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

Interviewing

‣ **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

SWOT Analysis

▸ 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

▸ An identification number for each risk event

▸ A rank for each risk event

▸ The name of each risk event

▸ A description of each risk event

▸ The category under which each risk event falls

▸ The root cause of each risk

Risk Register Contents (continued)

- 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

Table 11-5. Sample Risk Register

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

Performing Qualitative Risk Analysis

- Assess the likelihood and impact of identified risks to determine their magnitude and priority
- Risk quantification tools and techniques include:
  - Probability/impact matrixes
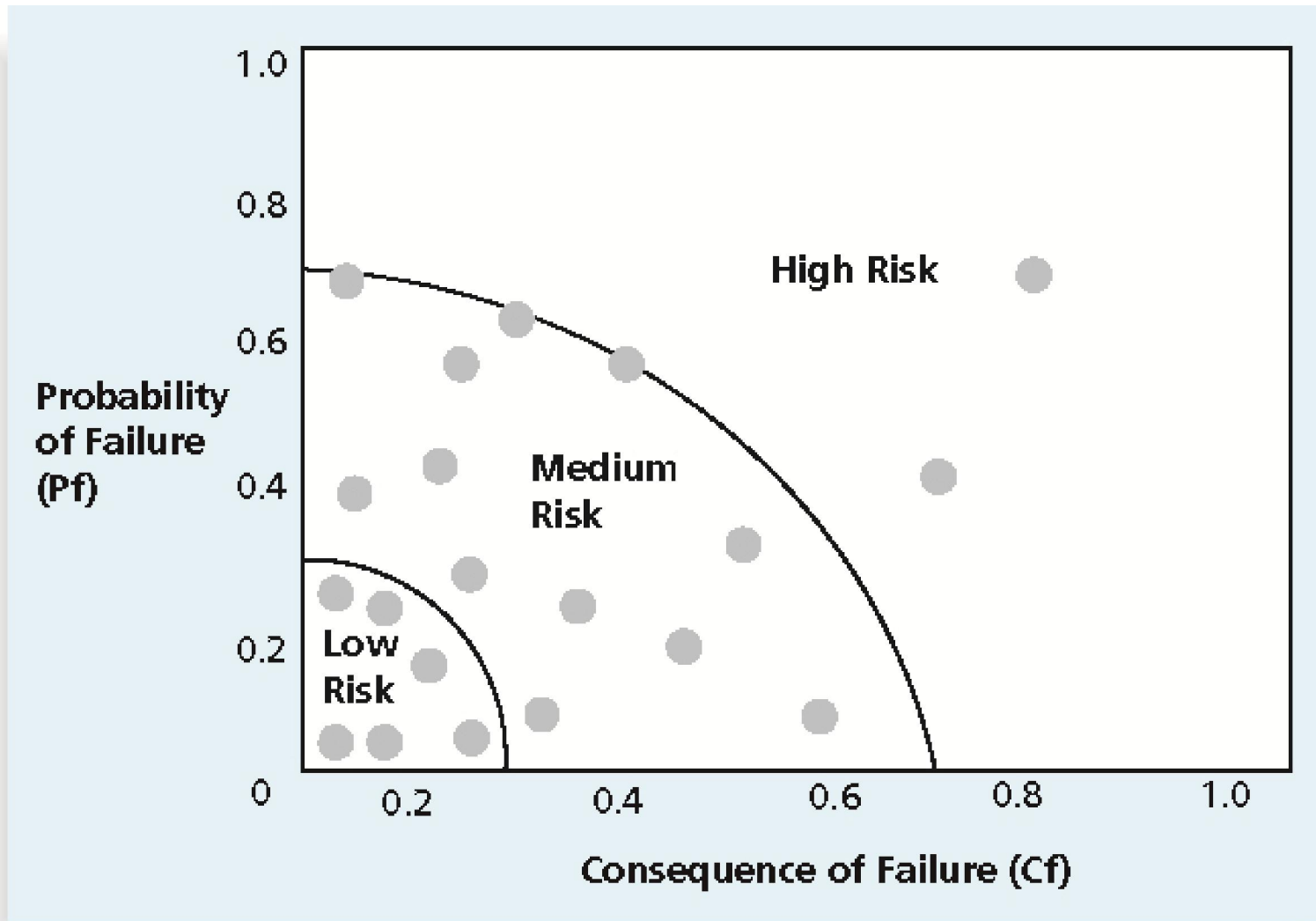 - The Top Ten Risk Item Tracking
  - Expert judgment

