



# **Project Risk Management**

## Unit 11

# What is risk?

- Risk is an **uncertain event** or condition that, if it occurs, has a **positive or negative effect** on at least one project objective
  - All projects have risks
  - Uncertainty
  - Probability
  - Impact
  - Positive or Negative

# Project Risk Management

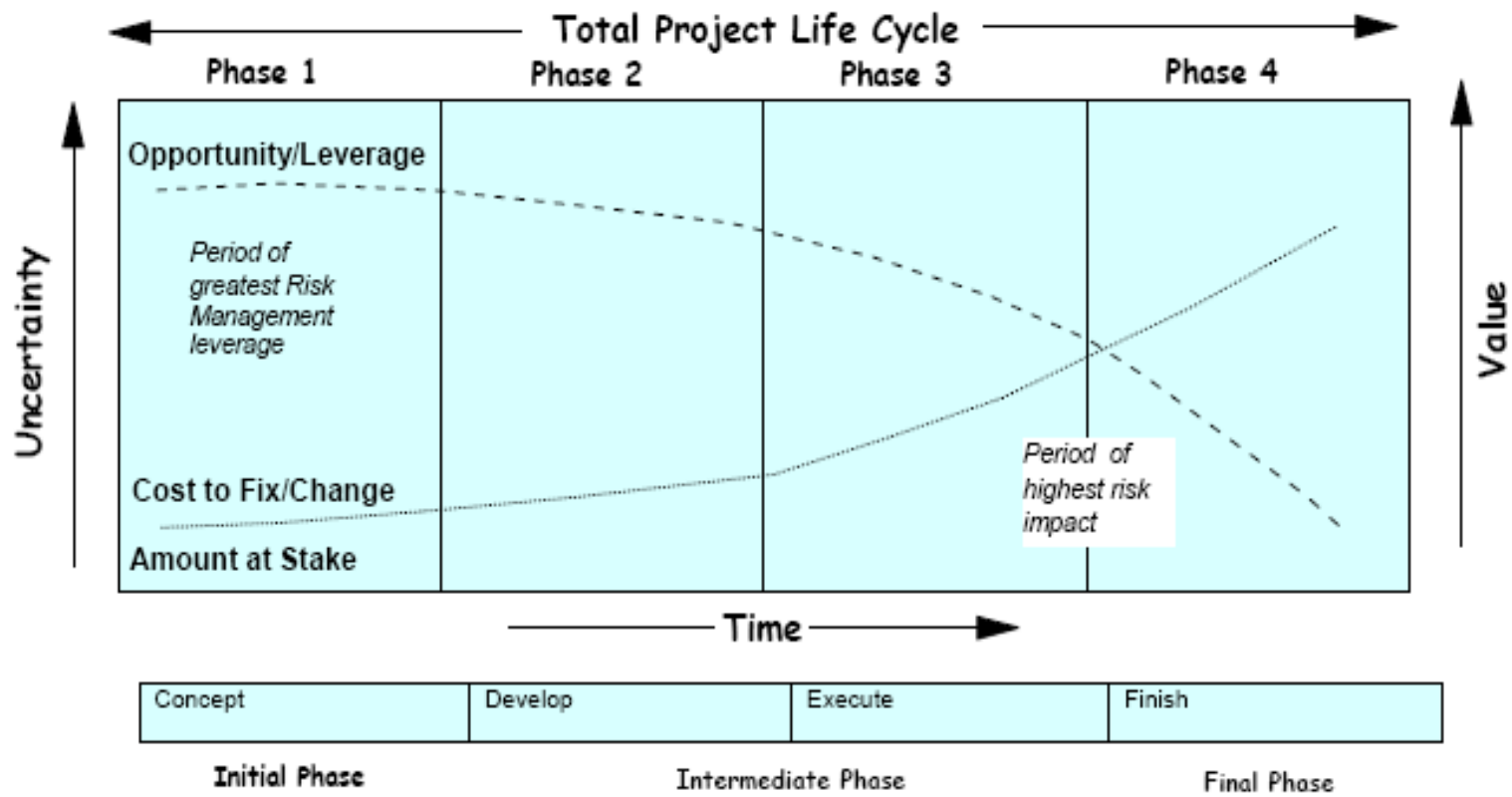
- Project risk management includes the processes of conducting risk management planning, identifications, analysis, response planning, and monitoring and control on a project.
- The objectives of project risk management are to increase the probability and the impact of positive events (**opportunity**), and decrease the probability and impact of negative events (**threats**) in the project.

**characteristics of risk management**  
**(continuous - iterative – ongoing)**

# Project Manager's Role in Risk Management

- Identifying and understanding risks.
- Planning to handle risks.
- Incorporating risk management into the project management.
- Planning processes.
- Monitoring and controlling risk on a regular basis.
- Looking forward and being proactive.
- Communicating effectively about risk to appropriate project stakeholders.
- Maintaining Risk Management Plan documentation.

# Manage Risk "Sooner better Than Later..."



# Risk sources

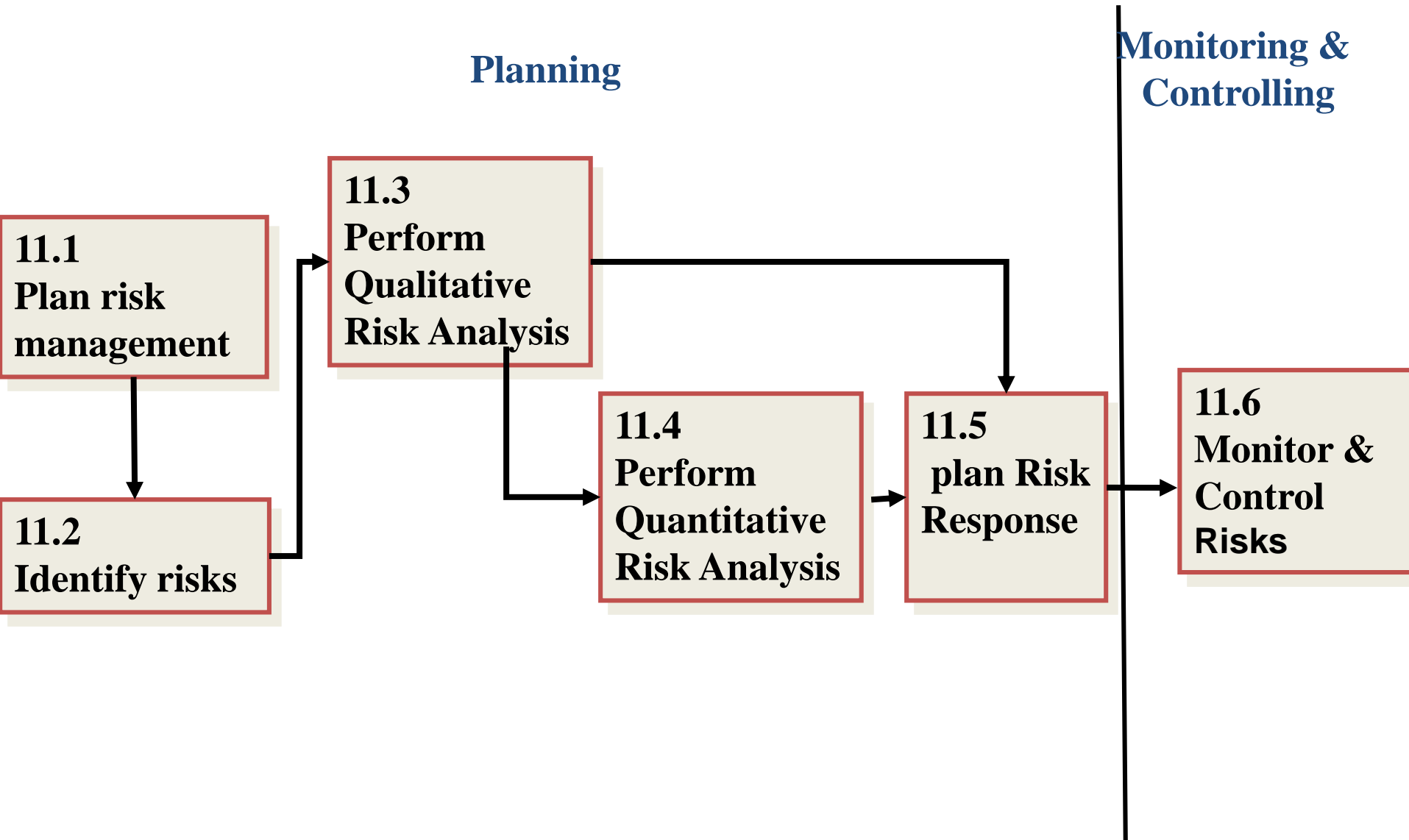
## Internal sources

- Financial
- Production
- Human Resources
- Administrative
- Strategic Preference

## External sources

- Economical
- Competition
- Social/Cultural
- Regulatory
- Political

# Project Risk Management



# Project Risk Management

## **11.1 Plan Risk Management**

Define how to conduct risk management activities for a project.

## **11.2 Identify Risks**

Determine which risks may affect the project and documenting their characteristics.

## **11.3 Perform Qualitative Risk Analysis**

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



# Project Risk Management

## **11.4 Perform Quantitative Risk Analysis**

Numerically analyze the effect of identified risks on the project objectives.

