Project Risk Management


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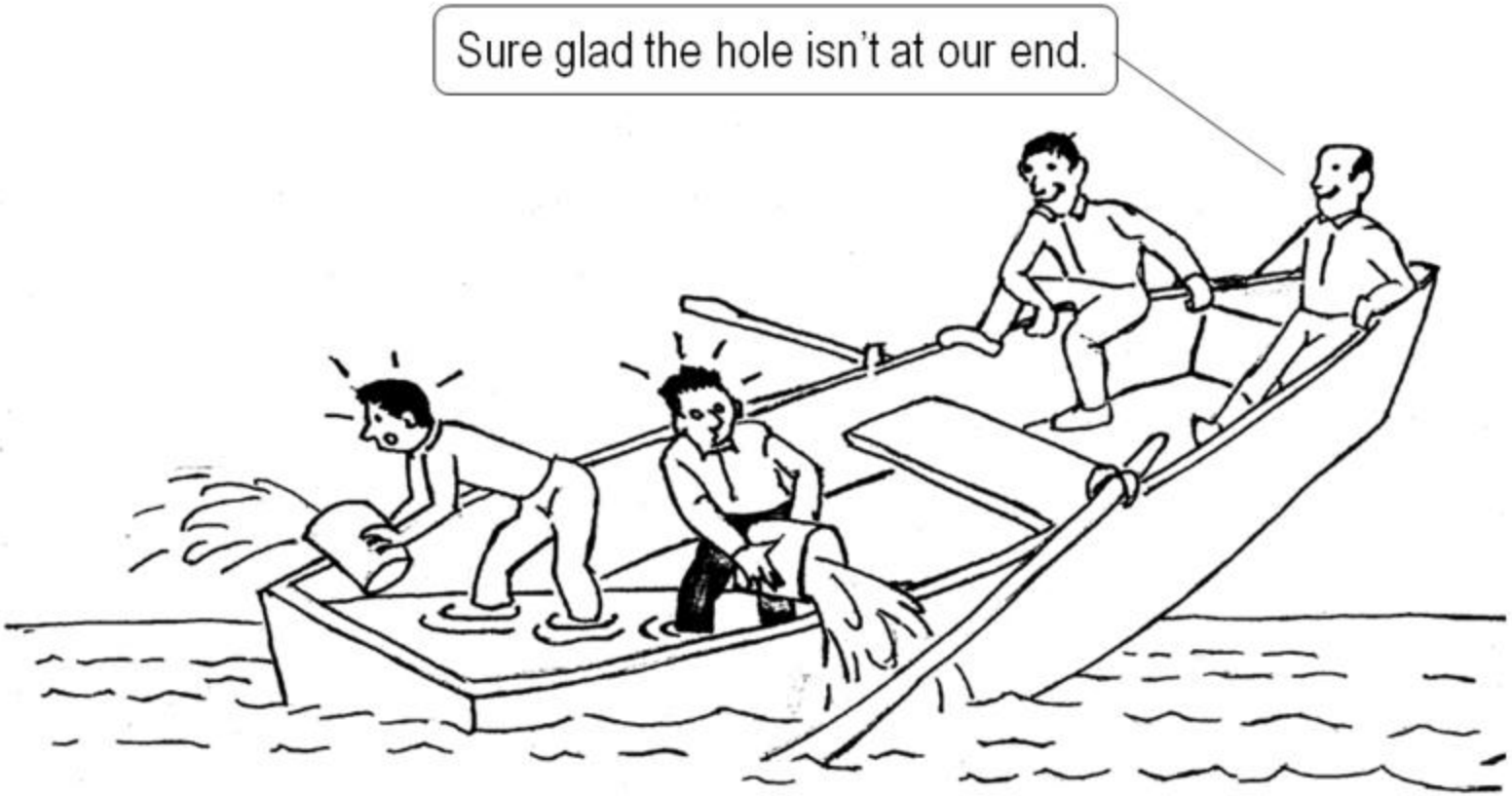
Sure glad the hole isn't at our end.


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Plan Risk Management

Definition

Processes for conducting risk management planning, identification, analysis, response planning and monitoring and control on a project.

Project Risk Management

33. Plan Risk Management [PLANNING]
34. Identify Risks [PLANNING]
35. Perform Qualitative Risk Analysis [PLANNING]
36. Perform Quantitative Risk Analysis [PLANNING]
37. Plan Risk Responses [PLANNING]
38. Monitor and Control Risks [M&C]

Personal Attitude to Risk

Individuals fall into one of the three categories

- Risks Averse
- Risk Seeking
- Risk Neutral

33. Plan Risk Management

Definition

Defining how to conduct risk management activities for a project .

Plan Risk Management

Knowledge Area : Project Risk Management

Process Group : Planning Process Group

Input	Tool & Technique	Output
1. Project scope statement 2. Cost management plan 3. Schedule management plan 4. Communications management plan 5. Enterprise environmental factors 6. Organizational process assets	1. Planning meetings and analysis	1. Risk management plan

