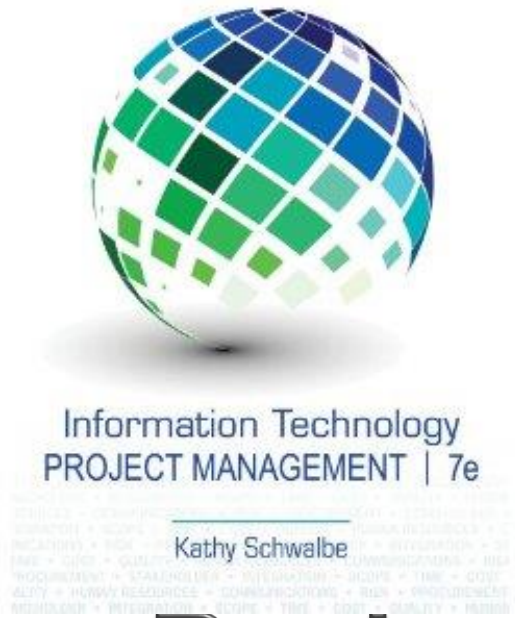
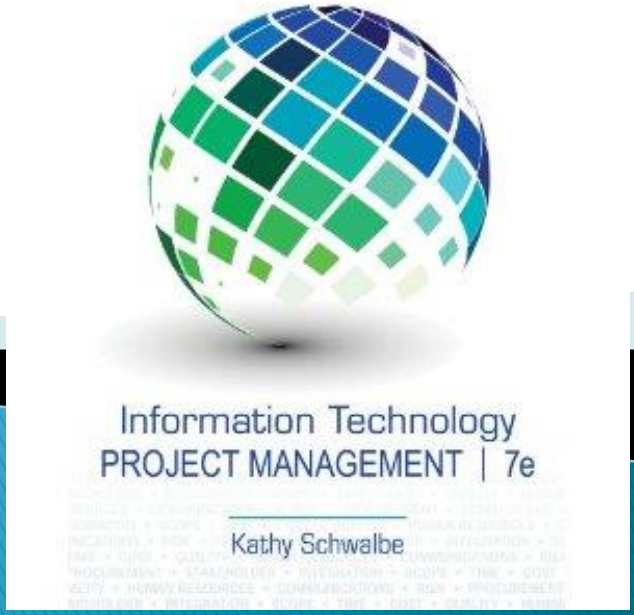