## **11.5 Plan Risk Responses**

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

## **11.6 Monitor and Control Risks**

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

# 11.1 Plan Risk Management

- **Plan risk management is the process of defining how to conduct risk management activities for a project**
- **Why do we have to plan risk management?**
  - Planning is so important to provide sufficient resources and time for risk management.
  - Risk management planning should be performed as early in the project as possible

**Plan the Work and Work the Plan**

# 11.1 Plan Risk Management

- **Project Scope Statement (Inputs)**
- **Cost Management Plan (Inputs)**
- **Schedule Management Plan (Inputs)**
- **Communications Management Plan (Inputs)**
- **Enterprise Environmental Factors (Inputs)**
- **Organizational Process Assets (Inputs)**

# 11.1 Plan Risk Management

- **Planning Meetings and Analysis (Tools & Techniques)**
  - Project teams hold planning meetings to develop the risk management plan.
  - High-level plans for conducting the risk management activities and Cost elements are defined in these meetings.
  - Risk contingency reserve application approaches may be established or reviewed.
  - Risk management responsibilities will be assigned.

# 11.1 Plan Risk Management

## Risk Management Plan (Output)

- **Roles and responsibilities :**
  - Defines the risk management team members for each type of activity in the risk management plan, and clarifies their responsibilities.
- **Budgeting :**
  - Assign resources, estimates funds needed for risk management.
- **Timing :**
  - Define when and how often the risk management processes will be performed ,
  - Establishes schedule contingency reserves, and
  - Establishes risk management activities to be included in the project schedule

# 11.1 Plan Risk Management

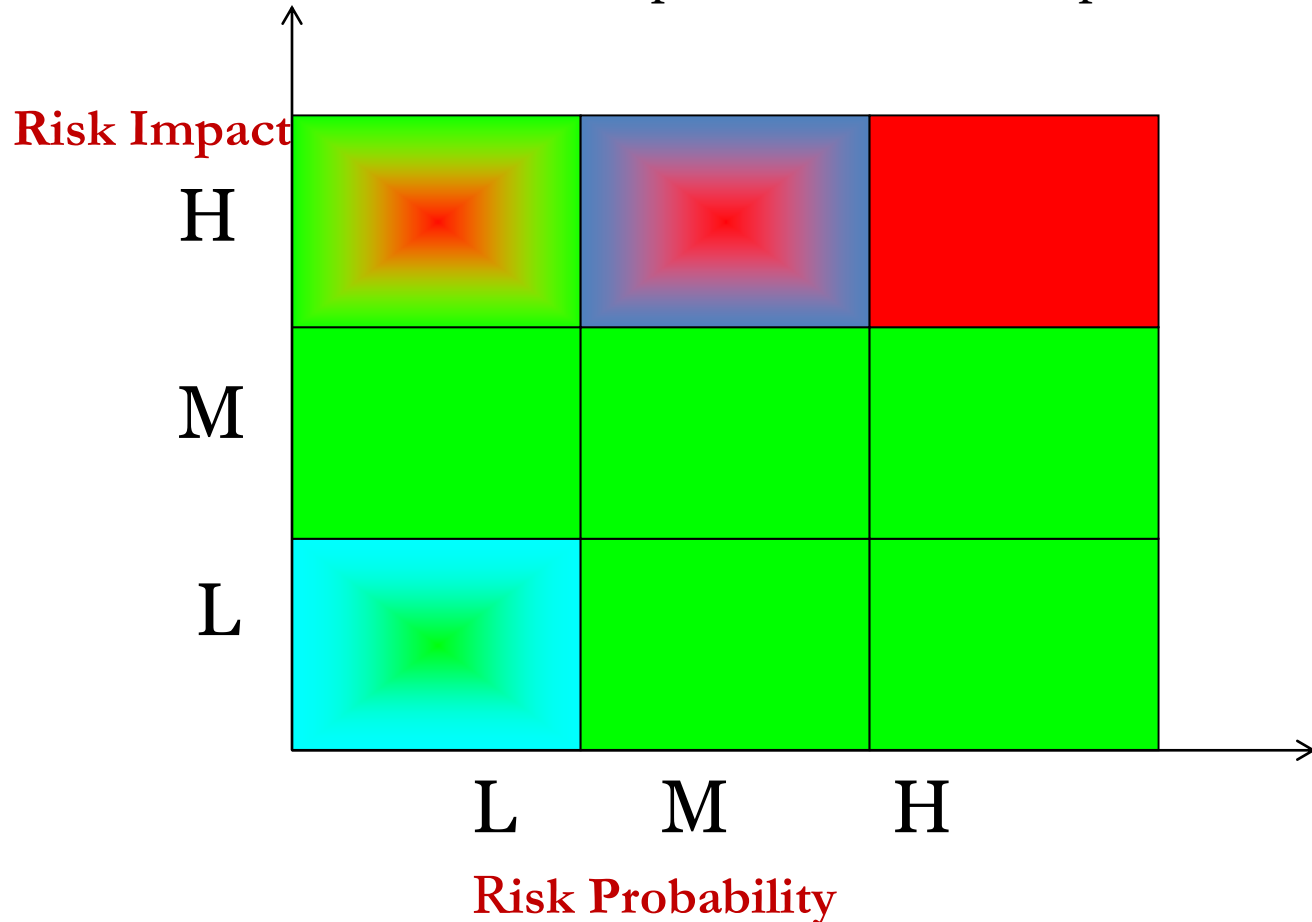
## Risk Management Plan (Output)

- **Probability and impact matrix :**
  - Risks are prioritized according to their potential implications for having an effect on the projects objectives.
- **Revised stakeholders” tolerances :**
  - Stakeholders” tolerances , as they apply to the specific project, may be revised in the plan risk management process
- **Reporting formats :**
  - Defines how the outcomes of the risk management processes will be documented, analyzed, and communicated

# 11.1 Plan Risk Management

## Risk Management Plan (Output)

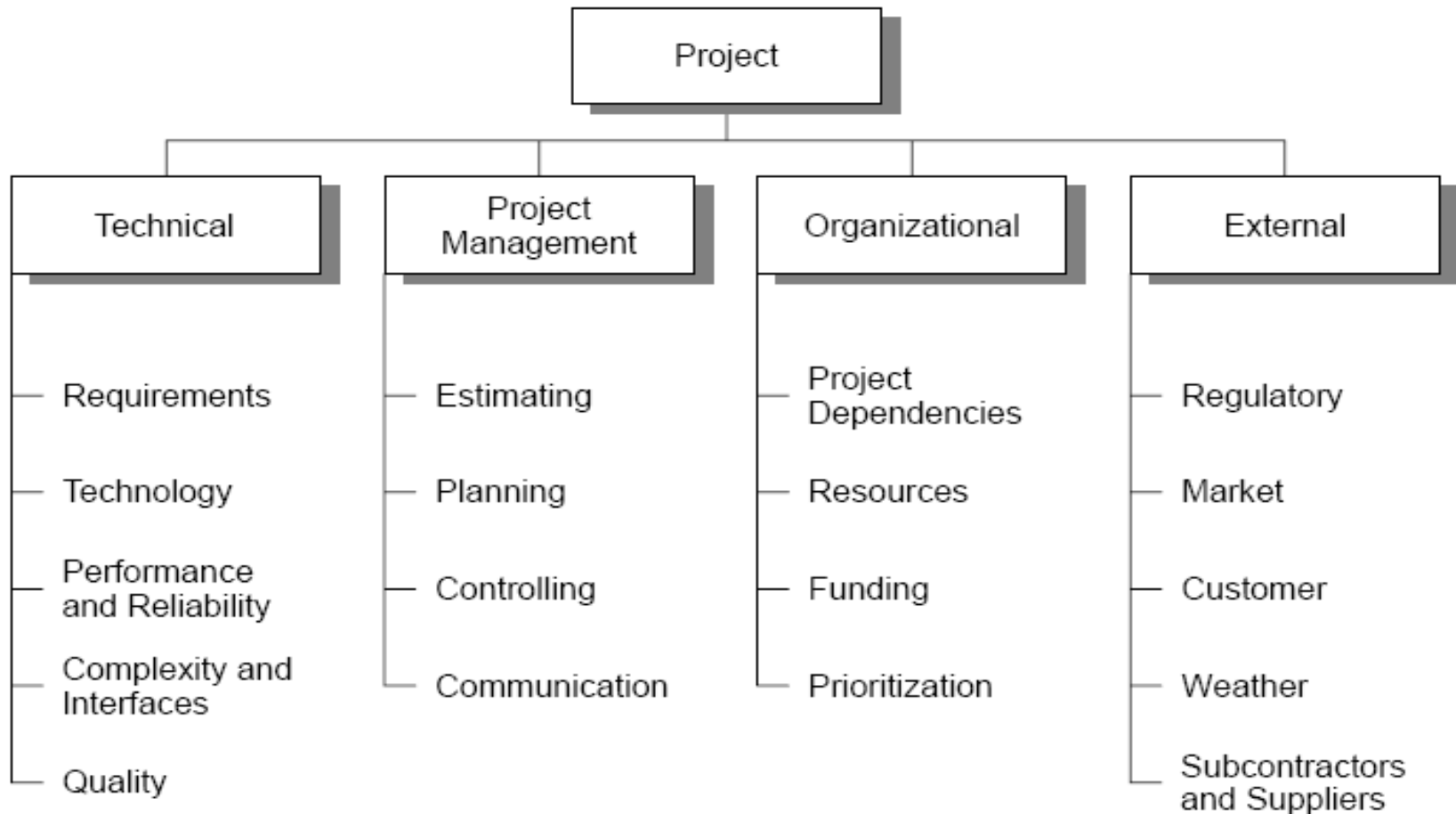
- **Definitions of risk probability and impact :**
  - The quality and credibility of the perform qualitative risk analysis process requires that different levels of the risks “ probabilities and impacts be defined



