Chapter 11: Project Risk Management

Information Technology Project Management, Ninth Edition

Note: See the text itself for full citations

Learning Objectives

- Explain the concept of risk as it relates to project management, and list the advantages of managing project risks according to best practices
- Discuss the elements of planning risk management and the contents of a risk management plan
- List common sources of risks on information technology (IT) projects
- Describe the process of identifying risks and create a risk register and risk report
- Discuss qualitative risk analysis and explain how to calculate risk factors, create probability/impact matrixes, and apply the Top Ten Risk Item Tracking technique to rank risks
- Explain quantitative risk analysis and how to apply decision trees, simulation, and sensitivity analysis to quantify risks
- Provide examples of using different risk response planning strategies to address both negative and positive risks
- Discuss how to monitor risks
- Describe how software can assist in project risk management
- Discuss considerations for agile/adaptive environments

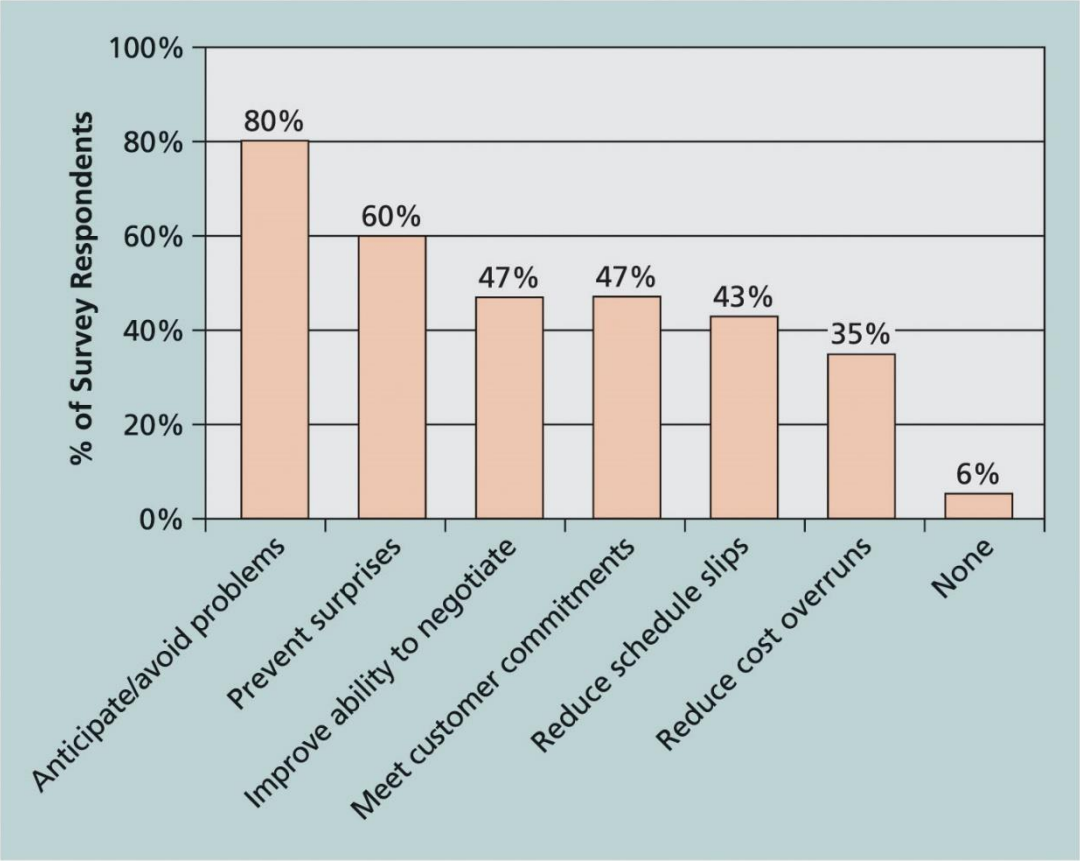
The Importance of Project Risk Management (1 of 7)

