

Project Management Professional - PMP

Chapter 9: Project Risk Management



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Agenda

- Overview
- Plan Risk - Planning
- Identify Risk - Planning
- Perform Qualitative Risk Analysis - Planning
- Perform Quantitative Risk Analysis - Planning
- Plan Risk Responses - Planning
- Monitor and Control Risks - M & C
- Lessons Learned - Q & a

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Overview

Project Risk Management

Risk Management:

- The processes of conducting risk management planning, identification, analysis, response planning and monitoring and controlling on a project
- Risk management objectives to increase impact of positive events and decrease impact of negative events
- Risk is always in future, it's an uncertain event that has effect (positive/negative) on at least on project's objective
- Risk can be known or unknown
- PM should focus on preventing problems not dealing with them
- Risk can be a **Threat** (Negative) or an **Opportunity** (Positive)
- **Risk Averse**: someone who doesn't want to take risks.

Project Risk Management – Cont'd

Risk Tolerance and Thresholds:

- **Tolerance:** accept varying degrees of risks
- **Thresholds:** risk is not acceptable at these points.
- Associate risks with rewards such as schedule fast tracking

Uncertainty

- Lack of knowledge about event that reduces confidence in conclusion.

Risk Factors:

- Probability, Range of possible outcomes, Expected time and frequency

Project Risk Management

Risk Management Processes:

Risk Management	Process Groups
Plan Risk	Planning
Identify Risk	Planning
Perform Qualitative Risk Analysis	Planning
Perform Quantitative Risk Analysis	Planning
Plan Risk Responses	Planning
Monitor and Control Risks	M & C

Inputs/Outputs of Risk Management

Inputs to Risk Management Process as a whole:

- Project Background Information
- **OPA:** historical records, lessons learned, procedures and policies.
- **EEF:** risk tolerances and thresholds, company culture
- **Others (Rita's Chart Sequence):** charter, scope statement, team, WBS, Network Diagrams, Time and cost estimates, Communication plans, staffing plan, procurement plan, and stakeholders

Outputs:

- Risk Management Plan

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Plan Risk Management Planning Process

Plan Risk Management

Plan Risk Management Process:

- Process of defining how to conduct risk management activities for a project.
- Think about how to approach it before you do it! (Plan before Act)
- This process answers: How, Who and How much time should be spent on risk management based on project's needs.

Risk Types:

- **Business:** risk of a gain or loss (opportunity or threat)
- **Pure (Insurable):** only a risk of loss (fire, theft, hurricane ..etc)

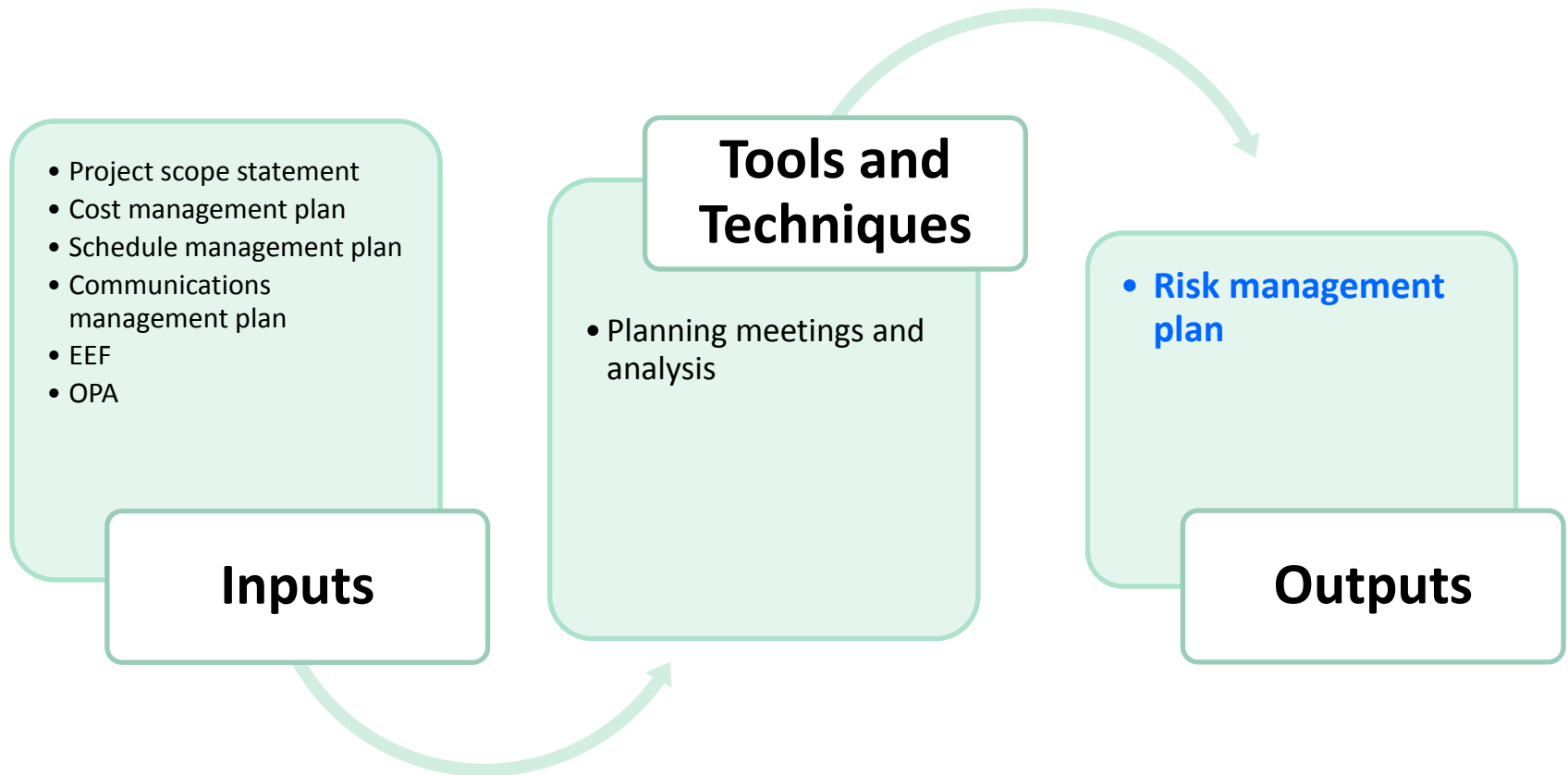
Risk Categories

Risk Categories:

- Common areas of risks based on the company.
- Companies should have standard list of risk categories
- Many classifications, some of them as following:

By Type	By:	By Source
<ul style="list-style-type: none">• External• Internal• Technical• Unforeseeable	<ul style="list-style-type: none">• Customer• Lack of project management effort• Lack of project management knowledge• Suppliers• Resistance to change• Cultural differences	<ul style="list-style-type: none">• Schedule• Cost• Quality• Scope• Resources• Customer Satisfaction

Plan Risk Management Inputs, Tools, Techniques and Outputs



Plan Risk Management Outputs:

Risk Management Plan:

- It includes:
 - > **Methodology:** how to perform risk management
 - > **Roles and Responsibilities:** Who will do what ?!
 - > **Budgeting:** how much risk will cost (it costs but minimize project total cost).
 - > **Timing:** When do it ? It should start once we have the inputs
 - > **Risk Categories:** discussed earlier
 - > **Definitions of probability and impact:** define rates to avoid personal indicators
 - > **Stakeholder tolerances:** what degrees of risk acceptable ?
 - > **Reporting formats:** what reports and what they will include.
 - > **Tracking:** how risk process will be audited ?! Documentation of what happens.

