

Project Management Professional



PMP PREPARATION COURSE

6TH EDITION

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/PMP TRICKS



Chapter 11

Project Risk Management

PMBOK-6th Page 395 to 458

Lecture 08 : Project Risk Management

0. Introduction

Introduction -> What is a Risk?



Risk is an uncertain event or condition that if occurs, has a positive or negative effect on one or more project objectives such as scope, cost & quality.



Uncertain event
or condition

Effect

Project objectives

Lecture 08 : Project Risk Management

0. Introduction

Introduction -> Why Risk Management



A PM work should not focus on dealing with problems; it should focus on preventing them.



How would it feel to say, “No problem; we anticipated this, and we have a plan in place that will resolve it”.



Performing risk management helps prevent many problems & helps make other problems less likely



Failure of PM to asses project risks is a major cause of Project failure

Lecture 08 : Project Risk Management

0. Introduction

Introduction -> What is a Risk? Cont..



If there is 100% chance of an event occurring, this would be an issue, not risk.



Risks with negative consequences are called threats.



Risks with positive consequences are called opportunities.



Yes, risk can be good! Stop thinking of risk as bad, & start thinking in terms of opportunities!

Lecture 08 : Project Risk Management

Contents

1 Plan Risk Management

2 Identify Risks

3 Perform Qualitative Risk Analysis

4 Perform Quantitative Risk Analysis

5 Plan Risk Responses

6 Implement Risk response

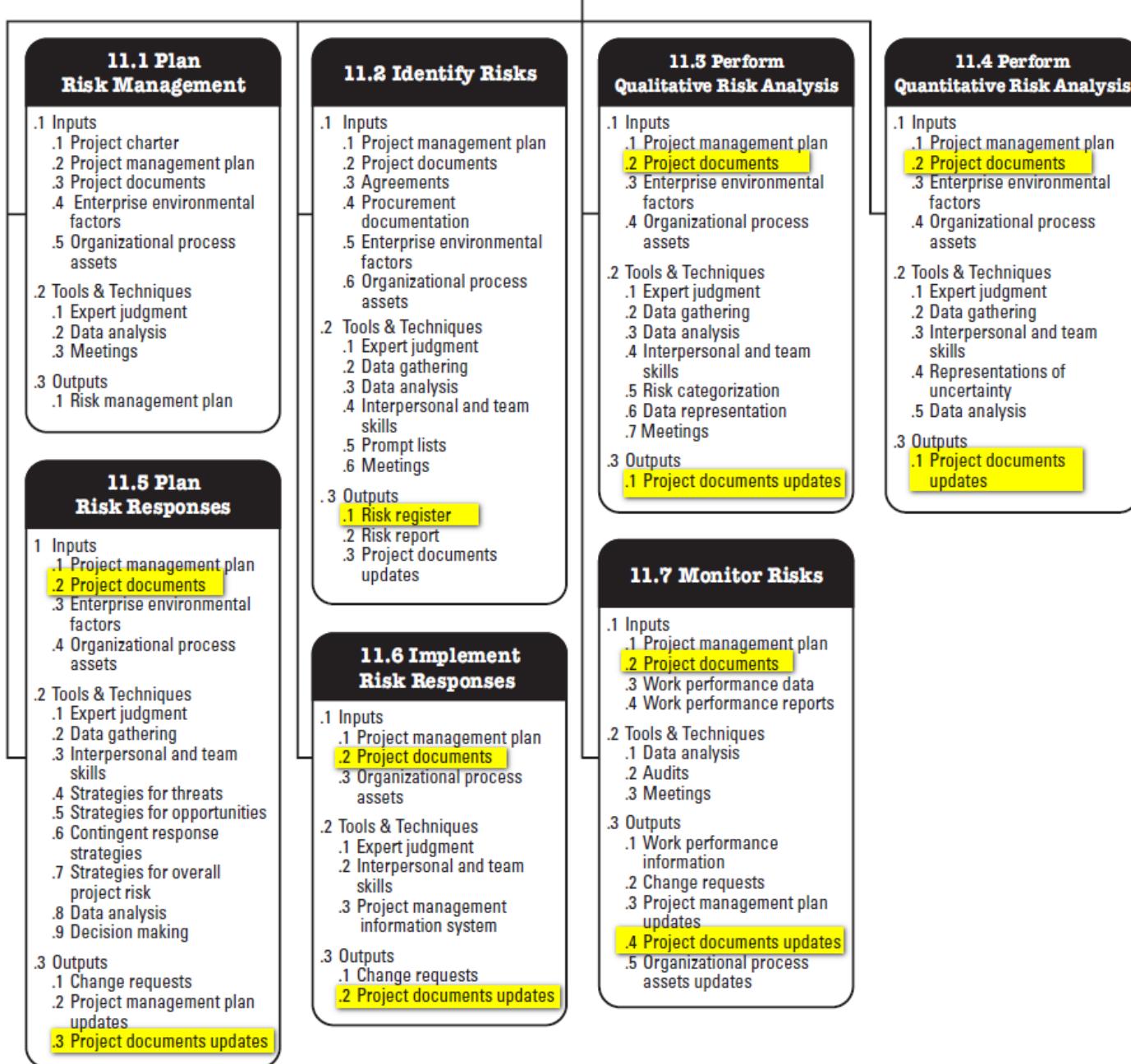
7 Monitor Risks

Planning

Executing

M&C

Project Risk Management Overview



Lecture 08 : Project Risk Management

01. Plan Risk Management



Lecture 08 : Project Risk Management

01. Plan Risk Management

➤ Plan Risk Management is the process of :

- Defining how to conduct risk management activities for a project.

هي عملية تحديد الطريقة التي يتم من خلالها تطبيق أنشطة إدارة المخاطر في المشروع.

❖ The key benefit of this process:

- ✓ ensures that the degree, type, and visibility of risk management are proportionate to both risks and the importance of the project to the organization and other stakeholders.

✓ تضمن أن تكون درجة، نوع، ووضوح إدارة المخاطر متناسبة مع المخاطر وأهمية المشروع بالنسبة للمنظمة والمعنيين الآخرين بالمشروع .

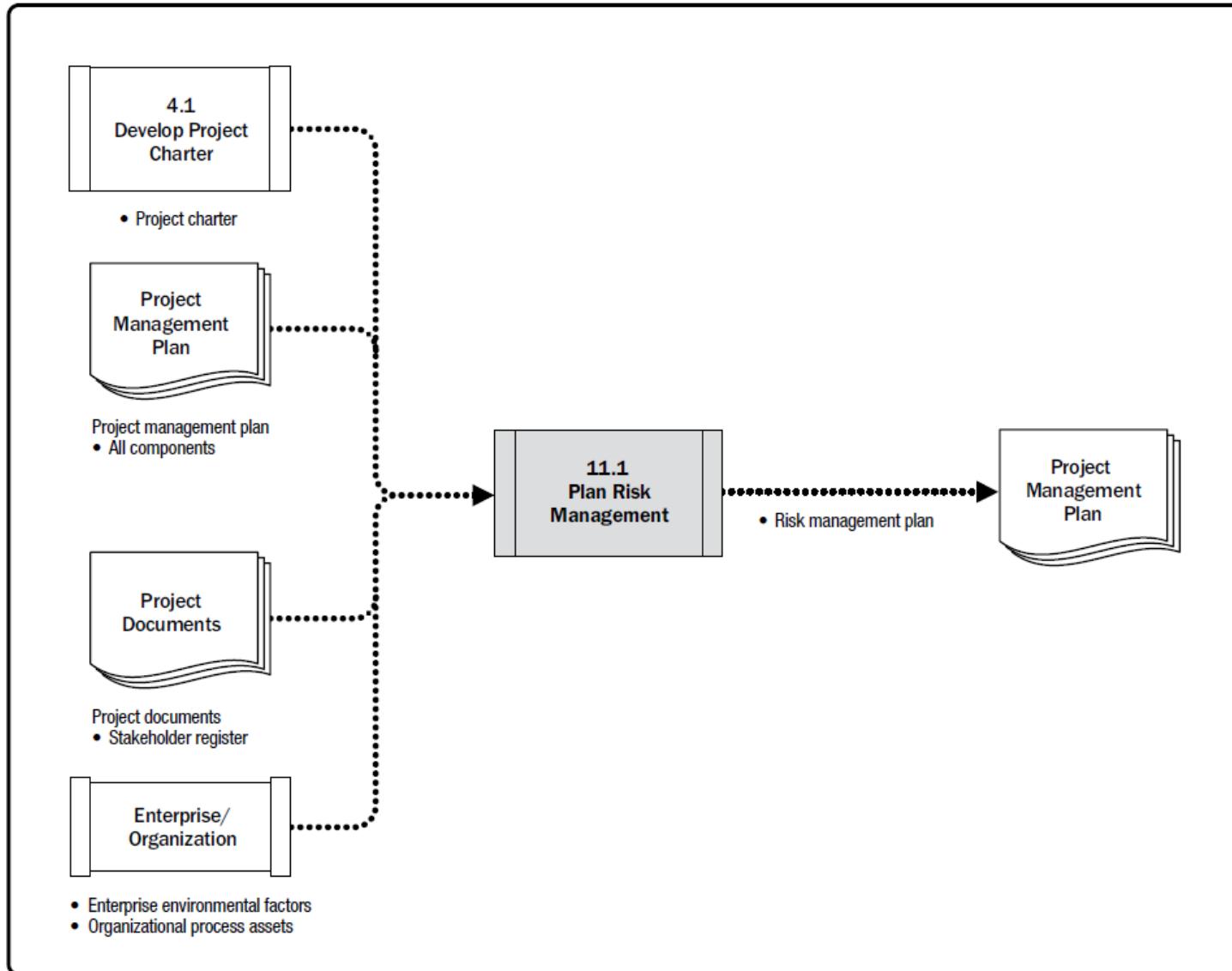


Figure 11-3. Plan Risk Management: Data Flow Diagram

BY: EL-Sayed Mohsen , PMP®, PMI- RMP®

Project Risk Management

(1) Plan Risk Management



Lecture 08 : Project Risk Management

01. Plan Risk Management

Outputs **Risk Management Plan:**

✓ **Risk strategy:** Describes the general approach to managing risk on this project



✓ **Methodology:** Approaches, tools, and data sources that will be used.



✓ **Roles & responsibilities:** Who will do what.



✓ **Funding:** Identifies the funds needed to perform activities related to Project Risk Management.



✓ **Timing:** When and how often risk management processes will be done.

Activity	2014						2015		
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
Risk Plan									
Risks Identification									
Risk Assessment									
Response Plan									

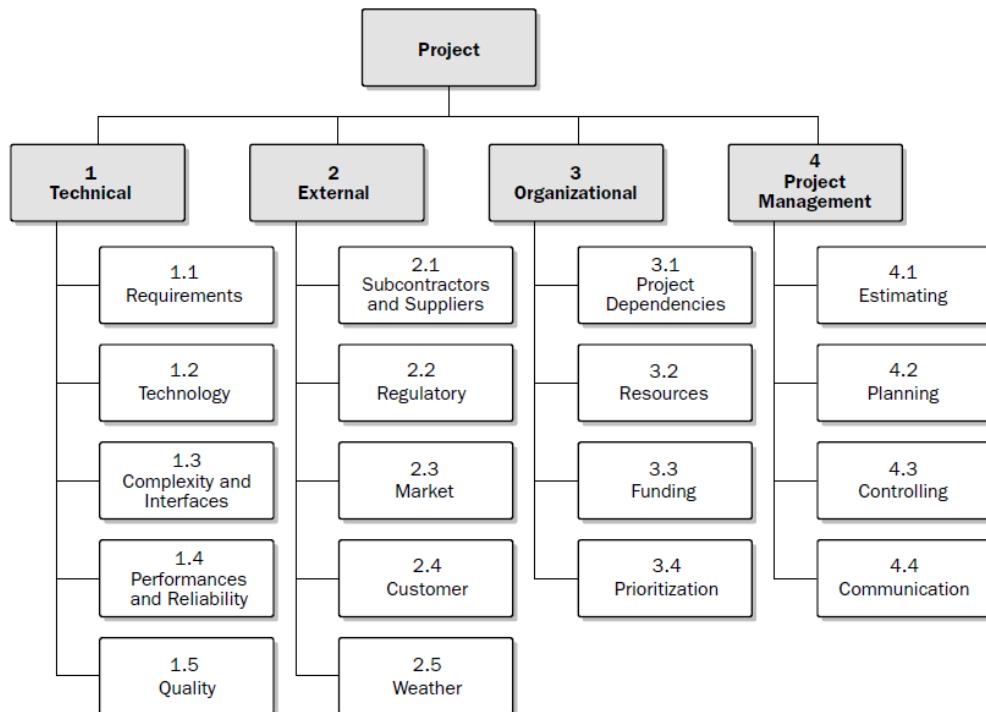
Lecture 08 : Project Risk Management

01. Plan Risk Management

Outputs Risk Management Plan:

✓ **Risk categories (Risk Breakdown Structure) (RBS)**

- Is a hierarchical framework of potential sources of risk to a project.
- Categorize the risks in Technical ,External ,Organizational, and management.