- 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 project**s, **determining project scop**e, and **developing realistic estimates**

The Importance of Project Risk Management (2 of 7)

- Research shows a **need to improve project risk management**
  - Study by Ibbs and Kwak shows **risk management has the lowest maturity rating of all (10) knowledge areas**
  - A similar survey was completed with software development companies in Mauritius, South Africa, and **risk management also had the lowest maturity**
  - KLCI study shows the benefits of following good software risk management practices

The Importance of Project Risk Management (3 of 7)



Source: Kulik and Weber, KLCI Research Group

FIGURE 11-1 Benefits from software risk management practices

The Importance of Project Risk Management (4 of 7)

- A dictionary definition of risk is "**the possibility of loss or injury**"
  - General definition of a project risk: **an uncertainty that can have a negative or positive effect on meeting project objectives**
  - **Managing negative risks** involves a number of possible actions that project managers can take to **avoid, lessen, change, or accept** the potential effects of risks on their projects
  - **Positive risk management** is like **investing in opportunities**
- The goal of project risk management is to **minimize potential negative risks while maximizing potential positive risks**

The Importance of Project Risk Management (5 of 7)

- **Risk utility** is the **amount of satisfaction or pleasure received from a potential payoff**
  - **Utility rises at a decreasing rate** for people who are **risk-averse**
  - Those who are **risk-seeking have a higher tolerance for risk** and their satisfaction increases when more payoff is at stake
  - **Risk-neutral approach achieves a balance between risk and**

The Importance of Project Risk Management (6 of 7)

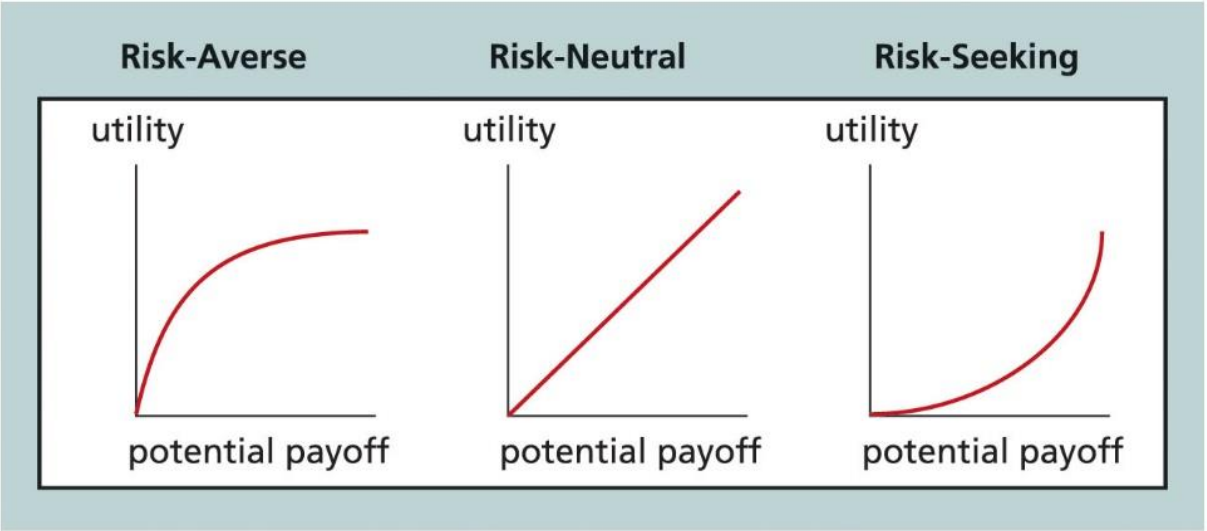


FIGURE 11-2 Risk utility function and risk preference

The Importance of Project Risk Management (7 of 7)