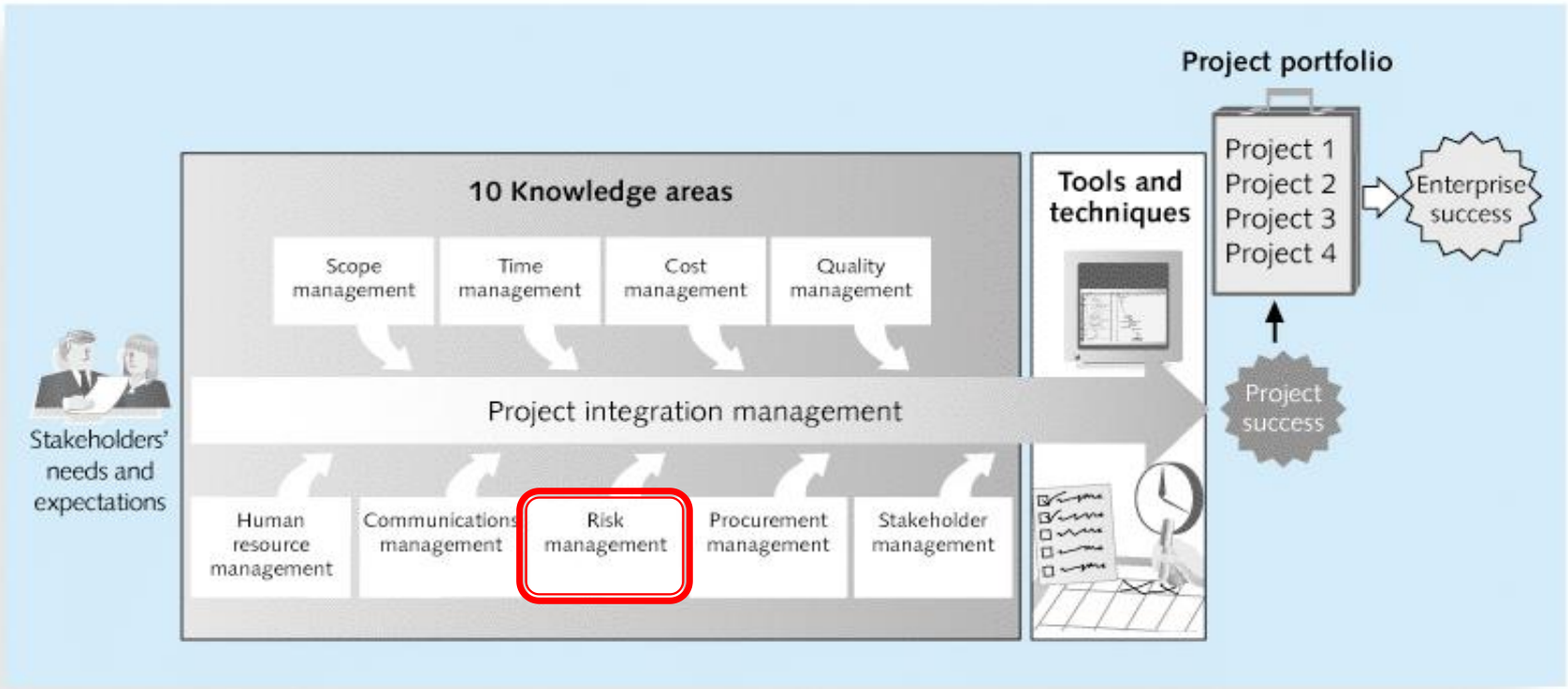
Chapter 11: Project Risk Management

Information Technology Project Management, Seventh Edition



ĐẶNG THỊ THU HÀ – SE
dtthuha79@gmail.com
https://lms.iuh.edu.vn

.


Project portfolio
10 Knowledge areas
Scope management
Time management
Cost management
Quality management
Project integration management
Human resource management
Communications management
Risk management
Procurement management
Stakeholder management
Stakeholders' needs and expectations
Tools and techniques
Project 1
Project 2
Project 3
Project 4
Enterprise success
Project success

Learning Objectives (1 of 2)

- Explain the concept of risk as it relates to project management, and list the advantages of managing project risks according to best practices
- Describe the process of identifying risks and create a risk register and risk report