RBS LEVEL 0	RBS LEVEL 1	RBS LEVEL 2
		1.1 Scope definition 1.2 Requirements definition 1.3 Estimates, assumptions, and constraints 1.4 Technical processes 1.5 Technology 1.6 Technical interfaces Etc.
	1. TECHNICAL RISK	2.1 Project management 2.2 Program/portfolio management 2.3 Operations management 2.4 Organization 2.5 Resourcing 2.6 Communication Etc.
	2. MANAGEMENT RISK	3.1 Contractual terms and conditions 3.2 Internal procurement 3.3 Suppliers and vendors 3.4 Subcontracts 3.5 Client/customer stability 3.6 Partnerships and joint ventures Etc.
0. ALL SOURCES OF PROJECT RISK	3. COMMERCIAL RISK	4.1 Legislation 4.2 Exchange rates 4.3 Site/facilities 4.4 Environmental/weather 4.5 Competition 4.6 Regulatory Etc.
	4. EXTERNAL RISK	

Figure 11-4. Extract from Sample Risk Breakdown Structure (RBS)

Lecture 08 : Project Risk Management

01. Plan Risk Management

Outputs

Risk Management Plan:

✓ Definitions of risk probability and impacts

- Definitions of risk probability and impact levels are specific to the project context and reflect the **risk appetite** and **thresholds** of the organization and key stakeholders.

Table 11-1. Example of Definitions for Probability and Impacts

SCALE	PROBABILITY	+/- IMPACT ON PROJECT OBJECTIVES		
		TIME	COST	QUALITY
Very High	>70%	>6 months	>\$5M	Very significant impact on overall functionality
High	51-70%	3-6 months	\$1M-\$5M	Significant impact on overall functionality
Medium	31-50%	1-3 months	\$501K-\$1M	Some impact in key functional areas
Low	11-30%	1-4 weeks	\$100K-\$500K	Minor impact on overall functionality
Very Low	1-10%	1 week	<\$100K	Minor impact on secondary functions
Nil	<1%	No change	No change	No change in functionality

Lecture 08 : Project Risk Management

01. Plan Risk Management

Outputs Risk Management Plan:

- ✓ Probability and impact matrix
- ✓ Stakeholder risk appetite: الرغبة في المخاطرة لدى المعنيين.
 - Identify the risk thresholds of the organization(s) and key stakeholders on the project with regard to each objective
- ✓ Reporting Formats:
 - How risk management output will be analyzed and documented.
- ✓ Tracking:
 - How risk activities will be recorded, tracked, and audited.

RISK MANAGEMENT PLAN

Project Title: _____ Date Prepared: _____

Frequency and Timing

Determine the frequency of conducting formal risk management activities and the timing of any specific activities.

Stakeholder Risk Tolerances

Identify the risk thresholds of the organization(s) and key stakeholders on the project with regard to each objective.

Risk Tracking and Audit

Document how risk activities will be recorded and how risk management processes will be audited.

RISK MANAGEMENT PLAN

Project Title: _____ Date Prepared: _____

Strategy

The general approach to managing risk on the project

Methodology

Describe the methodology or approach to the risk management. This includes any tools, approaches, or data sources that will be used.

Roles and Responsibilities

Role	Responsibility
1. Document the roles and responsibilities for various risk management activities.	1.
2.	2.
3.	3.
4.	4.

Risk Categories

Risk Management Funding

Contingency Protocols

RISK MANAGEMENT PLAN

Definitions of probability

Very High	there is an 80 percent probability or higher that the event will occur
High	there is a 60–80 percent probability that the event will occur
Medium	there is a 40–60 percent probability that the event will occur
Low	overrun of control account budget between 5–10 percent
Very Low	overrun of control account budget of <5 percent

Definitions of Impact by Objective

	Scope	Quality	Time	Cost
Very High				>20
High				15–20
Medium				10–15
Low				5–10
Very Low				<5

Lecture 08 : Project Risk Management

02. Identify Risks



Lecture 08 : Project Risk Management

02. Identify Risks

➤ Identify Risks is the process of :

- Identifying individual project risks as well as sources of overall project risk, and documenting their characteristics.

هي عملية تحديد المخاطر الفردية بالمشروع إضافةً إلى مصادر الخطر الكلي للمشروع وتوثيق خصائصها.

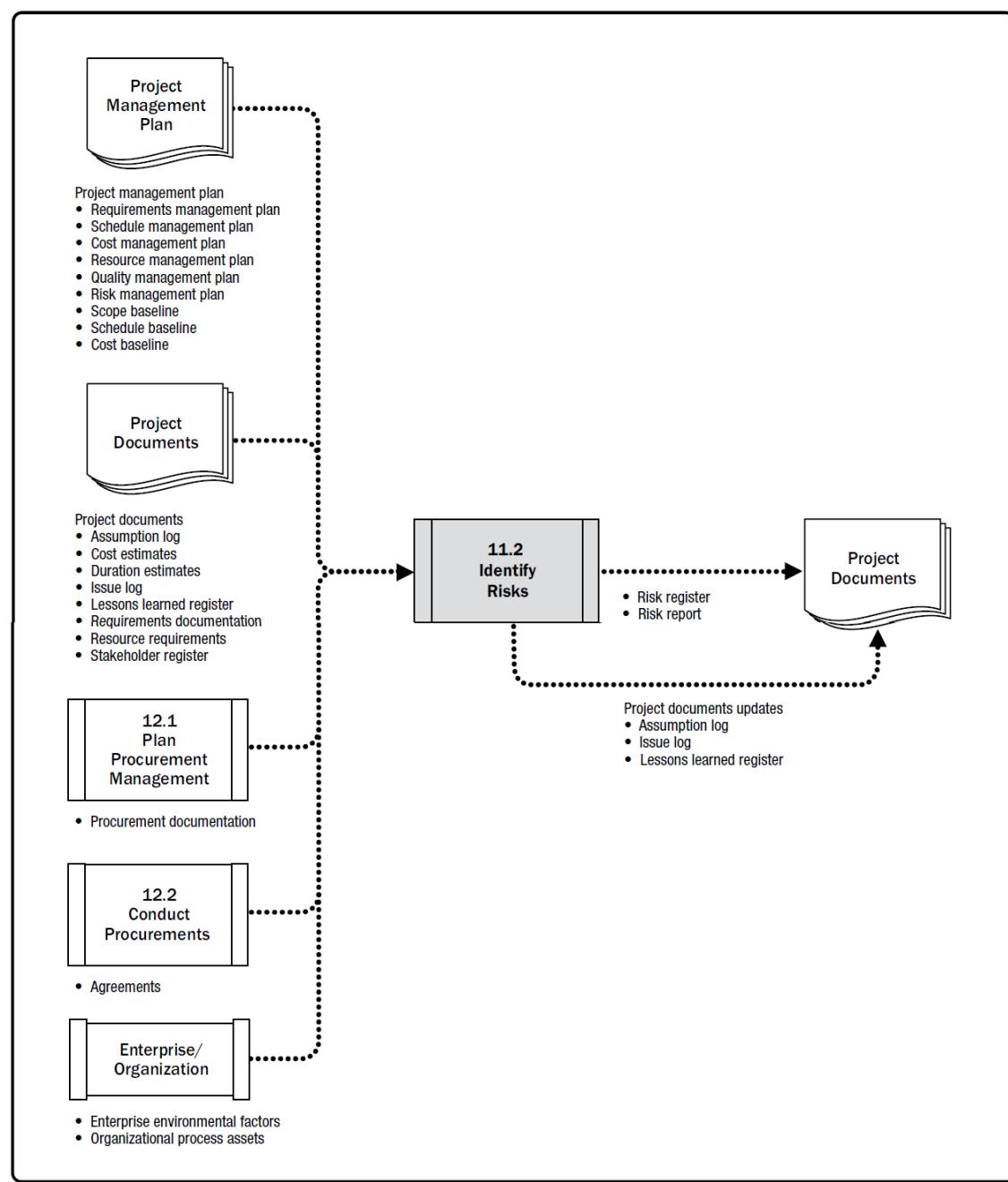
❖ The key benefit of this process:

- ✓ The documentation of existing individual project risks and the sources of overall project risk.

✓ توثيق مخاطر المشروع الفردية القائمة ومصادر الخطر الكلي للمشروع.

- ✓ Brings together information so the project team can respond appropriately to identified

risks. ✓ تجمع المعلومات بحيث يمكن فريق المشروع من الاستجابة بصورة ملائمة للمخاطر المحددة.



Project Risk Management

(2) Identify Risks



Input

1. Project management plan
2. Project documents
3. Agreements
4. Procurement documentation
5. Enterprise environmental factors
6. Organizational process assets



Tools & Techniques

1. Expert judgment
2. Data Gathering
3. Data Analysis
4. Interpersonal and team skills
5. Prompt Lists
6. Meetings



Outputs

1. Risk register
2. Risk report
3. Project documents updates

Lecture 08 : Project Risk Management

02. Identify Risks

Inputs

Agreements

If the project requires external procurement of resources, the agreements may have information such as milestone dates, contract type, acceptance criteria, and awards and penalties that can present threats or opportunities.



Lecture 08 : Project Risk Management

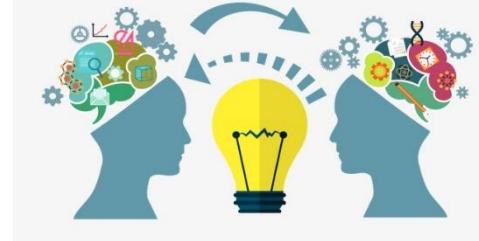
02. Identify Risks

TT

□ Data Gathering

✓ Brainstorming:

- Obtain a **comprehensive list** of individual project risks and **sources** of overall project risk.



✓ Checklists:

- Risk checklists are developed based on historical information and knowledge that has been accumulated from similar projects.
- listing specific individual project risks that have occurred **previously** and that may be relevant to this project.
- **Quick** and **simple** to use.
- It is **impossible** to build an **exhaustive** one.



✓ Interviews.

Lecture 08 : Project Risk Management

02. Identify Risks

TT

□ Data Gathering

✓ Checklists:

Project Name : _____

Risks Checklist		
Main Category	Potential Risks	Potentiality
Management	Schedule Risks	<input type="checkbox"/>
	Resource Risks	<input type="checkbox"/>
	Planning Weakness	<input type="checkbox"/>
	Communication Risks	<input type="checkbox"/>
Technical	Design Risks	<input type="checkbox"/>
	Site Risks	<input type="checkbox"/>
	Quality Risks	<input type="checkbox"/>
	Coordination Risks	<input type="checkbox"/>
Legal	Disputes	<input type="checkbox"/>
	Regulation Ambiguity	<input type="checkbox"/>
	Licences and Permits	<input type="checkbox"/>
Political	Wars and Strikes	<input type="checkbox"/>
	Bribes	<input type="checkbox"/>
	Revolutions	<input type="checkbox"/>

Lecture 08 : Project Risk Management

02. Identify Risks

TT Data analysis

✓ **Root cause analysis:**

- Used to discover the underlying causes that lead to a problem, and develop preventive action.
 - For example,
 - The project might be delayed or over budget) and exploring which threats might result in that problem occurring
 - Early delivery or under budget) and exploring which opportunities might result in that benefit being realized.

✓ **Assumption and constraint analysis:**

- Explores the validity of assumptions and constraints to determine which pose a risk to the project.
- Threats may be identified from the inaccuracy, instability, inconsistency, or incompleteness of assumptions.

Lecture 08 : Project Risk Management

02. Identify Risks

TT □ Data analysis

✓ SWOT Analysis:

S= Strength W= Weakness

O= Opportunities T= Threats

Identify opportunities that are result of organization strength as well as threats that are result of organization weakness



✓ Document analysis:

- Risks may be identified from a structured review of project documents **including**:
- Plans, assumptions, constraints, previous project files, contracts, agreements, and technical documentation.
- Uncertainty in project documents may be indicators of risk on the project.



Lecture 08 : Project Risk Management

02. Identify Risks

TT

Prompt List

القوائم الفورية

- ✓ A predetermined list of risk categories that might give rise to individual project risks and that could also act as **sources of overall project risk**.
- ✓ Used as a framework to aid the project team in idea generation when using risk identification techniques.
- ✓ The risk categories in the lowest level of the risk breakdown structure can be used as a prompt list for individual project risks.

1. The PESTLE prompt list:

- Political
- Economic
- Social
- Technological
- Legal
- Environmental

2. The TECOP prompt list:

- Technical
- Environmental
- Commercial
- Operational
- Political

3. The SPECTRUM prompt list:

- Socio-cultural
- Political
- Economic
- Competitive
- Technology
- Regulatory/legal
- Uncertainty/risk
- Market

Lecture 08 : Project Risk Management

02. Identify Risks

Outputs

Risk Register:

The risk register captures details of identified **individual project risks**.