- Project risk management processes
  - **Planning risk management**: deciding how to approach and plan the risk management activities for the project
  - **Identifying risks**: determining which risks are likely to affect a project and documenting the characteristics of each
  - **Performing qualitative risk analysis**: prioritizing risks based on their probability and impact of occurrence
  - **Performing quantitative risk analysis**: numerically estimating the effects of risks on project objectives
  - **Planning risk responses**: taking steps to enhance opportunities and reduce threats to meeting project objectives
  - **Implementing risk responses**: implementing the risk response plans
  - **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 Risk Management (1 of 3)

- 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

Planning Risk Management (2 of 3)

- Additional plans
  - **Contingency plans: predefined actions that the project team will take if an identified risk event occurs**
  - **Fallback plans**: developed for risks that have a high impact on meeting project objectives, and are **put into effect if attempts to reduce the risk are not effective**
  - **Contingency reserves or allowances**: funds included in the cost baseline that can be used to **mitigate cost or schedule overruns if known risks occur**
  - **Management reserves**: funds held for **unknown risks** that are used for management control purposes

Planning Risk Management (3 of 3)

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?

Table 11-2 Topics addressed in a risk management plan

Common Sources of Risk on IT Projects (1 of 3)

- Several studies show that IT projects share some common sources of risk
  - The Standish Group developed an IT success potential scoring sheet based on potential risks
- 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

Common Sources of Risk on IT Projects (2 of 3)

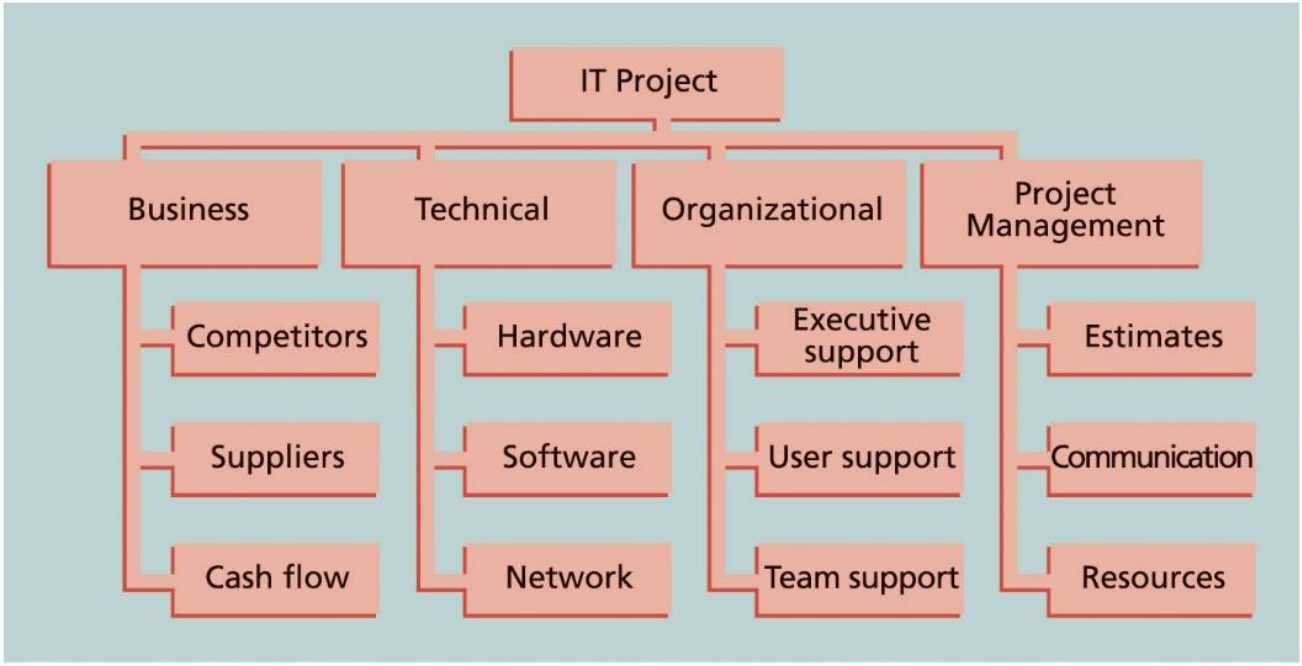


FIGURE 11-4 Sample risk breakdown structure

Common Sources of Risk on IT Projects (3 of 3)