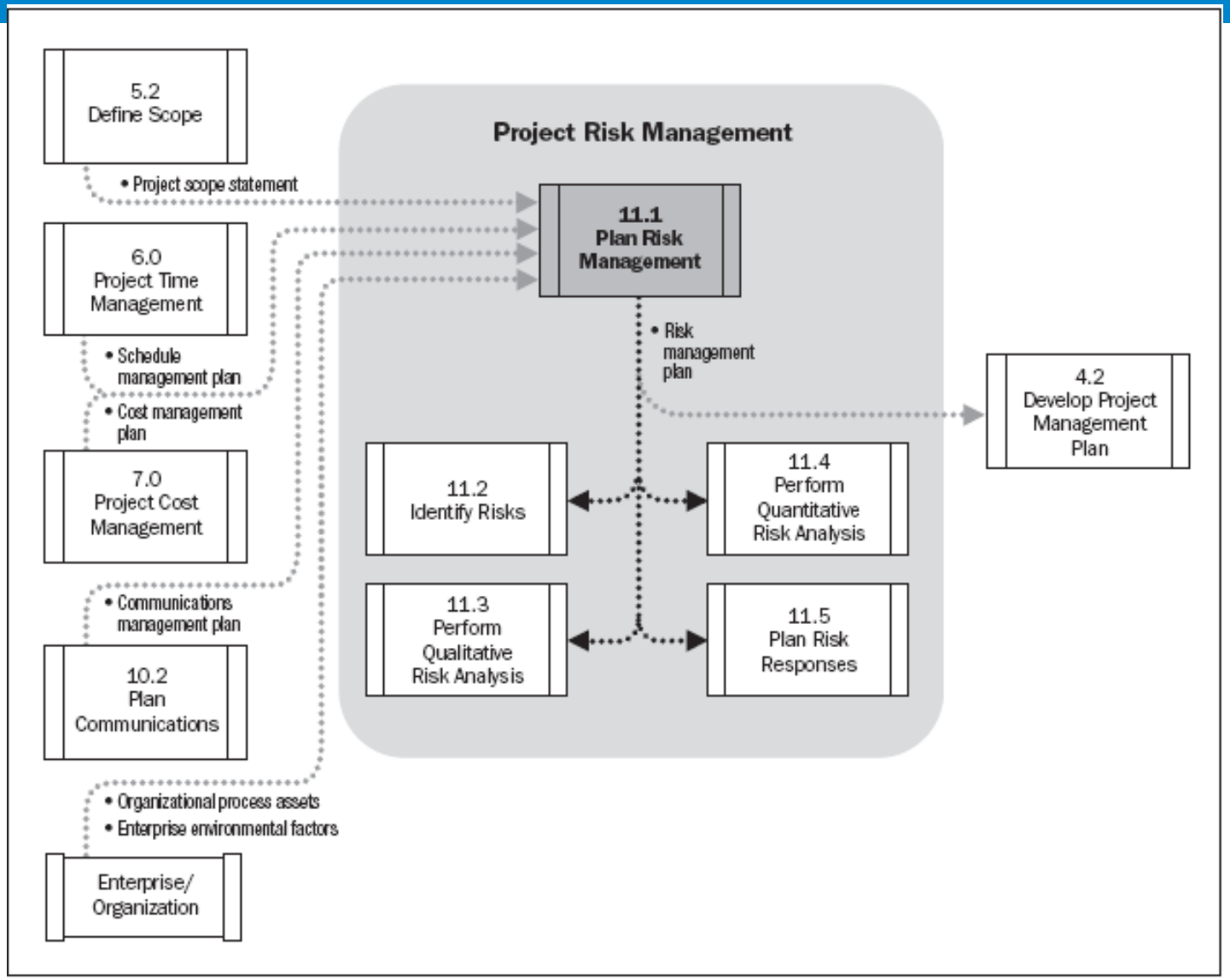
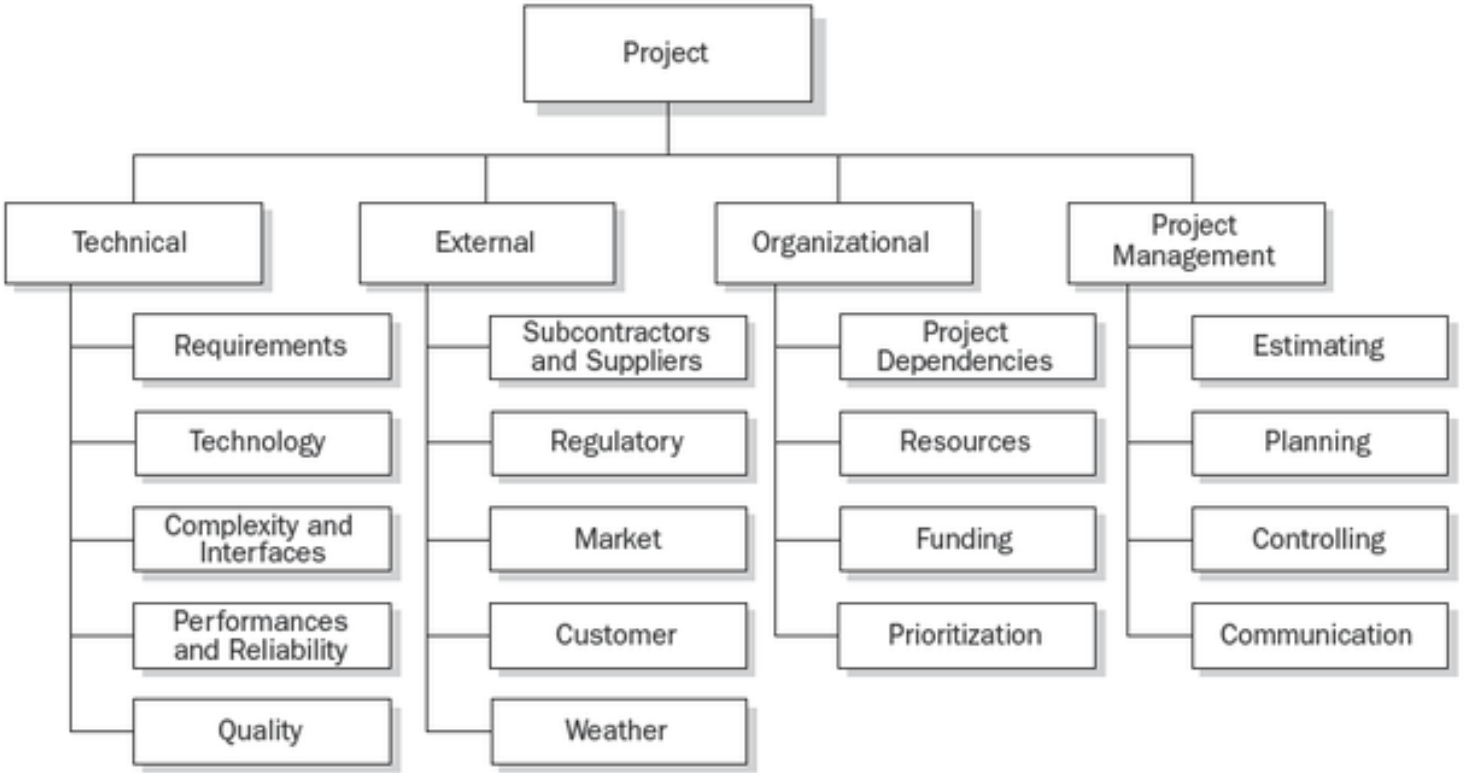