- Explain quantitative risk analysis and how to apply decision trees, simulation, and sensitivity analysis to quantify risks

The Importance of Project Risk Management

- Project risk management is the art and science of identifying, analyzing, and responding to risk throughout the life of a project and in the best interests of meeting project objectives
  - Risk management is often overlooked in projects, but it can help improve project success by helping select good projects, determining project scope, and developing realistic estimates

The Process of Project Risk Management

11.1.Planning risk management: deciding how to approach and plan the risk management activities for the project

11.2.Identifying risks: determining which risks are likely to affect a project and documenting the characteristics of each

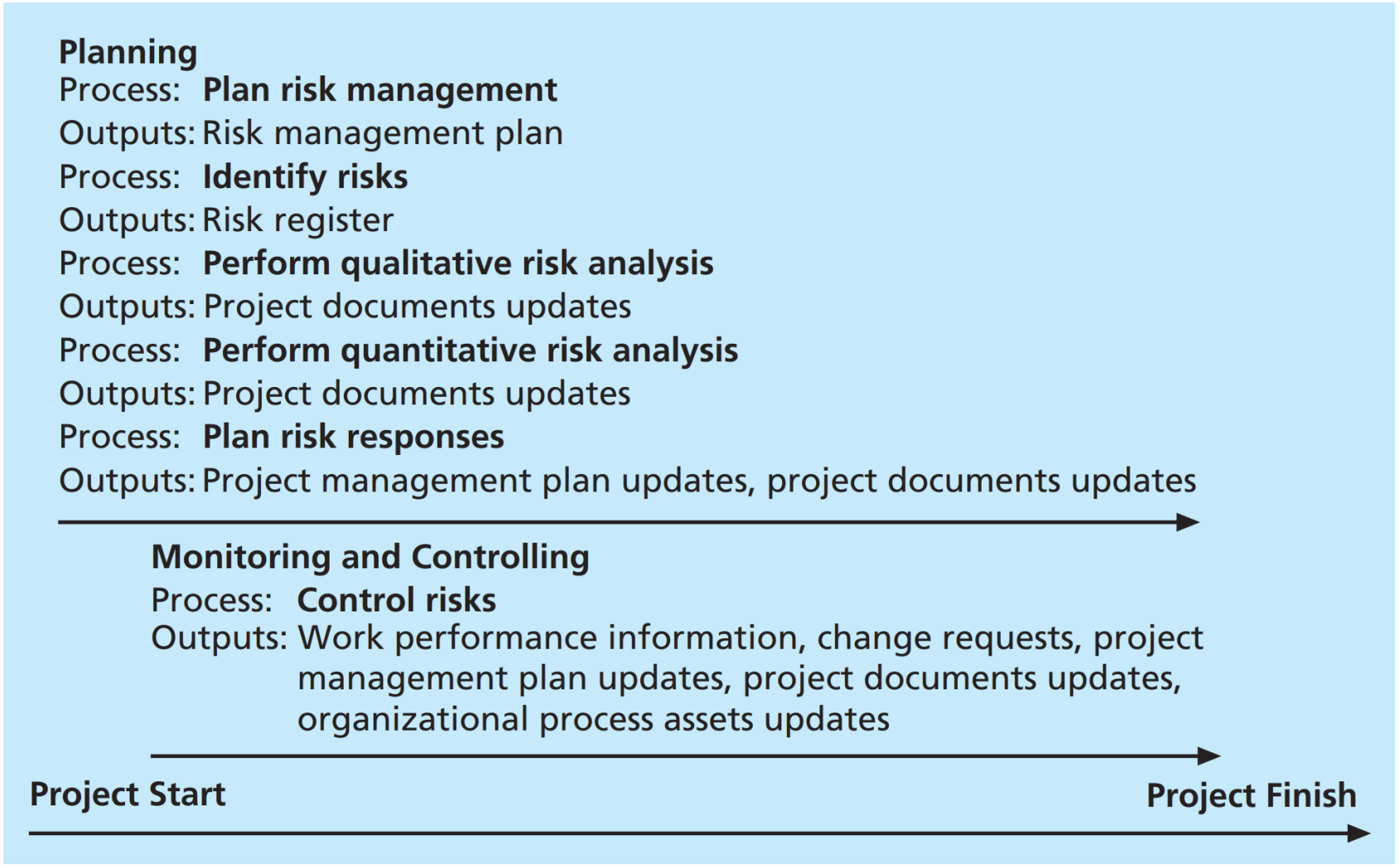
11.3.Performing qualitative risk analysis: prioritizing risks based on their probability and impact of occurrence

