

Target: PMP® Certification



Project Risk Management

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Project Risk Management

* **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.”

Project Risk Management

* **Risk.** An uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.

Risk Characteristics:

- Probability of occurrence (likelihood)
- Impact of occurrence (consequence)
 - Positive. The risk is an opportunity
 - Negative. The risk is a threat

* **Reserve.** A provision in the project management plan to mitigate cost and/or schedule risk. Often used with a modifier (e.g., management reserve, contingency reserve) to provide further detail on what types of risk are meant to be mitigated.

Reserve types:

- Contingency reserve: for the risks that cannot be manage proactively.
- Management reserve: for unexpected.

Project Risk Management

Individual Risks vs Overall Project Risks

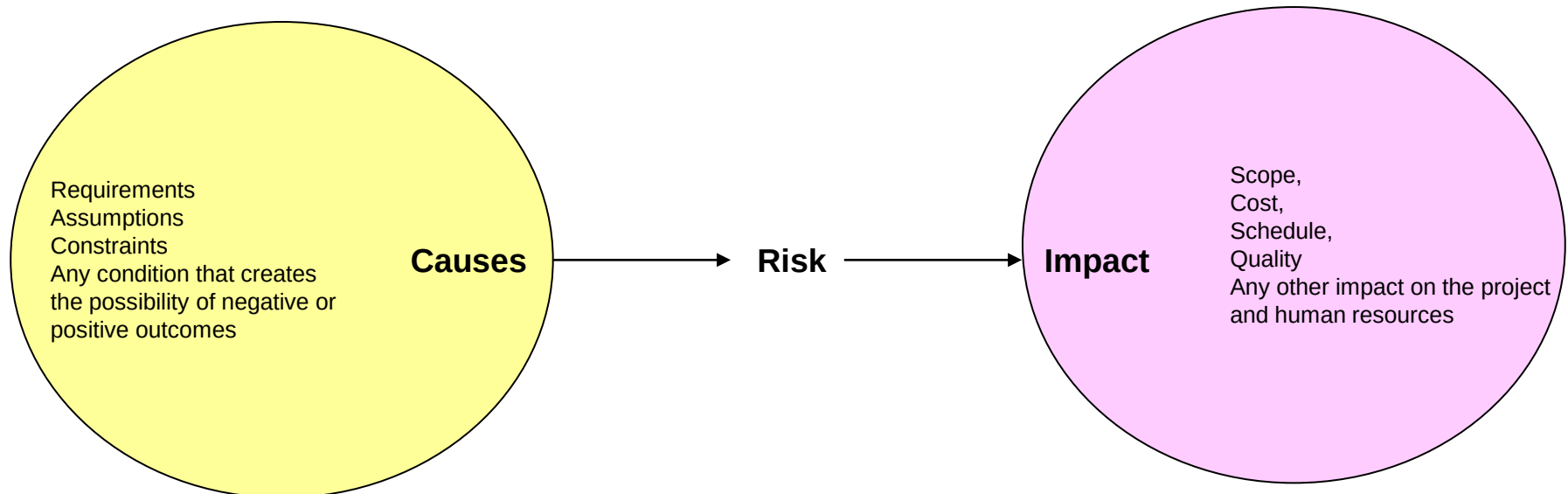
- Individual project risks are different from overall project risk.
- “**Overall project risk** represents the effect of uncertainty on the project as a whole. It is more than the sum of the individual risks within a project, since it includes all sources of project uncertainty. It represents the exposure of stakeholders to the implications of variations in project outcome, both positive and negative.”

Project Risk Management

The Risk Attitudes of both the organization and the stakeholders may be influenced by::

- * **Risk Appetite.** The degree of uncertainty an entity is willing to take on, in anticipation of a reward.
- * **Risk Tolerance.** The degree, amount, or volume of risk that an organization or individual will withstand.
- * **Risk Threshold.** Measure of the level of uncertainty or the level of impact at which a stakeholder may have a specific interest. Below that risk threshold, the organization will accept the risk. Above that risk threshold, the organization will not tolerate the risk.

Project Risk Management



Project Risk Management

SITUATION: A solution needs to be implemented in all of a company's worldwide locations, including those in developing countries. If the telecommunications lines are not upgraded on time where necessary, the solution will not be viable in those locations.

What is the **cause**, **risk** and its **effect**?

- It's the risk that we have to implement the solution in developing countries?
- It's the risk that the solution will not be used in certain countries?
- It's the risk that the necessary telecommunications upgrades are not performed on time?

