

PROJECT MONITORING

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PMG333

Lecture 07

RISK MANAGEMENT

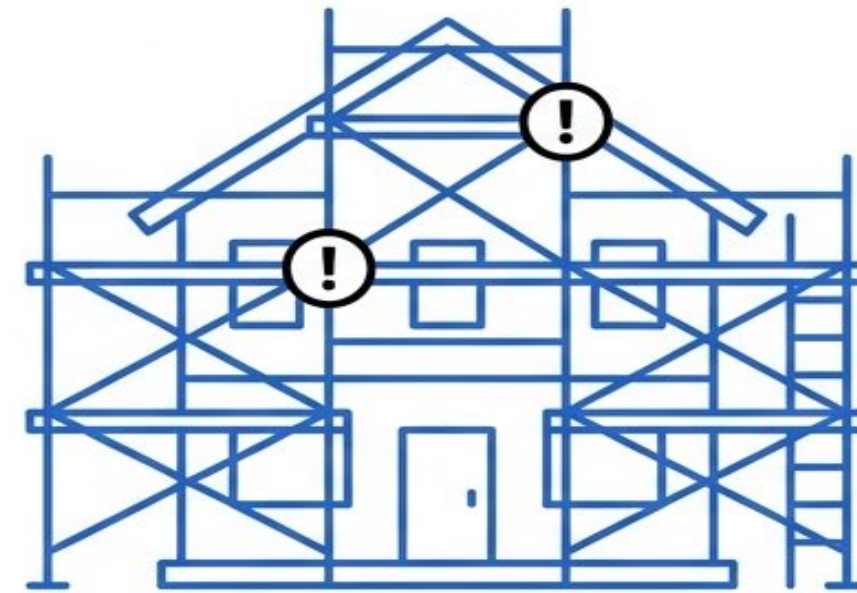
Prepared by
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1.  **Risk Definition**
2.  **Risk vs. Issue vs. Uncertainty**
3.  **Risk Sources**
4.  **Risk Categories**
5.  **Risk Management Process**
6.  **Risk Response Strategies**

Goals inherently attract derailments



A simple cycle to a cafe for coffee.



A complex house renovation disrupted by unexpected material costs and worker shortages.

Whether simple or complex, everyday goals are constantly impacted by variables outside our immediate control.

‘When Uncertainty Becomes Reality’

A major construction company in the Middle East launched a luxury residential tower project: \$50M budget, 24-month timeline.

Everything seemed perfect on paper. But in month six, global steel prices surged 35% due to international trade tensions.

Simultaneously, the engineering team discovered the site was in a low-seismic zone requiring design modifications.

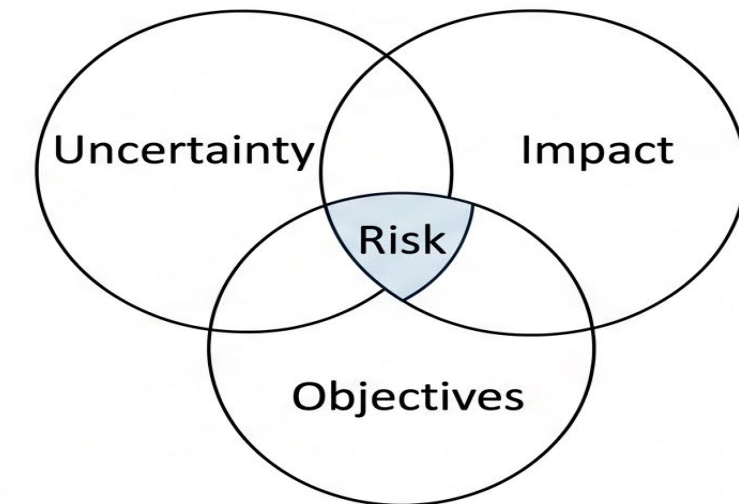
Key Question: Were these problems to solve now, or risks that should have been planned for earlier?



Understanding Risk: From Definition to Reality

PMBOK definition: “An uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.”

1. **Uncertainty** – The risk hasn’t occurred yet; it may or may not happen
2. **Dual Impact** – Risks can be negative (threats) or positive (opportunities)
3. **Objective-Driven** – A risk only matters if it affects project goals



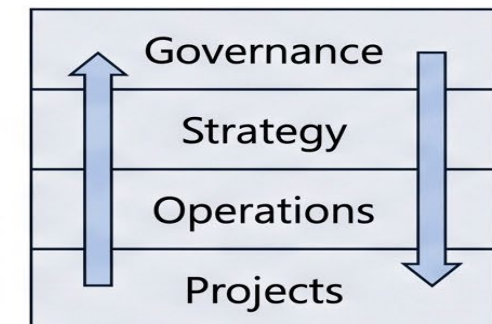
Not all uncertainty is risk. Only uncertainty that impacts project objectives becomes a risk worth managing.

