

PMP® V5 RDS

Project Risk Management

Overview

- Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project.
- The objectives of project risk management are to increase the **likelihood** and **impact** of **positive** events, and decrease the likelihood and impact of **negative** events in the project.

Risk Management Processes

- **11.1 Plan Risk Management** — The process of defining how to conduct risk management activities for a project.
- **11.2 Identify Risks** — The process of determining which risks may affect the project and documenting their characteristics.
- **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.
- **11.4 Perform Quantitative Risk Analysis** — The process of numerically analyzing the effect of identified risks on overall project objectives.
- **11.5 Plan Risk Responses** — The process of developing options and actions to enhance opportunities and to reduce threats to project objectives.
- **11.6 Control Risks** — The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

PMI's View

- Risks are identified and managed in initiating and are continually kept up-to-date
- The project manager and the team keep looking at the future and reassess the risks
- PM should focus on preventing problems
 - Eliminate uncertainties, the estimates for work can decrease
 - Risk management saves time and money on a project

Threats and Opportunities

- Risk is the effect of **uncertainty** on objectives (ISO 31000:2009 definition)
- Risk event: something that is identified in advance that may or may not happen; it can have positive or negative impacts on the project
- Opportunities
 - Any events that may benefit the project or organisation
 - Examples:
 - If you can combine orders for the ZYX equipment to buy over 20 items at once, it will be 20% cheaper than planned.
 - If we provide a training class to improve efficiency, work package number 3.4 could be completed two days faster.
 - If we can obtain a resource with more experience and a higher level of productivity in May, work on the critical path activity 4.7 could be done 10% faster.

Concepts

■ Uncertainty

- Lack of knowledge about an event that reduces confidence in conclusions

■ Risk Factors

- The **probability** that it will occur (what)
- The range of possible outcomes (**impact** or amount at stake)
- **Proximity**: Expected timing (when) in the project life cycle
- The anticipated frequency of risk events from that source (how often)

Concepts

- Tolerances: the areas of risk that can be acceptable or not
- Threshold: the point at which a risk become unacceptable
 - E.g. “If there is a delay, it can be no longer than 2 weeks”
- Tolerances and thresholds are related to an organization’s **risk appetite**
- Risk attitude
 - Risk taking, risk neutral, risk averse

* Notes: There are many risk management frameworks. They are similar in many ways. But memorizing different glossary is important for attending different exams.

ISO Standards

- ISO 31000
 - Provides principles and generic guidelines on risk management
 - Risk assessment
 - Risk identification
 - Risk analysis and risk evaluation
 - Risk treatment
 - Risk acceptance and residual risk management
 - Risk communication and consultation
 - Risk monitoring and review
 - [ISO 31000 Risk Manager Certification](#)
- ISO/IEC 27005
 - Information security risk management
 - [ISO 27005 Risk Manager Certification](#)

Risk Management Practices

- We can't eliminate all risks
- Managing risks within risk tolerances is the main objective
- Risks are brought up in every meeting
- If the risk events do happen, there is a plan in place to deal with them
- PM's role:
 - Monitor and control various aspects of the project, looking for deviations and trends
 - Keep stakeholders informed of project progress

Plan Risk Management

(planning)

Plan Risk Management

- The process of defining how to conduct risk management activities for a project
- The key benefit of this process is it ensures that the degree, type, and visibility of risk management are commensurate with both the risks and the importance of the project to the organization.
- The risk management plan is vital to **communicate** with and obtain agreement and support from all stakeholders to ensure the risk management process is supported and performed effectively over the project life cycle

Plan Risk Management

- Defining how to conduct risk management activities
- Planning risk management processes is important
 - to provide sufficient resources and time for risk management activities
 - to establish an agreed-upon basis for evaluating risks
- The Plan Risk Management process should begin as a project is conceived and should be completed early during project planning

Planning Meetings and Analysis

Plan Risk Management: Tools and Techniques

- The project manager, sponsor, team, customer, other stakeholders, and experts can be involved in the “Plan Risk Management” process to define how risk management will be structured and performed for the project
- The process answers:
 - How much time should be spent on risk management?
 - Who will be involved?

Risk Management Plan

Plan Risk Management: Outputs

- Methodology
- Roles and Responsibilities
 - Include non-team members
- Budgeting
- Timing
- Risk categories
- Definitions of probability and impact (required in the Probability and Impact Matrix)
- Stakeholder tolerances: how much risk tolerances can stakeholders withstand?
- Reporting formats
- Tracking
 - Means how risk process will be audited
 - Documentation of what happens with risk management activities

Definition of Impact Scale

Defined Conditions for Impact Scales of a Risk on Major Project Objectives (Examples are shown for negative impacts only)					
Project Objective	Relative or numerical scales are shown				
	Very low /0.05	Low /0.10	Moderate /0.20	High /0.40	Very high /0.80
Cost	Insignificant cost increase	< 10% cost increase	10 – 20% cost increase	20 – 40% cost increase	> 40% cost increase
Time	Insignificant time increase	< 5% time increase	5 – 10% time increase	10 – 20% time increase	> 20% time increase
Scope	Scope decrease barely noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item is effectively useless
Quality	Quality degradation barely noticeable	Only very demanding applications are affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item is effectively useless
This table presents examples of risk impact definitions for four different project objectives. They should be tailored in the Risk Management Planning process to the individual project and to the organization's risk thresholds. Impact definitions can be developed for opportunities in a similar way.					