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Identify Risks

Planning Process

Identify Risks

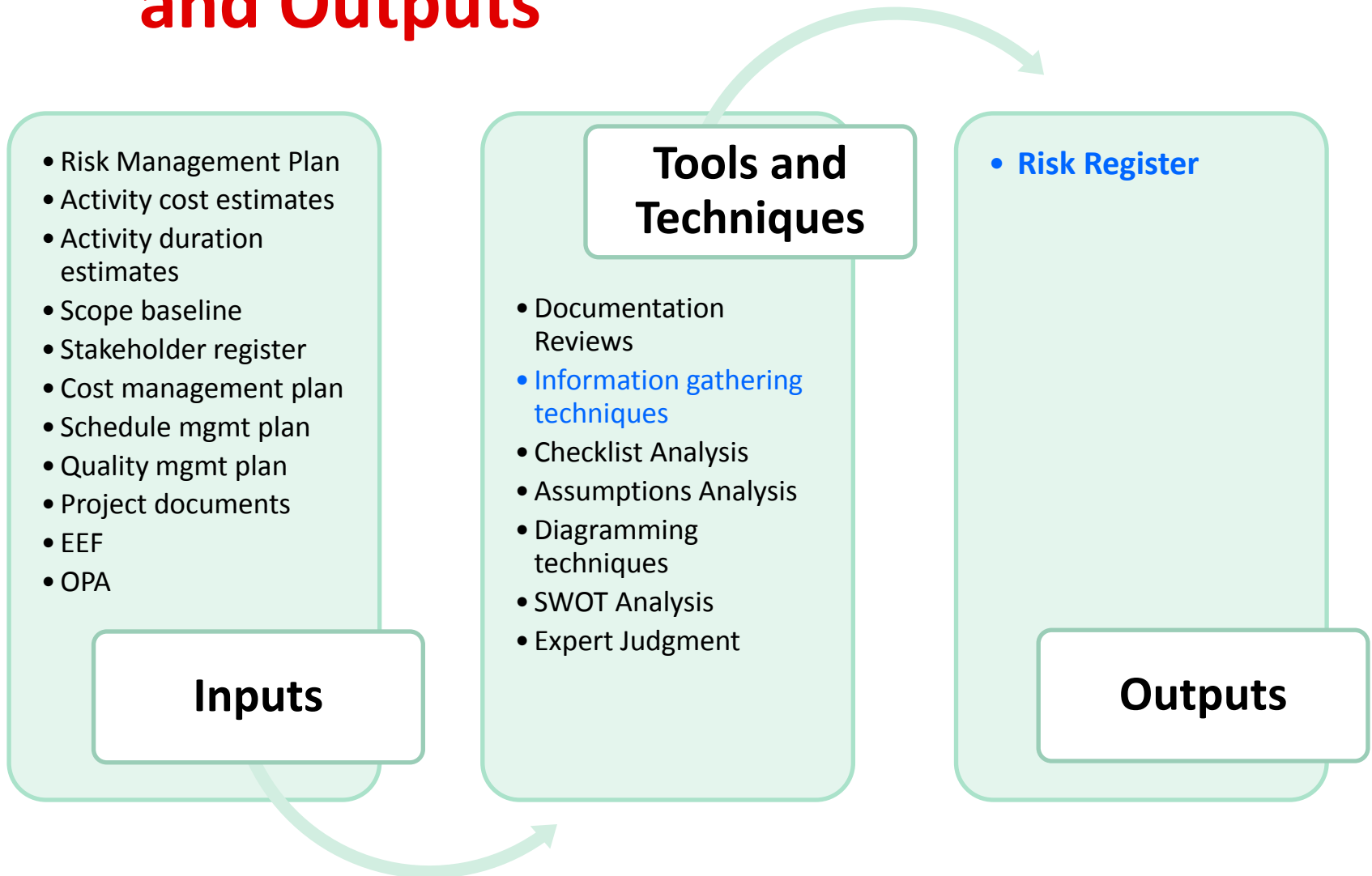
Identify Risks Process:

- Process of determining which risks may affect the project and documenting their characteristics.
- Everyone is involved in risk identification!
- Smart PMs should look for risks once the project started to discuss
- Project Charter includes high-level risks but most identification happened during the planning processes group
- Risk should continuously assessed, smaller no. of risks will be identified later after the planning.



- Exam focuses on risk management during execution & monitoring and controlling.

Identify Risks Inputs, Tools, Techniques and Outputs



Identify Risks Tools and Techniques

Documentation Review:

- Review all documentations to help identify risks

Information Gathering Techniques:

- Many techniques that already used before during the project:
 - > **Brainstorming:** one idea generates other ideas during meetings
 - > **Delphi Technique:** Consensus of experts who participate anonymously.
 - > **Interviewing (Expert Interviewing):** for project participants on specific work.
 - > **Root Cause Analysis:** recognize risks by root causes

SWOT Analysis:

- Strengths, Weaknesses, Opportunities and Threats

Identify Risks Tools and Techniques – Cont'd

Checklists Analysis:

- Risk categories checklists, identify risks within which category.

Assumptions Analysis

- What assumptions on the projects made and their impacts, risks.