36**PLAN RISK MANAGEMENT**

*** Plan Risk Management.** The process of defining how to conduct risk management activities for a project.

36**PLAN RISK MANAGEMENT****INPUTS**

- » Project charter
- » Project management plan
 - All components
- » Project documents
 - Stakeholder register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
 - Stakeholder analysis
- ✓ Meetings

OUTPUTS

Risk management plan »

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PLAN RISK MANAGEMENT



OUTPUTS

Risk management plan »

* **Risk Management Plan.** A component of the project, program, or portfolio management plan that describes how risk management activities will be structured and performed.

“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.”

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PLAN RISK MANAGEMENT



OUTPUTS

Risk management plan »

The Risk Management Plan includes the following:

- **Methodology** (approaches, tools, data sources).
- **Roles and responsibilities.**
- **Budgeting** (assign resources and estimates costs associated to risks for inclusion in project cost baseline).
- **Timing** (defines when and how often the risk management process will be performed and establish risk management activities to be included in project schedule).
- **Risk categories.**
- **Definitions of risk probability and impact** (different levels of risks' probabilities and impacts are to be defined) .
- **Probability and impact matrix** (risk are prioritized according to their potential implication for meeting the project's objectives).
- **Revised stakeholders' tolerances.**
- **Reporting formats** (describes the content and format of the risk register and any other risk reports required).
- **Tracking** (documents how risk activities will be recorded).

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PLAN RISK MANAGEMENT



OUTPUTS

Risk management plan »

Definitions of risk probability and impact example:

Table 11-1. Definition of Impact Scales for Four Project Objectives

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.					

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IDENTIFY RISKS



* **Identify Risks.** The process of identifying individual risks as well as sources of overall risk and documenting their characteristics.

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IDENTIFY RISKS



INPUTS

- » Project management plan
 - Requirements management plan
 - Schedule management plan
 - Cost management plan
 - Quality management plan
 - Resource management plan
 - Risk management plan
 - Scope baseline
 - Schedule baseline
 - Cost baseline
- » Project documents
 - Cost estimates
 - Duration estimates
 - Issue log
 - Lessons learned register
 - Requirements documentation
 - Resource requirements
 - Stakeholder register
- » Agreements
- » Procurement documentation
- » Enterprise environmental factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Brainstorming
 - Checklists
 - Interviews
- ✓ Data analysis
 - Root cause analysis
 - Assumption and constraint analysis
 - SWOT analysis
 - Document analysis
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Prompt lists
- ✓ Meetings

OUTPUTS

- Risk register »
- Risk report »
- Project document updates »
 - Assumption log
 - Issue log
 - Lessons learned register

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IDENTIFY RISKS



INPUTS

- » Risk management plan
- » Cost management plan
- » Schedule management plan
- » Quality management plan
- » Human resource management plan

- **Risk Management Plan:** Risk categories, RBS, responsibilities, budgeting, risk tolerance are key inputs in this process.
- **Cost Management Plan:** The project-specific approach, processes, and controls provided by this plan may generate risks.
- **Schedule Management Plan:** it provides insight to project schedule objectives which may be impacted by risks.
- **Quality Management Plan:** it provides a baseline of quality measures and metrics for use in identifying risks
- **HR Management Plan:** it contains roles and responsibilities, project organization charts, and the staffing management plan, all of them key inputs in this process

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IDENTIFY RISKS



INPUTS

» Scope baseline

- **Project Scope Statement** includes the list of constraints and assumptions. The assumptions are some uncertain events that we consider certain for some a specific purpose. So the assumptions should be considered as risks as well.
- **WBS and WBS Dictionary** are key inputs for identifying the risks. The WBS contains Work packages and all the work packages are potential risk bearer.

37**IDENTIFY RISKS****INPUTS**

- » Activity cost estimates
- » Activity duration estimates

Both of them contain ranges around the estimates so they have an uncertainty degree. As a results there are risks associated with these estimates and the ranges.

37**IDENTIFY RISKS****INPUTS**

» Stakeholder register

- The risk attitudes of the key stakeholders should be understood.
- The stakeholder expectations may carry risks.
- Inputs from key stakeholders could be gathered for risk identification.

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IDENTIFY RISKS



INPUTS

» Project documents

Project documents as **Project charter**, **Issue log** or **Project schedule** can help to identify risks.

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IDENTIFY RISKS



INPUTS

» Procurement documents

*** Procurement Documents.** The documents utilized in bid and proposal activities, which include the buyer's Invitation for Bid, Invitation for Negotiations, Request for Information, Request for Quotation, Request for Proposal, and seller's responses. *(will be detailed in Procurement Management area)*

The procurement documents complexity and level of detail may generate risks.

