Project Risk Management

Based on PMBOK 5th Edition

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Project Risk Management

- The processes of conducting risk management planning, identification, analysis, response planning and monitoring and control on a project
- Objectives are to increase the probability and impact of positive events and decrease the probability and impact of negative events In the project

TAKING RISK

There's a fine line between taking a calculated risk and doing something dumb.

11.1 Plan Risk Management

- The process of defining how to conduct risk management activities for a project
- Important to provide sufficient resources and time for risk management activities, and to establish an agreed upon basis for evaluating risk.

Plan Risk Management: Inputs (1)

1. Project Management Plan
2. Project Charter
3. Stakeholder Register
4. Enterprise Environmental Factors

Plan Risk Management: Inputs (2)

5. Organizational Process Assets, include but not limited to:
   - Risk Categories
   - Common definitions of concepts and terms
   - Risk statement formats
   - Standard templates
   - Roles and responsibilities
   - Authority levels for decision making
   - Lessons learned

Plan Risk Management: T & T

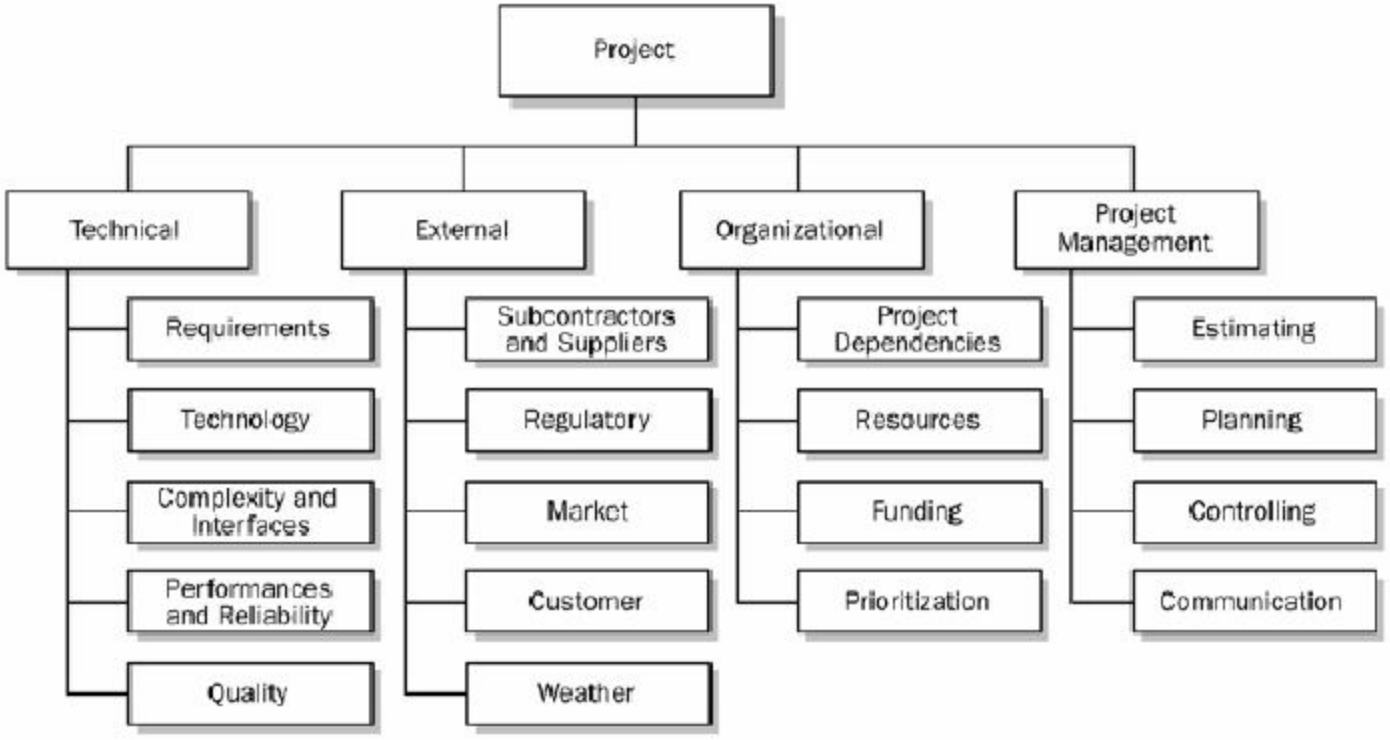
1. Analytical Techniques
2. Expert Judgment
3. Meetings

Plan Risk Management: Outputs

1. Risk Management Plan
   - Methodology
   - Roles and Responsibilities
   - Budgeting
   - Timing
   - Risk Categories
   - Definition of probability and impact
   - Probability and Impact Matrix
   - Revised stakeholders' tolerance
   - Reporting format
   - Tracking

CA Risk Mgmt Plan Outline

Risk Categories



The Risk Breakdown Structure (RBS) lists the categories and sub-categories within which risks may arise for a typical project. Different RBSs will be appropriate for different types of projects and different types of organizations. One benefit of this approach is to remind participants in a risk identification exercise of the many sources from which project risk may arise.