# 11.1 Plan Risk Management

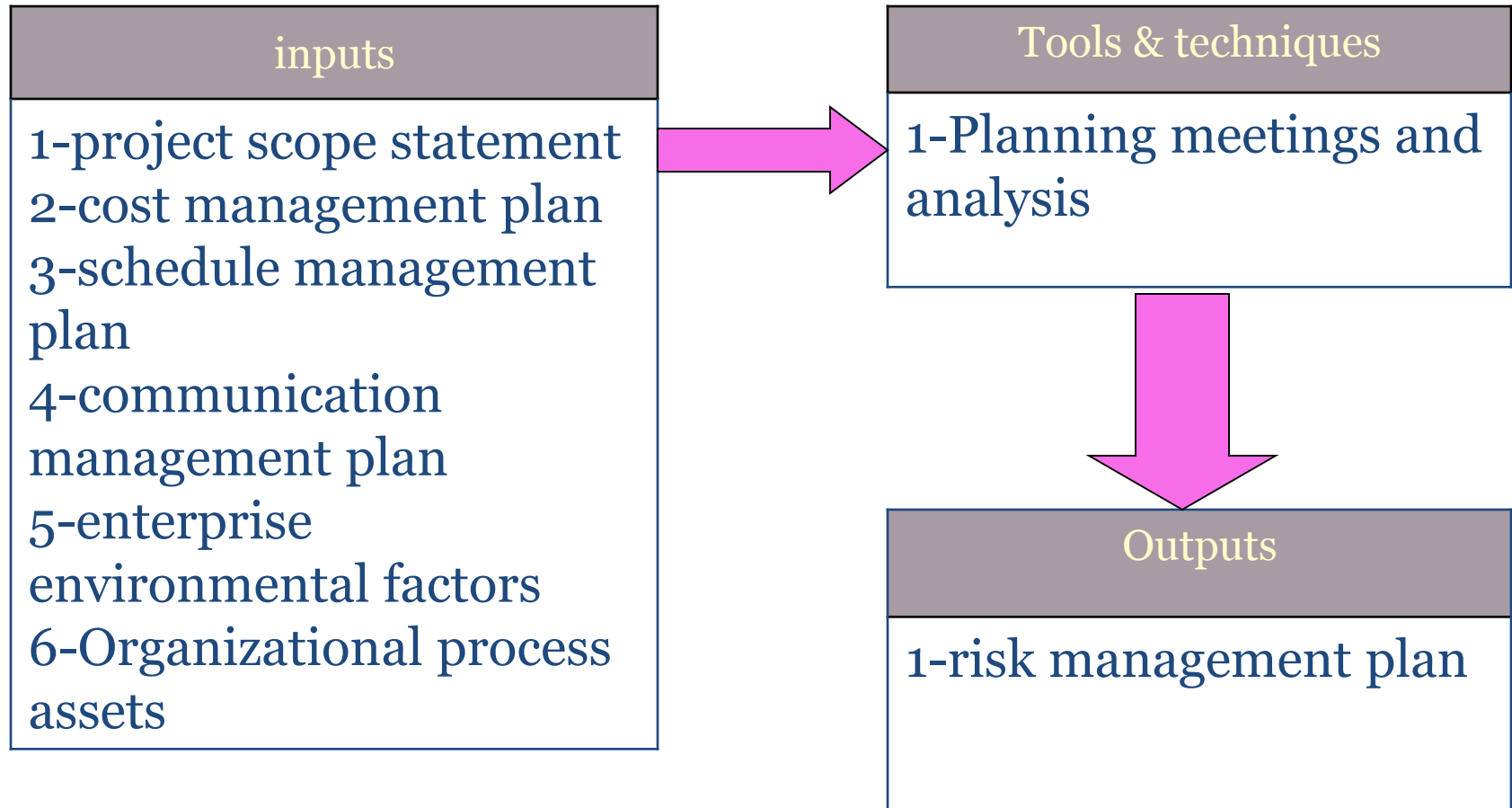
## Risk Management Plan (Output)

- Risk categories :
  - Provides a structure for identifying risk categories.

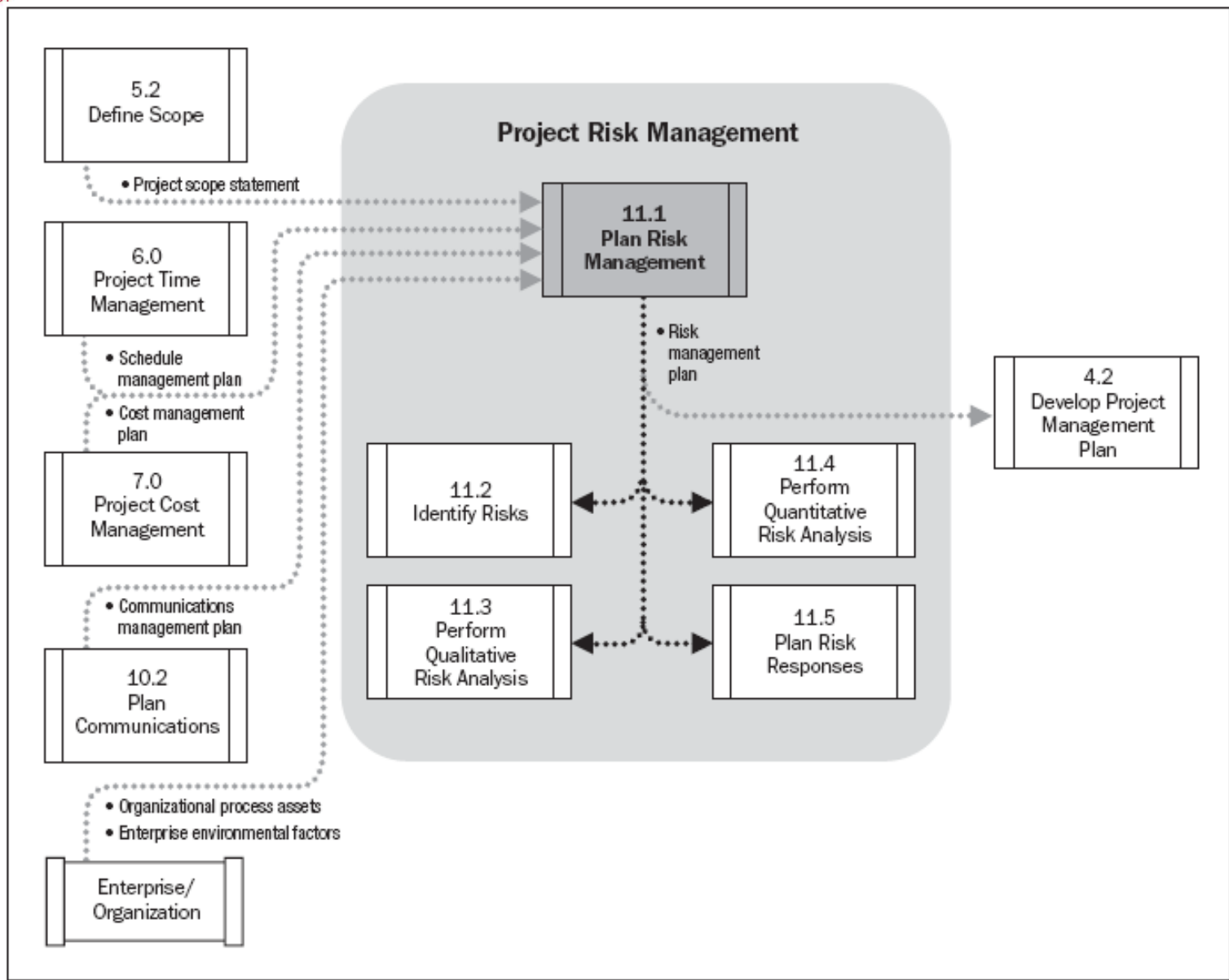




# 11.1 Plan Risk Management



# 11.1 Plan Risk Management



# 11.2 Identify Risks

- **Determining which risks may affect the project and documenting their characteristics**

**Who should be involved in the identify risks process?**

- **(project manager – project team members –subject matter experts –other project managers – risk management team (if assigned) –stakeholders – end users )**  
**(all project personnel should be encouraged to identify risks)**
- **Identify risks is an iterative process throughout the project life cycle.**

# 11.2 Identify Risks

- **Risk Management Plan (Inputs)**
- **Activity Cost Estimates (Inputs)**
- **Activity Duration Estimates (Inputs)**
- **Scope Baseline (Inputs)**
- **Stakeholder Register (Inputs)**
- **Organizational Process Assets (Inputs)**

# 11.2 Identify Risks

- **Documentation Reviews** (Tools & Techniques)
- **Information gathering Techniques** (Tools & Techniques)
  - Brainstorming.
  - Delphi technique.
  - Interviewing.
- **Checklist Analysis** (Tools & Techniques)
- **Assumptions Analysis** (Tools & Techniques)
- **Diagramming Techniques** (Tools & Techniques)
  - Cause and effect diagrams
  - System or process flow charts.
- **SWOT Analysis** (Tools & Techniques)
- **Expert judgment** (Tools & Techniques)