37**IDENTIFY RISKS****TOOLS & TECHNIQUES**✓ **Assumptions analysis**

Assumptions are found in more project documents and parts of the project management plan (for example: are found in project charter and project scope statement) .

The assumptions should be evaluated to find out how much risk is associated with them.

Example: a certain level of skills for a human resource or a type of human resource can be assumed will be available. What are the risks associated with these assumptions?

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IDENTIFY RISKS



TOOLS & TECHNIQUES

✓ Diagramming techniques

- * **Cause and effect diagrams** (Ishikawa, Fishbone): A decomposition technique that helps trace an undesirable effect back to its root cause.
- **System or process flow charts:** show how elements in a system relate each other.
- * **Influence diagrams:** A graphical representation of situations showing causal influences, time ordering of events, and other relationships among variables and outcomes.

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IDENTIFY RISKS



OUTPUTS

Risk register »

* **Risk Register.** A document in which the results of risk analysis and risk response planning are recorded.

The Risk Register will be updated through all the risk management processes

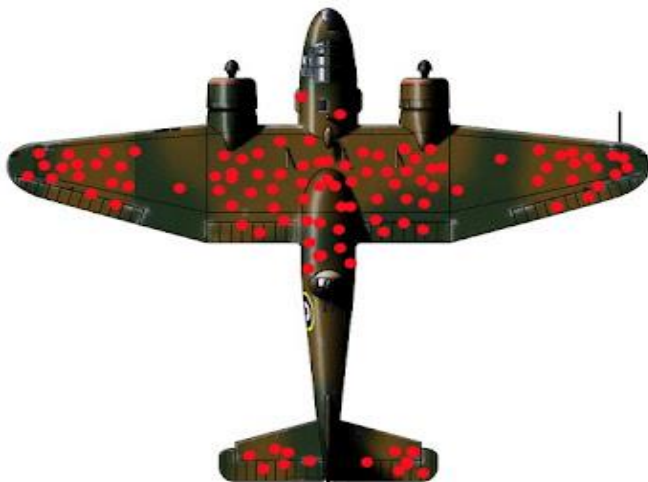
As result of Identify Risk Process, the Risk Register will contain the following information:

- **List of identified risks.** A structure for describing risks may be applied:
 - EVENT may occur causing IMPACT,
 - If CAUSE exists, EVENT may occur leading to EFFECT.
- **List of potential responses.**

Identify Risks

Case Study: Abraham Wald

- Allied pilots are bombing targets in Germany. Most bomber airplanes come back with heavy damage, some even don't come back at all. Therefore it is considered important to protect bombers with extra armor.
- As there is only very limited supply of retrofitting armor, you as a risk manager are hired to determine where this extra armor is best placed on a plane.
- In order to find out the vulnerable parts of the plane, you mark every bullet hole of every plane that comes back from a bombing mission as a red dot on a plane-bullet-hole diagram.
- After having observed more than 50 planes coming back, you end up with the next diagram:



Please point out in detail the most important places where you as a risk manager, would put the armor on the plane.

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PERFORM QUALITATIVE RISK ANALYSIS

*** Perform Qualitative Risk Analysis.** 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.

Besides the probability and impact other factors can be assessed:

- Urgency
- Organization's risk tolerance associated with project constraints of cost, schedule, scope, quality

There is a risk in performing qualitative risk analysis associated with bias introduced by individual risk attitudes and approaches. Establishing definitions of the levels of probability and impact can reduce the influence of bias.

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PERFORM QUALITATIVE RISK ANALYSIS



INPUTS

- » Project management plan
 - Risk management plan
- » Project documents
 - Assumption log
 - Risk register
 - Stakeholder register
- » Enterprise environmental factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Interviews
- ✓ Data analysis
 - Risk data quality assessment
 - Risk probability and impact assessment
 - Assessment of other risk parameters
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Risk categorization
- ✓ Data representation
 - Probability and impact matrix
 - Hierarchical charts
- ✓ Meetings

OUTPUTS

- Project documents updates »
 - Assumption log
 - Issue log
 - Risk register
 - Risk report

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PERFORM QUALITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

- ✓ Risk probability and impact assessment

It is used to prioritize the risks from a relative standpoint. The scales for probability and impact assessment defined in the risk management plan are used (example: “1-10” scale, “low, moderate, high” scale).

