

COST MANAGEMENT

A General Look

COST MANAGEMENT

A General Look

Cost Management

	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Cost Management	0	3	0	1	0

- ➔ Plan Cost Management // Planning
- ➔ Estimate Costs // Planning
- ➔ Determine Budget // Planning
- ➔ Control Costs // Monitoring and Controlling

COST MANAGEMENT

A General Look

Important Terms to Know

- Life Cycle Costing
- Value Engineering
- Cost Risk

Life Cycle Costing

→ Not only the cost of the Project but also the Product should be considered while designing the Project.

Example

1st Option:

Installing Cost: \$100,000; Maintenance Cost: \$30,000

2nd Option:

Installing Cost: \$110,000; Maintenance Cost: \$10,000

COST MANAGEMENT

A General Look

Important Terms to Know

- Life Cycle Costing
- **Value Engineering**
- Cost Risk

Value Engineering

→ Trying to complete the same Project with a less costly way without reducing the Scope

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CasePM

COST MANAGEMENT

A General Look

Important Terms to Know

- Life Cycle Costing
- Value Engineering
- Cost Risk

Cost Risk

→ Monetary risks of the Project

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COST MANAGEMENT

Plan Cost Management

COST MANAGEMENT

Plan Cost Management

Plan Cost Management

- Plan how to manage, monitor and control the cost of the Project
- The specifications about the cost estimates are determined
 - Techniques to be used for cost estimations are determined
 - The cost monitoring and controlling techniques and rules are determined
 - Reporting and documenting templates to be used are determined
 - Guidelines for developing the Project budget are determined
 - Are we going to use the organization's existing funds?
 - Rules for revising the Budget are determined

Plan Cost Management Process

What Do We Need? What Do We Use? What Do We Get?

COST MANAGEMENT

Plan Cost Management

What do we get?

- Cost Management Plan

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Plan Cost Management

What do we need?

- Project Charter

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COST MANAGEMENT

Plan Cost Management

What do we need?

- Schedule Management Plan
- Risk Management Plan

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Plan Cost Management

- Schedule Management Plan
- Risk Management Plan

} Project Management Plan

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Plan Cost Management

What do we need?

- Enterprise Environmental Factors

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Plan Cost Management

What do we need?

- Organizational Process Assets

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What do we use?

- Expert Judgment

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What do we use?

- Data Analysis techniques like Alternatives analysis, and etc.

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Plan Cost Management

What do we use?

- Meetings

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COST MANAGEMENT

Estimate Costs

COST MANAGEMENT

Estimate Costs

Estimate Costs

→ All of the costs are calculated one by one

- Cost of the Resources
- Cost of the Activities
- Cost of Quality
- Cost of Risks
- Financial Costs
- Taxes
- Overhead Costs
- Accommodation Costs
- Mobilization and Demobilization Costs
- Transportation Costs
- Health and Safety Costs

COST MANAGEMENT

Estimate Costs

Accuracy

→ The accuracy of the Estimates increases over time since more information will be known about the Project.

Less Information → Less Accuracy

Range of Estimates

- Rough Order of Magnitude (ROM) Estimate
-20 to +75 %
- Budget Estimate
-10 to +25 %
- Definitive Estimate
-5 to 10 %

Accuracy Increases

COST MANAGEMENT

Estimate Costs

Types of Costs

- Variable Costs
 - Fixed Costs
-
- Direct Costs
 - Indirect Costs

Variable Costs

➔ Cost is related to the amount of work or material

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COST MANAGEMENT

Estimate Costs

Types of Costs

- Variable Costs
- Fixed Costs
- Direct Costs
- Indirect Costs

Fixed Costs

➔ Cost is fixed, it is not related to the amount of work or material

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COST MANAGEMENT

Estimate Costs

Types of Costs

- Variable Costs
- Fixed Costs
- Direct Costs
- Indirect Costs

Direct Costs

➔ Directly related to the Project work

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COST MANAGEMENT

Estimate Costs

Types of Costs

- Variable Costs
- Fixed Costs
- Direct Costs
- Indirect Costs

Indirect Costs

➔ The costs not directly related to the Project work

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Estimate Costs Process

What Do We Need? What Do We Use? What Do We Get?

COST MANAGEMENT

Estimate Costs

What do we get?

- Cost Estimates

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COST MANAGEMENT

Estimate Costs

What do we get?

- Basis of Estimates

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COST MANAGEMENT

Estimate Costs

What do we get?

- Revisions in:
 - Assumption Log

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COST MANAGEMENT

Estimate Costs

What do we get?

- Revisions in:
 - Assumption Log
 - Lessons Learned Register

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COST MANAGEMENT

Estimate Costs

What do we get?

- Revisions in:
 - Assumption Log
 - Lessons Learned Register
 - Risk Register

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COST MANAGEMENT

Estimate Costs

- Assumption Log
- Lessons Learned Register
- Risk Register

Project
Documents

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COST MANAGEMENT

Estimate Costs

What do we need?

- Cost Management Plan

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COST MANAGEMENT

Estimate Costs

What do we need?