Figure 11-3. Plan Risk Management Data Flow Diagram

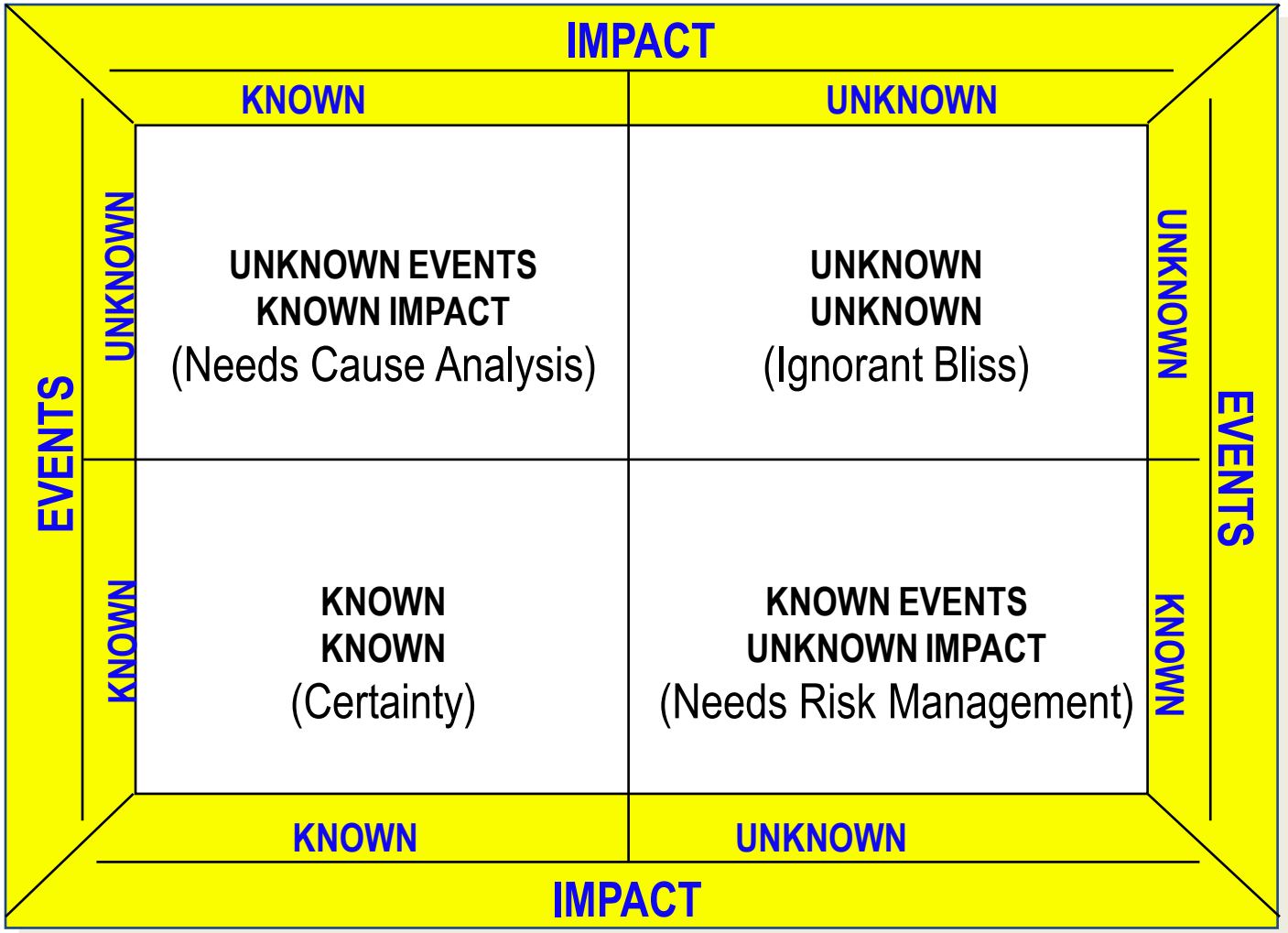
Risk Breakdown Structure



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.

Source : PMI PMBOK® ***Fourth Edition***

Project Risk Management



Definition of 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.

Source : PMI PMBOK® ***Fourth Edition***

34. Identify Risks

Definition

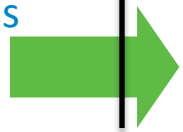
Determining which risks may affect the project and documenting their characteristics

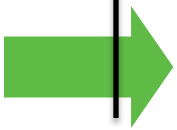
Identify Risks

Knowledge Area : Project Risk Management

Process Group : Planning Process Group

Input	Tool & Technique	Output
1. Risk management Plan 2. Activity cost estimates 3. Activity duration estimates 4. Scope baseline 5. Stakeholder register 6. Cost management plan 7. Schedule management plan 8. Quality management plan 9. Project documents 10. Enterprise environmental factors 11. Organizational process assets	1. Documentation reviews 2. Information gathering techniques 3. Checklist analysis 4. Assumptions analysis 5. Diagramming techniques 6. SWOT analysis 7. Expert judgment	1. Risk register