The Process of Project Risk Management

11.4.Performing quantitative risk analysis: numerically estimating the effects of risks on project objectives

11.5.Planning risk responses: taking steps to enhance opportunities and reduce threats to meeting project objectives

11.6.Monitoring risk: monitoring identified and residual risks, identifying new risks, carrying out risk response plans, and evaluating the effectiveness of risk strategies throughout the life of the project


Planning
Process: Plan risk management
Outputs: Risk management plan
Process: Identify risks
Outputs: Risk register
Process: Perform qualitative risk analysis
Outputs: Project documents updates
Process: Perform quantitative risk analysis
Outputs: Project documents updates
Process: Plan risk responses
Outputs: Project management plan updates, project documents updates
Monitoring and Controlling
Process: Control risks
Outputs: Work performance information, change requests, project management plan updates, project documents updates, organizational process assets updates
Project Start
Project Finish

11.1.Planning Risk Management

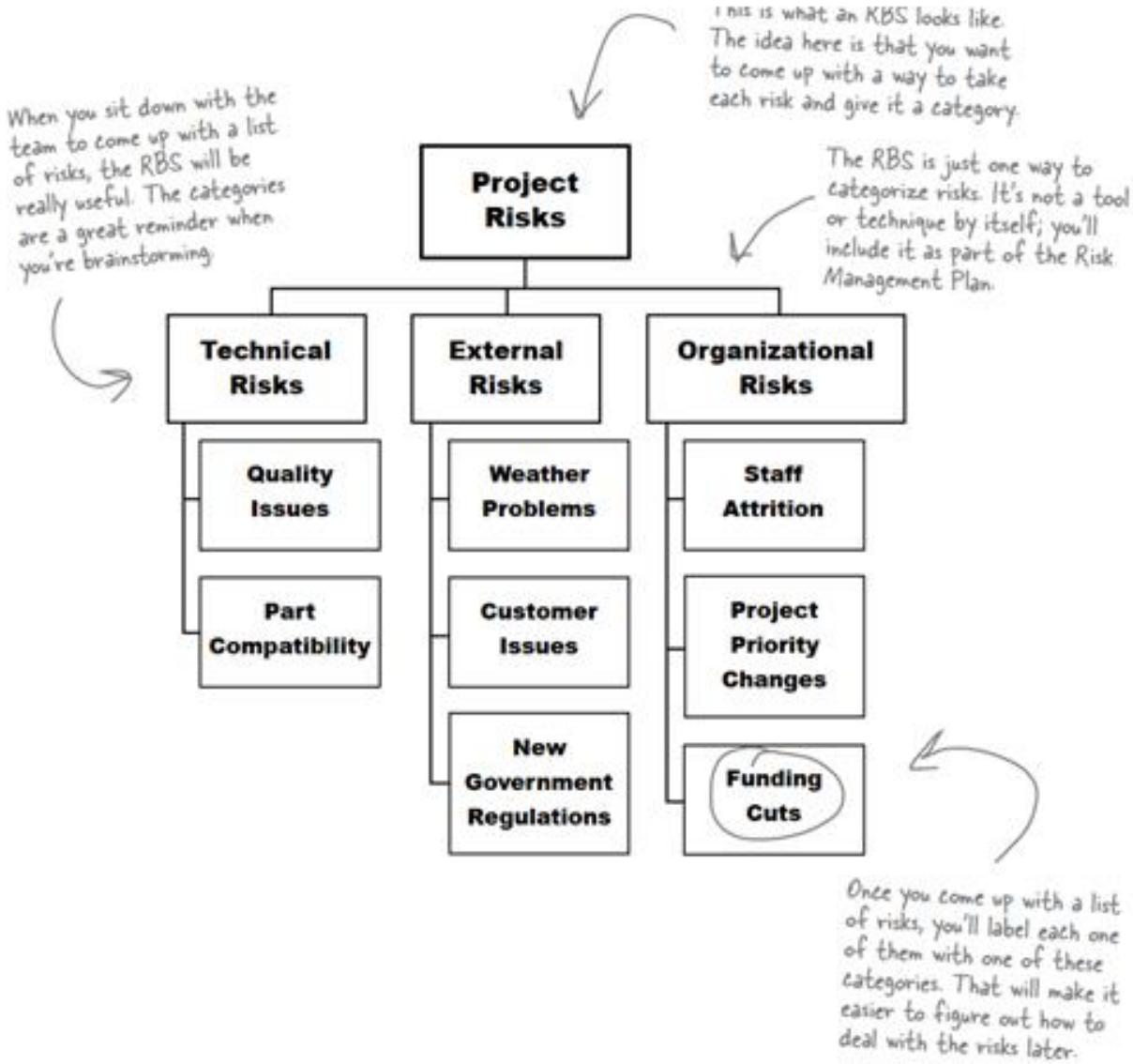
- Main output of this process is a risk management plan
  - Documents the procedures for managing risk throughout a project
- The project team should review project documents as well as corporate risk management policies, risk categories, lessons-learned reports from past projects, and templates for creating a risk management plan
  - It is also important to review the risk tolerances of various stakeholders

Topic	Questions to Answer
Methodology	How will risk management be performed on this project? What tools and data sources are available and applicable?
Roles and responsibilities	Which people are responsible for implementing specific tasks and providing deliverables related to risk management?
Budget and schedule	What are the estimated costs and schedules for performing risk-related activities?
Risk categories	What are the main categories of risks that should be addressed on this project? Is there a risk breakdown structure for the project? (See the information on risk breakdown structures later in this chapter.)

Risk probability and impact	How will the probabilities and impacts of risk items be assessed? What scoring and interpretation methods will be used for the qualitative and quantitative analysis of risks? How will the probability and impact matrix be developed?
Revised stakeholders' tolerances	Have stakeholders' tolerances for risk changed? How will those changes affect the project?
Tracking	How will the team track risk management activities? How will lessons learned be documented and shared? How will risk management processes be audited?
Risk documentation	What reporting formats and processes will be used for risk management activities?

Common Sources of Risk on IT Projects

- Other broad categories of risk help identify potential risks
  - Market risk
  - Financial risk
  - Technology risk
  - People risk
  - Structure/process risk
- A risk breakdown structure is a hierarchy of potential risk categories for a project


This is what an RBS looks like. The idea here is that you want to come up with a way to take each risk and give it a category.
When you sit down with the team to come up with a list of risks, the RBS will be really useful. The categories are a great reminder when you're brainstorming.
The RBS is just one way to categorize risks. It's not a tool or technique by itself; you'll include it as part of the Risk Management Plan.
Project Risks
Technical Risks
External Risks
Organizational Risks
Quality Issues
Part Compatibility
Weather Problems
Customer Issues
New Government Regulations
Staff Attrition
Project Priority Changes
Funding Cuts
Once you come up with a list of risks, you'll label each one of them with one of these categories. That will make it easier to figure out how to deal with the risks later.