Risk probability and impact are assessed for **all** identified risks.

Risks with low ratings of probability and impact will be included in the risk register but marked on the **watch list** for future monitoring.

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PERFORM QUALITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

✓ Probability and impact matrix

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

A risk can be rated separately for each objective (e.g., cost, time, and scope). An overall rating can be based on a weighted formula.

Figure 11-10. Probability and Impact Matrix

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PERFORM QUALITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

✓ Risk data quality assessment

* **Risk Data Quality Assessment.** Technique to evaluate the degree to which the data about risks is useful for risk management.

Among others, the following data characteristics can be considered:

- Accuracy
- Quality
- Reliability
- Integrity

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PERFORM QUALITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

✓ Risk categorization

* **Risk Categorization.** Organization by sources of risk (e.g., using the RBS), the area of the project affected (e.g., using the WBS), or other useful category (e.g., project phase) to determine the areas of the project most exposed to the effects of uncertainty.

It can help to a better and more efficient way to manage the risks.

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PERFORM QUALITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

✓ Risk urgency assessment

*** Risk Urgency Assessment.** Review and determination of the timing of actions that may need to occur sooner than other risk items.

The risks are often prioritized by impact and probability. In some cases there is another dimension should be considered: **urgency**.

Urgency is how quickly the risk require a response. A risk that require an immediate response may take a higher priority than one that does not.

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PERFORM QUALITATIVE RISK ANALYSIS



OUTPUTS

Project documents updates »

Risk register updates. The updates may include:

- Assessments of probability and impacts for each risk,
- Risk ranking or scores,
- Risk urgency information
- Risk categorization
- Watch list

“Assumptions log updates. As new information becomes available through the qualitative risk assessment, assumptions could change. The assumptions log needs to be revisited to accommodate this new information. Assumptions may be incorporated into the project scope statement or in a separate assumptions log.”

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PERFORM QUANTITATIVE RISK ANALYSIS

*** Perform Quantitative Risk Analysis.** The process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives.

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PERFORM QUANTITATIVE RISK ANALYSIS



INPUTS

- » Project management plan
 - Risk management plan
 - Scope baseline
 - Schedule baseline
 - Cost baseline
- » Project documents
 - Assumption log
 - Basis of estimates
 - Cost estimates
 - Cost forecasts
 - Duration estimates
 - Milestone list
 - Resource requirements
 - Risk register
 - Risk report
 - Schedule forecasts
- » Enterprise environmental factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Interviews
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Representation of uncertainty
- ✓ Data analysis
 - Simulations
 - Sensitivity analysis
 - Decision tree analysis
 - Influence diagrams

OUTPUTS

- Project documents updates »
 - Risk report

39

PERFORM QUANTITATIVE RISK ANALYSIS



INPUTS

- » Risk management plan
- » Cost management plan
- » Schedule management plan

- **Risk Management Plan** includes a description how to perform quantitative risk analysis.
- **Cost Management Plan** and **Schedule Management Plan** describe how **risk reserves** (for cost and schedule) are set-up and managed.

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PERFORM QUANTITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

- ✓ Data gathering and representation techniques

Interviewing technique appeals the experience and gathers historical data to quantify the probability and impact of risks on project objectives. For example interviewing relevant stakeholders for determining the three-points estimating for each work package.

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PERFORM QUANTITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

- ✓ Data gathering and representation techniques

Probability distributions represents graphically the durations or costs uncertainty of project components.

“**Uniform distributions** can be used if there is no obvious value that is more likely than any other between specified high and low bounds, such as in the early concept stage of design.”

