Developing An Entrepreneurial Mindset

Calculated Risk Taking

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Sample Risk Register / Risk Analysis

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

- Project severity = expectation (1-10) * impact (1-10)
- When should risk analysis be formed?
- Is not a time activity
- Periodic update and reviewed

Calculating severity

Problem	Expectation	Impact	Severity
Staff	6	5	30
Late delivery of hardware	5	8	40
Communication and Networks problem	5	5	25

Project severity = expectation (1-10) * impact (1-10)

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.

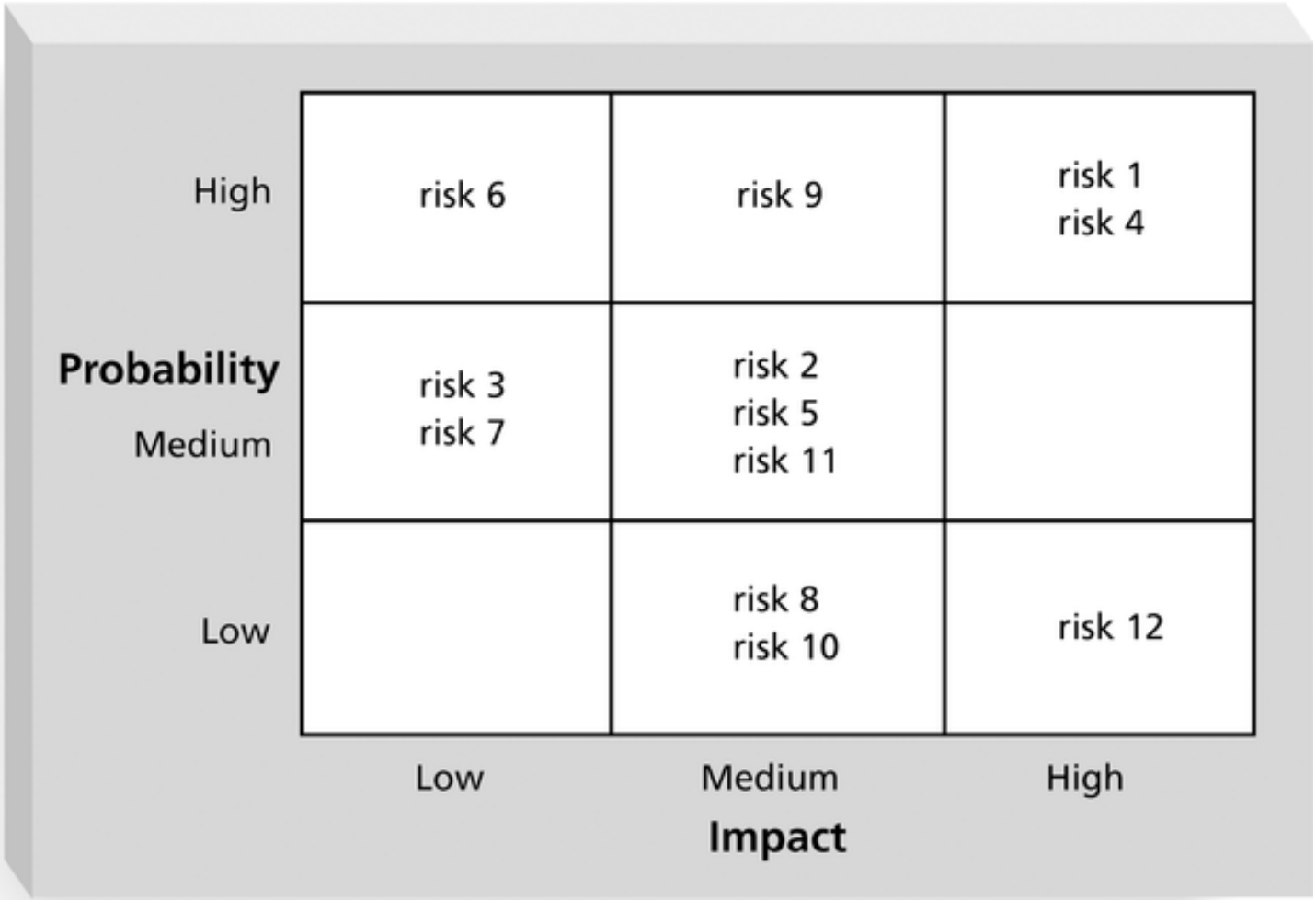
Probability/Impact Matrix

- 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.