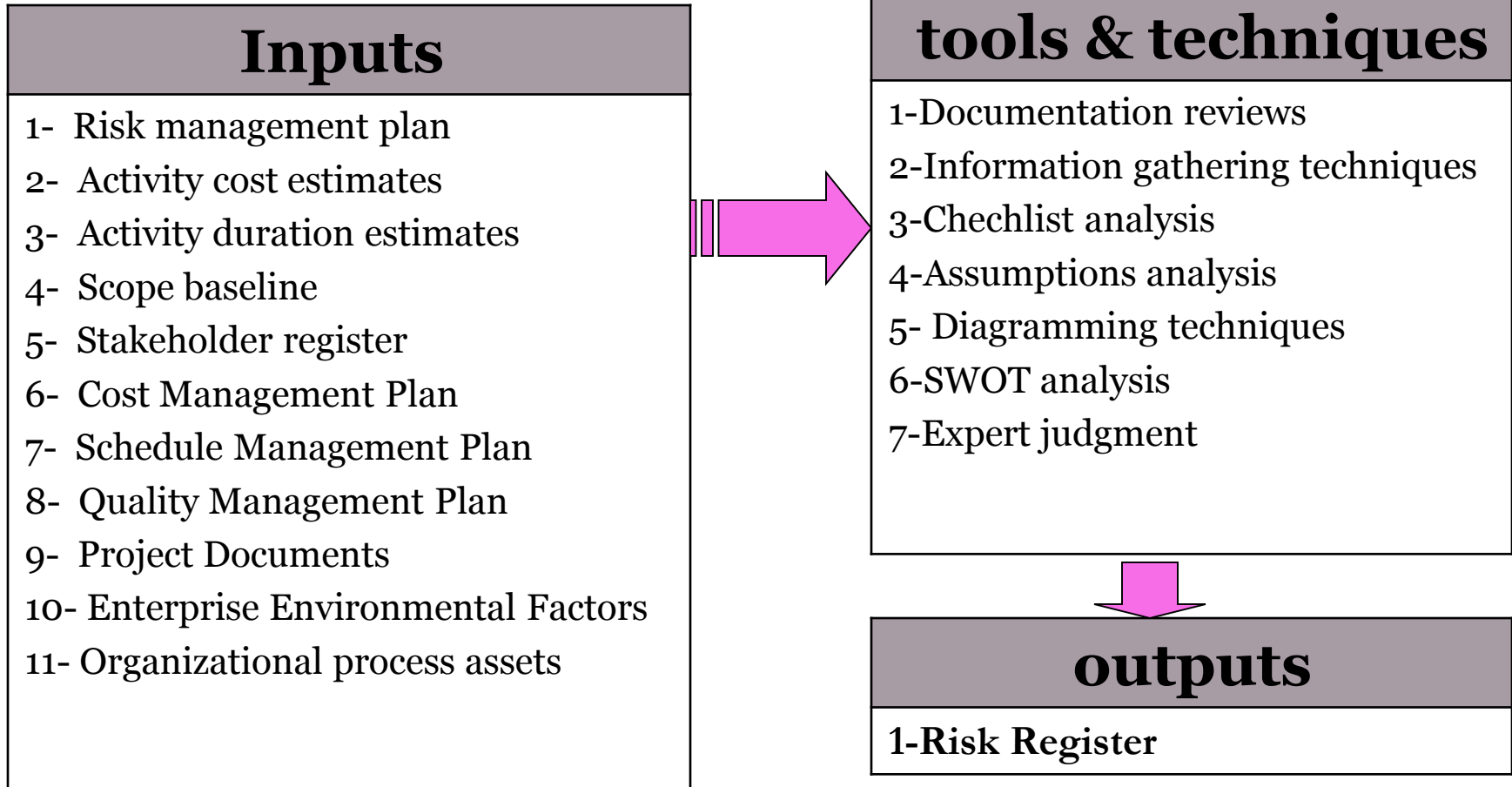
# 11.2 Identify Risks

## **Risk Register** (Output)

Will ultimately contain the outcomes of the other risk management processes:

- List of identified risk
  - EVENT may occur, causing IMPACT,
  - If CAUSE, EVENT may occur, leading to EFFECT.
  
- List of identified potential risk responses

# 11.2 Identify Risks



## 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.
- Organizations can improve the projects performance by focusing on high priority risks.
- The process of assessing the impact and likelihood of identified risks.



## 11.3 Perform Qualitative Risk Analysis

- **Risk Register** (Inputs)
- **Risk Management Plan** (Inputs)
- **Project scope statement** (Inputs)
- **Organizational Process Assets** (Inputs)

## 11.3 Perform Qualitative Risk Analysis

- **Risk Probability and Impact Assessment** (Tools & Techniques)
- **Probability and Impact Matrix** (Tools & Techniques)

Probability	Threats					Opportunities				
<b>0.90</b>	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
<b>0.70</b>	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
<b>0.50</b>	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
<b>0.30</b>	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
<b>0.10</b>	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

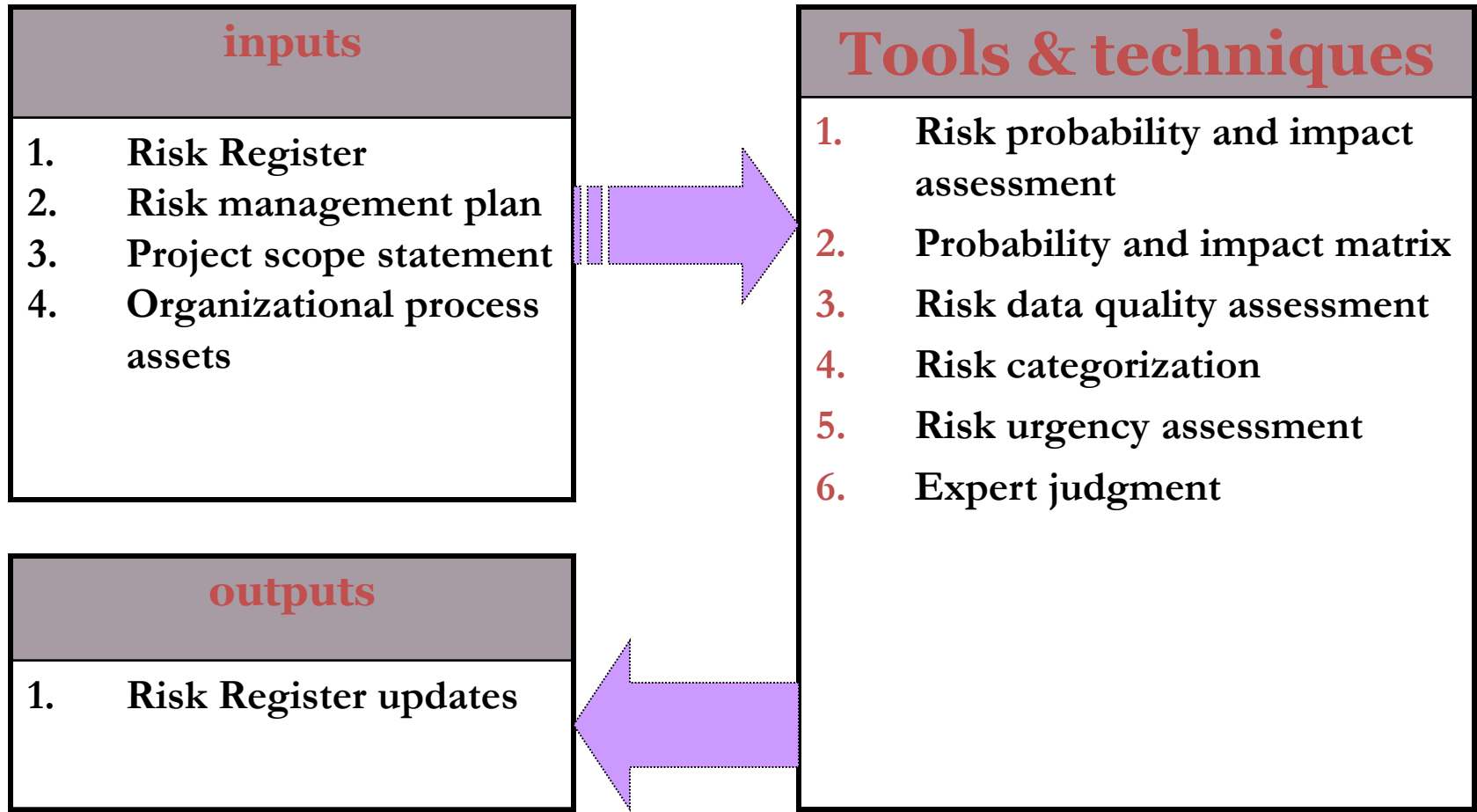
## 11.3 Perform Qualitative Risk Analysis

- **Risk Data Quality Assessment** (Tools & Techniques)
- **Risk Categorization** (Tools & Techniques)
- **Risk Urgency Assessment** (Tools & Techniques)
- **Expert judgment** (Tools & Techniques)