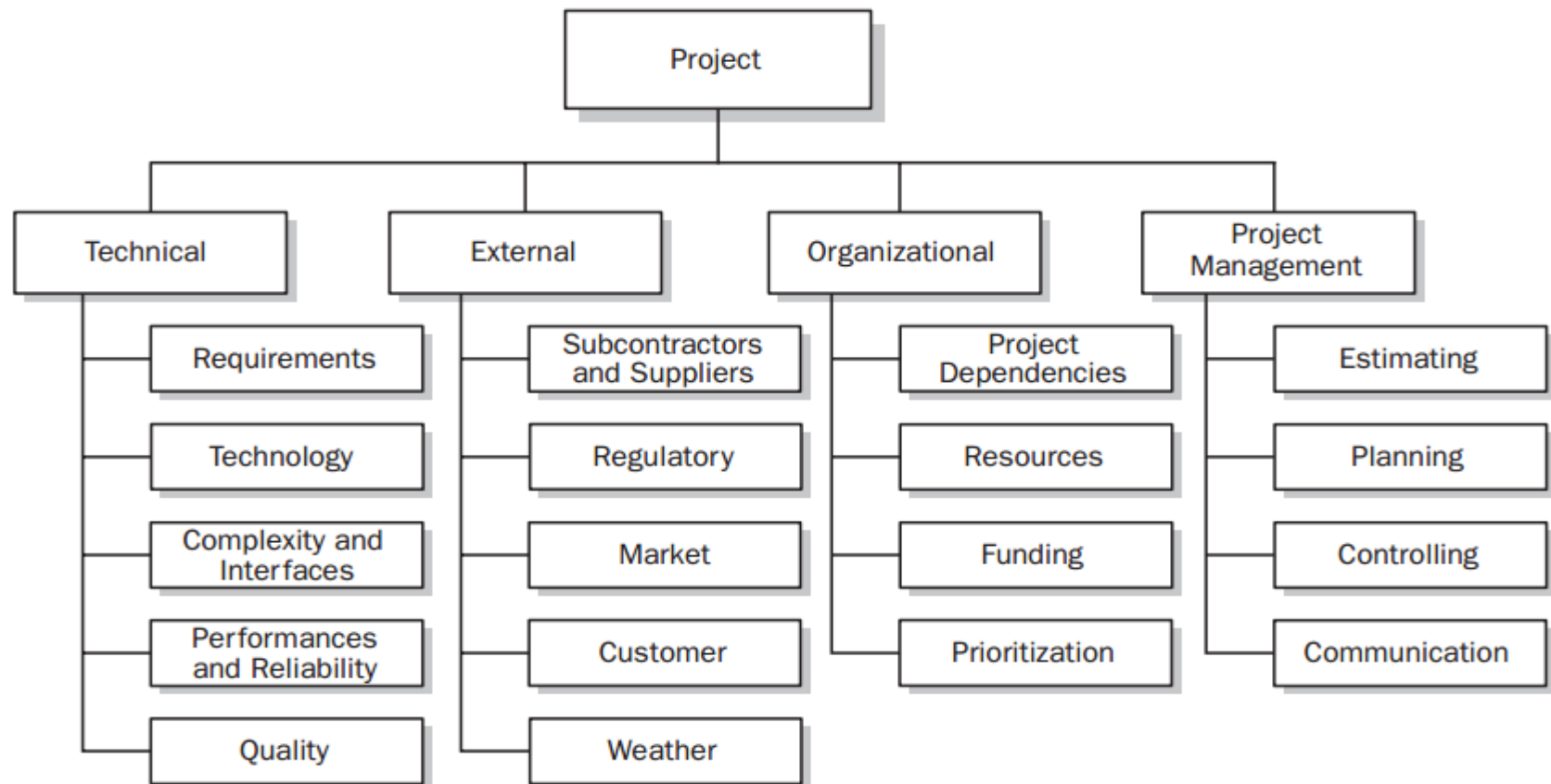
Risk Categories

- Lists of areas or source of risk experienced by the company or on similar projects
- Many ways to categorize risks
 - External
 - Regulatory, environmental, government, market shifts
 - Internal
 - Time, cost, or scope changes; inexperience; poor planning; people; staffing; materials; equipment
 - Technical
 - Changes in technology
 - Unforeseeable (a small portion, <10%)

Risk Categories

- Classified by risks caused/generated by
 - The customer
 - Lack of project management effort
 - Lack of knowledge of project management
 - The customer's customer
 - Suppliers
 - Cultural differences, etc.
- Classified by risks may come from
 - Schedule
 - Cost
 - Quality
 - Scope
 - Resources

Risk Breakdown Structure



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

Type of Risk

- Business
 - Risk of a gain or loss
- Pure (Insurable) Risk
 - Only a risk of loss (such as fire, theft, personal injury, etc.)

Plan Risk Management (planning)

Inputs

- .1 Project management plan
- .2 Project charter
- .3 Stakeholder register
- .4 Enterprise environmental factors
- .5 Organizational process assets

Tools & Techniques

- .1 Analytical techniques
- .2 Expert judgment
- .3 Meetings

Outputs

- .1 Risk management plan

Identify Risks

(planning)

Identify Risks

- The process of determining which risks may affect the project and documenting their characteristics
- The key benefit of this process is the documentation of existing risks and the knowledge and ability it provides to the project team to anticipate events

Identify Risks

- Who are involved?
 - Project manager, project team members, risk management team, customers, subject matter experts, end users, other project managers, **stakeholders**, and risk management experts
- Is an **iterative** process because new risks may evolve
- When are risks identified?
 - High-level risks: Project charter
 - Majority of risks: Planning
 - Small no. of risks: during later parts of the project

Identify Risks

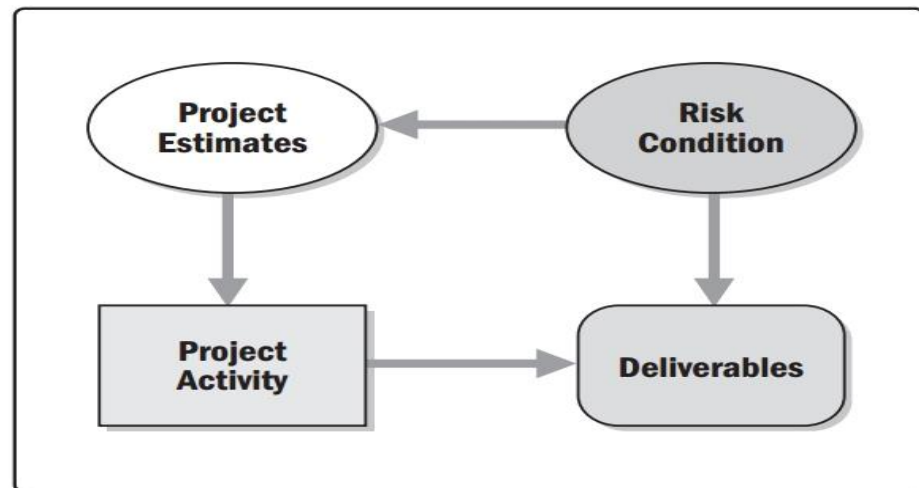
Tools and Techniques

- Documentation Reviews
 - What is and what is not part of the documentation, including project charter, contracts, and planning documentation as well as lessons learned
- Information Gathering Techniques
 - Brainstorming
 - Delphi technique
 - A facilitator uses a questionnaire to solicit ideas about the important project risks.
 - The responses are summarized and are then recirculated to the **experts** for further comment.
 - Consensus may be reached in a few rounds of this process.
 - Interviewing
 - Root cause analysis

Identify Risks

Tools and Techniques

- Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis
- Checklist Analysis: helps identify specific risks in each risk category
- Assumptions Analysis: analyzes the assumptions made in the project and if they are valid, may lead to identification of further risks
- Diagramming Techniques
 - E.g. Cause and effect diagrams , System or process flow charts, Influence diagrams