Probability/Impact Matrix

- Can also calculate **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.

Sample Probability/Impact Matrix



Sample Probability/Impact Matrix for Qualitative Risk Assessment

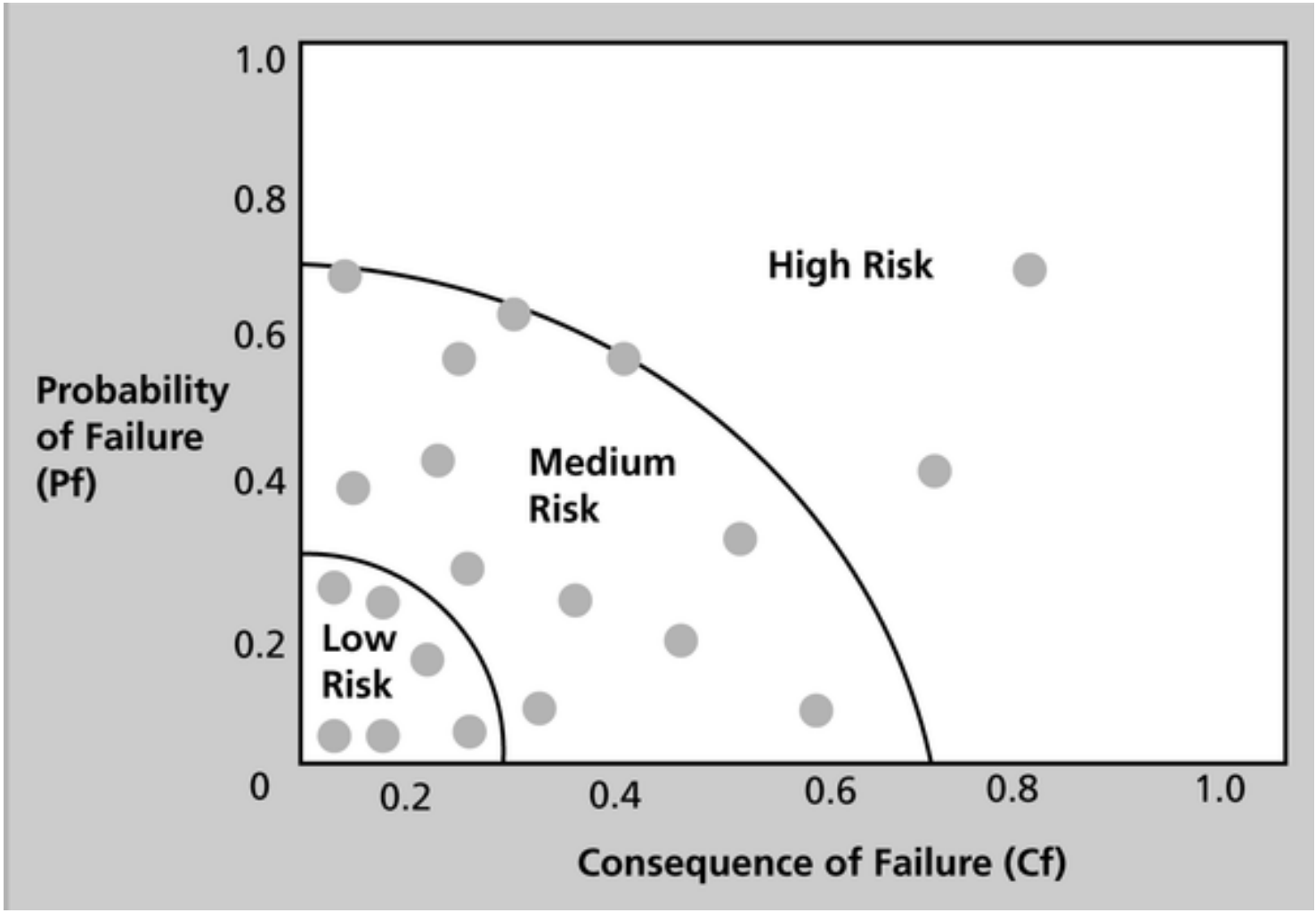
PROBABILITY OF FAILURE (P_F) ATTRIBUTES OF SUGGESTED TECHNOLOGY

Value	Maturity Hardware/Software	Complexity Hardware/Software	Support Base
0.1	Existing	Simple Design	Multiple Programs And Services
0.3	Minor Redesign	Somewhat Complex	Multiple Programs
0.5	Major Change Feasible	Fairly Complex	Several Parallel Programs
0.7	Complex HW Design/ New SW Similar to Existing	Very Complex	At Least One Other Program
0.9	Some Research Completed/ Never Done Before	Extremely Complex	No Additional Programs