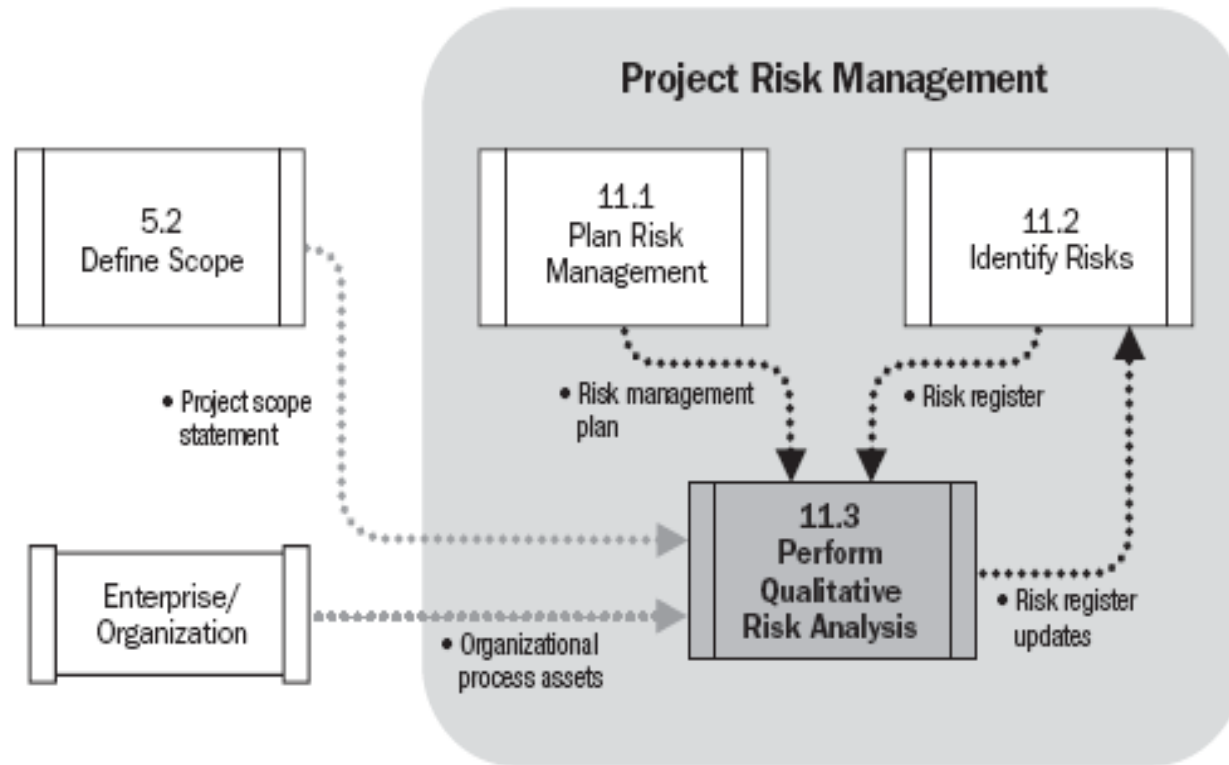
## 11.3 Perform Qualitative Risk Analysis

- **Risk Register Updates** (Outputs)
  - 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.
  - Trends in qualitative risk analysis results.

# 11.3 Perform Qualitative Risk Analysis



## 11.3 Perform Qualitative Risk Analysis



## 11.4 Perform Quantitative Risk Analysis

- The process of numerically analyzing the effect of identified risks on overall project objectives.
- Performed on the risks that have been prioritized by the perform Qualitative Risk Analysis process.
- It present a quantitative approach to making decisions in the presence of uncertainty.

## 11.4 Perform Quantitative Risk Analysis

- Risk Register (Inputs)
- Risk Management Plan (Inputs)
- Cost Management Plan (Inputs)
- Schedule Management Plan (Inputs)
- Organizational Process Assets (Inputs)



## 11.4 Perform Quantitative Risk Analysis

- **Data gathering and Representation Techniques** (Tools)
- **Quantitative Risk Analysis and Modeling Techniques** (Tools)
  - Sensitivity analysis.
    - Helps to determine which risks have the most potential impact on the project

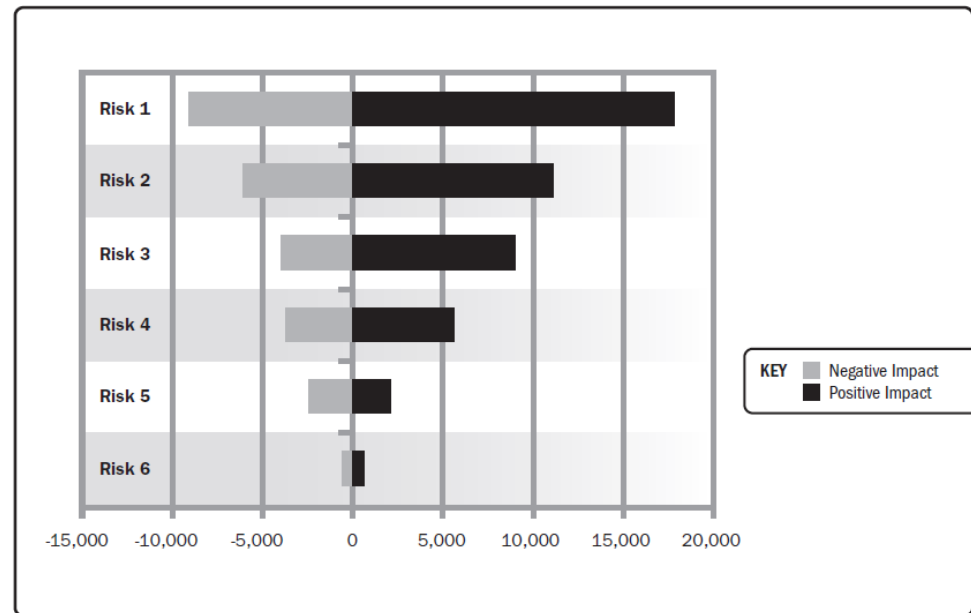


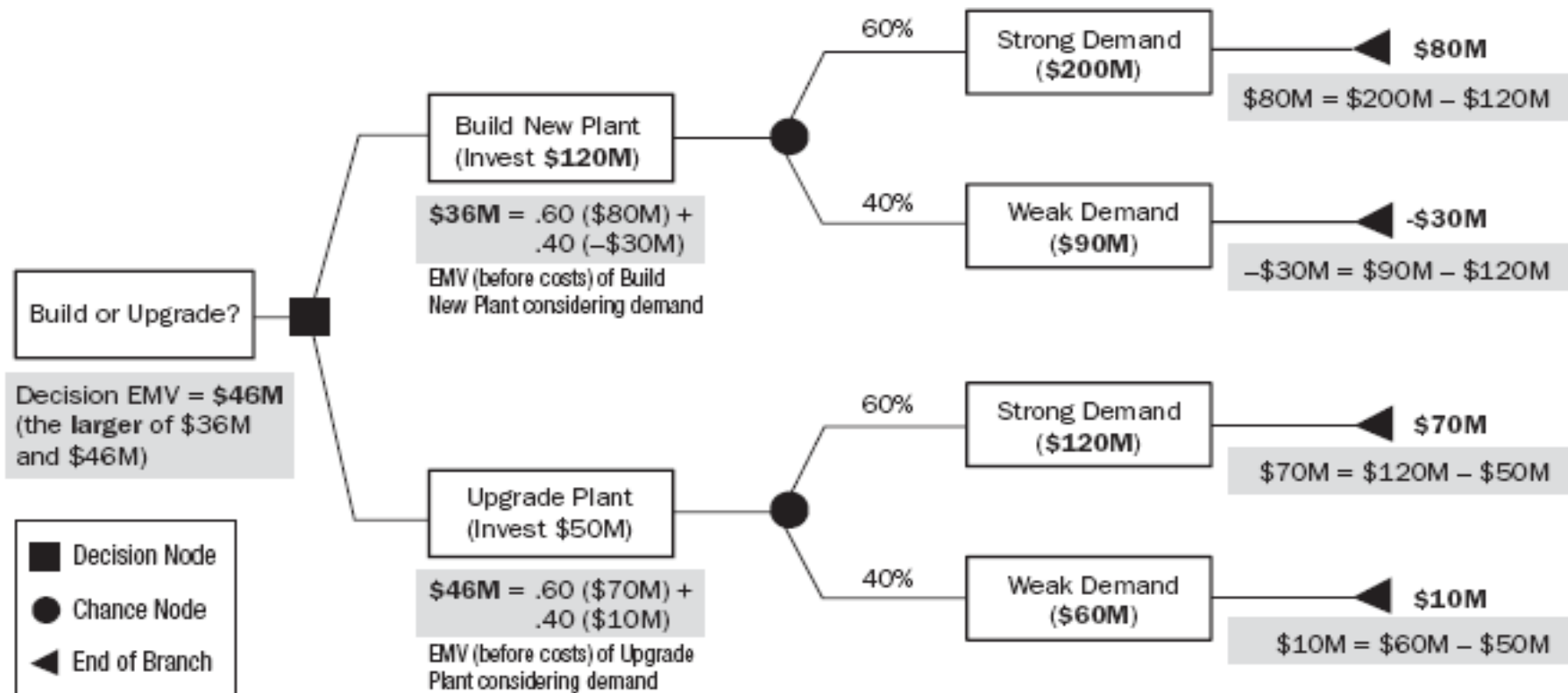
Figure 11-15. Example of Tornado Diagram

- **Expert judgment** (Tools)