Risk Register

Identify Risks: Outputs

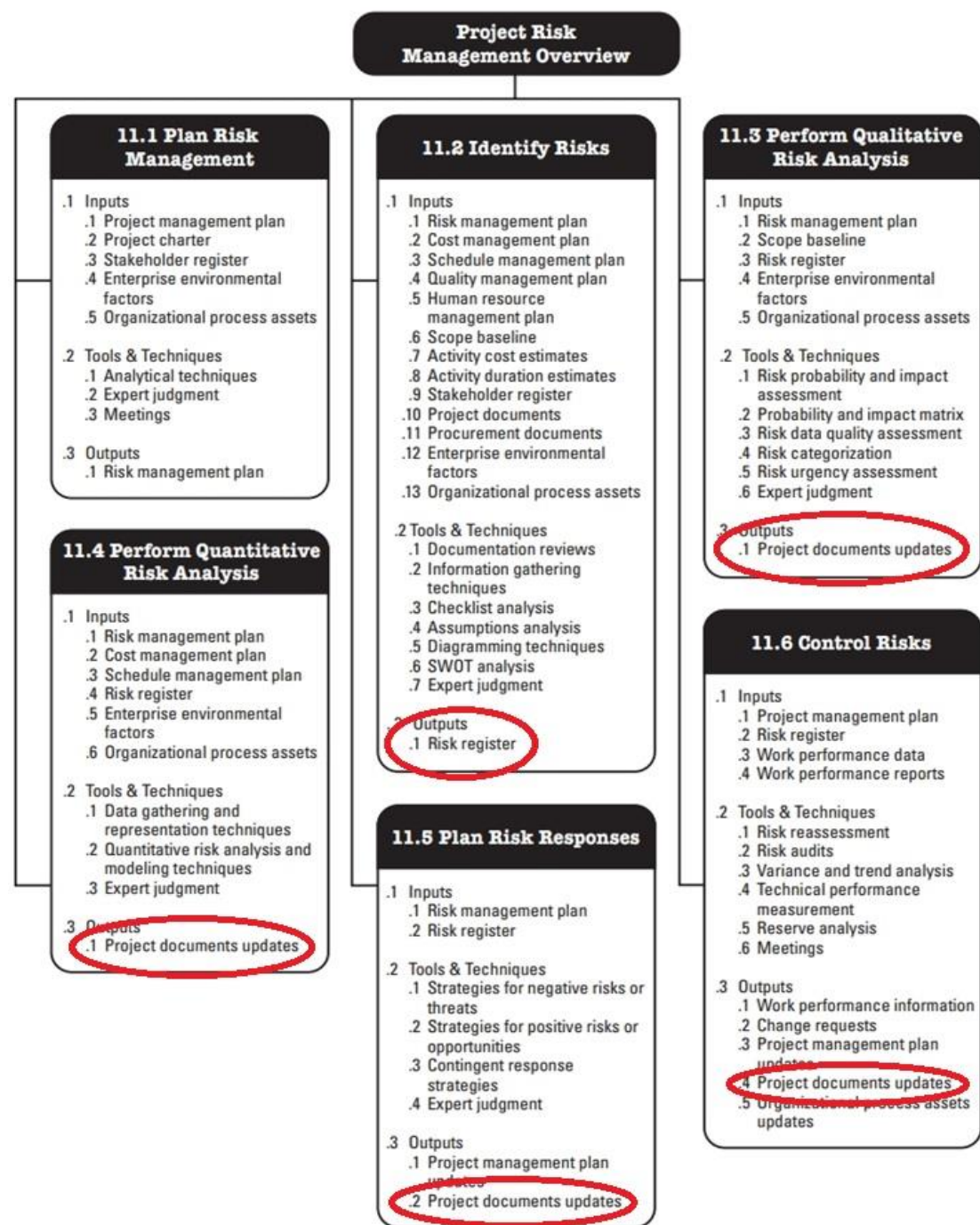
- List of risks
- List of potential response
 - There will be times when a response is identified at the same time as a risk
- Root cause of risks

Risk Register for Project Name											
Prepared by:				Date:							
No.	Rank	Risk	Description	Category	Root Cause	Triggers	Potential Responses	Risk Owner	Probability	Impact	Status

Risk Register

Identify Risks: Outputs

- Very important.
- It is frequently updated.



Identify Risks

(planning)

Inputs

- .1 Risk management plan
- .2 Cost management plan
- .3 Schedule management plan
- .4 Quality management plan
- .5 Human resource management plan
- .6 Scope baseline
- .7 Activity cost estimates
- .8 Activity duration estimates
- .9 Stakeholder register
- .10 Project documents
- .11 Procurement documents
- .12 Enterprise environmental factors
- .13 Organizational process assets

Tools & Techniques

- .1 Documentation reviews
- .2 Information gathering techniques
- .3 Checklist analysis
- .4 Assumptions analysis
- .5 Diagramming techniques
- .6 SWOT analysis
- .7 Expert judgment

Outputs

- .1 Risk register

Perform Qualitative Risk Analysis (planning)

Perform Qualitative Risk Analysis

- The process of **prioritizing** risks for further analysis or action by assessing and combining their probability of occurrence and impact
- The key benefit of this process is that it enables project managers to reduce the level of uncertainty and to focus on high-priority risks

Perform Qualitative Risk Analysis

- Organizations can improve the project's performance by focusing on high-priority risks
- Assesses the priority of identified risks using
 - the **probability** or likelihood of occurrence
 - the corresponding **impact** on project objectives if the risks occur
 - other factors e.g. proximity, risk tolerance, cost, schedule, scope, and quality
- The time criticality of risk-related actions may magnify the importance of a risk
- Usually a rapid and cost-effective means of establishing priorities for Plan Risk Responses
- Lead to Perform Quantitative Risk Analysis or directly to Plan Risk Responses

Perform Qualitative Risk Analysis

- Should be revisited during the project's life cycle to stay current with changes in the project risks
- Is a **subjective** analysis in order to determine
 - The **probability** of each risk occurring, using a standard scale such as Low, Medium, High or 1 to 10
 - The **impact** (amount at stake, or consequences, positive or negative) of each risk occurring, using a standard scale such as Low, Medium, High or 1 to 10

Risk Probability and Impact Matrix

Perform Qualitative Risk Analysis: Tools and Techniques

- As the qualitative risk analysis is based on **subjective** evaluation, the rating of any one risk can vary depending on the bias of the person doing the rating
- Therefore, organizations frequently have a **standard rating system** to promote a common understanding of what each risk rating means
- This matrix may be used to sort or rate risks to determine which ones warrant an immediate response (will therefore be moved on through the risk process) and which ones should be put on the **watchlist**
- Use of a **standardized matrix** makes the risk rating process more repeatable between projects

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/ Very Low	0.10/ Low	0.20/ Moderate	0.40/ High	0.80/ Very High	0.80/ Very High	0.40/ High	0.20/ Moderate	0.10/ Low	0.05/ Very Low

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.