CONSEQUENCE OF FAILURE (C_F) ATTRIBUTES OF SUGGESTED TECHNOLOGY

Value	Fallback Solutions	Life Cycle Cost (LCC) Factor	Schedule Factor (Initial Operational Capability = IOC)	Downtime (DT) Factor
0.1	Several Acceptable Alternatives	Highly Confident Will Reduce LCC	90—100% Confident Will Meet IOC Significantly	Highly Confident Will Reduce DT
0.3	A Few Known Alternatives	Fairly Confident Will Reduce LCC	75—90% Confident Will Meet IOC	Fairly Confident Will Reduce DT Significantly
0.5	Single Acceptable Alternative	LCC Will Not Change Much	50—75% Confident Will Meet IOC	Highly Confident Will Reduce DT Somewhat
0.7	Some Possible Alternatives	Fairly Confident Will Increase LCC	25—50% Confident Will Meet IOC	Fairly Confident Will Reduce DT Somewhat
0.9	No Acceptable Alternatives	Highly Confident Will Increase LCC	0—25% Confident Will Meet IOC	DT May Not Be Reduced Much

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.

Top Ten Risk Item Tracking

- 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.

Example of Top Ten Risk Item Tracking

	Monthly Ranking			
Risk Item	**This Month**	**Last Month**	**Number of Months**	**Risk Resolution Progress**
Inadequate planning	1	2	4	Working on revising the entire project plan
Poor definition of scope	2	3	3	Holding meetings with project customer and sponsor to clarify scope
Absence of leadership	3	1	2	Just assigned a new project manager to lead the project after old one quit
Poor cost estimates	4	4	3	Revising cost estimates
Poor time estimates	5	5	3	Revising schedule estimates

Expert Judgment

- Many organizations rely on the intuitive feelings and past experience of experts to help identify potential project risks.

Expert Judgment

- Experts can categorize risks as high, medium, or low with or without more sophisticated techniques.

Expert Judgment

- Can also help create and monitor a **watch list**, a list of risks that are low priority, but are still identified as potential risks.