# 11.4 Perform Quantitative Risk Analysis

## Decision Tree Example (EMV)

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

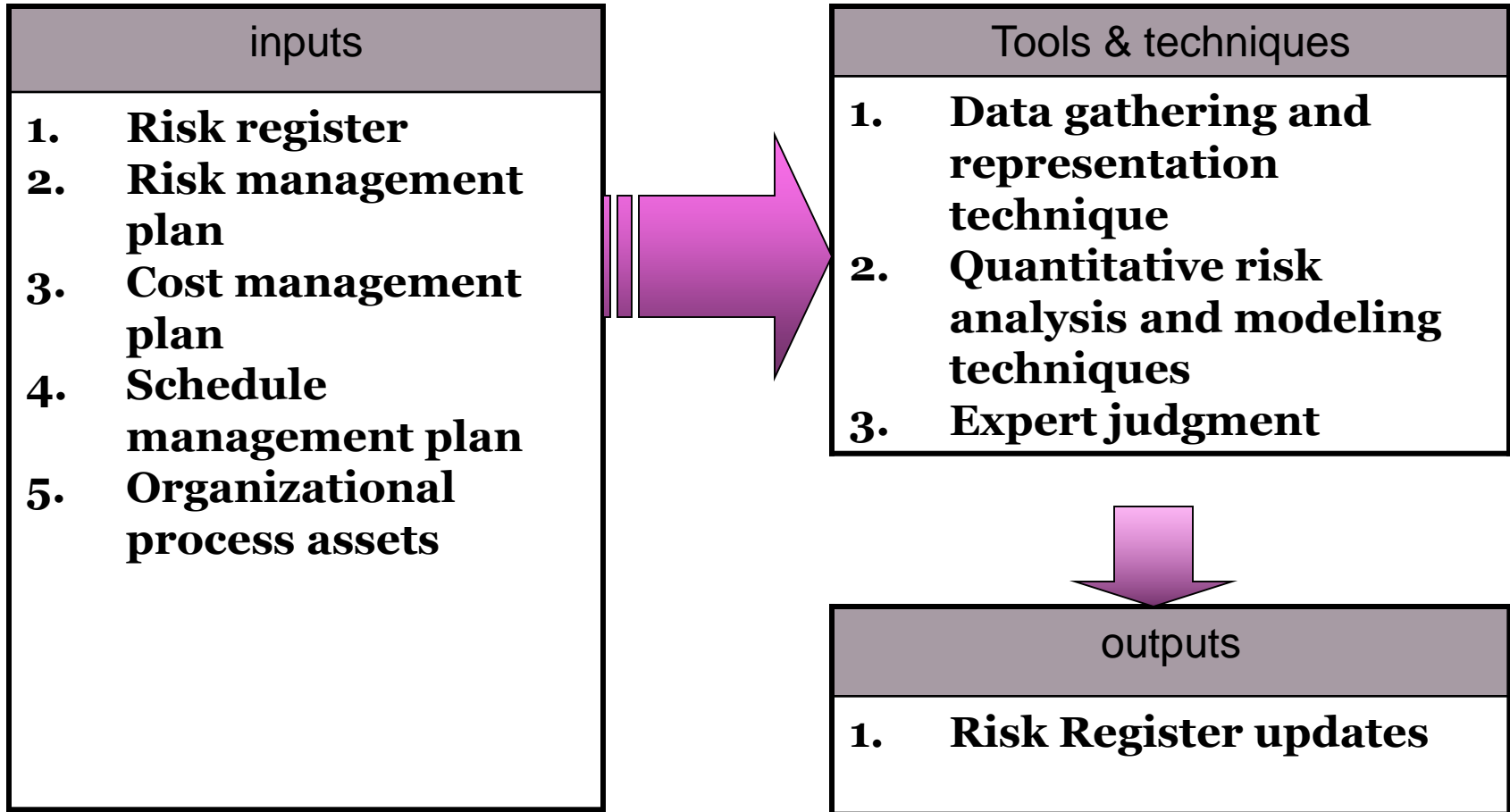


## 11.4 Perform Quantitative Risk Analysis

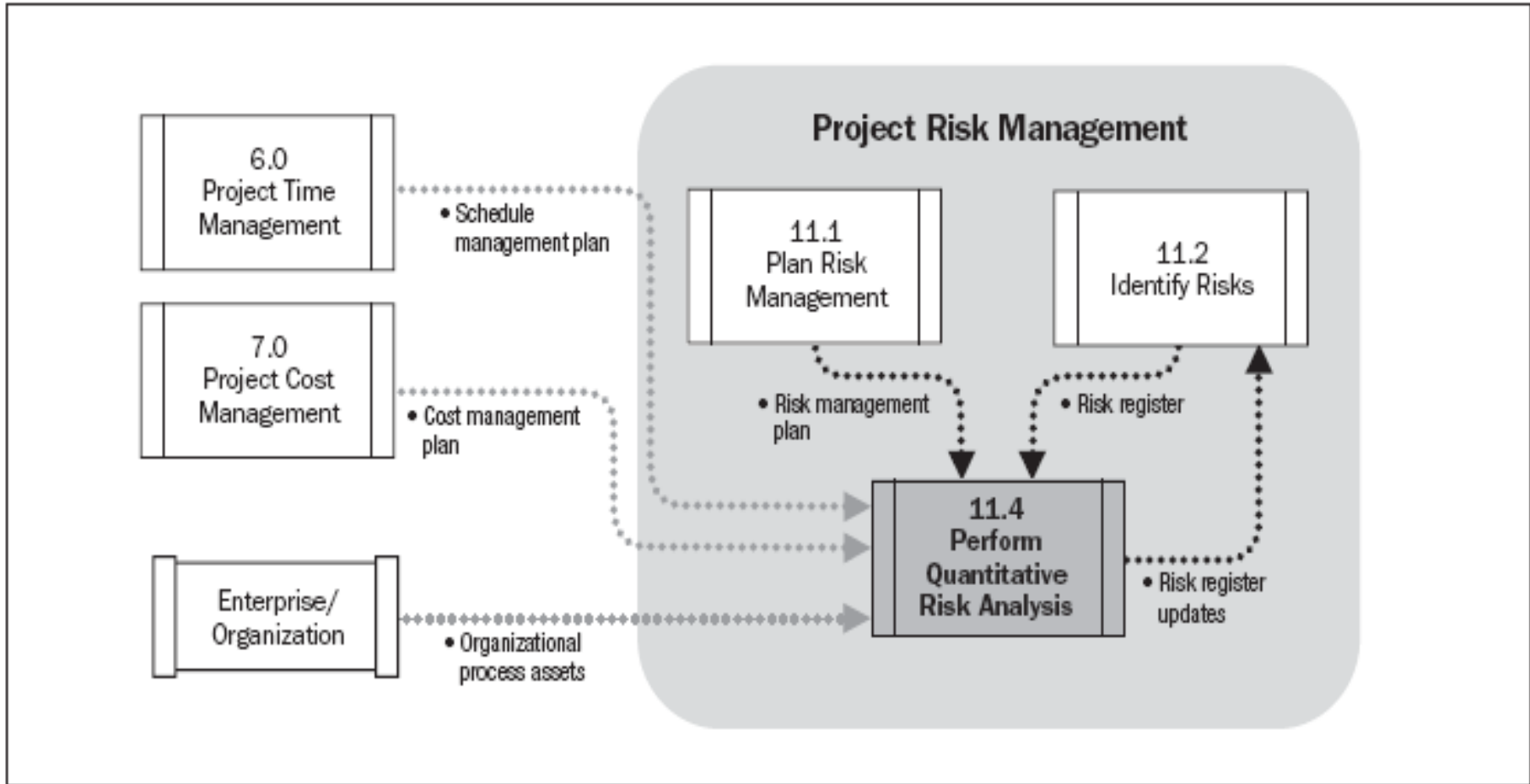
### **Risk register updates** (Outputs)

- Probabilistic analysis of the project
  - Listing the possible completion dates and costs with their associated confidence levels.
- Probability of achieving cost and time objectives
- Prioritized list of quantified risks
- Trends in quantitative risk analysis results

# 11.4 Perform Quantitative Risk Analysis



# 11.4 Perform Quantitative Risk Analysis



## 11.5 Plan Risk Responses

- The process of developing options and actions to enhance opportunities and to reduce threats to project objectives.
- Includes the identification and assignment of one person ( the “risk response owner” ) to take responsibility for each agreed-to and funded risk response.
- Addresses the risks by their priority, inserting resources and activities into the budget, schedule, and project management plan as needed.

# 11.5 Plan Risk Responses

- **Risk Register** (Inputs)
- **Risk Management Plan** (Inputs)

# 11.5 Plan Risk Responses

- **Strategies for negative Risks or Threats** (Tools)

## Avoid

- Changing the project management plan to eliminate the threat entirely.
- The project manager may change the objective that is in jeopardy.

## Transfer

- Transferring the risk simply gives another party responsibility for its management. (Assurance, Warranties, ....)

## Mitigate

- Implies a reduction on the probability and/or impact of an adverse risk event to be within acceptable threshold limits.

## Accept

- This strategy is adopted because it is seldom possible to eliminate all the threats from a project



# 11.5 Plan Risk Responses

- **Strategies for Positive Risks or Opportunities** (Tools)

## Exploit

This strategy may be selected for risks with positive impacts where the organization wishes to ensure that the opportunity is realized.

## Share

Sharing a positive risk involves allocating some or all of the ownership of the opportunity to a third party who is best able to capture the opportunity for the benefit of the project.

## Enhance

This strategy is used to increase the probability and/or the positive impacts of an opportunity.