The content of the risk register may include but is not limited to:

- ✓ **List of identified risks.**
- ✓ **Potential risk owners.**

Where a potential risk owner has been identified during the Identify Risks process, the risk owner is recorded in the risk register. This will be **confirmed** during the **Perform Qualitative Risk Analysis** process

- ✓ **List of potential risk responses.**
 - Where a potential risk response has been identified during the Identify Risks process, it is recorded in the risk register.
- ❖ Risk register will be updated through each process of risk management.

Lecture 08 : Project Risk Management

02. Identify Risks

Outputs

Risk Report:

Information in the risk report may include but is not limited to:

- ✓ Sources of overall project risk, indicating which are the most important drivers of overall project risk exposure.
- ✓ Summary information on identified individual project risks, such as number of identified threats and opportunities, distribution of risks across risk categories, metrics and trends.

❖ Risk report will be updated through each process of risk management.

Project Documents Updates

- Assumption log
- Issue log
- Lessons learned register

Lecture 08 : Project Risk Management

03. Perform Qualitative Risk Analysis



Lecture 08 : Project Risk Management

03. Perform Qualitative Risk Analysis

➤ Perform Qualitative Risk Analysis is the process of :

- Prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics.

هي عملية إخضاع المخاطر الفردية للمشروع حسب أولوياتها لمزيد من التحليل أو الإجراءات عن طريق تقييم احتمالية حدوثها وتأثيرها إضافيةً إلى الخصائص الأخرى

❖ The key benefit of this process:

- ✓ it focuses efforts on high-priority risks.
- ✓ تركز الجهد على المخاطر عالية الأولوية.

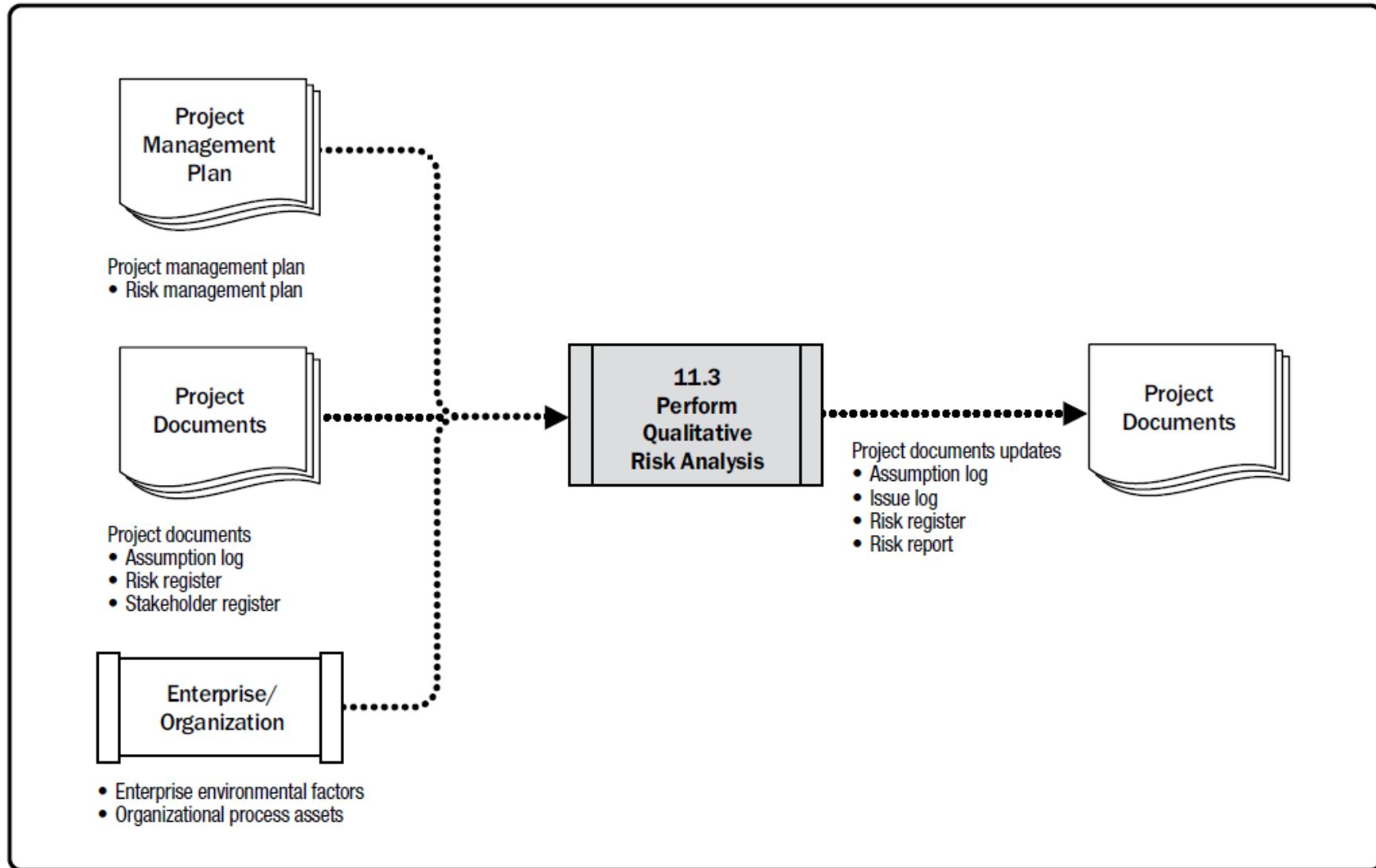


Figure 11-9. Perform Qualitative Risk Analysis: Data Flow Diagram

BY: EL-Sayed Mohsen , PMP®, PMI- RMP®

Project Risk Management

(3) Perform Qualitative Risk Analysis



Input

1. Project management plan
2. Project documents
3. Enterprise environmental factors
4. Organizational process assets



Tools & Techniques

1. Expert judgment
2. Data Gathering
3. Data Analysis
4. Interpersonal and team skills
5. Risk categorization
6. Data representation
7. Meetings



Outputs

1. Project documents updates

Lecture 08 : Project Risk Management

03. Perform Qualitative Risk Analysis

TT

Data Analysis

✓ Risk Data Quality Assessment:

- Evaluates the degree to which the data about individual project risks is **accurate** and **reliable**.

✓ Risk Probability and Impact Assessment:

- Considers the **likelihood** that a specific risk will **occur**.
- Risk impact assessment considers the **potential effect** on one or more project **objectives** such as schedule, cost, quality, or performance.
- Risks can be assessed in **interviews** or **meetings** with participants selected for their **familiarity** with the types of risk recorded in the risk register.

Lecture 08 : Project Risk Management

03. Perform Qualitative Risk Analysis

TT

Risk Categorization:

- Risks to the project can be categorized by sources of risk (ex: RBS , WBS project phase, roles and responsibilities, ..etc)
- Grouping risks into categories can lead to the development of more effective risk responses by focusing attention and effort on the areas of highest risk exposure.

Lecture 08 : Project Risk Management

03. Perform Qualitative Risk Analysis

TT

□ Data Representation

✓ Probability and impact matrix مصفوفة الاحتمالات والتأثير

- This matrix specifies combinations of probability and impact that allow individual project risks to be divided into priority groups.
- Rate the risks as low, moderate, or high priority.
- This helps finding risks need immediate response, risks need additional analysis, and risks need to be put on the watch list.

		Threats					Opportunities				
Probability	Very High 0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
	High 0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
	Medium 0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
	Low 0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
	Very Low 0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
		Very Low 0.05	Low 0.10	Moderate 0.20	High 0.40	Very High 0.80	Very High 0.80	High 0.40	Moderate 0.20	Low 0.10	Very Low 0.05
Negative Impact						Positive Impact					

Lecture 08 : Project Risk Management

03. Perform Qualitative Risk Analysis

Outputs Project Documents Updates

- ✓ **Assumption log.**
 - When new assumptions may be made, new constraints may be identified ,The assumption log should be updated with this new information.
- ✓ **Issue log**
 - The issue log should be updated to capture any new issues uncovered or changes in currently logged issues.
- ✓ **Risk register**
 - Updates to the risk register may include assessments of probability and impacts for each individual project risk, its priority level.
 - Risk urgency information or risk categorization.
 - a watch list for low-priority risks or risks requiring further analysis.
- ✓ **Risk report.**
 - The risk report is updated to reflect the most important individual project risks (usually those with the highest probability and impact), as well as a prioritized list of all identified risks on the project and a summary conclusion.

Lecture 08 : Project Risk Management

04. Perform Quantitative Risk Analysis



Lecture 08 : Project Risk Management

04. Perform Quantitative Risk Analysis

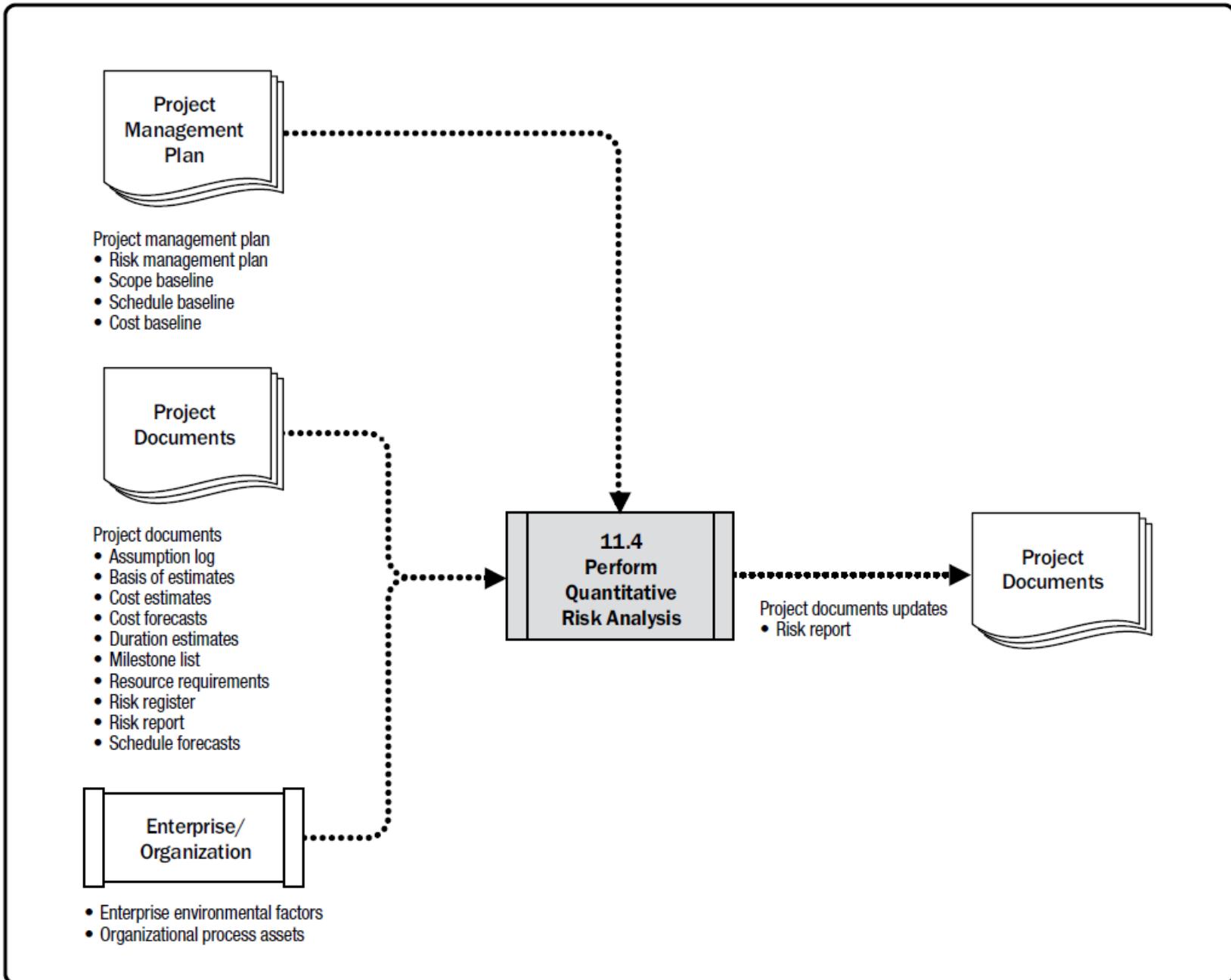
➤ Perform Quantitative Risk Analysis is the process of :

- Numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives.

عملية القيام بتحليل عددي للتأثير المشترك لمخاطر المشروع الفردية المحددة ومصادر الشك الأخرى على أهداف المشروع ككل.