- Quality Management Plan

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COST MANAGEMENT

Estimate Costs

What do we need?

- Scope Baseline

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COST MANAGEMENT

Estimate Costs

- Cost Management Plan
- Quality Management Plan
- Scope Baseline

} Project
Management Plan

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COST MANAGEMENT

Estimate Costs

What do we need?

- Lessons Learned Register

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Estimate Costs

What do we need?

- Project Schedule

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COST MANAGEMENT

Estimate Costs

What do we need?

- Resource Requirements

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COST MANAGEMENT

Estimate Costs

What do we need?

- Risk Register

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COST MANAGEMENT

Estimate Costs

- Lessons Learned Register
- Project Schedule
- Resource Requirements
- Risk Register

Project
Documents

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Estimate Costs

What do we need?

- Enterprise Environmental Factors

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COST MANAGEMENT

Estimate Costs

What do we need?

- Organizational Process Assets

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Estimate Costs

What do we use?

- Expert Judgment

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Estimate Costs

What do we use?

- Analogous, Parametric, Bottom-up, Three-point Estimating

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Estimate Costs

What do we use?

- Data Analysis techniques like Alternatives Analysis, Reserve Analysis, Cost of Quality, and etc.

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COST MANAGEMENT

Estimate Costs

What do we use?

- Data Analysis techniques like Alternatives Analysis, Reserve Analysis, **Cost of Quality**, and etc.

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Estimate Costs

What do we use?

- Project Management Information System (PMIS)

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COST MANAGEMENT

Estimate Costs

What do we use?

- Decision Making methods like Voting and etc.

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COST MANAGEMENT

Determine Budget

COST MANAGEMENT

Determine Budget

Determine Budget

→ All of the costs and reserves are added together to determine the Budget

PROJECT BUDGET	\$ 100,00
MANAGEMENT RESERVE	\$ 5,00
	Quantity Unit Price Total
COST BASELINE	\$ 95,00
CONTROL ACCOUNT 1	\$ 41,00
CONTINGENCY RESERVE 1	\$ 1,00
WORK PACKAGE 1	\$ 28,00
ACTIVITY CONTINGENCY RESERVES	\$ 2,00
ACTIVITY 1	4 sqm \$ 5,00 \$ 20,00
ACTIVITY 2	3 sqm \$ 2,00 \$ 6,00
WORK PACKAGE 2	\$ 12,00
ACTIVITY CONTINGENCY RESERVES	\$ 1,00
ACTIVITY 3	2 m \$ 3,00 \$ 6,00
ACTIVITY 4	3 tons \$ 1,00 \$ 3,00
ACTIVITY 5	1 m3 \$ 2,00 \$ 2,00
CONTROL ACCOUNT 2	\$ 54,00
CONTINGENCY RESERVE 2	\$ 1,00
WORK PACKAGE 3	\$ 13,00
ACTIVITY CONTINGENCY RESERVES	\$ 1,00
ACTIVITY 6	2 tons \$ 3,00 \$ 6,00
ACTIVITY 7	3 tons \$ 2,00 \$ 6,00
WORK PACKAGE 4	\$ 40,00
ACTIVITY CONTINGENCY RESERVES	\$ 3,00
ACTIVITY 8	4 m3 \$ 1,00 \$ 4,00
ACTIVITY 9	5 m \$ 5,00 \$ 25,00
ACTIVITY 10	2 m \$ 4,00 \$ 8,00

Budget Known by the Project Manager

COST MANAGEMENT

Determine Budget

Determine Budget

→ All of the costs and reserves are added together to determine the Budget

PROJECT BUDGET			\$ 100,00
MANAGEMENT RESERVE			\$ 5,00
		Quantity	Unit Price
COST BASELINE			Total
CONTROL ACCOUNT 1			\$ 95,00
CONTINGENCY RESERVE 1			\$ 1,00
WORK PACKAGE 1			\$ 28,00
ACTIVITY CONTINGENCY RESERVES			\$ 2,00
ACTIVITY 1	4	sqm	\$ 5,00
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Budget
Known by the
Higher
Management

COST MANAGEMENT

Determine Budget

Determine Budget

→ All of the costs and reserves are added together to determine the Budget

PROJECT BUDGET	\$ 100,00
MANAGEMENT RESERVE	\$ 5,00
COST BASELINE	\$ 95,00
CONTROL ACCOUNT 1	\$ 41,00
CONTINGENCY RESERVE 1	\$ 1,00
WORK PACKAGE 1	\$ 28,00