Risk Defined: The ISO 31000 Standard

ISO 31000 definition: 'Effect of uncertainty on objectives'

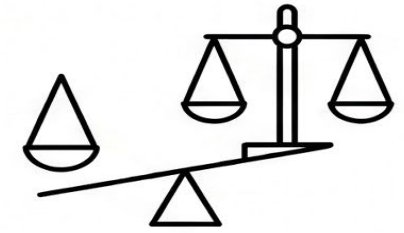
Key Differences from PMBOK:

- Focuses on the impact rather than the event itself
- Applies to entire organizations, not just projects
- Emphasizes how incomplete knowledge affects decision-making



Why This Matters: ISO 31000 recognizes that risk management is fundamental to organizational strategy and governance.

Risks Are Not Always Negative



Threats (Negative Risks)

- Events that decrease project value
- **Examples:** Cost overruns, delays, defects
- **Response:** Mitigate, avoid, transfer

Opportunities (Positive Risks)

- Events that increase project value
- **Examples:** Cost savings, faster completion, quality
- **Response:** Enhance, exploit, share

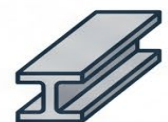
Real Example: COVID-19 pandemic accelerated global e-commerce adoption, creating significant growth opportunities for online retailers.

Construction Industry: Common Threats and Their Impact

According to Caltech study of 150 Middle East projects



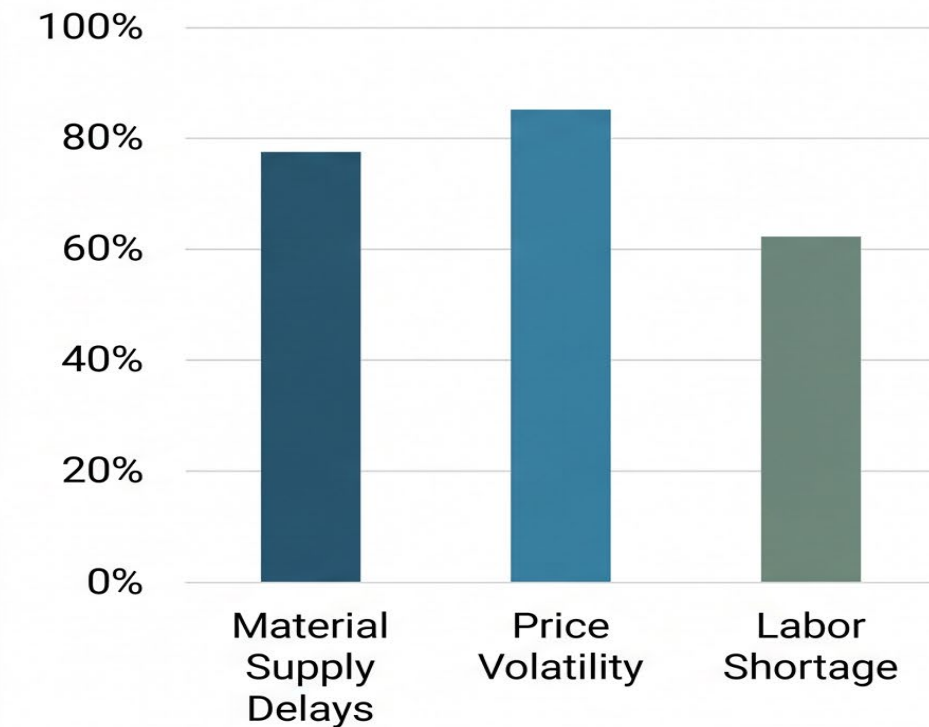
1. Material Supply Delays (78% affected) - 2-4 week delays, 5-8% cost increase



2. Price Volatility (85% affected) - Steel prices surged 35%



3. Labor Shortage (62% affected) - 10-15% schedule extension



Key Insight: These threats are **predictable and manageable**.

IT Projects: Security and Resource Threats

According to Gartner 2023 Report



1. Security Vulnerabilities

- 4-8 week delays
- 10% budget increase
- affects 72%



2. Key Personnel Departure

- 30-40% productivity loss
- affects 45%



3. Requirement Changes

- 15-25% schedule extension
- affects 72%

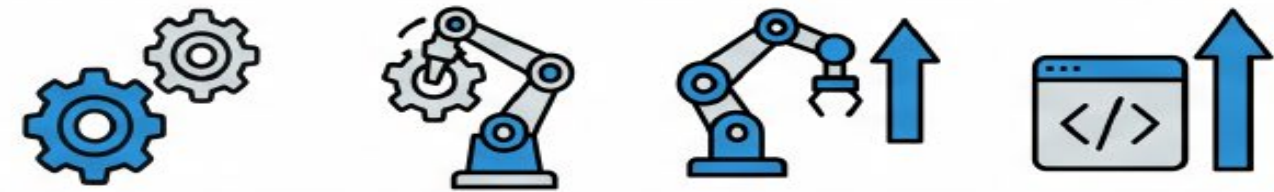
Lesson: Proactive threat identification prevents costly surprises.

IT Projects: How New Technologies Create Opportunities

According to McKinsey Digital 2023

1. AI and Automation Tools

- **25-35%** reduction in development time
- **AI-assisted** code generation



2. Strategic Partnerships

- **Market access** and revenue growth
- Integration with major platforms



3. Emerging Talent Pool

- Improved code quality and **innovation**
- Access to specialized AI/ML developers



Competitive Reality: Companies leveraging opportunities grow 40% faster.