Diagramming Techniques:

- Cause and Effect Diagrams, Flowcharts, ..etc to identify risks

Identify Risks Outputs

Risk Register:

- Place where most risk information are found.
- Information of risk register regularly updated based on the process to include additional information, at this point includes:
 - > List of risks
 - > List of potential responses “initially here and reviewed in *Plan Risk Responses*”
 - > Root causes of risks
 - > Updated Risk Categories



- Risk Responses are documented in both Identify Risks and Plan Risk Responses processes “Risk Register”

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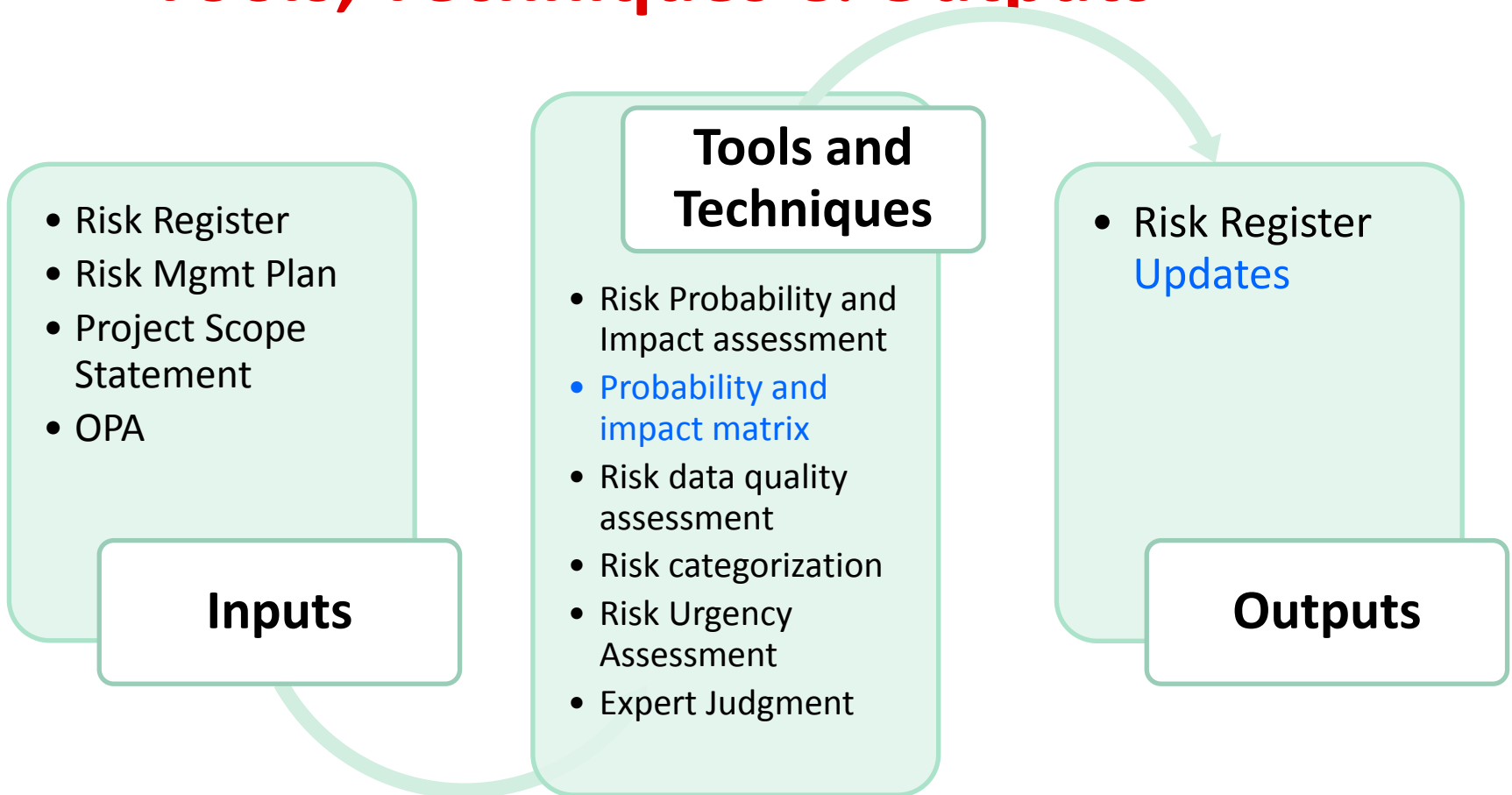
Perform Qualitative Risk Analysis Planning Process

Perform Qualitative Risk Analysis

Perform **Qualitative** Risk Analysis Process:

- Process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.
- Establishing definitions of levels of probability and impact can reduce the influence of bias.
- Shortlist of identified risks
- Qualitative risk analysis is a subjective analysis that uses:
 - > Use probability of each risk and its occurrence at a scale (Ex: Low, Medium, high)
 - > Use Impact of each risk and its occurrence at a scale (Ex: Low, Medium, high)

Perform Qualitative Risk Analysis Inputs, Tools, Techniques & Outputs



Perform Qualitative Risk Analysis Tools and Techniques

Probability and Impact Matrix

- Rates and scales for probabilities and impacts

Risk Data Quality Assessment

- Analyze the quality of collected risk information and can be reliable or not!

Risk Categorization

- Should we categorize by activities ? Or work packages ?!

Risk Urgency Assessment:

- Identify risks need to move quickly than others in risk management process

Perform Qualitative Risk Analysis Tools and Techniques – Cont'd

Copied from PMBOK

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 (numerical 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.

Probability and Impact Matrix

Perform Qualitative Risk Analysis Outputs

Risk Register

List of risks

List of potential responses “initially here and reviewed in *Plan Risk Responses*”