Risk Data Quality Assessment

Perform Qualitative Risk Analysis: Tools and Techniques

- “How accurate and well understood is the risk information?” or “How good is the data?”
- Determine the following for each risk:
 - Extent of the understanding of the risk
 - Data available about the risk
 - Reliability and integrity of the data
 - Kind of **expert judgment**

Perform Qualitative Risk Analysis

Tools and Techniques

- Risk Categorization
 - Group the risks by cause to know which work packages, processes, people, or other potential causes
 - Eliminate many risks at once by eliminating one cause
- Risk Urgency Assessment
 - In addition to creating a shortlist of risks, qualitative risk analysis includes noting risks that should move more quickly through the process than others
 - Some risks may occur very soon or will require a long time to plan a response
 - Project manager may consider both the urgency of the risk and the risk's probability and impact rating (from the probability and impact matrix) to determine the overall severity of the risk

Project Documents Updates

Perform Qualitative Risk Analysis: Outputs

- Risk register updates
 - Risk ranking
 - List of prioritized risks and their probability and impact ratings
 - List of risks requiring additional analysis in the near term
 - List of risks for additional analysis and response
 - These are the risks that will move forward into quantitative risk analysis and/or response planning
 - Watchlist (non-critical or non-top risks)
 - These risks are documented for later review during risk monitoring and controlling

Usage of Perform Qualitative Risk Analysis

- Compare the risk of the project to overall risk of other projects
- Determine whether the project should be selected, continued, or terminated
- Determine whether to proceed to the “Perform Quantitative Risk Analysis” or “Plan Risk Responses” process

Perform Qualitative Risk Analysis

(planning)

Inputs

- .1 Risk management plan
- .2 Scope baseline
- .3 Risk register
- .4 Enterprise environmental factors
- .5 Organizational process assets

Tools & Techniques

- .1 Risk probability and impact assessment
- .2 Probability and impact matrix
- .3 Risk data quality assessment
- .4 Risk categorization
- .5 Risk urgency assessment
- .6 Expert judgment

Outputs

- .1 Project documents updates

Perform Quantitative Risk Analysis (planning)

Perform Quantitative Risk Analysis

- The process of numerically analyzing the effect of identified risks on overall project objectives
- The key benefit of this process is that it produces quantitative risk information to support decision making in order to reduce project uncertainty

Perform Quantitative Risk Analysis

- Performed on risks that have been prioritized by the Perform Qualitative Risk Analysis process as potentially and substantially impacting the project's competing demands
- May not be required, depends on
 - the availability of time and budget
 - the importance of the project

Perform Quantitative Risk Analysis

■ Purposes

- Determine which risk events warrant a response
- Determine overall project risk (risk exposure)
- Determine the quantified probability of meeting project objectives
- Determine cost and schedule reserves
- Create realistic and achievable cost, schedule, or scope targets

■ Qualitative vs. Quantitative

- Qualitative is a subjective evaluation, even though numbers are used for the rating
- Quantitative is a more objective or numerical evaluation; the rating of each risk is based on an attempt to measure the actual probability or amount at stake (impact)
- We always do qualitative but quantitative is not required for all projects and may be skipped

Perform Quantitative Risk Analysis

- Further investigating the highest risks on the project
- Determining the type of probability distribution that will be used, i.e. triangular, normal, beta, uniform, or log normal distributions
 - Revision PERT of Schedule Management
 - The probability distribution of activity cost and schedule estimate comes from three point estimates
- Performing sensitivity analysis to determine which risks have the most impact on the project
- Determining how much quantified risk the project has through expected monetary value analysis or Monte Carlo analysis

Three-Point Estimating

Estimate Activity Durations: Tools and Techniques

- **Program Evaluation and Review Technique (PERT).**
- Uses three estimates to define an approximate range for an activity's duration:
 - **Most likely M, Optimistic O, Pessimistic P**

Expected Activity Duration	Activity Standard Deviation	Activity Variance
$\frac{(P+4M+O)}{6}$	$\frac{P-O}{6}$	$\left[\frac{P-O}{6} \right]^2$

Range of EAD = EAD +/- SD

Start of the range = EAD – SD

End of the range = EAD + SD

PERT can be used for **both time and cost estimates**; particularly for **quantitative analysis**.

Three Point Estimates

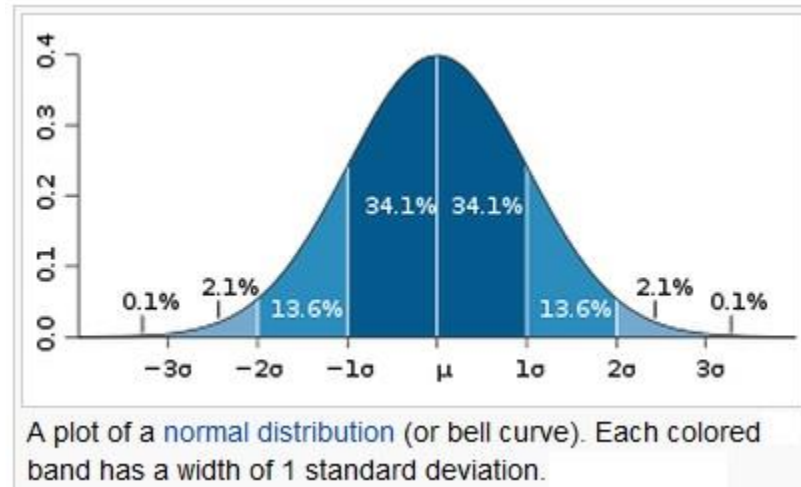
Range of Project Cost Estimates

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

Three-Point Estimating

Estimate Activity Durations: Tools and Techniques

- \pm one SD = 68% confidence level
- \pm two SD = 95% confidence level



- Use these concepts to better control project: it's a confidence interval, not an absolute value
- To assess risk: the larger the SD, the riskier

Concepts

- Probability and Impact determined by
 - Interviewing
 - Cost and time estimating
 - Delphi technique
 - Use of historical records from previous projects
 - Expert judgment
- Exam mainly covers 3 techniques
 - Expected monetary value analysis
 - Monte Carlo analysis
 - Decision tree

Expected Monetary Value Analysis

- Expected monetary value (EMV)
= Probability (P) x Impact (I)
- The higher the EMV of a threat, we need to do something to reduce its probability or impact
- The higher the EMV of an opportunity, we need to do something to increase its probability or impact