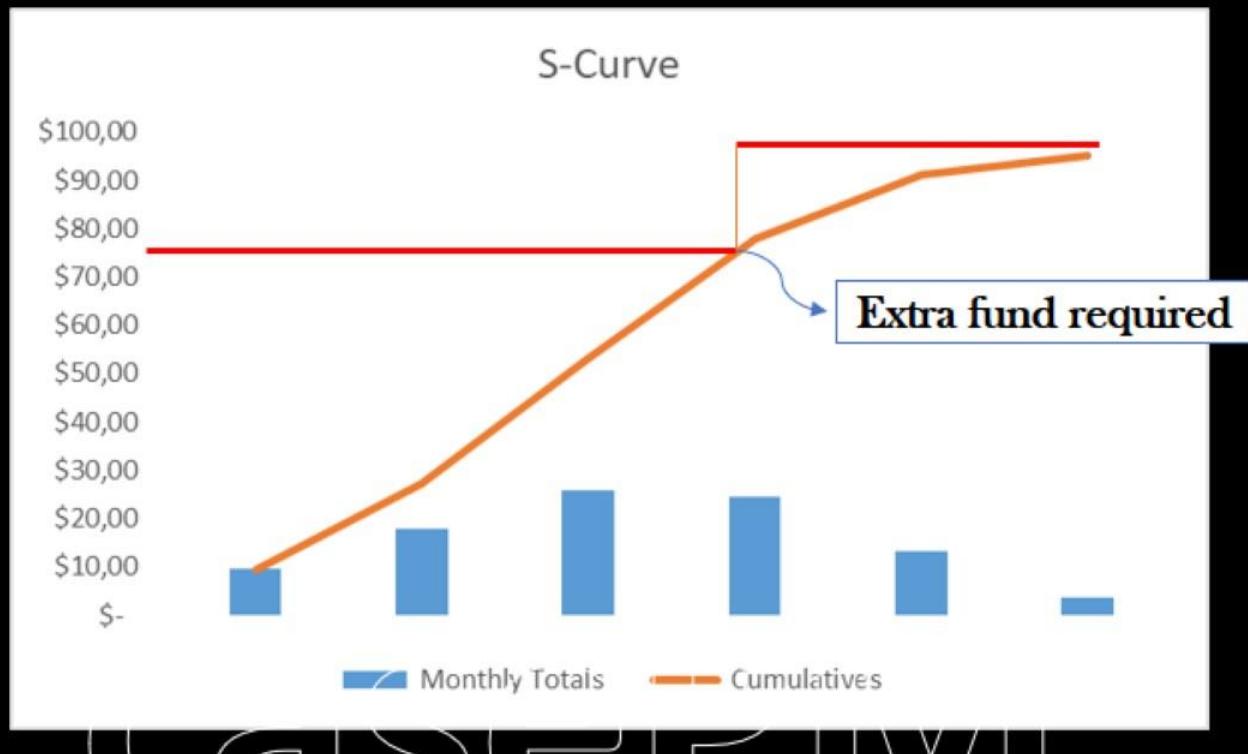
Needs to be compared by using:

- Past Similar Projects
- Expert Judgment
- Parametric Estimation

CONTINGENCY RESERVE 2	\$ 1,00
WORK PACKAGE 3	\$ 13,00
ACTIVITY CONTINGENCY RESERVES	\$ 1,00
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PROJECT BUDGET		\$ 100,00		
MANAGEMENT RESERVE		\$ 5,00		
		Quantity	Unit Price	
COST BASELINE			Total	
CONTROL ACCOUNT 1			\$ 41,00	
CONTINGENCY RESERVE 1			\$ 1,00	
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ACTIVITY 8	4	m3	\$ 1,00	\$ 4,00
ACTIVITY 9	5	m	\$ 5,00	\$ 25,00
ACTIVITY 10	2	m	\$ 4,00	\$ 8,00

		PROJECT CASH FLOW						
Planned Start	Planned Finish	March	April	May	Jun	July	Aug	
		\$ 9,48	\$ 17,73	\$ 25,98	\$ 24,65	\$ 13,40	\$ 3,75	
		\$ 5,57	\$ 5,57	\$ 11,82	\$ 12,48	\$ 4,48	\$ 1,08	
		\$ 0,17	\$ 0,17	\$ 0,17	\$ 0,17	\$ 0,17	\$ 0,17	
		\$ 5,40	\$ 5,40	\$ 7,40	\$ 7,40	\$ 2,40	\$ -	
		\$ 0,40	\$ 0,40	\$ 0,40	\$ 0,40	\$ 0,40		
1-Mar	30-Jun	\$ 5,00	\$ 5,00	\$ 5,00	\$ 5,00			
1-May	31-Jul			\$ 2,00	\$ 2,00	\$ 2,00		
		\$ -	\$ -	\$ 4,25	\$ 4,92	\$ 1,92	\$ 0,92	
				\$ 0,25	\$ 0,25	\$ 0,25	\$ 0,25	
1-May	30-Jun			\$ 3,00	\$ 3,00			
1-May	31-Jul			\$ 1,00	\$ 1,00	\$ 1,00		
1-Jun	31-Aug				\$ 0,67	\$ 0,67	\$ 0,67	
		\$ 3,92	\$ 12,17	\$ 14,17	\$ 12,17	\$ 8,92	\$ 2,67	
		\$ 0,17	\$ 0,17	\$ 0,17	\$ 0,17	\$ 0,17	\$ 0,17	
		\$ 2,25	\$ 4,25	\$ 4,25	\$ 2,25	\$ -	\$ -	
		\$ 0,25	\$ 0,25	\$ 0,25	\$ 0,25			
1-Mar	31-May	\$ 2,00	\$ 2,00	\$ 2,00				
1-Apr	30-Jun			\$ 2,00	\$ 2,00	\$ 2,00		
		\$ 1,50	\$ 7,75	\$ 9,75	\$ 9,75	\$ 8,75	\$ 2,50	
		\$ 0,50	\$ 0,50	\$ 0,50	\$ 0,50	\$ 0,50	\$ 0,50	
1-Mar	30-Jun	\$ 1,00	\$ 1,00	\$ 1,00	\$ 1,00			
1-Apr	31-Jul			\$ 6,25	\$ 6,25	\$ 6,25		
1-May	31-Aug			\$ 2,00	\$ 2,00	\$ 2,00	\$ 2,00	
		\$ 9,48	\$ 17,73	\$ 25,98	\$ 24,65	\$ 13,40	\$ 3,75	
		\$ 9,48	\$ 27,22	\$ 53,20	\$ 77,85	\$ 91,25	\$ 95,00	
Cumulative Values								