❖ The key benefit of this process:

- ✓ Quantifies overall project risk exposure, and it can also provide additional quantitative risk information to support risk response planning.
- ✓ تقوم بحساب كمية التعرض للخطر الكلي للمشروع ويمكنها أيضاً أن تقدم معلومات كمية إضافية عن المخاطر لدعم تحضير الاستجابة للمخاطر.
- ❖ This process is not required for every project, but where it is used, it is performed throughout the project.



Project Risk Management

(4) Perform Quantitative Risk Analysis



Input

1. Project management plan
2. Project documents
3. Enterprise environmental factors
4. Organizational process assets



Tools &
Techniques

1. Expert judgment
2. Data Gathering
3. Interpersonal and team skills
4. Representations of uncertainty
5. Data Analysis

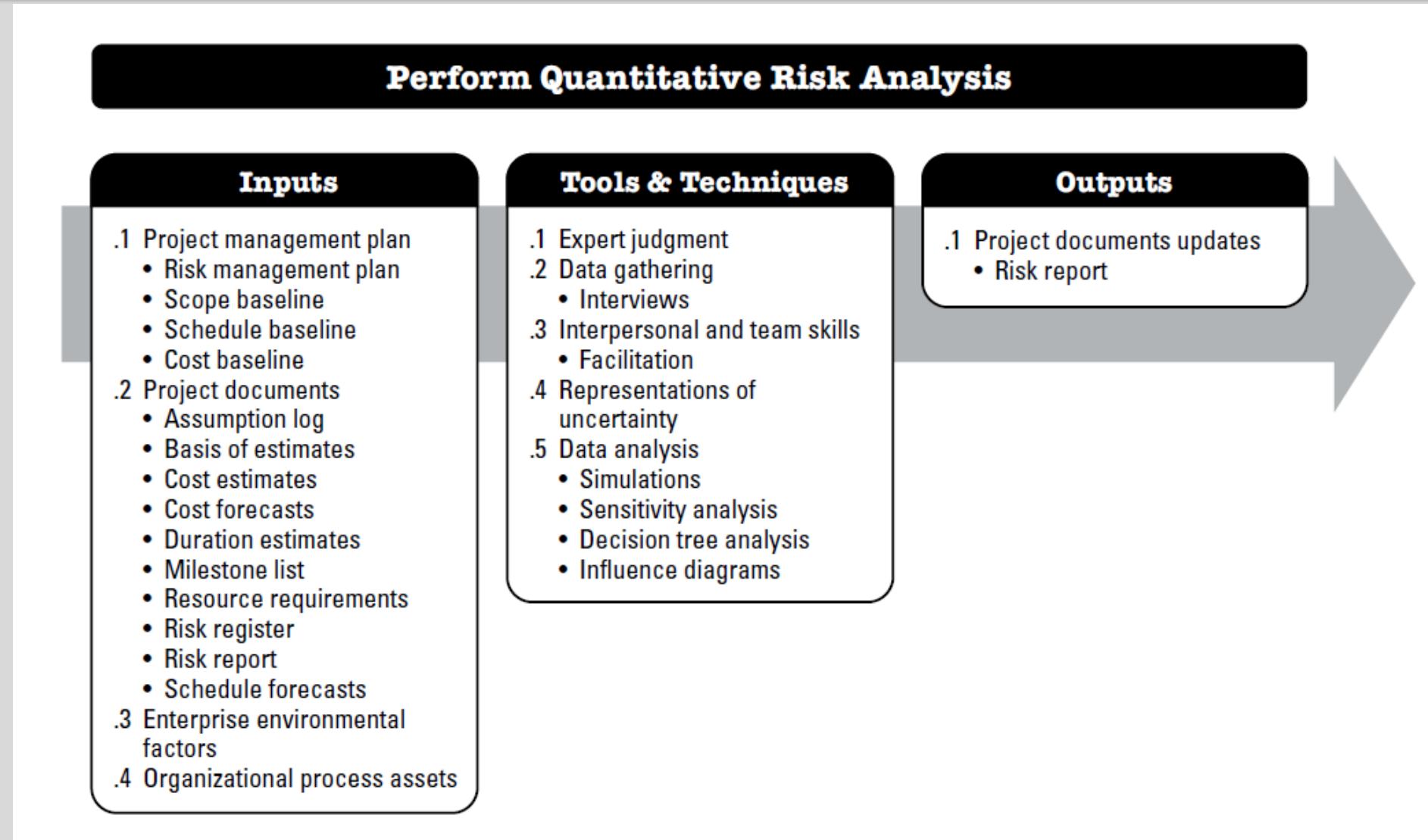


Outputs

1. Project documents updates

Lecture 08 : Project Risk Management

04. Perform Quantitative Risk Analysis



Lecture 08 : Project Risk Management

04. Perform Quantitative Risk Analysis

TT

Interviewing.

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 11-17 (Cost Risk Simulation Results).

Data Analysis

- Simulation.
- Sensitivity analysis
- Decision tree analysis
- Influence diagrams

Range of Project Cost Estimates Collected During the Risk Interview

Lecture 08 : Project Risk Management

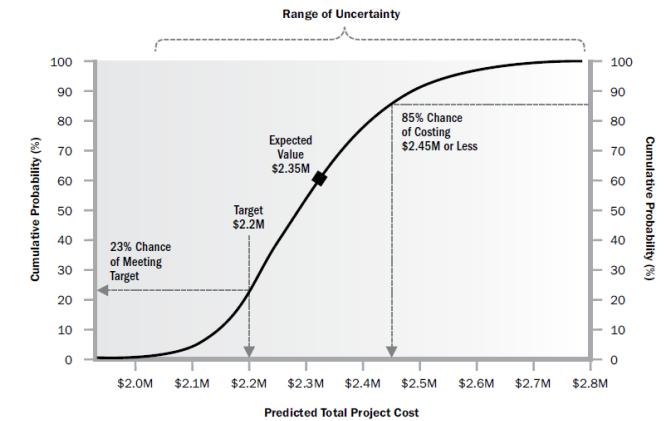
04. Perform Quantitative Risk Analysis

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□ Data Analysis

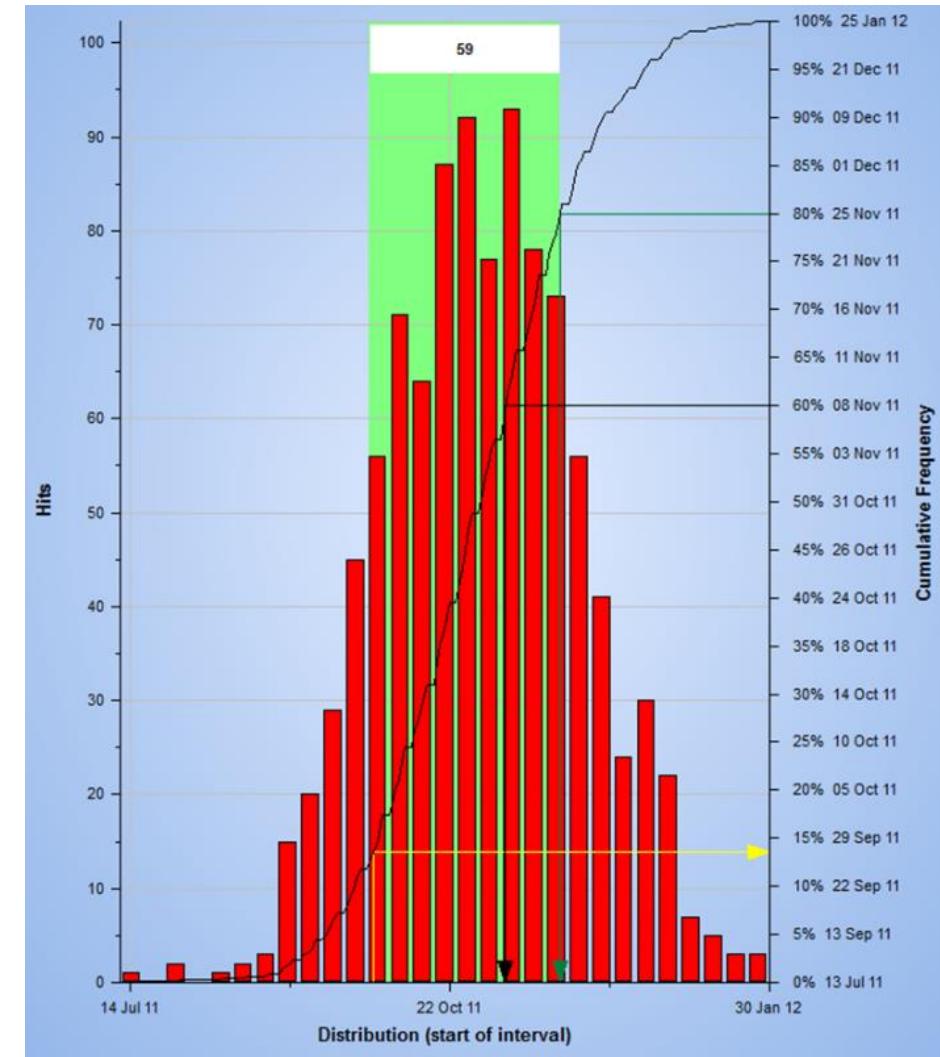
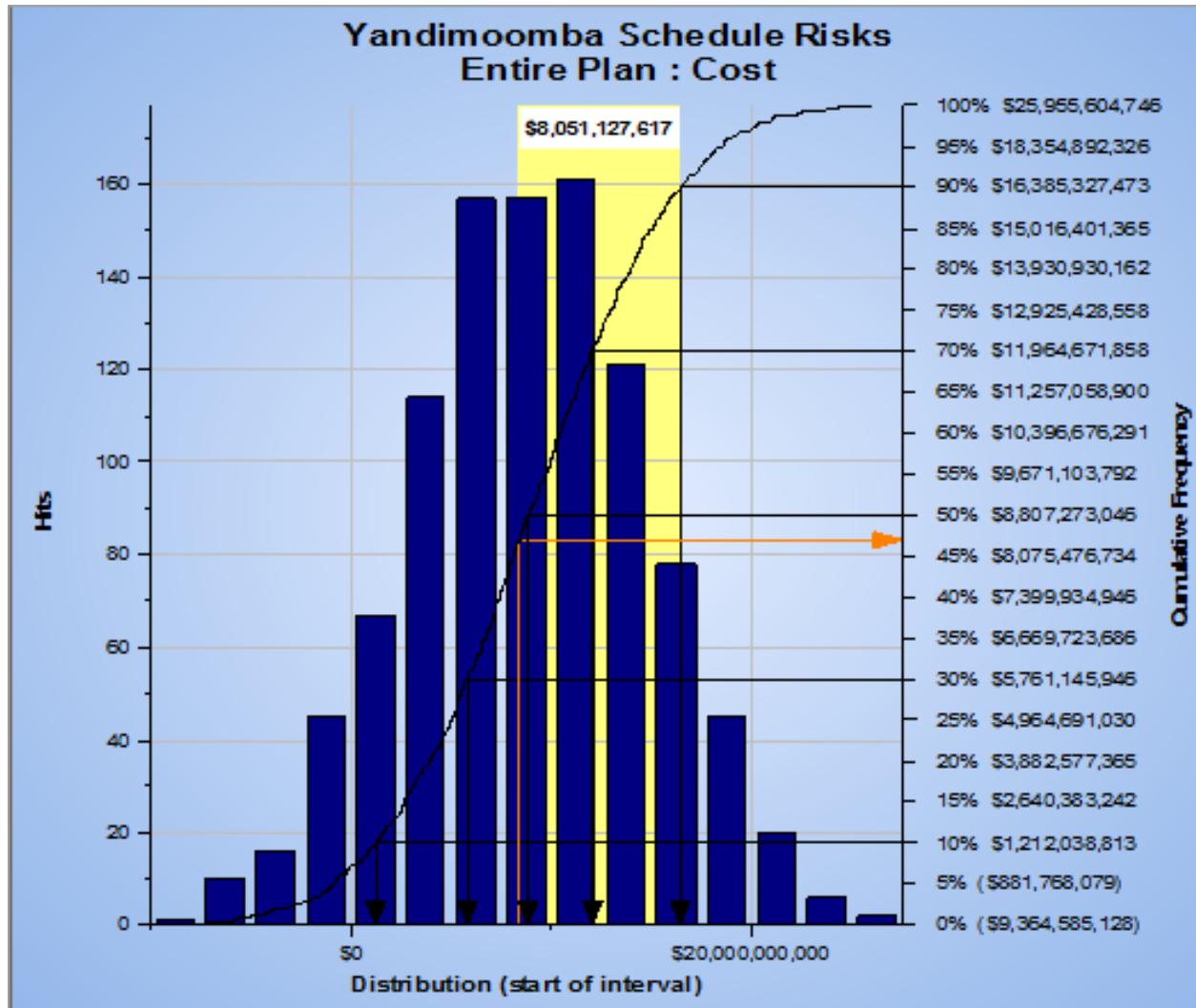
■ Simulation.