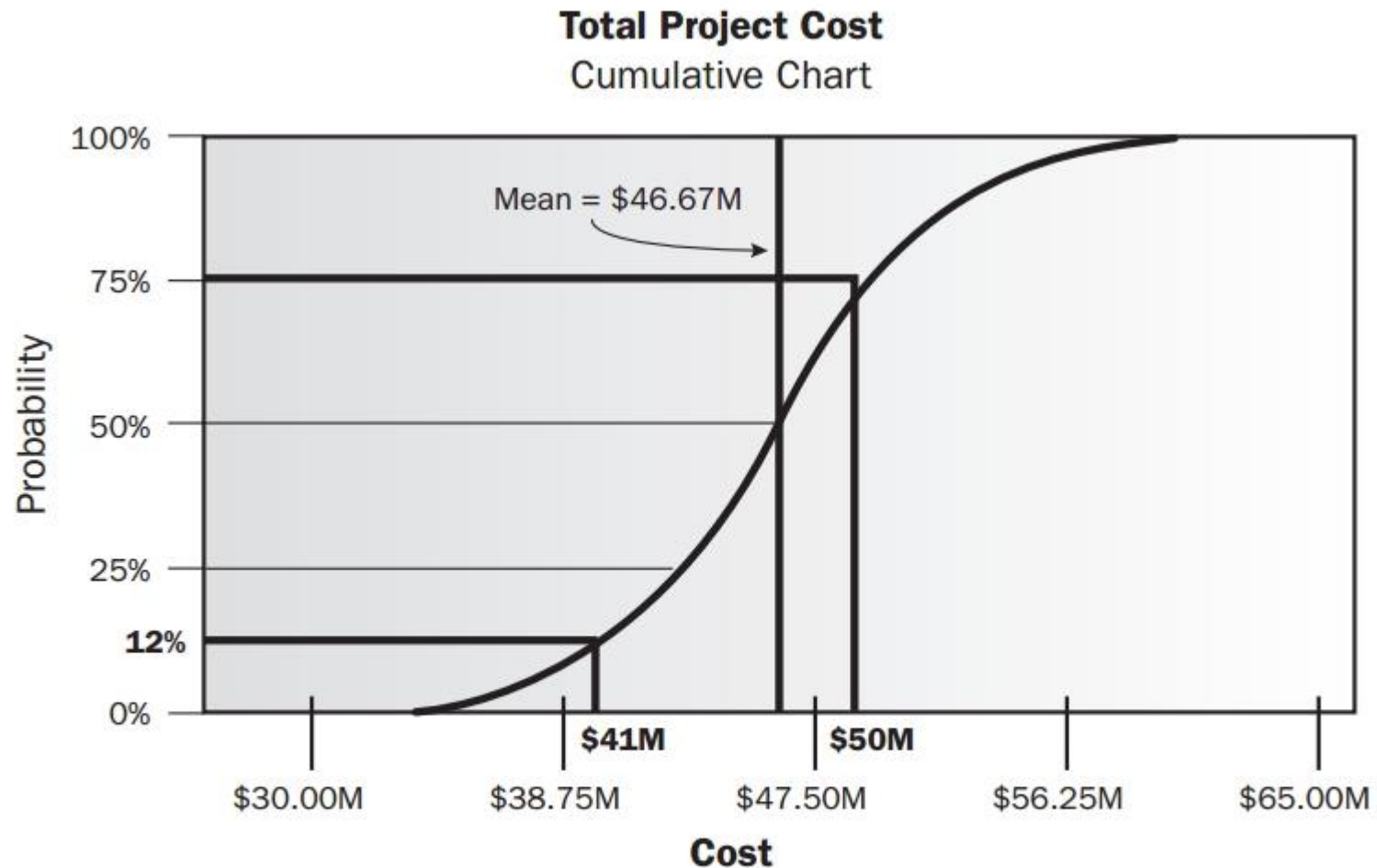
Sensitivity Analysis

- To determine which risks have the most potential impact on the project.
- It helps to understand how the variations in project's objectives correlate with variations in different uncertainties.
- Monte Carlo Analysis is a kind of what-if analysis
- What-if analysis is a kind of sensitivity analysis

Monte Carlo Analysis

- Kind of “what if analysis”
- Use network diagram and estimates to “perform” the project many times and to simulate the cost or schedule results
- Done with a computer-based Monte Carlo program
- Evaluates the overall risk in the project
- Provides the probability of
 - completing the project on any specific day or for specific cost
 - any activity actually being on the critical path
- Takes into account path convergence (in network diagram)
- Can be used to assess cost and schedule impacts
- Results: a probability distribution
- Commercial tool: e.g. Oracle Crystal Ball