Common Sources of Risk on IT Projects

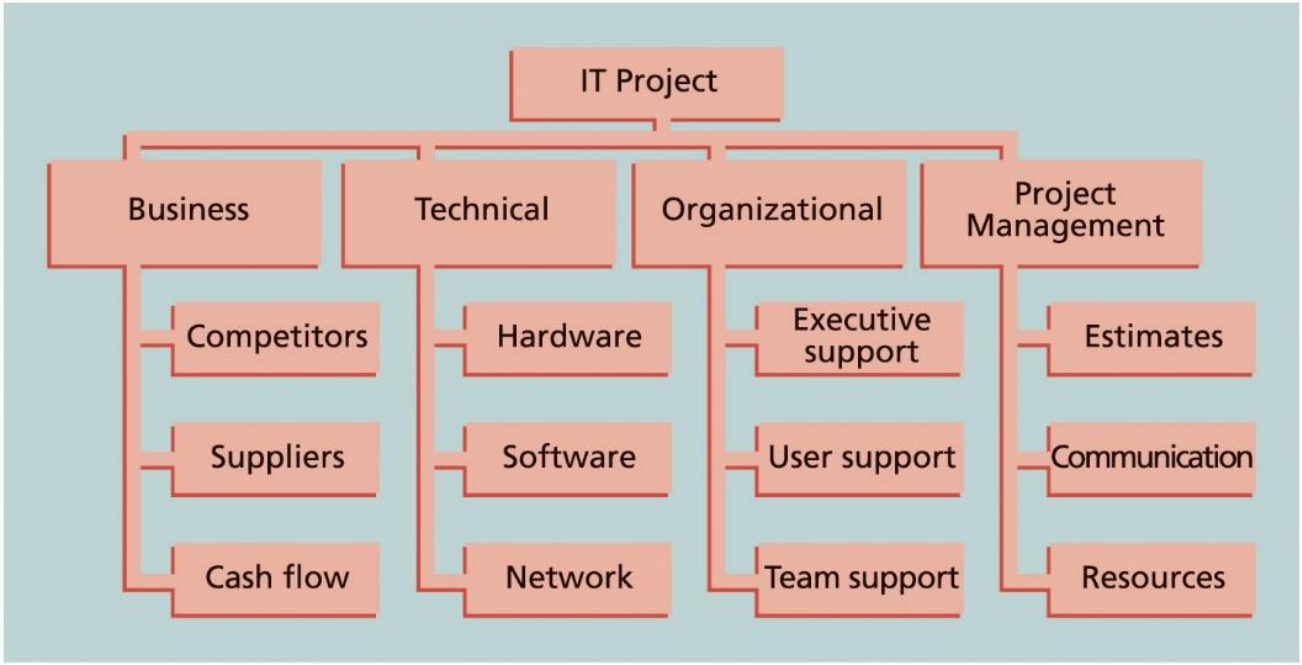


FIGURE 11-4 Sample risk breakdown structure

11.2.Identifying Risks

- Understanding what potential events might hurt or enhance a particular project
- Another consideration is the likelihood of advanced discovery
- Suggestions for identifying risks: tools and techniques
  - Brainstorming
  - The Delphi Technique
  - Interviewing
  - SWOT analysis

- Brainstorming
  - Group attempts to generate ideas or find a solution for a specific problem by amassing ideas spontaneously and without judgment
  - An experienced facilitator should run the brainstorming session
  - Be careful not to overuse or misuse brainstorming
    - Psychology literature shows that individuals produce a greater number of ideas working alone than they do through brainstorming in small, face-to-face groups
    - Group effects often inhibit idea generation

- Delphi Technique
  - Used to derive a consensus among a panel of experts who make predictions about future developments
  - Provides independent and anonymous input regarding future events
  - Uses repeated rounds of questioning and written responses and avoids the biasing effects possible in oral methods

- Interviewing
  - Fact-finding technique for collecting information in face-to-face, phone, e-mail, or virtual discussions
  - Interviewing people with similar project experience is an important tool for identifying potential risks
- SWOT analysis
  - Strengths, weaknesses, opportunities, and threats
  - Helps identify the broad negative and positive risks that apply to a project

Index	WBS Element	Category	Description	Effects	Expected Effect Date	Probability	Impact	Risk Rank	Owner	Response Plan
0001	1.1.3	Vendors	Web component of the application depends on the design created by the external design team.	Delays in the design delivery will directly impact the project schedule	02.01.2021	6	10	60	D. Nizhebetski	"Procurement manager should include the following terms in the contract: - Weekly Reports. - Weekly on-site meetings. - Delivery via collaboration system (e.g. Invision)"
0002	1.6.5	HR	Resources for mobile development are limited and on high demand.	- Unavailability of developers may cause delays. - Quality may suffer due to multitasking.	10.02.2021	8	8	64	D. Nizhebetski	- Develop cross-project HR plan together with Ann Smith and Ron Nagle - Secure required resources.
0003	1.2.3.6	Quality	New functionality may require changes to the infrastructure.	- Poor performance. - Delivery will not be accepted.	01.03.2021	3	10	30	R. Anderson	- Reserve 2 days of work in the beginning of January for Infrastructure Team. - Perform regular performance testing. - Reserve time for performance optimisation (about 2 weeks).
0004	1,3	Scope	Implementation depends on Deliverable 1.1.3.	- More efforts will be required to implement the UI.	12.03.2021	3	7	21	J. Robertson	- Task PT-332 was create to encorporate Risk Reserves - BSA should control the vendor on regular basis - Final designs should not require any unsupported technologies.
0005	1.3.2.1	HR	Only one engineer in the company has required skills to deliver the work package. He is currently in conflict with the functional manager. There is a good chance that he will leave the company.	- Delivery will be fully blocked.	01.02.2021	6	10	60	A. Lee E. Remington	- Request HR department to open new vacancy. - Request HR to find an outsourcing/freelancing options. - Start knowledge transfer asap.