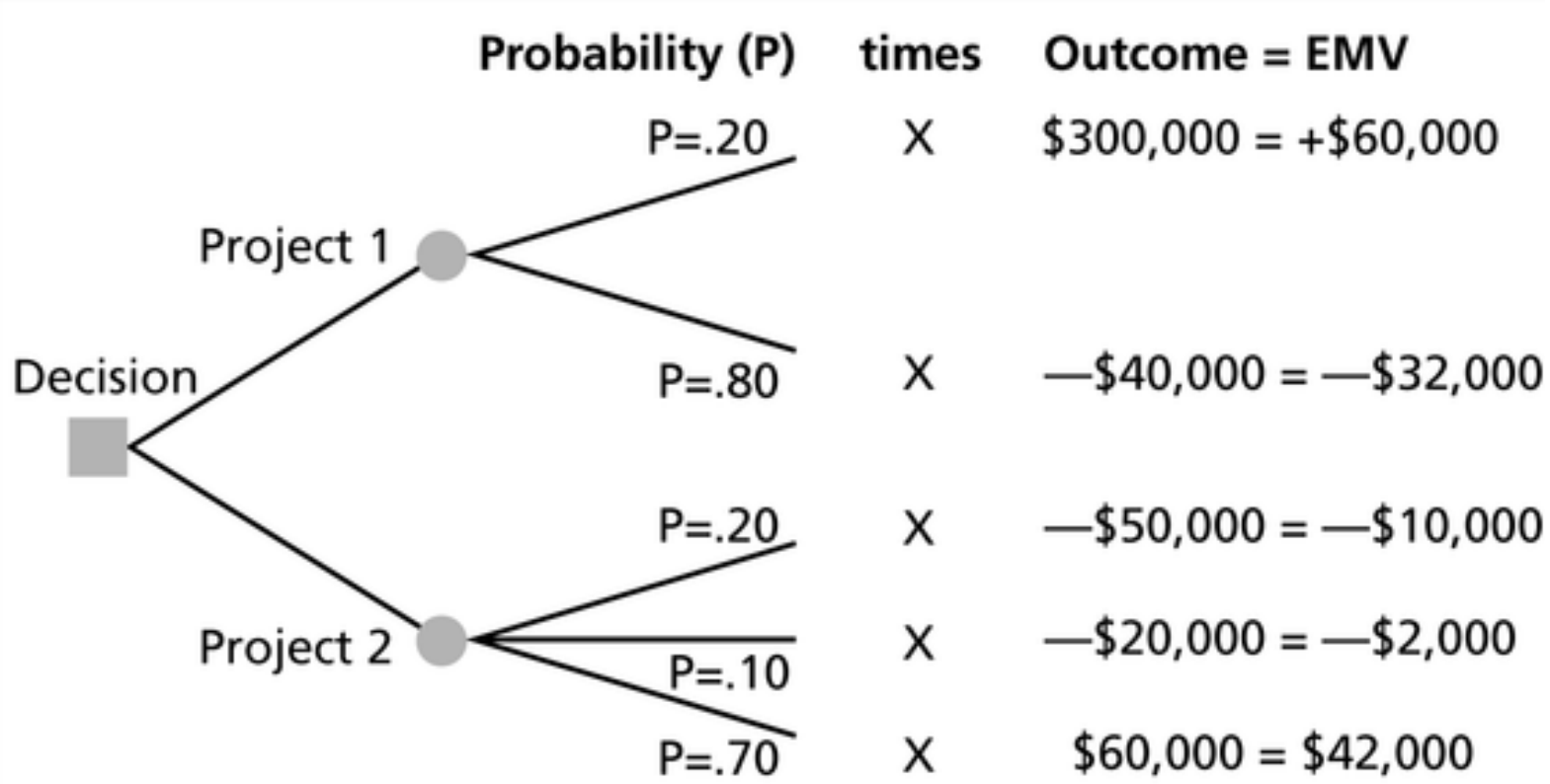
Quantitative Risk Analysis

- 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.
- **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.

Expected Monetary Value (EMV) Example



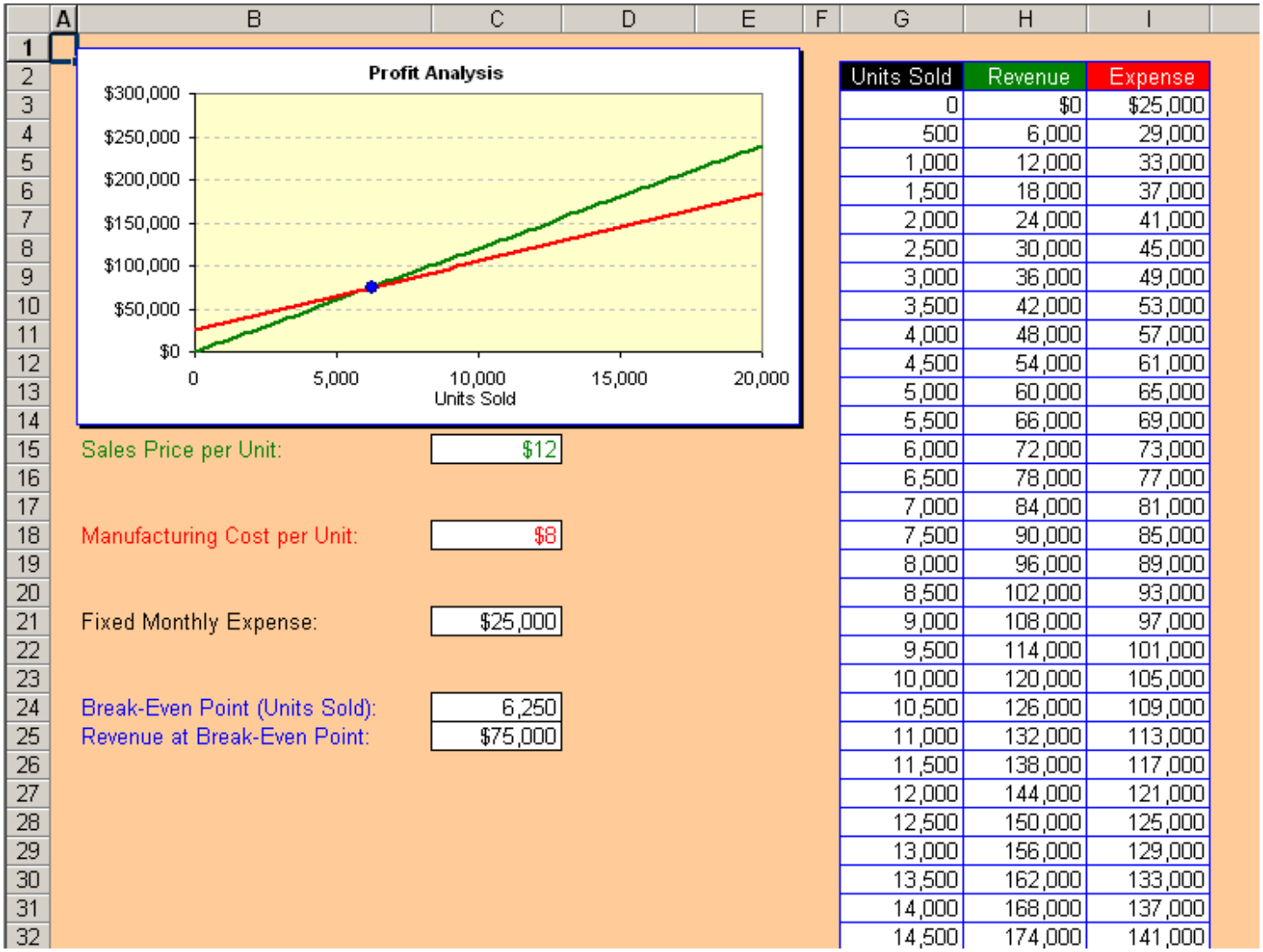
Project 1's EMV = $60,000 —32,000 = $28,000