Cost Risk Simulation Results

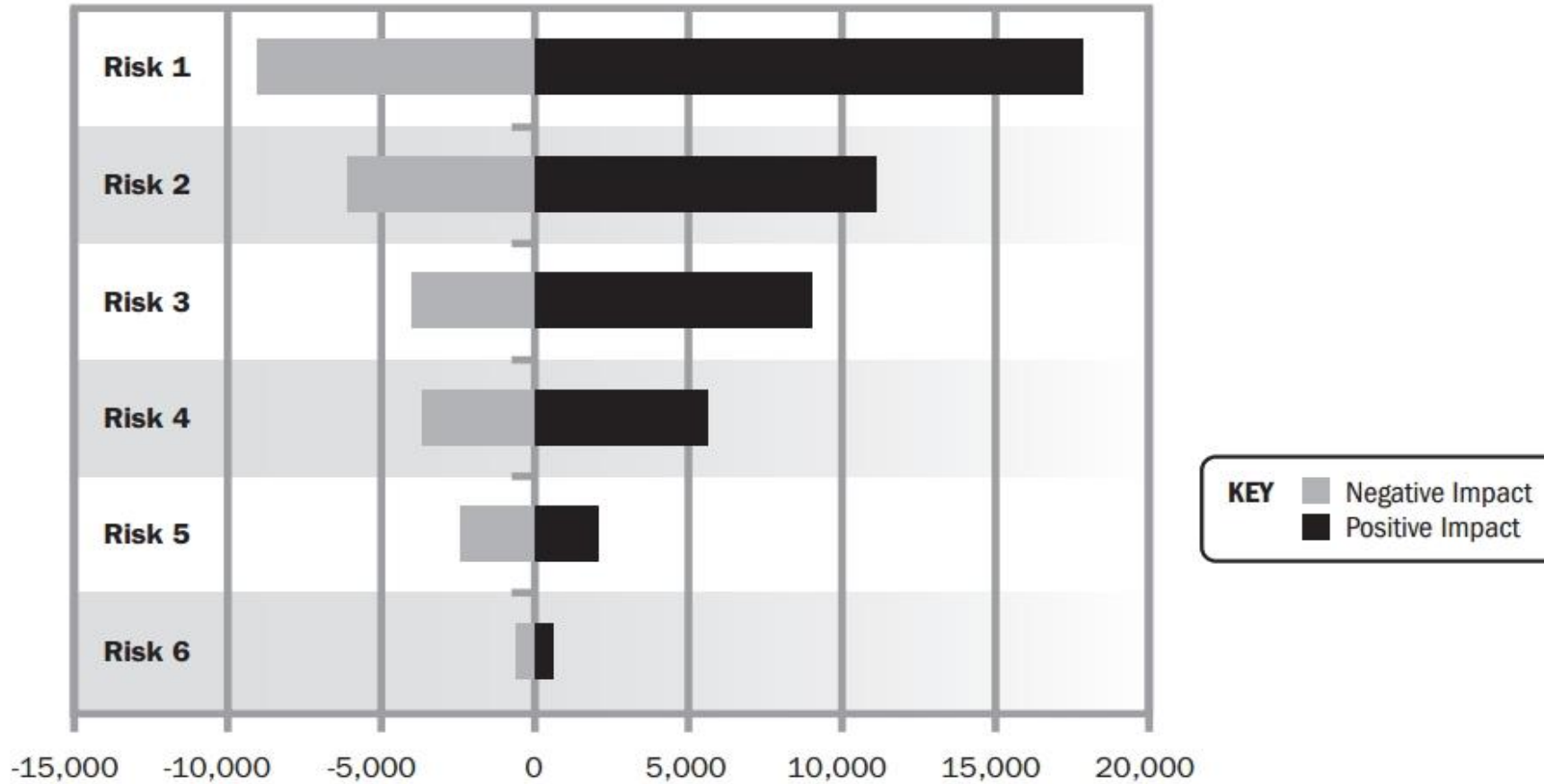


This cumulative distribution, assuming the data ranges in Figure 11-13 and triangular distributions, shows that the project is only 12 percent likely to meet the \$41 million most likely cost estimate. If a conservative organization wants a 75% likelihood of success, a budget of \$50 million (a contingency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

Tornado Diagram

- Typical display of sensitivity analysis
- Useful for comparing relative importance and impact of variables that have a high degree of uncertainty to those that are more stable
- Also helpful in analyzing risk-taking scenarios enabled on specific risks whose quantitative analysis highlights possible benefits greater than corresponding identified negative impacts

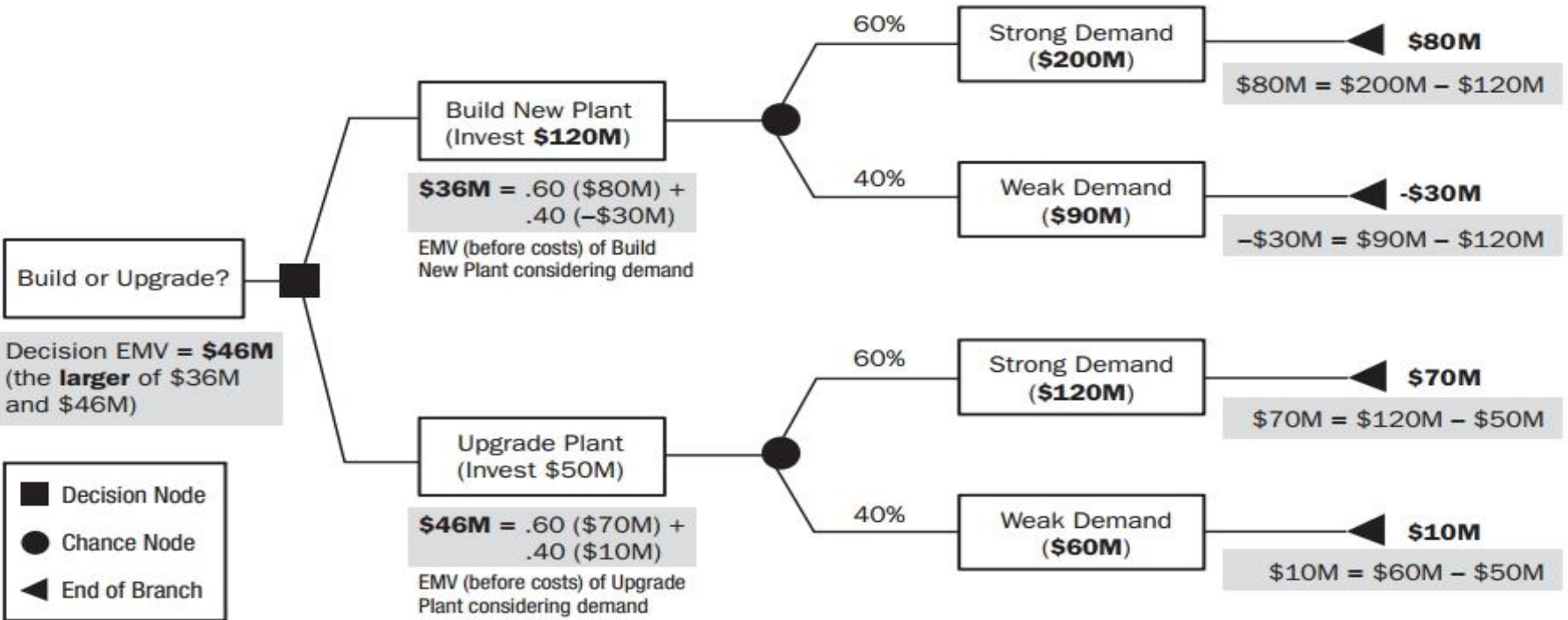
Tornado Diagram



Decision Tree

- If you have to choose between many alternatives, you need to analyze how each choice benefits or hurts the project before making the decision
- A decision tree takes into account future events in trying to make a decision today
- It calculates the expected monetary value (probability times impact) in more complex situations
- It involves mutual exclusivity

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



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

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

Project Documents Updates

Perform Quantitative Risk Analysis: Outputs

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

Perform Quantitative Risk Analysis

(planning)

Inputs

- .1 Risk management plan
- .2 Cost management plan
- .3 Schedule management plan
- .4 Risk register
- .5 Enterprise environmental factors
- .6 Organizational process assets

Tools & Techniques

- .1 Data gathering and representation techniques
- .2 Quantitative risk analysis and modeling techniques
- .3 Expert judgment

Outputs

- .1 Project documents updates

Plan Risk Responses

(planning)

Plan Risk Responses

- The process of developing options and actions to enhance opportunities and to reduce threats to project objectives
- The key benefit of this process is that it addresses the risks by their priority, inserting resources and activities into the budget, schedule and project management plan as needed

Plan Risk Responses

- Includes the identification and assignment of 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 project management plan
 - appropriate to the significance of the risk
 - cost effective
 - realistic
 - agreed upon by all parties involved
 - owned by a responsible person
 - timely
- And select the best risk response from several options

Plan Risk Responses

- For each top risk
 - Do something to eliminate the threats before they happen
 - Do something to make sure the opportunities happen
 - Decrease the probability and/or impact of threats
 - Increase the probability and/or impact of opportunities
- For the remaining (residual) threats
 - Do something if the risk happens (contingency plans)
 - Do something if contingency plans are not effective (fallback plans)
- Risk management may save huge amounts of time and cost

Plan Risk Responses

Inputs

- Risk Register
 - Identified risks, root causes of risks, lists of potential responses
 - Risk owners, symptoms and warning signs
 - The relative rating or priority list of project risks
 - A list of
 - risks requiring response in the near term
 - risks for additional analysis and response
 - Trends in qualitative analysis results
 - Watchlist of low-priority risks
- Risk Management Plan
 - Includes roles and responsibilities, risk analysis definitions, timing for reviews, risk thresholds
 - Risk thresholds help identify those risks for which specific responses are needed