	March	April	May	June	July	Aug
Monthly Totals	\$ 9,48	\$ 17,73	\$ 25,98	\$ 24,65	\$ 13,40	\$ 3,75
Cumulatives	\$ 9,48	\$ 27,22	\$ 53,20	\$ 77,85	\$ 91,25	\$ 95,00

COST MANAGEMENT

Determine Budget

Determine Budget

Before finalizing the Budget, we need to be sure about if it satisfies the constraints in the Project Charter!

Ex: You have calculated the Budget and confirmed your calculations by using Expert Judgment and Parametric Estimation. So, you know that all of the calculations are reasonable and the Budget you prepared is reliable. But there is a problem; in the Project Charter, the Budget of the Project is determined to be \$100,000, but according to your calculations the Project Budget should be \$120,000. What should you do?

→ You need to explain the condition to the upper management, and **suggest your solutions.**

Determine Budget Process

What Do We Need? What Do We Use? What Do We Get?

COST MANAGEMENT

Determine Budget

What do we get?

- Cost Baseline

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COST MANAGEMENT

Determine Budget

What do we get?

- Project Funding Requirements

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COST MANAGEMENT

Determine Budget

What do we get?

- Revisions in:
 - Cost Estimates

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COST MANAGEMENT

Determine Budget

What do we get?

- Revisions in:
 - Cost Estimates
 - Project Schedule

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COST MANAGEMENT

Determine Budget

What do we get?

- Revisions in:
 - Cost Estimates
 - Project Schedule
 - Risk Register

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COST MANAGEMENT

Determine Budget

- Cost Estimates
- Project Schedule
- Risk Register

Project
Documents

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COST MANAGEMENT

Determine Budget

What do we need?

- Cost Management Plan

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COST MANAGEMENT

Determine Budget

What do we need?

- Resource Management Plan

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COST MANAGEMENT

Determine Budget

What do we need?

- Scope Baseline

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COST MANAGEMENT

Determine Budget

- Cost Management Plan
- Resource Management Plan
- Scope Baseline

} Project
Management
Plan

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COST MANAGEMENT

Determine Budget

What do we need?

- Cost Estimates

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COST MANAGEMENT

Determine Budget

What do we need?

- Basis of Estimates

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COST MANAGEMENT

Determine Budget

What do we need?

- Project Schedule

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COST MANAGEMENT

Determine Budget

What do we need?

- Risk Register

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COST MANAGEMENT

Determine Budget

- Cost Estimates
- Basis of Estimates
- Project Schedule
- Risk Register



Project
Documents

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COST MANAGEMENT

Determine Budget

What do we need?

- Business Case

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COST MANAGEMENT

Determine Budget

What do we need?

- Benefits Management Plan

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COST MANAGEMENT

Determine Budget

- Business Case
- Benefits Management Plan

} Business Documents

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COST MANAGEMENT

Determine Budget

What do we need?

- Agreements

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COST MANAGEMENT

Determine Budget

What do we need?

- Enterprise Environmental Factors

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COST MANAGEMENT

Determine Budget

What do we need?

- Organizational Process Assets

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COST MANAGEMENT

Determine Budget

What do we use?

- Expert Judgment

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COST MANAGEMENT

Determine Budget

What do we use?

- Cost Aggregation

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COST MANAGEMENT

Determine Budget

What do we use?

- Data Analysis techniques like Reserve Analysis, and etc.

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COST MANAGEMENT

Determine Budget

What do we use?

- Historical Information Review

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COST MANAGEMENT

Determine Budget

What do we use?

- Funding Limit Reconciliation

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COST MANAGEMENT

Determine Budget

What do we use?