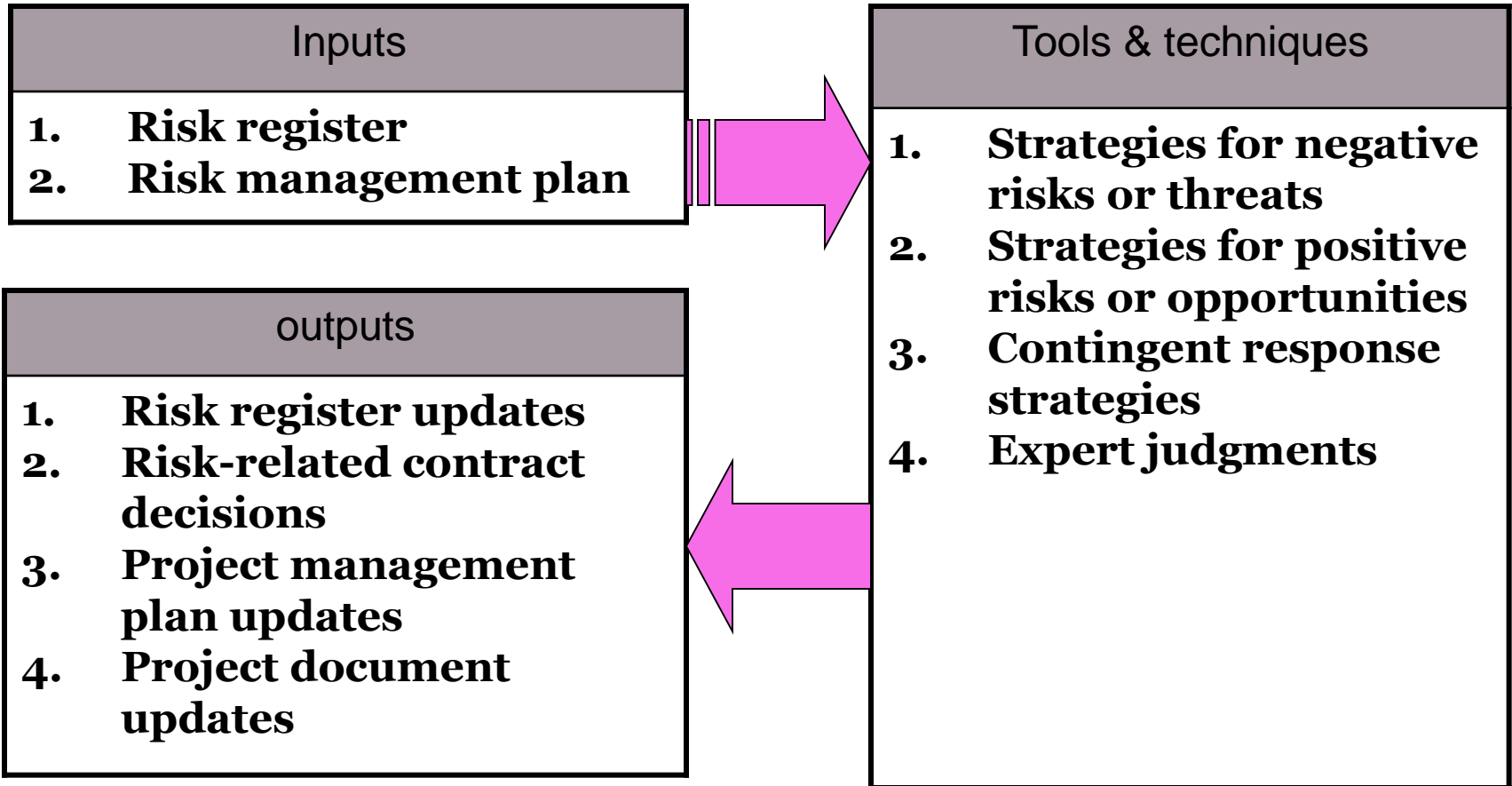
## Accept

Accepting an opportunity is being willing to take advantage of it if it comes along, but not actively pursuing it.

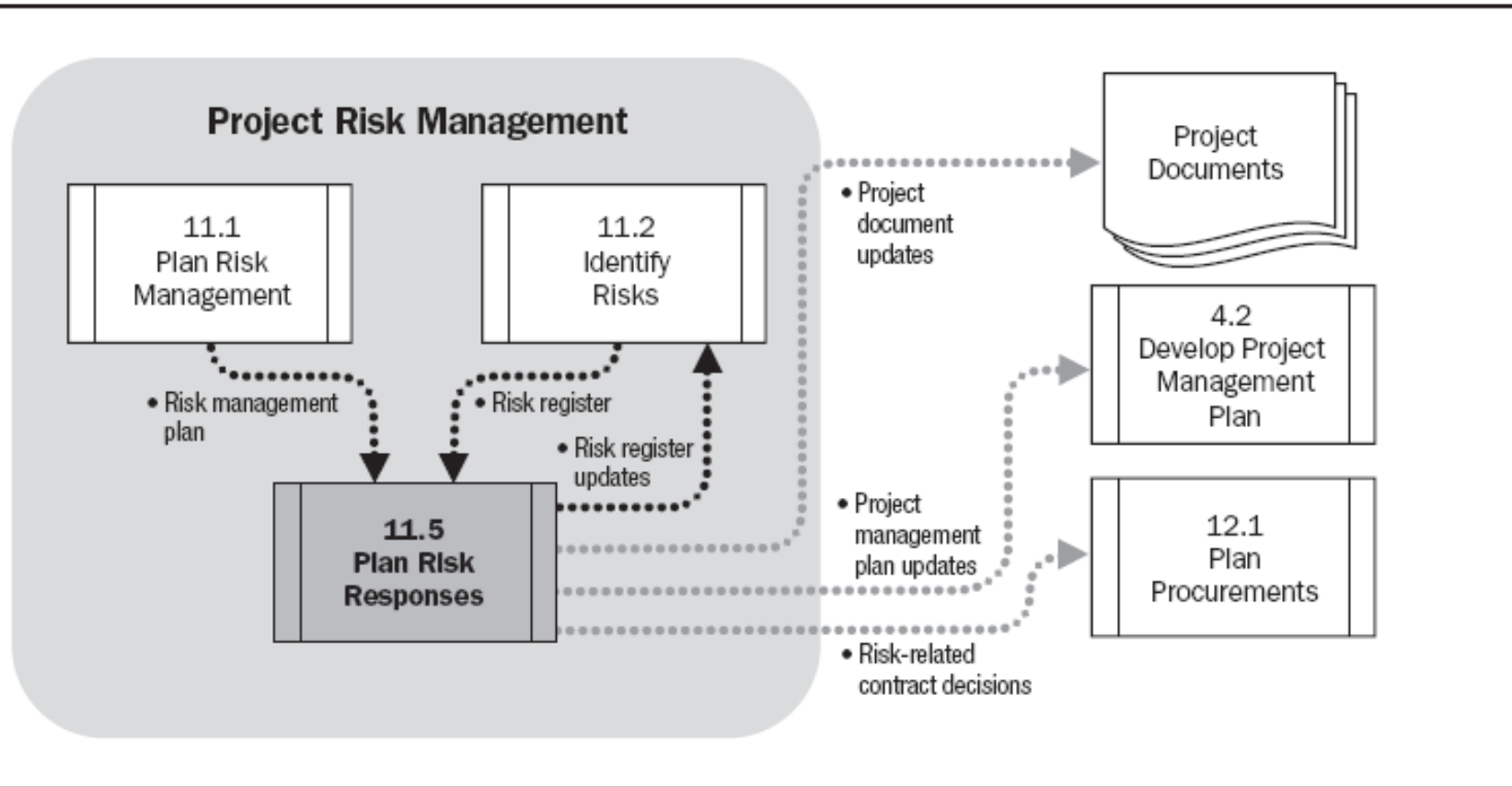
# 11.5 Plan Risk Responses

- Risk Register Updates (Outputs)
  - Identified risks, their descriptions, areas of the project effected, their causes, and how they may affect project objectives.
  - Risk owners and assigned responsibilities
  - Agreed-upon response strategies
  - Specific actions to implement the chosen response strategy
  - Triggers, symptoms, and warning signs of risks' occurrence;
  - Contingency plans and triggers that call for their execution;
  - Residual risks;
  - Secondary risks;
  - Contingency reserves.
- Risk-Related Contract Decisions (Outputs)
- Project Management Plan Updates (Outputs)
- Project Document Updates (Outputs)