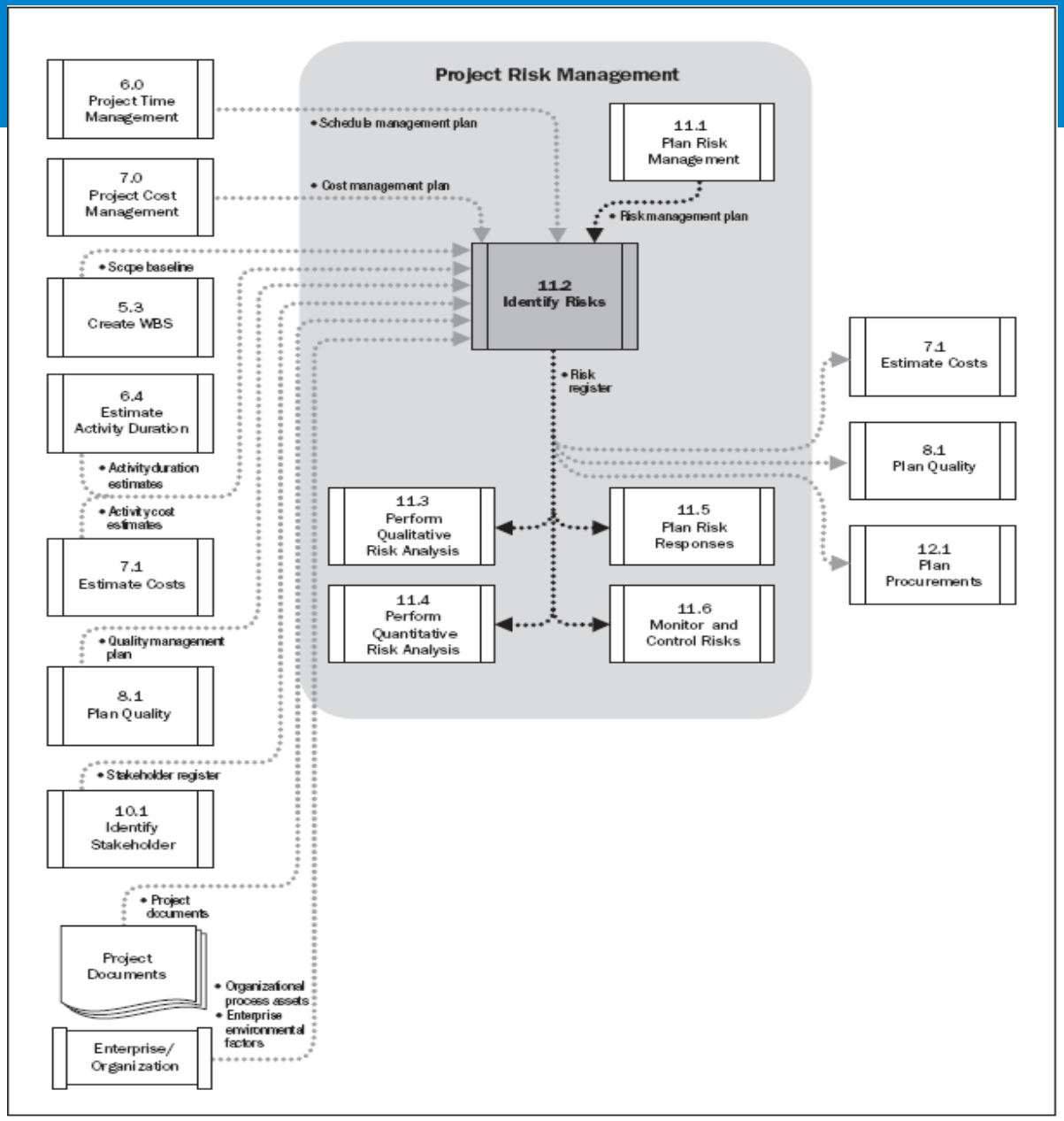


Figure 11-7. Identify Risks Data Flow Diagram

35. Perform Qualitative Risk Analysis

Definition

Prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.

Perform Qualitative Risk Analysis

Knowledge Area : Project Risk Management

Process Group : Planning Process Group

Input	Tool & Technique	Output
1. Risk register 2. Risk management plan 3. Project scope statement 4. Organizational process assets	1. Risk probability and Impact assessment 2. Probability and impact matrix 3. Risk data quality assessment 4. Risk categorization 5. Risk urgency assessment 6. Expert judgment	1. Risk register updates

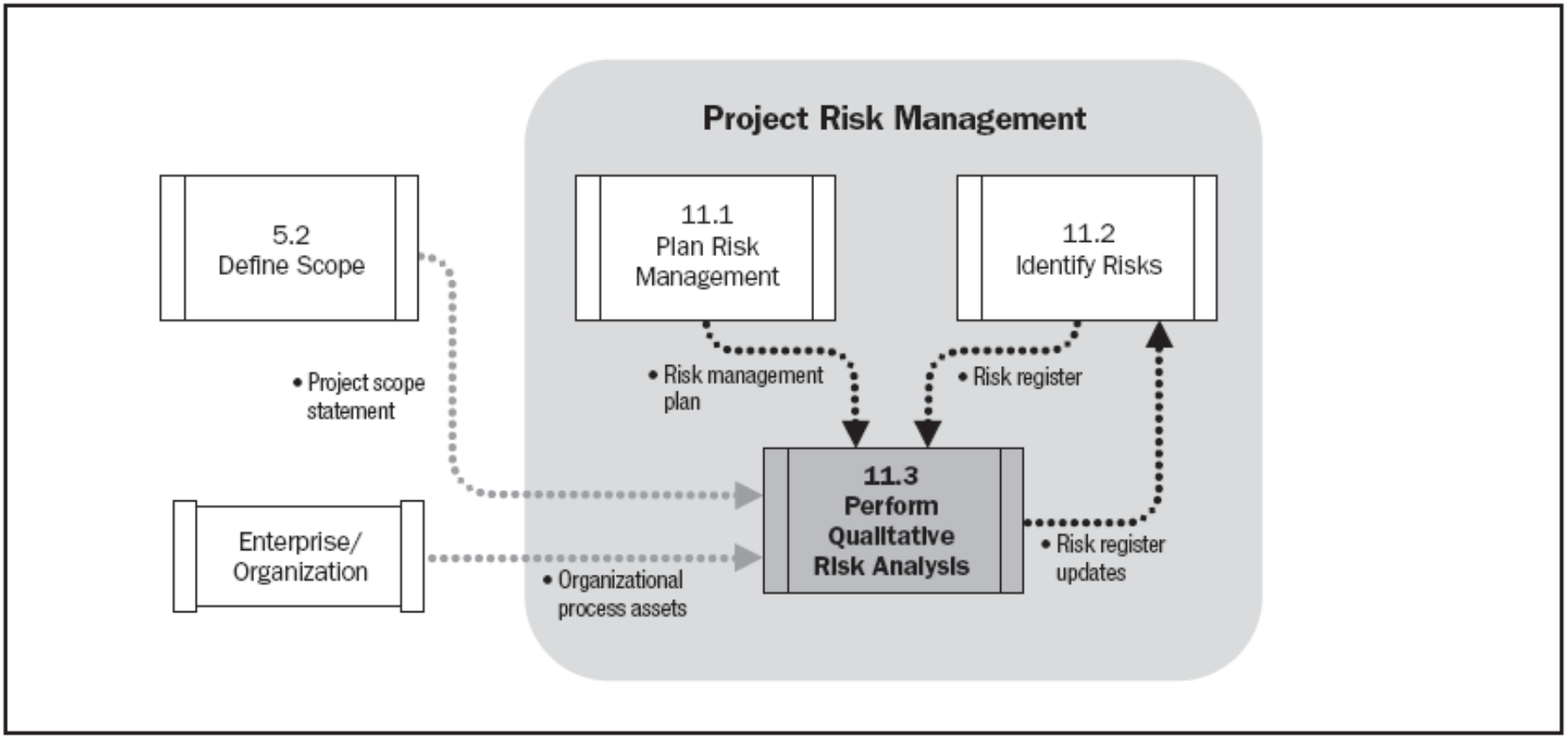


Figure 11-9. Perform Qualitative Risk Analysis Data Flow Diagram

Probability Impact Matrix

Probability and Impact Matrix

Probability	Threats					Opportunities				
0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05	0.10	0.20	0.40	0.80	0.80	0.40	0.20	0.10	0.05

Impact (relative scale) on an objective (e.g., cost, time, scope or quality)

Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

Define Threshold

High risk (“red condition”)

Medium risk (“yellow condition”)

Low risk (“green condition”)

Source : PMI PMBOK® ***Fourth Edition***

36. Perform Quantitative Risk Analysis

Definition

Numerically analyzing the effect of identified risks on overall project objectives.