Definition of Risk Probability and Impact

Defined Conditions for Impact Scales of a Risk on Major Project Objectives (Examples are shown for negative impacts only)					
	Relative or numerical scales are shown				
Project Objective	Very low /.05	Low /.10	Moderate /.20	High /.40	Very high /.80
Cost	Insignificant cost increase	<10% cost increase	10-20% cost increase	20-40% cost increase	>40% cost increase
Time	Insignificant time increase	<5% time increase	5-10% time increase	10-20% time increase	>20% time increase
Scope	Scope decrease barely noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item is effectively useless
Quality	Quality degradation barely noticeable	Only very demanding applications are affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item is effectively useless
This table presents examples of risk impact definitions for four different project objectives. They should be tailored in the Risk Management Planning process to the individual project and to the organization's risk thresholds. Impact definitions can be developed for opportunities in a similar way.					

Quiz

“ An uncommon state of nature, characterized by the absence of any information related to a desired outcome”, is a common definition for:

A. An act of God

B. An amount at stake

C. Uncertainty

D. Risk aversion

Answer: C

11.2 Identify Risks

Identify Risks is the process of determining which risks may affect the project and documenting their characteristics

Identify Risks: Inputs (1)

1. Risk Management Plan
2. Cost management Plan
3. Schedule Management Plan
4. Quality Management Plan
5. Human Resource Management Plan
6. Scope Baseline

Identify Risks: Inputs (2)

7. Activity Cost Estimates
8. Activity Duration Estimates
9. Stakeholder Register
10. Project Documents
11. Procurement Documents
12. Enterprise Environmental Factors
13. Organizational Process Assets

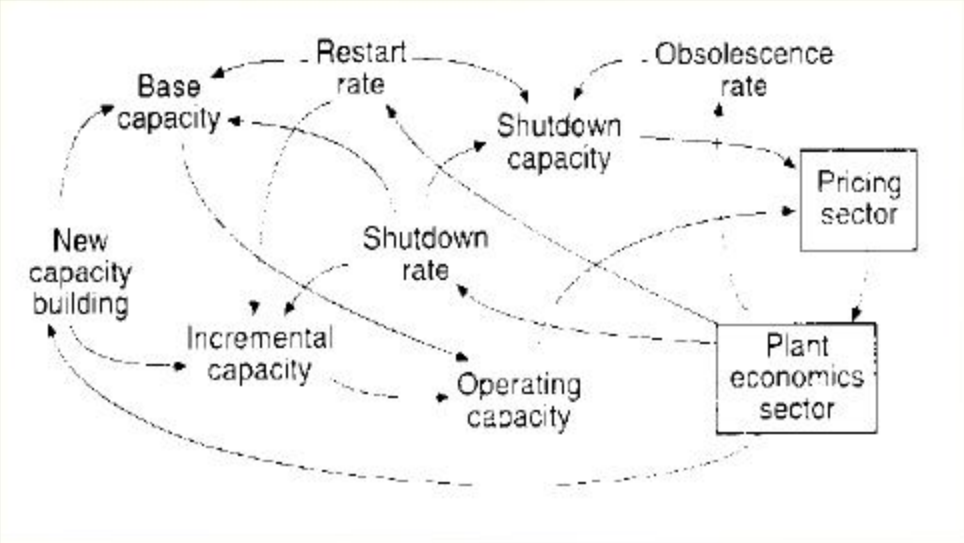
Identify Risks: T & T (1)

1. Documentation Reviews
2. Information Gathering Techniques
   - Brainstorming
   - Delphi Technique
   - Interviewing
   - Root Cause Analysis
3. Checklist Analysis