- ✓ Performed using a Monte Carlo analysis
- ✓ simulates the combined effects of individual project risks and other sources of uncertainty to evaluate their potential impact on achieving project objectives.
- ✓ Computer software is used to iterate the quantitative risk analysis model several thousand times
- ✓ The input values (e.g., cost estimates or duration estimates) are chosen at random for each iteration.
- ✓ Outputs represent the range of possible outcomes for the project (e.g., project end date, project cost at completion).



Lecture 08 : Project Risk Management

04. Perform Quantitative Risk Analysis



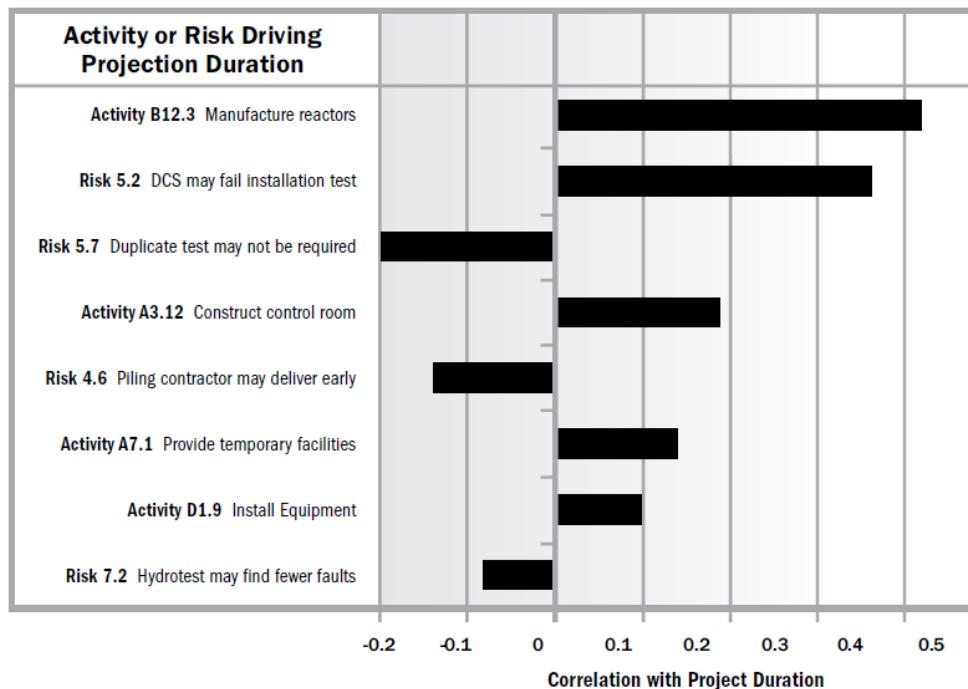
Lecture 08 : Project Risk Management

04. Perform Quantitative Risk Analysis

TT □ Data Analysis

▪ Sensitivity analysis

- ✓ Helps to determine which individual project risks or other sources of uncertainty have the most potential impact on project outcomes.
- ✓ Tornado diagram is a typical display of sensitivity analysis.



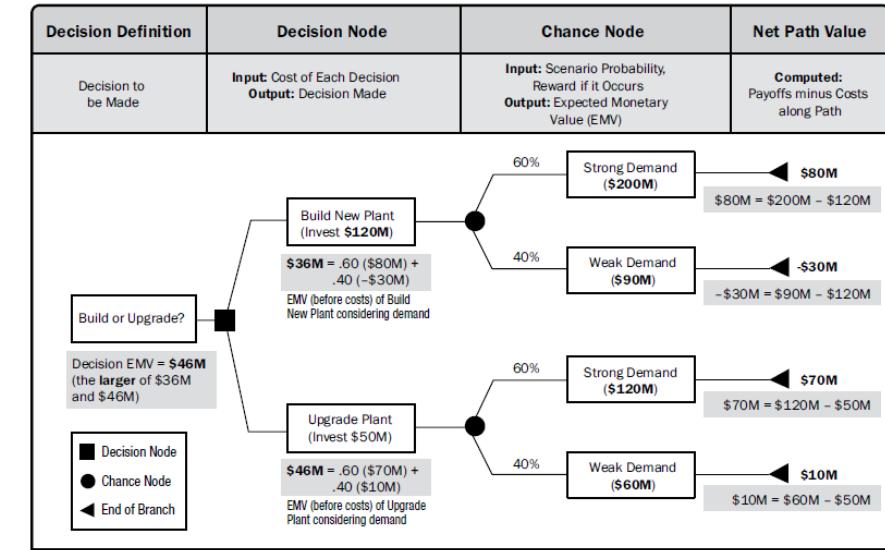
Lecture 08 : Project Risk Management

04. Perform Quantitative Risk Analysis

TT □ Data Analysis

▪ Decision tree analysis

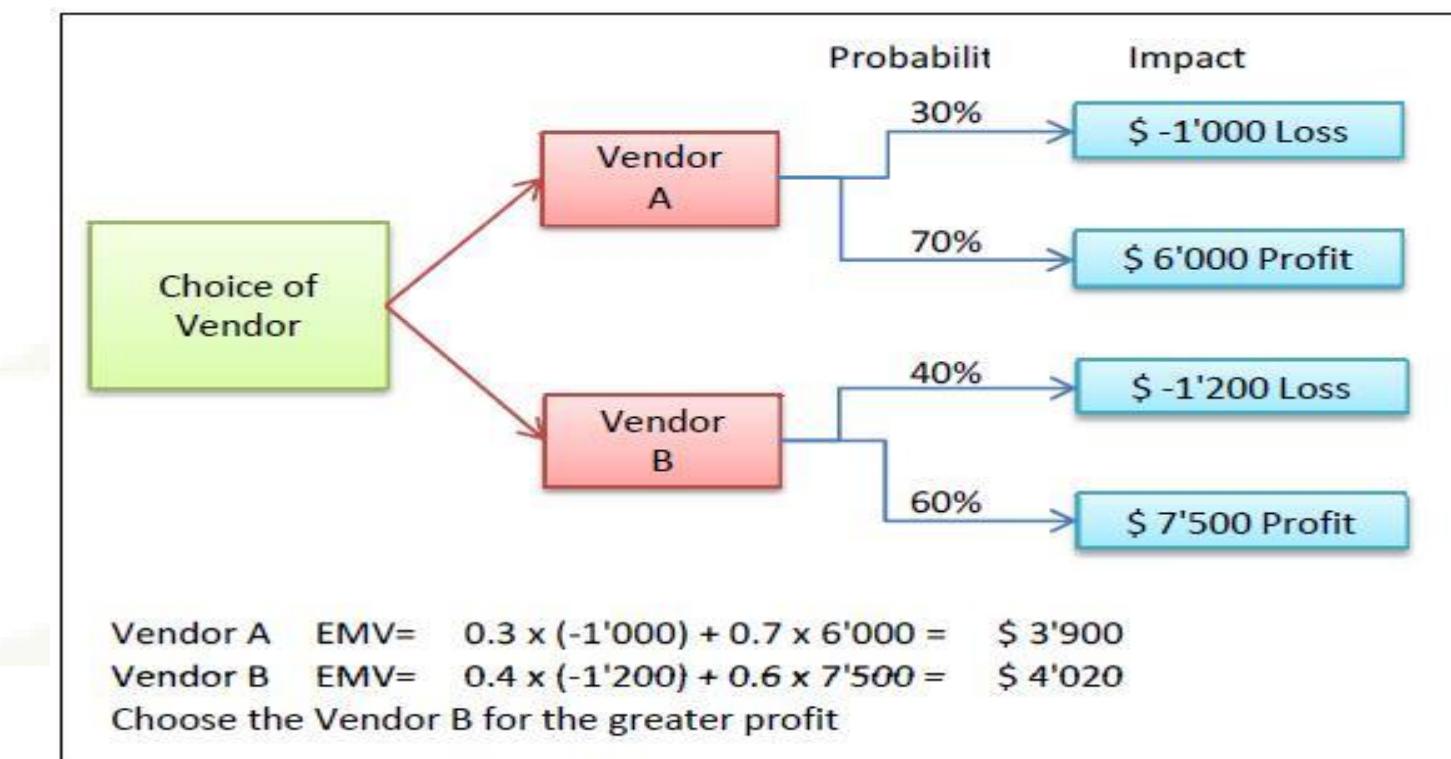
- ✓ Used to support selection of the best of several alternative courses of action.
- ✓ Alternative paths through the project are shown in the decision tree.
- ✓ The decision tree is evaluated by calculating the expected monetary value of each branch, allowing the optimal path to be selected.
- ✓ $EMV = P \times I$ where P=Probability and I=Impact



Lecture 08 : Project Risk Management

04. Perform Quantitative Risk Analysis

Expected Monetary Value :



Lecture 08 : Project Risk Management

05. Plan Risk Responses



Lecture 08 : Project Risk Management

05. Plan Risk Responses

➤ Plan Risk Responses is the process of :

- Developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks.

هي عملية وضع الخيارات، و اختيار الاستراتيجيات، والموافقة على الإجراءات لمعالجة التعرض للخطر الكلي للمشروع، إضافة إلى معالجة المخاطر الفردية للمشروع.

❖ The key benefit of this process:

- ✓ Identifies appropriate ways to address overall project risk and individual project risks.
- ✓ تحدد الطرق الملائمة لمعالجة الخطر الكلي للمشروع والمخاطر الفردية للمشروع.

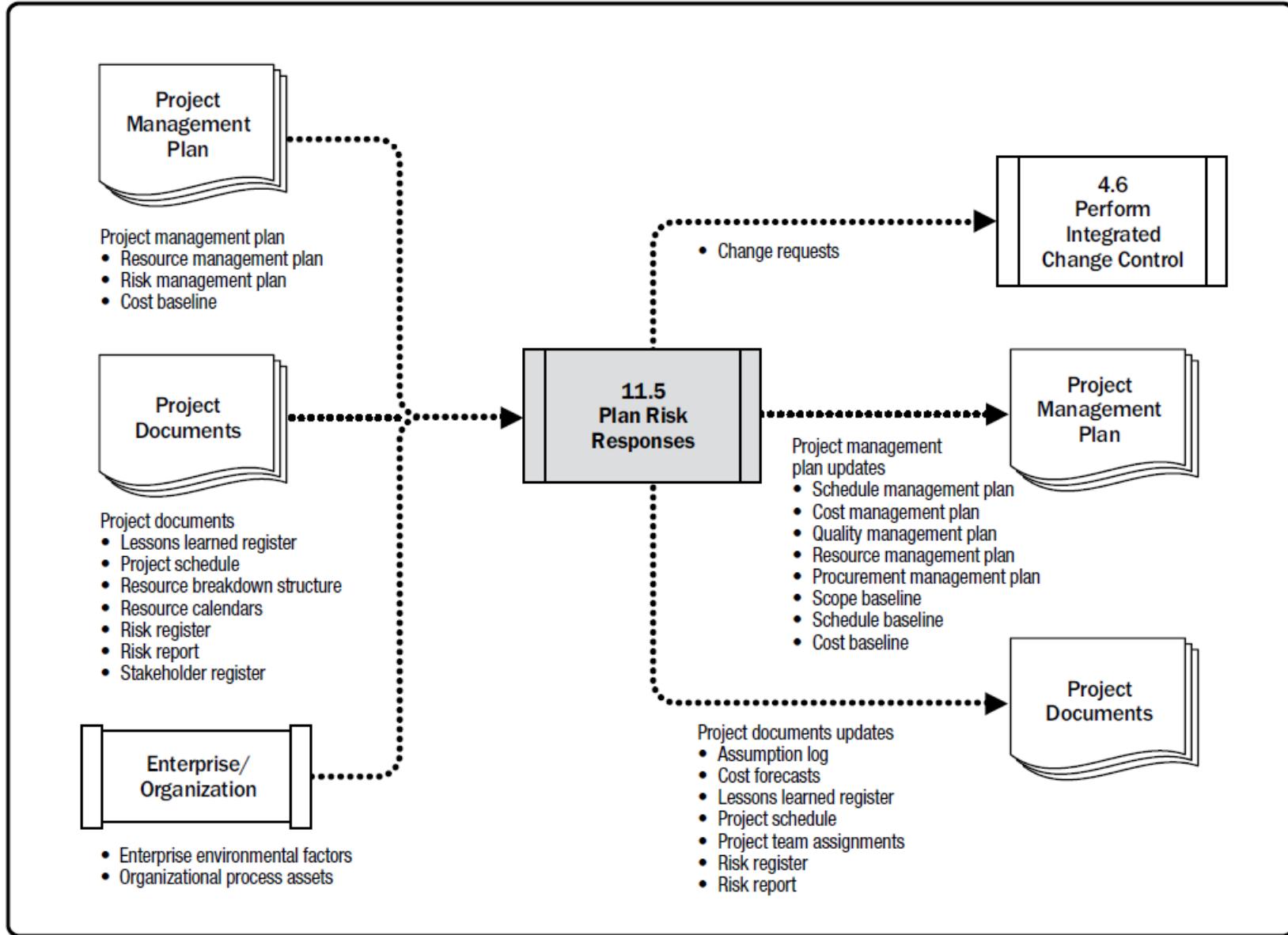


Figure 11-17. Plan Risk Responses: Data Flow Diagram

Project Risk Management

(5) Plan Risk Responses



Input

1. Project management plan
2. Project documents
3. Enterprise environmental factors
4. Organizational process assets



Tools & Techniques

1. Expert judgment
2. Data Gathering
3. Interpersonal and team skills
4. Strategies for threats
5. Strategies for Opportunities
6. Contingent response strategies
7. Strategies for overall project risks
8. Data Analysis
9. Decision making



Outputs

1. Change requests
2. Project management plan updates
3. Project document updates

Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies For Threats

1- Escalate.