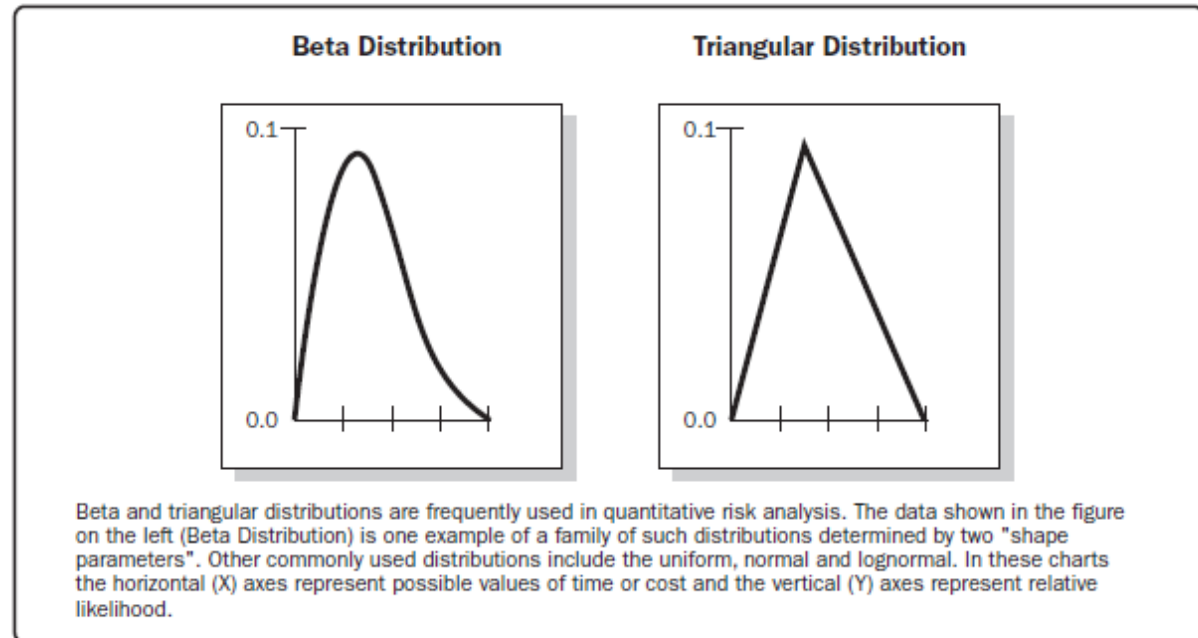


Figure 11-14. Examples of Commonly Used Probability Distributions

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PERFORM QUANTITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

- ✓ Quantitative risk analysis and modeling techniques

1. * **Sensitivity analysis.** A quantitative risk analysis and modeling technique used to help determine which risks have the most potential impact on the project. It examines the extent to which the uncertainty of each project element affects the objective being examined when all other uncertain elements are held at their baseline values. The typical display of results is in the form of a **tornado diagram**.

2. * **Expected Monetary Value (EMV) Analysis.** A statistical technique that calculates the average outcome when the future includes scenarios that may or may not happen. A common use of this technique is within **decision tree analysis**.

3. **Modeling and simulation.** Often a model is used to simulate a particular risk and its effect on project objectives. When using a model to simulate a cost risk, the cost estimates are needed. When using a model to simulate schedule risk, the activity durations and network diagram are needed.

3.1. * **Monte Carlo Simulation.** A process which generates hundreds or thousands of probable performance outcomes based on probability distributions for cost and schedule on individual tasks. The outcomes are then used to generate a probability distribution for the project as a whole.

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PERFORM QUANTITATIVE RISK ANALYSIS