Root causes of risks

Updated Risk Categories

+

Updates

Risk ranking for the project compared to other projects

List of prioritized risks and their probability and impact rating

Risks grouped by categories

List of risks requires additional analysis in the near term

Watchlist (non-critical or non-top) risks

Trends

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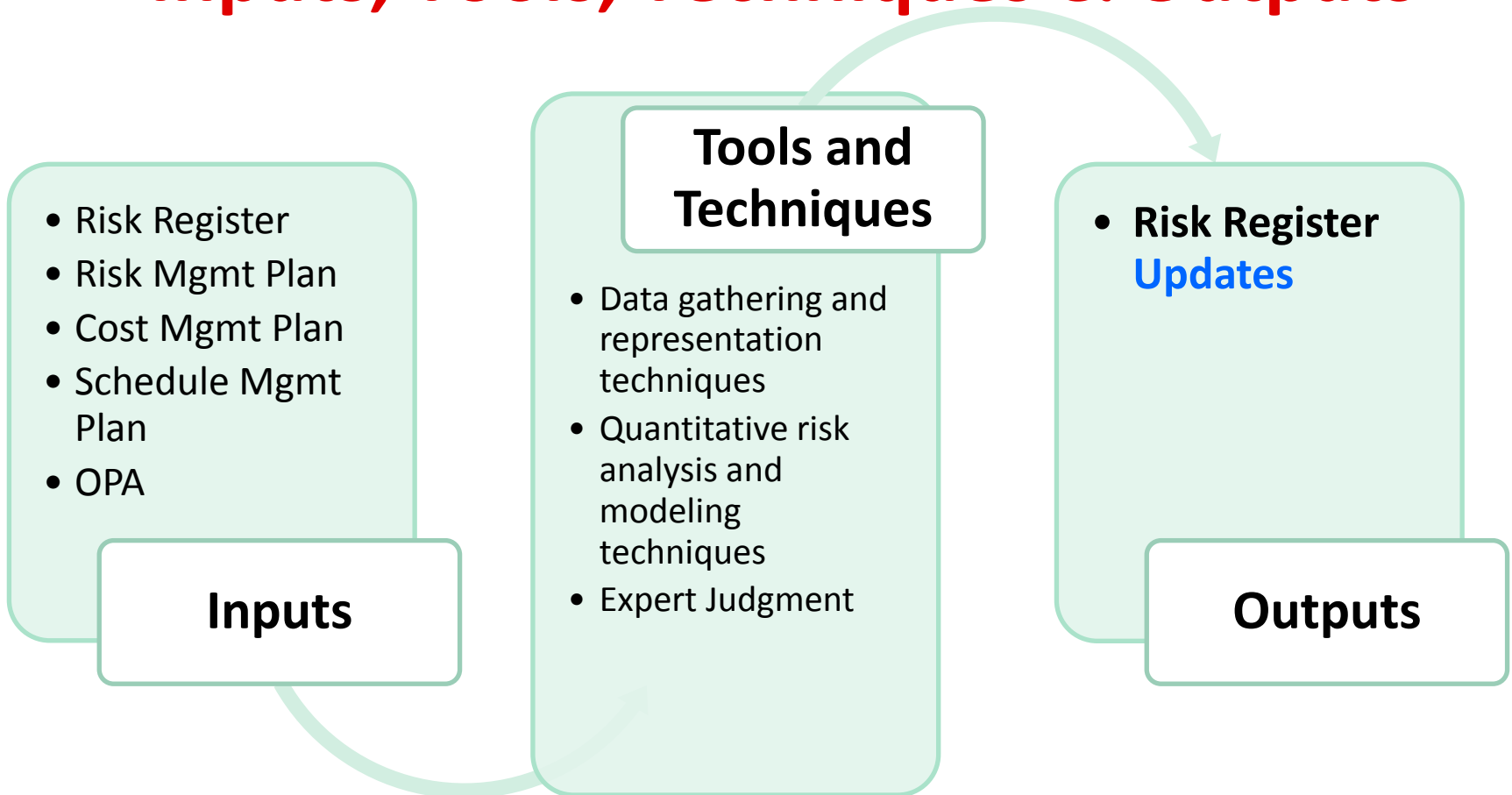
Perform Quantitative Risk Analysis Planning Process

Perform Quantitative Risk Analysis

Perform **Quantitative** Risk Analysis Process:

- Process of numerically analyzing the effect of identified risks on overall project objectives.
- Performed on prioritized shortlist of **qualitative** analysis to analyze the effect of those risks
- Quantitative Risk Analysis used to
 - > Assign numerical rating for risks to warrant a response
 - > Evaluate the aggregating effect on the project “Overall risk”
 - > Determine cost and schedule reserves
 - > Determine the quantitative probability of meeting project objectives
- Should be repeated after *Plan Risk Responses* process
- Numerical analysis of the probability and impact
- Can be skipped in favour of moving to Risk Response

Perform Quantitative Risk Analysis Inputs, Tools, Techniques & Outputs



Perform Quantitative Risk Analysis Tools and Techniques

Expected Monetary Value Analysis

- Determine an overall ranking for risks
- $EMV = Probability * Impact$

Monte Carlo Analysis (Simulation)

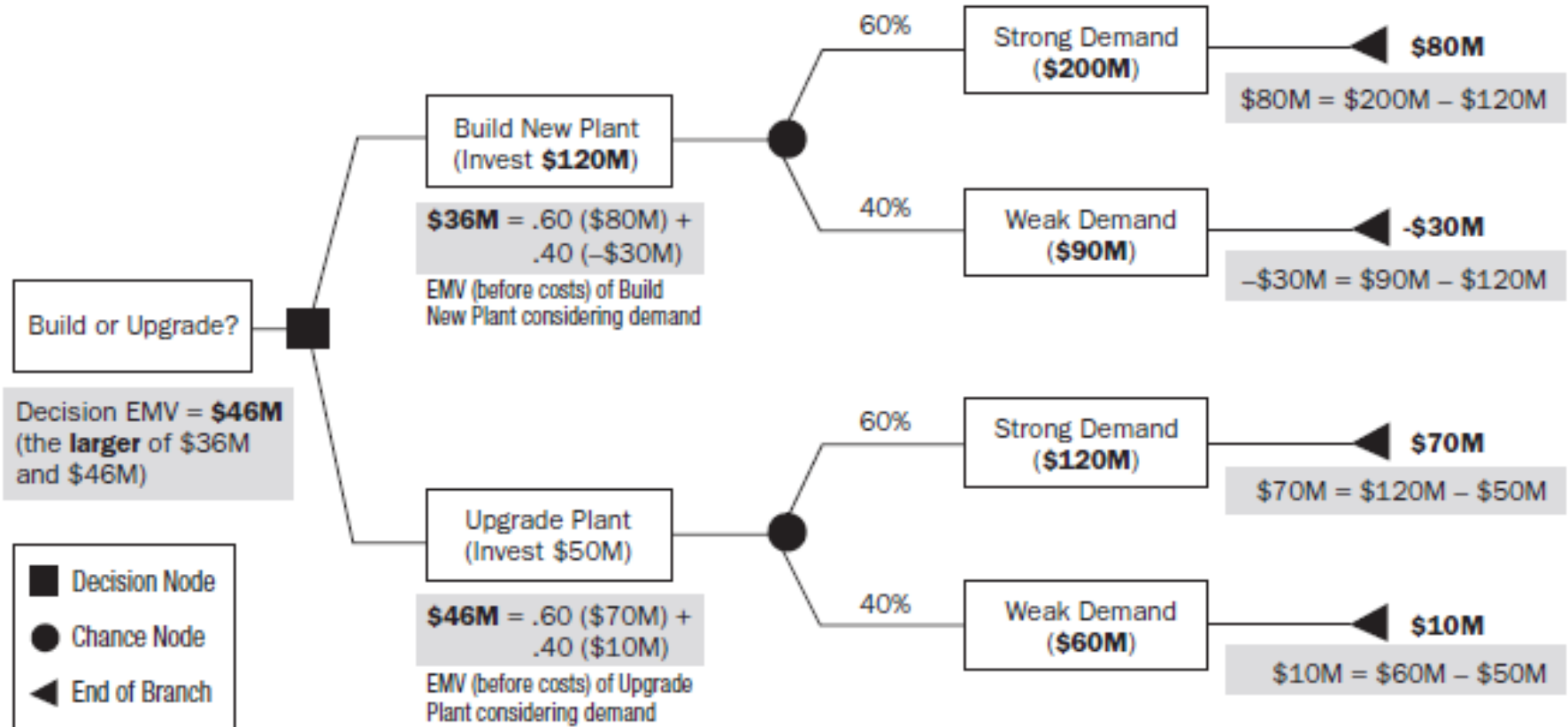
- Evaluates the overall risk of the project
- Provides probability of completing project on specific day or at specific costs
- Can be used to assess costs and schedule impacts
- Provides probability of any activity actually being on critical path
- Results in probability distribution