# 11.5 Plan Risk Responses



# 11.5 Plan Risk Responses



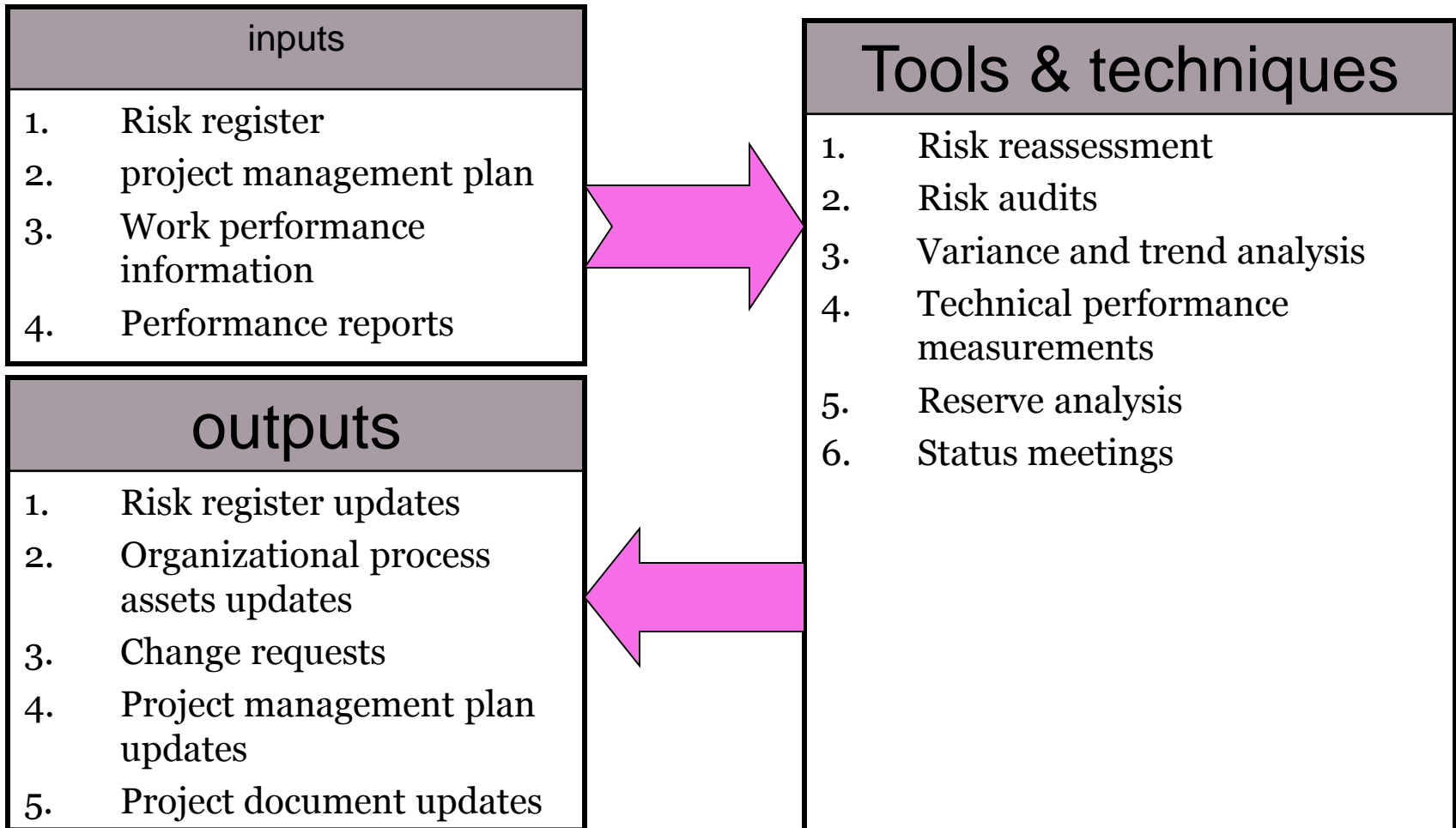
## 11.6 Monitor and Control Risks

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

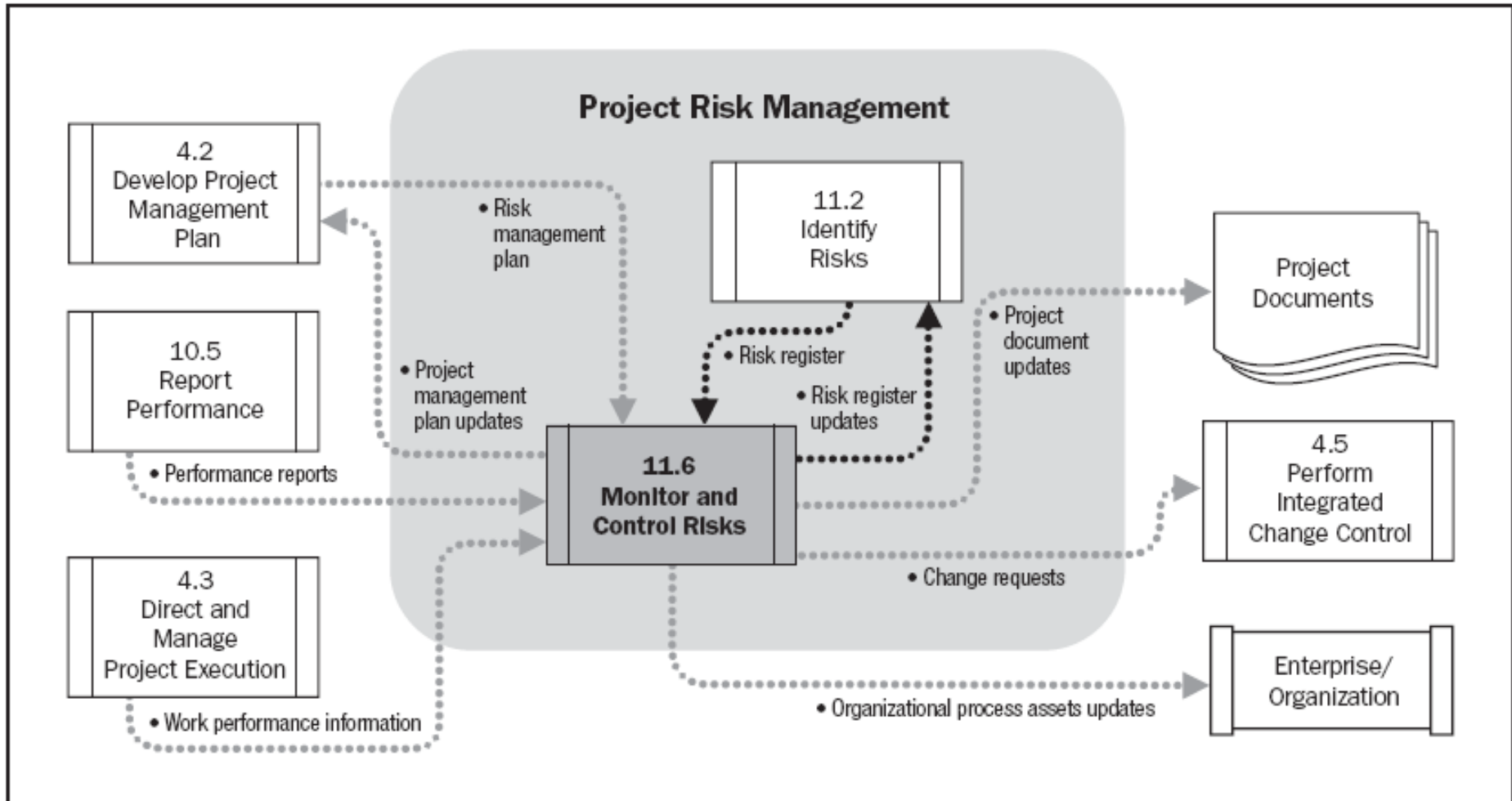
### Can involve:

- Choosing alternative strategies.
- Executing a contingency plan.
- Tracking corrective action.
- Modifying the project management plan.
- Updating the organizational process assets.

# Monitor and control risks



# Monitor and control risks



# Questions



**1 ) A project team is trying to decrease risks on the project. Management has a good relationship with a seller who is experienced in areas that your company is not experienced in. Management wants all activities with a U.S.\$50000 or higher risks to be transferred to that seller. Management believes that this will remove the impact of those higher risks from the project. Why would this NOT be effective?**

- A ) working with sellers add more than the \$50000 of risk to the project**
- B ) You would have to go through the contracting process.**
- C ) the transference of a risk does not remove all impacts of the risk.**
- D ) Management's association with the seller is a conflict of interest for the project.**

**1 ) A project team is trying to decrease risks on the project. Management has a good relationship with a seller who is experienced in areas that your company is not experienced in. Management wants all activities with a U.S.\$50000 or higher risks to be transferred to that seller. Management believes that this will remove the impact of those higher risks from the project. Why would this NOT be effective?**

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**B ) You would have to go through the contracting process.**

**C ) the transference of a risk does not remove all impacts of the risk.**

**D ) Management's association with the seller is a conflict of interest for the project.**

**2 ) A project manager is working on a major new product development project when a risk occurs that does not have a risk response plan. What should the project manager do?**

**A ) Hold a risk reassessment, and plan a workaround.**

**b ) Inform management, and communicate the new risk to the team.**

**C ) communicate the planned response to the stakeholders.**

**D ) Use some of the reserves to accommodate the risk.**

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**3 ) One of the risks your team has discovered is a high probability that the equipment you are developing will not perform under the pressure it needs to in the work place. In order to handle this risk, you have chosen to prototype the equipment. This is an example of risk:**

**A ) Mitigation.**

**B ) Avoidance.**

**C ) Transference.**

**D ) acceptance.**

**3 ) One of the risks your team has discovered is a high probability that the equipment you are developing will not perform under the pressure it needs to in the work place. In order to handle this risk, you have chosen to prototype the equipment. This is an example of risk:**

**A ) Mitigation.**

**B ) Avoidance.**

**C ) Transference.**

**D ) acceptance.**

4 ) Residual risks are risks that remain after risk response planning. Secondary risks are :

**A ) Planning risks that are no longer a factor during project executing**

**B ) Discovered during risk identification.**

**C ) New risks created by the risk response strategies selected.**

**D ) Lower priority risks not requiring mitigation efforts.**

4 ) Residual risks are risks that remain after risk response planning. Secondary risks are :

**A ) Planning risks that are no longer a factor during project executing**

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**C ) New risks created by the risk response strategies selected.**

**D ) Lower priority risks not requiring mitigation efforts.**



5 ) A project manager that you have been mentoring has completed risk response planning and has a risk response plan. What is the NEXT thing the project manager should do ?

**A ) Revise the project management plan.**

**B ) Recommend corrective action.**

**C ) Update the risk identification checklist.**

**D ) Create risk response strategies.**

5 ) A project manager that you have been mentoring has completed risk response planning and has a risk response plan. What is the NEXT thing the project manager should do ?

**A ) Revise the project management plan.**

**B ) Recommend corrective action.**

**C ) Update the risk identification checklist.**

**D ) Create risk response strategies.**

**6 ) What risk management process MOST affects the project management plan ?**

**A ) Identify risks.**

**B ) Perform quantitative risk analysis.**

**C ) Plan risk responses.**

**D ) Monitor and control risks.**

**6 ) What risk management process **NOST** affects the project management plan ?**

**A ) Identify risks.**

**B ) Perform quantitative risk analysis.**

**C ) Plan risk responses.**

**D ) Monitor and control risks.**

**7 ) A team member assigned to the project needs two days of training to satisfactorily complete certain activities. No one else with the necessary skills is available to the project team. What is the BEST thing to do?**

- A ) Add two days to the schedule and inform management of the delay.
- B ) Ask management for additional personnel because you cannot afford the extra schedule time.
- C ) Offer a bonus to the project team member if he gets the training in his own time.
- D ) include training in the project management plan.

**7 ) A team member assigned to the project needs two days of training to satisfactorily complete certain activities. No one else with the necessary skills is available to the project team. What is the BEST thing to do?**

- A ) Add two days to the schedule and inform management of the delay.
- B ) Ask management for additional personnel because you cannot afford the extra schedule time.
- C ) Offer a bonus to the project team member if he gets the training in his own time.
- D ) include training in the project management plan.**

Thank you