- Financing

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COST MANAGEMENT

Earned Value Analysis // Acronyms, Terms and Formulas

COST MANAGEMENT

Earned Value Analysis

Introduction

- ➔ Acronyms and Terms
- ➔ Formulas
- ➔ EVM Basic Principles
- ➔ EVM in Deep
- ➔ Mini-quiz

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COST MANAGEMENT

Earned Value Analysis

Acronyms and Terms

PV: Planned Value

EV: Earned Value

AC: Actual Cost (Total Cost)

BAC: Budget at Completion

EAC: Estimate at Completion

ETC: Estimate to Complete

VAC: Variance at Completion

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COST MANAGEMENT

Earned Value Analysis

Formulas

CV (Cost Variance):

$$CV = EV - AC$$

SV (Schedule Variance):

$$SV = EV - PV$$

CPI (Cost Performance Index):

$$CPI = EV / AC$$

SPI (Schedule Performance Index):

$$SPI = EV / PV$$

EAC (Estimate at Completion):

- 1) $EAC = BAC / CPI$
- 2) $EAC = AC + (BAC - EV)$
- 3) $EAC = AC + (BAC-EV)/(CPI \times SPI)$
- 4) $EAC = AC + \text{New Cost Estimation}$

TCPI (To-Complete Performance Index)

$$TCPI = (BAC - EV) / (BAC - AC)$$

ETC (Estimate to Complete)

$$ETC = EAC - AC$$

We can re-estimate ETC!

VAC (Variance at Completion)

$$VAC = BAC - EAC$$

COST MANAGEMENT

Earned Value Analysis // Basic Principles

COST MANAGEMENT

Earned Value Analysis / Basic Principles

Example: Pipeco Incorporated has been awarded a piping project to install 1,000 meters of pipeline in 100 days with a cost of \$100,000. Today is the 30th day of the project, and Pipeco has installed 400 meters of piping work up to now. Also, the report says \$20,000 has been spent until now. Let's do the EVM calculations.



- Assume the company simply prepared the schedule to install 10 meters each day
 - Pipeco will spend \$1,000 each day
 - Scope Baseline
 - Schedule Baseline
 - Cost Baseline
- If we spend \$800 each day this is good, since it is less than \$1,000.
→ If we install 8.00 meters of pipeline each day, this is bad, since it is less than 10 meters.
- Performance Measurement Baseline**

COST MANAGEMENT

Earned Value Analysis / Basic Principles

Example: Pipeco Incorporated has been awarded a piping project to install 1,000 meters of pipeline in 100 days with a cost of \$100,000. Today is the 30th day of the project, and Pipeco has installed 400 meters of piping work up to now. Also, the report says \$20,000 has been spent until now. Let's do the EVM calculations.



- Assume the company simply prepared the schedule to install 10 meters each day
- Pipeco will spend \$1,000 each day

\$100,000	= Budget	→ BAC
\$30,000	= Planned Value	→ PV
\$20,000	= Actual Cost	→ AC
\$40,000	= Earned Value	→ EV

COST MANAGEMENT

Earned Value Analysis / Basic Principles

Example: Pipeco Incorporated has been awarded a piping project to install 1,000 meters of pipeline in 100 days with a cost of \$100,000. Today is the 30th day of the project, and Pipeco has installed 400 meters of piping work up to now. Also, the report says \$20,000 has been spent until now. Let's do the EVM calculations.



$$\begin{aligned} \text{BAC} &= \$100,000; & \text{PV} &= \$30,000 \\ \text{AC} &= \$20,000; & \text{EV} &= \$40,000 \end{aligned}$$

- 1) Cost Variance (CV): $\text{CV} = \text{EV} - \text{AC}$
 $= \$40,000 - \$20,000$
 $= \$20,000$
 $\text{CV} > 0 \rightarrow \text{GOOD!}$

COST MANAGEMENT

Earned Value Analysis / Basic Principles

Example: Pipeco Incorporated has been awarded a piping project to install 1,000 meters of pipeline in 100 days with a cost of \$100,000. Today is the 30th day of the project, and Pipeco has installed 400 meters of piping work up to now. Also, the report says \$20,000 has been spent until now. Let's do the EVM calculations.



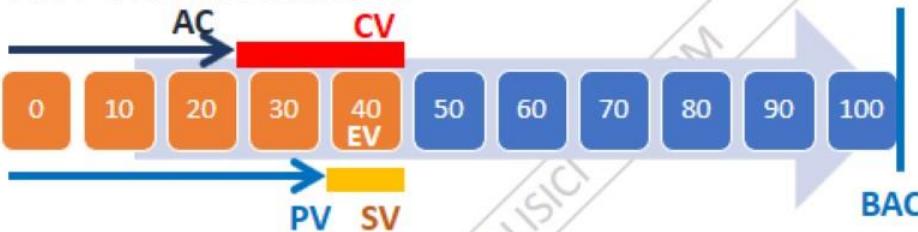
$$\begin{array}{ll} \text{BAC} = \$100,000; & \text{PV} = \$30,000 \\ \text{AC} = \$20,000; & \text{EV} = \$40,000 \end{array}$$

2) Schedule Variance (SV): $\text{SV} = \text{EV} - \text{PV}$
 $= \$40,000 - 30,000$
 $= \$10,000$
 $\text{SV} > 0 \rightarrow \text{GOOD!}$

COST MANAGEMENT

Earned Value Analysis / Basic Principles

Example: Pipeco Incorporated has been awarded a piping project to install 1,000 meters of pipeline in 100 days with a cost of \$100,000. Today is the 30th day of the project, and Pipeco has installed 400 meters of piping work up to now. Also, the report says \$20,000 has been spent until now. Let's do the EVM calculations.



$$\begin{array}{ll} \text{BAC} = \$100,000; & \text{PV} = \$30,000 \\ \text{AC} = \$20,000; & \text{EV} = \$40,000 \end{array}$$

- 3) Cost Performance Index (CPI): $\text{CPI} = \text{EV} / \text{AC}$
= $\$40,000 / \$20,000$
= 2
CPI > 1 → GOOD!