The Risk Register (4 of 4)

- Risk report contents
  - Sources of overall project risk
  - Important drivers of overall project risk exposure
  - Summary information on risk events

11.3.Performing Qualitative Risk Analysis

- Assess the likelihood and impact of identified risks to determine their magnitude and priority
- Risk quantification tools and techniques
  - Probability/impact matrixes
  - Expert judgment

Using Probability/Impact Matrixes to Calculate Risk Factors

- Lists relative probability of a risk occurring on one side of a matrix or axis on a chart and the relative impact of the risk occurring
  - List the risks and then label each one as high, medium, or low in terms of its probability of occurrence and its impact if it did occur
- Calculates risk factors
  - Numbers that represent the overall risk of specific events based on their probability of occurring and the consequences to the project if they do occur

Using Probability/Impact Matrixes to Calculate Risk Factors

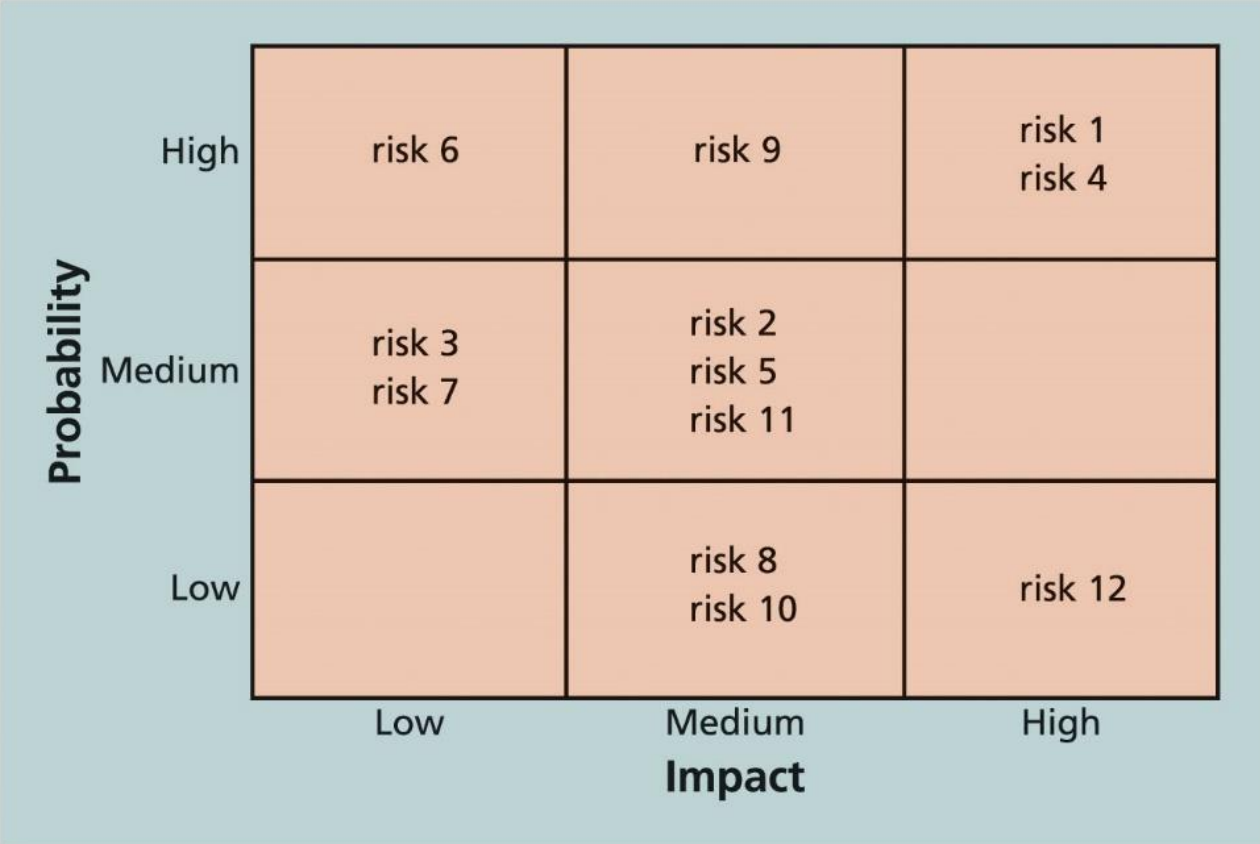


FIGURE 11-5 Sample probability/impact matrix

11.4.Performing Quantitative Risk Analysis

- Often follows qualitative risk analysis, but both can be done together
  - Large, complex projects involving leading edge technologies often require extensive quantitative risk analysis
- Main techniques
  - Decision tree analysis
  - Simulation
  - Sensitivity analysis