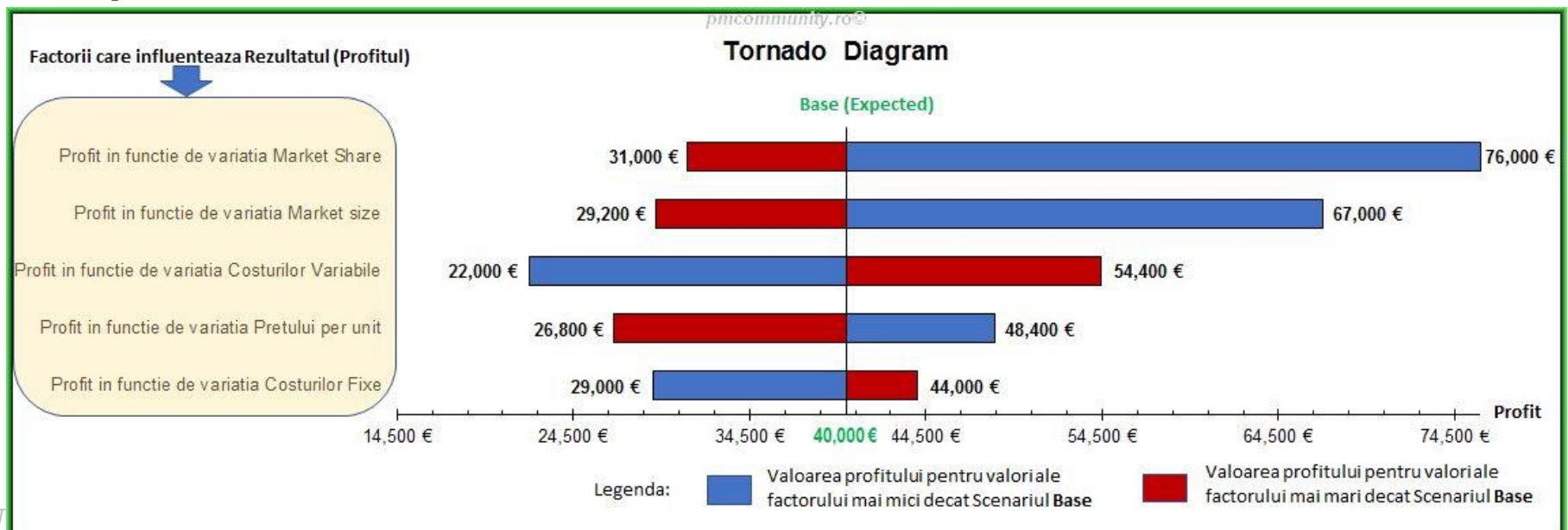
TOOLS & TECHNIQUES

- ✓ Quantitative risk analysis and modeling techniques

	Low	Base	High
Pret per unit (EUR)	540	650	720
Market size (numar de unit-uri)	800	1000	1500
Market Share (procentual)	0.1	0.12	0.2
Costuri Variabile per unit (EUR)	80	200	350
Costuri Fixe (EUR)	10000	14000	25000

Sensitivity analysis

* **Tornado Diagram.** A special type of bar chart used in sensitivity analysis for comparing the relative importance of the variables. **[Profit = (Pret – Costuri variabile) * Market Size * Market Share – Costuri Fixe]**



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PERFORM QUANTITATIVE RISK ANALYSIS**TOOLS & TECHNIQUES**

- ✓ Quantitative risk analysis and modeling techniques

Expected Monetary Value (EMV) Analysis

The EMV of opportunities are positive values, while those of threats are negative values. An example:

Risk	Probability	Impact	Expected Monetary Value
A (threat)	30%	- \$80,000	- \$24.000
B (opportunity)	20%	\$10,000	\$2.000
C (opportunity)	10%	\$40,000	\$4.000
D (threat)	50%	- \$20,000	- \$10.000

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PERFORM QUANTITATIVE RISK ANALYSIS



TOOLS & TECHNIQUES

- ✓ Quantitative risk analysis and modeling techniques

Expected Monetary Value Analysis

The Decision Tree analysis is an example of EMV use:

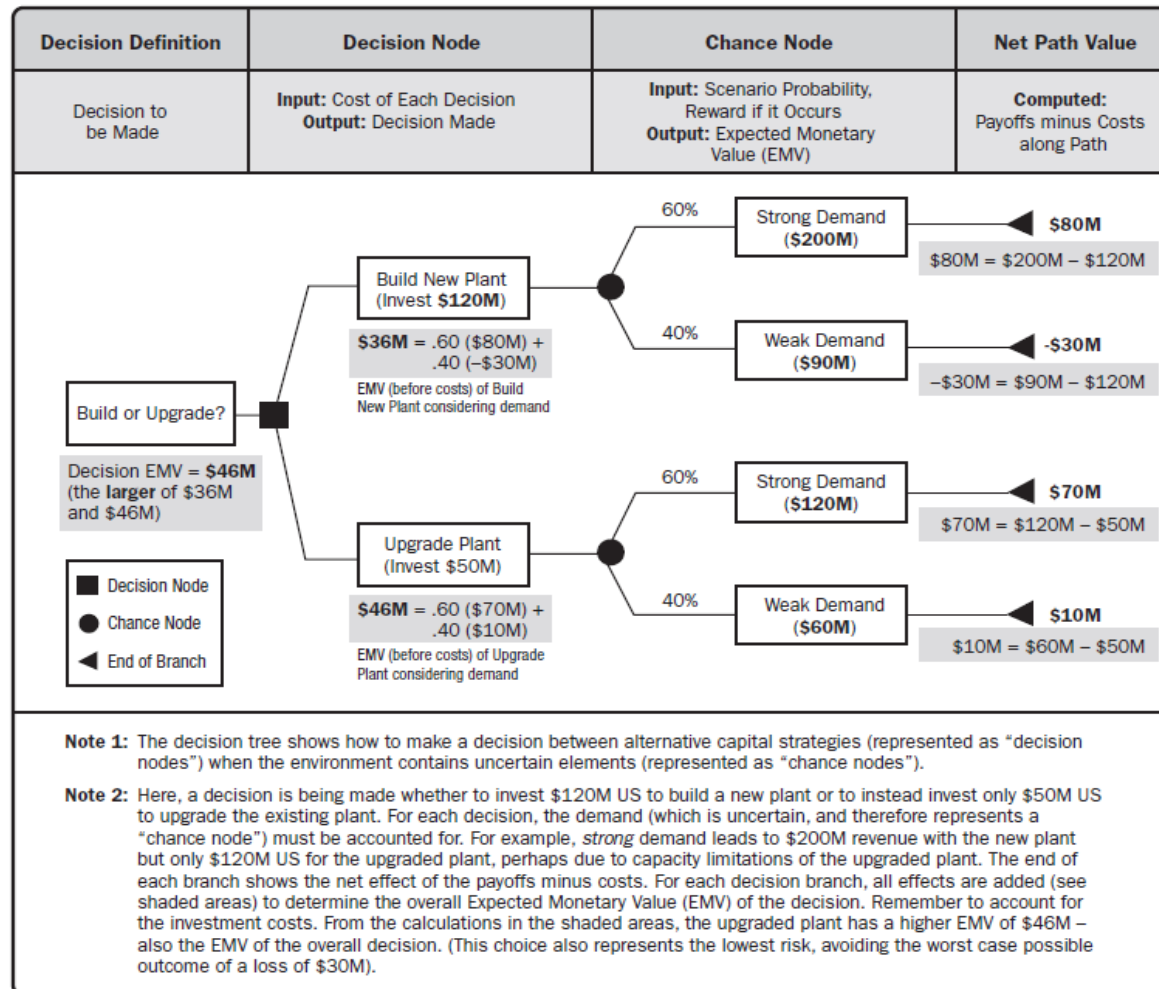


Figure 11-16. Decision Tree Diagram

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PERFORM QUANTITATIVE RISK ANALYSIS



OUTPUTS

Project documents updates »

Risk register updates. The updates may include:

- Probabilistic analysis of the project:
“Estimates are made of potential project schedule and cost outcomes listing the possible completion dates and costs with their associated confidence levels. This output, often expressed as a cumulative frequency distribution, is used with stakeholder risk tolerances to permit quantification of the cost and time contingency reserves.”
- Probability of achieving cost and time objectives.
- Prioritized list of quantified risks.
- Trends in quantitative risk analysis results.

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PLAN RISK RESPONSES



* **Plan Risk Responses.** 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.

40

PLAN RISK RESPONSES



INPUTS

- » Project management plan
 - Resource management plan
 - Risk management plan
 - Cost baseline
- » Project documents
 - Lessons learned register
 - Project schedule
 - Project team assignments
 - Resource calendars
 - Risk register
 - Risk report
 - Stakeholder register
- » Enterprise environmental factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Interviews
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Strategies for threats
- ✓ Strategies for opportunities
- ✓ Contingent response strategies
- ✓ Strategies for overall project risk
- ✓ Data analysis
 - Alternatives analysis
 - Cost-benefit analysis
- ✓ Decision making
 - Multicriteria decision analysis

OUTPUTS

- Change requests »
- Project management plan updates »
 - Schedule management plan
 - Cost management plan
 - Quality management plan
 - Resource management plan
 - Procurement management plan
 - Scope baseline
 - Schedule baseline
 - Cost baseline
- Project documents updates »
 - Assumption log
 - Cost forecasts
 - Lessons learned register
 - Project schedule
 - Project team assignments
 - Risk register
 - Risk report

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PLAN RISK RESPONSES



TOOLS & TECHNIQUES

- ✓ Strategies for negative risks or threats

- **Avoid:** * A risk response strategy whereby the project team acts to eliminate the threat or protect the project from its impact.
- **Transfer:** * A risk response strategy whereby the project team shifts the impact of a threat to a third party, together with ownership of the response. (e.g. insurance, warranties, guarantees)
- **Mitigate:** * A risk response strategy whereby the project team acts to reduce the probability of occurrence or impact of a risk.
- **Accept:** * A risk response strategy whereby the project team decides to acknowledge the risk and not take any action unless the risk occurs.

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PLAN RISK RESPONSES



TOOLS & TECHNIQUES

✓ Strategies for positive risks or opportunities

- **Exploit:** seeks to eliminate the uncertainty by making opportunity happening
- **Share:** sharing a positive risk involves allocating ownership to a third party who is best able to capture the opportunity for the benefit of the project (e.g. risk sharing partnerships, teams, joint ventures)
- **Enhance:** modifies the “size” of an opportunity by increasing probability and / or positive impacts
- **Accept:** * A risk response strategy whereby the project team decides to acknowledge the risk and not take any action unless the risk occurs.