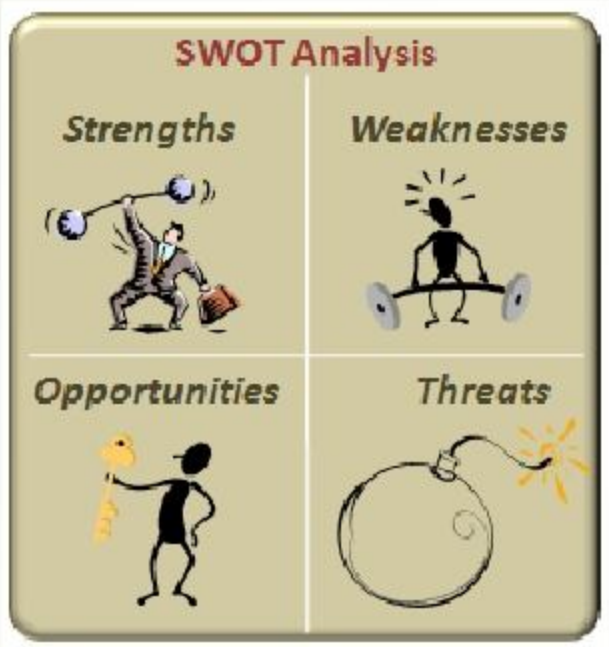
Identify Risks: T & T (2)

4. Assumptions Analysis
5. Diagramming Techniques
   - Cause-and-effect diagrams
   - System or process flow charts
   - Influence diagrams
6. SWOT Analysis (Strength, Weakness, Opportunities, Threats)
7. Expert Judgment

Influence Diagram



SWOT Analysis



Identify Risks: Outputs

1. Risk Register

PARTNERSHIP RISK REGISTER

Partnership Name: Children & Young People's Partnership Trust
Prepared by: Operational Group
Date Prepared: September 2007
Version No: 1

Risk No	Date Identified	Risk Description	Likelihood	Impact	Risk Score (LxI)	Risk Class	Control Measures	Target Risk Score	Target Date	Risk Owner
1	Sep-07	Organisational change within several partner organisations could lead to disengagement in the work of the partnership resulting in non-achievement of objectives	4	3	12	High	Scoping change in partner organisations. Understanding agendas in different organisations. Alert to disengagement. Proactive contact to re-engage people.	4 x 2	Apr-08	Lisa Christensen
2	Sep-07	Lack of coordinated approach to project development leading to disjointed and unconnected activities that collectively do not achieve the objectives of the strategy	4	3	12	High	Clear accountability. Clear reporting, especially where there are difficulties. Formal performance management of projects needs to be put into place.	2 x 2	Apr-08	Tom Savory
3	Sep-07	Lack of partnership funding and resources to deliver the ambition of the partnership taking account of future service demand and demographic growth, places financial pressure on partners to increase contributions or a reduction in service provision	3	4	12	High	Clear focus on priorities. Excellent financial management & budgeting control. Flexibility of response to changing circumstances. Set up of sub group to focus on this area.	3 x 3	Mar-08	Rosalie Monbiot
4	Sep-07	Changes of political leadership from partner organisations may lead to a change of direction from existing priorities	3	3	9	Medium	Ensure clear rationale for priorities. Focus on outcomes. Focus on what works/evidence.	3 x 2	Apr-08	Rosalie Monbiot
5	Sep-07	Lack of representation of the right people to attend at the right level to make decisions for their organisations	3	3	9	Medium	Membership of different elements of partnership reviewed. Review level of active attendance. Strong communication between partners.	1 x 3	Mar-08	Rosalie Monbiot

Quiz

Risk tolerances are determined in order to help:

A. The team rank the project risks

B. The project manager estimate the project

C. The team schedule the project

D. Management know how other managers will act to the project

Answer: A

11.3 Perform Qualitative Risk Analysis

The process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact

Perform Qualitative Risk Analysis: Inputs

1. Risk Management Plan
2. Scope Baseline
3. Risk Register
4. Enterprise Environmental Factors
5. Organizational Process Assets

Perform Qualitative Risk Analysis: Tools & Techniques

1. Probability and Impact Matrix

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Severe
Almost certain	M	H	H	E	E
Likely	M	M	H	H	E
Possible	L	M	M	H	E
Unlikely	L	M	M	M	H
Rare	L	L	M	M	H

Perform Qualitative Risk Analysis: T & T

2. Risk Probability and Impact Assessment
3. Risk Data Quality Assessment
4. Risk Categorization
5. Risk Urgency Assessment
6. Expert Judgment

Perform Qualitative Risk Analysis: Outputs

1. Risk Register Updates
   - Relative ranking or priority list of project risks
   - Risks grouped by categories
   - Causes of risk or project areas requiring particular attention
   - List of risks requiring response in the near-term
   - List of risks for additional analysis and response
   - Watch lists of low-priority risks
   - Trends in qualitative risk analysis results

11.4 Perform Quantitative Risk Analysis

- The process of numerically analyzing the effect of identified risks on overall project objectives.
- Quantitative analysis is performed on risks that have been prioritized by the qualitative risk analysis process as potentially and substantially impacting the project's competing demands.