- Escalation is appropriate when the project team or the project sponsor agrees that a threat is outside the scope of the project or the proposed response would exceed the project manager's authority.
- Escalated risks are managed at the program level, portfolio level and not on the project level.
- The project manager determines who should be notified about the threat and communicates the details to that person or part of the organization.
- Escalated threats are not monitored further by the project team after escalation, although they may be recorded in the risk register for information.



Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies For Threats

2- Avoid.

- The project team acts to **eliminate** the threat or protect the project from its impact.
- **Changing** the project management plan to eliminate the threat entirely.
- Examples of this include **extending** the schedule, **changing** the strategy, or **reducing** scope.



3- Transfer.

- The project team **shifts** the impact of a threat to a third party.
- Examples of this include **insurance**, performance bonds, warranties, guarantees, and contracts (a fixed-price contract may transfer risk to the seller.)



Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies For Threats

4- Mitigate.

- The project team acts to **reduce** the probability of occurrence or **impact** of a risk.
- Conducting **more tests**, or choosing a more **stable supplier** are examples of mitigation actions.
- Mitigation may require **prototype** development to reduce the **Risk**.



Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

5- Accept.

□ Strategies For Threats



- Risk acceptance acknowledges the **existence** of a threat, but **no proactive** action is taken.
- Appropriate for **low-priority threats**, and it may also be adopted where it is not possible or cost-effective to address a threat in any other way.
- Acceptance can be either **active** or **passive**
- Active acceptance strategy is to establish a **contingency reserve**, including amounts of **time, money, or resources** to handle the threat if it occurs.
- Passive acceptance involves **no proactive** action apart from periodic review of the threat to ensure that it does not change significantly.

Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies for Opportunities

1- Escalate.



2- Exploit.

- Selected for **high-priority opportunities** where the organization wants to **ensure that the opportunity is realized**.
- Examples of exploiting responses may include **assigning** an organization's **most talented resources** to the project to reduce the time to completion,
- Using **new technologies** or technology upgrades to reduce cost and duration.



Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies for Opportunities

3- Share.

- Transferring ownership of an opportunity to a third party so that it shares some of the benefit if the opportunity occurs.
- Examples of sharing actions include forming risk-sharing partnerships, teams, special-purpose companies, or joint ventures.



4- Enhance.

- Used to increase the probability and/or impact of an opportunity.
- Examples of enhancing opportunities include adding more resources to an activity to finish early.



5- Accept.



Difference Between **Enhance** and **Exploit** Risk Response Strategies:

- In the enhance risk response strategy you try to realize opportunity, while in the exploit risk response strategy you ensure realizing the opportunity.
- In the enhance risk response strategy you increase the probability of the opportunity happening, while in the exploit risk response strategy you increase the opportunity to 100%.
- The enhance risk response strategy can be considered the opposite of the mitigation risk response strategy, and the exploit risk response strategy can be considered the opposite of the avoid risk response strategy.

Summary

Enhance and exploit are two kinds of positive risk response strategies. If the opportunity is not very important or you don't have any extra resources, you will use the enhance risk response strategy. However, if you have extra resources available or the opportunity is so important that you cannot let go, you will use the exploit risk response strategy. The strategy chosen for the opportunity will depend on the situation, requirements, and resources available to you.



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Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT □ Contingent Response Strategy



Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT □ Contingent Response Strategy



Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT □ Contingent Response Strategy



Fallback plan:

- Plan that gets Implemented when the contingency plan fails or is not fully effective.



Construction project Risk:

There is a risk that rain may fall, which will damage your materials lying in the open.

Suppose rain continued for a long time than anticipated, leading material to be useless.



Plan B:

If material is useless, you will reorder them from a pre-identified supplier & start the work immediately.

Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies for overall project risk

1- Avoid.

- Where the level of overall project risk is significantly negative and outside the agreed-upon risk thresholds for the project, an avoid strategy may be adopted.
- involves taking focused action to reduce the negative effect of uncertainty on the project as a whole and bring the project back within the thresholds.
- An example of avoidance at the overall project level would include **removal of high-risk elements of scope** from the project.
- Where it is not possible to bring the project back within the thresholds, the **project may be cancelled**.



Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies for overall project risk

1- Exploit.

- Where the level of overall project risk is significantly positive and **outside** the agreed-upon risk **thresholds** for the project, an exploit strategy may be adopted.
- An example of exploiting at the overall project level would include **addition** of high-benefit elements of **scope** to the project to add value or benefits to stakeholders
- The risk thresholds for the project may be modified with the agreement of key stakeholders in order to embrace the opportunity.



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Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies for overall project risk

2- Transfer/share.

- If the level of overall project risk is high but the organization is unable to address it effectively, a third party may be involved to manage the risk on behalf of the organization.
- Where overall project risk is negative, a transfer strategy is required.
- Examples of both transfer and share strategies :,
 - Setting up a collaborative business structure in which the buyer and the seller share the overall project risk.
 - launching a joint venture or special-purpose company, or subcontracting key elements of the project.

Lecture 08 : Project Risk Management

05. Plan Risk Responses

TT

□ Strategies for overall project risk

3- Mitigate/enhance.

- The mitigation strategy is used where overall project risk is negative.
- The enhancement applies when it is positive.
- Examples of mitigation or enhancement strategies include:
 - Replanning the project.
 - Changing the scope.
 - modifying project priority, changing resource allocations, adjusting delivery times,

4- Accept.

Lecture 08 : Project Risk Management

05. Plan Risk Responses

Outputs

Project Documents Updates

➤ Risk register

- Agreed-upon response strategies.
- Specific actions to implement the chosen response strategy.
- Trigger conditions, symptoms, and warning signs of a risk occurrence.
- Budget and schedule activities required to implement the chosen responses.
- Contingency plans and risk triggers that call for their execution.
- Fallback plans for use when a risk that has occurred and the primary response proves to be inadequate.
- Residual risks that are expected to remain after planned responses have been taken, as well as those that have been deliberately accepted.
- Secondary risks that arise as a direct outcome of implementing a risk response.

- **Fallback plans**

- For use when a risk that has **occurred** and the **primary response** proves to be **inadequate**.

- **Residual risks**

- That are expected to **remain** after planned responses have been taken, as well as those that have been deliberately **accepted**.

- **Secondary risks**

- That arise as a **direct outcome** of implementing a risk response.

Lecture 08 : Project Risk Management

06. Implement Risk Responses



Lecture 04 : Project Risk Management

06. Implement Risk Responses

➤ **Implement Risk Responses** is the process of :

- implementing agreed-upon risk response plans.

هي عملية تطبيق خطط الاستجابة للمخاطر المتفق عليها.

❖ **The key benefit of this process:**

- ✓ Ensures that agreed-upon risk responses are executed as planned in order to address overall project risk exposure, minimize individual project threats, and maximize individual project opportunities.
- ✓ تضمن تنفيذ الاستجابات للمخاطر المتفق عليها حسبما تم التخطيط لها لمعالجة التعرض للخطر الكلي للمشروع وخفض تهديدات المشروع الفردية وزيادة فرص المشروع الفردية.

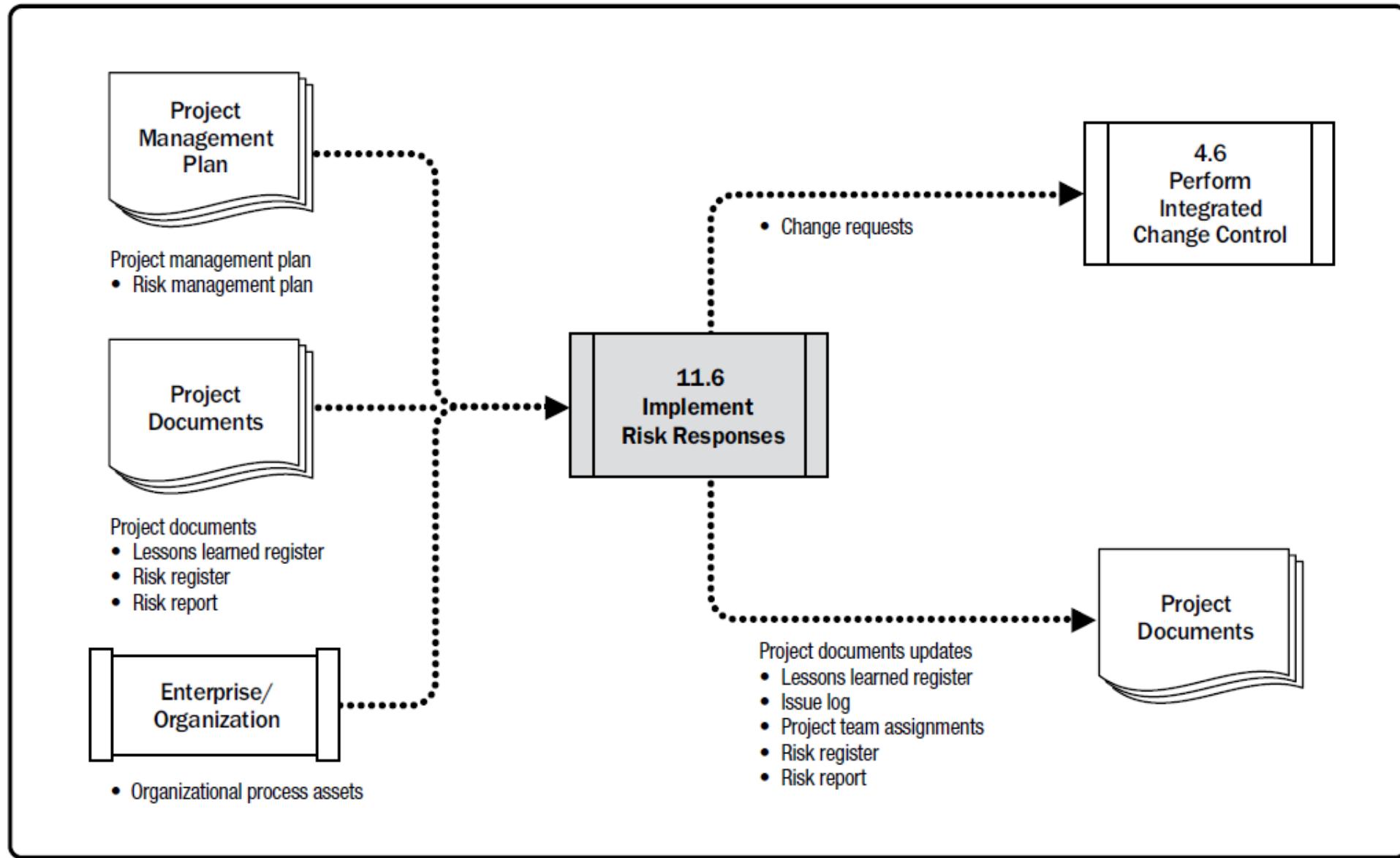
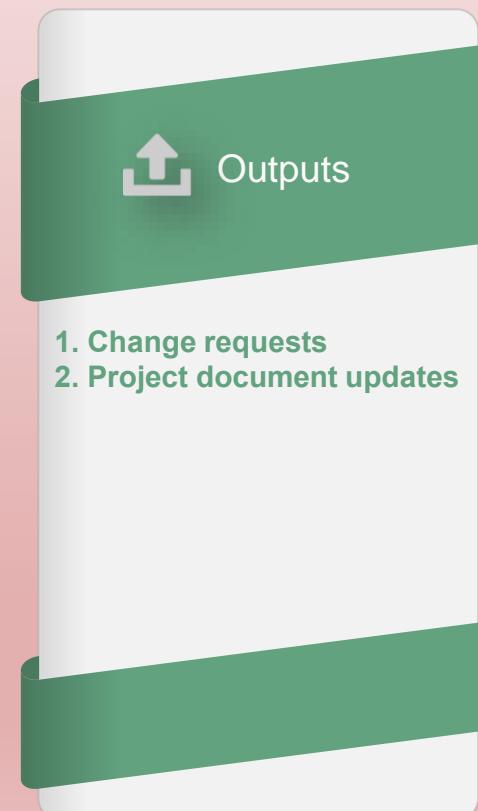


Figure 11-19. Implement Risk Responses: Data Flow Diagram

Project Risk Management

(6) Implement Risk Responses



Lecture 08 : Project Risk Management

06. Implement Risk Responses

TT

EXPERT JUDGMENT

- Expertise should be considered from individuals or groups with specialized knowledge to validate or modify risk responses if necessary, and decide how to implement them in the most efficient and effective manner.