Risk Response Strategies

- For threats
 - Avoid
 - Eliminate the threat by eliminating the cause
 - Mitigate
 - Reduce the probability or the impact of a threat, thereby making it a smaller risk and removing it from the list of top risks on the project
 - Transfer (Deflect, Allocate)
 - Make another party responsible for the risk by purchasing insurance, performance bonds, warranties, guarantees, or outsourcing the work
 - Will still leave some risk behind, you still need to decide what to do about the residual risk

Risk Response Strategies

- For opportunities
 - Exploit (the reverse of avoid)
 - Add work or change the project to make sure the opportunity occurs
 - Enhance (the reverse of mitigate)
 - Increase the likelihood (probability) and positive impacts of the risk event
 - Share
 - Allocate ownership of the opportunity to a third party (forming a partnership, team, or joint venture) that is best able to achieve the opportunity

Risk Response Strategies

- For both threats and opportunities
 - Accept
 - Do nothing
 - Active acceptance: the creation of contingency plans to be implemented if the risk occurs and the allocation of time and cost reserves to the project
 - Passive acceptance: leaves actions to be determined as needed if (after) the risk occurs
 - A decision to accept a risk must be communicated to stakeholders
- Contingent response strategies
 - Contingency plan / fallback plan

Considerations

- Strategies must be timely
- The effort selected must be appropriate to the severity of the risk
- One response can be used to address more than one risk
- More than one response can be used to address the same risk
- A response can address a root cause of risk and thereby address more than one risk
- Involve the team, other stakeholders, and experts in selecting a strategy

Project Documents Updates

Plan Risk Responses: Outputs

- Risk owners and assigned responsibilities
- Agreed-upon response strategies
- Specific actions to implement the chosen response strategy
- Triggers, symptoms, and warning signs of a risk occurrence
- Budget and schedule activities required to implement the chosen responses
- Contingency plans and triggers that call for their execution

Project Documents Updates

Plan Risk Responses: Outputs

- Fallback plans for use as a reaction to 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
- Contingency reserves that are calculated based on the quantitative risk analysis of the project and the organization's risk thresholds

More about Updates

- Residual risks
 - Risk remaining after risk response planning
 - Should be properly documented and reviewed throughout the project to see if their ranking has changed
- Risk response owners
 - Project manager does not have to do it all and neither does the team
 - Can be a stakeholder other than a team member
 - When risk occurs, the risk response owner takes the prearranged and preapproved plan of action determined in project planning and informs the project manager. No meeting, just action
- Technical documentation updates

More about Updates

- Secondary risks
 - An analysis of the new risks created by the implementation of selected risk response strategies
 - Respond to one risk will cause other risks to occur
- Risk triggers
 - Events that trigger the contingency response
 - Project manager should identify the early warning signs

More about Updates

- Contracts
 - Project manager must be involved before a contract is signed
 - Before the contract is finalized, the project manager will have completed a risk analysis and include **contract terms and conditions** required to mitigate or allocate threats and to enhance opportunities
- Fallback plans
 - Specific actions that will be taken if the contingency plan is not effective
- Reserves (contingency)

Plan Risk Responses Notes

- What do you do with non-critical risks?
 - Document them in a watchlist, and revisit them periodically
- Would you choose only one risk response strategy?
 - No, you can select a combination of choices
- What risk management activities are done during the execution of the project?
 - Watching out for non-critical risks that increase in importance
- What is the most important item to address in project team meetings?
 - RISK
- How would risks be addressed in project meetings?
 - By asking “What is the status of risks? Are there any new risks? Is there any change to the order of importance?”

Plan Risk Responses

(planning)

Inputs

- .1 Risk management plan
- .2 Risk register

Tools & Techniques

- .1 Strategies for negative risks or threats
- .2 Strategies for positive risks or opportunities
- .3 Contingent response strategies
- .4 Expert judgment

Outputs

- .1 Project management plan updates
- .2 Project documents updates

Control Risks

(monitoring and controlling)

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
- The key benefit of this process is that it improves efficiency of the risk approach throughout the project life cycle to continuously optimize risk responses

Control Risks

- Project work should be continuously monitored for new, changing, and outdated risks
- To determine if
 - Project assumptions are still valid
 - Analysis shows an assessed risk has changed or can be retired
 - Risk management policies and procedures are being followed
 - Contingency reserves of cost or schedule should be modified in alignment with the current risk assessment.
- Involve choosing alternative strategies, executing a contingency or fallback plan, taking corrective actions, and modifying the project management plan

Actions

- Look for the occurrence of risk triggers
- Monitor residual risks
- Identify new risks and then analyze and plan for them
 - Risks can be identified anytime during the project, along with plans for how to handle the newly identified risks
- Evaluate the effectiveness of the risk management plan
- Develop new risk responses
- Collect and communicate risk status

Actions

- Communicate with stakeholders about risks
- Revisit the watchlist
- Recommend corrective actions to adjust to the severity of actual risk events
- Look for any unexpected effects or consequences of risk events
- Reevaluate risk identification and qualitative and quantitative risk analysis when the project deviates from the baseline
- Update risk management and response plans
- Create a database of risk data
- Perform variance and trend analysis on project performance data

Control Risks

Tools and Techniques

- Workarounds
 - Contingency responses are developed in advance
 - But workarounds are **unplanned responses** developed to deal with the occurrence of unanticipated risk events
 - Project managers who do not perform risk management will spend most of their time creating workarounds
- Risk Reassessments
 - The team needs to periodically review risk management plan and risk register and adjust them as required
 - Good topic for a team meeting or even a separate meeting
- Risk Audits
 - Imagine having a team of auditors descend upon you, asking you to prove you have identified all the risks that can be or should be identified for your project, that you have plans for each of the major risks, and that risk response owners are prepared to take action
 - Evidence of how seriously risk should be taken on a project

Reserve Analysis

Control Risks: Tools and Techniques

- Checking to see how much reserve remains and how much might be needed. Reserve must be guarded throughout the project life cycle
- Contingency reserve may only be used to handle the impact of the specific risk it was set aside for
- If the change is part of the risk response plan that was budgeted for, the reserve may be used

Reserve Analysis

Control Risks: Tools and Techniques

- Under certain circumstances, determined by the performing organization, **management reserves** may be used to accommodate for problems that had not previously been identified as risks
- The reserve needs of the project could be diminished and the time or cost reserve returned to the company if identified risks do not occur
- Reserve is NOT a free amount of time or cost that can be used at will by the project manager for any needs

Control Risks

Tools and Techniques

- Meetings
 - Don't hold the “go around the room” type status meetings
 - Risk should be a major topic at status meetings
- Closing of risks that are no longer applicable
 - The time when each identified risk can logically occur will eventually pass
 - Closing of risks allows the team to focus on managing those risks that are still open
 - The closing of a risk will likely result in the risk reserve being returned to the company