Decision Tree (Concept only can be just fine)

- Takes in account future events to make decision today
- Calculate expected monetary value in complex situations
- Involves mutual exclusivity

Decision Tree Example

Copied from PMBOK



Perform Quantitative Risk Analysis Outputs

Risk Register

- List of risks
- List of potential responses “initially here and reviewed in *Plan Risk Responses*”
- Root causes of risks
- Updated Risk Categories
- Risk ranking for the project compared to other projects
- List of prioritized risks and their probability and impact rating
- Risks grouped by categories
- List of risks requires additional analysis in the near term
- Watchlist (non-critical or non-top) risks
- Trends

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Updates

- Prioritized list of quantified risks
- Amount of contingency time and cost reserves needed
- Possible realistic and achievable completion dates and costs
- The quantified probability of meeting project objectives
- Trends in quantitative analysis

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Plan Risk Responses

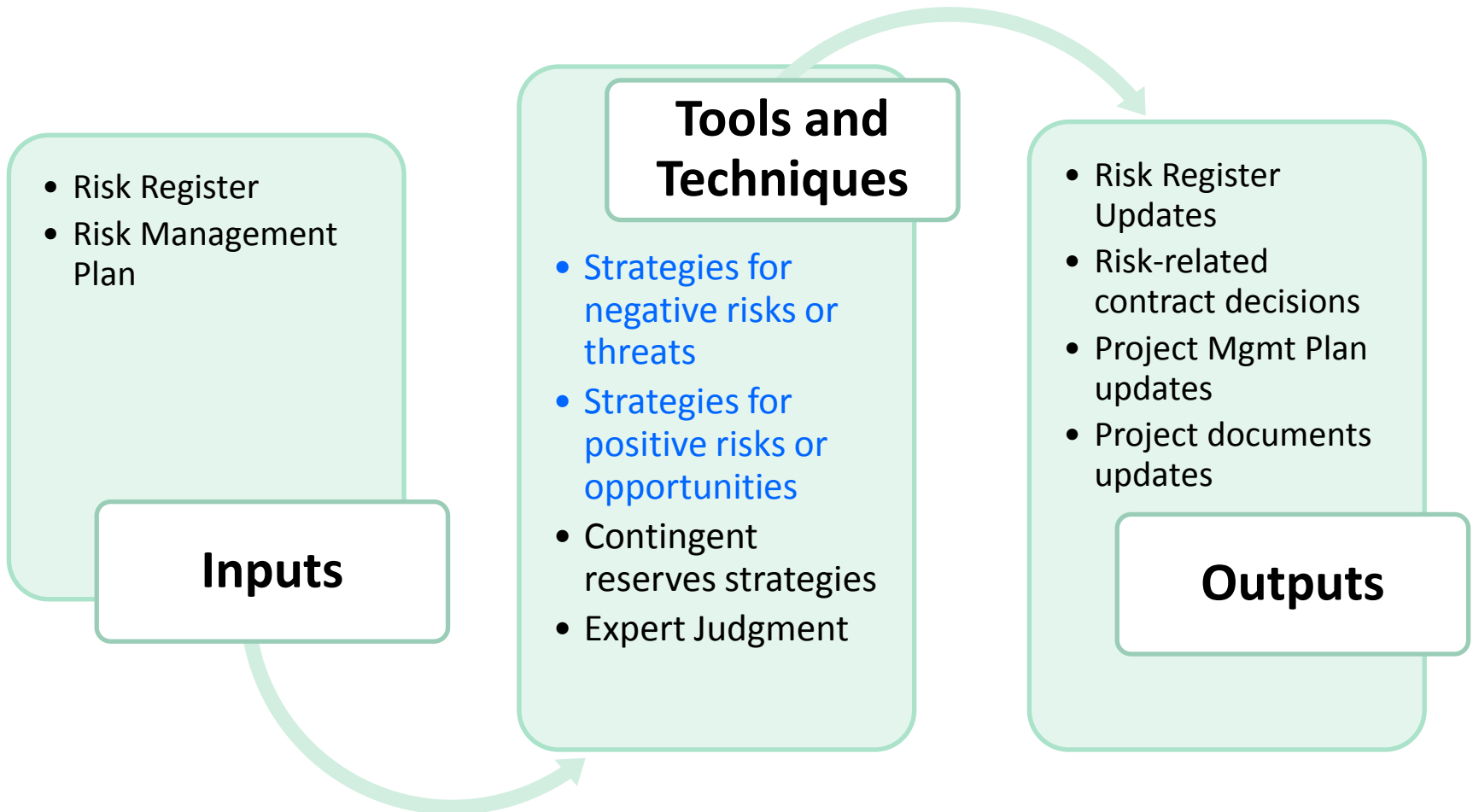
Planning Process

Plan Risk Responses

Planning Risk Responses process:

- Process of developing options and actions to enhance opportunities and reduce threats to project objectives. For top risks:
 - > Eliminate threats before they happen
 - > Make sure that opportunities will occur
 - > Decrease the probability/impact of threats and increase them for opportunities
- For remaining (residual) risks:
 - > Make contingency plan just in case and assign to risk response owners
 - > Fallback plans if contingency plans are not effective
- Risk response strategies must be communicated to all project stakeholders even if there's a problem
- Communicating about risk is essential in order to get buy-in

Plan Risk Responses Inputs, Tools, Techniques & Outputs



Plan Risk Responses Tools and Techniques

Threats Strategies

Mitigate

- Reduce the probability or impact of the threat
- **Ex:** purchase **insurances** against fire