PROJECT MANAGEMENT INFORMATION SYSTEM (PMIS)

- Project management information systems can include schedule, resource, and cost software to ensure that agreed-upon risk response plans and their associated activities are integrated into the project alongside other project activities.

Lecture 08 : Project Risk Management

06. Implement Risk Responses

Outputs

CHANGE REQUESTS

- ✓ Implementation of risk responses may result in a **change request** to the cost and schedule **baselines** or other components of the project management plan.

PROJECT DOCUMENTS UPDATES

➤ Risk register

- ✓ May be updated to reflect any changes to the previously agreed-upon risk responses for individual project risks.

➤ Risk report

- ✓ May be updated to reflect any changes to the previously agreed-upon risk response to overall project risk exposure.

Lecture 08 : Project Risk Management

07. Monitor Risks



Lecture 08 : Project Risk Management

07. Monitor Risks

➤ Monitor Risks is the process of :

- Monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project.

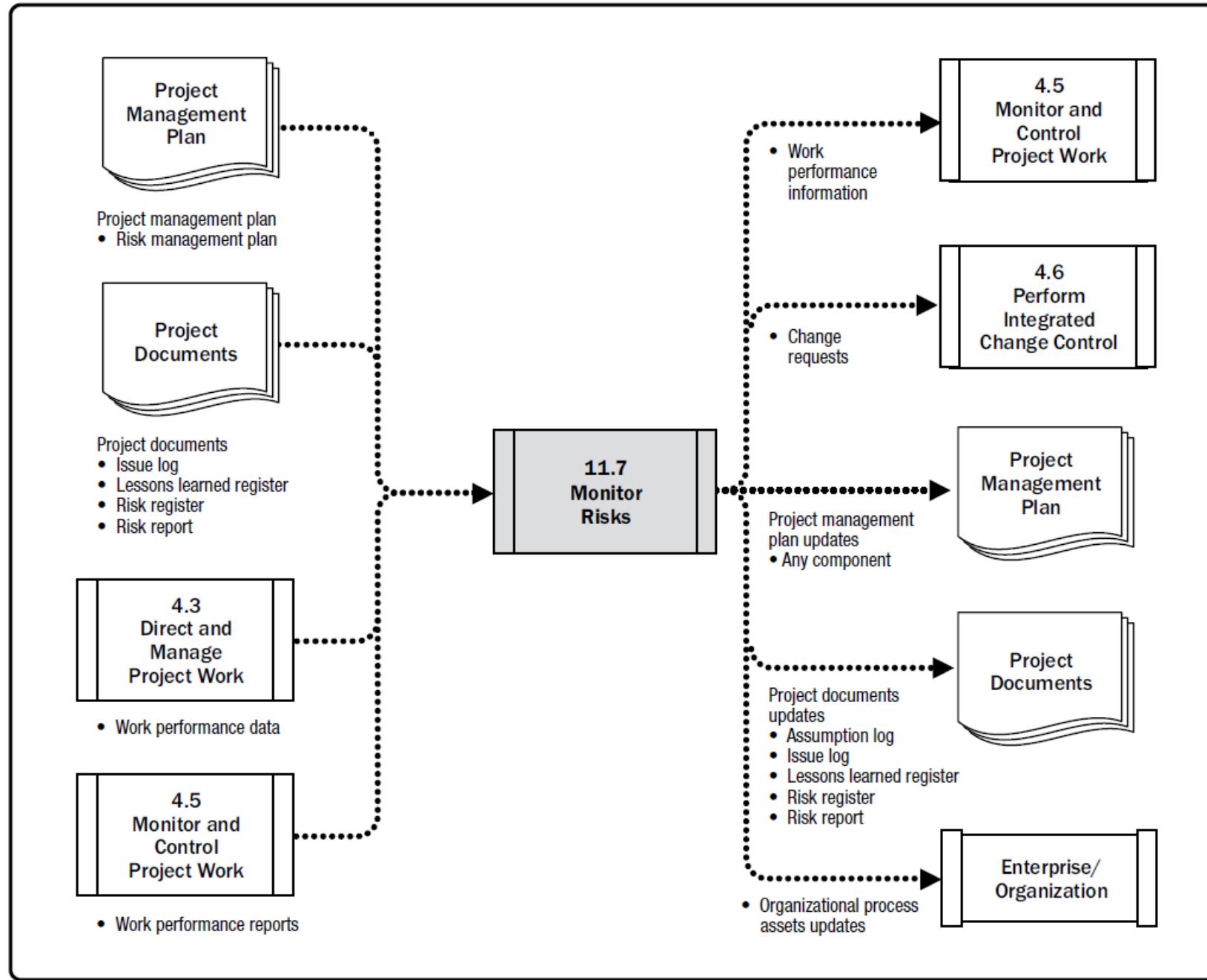
هي عملية متابعة تنفيذ خطط الاستجابة للمخاطر المتفق عليها، وتعقب المخاطر المحددة، وتحديد المخاطر الجديدة وتحليلها، وتقييم مدى فاعلية عملية التعامل مع المخاطر خلال المشروع بأسره

❖ The key benefit of this process:

- ✓ enables project decisions to be based on current information about overall project risk exposure and individual project risks.

✓ تجعل قرارات المشروع قائمة على المعلومات الحالية حول التعرض للخطر الكلي للمشروع والمخاطر الفردية للمشروع.





Project Risk Management

(7) Monitor risks



Input

1. Project management plan
2. Project documents
3. Work performance data
4. Work performance reports



Tools &
Techniques

1. Data Analysis
2. Audits
3. Meetings



Outputs

1. Work Performance Information
2. Change requests
3. Project management plan updates
4. Project documents updates
5. Organizational process assets updates

Lecture 08 : Project Risk Management

07. Monitor Risks

- The Monitor Risks process uses performance information generated during project execution to determine if:
 - ✓ Implemented risk responses are effective,
 - ✓ Level of overall project risk has changed,
 - ✓ Status of identified individual project risks has changed,
 - ✓ New individual project risks have arisen,
 - ✓ Risk management approach is still appropriate,
 - ✓ Project assumptions are still valid,
 - ✓ Risk management policies and procedures are being followed,
 - ✓ Contingency reserves for cost or schedule require modification, and
 - ✓ Project strategy is still valid.

Lecture 08 : Project Risk Management

07. Monitor Risks

Monitor Risk : Tools and Techniques

DATA ANALYSIS

Reserve analysis

- ✓ Compares the amount of the contingency reserves remaining to the amount of risk remaining at any time in the project in order to determine if the remaining reserve is adequate.



AUDITS

- ✓ Used to consider the effectiveness of the risk management process.
- ✓ The project manager is responsible for ensuring that risk audits are performed at an appropriate frequency, as defined in the project's risk management plan.



Lecture 08 : Project Risk Management

07. Monitor Risks

Monitor Risk : Tools and Techniques

❑ MEETINGS:-

➤ Risk Reviews

- ✓ Examine and document the **effectiveness** of risk responses in dealing with overall project risk and with identified individual project risks.
- ✓ Identification of **new** individual project risks.
- ✓ Reassessment of current risks.
- ✓ The **closing** of risks that are **outdated**.
- ✓ Issues that have arisen as the result of risks that have occurred.
- ✓ identification of lessons to be learned for implementation in ongoing phases in the current project or in similar projects in the future.



Very Important Keywords

- 1- SWOT Analysis (Strength-Weakness-Opportunities-Threats)
- 2- Prompt List (framework -idea generation)
- 3- Risk Probability and Impact Assessment (likelihood)
- 4- Tornado diagram (Risks have the most potential impact on project outcomes)
- 5- Escalate (a threat is outside the scope – Program level- portfolio level)
- 6- Avoid (Eliminate the threat – Changing PMP – extend schedule- reduce scope)
- 7- Transfer (insurance - Contracts /fixed price contract)
- 8- Mitigate (reduce the probability , Impact – Prototype – Stable supplier)
- 9- Active acceptance (Contingency Reserve time, money, or resources)
- 10 - Passive acceptance (no proactive action - Periodic review)

Very Important Keywords

- 11- Exploit (assigning an organization's most talented resources – New Technology)
- 12- Share (joint ventures – Partnership)
- 13- Enhance (increase the probability ,impact of opportunity)
- 14- Fallback plans (Primary response proves to be inadequate)
- 15- Residual risks (Risks remain after planned responses have been taken)
- 16- Secondary risks (direct outcome of implementing a risk response)
- 17- Reserve analysis (Compares C.R remaining & Risks remaining -)
- 18- Audits (effectiveness of the risk management process)
- 19- Risk Reviews (effectiveness of risk responses – new Risks – Closing outdate risks)

What is a workaround?

Workarounds are responses that were **not initially planned** but are required to deal with emerging risks that were previously **unidentified or accepted passively**.

Put more simply, workarounds are responses to any **unidentified** risks that occur during your project execution. It also covers the response to risks you have identified but did not make a plan to manage or **accepted passively**.

Workarounds are also responses to **unidentified risks or passively accepted risks if they occur**.

Which plan will you use to manage a workaround?

This is the first question that comes to mind when you talk about managing workarounds.

People are always wondering which plan will be used in case any unidentified risk occurs; i.e. **contingency plan or the fallback plan**.

Please note that the contingency plan and fallback plan are developed to manage identified risks, and workarounds are a response for unidentified risks. Therefore, none of these plans have strategies for workarounds.

When any unidentified risk occurs, you will discuss it with your team members and come up with **a strategy** to contain the incident.

Which reserve will you use for workarounds?

Of course, you are going to use the **management reserve**, because workarounds are responses to unidentified risks for which you did not create a mitigation plan or keep money in the contingency reserve for.

In which process do you carry out the workarounds?

You carry out workarounds in the **implemented risk response process**. Implementing workarounds sometimes results in a **change request**.

The Difference Between **Contingency Reserve** vs **Management Reserve** and Illustrated Example

Contingency reserve

- Used to manage identified risks, or “known-unknown” (known = identified, unknown = risks), with the Contingency Reserve. We can measure this reserve in either cost or time.
- The contingency reserve is a computable reserve that can be calculated with the help of techniques such as Monte Carlo Analysis, Decision Tree Analysis and EMV (Expected Monetary Value).
- The contingency reserve is included in the cost baseline (Cost Baseline = Project Cost Estimate + Contingency Reserve)
- Since contingency reserve is added to the cost baseline/ schedule baseline, the project manager has the authority to use it.
- The contingency reserve is a part of the cost baseline (or schedule baseline).
- Is used with active response strategies, or more specifically when you use “Accept” risk response strategy.