Perform Quantitative Risk Analysis

Knowledge Area : Project Risk Management

Process Group : Planning Process Group

Input	Tool & Technique	Output
1. Risk register 2. Risk management Plan 3. Cost management Plan 4. Schedule management Plan 5. Organizational process assets	1. Data gathering and representation techniques 2. Quantitative risk analysis and modeling techniques 3. Expert judgment	1. Risk register updates

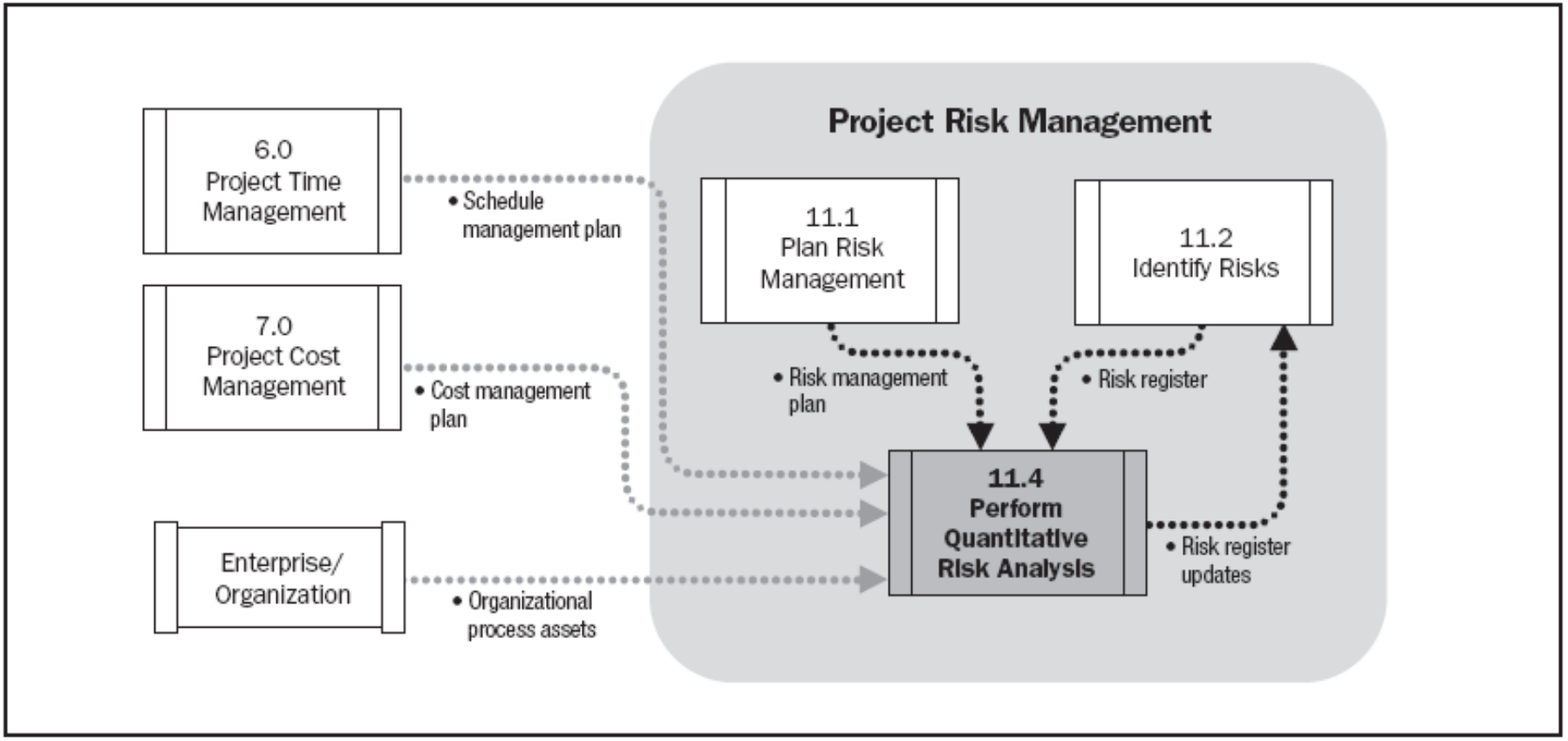


Figure 11-12. Perform Quantitative Risk Analysis Data Flow Diagram

Formulae

- **Probability = Number of Occurrences / Total Number occurrences**
  = Frequency of Related Events / Total Number of Events

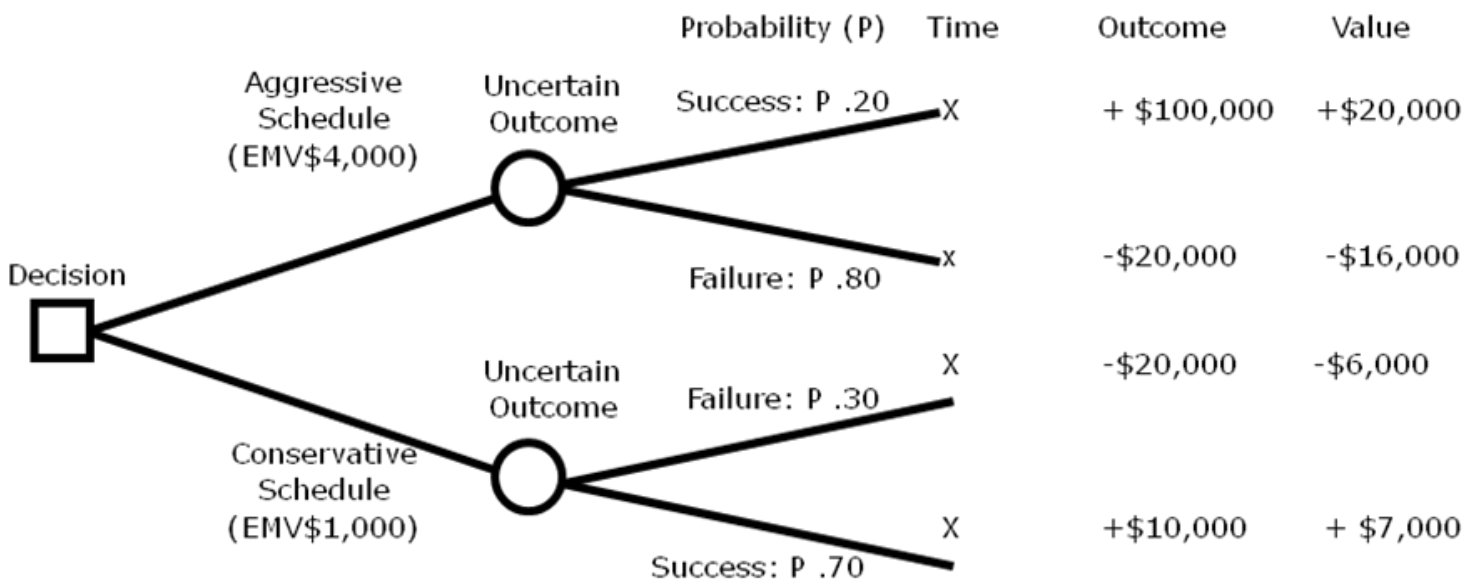
- **Probability = Frequency of Related Events /**
- **Total Number of Possible Events**