Avoid

- Eliminate the threat by eliminate the cause
- **Ex:** remove WP or person

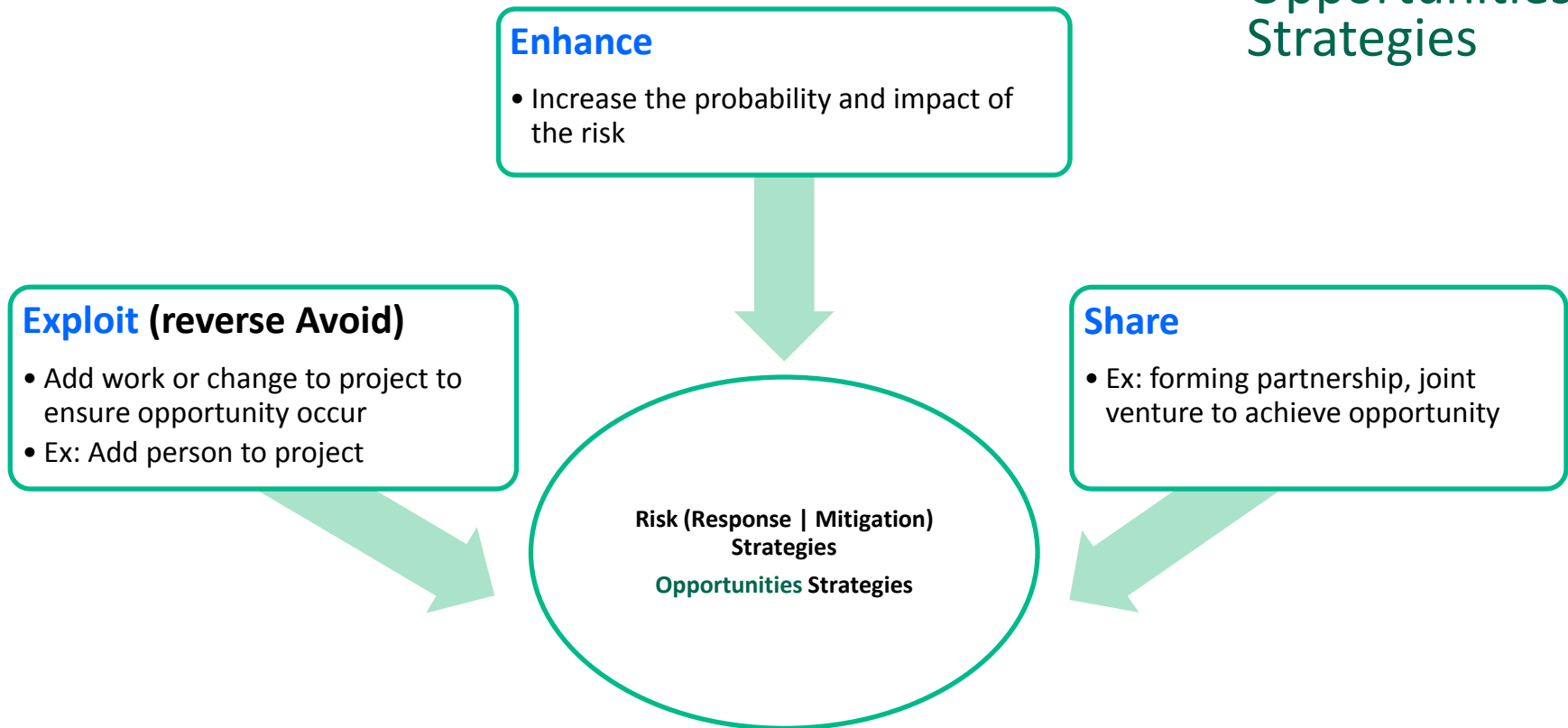
Transfer (Deflect, Allocate)

- Make another party responsible for the risk
- **Ex:** outsource work to third party



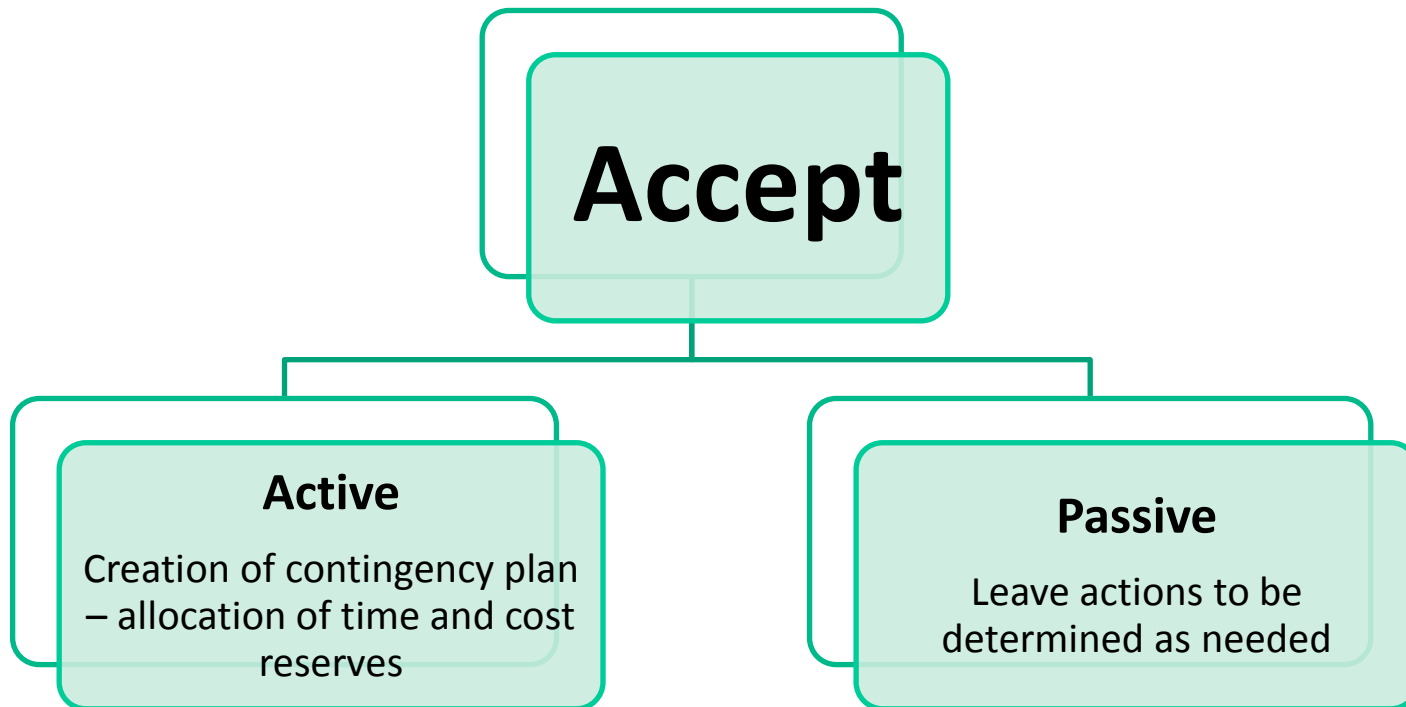
Plan Risk Responses Tools and Techniques – Cont'd

Opportunities Strategies



Plan Risk Responses Tools and Techniques – Cont'd

Strategies for both Threats and Opportunities



Plan Risk Response Outputs

Risk Register

- List of risks
- List of potential responses “initially here and reviewed in *Plan Risk Responses*”
- Root causes of risks
- Updated Risk Categories
- Risk ranking for the project compared to other projects
- List of prioritized risks and their probability and impact rating
- Risks grouped by categories