Knowledge Area	Risk Conditions
Integration	Inadequate planning; poor resource allocation; poor integration management; lack of post-project review
Scope	Poor definition of scope or work packages; incomplete definition
Time	Errors in estimating time or resource availability; errors in determining the critical path; poor allocation and management of float; early release of competitive products
Cost	Estimating errors; inadequate productivity, cost, change, or contingency
Quality	Poor attitude toward quality; substandard design, materials, and workmanship; inadequate quality assurance program
Human resource	Poor conflict management; poor project organization and definition of responsibilities; absence of leadership
Communications	Carelessness in planning or communicating
Risk	Ignoring risk; unclear analysis of risk; poor insurance management
Procurement	Unenforceable conditions or contract clauses; adversarial relations
Stakeholders	Lack of consultation with key stakeholder; poor sponsor engagement

Table 11-3 Potential negative risk conditions associated with each knowledge area. *Source: R.M. Wideman

Identifying Risks (1 of 2)

- **Understanding what potential events might hurt or enhance a particular project**
  - You cannot manage risks if you do not identify them first
- Another consideration is the **likelihood** of advanced discovery
  - Often viewed at a program level rather than a project level
- Suggestions for identifying risks: tools and techniques
  - Brainstorming
  - The Delphi Technique
  - Interviewing
  - SWOT analysis

The Risk Register (1 of 3)

- Risk register contents
  - **Identification number** for each risk event
  - **Rank** for each risk event
  - **Name** of each risk event
  - **Description** of each risk event
  - **Category** under which each risk event falls
  - **Root cause** of each risk
  - **Triggers** for each risk; indicators or symptoms of actual risk events
  - **Potential responses** to each risk
  - **Risk owner** or person who will own or take responsibility for each risk
  - **Probability** and **impact** of each risk occurring
  - **Status** of each risk

The Risk Register (2 of 3)

No.	Rank	Risk	Description	Category	Root Cause	Triggers	Potential Responses	Risk Owner	Probability	Impact	Status
R44	1										
R21	2										
R7	3										

Table 11-4 Sample risk register

The Risk Register (3 of 3)

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

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
  - The Top Ten Risk Item Tracking
  - Expert judgment

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

Planning Risk Responses (1 of 3)

- **After identifying and quantifying risk**s, the organization **must decide how to respond to them**
  - Basic **response strategies for negative risks**
    - Risk **avoidance**
    - Risk **acceptance**
    - Risk **transference**
    - Risk **mitigation**
    - Risk **escalation**
  - Basic **response strategies for positive risks**
    - Risk **exploitation**
    - Risk **sharing**
    - Risk **enhancement**
    - Risk **acceptance**
    - Risk **escalation**

Implementing Risk Responses

- **Main executing process** performed as part of project risk management is implementing risk responses
  - Key outputs
    - **Change requests**
    - **Project documents updates**

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
- 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

Considerations for Agile/Adaptive Environments

- All types of projects should share knowledge related to risks as quickly as possible and keep documents up to date
  - **Risk is considered during each iteration for agile/adaptive projects**, which does elevate its importance
  - **Changing priorities can be addressed more easily by changing the product backlo**g for each iteration

Chapter Summary

- Risk is an uncertainty that can have a negative or positive effect on meeting project objectives
  - Many organizations do a poor job of project risk management, if they do any at all
  - Successful organizations realize the value of good project risk management
- Risk management is an investment
  - Costs are associated with identifying risks, analyzing those risks, and establishing plans to address them
- 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