Perform Quantitative Risk Analysis: Inputs

1. Risk Management Plan
2. Cost Management Plan
3. Schedule Management Plan
4. Risk Register
5. Enterprise Environmental Factors
6. Organizational Process Assets

Perform Quantitative Risk Analysis: Tools & Techniques (1)

1. Data Gathering and Representation

   Techniques

   - Interviewing
   - Probability Distribution

Range of Project Cost Estimates

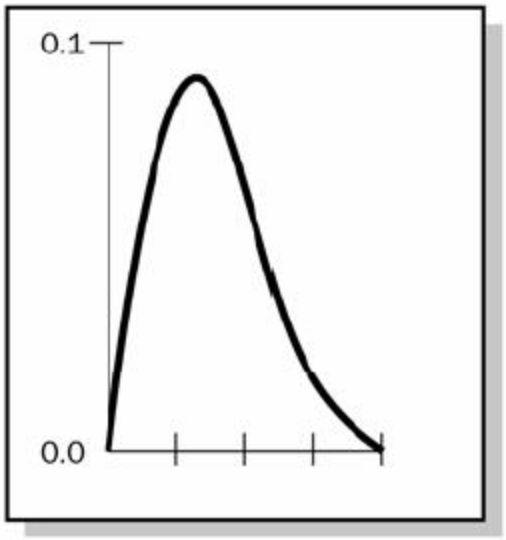
WBS Element	Low	Most Likely	High
Design	$4M	$6M	$10M
Build	$16M	$20M	$35M
Test	$11M	$15M	$23M
Total Project	$31M	$41M	$68M

Interviewing relevant stakeholders helps determine the three-point estimates for each WBS element for triangular, beta or other distributions. In this example, the likelihood of completing the project at or below the most likely estimate of $41 million is relatively small as shown in the simulation results in Figure 11-16 (Cost Risk Simulation Results).

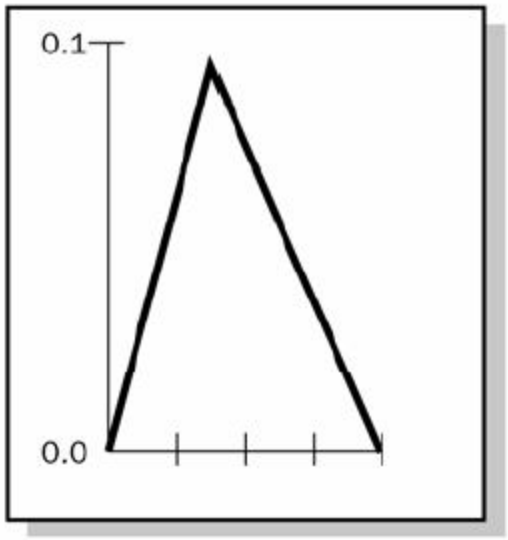
Range of Project Cost Estimates Collected During the Risk Interview

Probability Distribution

Beta Distribution



Triangular Distribution

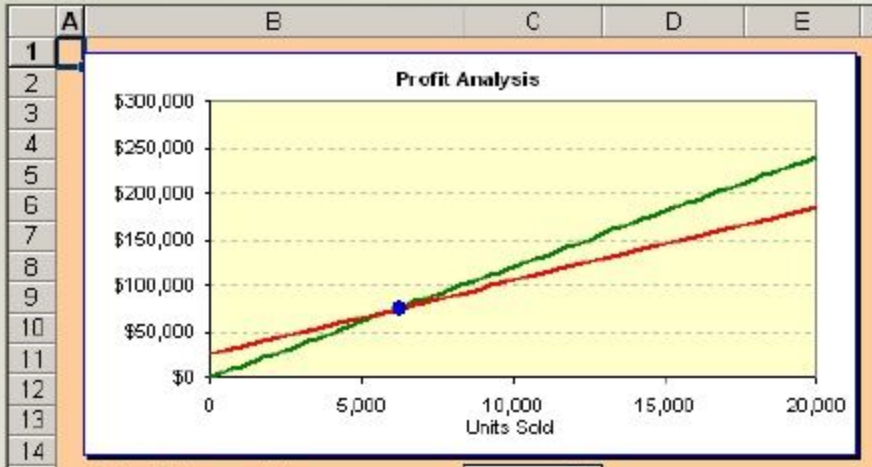


Beta and triangular distributions are frequently used in quantitative risk analysis. The data shown in the figure on the left (Beta Distribution) is one example of a family of such distributions determined by two "shape parameters". Other commonly used distributions include the uniform, normal and lognormal. In these charts the horizontal (X) axes represent possible values of time or cost and the vertical (Y) axes represent relative likelihood.