Risk Register

- Watchlist (non-critical or non-top) risks
- Trends
- Prioritized list of quantified risks
- Amount of contingency time and cost reserves needed
- Possible realistic and achievable completion dates and costs
- The quantified probability of meeting project objectives
- Trends in quantitative analysis
- List of risks requires additional analysis in the near term

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Updates

- Residual Risks, Contingency Plans, Risk Response Owners, Secondary Risks, Risk Triggers, Contracts, Fallback plans, Reserves

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Monitor and Control Risks

Monitoring and Controlling Process

Monitor and Control Risks

Monitor and Control Risks

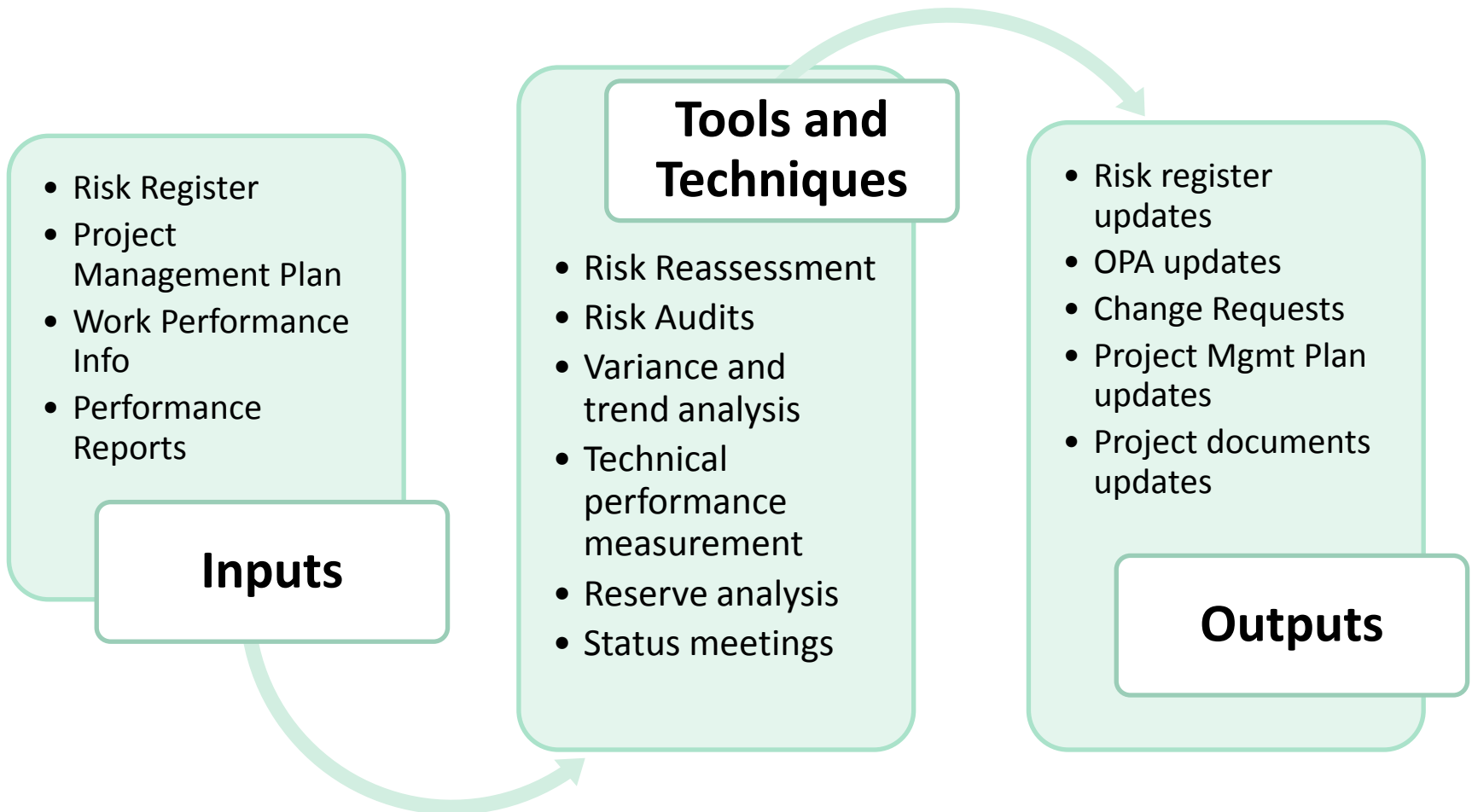
- Process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project
- Help to determine that:
 - > Project assumptions still valid
 - > Analysis shows an assessed risk has changed or retired
 - > Risk management policies and procedures are being followed
 - > Contingency reserves or cost or schedule should be modified to align current risk assessment
- Exam assumes that you made all risk management process just perfect