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.

Sample Sensitivity Analysis for Determining Break-Even Point



Sales Price per Unit:	$12
Manufacturing Cost per Unit:	$8
Fixed Monthly Expense:	$25,000
Break-Even Point (Units Sold):	6,250
Revenue at Break-Even Point:	$75,000

Units Sold	Revenue	Expense
0	$0	$25,000
500	6,000	29,000
1,000	12,000	33,000
1,500	18,000	37,000
2,000	24,000	41,000
2,500	30,000	45,000
3,000	36,000	49,000
3,500	42,000	53,000
4,000	48,000	57,000
4,500	54,000	61,000
5,000	60,000	65,000
5,500	66,000	69,000
6,000	72,000	73,000
6,500	78,000	77,000
7,000	84,000	81,000
7,500	90,000	85,000
8,000	96,000	89,000
8,500	102,000	93,000
9,000	108,000	97,000
9,500	114,000	101,000
10,000	120,000	105,000
10,500	126,000	109,000
11,000	132,000	113,000
11,500	138,000	117,000
12,000	144,000	121,000
12,500	150,000	125,000
13,000	156,000	129,000
13,500	162,000	133,000
14,000	168,000	137,000
14,500	174,000	141,000

Risk Response Planning

- 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

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		

Response Strategies for Positive Risks

- Risk exploitation
- Risk sharing
- Risk enhancement
- Risk acceptance

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.

Media Snapshot

- A highly publicized example of a risk response to corporate financial scandals, such as those affecting Enron, Arthur Andersen, and WorldCom, was legal action.
- The Sarbanes-Oxley Act of 2002 is considered the most significant change to federal securities laws in the United States since the New Deal.
- This Act has caused many organizations to initiate projects and other actions to avoid litigation.*

Risk Monitoring and Control

- 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:
  - Requested changes.
  - Recommended corrective and preventive actions.
  - Updates to the risk register, project management plan, and organizational process assets.

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.

Results of Good Project Risk Management

- Unlike crisis management, good project risk management often goes unnoticed.
- Well-run projects appear to be almost effortless, but a lot of work goes into running a project well.
- Project managers should strive to make their jobs look easy to reflect the results of well-run projects.

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:
  - Risk management planning
  - Risk identification
  - Qualitative risk analysis
  - Quantitative risk analysis
  - Risk response planning
  - Risk monitoring and control

Topics Addressed in a Risk Management Plan

- Methodology
- Roles and responsibilities
- Budget and schedule
- Risk categories
- Risk probability and impact
- Risk documentation

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