Probability/Impact Matrix

▸ A **probability/impact matrix** or **chart** lists the 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 on the other

▸ 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

Figure 11-5. Sample Probability/Impact Matrix

	Low	**Medium**	**High**
High	risk 6	risk 9	risk 1 risk 4
Medium	risk 3 risk 7	risk 2 risk 5 risk 11	
Low		risk 8 risk 10	risk 12

Probability (vertical axis)

Impact (horizontal axis)

Figure 11-6. Chart Showing High-, Medium-, and Low-Risk Technologies

Top Ten Risk Item Tracking

- **Top Ten Risk Item Tracking** is a qualitative risk analysis tool that helps to identify risks and maintain an awareness of risks throughout the life of a project
- Establish a periodic review of the top ten project risk items
- List the current ranking, previous ranking, number of times the risk appears on the list over a period of time, and a summary of progress made in resolving the risk item

Table 11-6. Example of Top Ten Risk Item Tracking

	MONTHLY RANKING			
RISK EVENT	RANK THIS MONTH	RANK LAST MONTH	NUMBER OF MONTHS IN TOP TEN	RISK RESOLUTION PROGRESS
Inadequate planning	1	2	4	Working on revising the entire project management plan
Poor definition	2	3	3	Holding meetings with project customer and sponsor to clarify scope
Absence of leadership	3	1	2	After previous project manager quit, assigned a new one to lead the project
Poor cost estimates	4	4	3	Revising cost estimates
Poor time estimates	5	5	3	Revising schedule estimates

Watch List

▸ A **watch list** is a list of risks that are low priority but are still identified as potential risks

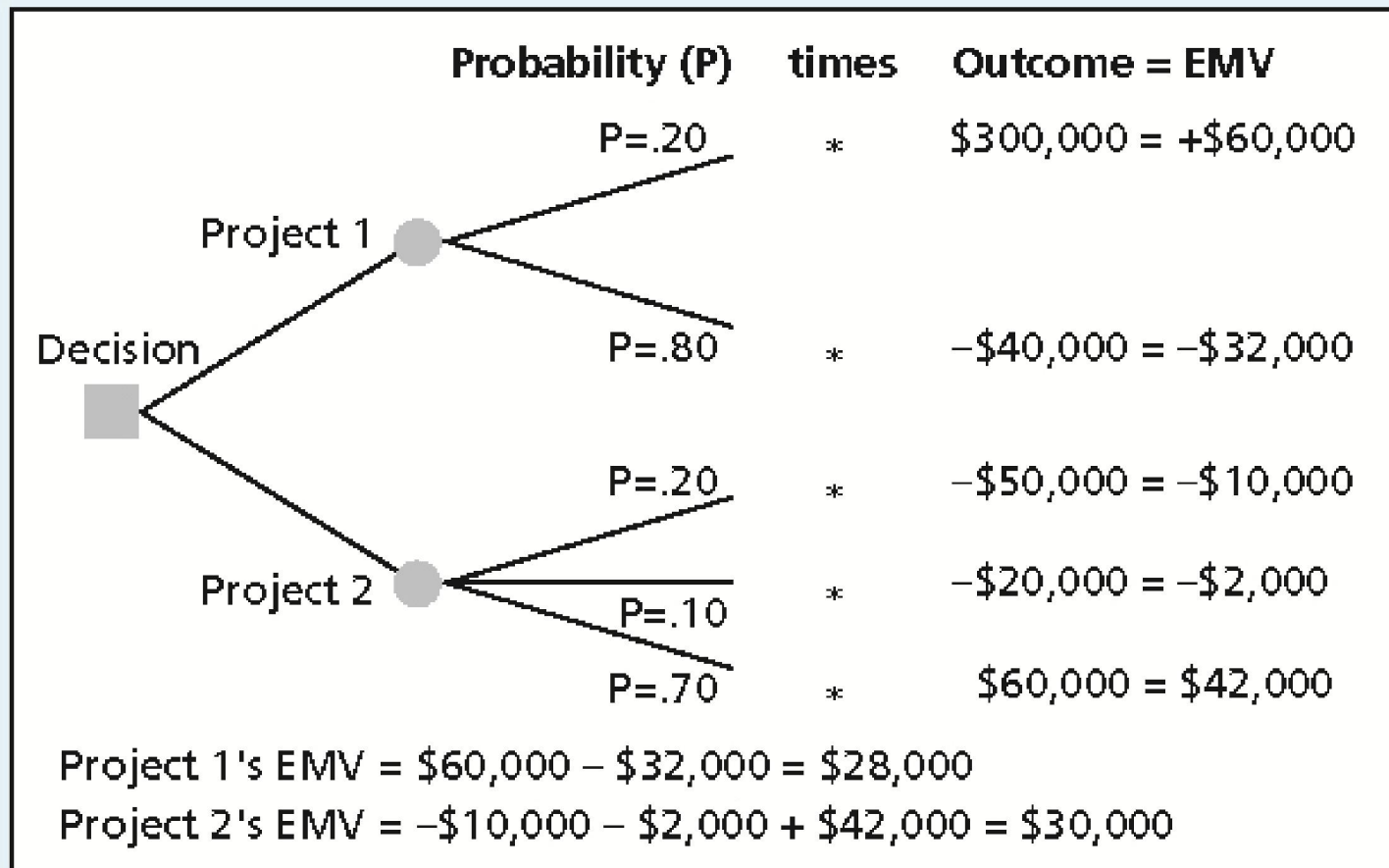▸ Qualitative analysis can also identify risks that should be evaluated on a quantitative basis