Perform Quantitative Risk Analysis: Tools & Techniques (2)

2. Quantitative Risk Analysis and Modeling Techniques
   - Sensitivity analysis
   - Expected monetary value analysis
   - Modeling and Simulation
3. Expert Judgment

Sample Sensitivity Analysis

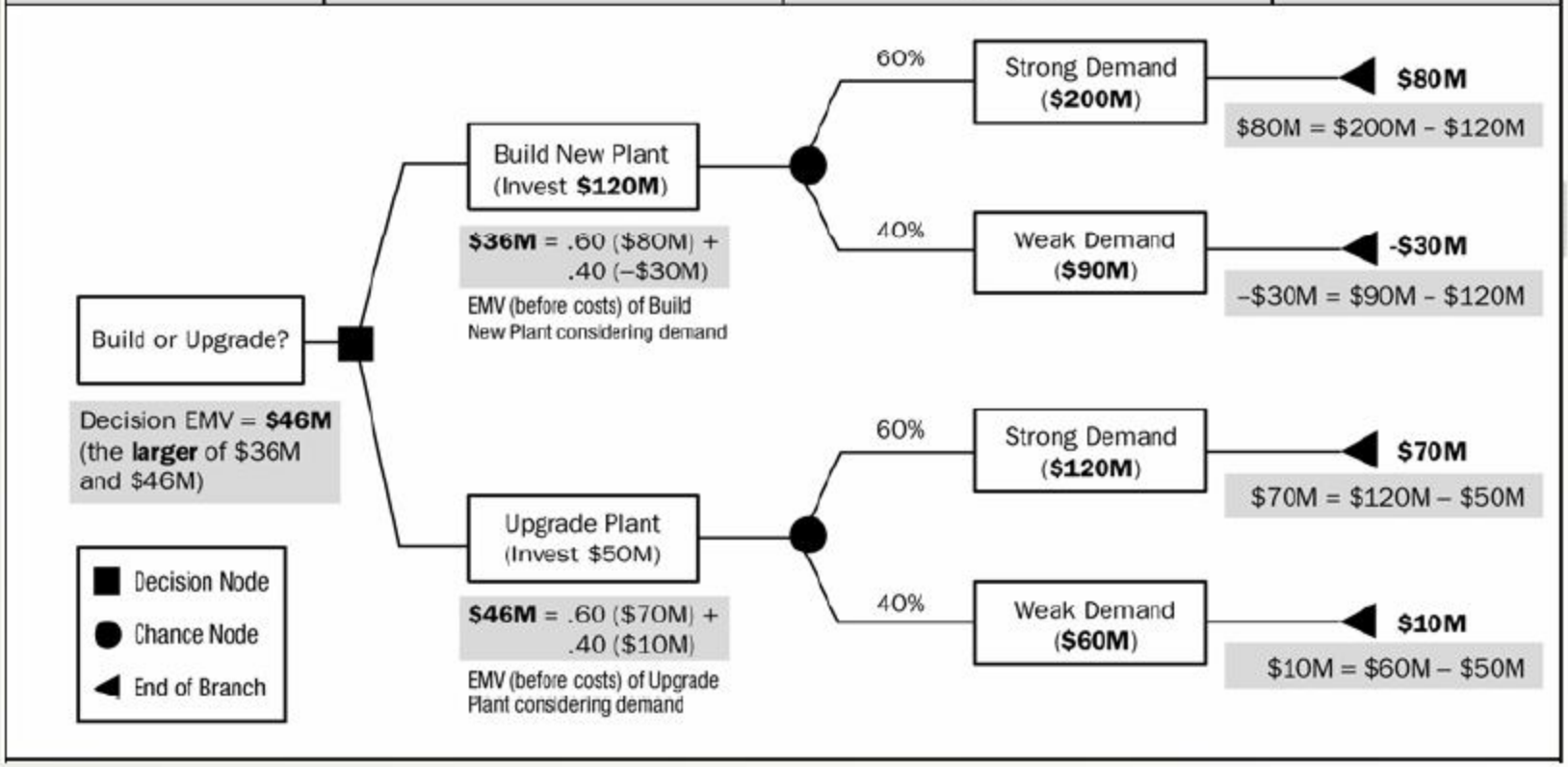


Sales Price per Unit:	$12
Manufacturing Cost per Unit:	$8
Fixed Monthly Expense:	$25,000
Break-Even Point (Units Sold):	6,250
Revenue at Break-Even Point:	$75,000