COST MANAGEMENT

Earned Value Analysis / Basic Principles

Example: Pipeco Incorporated has been awarded a piping project to install 1,000 meters of pipeline in 100 days with a cost of \$100,000. Today is the 30th day of the project, and Pipeco has installed 400 meters of piping work up to now. Also, the report says \$20,000 has been spent until now. Let's do the EVM calculations.



$$\begin{array}{ll} \text{BAC} = \$100,000; & \text{PV} = \$30,000 \\ \text{AC} = \$20,000; & \text{EV} = \$40,000 \end{array}$$

4) Schedule Performance Index: $\text{SPI} = \frac{\text{EV}}{\text{PV}}$
= $\frac{\$40,000}{\$30,000}$
= 1.33
SPI > 1 ➔ GOOD!

COST MANAGEMENT

Earned Value Analysis / Basic Principles

Important Results:

Cost Variance ($CV = EV - AC$)

$CV > 0 \rightarrow$ Good (Under budget)

$CV = 0 \rightarrow$ Good (Just within the limits)

$CV < 0 \rightarrow$ Bad (Over budget)

Schedule Variance ($SV = EV - PV$)

$SV > 0 \rightarrow$ Good (Ahead of schedule)

$SV = 0 \rightarrow$ Good (Just as planned)

$SV < 0 \rightarrow$ Bad (Behind of schedule)

Cost Performance Index ($CPI = EV / AC$)

$CPI > 1 \rightarrow$ Good (Under budget)

$CPI = 1 \rightarrow$ Good (Just within the limits)

$CPI < 1 \rightarrow$ Bad (Over budget)

Schedule Performance Index ($SPI = EV / PV$)

$SPI > 1 \rightarrow$ Good (Ahead of schedule)

$SPI = 1 \rightarrow$ Good (Just as planned)

$SPI < 1 \rightarrow$ Bad (Behind of schedule)

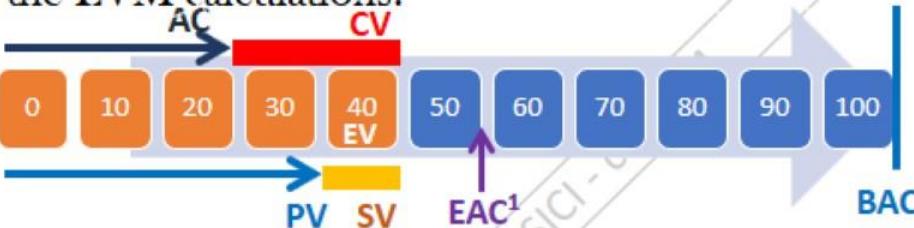
COST MANAGEMENT

Earned Value Analysis // EVM in Deep

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$$BAC = \$100,000;$$

$$AC = \$20,000;$$

$$PV = \$30,000;$$

$$EV = \$40,000;$$

$$CPI = 2$$

$$SPI = 1.33$$

Assuming you will continue at the same cost spending rate, calculate the estimated total cost at the end of the project.

Estimate at Completion (EAC)

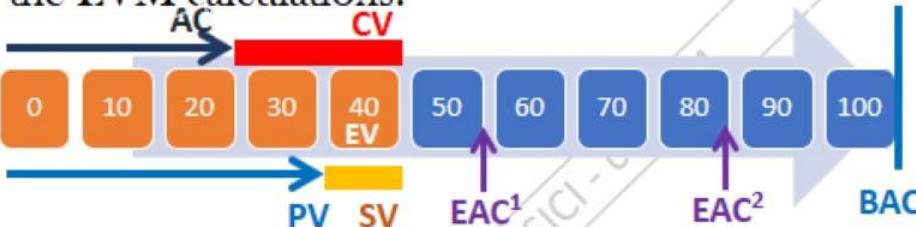
$$\begin{aligned} EAC &= BAC / CPI \\ &= \$100,000 / 2 \\ &= \$ 50,000 \end{aligned}$$

→ Formula 1

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$$BAC = \$100,000;$$

$$AC = \$20,000;$$

$$PV = \$30,000;$$

$$EV = \$40,000;$$

$$CPI = 2$$

$$SPI = 1.33$$

Assuming from now on, the spending rate will be as it is planned at the beginning, calculate the estimated total cost at the end of the project.

