cost Determine a pessimistic cost estimate. Pessimistic estimates assume there are signifi- cant risks that will materialize and cause cost overruns.

Example: $7,500

Weighting equation Weight the three estimates and divide. The most common method of weighting is the beta distribution, where c = cost:

cE = cO+ c4M + cP/6 Example: 4,000 +4 5,000/6

Expected cost Enter the expected cost based on the beta distribution.

Example: $5,250

#### 90 Planning Forms

You can use the element descriptions in the following table to assist you in developing a bottom-up cost estimating worksheet.

table 2.20 elements of a bottom-up cost estimating Worksheet

Document element Description

ID Unique identifier, such as the WBS ID or activity ID

Labor hours Enter the estimated effort hours.

Labor rate Enter the hourly or daily rate.

Total labor Multiply the labor hours times the labor rate.

Material Enter quotes for material, either from vendors or multiply the amount of material times the cost per unit.

Supplies Enter quotes for supplies, either from vendors or multiply the amount of supplies times the cost per unit.

Equipment Enter quotes to rent, lease, or purchase equipment.

Travel Enter quotes for travel.

Other direct costs Enter any other direct costs and document the type of cost. Indirect costs Enter any indirect costs, such as overhead.

Reserve Enter any contingency reserve cost for the work package.

Estimate Sum the labor, materials, supplies, equipment, travel, other direct costs, indirect costs, and any contingency reserve.



# COST ESTIMATING WORKSHEET

Project title: Date Prepared:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parametric estimates | | | | | |
| iD | cost variable | cost per unit | number of units | cost estimate | |
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| analogous estimates | | | | | |
| iD | Previous activity | Previous cost | current activity | Multiplier | cost estimate |
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| three-Point estimates | | | | | |
| iD | optimistic cost | Most likely cost | Pessimistic cost | Weighting equation | expected cost estimate |
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# BOTTOM-UP COST ESTIMATING WORKSHEET

Project title: Date Prepared:

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| iD | labor hours | labor rate | total labor | Material | Supplies | equipment | travel | other Direct costs | indirect costs | reserve | estimate |
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#### Planning Forms 93

* 1. coSt baSeline

The cost baseline is a time-phased budget that is used to measure, monitor, and control cost performance for the project. It is developed by summing the costs of the project by the time period and developing a cumula- tive cost curve that can be used to track actual performance, planned performance, and the funds spent.

A project may have multiple cost baselines; for example, the project manager may keep a separate baseline for labor or procurements. The baseline may or may not include contingency funds or indirect costs. When earned value measurements are being used, the baseline may be called the performance measurement baseline.

The cost baseline can receive information from:

* + - Scope baseline
    - Cost management plan
    - Cost estimates
    - Project schedule
    - Resource management plan
    - Risk register
    - Agreements (contracts) It provides information to:
    - Project management plan
    - Risk register

The cost baseline is an output from process 7.3 Determine Budget in the *PMBOK*® *Guide* – Sixth Edition. This is developed once and is not expected to change unless there is a significant change in scope.

#### tailoring tips

Consider the following tips to help tailor the cost baseline to meet your needs:

* + - The cost baseline generally includes contingency reserve to account for known risks. It does not generally include management reserve. Management reserve is held above the cost baseline, but is considered part of the project budget. If your company policies differ, the reserve in your baseline may be different.
    - Your cost baseline may be displayed to show the funding constraints, funding requirements, or different

sources of funding.

* + - Your organization may not require a graphic display of the cost baseline; they may require a spread- sheet or internal budgeting system displays instead.

#### alignment

The cost baseline should be aligned and consistent with the following documents:

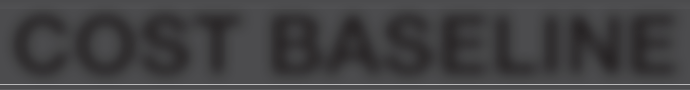
* + - Assumption log
    - Project schedule
    - Cost estimates
    - Project team assignments
    - Risk register

The cost baseline on the following page is displayed in a form called an S-curve.

# COST BASELINE

### Project Title:

**Date Prepared:**



14,000

12,000

10,000

8,000

6,000

4,000

2,000

0

1

2

3

4

5

6

7

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