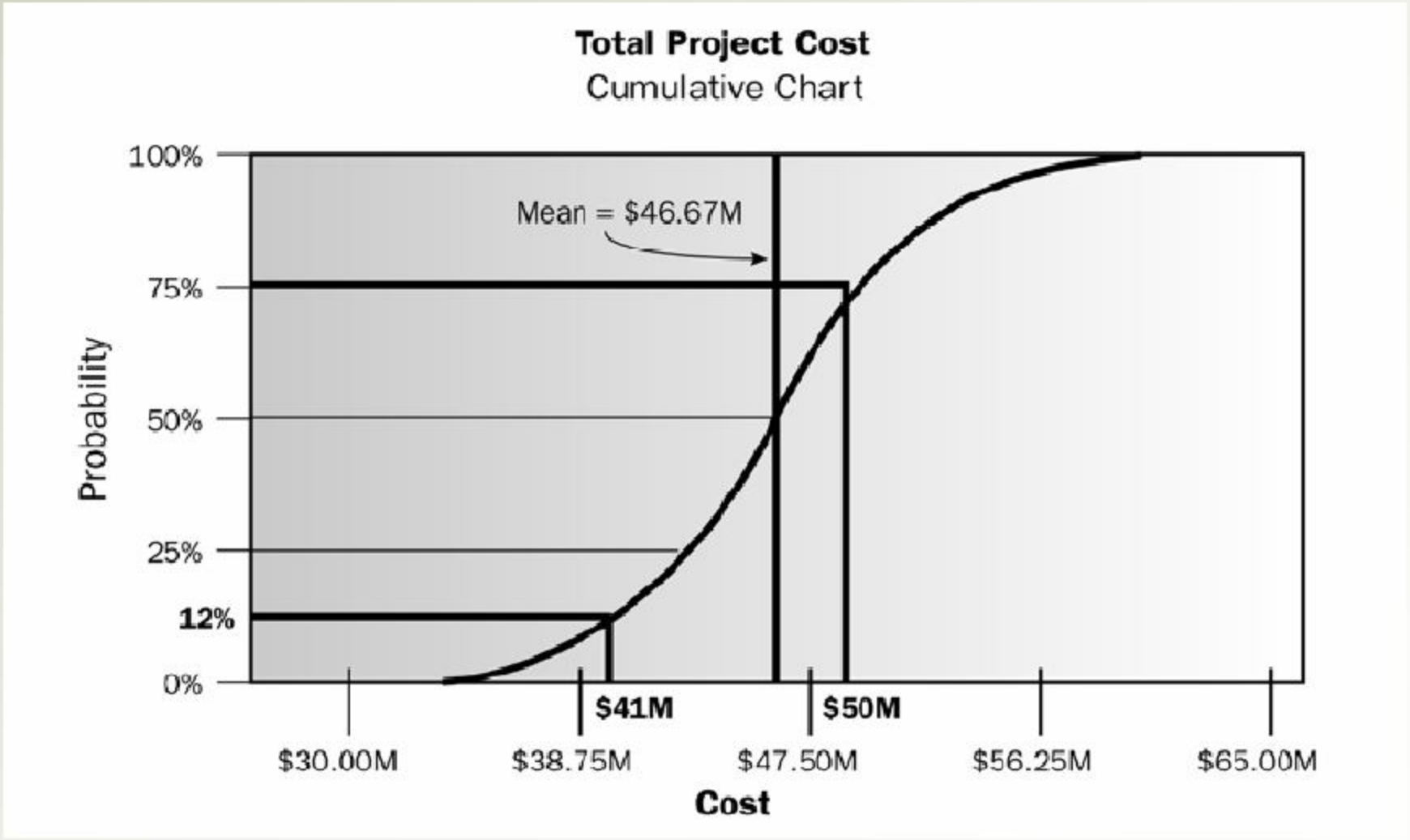
Units Sold	Revenue	Expense
0	$0	$25,000
500	6,000	29,000
1,000	12,000	33,000
1,500	18,000	37,000
2,000	24,000	41,000
2,500	30,000	45,000
3,000	36,000	49,000
3,500	42,000	53,000
4,000	48,000	57,000
4,500	54,000	61,000
5,000	60,000	65,000
5,500	66,000	69,000
6,000	72,000	73,000
6,500	78,000	77,000
7,000	84,000	81,000
7,500	90,000	85,000
8,000	96,000	89,000
8,500	102,000	93,000
9,000	108,000	97,000
9,500	114,000	101,000
10,000	120,000	105,000
10,500	126,000	109,000
11,000	132,000	113,000
11,500	138,000	117,000
12,000	144,000	121,000
12,500	150,000	125,000
13,000	156,000	129,000
13,500	162,000	133,000
14,000	168,000	137,000
14,500	174,000	141,000