Decision Trees and Expected Monetary Value (EMV)

- A decision tree is a diagramming analysis technique used to help select the best course of action in situations in which future outcomes are uncertain
  - Estimated monetary value (EMV) is the product of a risk event probability and the risk event's monetary value
    - You can draw a decision tree to help find the EMV

Decision Trees and Expected Monetary Value (EMV)

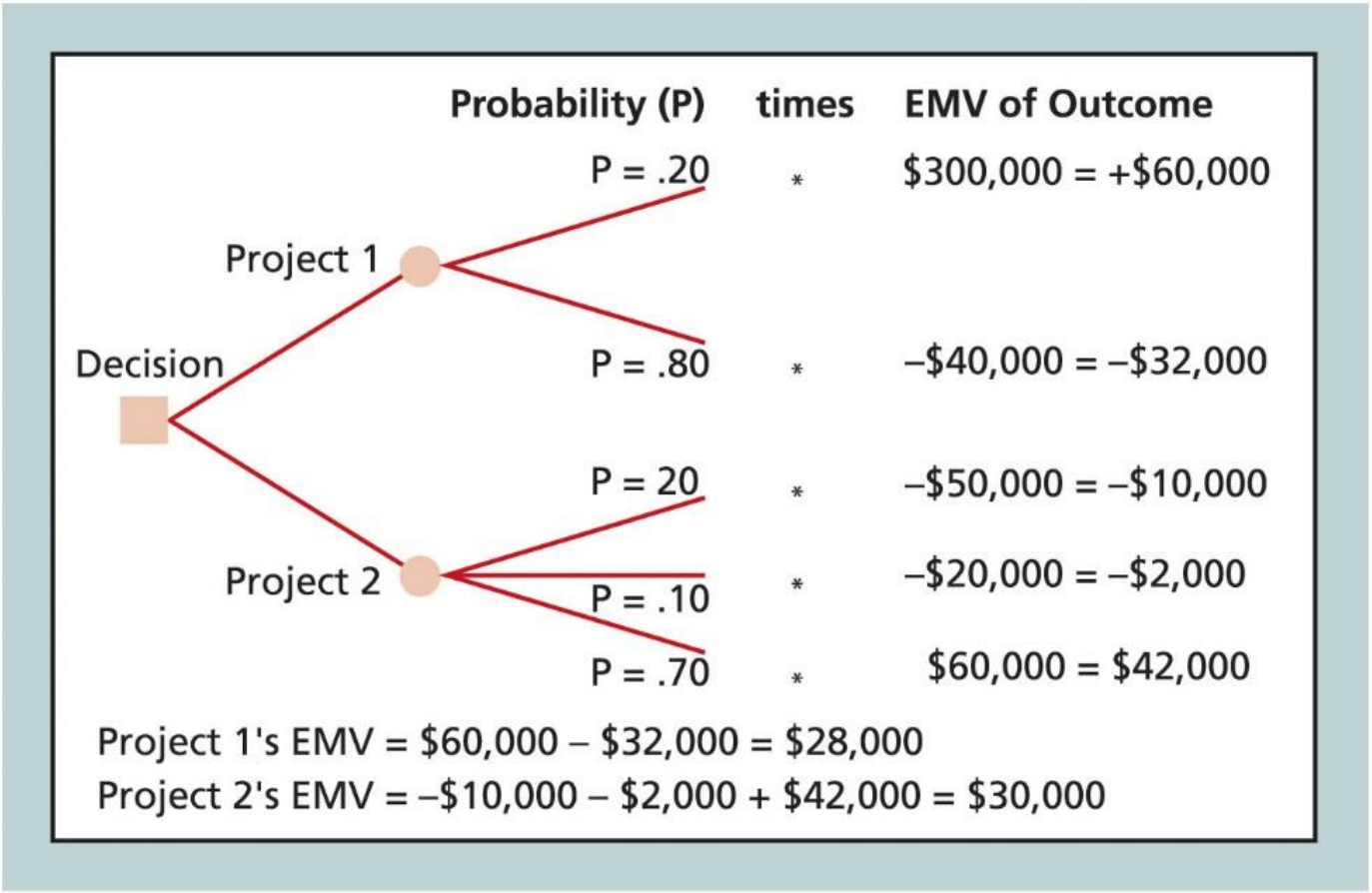


FIGURE 11-7 Expected monetary value (EMV) example

Simulation

- Uses a representation or model of a system to analyze the expected behavior or performance of the system
  - Monte Carlo analysis simulates a model's outcome many times to provide a statistical distribution of the calculated results
    - Predict the probability of finishing by a certain date or the probability that the cost will be equal to or less than a certain value
    - You can use several different types of distribution functions when performing a Monte Carlo analysis