40**PLAN RISK RESPONSES****TOOLS & TECHNIQUES**✓ **Contingent response strategies**

- Some responses are designed for use only if certain events occur
- For some risks it is appropriate to make a response plan to be executed under predefined conditions.
- Trigger- warning event

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PLAN RISK RESPONSES



OUTPUTS

Project management plan
updates »

Some examples of Project management Plan updates:

- **Schedule management plan:** may include changes in tolerance or behavior related to resource loading and leveling, as well as updates to the schedule strategy.
- **Cost management plan:** may include changes in tolerance or behavior related to cost accounting, tracking, and reports, as well as updates to the budget strategy and how contingency reserves are consumed.
- **Quality management plan:** may include changes in tolerance or behavior related to requirements, quality assurance, or quality control, as well as updates to the requirements documentation.
- **Procurement management plan:** may be updated to reflect changes in strategy, such as alterations in the make-or-buy decision or contract type(s) driven by the risk responses.
- **Human resource management plan:** may include changes in tolerance or behavior related to staff allocation, as well as updates to the resource loading.
- The baselines

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PLAN RISK RESPONSES



OUTPUTS

Project documents updates »

Risk register updates. The updates may include:

- “Risk owners and assigned responsibilities;
- 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 triggers that call for their execution;
- **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.”

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IMPLEMENT RISK RESPONSES

* **Implement Risk Responses.** The process of implementing agreed-upon risk response plans.

41**IMPLEMENT RISK RESPONSES****INPUTS**

- » Project management plan
 - Risk management plan
- » Project documents
 - Lessons learned register
 - Risk register
 - Risk report
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Interpersonal and team skills
 - Influencing
- ✓ Project management information system

OUTPUTS

- Change requests »
- Project documents updates »
 - Issue log
 - Lessons learned register
 - Project team assignments
 - Risk register
 - Risk report

42

MONITOR RISKS



* **Monitor Risks.** 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.

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MONITOR RISKS



INPUTS

- » Project management plan
 - Risk management plan
- » Project documents
 - Issue log
 - Lessons learned register
 - Risk register
 - Risk report
- » Work performance data
- » Work performance reports

TOOLS & TECHNIQUES

- ✓ Data analysis
 - Technical performance analysis
 - Reserve analysis
- ✓ Audits
- ✓ Meetings

OUTPUTS

- Work performance information »
- Change requests »
- Project management plan updates »
 - Any component
- Project documents updates »
 - Assumption log
 - Issue log
 - Lessons learned register
 - Risk register
 - Risk report
- Organizational process assets updates »

42

MONITOR RISKS



TOOLS & TECHNIQUES

✓ Risk audits

* **Risk Audits.** Examination and documentation of the effectiveness of risk responses in dealing with identified risks and their root causes, as well as the effectiveness of the risk management process.

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MONITOR RISKS



OUTPUTS

Change requests »

- Change request can include recommended corrective and preventive actions.
 - Recommended corrective actions can include **contingency plans** and **workarounds**.
- * **Workaround.** A response to a threat that has occurred, for which a prior response had not been planned or was not effective.

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MONITOR RISKS



OUTPUTS

Project documents updates »

Project documents updates examples:

- **Risk register updates.** The updates may include:
 - Outcomes of risk reassessments, risk audits, and periodic risk reviews:
 - identification of new risks,
 - updates to probability, impact, priority,
 - response plans, ownership,
 - closing risks that are no longer applicable and **releasing their associated reserves.**
 - Actual outcomes of the project's risks and of the risk responses (useful as lesson learned)
- **Change log**

Project Risk Management

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40	PLAN RISK RESPONSES		
41	IMPLEMENT RISK RESPONSES		
42	MONITOR RISKS		

Project Risk Management



- Management reserve vs Contingency reserve
- Individual Risks vs Overall Project Risk
- Risk Attitude: Risk Appetite, Risk Tolerance, Risk Threshold
- Cause, Risk, Effect
- Risk Management plan content
- Risk register content
- Influence diagrams
- Risk Data Quality Assessment
- Risk urgency assessment
- Probability distribution
- Sensitivity Analysis, Tornado diagram
- Expected Monetary Value, Decision Trees
- Monte Carlo simulation
- Avoid, Transfer, Mitigate, Accept
- Exploit, Share, Enhance, Accept
- Fallback plan
- Residual Risks
- Secondary Risks
- Workarounds
- Risk reassessment
- Risk audit

Project Risk Management

25 Questions/30 Minutes