Expected monetary value analysis (Decision tree)

Decision Definition	Decision Node	Chance Node	Net Path Value
Decision to be Made	**Input:** Cost of Each Decision **Output:** Decision Made	**Input:** Scenario Probability, Reward if it Occurs **Output:** Expected Monetary Value (EMV)	**Computed:** Payoffs minus Costs along Path



Modeling And Simulation



Perform Quantitative Risk Analysis: Outputs

1. Project Document Updates
   - Probabilistic analysis of the project
   - Probability of achieving cost and time objectives
   - Prioritized list of quantified risks
   - Trends in quantitative risk analysis results

Quiz

If a project has a 60% chance of a US $ 100,000 profit and a 40% chance of a US $ 100,000 loss, the expected monetary value for the project is :

A. $ 100,000 profit
B. $ 60,000 loss
C. $ 20,000 profit
D. $ 40,000 loss

Answer C

11.5 Plan Risk Responses

The process of developing options and actions to enhance opportunities and to reduce threats to project objectives.

The key benefit is to address the risks by their priority, have strategies to handle the risks and assigned resources & budget to handle those risks

Plan Risk Responses: Inputs

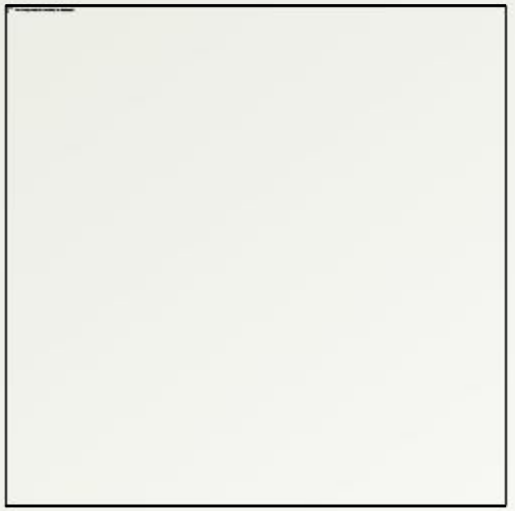
1. Risk Management Plan
2. Risk Register

Plan Risk Responses: Tools & Techniques (1)

1. Strategies for negative risks or threats
   - Avoid
   - Transfer
   - Mitigate
   - Accept

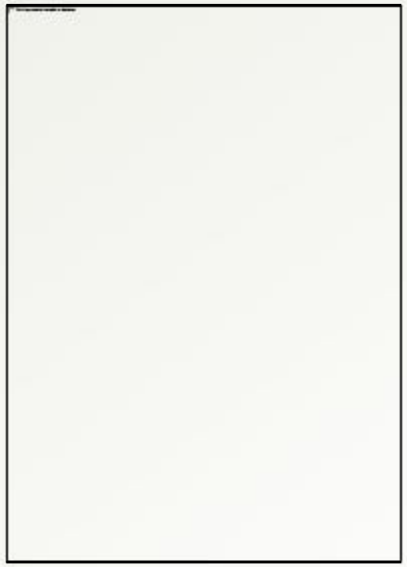
Response Strategies for Threats

- **Avoidance:**
  - Risk prevention
  - Changing the plan to eliminate a risk by avoiding the cause/source of risk
  - Protect project from impact of risk
  - Examples:
    - Change the implementation strategy
    - Do it ourselves (do not subcontract)
    - Reduce scope to avoid high risk deliverables
    - Adopt a familiar technology or product