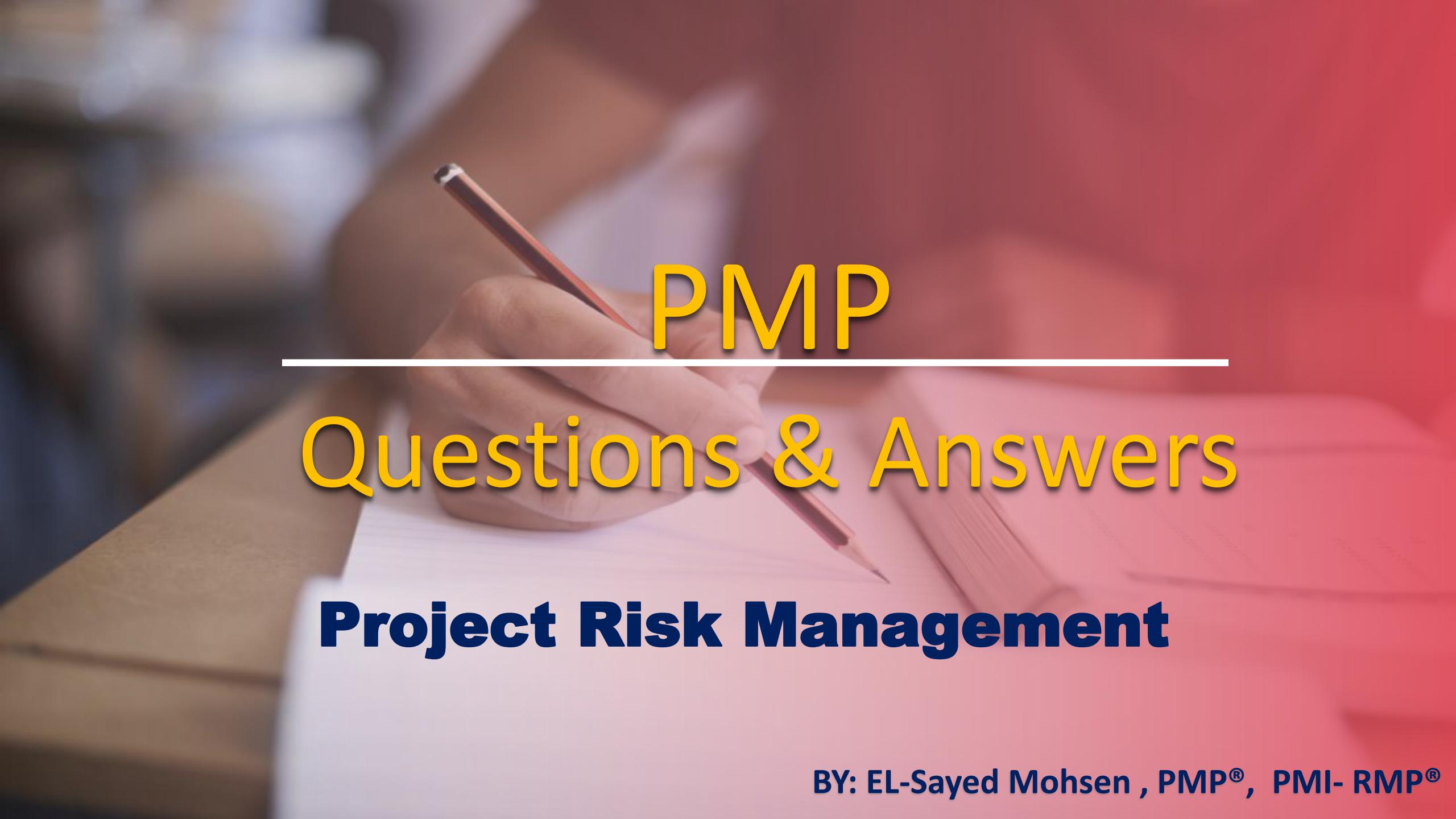
Management reserve

- Management reserve is defined as the cost or time reserve that is used to manage the unidentified risks or “unknown-unknown” (unknown = unidentified, unknown = risks).
- The Management reserve is not a computable reserve. It can be added as a percentage of total project costs (or duration).
- the Management reserve is NOT included in the cost baseline but in the project overall budget (Project Budget = Cost Baseline + Management Reserve)
- The management reserve is controlled by a representative from senior management (NOT the project manager), The project manager must get approval to use management reserve.
- The use of management reserves may require a change to the Cost Baseline/ schedule baseline.
- Used to reserve the unforeseen work that is within the scope of the project “unknown-unknown”

Illustrated Example

-Let' s assume that you are a project manager of a bridge construction project.

- 3 days ago a storm demolished some parts of the bridge. As a project manager, you have the authority to use the Contingency Reserve to repair the demolished parts. Because this risk was defined in the risk management plan and the fund has been added for this situation.
- Your project is not on a known earthquake zone so earthquakes are not considered as a risk (threat) to your project. But an earthquake happened last week and destroyed some parts of your bridge. As a project manager, you reported the event to your top management and asked their permission to use the Management Reserve to repair the destroyed parts.

A close-up photograph of a person's hands writing in a notebook with a pencil. The hands are positioned in the upper left corner of the frame, with one hand holding the pencil and the other hand resting on the page. The notebook is white and appears to be a spiral-bound or lined notebook. The background is blurred, showing what might be a window or a wall.

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Questions & Answers

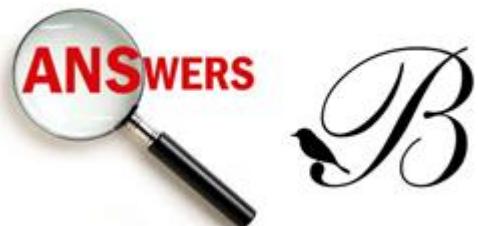
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Q1) While completing your assessment of the risks on your project, you begin to examine the ones with the greatest potential Risk to your project. You are using a diagram to help you complete this task, and you are currently looking at the high priority risks. What diagram would best help you?

- A. Control chart
- B. Tornado Diagram
- C. Pareto char
- D. Risk register



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Q2) Which of the following tools used to identify and analyze project risks?

A-Simulation

B-Expert judgment.

C-Probability and impact matrix.

D. Reserve Analysis



B



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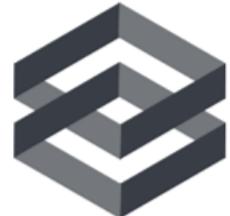


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Q3) During the design for a new mobile phone project, one of your team members discovers an approach for increasing the stowage area for phone without increasing the expenses of project. What is the best risk response should you plan ?

- A) Accept
- B) Mitigate
- C) Exploit
- D) Transfer



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Q4) You have decided to take out insurance on your project to cover your project financially if a risk occurs. This is an example of what sort of risk response?

- A) Accept
- B) Mitigate
- C) Exploit
- D) Transfer

PMBOK 443

◆ **Transfer.** Transfer involves shifting ownership of a threat to a third party to manage the risk and to bear the impact if the threat occurs. Risk transfer often involves payment of a risk premium to the party taking on the threat. Transfer can be achieved by a range of actions, which include but are not limited to the use of **insurance**, performance bonds, warranties, guarantees, etc. Agreements may be used to transfer ownership and liability for specified risks to another party.



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Q5) You are a project manager in the execution stage of the project where your team members are conducting a meeting to examine and document the effectiveness of risk responses in dealing with overall project risk and with identified individual project risk . What is project team doing?

- A) Risk Audit**
- B) Risk reassessment**
- C) Risk reviews**
- D) Reserve analysis**

PMBOK 457

11.7.2.3 MEETINGS

Meetings that can be used during this process include but are not limited to risk reviews. Risk reviews are scheduled regularly and should examine and document the effectiveness of risk responses in dealing with overall project risk and with identified individual project risks. Risk reviews may also result in identification of new individual project risks, (including secondary risks that arise from agreed-upon risk responses), reassessment of current risks, the closing of



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Q6) Which of the following Processes used to implementing agreed-upon risk response plans and the benefit of this process is that it ensures that agreed-upon risk responses are executed as planned ?

- A) Implement Risk Responses**
- B) Plan Risk management**
- C) Identify Risk**
- D) Monitor Risk**

PMBOK 449

11.6 IMPLEMENT RISK RESPONSES

Implement Risk Responses is the process of **implementing agreed-upon risk response plans**. The key benefit of this process is that it **ensures that agreed-upon risk responses are executed as planned** in order to address overall project risk exposure, minimize individual project threats, and maximize individual project opportunities. This process is



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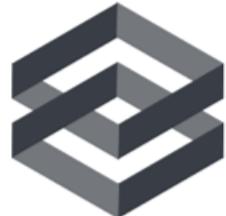


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Q7) You are a project manager and your organization requested from you to start working in the feasibility study for new project for special owner . when you start to review the historical information you notice that your organization finished a previous project to this owner and delayed for the final financial payment for past contract , and leaded to arbitration . What type of suitable response strategy that the project manager will use for this risk ?

- A) Accept**
- B) Mitigate**
- C) Exploit**
- D) Avoid**



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Q8) You are a project manager in Critical Project for your organization . You and your team finished the identification and analysis risks in the project . Now you are in the plan risk response and you want to select the appropriate risk response strategy in order to dealing with the opportunities that is outside the scope of the project and are managed at the program level, portfolio level. What is the BEST Risk response strategy ?

- A) Escalate
- B) Mitigate
- C) Exploit
- D) Avoid

PMBOK 444



◆ **Escalate.** This risk response strategy is appropriate when the project team or the project sponsor agrees that **an opportunity is outside the scope of the project** or that the proposed response would exceed the project manager's authority. Escalated opportunities are **managed at the program level, portfolio level**, or other relevant



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Q9) There are a number of risks that have been identified in your project. The team has decided not to change the project plan to deal with the risks, but they have established a contingency reserve of money in the event something triggers these risks. This is an example of what type of risk mitigation technique?

- A) Passive transference**
- B) Active acceptance**
- C) Passive acceptance**
- D) Active mitigation**

PMBOK 444



B

◆ **Accept.** Accepting an opportunity acknowledges its existence but no proactive action is taken. This strategy may be appropriate for low-priority opportunities, and it may also be adopted where it is not possible or cost-effective to address an opportunity in any other way. Acceptance can be either active or passive. The most common active acceptance strategy is to establish a contingency reserve, including amounts of time, money, or resources to take advantage of the opportunity if it occurs. Passive acceptance involves no proactive action apart from periodic review of the opportunity to ensure that it does not change significantly.



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Q10) As part of a strategy to handle negative risk, a project manager decided to adopt less complex processes, conduct more tests, and choose a more stable supplier. What strategy would this be classified as?

- A) Escalate
- B) Mitigate
- C) Exploit
- D) Avoid



B

PMBOK 443

◆ **Mitigate.** In risk mitigation, action is taken to reduce the probability of occurrence and/or impact of a threat. Early mitigation action is often more effective than trying to repair the damage after the threat has occurred. Adopting less complex processes, conducting more tests, or choosing a more stable seller are examples of mitigation actions. Mitigation may involve prototype development (see Section 5.2.2.8) to reduce the risk of scaling up from



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Q11) Early in the project, you are meeting with your team and would like to address all the strengths, weaknesses, opportunities, and threats the project is facing. What tool should be used?

- A) SWOT Analysis
- B) Interviewing
- C) Delphi Technique
- D) Cause and effect diagram



PMBOK 415

◆ **SWOT analysis.** This technique examines the project from each of the **strengths**, **weaknesses**, **opportunities**, and **threats** (SWOT) perspectives. For risk identification, it is used to increase the breadth of identified risks by including internally generated risks. The technique starts with the identification of strengths and weaknesses of the organization, focusing on either the project, organization, or the business area in general. SWOT analysis



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Q12) Lee is the project manager of a project, and he is planning responses to a set of risks. As a direct result of implementing these risk responses, he anticipates certain other risks to arise. These are:

- A) Workaround**
- B) Planned risks**
- C) Primary risks**
- D) Secondary risks**



PMBOK 448

- Residual risks that are expected to remain after planned responses have been taken, as well as those that have been deliberately accepted; and
- Secondary risks that arise as a direct outcome of implementing a risk response.



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Q13) As part of the Risk Response planning for your project, you are trying to come up with a strategy to deal with negative risks or threats. In order to eliminate the impact of a particular risk, you relax the objective that is in jeopardy by extending the project schedule. This is an example of:

- A- Transference**
- B- Mitigation**
- C- Avoidance**
- D- Postponement**



C

PMBOK 443

◆ **Avoid.** Risk avoidance is when the project team acts to eliminate the threat or protect the project from its impact. It may be appropriate for high-priority threats with a high probability of occurrence and a large negative impact. Avoidance may involve changing some aspect of the project management plan or changing the objective that is in jeopardy in order to eliminate the threat entirely, reducing its probability of occurrence to zero. The risk owner may also take action to isolate the project objectives from the risk's impact if it were to occur. Examples of avoidance actions may include removing the cause of a threat, **extending the schedule, changing the project strategy, or reducing scope.** Some risks can be avoided by clarifying requirements, obtaining information, improving communication, or acquiring expertise.



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Q14) Three strategies that typically deal with negative risks or threats are:

- A- Enhance, Share, and Accept**
- B- Transfer, Exploit, and Accept**
- C- Avoid, Transfer, and Exploit**
- D- Avoid, Transfer, and Mitigate**



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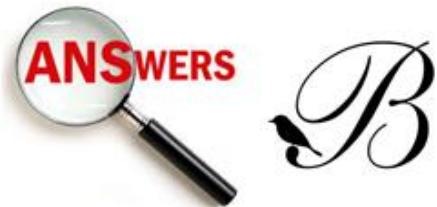


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Q15) A small project with a limited budget is trying to curtail costs. Which of the following processes may be eliminated in such a project?

- A- Perform Qualitative Risk Analysis**
- B- Perform Quantitative Risk Analysis**
- C- Identify Risks**
- D- Plan Risk Management**



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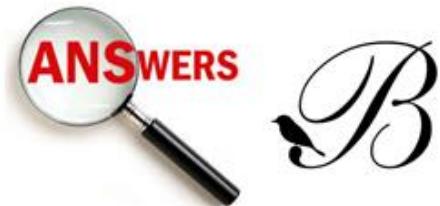


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Q16) You are a Project manager in big organization. During the implementation phase, one of your project team has told you that, the cement will be delayed, as a project what should you do next?

- A- Risk Mitigation**
- B- Workaround**
- C- Contingency reserve**
- D- Workaround plan**



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Q17) You are a project manager in Critical Project for your organization, you expect that the generator that used may breaks down, and you don't have any other generators available. Therefore, you planned to call your friend who have an equipment supplier to rent generator at a reasonable price. This is an example of:

- A- Risk Mitigation**
- B- Workaround**
- C- Risk Avoid**
- D- Risk Acceptance**



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