Monitor and Control Risks – Cont'd

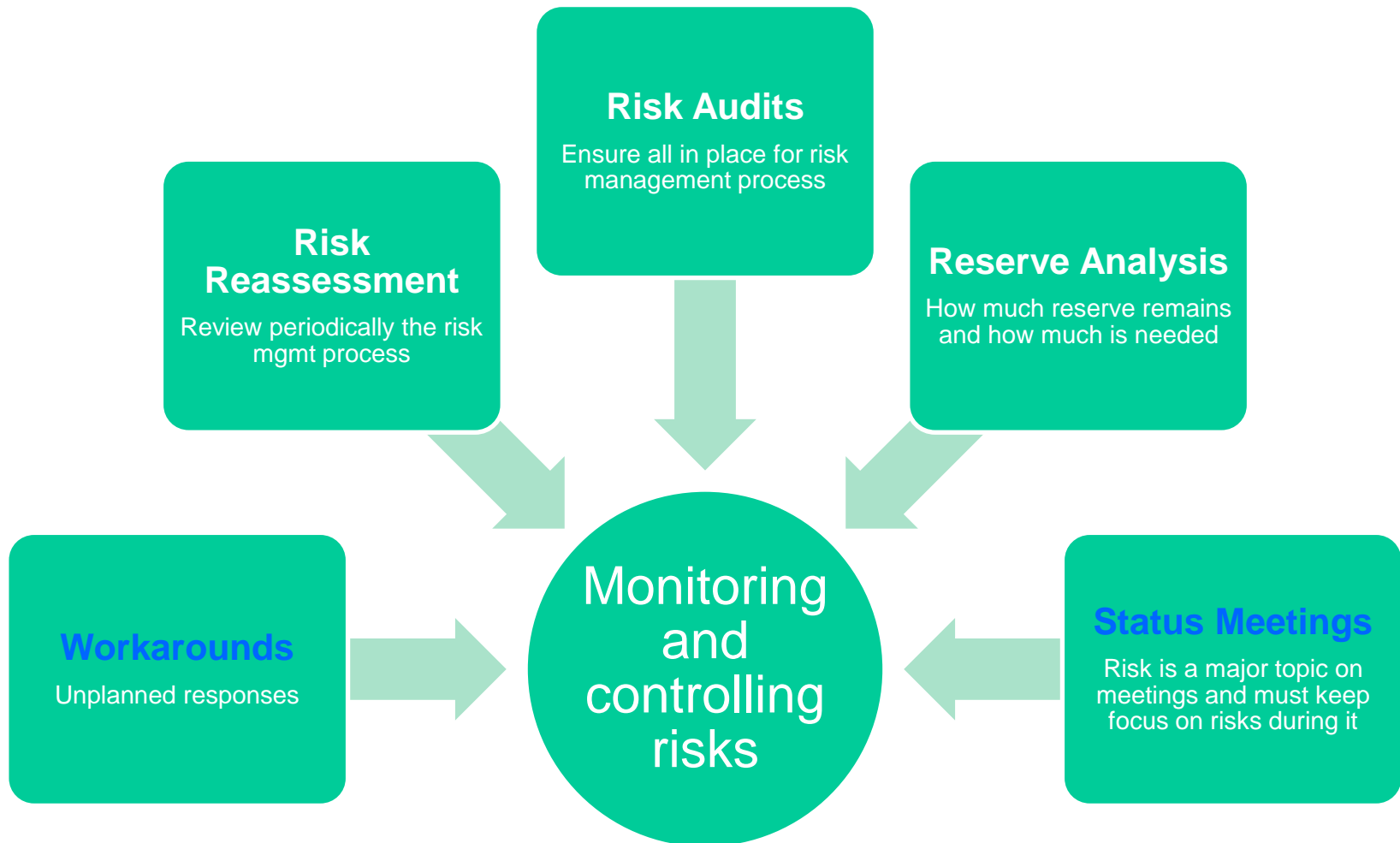
List of actions involved in monitoring and controlling risks:

- Look for occurrence of risk triggers
- Monitor residual risks
- Identify new risks and then analyze the plan for them
- Evaluate the effectiveness of the risk management plan
- Develop new risk responses
- Collect and communicate risk status
- Determine if assumptions are still valid
- Ensure proper risk management procedures are being followed
- Recommend corrective actions to adjust severity of risk events
- Look at unexpected effects or consequences of risk events
- Make changes and updates project documents

Monitor and Control Risks Inputs, Tools, Techniques & Outputs

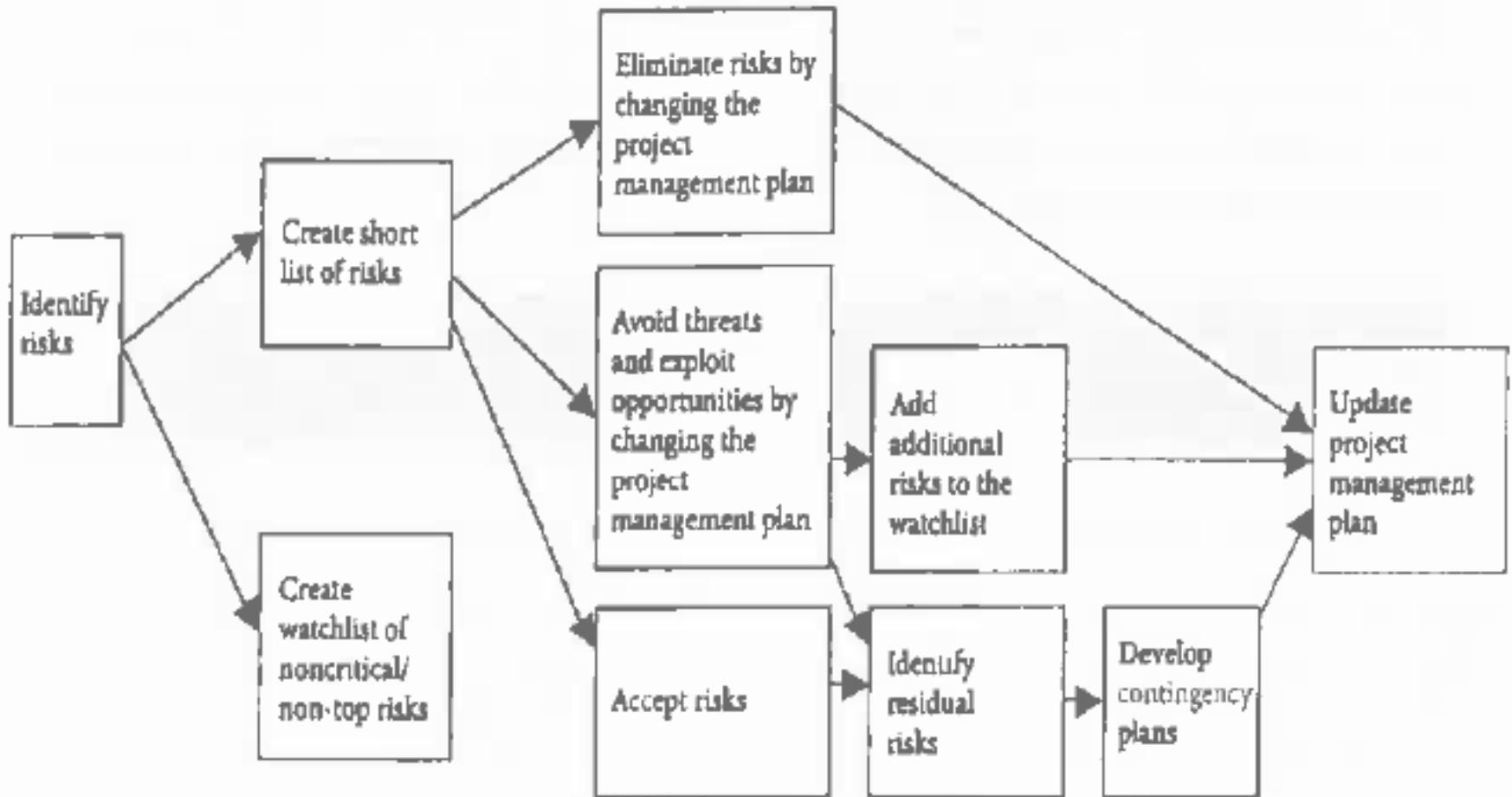


Monitor and Control Risks Tools and Techniques



Putting ALL Together

Copied from Rita's Book



Lesson Learned

Practice Exam Questions

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Thank You ..

Q & A

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