- **Expected Monetary Value (EMV) = Risk Event Probability X**
  Risk Event Value

- The sum of their probabilities of occurrence is 1.0

Decision Tree

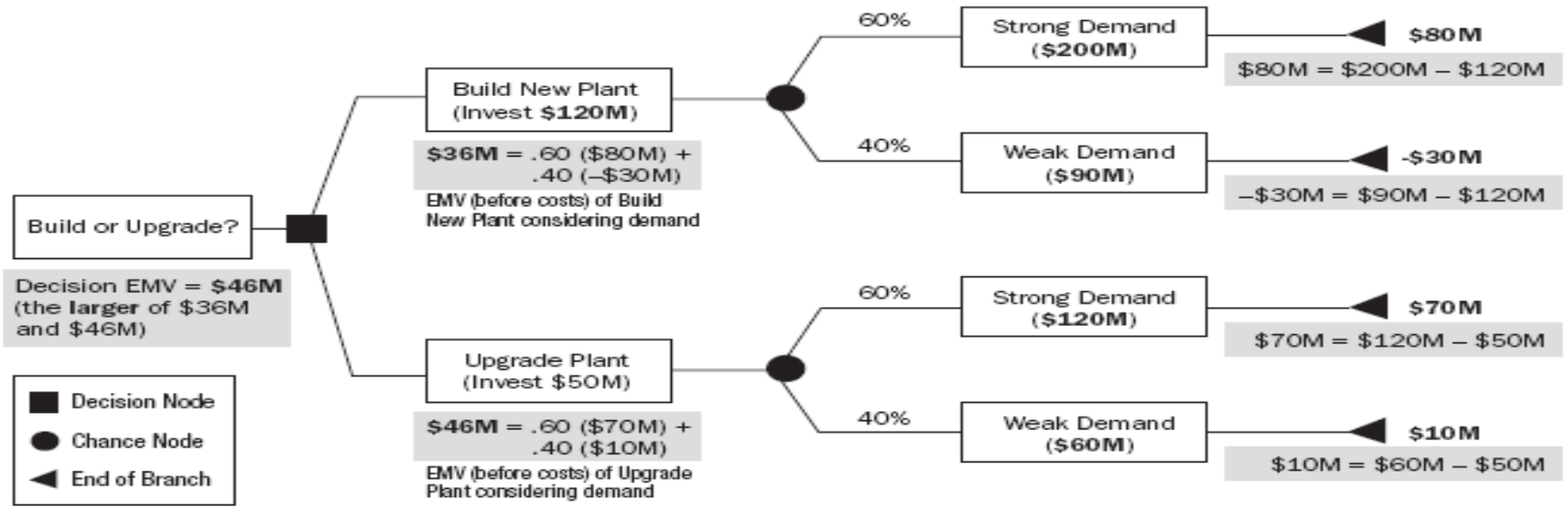
A decision tree is a diagram that describes a decision under consideration and the implications of choosing one or other available alternatives



- Expected monetary value (EMV) of result Outcome x Probability of that outcome
- Expected monetary value of a decision sum of EMVs of all Outcomes stemming from that decision
- Aggressive schedule has expected monetary value of $4,000 and is "preferred" over conservative schedule with expected monetary value of $1,000

EVM- Decision Tree

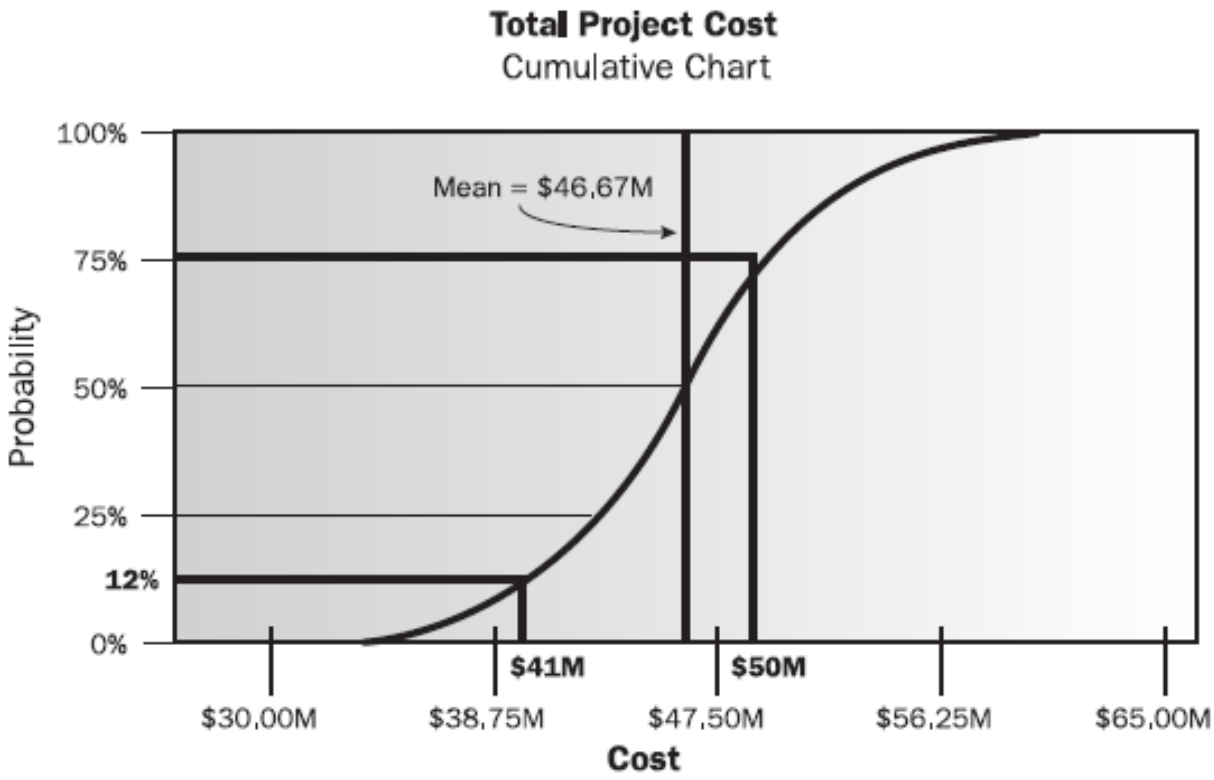
Decision Definition	Decision Node	Chance Node	Net Path Value
Decision to be Made	**Input:** Cost of Each Decision **Output:** Decision Made	**Input:** Scenario Probability, Reward if it Occurs **Output:** Expected Monetary Value (EMV)	**Computed:** Payoffs minus Costs along Path