Estimate at Completion (EAC)

$$EAC = AC + (BAC - EV) \quad \rightarrow \text{Formula 2}$$

$$= \$20,000 + (\$100,000 - \$40,000)$$

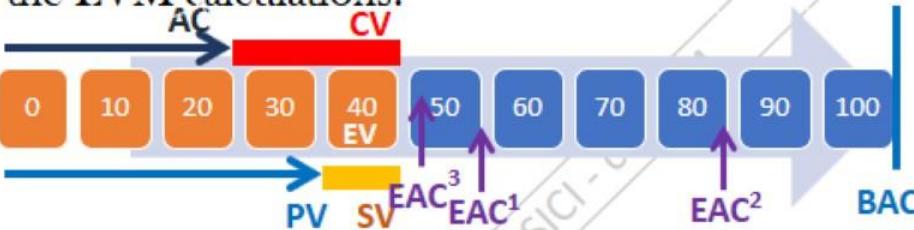
$$= \$20,000 + \$60,000$$

$$= \$80,000$$

COST MANAGEMENT

Earned Value Analysis // EVM in Deep

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Assuming from now on, future spending will be affected by both actual schedule performance and actual cost performance until now, calculate the estimated total cost at the end of the project.

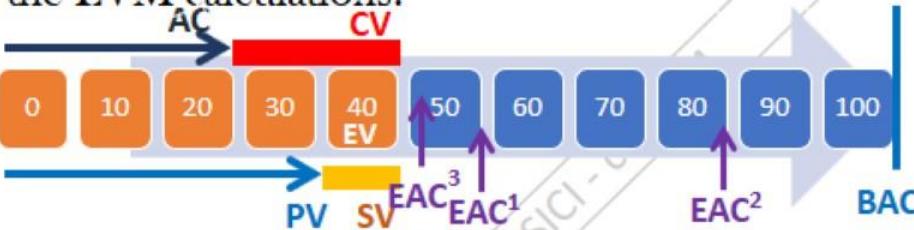
Estimate at Completion (EAC)

$$\begin{aligned} \text{EAC} &= \text{AC} + \frac{(\text{BAC} - \text{EV})}{(\text{SPI} \times \text{CPI})} \quad \rightarrow \text{Formula 3} \\ &= \$20,000 + \frac{(\$100,000 - 40,000)}{(1.33 \times 2)} \\ &= \$42,556.39 \end{aligned}$$

COST MANAGEMENT

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Assume we have re-estimated the future cost from now on as \$50,000, calculate the estimated total cost at the end of the project.

Estimate at Completion (EAC)

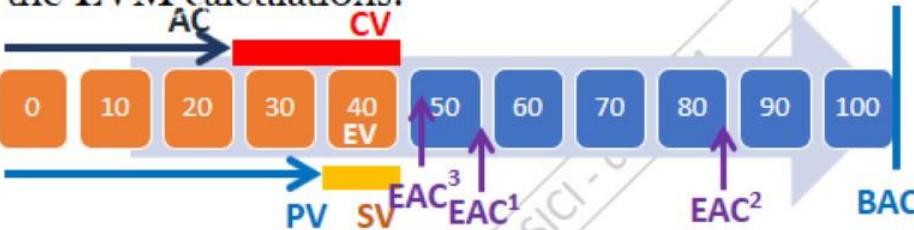
$$\text{EAC} = \text{AC} + \text{New Cost Estimation}$$

$$\begin{aligned} &= \$20,000 + \$50,000 \\ &= \$70,000 \end{aligned}$$

COST MANAGEMENT

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$$BAC = \$100,000;$$

$$AC = \$20,000;$$

$$PV = \$30,000;$$

$$EV = \$40,000;$$

$$CPI = 2$$

$$SPI = 1.33$$

If we want to complete the project with a cost equal to the budget, what should be the remaining CPI?

To Complete Performance Index (TCPI)

$$TCPI = (BAC - EV) / (BAC - AC)$$

$$= (\$100,000 - \$40,000) / (\$100,000 - \$20,000)$$

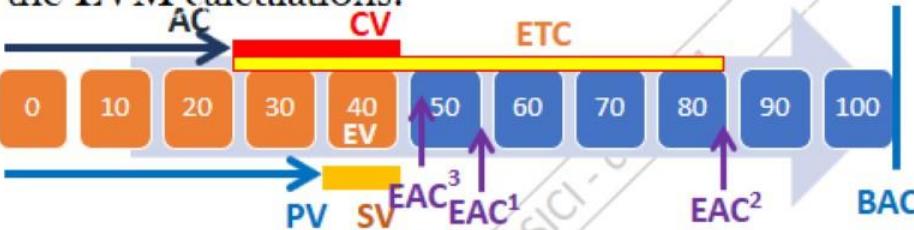
$$= \$60,000 / \$80,000$$

$$= 0.75$$

COST MANAGEMENT

Earned Value Analysis // EVM in Deep

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If EAC=\$80,000, how much more should we spend to complete the project?

Estimate to Complete (ETC)

$$\text{ETC} = \text{EAC} - \text{AC}$$

$$\begin{aligned} &= \$80,000 - \$20,000 \\ &= \$60,000 \end{aligned}$$

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If EAC=\$80,000, how much under or over budget will the estimation be when we complete the Project?

