Chapter 7:
Project Risk Management

Note: See the text itself for full citations.

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

Negative Risk

- A dictionary definition of risk is "the possibility of loss or injury"
- Negative risk involves understanding potential problems that might occur in the project and how they might impede project success
- Negative risk management is like a form of insurance; it is an investment

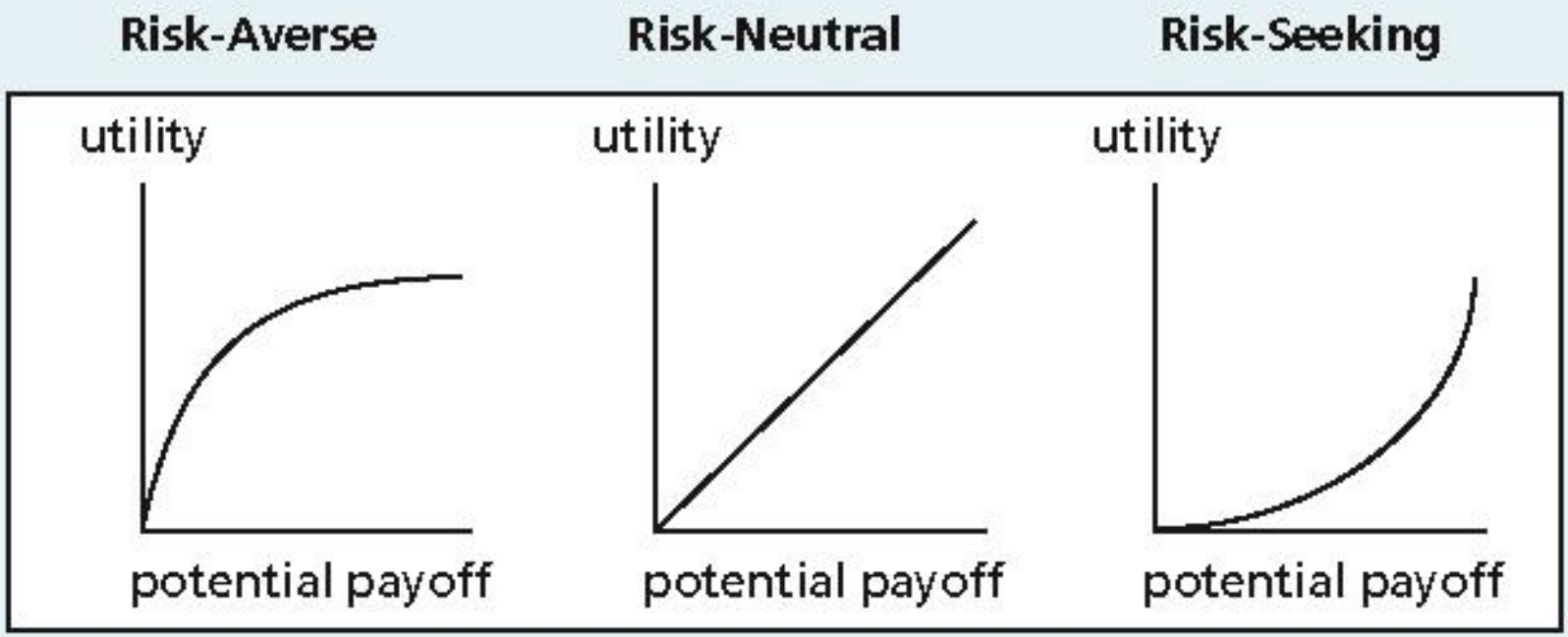
Risk Can Be Positive

- Positive risks are risks that result in good things happening; sometimes called opportunities
- A general definition of project risk is an uncertainty that can have a negative or positive effect on meeting project objectives
- The **goal of project risk management** is to **minimize** potential **negative risks** while **maximizing** potential **positive risks**

Risk Utility

- **Risk utility** or **risk tolerance** 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
  - The risk-neutral approach achieves a balance between risk and payoff

Figure 11-2. Risk Utility Function and Risk Preference



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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

Project Risk Management Processes (cont'd)

- **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
- **Controlling 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

Contingency and Fallback Plans, Contingency Reserves

- **Contingency plans** are predefined actions that the project team will take if an identified risk event occurs
- **Fallback plans** are 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** are provisions held by the project sponsor or organization to reduce the risk of cost or schedule overruns to an acceptable level; **management reserves** are funds held for unknown risks

Common Sources of Risk in Information Technology Projects

- 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

Cont'd

- Identifying risks is the process of understanding what potential events might hurt or enhance a particular project
- Another consideration is the likelihood of advanced discovery
- Risk identification tools and techniques include:
  - **Brainstorming**
  - **The Delphi Technique**
  - **Interview**
  - **SWOT analysis**

Cont'd

- **Brainstorming** is a technique by which a 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

Cont'd

- **Delphi Technique**

- The **Delphi Technique** is 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, such as brainstorming

Cont'd

- **Interviewing** is a fact-finding technique for collecting information in face-to-face, phone, e-mail, or instant-messaging discussions

- Interviewing people with similar project experience is an important tool for identifying potential risks

Cont'd

- **SWOT analysis** (strengths, weaknesses, opportunities, and threats) can also be used during risk identification