Note 1: The decision tree shows how to make a decision between alternative capital strategies (represented as "decision nodes") when the environment contains uncertain elements (represented as "chance nodes").

Note 2: Here, a decision is being made whether to invest $120M US to build a new plant or to instead invest only $50M US to upgrade the existing plant. For each decision, the demand (which is uncertain, and therefore represents a "chance node") must be accounted for. For example, *strong* demand leads to $200M revenue with the new plant but only $120M US for the upgraded plant, perhaps due to capacity limitations of the upgraded plant. The end of each branch shows the net effect of the payoffs minus costs. For each decision branch, all effects are added (see shaded areas) to determine the overall Expected Monetary Value (EMV) of the decision. Remember to account for the investment costs. From the calculations in the shaded areas, the upgraded plant has a higher EMV of $46M – also the EMV of the overall decision. (This choice also represents the lowest risk, avoiding the worst case possible outcome of a loss of $30M).

Modeling & Simulation



This cumulative distribution, assuming the data ranges in Figure 11-13 and triangular distributions, shows that the project is only 12 percent likely to meet the $41 million estimate. If a conservative organization wants a 75% likelihood of success, a budget of $50 million (a contingency of nearly 22 % (($50M - $41M)/$41M)) is required.

Figure 11-16. Cost Risk Simulation Results

37. Plan Risk Response

Definition

Developing options and actions to enhance opportunities and reduce threats to project objectives.

Plan Risk Response

Knowledge Area : Project Risk Management

Process Group : Planning Process Group

Input	Tool & Technique	Output
1. Risk register 2. Risk management plan	1. Strategies for negative risks or threats 2. Strategies for positive risks or opportunities 3. Contingent response strategy 4. Expert judgment	1. Risk register updates 2. Risk-related contract decisions 3. Project management plan updates 4. Project document updates

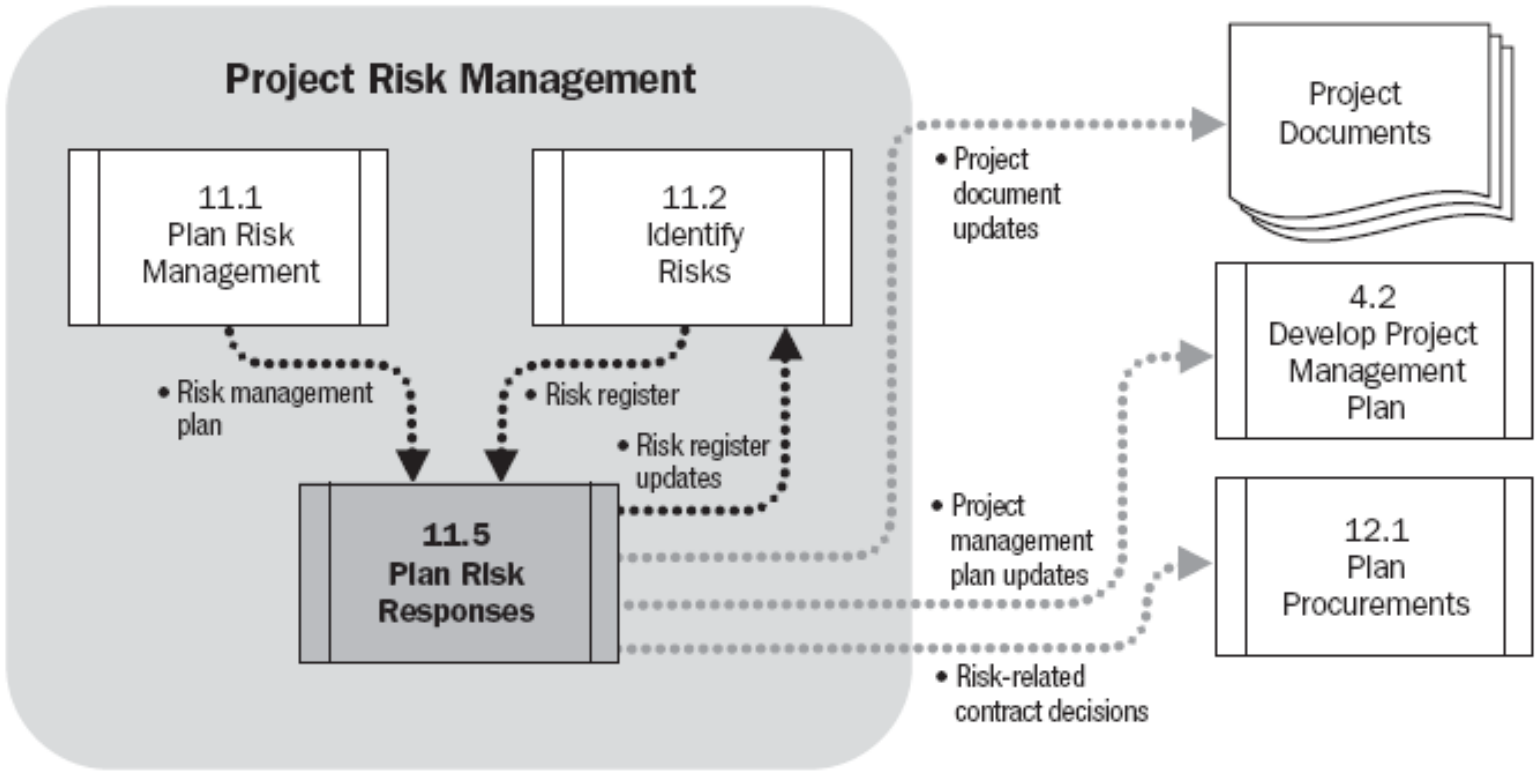


Figure 11-18. Plan Risk Responses Data Flow Diagram

Plan Risk Responses

- **A risk may be:**
  - ***Unrecognized,*** unmanaged or ignored (by default)
  - ***Recognized,*** but no action taken (absorbed as a matter of policy)
  - ***Avoided*** (by taking appropriate steps)
  - ***Reduced*** (by an alternative approach) reduction is dealing with the probability of the event occurring and / or actions to change specifications to reduce the consequences
  - ***Shared*** (with others through contract or insurance)
  - ***Transferred*** (to others through contract or insurance)
  - ***Retained*** and absorbed (by prudent allowances)
  - ***Managed*** through a combination of the above
- **But you can never eliminate the risk**
  - Can only be responded to