Control Risks

Outputs

- Project documents updates
 - Outcomes of the risk reassessments, risk audits, and periodic risk reviews
 - Actual outcomes of the project's risks and the risk responses
 - The identification of new risks
 - Closing of risks that no longer applicable
 - Details of what happened when risks occurred
- Change requests
- Project management plan updates

Common Risk Management Errors

- Risk identification is completed without knowing enough about the project and ends too soon
- Project risk is evaluated using only a questionnaire, interview, or Monte Carlo analysis
- The risks identified are general rather than specific
 - E.g. “communications” rather than “poor communication of customer’s needs regarding installation of system XXX could cause two weeks of rework”

Common Risk Management Errors

- The first risk response strategy identified is selected without looking at other options and finding the best option or combination of options
- Risk management is not given enough attention during executing
- Project managers do not explain the risk management process to their team
- Contracts are signed before risks are discussed

Control Risks

(monitoring and controlling)

Inputs

- .1 Project management plan
- .2 Risk register
- .3 Work performance data
- .4 Work performance reports

Tools & Techniques

- .1 Risk reassessment
- .2 Risk audits
- .3 Variance and trend analysis
- .4 Technical performance measurement
- .5 Reserve analysis
- .6 Meetings

Outputs

- .1 Work performance information
- .2 Change requests
- .3 Project management plan updates
- .4 Project documents updates
- .5 Organizational process assets updates

Exercise

- All of the following are factors in the assessment of project risk EXCEPT:
 - A. Risk event.
 - B. Risk probability.
 - C. Amount at stake.
 - D. Insurance premiums.

Answer: D

- If a project has a 60 percent chance of a US \$100,000 profit and a 40 percent chance of a US\$100,000 loss, the expected monetary value for the project is:
 - A. \$100,000 profit.
 - B. \$60,000 loss.
 - C. \$20,000 profit.
 - D. \$40,000 loss.

Answer: C

- Risks will be identified during which risk management process?
 - A. Perform Quantitative Risk Analysis and Identify Risks
 - B. Identify Risks and Control Risks
 - C. Perform Qualitative Risk Analysis and Control Risks
 - D. Identify Risks

Answer: B

- What should be done with risks on the watchlist?
 - A. Document them for historical use on other projects.
 - B. Document them and revisit during project monitoring and controlling.
 - C. Document them and set them aside because they are already covered in your contingency plans.
 - D. Document them and give them to the customer.

Answer: B

- Risk tolerances are determined in order to help:
 - A. The team rank the project risks.
 - B. The project manager estimate the project.
 - C. The team schedule the project.
 - D. Management know how other managers will act on the project.

Answer: A

- All of the following are common results of risk management EXCEPT:
 - A. Contract terms and conditions are created.
 - B. The project management plan is changed.
 - C. The communications management plan is changed.
 - D. The project charter is changed.

Answer: D

- Purchasing insurance is BEST considered an example of risk:
 - A. Mitigation.
 - B. Transfer.
 - C. Acceptance.
 - D. Avoidance.

Answer: B

- Outputs of the Plan Risk Responses process include:
 - A. Residual risks, fallback plans, and contingency reserves.
 - B. Risk triggers, contracts, and a risk list.
 - C. Secondary risks, process updates, and risk owners.
 - D. Contingency plans, project management plan updates, and change requests.

Answer: A

- Workarounds are determined during which risk management process?
 - A. Identify Risks
 - B. Perform Quantitative Risk Analysis
 - C. Plan Risk Responses
 - D. Control Risks

Answer: D

- A project manager has just finished the risk response plan for a project. Which of the following should he probably do NEXT?
 - A. Determine the overall risk rating of the project.
 - B. Begin to analyze the risks that show up in the project drawings.
 - C. Add work packages to the project work breakdown structure.
 - D. Hold a project risk reassessment.

Answer: C

- A project manager has assembled the project team, identified 56 risks on the project, determined what would trigger the risks, rated them on a risk rating matrix, tested their assumptions, and assessed the quality of the data used. The team is continuing to move through the risk management process. What has the project manager forgotten to do?
 - A. Simulation
 - B. Risk mitigation
 - C. Overall risk ranking for the project
 - D. Involvement of other stakeholders

Answer: D

- A project manager is quantifying risk for her project. Several of her experts are offsite, but wish to be included. How can this be done?
 - A. Use Monte Carlo analysis using the Internet as a tool.
 - B. Apply the critical path method.
 - C. Determine options for recommended corrective action.
 - D. Apply the Delphi technique.

Answer: D

- While preparing your risk responses, you identify additional risks. What should you do?
 - A. Add reserves to the project to accommodate the new risks and notify management.
 - B. Document the risk items, and calculate the expected monetary value based on probability and impact that result from the occurrences.
 - C. Determine the risk events and the associated cost, then add the cost to the project budget as a reserve.
 - D. Add a 10 percent contingency to the project budget and notify the customer.

Answer: B

- During project executing, a major problem occurs that was not included in the risk register. What should you do FIRST?
 - A. Create a workaround.
 - B. Reevaluate the Identify Risks process.
 - C. Look for any unexpected effects of the problem.
 - D. Tell management.

Answer: A

- Monte Carlo analysis is used to:
 - A. Get an indication of the risk involved in the project.
 - B. Estimate an activity's length.
 - C. Simulate the order in which activities occur.
 - D. Prove to management that extra staff is needed.

Answer: A

- A watchlist is an output of which risk management process?
 - A. Plan Risk Responses
 - B. Perform Quantitative Risk Analysis
 - C. Perform Qualitative Risk Analysis
 - D. Plan Risk Management

Answer: C

- Which of the following **MUST** be an agenda item at all team meetings?
 - A. Discussion of project risks
 - B. Status of current activities
 - C. Identification of new activities
 - D. Review of project problems

Answer: A

- Which of these is a valid response to both positive and negative risks?
 - A. Exploit
 - B. Mitigate
 - C. Accept
 - D. Share

Answer: C

- A project manager gets a report from the risk response owner that a risk did not occur. The project manager should then:
 - A. Update the risk register.
 - B. Update the network diagram.
 - C. Decrease some project reserves.
 - D. Change all future risk response strategies.

Answer: A

- Which of the following BEST describes an opportunity on a project?
 - A. Team members will learn more about spy satellites, and will be able to use that information on future projects.
 - B. The requirements might need updating later.
 - C. The quality requirements are hard to achieve.
 - D. Additional engineering may be needed in order to get the satellite to meet the customer's requirements.

Answer: A

- Which of the following is NOT a possible outcome of risk acceptance?
 - A. The project will suffer no damages.
 - B. The project will use the risk reserve.
 - C. The project will recover costs from the insurance company.
 - D. The project will experience a cost or schedule overrun.

Answer: C

The End