- Helps identify the broad negative and positive risks that apply to a project

Risk Register

- The main output of the risk identification process is a list of identified risks and other information needed to begin creating a risk register
- A **risk register** is:
  - A document that contains the results of various risk management processes and that is often displayed in a table or spreadsheet format
  - A tool for documenting potential risk events and related information
- **Risk events** refer to specific, uncertain events that may occur to the detriment or enhancement of the project

Risk Register Contents (cont'd)

- Triggers for each risk; **triggers** are indicators or symptoms of actual risk events
- Potential responses to each risk
- The **risk owner** or person who will own or take responsibility for each risk
- The probability and impact of each risk occurring.
- The status of each risk

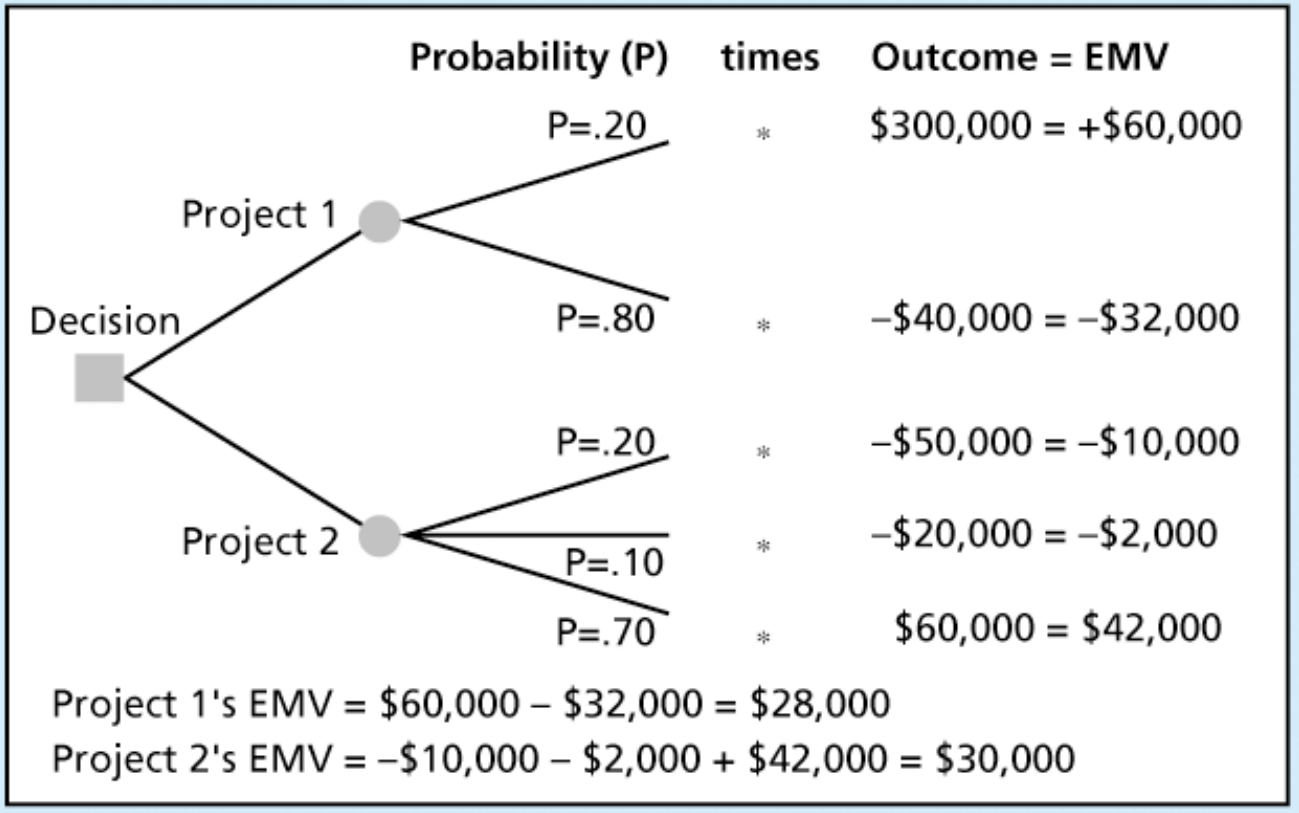
Performing Quantitative Risk Analysis

- 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 include:
  - 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
- **Expected 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

Figure 11-7. Expected Monetary Value (EMV) Example



Simulation

- 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
- To use a Monte Carlo simulation, you must have three estimates (most likely, pessimistic, and optimistic) plus an estimate of the likelihood of the estimate being between the most likely and optimistic values

Planning Risk Responses

- After identifying and quantifying risks, you must decide how to respond to them
- **Four main response strategies for negative risks:**
  - Risk avoidance
  - Risk acceptance
  - Risk transference
  - Risk mitigation

Response Strategies for Positive Risks

- Risk exploitation— Doing whatever you can to make sure a positive risk happens

- Risk sharing— Allocating ownership of a risk to another party
- Risk enhancement— Changing the size of an opportunity by identifying and maximizing key drivers of the positive risk
- Risk acceptance— Accepting the consequences if a risk occurs

End of Software Project Management