38. Monitor & Control Risks

Definition

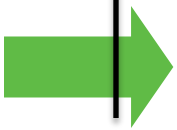
Implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

Monitor & Control Risk

Knowledge Area : Project Risk Management

Process Group : Monitoring & Controlling Process Group

Input	Tool & Technique	Output
1. Risk register	1. Risk reassessment	1. Risk register updates
2. Project management plan	2. Risk audits	2. Organizational process assets updates
3. Work performance information	3. Variance and trend analysis	3. Change requests
4. Performance reports	4. Technical performance measurement	4. Project management plan updates
	5. Reserve analysis	5. Project document updates
	6. Status meetings	



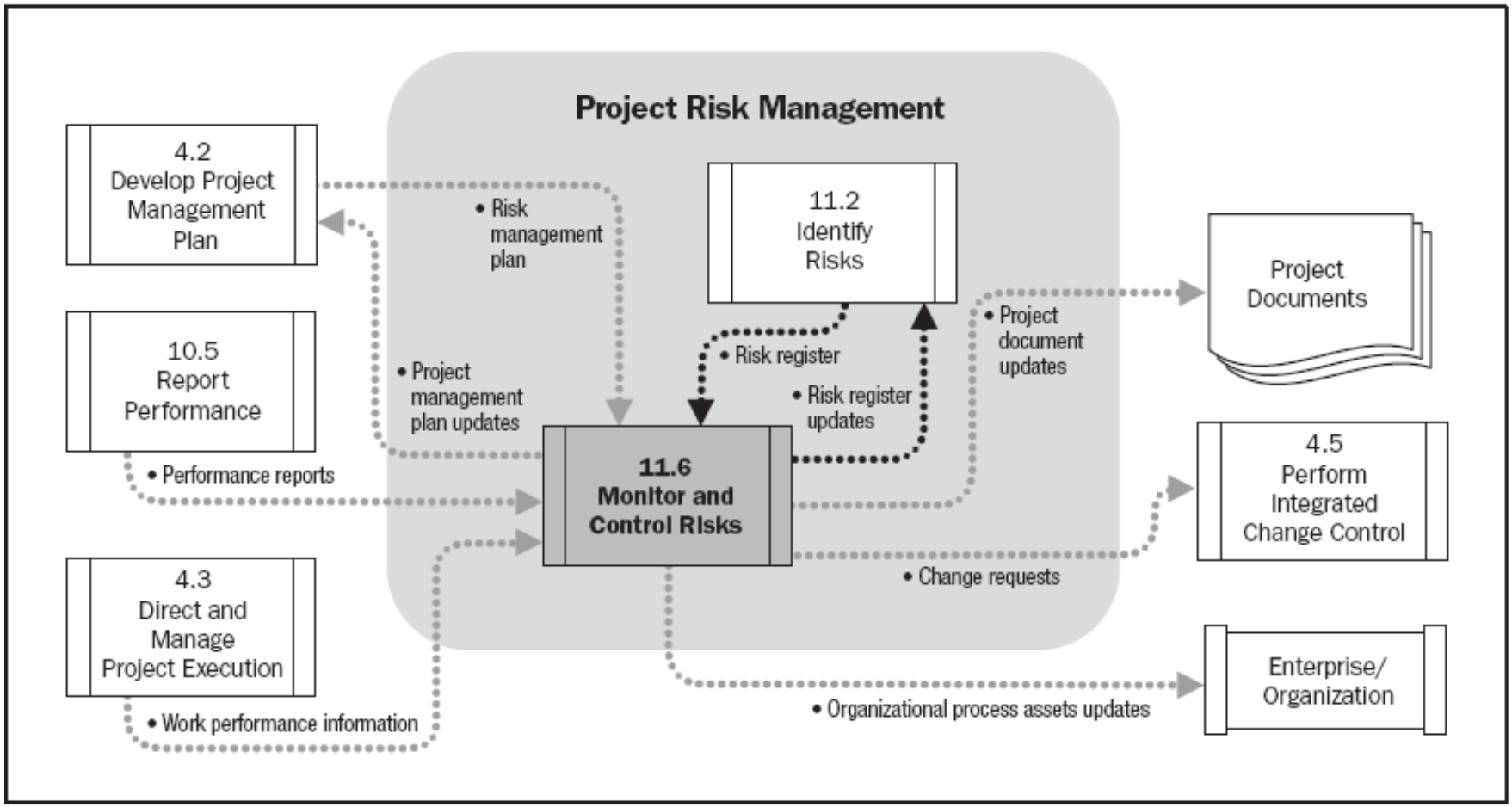


Figure 11-20. Monitor and Control Risks Data Flow Diagram

Project Risk Management

- **Contingency Reserve**
  - A separately planned quantity used to allow for future situations which may be planned for only in part (sometimes called “Known-unknowns”)
  - Intended to reduce the impact of missing cost or schedule objectives
  - Normally included in the project costs
- **Management Reserves**
  - “A separately planned quantity used to allow for future situations which are impossible to predict (sometimes called “Unknown- unknowns”)
  - Intended to reduce the risk of missing cost or schedule objectives
  - Use of Management reserves requires a change to the project’s cost baseline
- **Residual Risks**
  - Residual risks are those that remain after response measures have been taken.
  - Include minor risks that have been accepted and addressed. E.g., By adding contingency amounts to the cost or by allowing time
- **Secondary risks**
  - Risks that arise as a result of implementing risk response
  - Should be identified and responses planned

Project Risk Management Summary

There will always be risk in your project, so

- **Identify *RISK EVENTS***
- **Identify *RISK CONSEQUENCES***
- **Identify *RISK PROBABILITY***
- **Identify *QUALITY AND QUANTITY***
- **Identify *RISK CONTAINMENT***
- **Identify *RISK CONTINGENCY***
- **Then go and ...**

SELL IT TO THE SPONSORS

RM Documents

- Risk Register
- Risk Database

Questions & Discussions !