Variance at Completion (VAC)

$$\text{VAC} = \text{BAC} - \text{EAC}$$

$$\begin{aligned} &= \$100,000 - \$80,000 \\ &= \$20,000 \end{aligned}$$

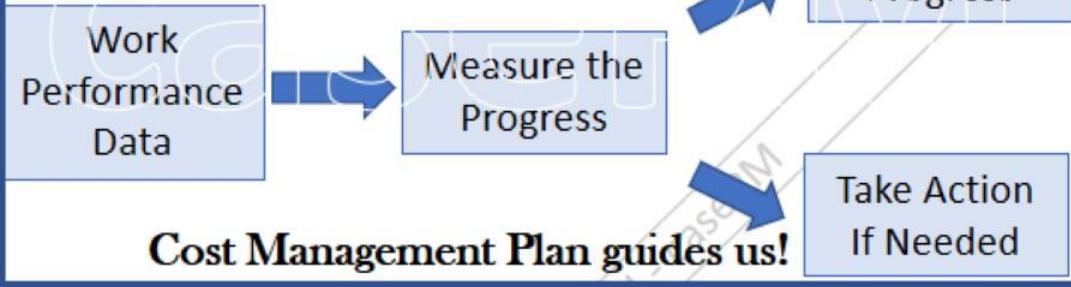
COST MANAGEMENT

Control Costs

COST MANAGEMENT

Control Costs

Control Costs Process



- Use the collected data
- Earned Value Analysis
- Variance Analysis
- Trend Analysis
- To Complete Performance Index
- Reserve Analysis
- Progress Reports are created
- Take Corrective Actions
- Take Preventive Actions

Change Request
is needed!

Control Costs Process

What Do We Need? What Do We Use? What Do We Get?

COST MANAGEMENT

Control Costs

What do we get?

- Work Performance Information

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COST MANAGEMENT

Control Costs

What do we get?

- Cost Forecasts

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COST MANAGEMENT

Control Costs

What do we get?

- Change Requests

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COST MANAGEMENT

Control Costs

What do we get?

- Revisions in:

- Cost Management Plan
- Cost Baseline
- Performance Measurement Baseline
- Assumption Log
- Cost Estimates
- Basis of Estimates
- Risk Register
- Lessons Learned Register

Project
Management
Plan

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COST MANAGEMENT

Control Costs

What do we need?

- Cost Management Plan

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COST MANAGEMENT

Control Costs

What do we need?

- Cost Baseline

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COST MANAGEMENT

Control Costs

What do we need?

- Performance Measurement Baseline

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COST MANAGEMENT

Control Costs

What do we need?

- Work Performance Data

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COST MANAGEMENT

Control Costs

What do we need?

- Project Funding Requirements

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COST MANAGEMENT

Control Costs

What do we need?

- Lessons Learned Register

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COST MANAGEMENT

Control Costs

What do we need?

- Organizational Process Assets

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COST MANAGEMENT

Control Costs

What do we use?

- Data Analysis techniques like Earned Value Analysis, Variance Analysis, Trend Analysis, Reserve Analysis...
- To Complete Performance Index

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COST MANAGEMENT

Control Costs

What do we use?

- Project Management Information System (PMIS)

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COST MANAGEMENT

Control Costs

What do we use?

- Expert Judgment

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COST MANAGEMENT

Agile Considerations

COST MANAGEMENT

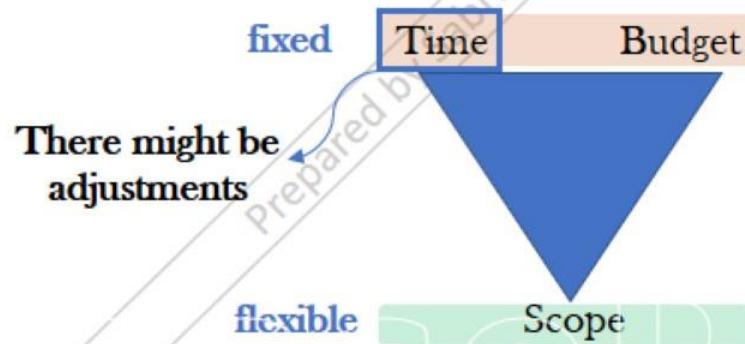
Agile Considerations

Agile Cost Management

- There are lots of changes
- There are lots of uncertainties
- Detailed cost calculations are done only in a just-in-time manner.

Light Weight
Estimation Methods
are used

High-variability Project with a Strict Budget



COST MANAGEMENT

Tailoring Cost Management

COST MANAGEMENT

Tailoring Cost Management

Tailoring Considerations for Cost Management

While determining the Cost Management processes to be used in the Project:

- We need to consider if there are any formal organizational knowledge management processes, we need to follow
- We need to know if there are existing processes related to cost estimating and budgeting.
- We need to consider the organizational processes related to Earned Value Management
- We need to consider if we are going to use agile approach or not
- We need to consider the organizational governance