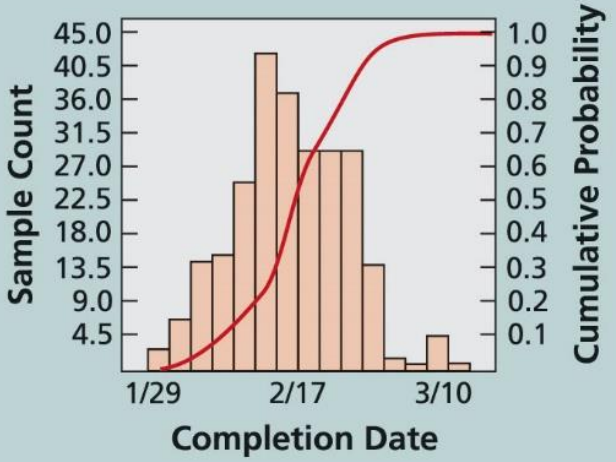
Simulation

- Steps of a Monte Carlo analysis
  - Collect the most likely, optimistic, and pessimistic estimates for the variables in the model
  - Determine the probability distribution of each variable
  - Select a random value based on the probability distribution for each variable
  - Run a deterministic analysis or one pass through the model
  - Repeat steps three and four many times to obtain the probability distribution of the model's results

Simulation

Date: 1/14 11:13:56 AM
Number of Samples: 250
Unique ID: 1
Name: Widget

Completion Std Deviation: 5.2 days
95% Confidence Interval: 0.6 day
Each bar represents 2 days.



Completion Probability Table

Prob	Date	Prob	Date
0.05	2/4	0.55	2/17
0.10	2/8	0.60	2/18
0.15	2/9	0.65	2/19
0.20	2/10	0.70	2/22
0.25	2/11	0.75	2/22
0.30	2/12	0.80	2/23
0.35	2/15	0.85	2/24
0.40	2/15	0.90	2/25
0.45	2/16	0.95	2/26
0.50	2/17	1.00	3/10

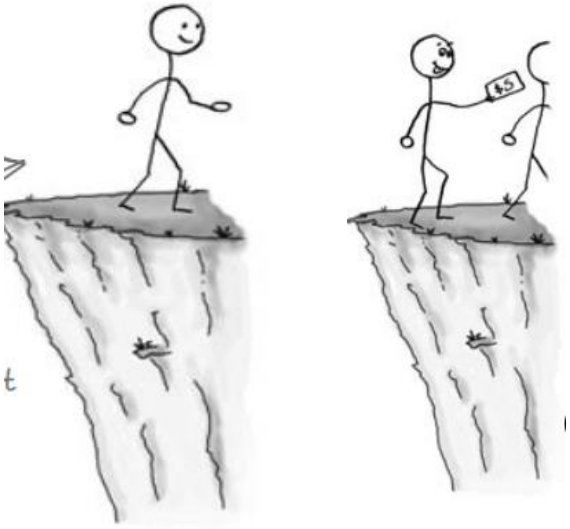
FIGURE 11-8 Sample Monte Carlo–based simulation results for project schedule

Sensitivity Analysis

- Used to show the effects of changing one or more variables on an outcome
  - For example, many people use it to determine what the monthly payments for a loan will be given different interest rates or periods of the loan
- Spreadsheet software, such as Microsoft Excel, is a common tool for performing sensitivity analysis

11.5.Planning Risk Responses

- Risk avoidance
- Risk transference
- Risk acceptance
- Risk mitigation



11.6.Monitoring Risks

- Involves ensuring the appropriate risk responses are performed, tracking identified risks, identifying and analyzing new risk, and evaluating effectiveness of risk management throughout the entire project
  - Project risk management does not stop with the initial risk analysis

Monitoring Risks

- Carrying out individual risk management plans involves monitoring risks based on defined milestones and making decisions regarding risks and their response strategies
  - Project teams sometimes use workarounds—unplanned responses to risk events—when they do not have contingency plans in place

Chapter Summary

- Risk is an uncertainty that can have a negative or positive effect on meeting project objectives
- Risk management is an investment
- Implementing risk responses involves putting the appropriate risk response plans into action
- Monitoring risks involves monitoring implementation of risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating effectiveness of risk management throughout the entire project