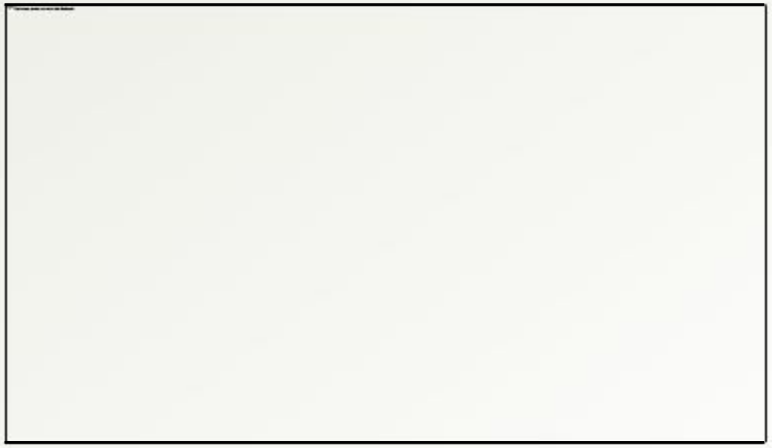
Response Strategies for Threats

- **Mitigation**
  - Seeks to reduce the impact or probability of the risk event to an acceptable threshold
  - Be proactive: Take early actions to reduce impact/probability and don't wait until the risk hits your project
  - Examples:
    - Staging - More testing - Prototype
    - Redundancy planning
    - Use more qualified resources



Response Strategies for Threats

- **Transfer**
  - Shift responsibility of risk consequence to another party
  - Does **NOT** eliminate risk
  - Most effective in dealing with financial exposure
  - Examples:
    - Buy/subcontract: move liabilities
    - Selecting type of Procurement contracts: Fixed Price
    - Insurance: liabilities + bonds + Warranties



Response Strategies for Threats

- **Acceptance**
  - Used when project plan cannot be changed & other risk response strategy cannot be used
  - Active Acceptance
    - Develop a contingency plan to execute if the risk occur
    - Contingency plan = be ready with Plan B
  - Passive Acceptance
    - Deal with the risks as they occur = No Plan B prepared
- **Contingency allowance/ reserve**
  - Established amount of reserve (e.g.: time and/or money) to account for the identified known risks.
  - Amount is decided based on probability and impact

Plan Risk Responses: T & T (2)

2. Strategies for Positive Risks or Opportunities
   - Exploit: Ensure opportunity is realized
     - Ex: Assigning organization most talented resources to the project to reduce cost lower than originally planned.
   - Share: Allocating some or all of the ownership to third part best able to capture the opportunity
     - Ex: Joint ventures, special-purpose companies
   - Enhance: Increase the probability and/or the positive impact of the opportunity
     - Ex: Adding more resources to finish early
   - Accept: Welling to take advantage of opportunity if it comes, but not actively pursuing it.

Plan Risk Responses: Tools & Techniques (3)

3. Contingent Response Strategies

4. Expert Judgment

Plan Risk Responses: Outputs (1)

1. Project management Plan Updates
   - Schedule Management Plan
   - Cost Management Plan
   - Quality Management Plan
   - Procurement Management Plan
   - Human Resource Management Plan
   - Scope Baseline
   - Schedule Baseline
   - Cost Baseline

Plan Risk Responses: Outputs (2)

2. Project Documents Updates
   - Assumptions log updates
   - Technical Documentation Updates
   - Change Requests

Quiz

Purchasing insurance is BEST considered an example of risk:

A. Mitigation

B. Transfer

C. Acceptance

D. Avoidance

Answer B

11.6 Control Risks

The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

Monitor and Control Risks: Inputs

1. Risk Register
2. Project Management Plan
3. Work Performance Data
4. Work Performance Reports

Monitor and Control Risks: Tools & Techniques

1. Risk Reassessment
2. Risk Audits
3. Variance and Trend Analysis
4. Technical Performance Measurement
5. Reserve Analysis
6. Meetings

Monitor and Control Risks: Outputs

1. Work Performance Information
2. Change Requests
   - Recommended corrective actions
   - Recommended preventive actions
3. Project management Plan Updates
   - Outcome of risk reassessment, risk audits, and periodic risk reviews
   - Actual outcome of the project's risks and the risk's response
4. Project Document Updates
5. Organizational Process Assets Updates

Quiz

What should be done with a non-critical Risk?

A. Document them for historical use on other projects

B. Document them and revisit during project execution

C. Document them & set them aside because they are already covered in your contingency plans

D. Document them and give them to the customer

Answer: B


Thank you