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

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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

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

	Probability (P)	times	Outcome = EMV
Project 1	P=.20	*	$300,000 = +$60,000
	P=.80	*	−$40,000 = −$32,000
Project 2	P=.20	*	−$50,000 = −$10,000
	P=.10	*	−$20,000 = −$2,000
	P=.70	*	$60,000 = $42,000

Decision

Project 1's EMV = $60,000 − $32,000 = $28,000
Project 2's EMV = −$10,000 − $2,000 + $42,000 = $30,000

Sensitivity Analysis

▸ **Sensitivity analysis** is a technique 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, or for determining break-even points based on different assumptions

▸ Spreadsheet software, such as Excel, is a common tool for performing sensitivity analysis

Figure 11-9. Sample Sensitivity Analysis for Determining Break-Even Point
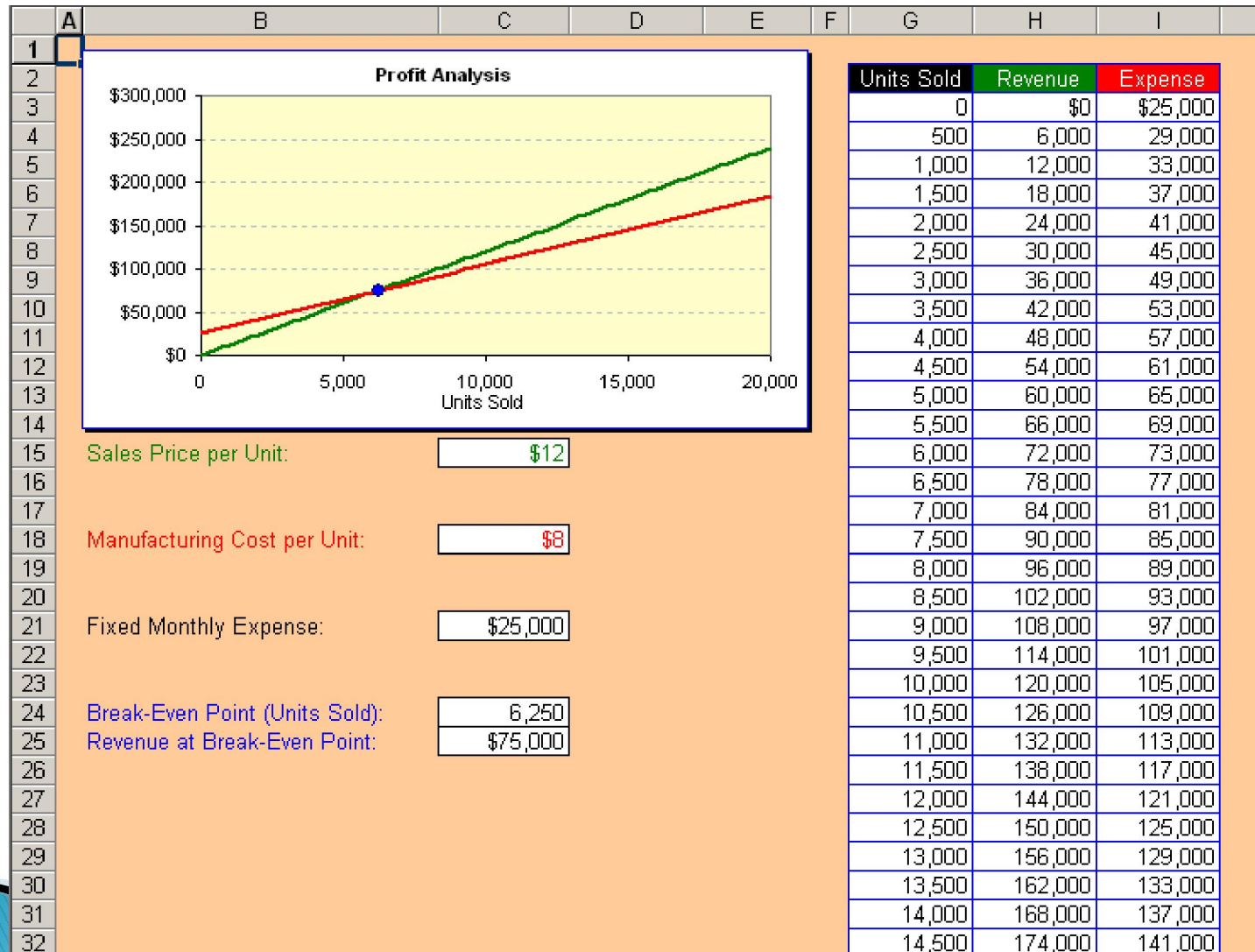
Planning Risk Responses

- 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

Table 11-7. General Risk Mitigation Strategies for Technical, Cost, and Schedule Risks

TECHNICAL RISKS	COST RISKS	SCHEDULE RISKS
Emphasize team support and avoid stand-alone project structure	Increase the frequency of project monitoring	Increase the frequency of project monitoring
Increase project manager authority	Use WBS and CPM	Use WBS and CPM
Improve problem handling and communication	Improve communication, project goals understanding, and team support	Select the most experienced project manager
Increase the frequency of project monitoring	Increase project manager authority	
Use WBS and CPM		

Residual and Secondary Risks

- It's also important to identify residual and secondary risks
- **Residual risks** are risks that remain after all of the response strategies have been implemented
- **Secondary risks** are a direct result of implementing a risk response

Monitoring and Controlling Risks

- Involves executing the risk management process to respond to risk events
- **Workarounds** are unplanned responses to risk events that must be done when there are no contingency plans
- Main outputs of risk monitoring and control are:
  - Risk register updates
  - Organizational process assets updates
  - Change requests
  - Updates to the project management plan and other project documents

Using Software to Assist in Project Risk Management

▸ Risk registers can be created in a simple Word or Excel file or as part of a database

▸ More sophisticated risk management software, such as Monte Carlo simulation tools, help in analyzing project risks

▸ You can purchase add-ons for Excel and Project 2007 to perform simulations

Chapter Summary

- 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
- Main processes include:
  - Plan risk management
  - Identify risks
  - Perform qualitative risk analysis
  - Perform quantitative risk analysis
  - Plan risk responses
  - Monitor and control risks