When Risk Becomes a Problem: Timing Matters

Risk (Future-Oriented)

- Uncertain event that MAY occur
- Management: Proactive planning
- Example: 40% chance lead developer leaves
- Action: Develop succession plan

Problem (Present-Oriented)

- Uncertain event that HAS occurred
- Management: Reactive crisis
- Example: Lead developer resigned today
- Action: Emergency hiring

Critical Insight: Proactive risk management prevents problems.

Uncertainty Is the Environment; Risk Is the Consequence

Uncertainty	Risk
• Lack of complete knowledge • Example: We don't know testing duration • Status: Environmental condition	• Measurable impact on objectives • Example: Testing delays could push project 2 weeks past deadline • Status: Actionable concern



Key Principle: Not all uncertainty becomes risk. Only uncertainty affecting objectives qualifies as risk.

Differentiating the Variables

The Issue	The Uncertainty	The Risk
An event that has already happened and is actively impacting the activity.	An unknown due to inherent lack of knowledge, weather, or ambiguity.	A future event that, if it occurs, will affect the goal positively or negatively.
Fix immediately.	Estimate a range.	Systematically identify and plan.
Car brakes are currently making a loud clunking noise.	Based on experience, the driving journey takes anywhere from 40 to 55 minutes.	Traffic might be slowed down by road maintenance.

Measuring Risk: Probability and Its Importance

Probability is the likelihood that a risk event will occur

Measurement methods:

- **Quantitative:** Percentage (0-100%) – Example: 35% chance of material delay
- **Qualitative:** Descriptive levels – Low (0-25%), Medium (26-50%), High (51-75%), Very High (76-100%)

Practical Application: A 60% probability of 2-week delay is more concerning than 15%

Why It Matters: Probability helps prioritize which risks demand attention.



Measuring Risk: Impact and Its Dimensions

Impact is the magnitude of consequence if the risk occurs

Measurement Methods

- **Quantitative:** Specific numbers
 - Cost: \$500,000 loss
 - Schedule: 3-week delay
 - Quality: 15% defect increase

- **Qualitative:** Severity levels

- Low
- Medium
- High
- Critical



Real Example:

Risk A: 80% probability, \$50,000 impact vs Risk B: 20% probability, \$500,000 impact

Strategic Insight: Impact often matters more than probability in resource allocation.

Understanding Root Causes: The Key to Prevention

Root cause is the underlying condition creating the risk

Why Root Cause Matters:

- Identifies where to intervene
- Enables preventive strategies
- Reveals systemic issues

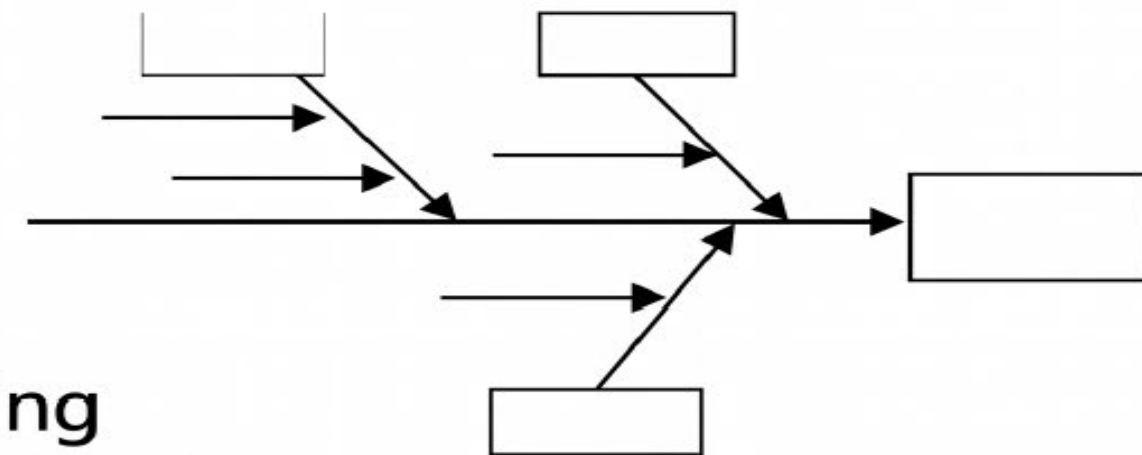
Risk: Project delay

Root Cause: Inadequate resource planning

Prevention: Implement better capacity planning

Mitigation: Hire temporary staff

Best Practice: Always trace risks back to root causes.



Formulating Risk: The Cause-Event-Effect Model

Because of [ROOT CAUSE], [RISK EVENT] may occur, resulting in [IMPACT ON OBJECTIVES]

Why This Structure Works: Cause → Event → Effect

1. **Identifies** the **source** (enables prevention)
2. **Describes** the **uncertain event** (clarifies what might happen)
3. **Quantifies** the **consequence** (enables prioritization)

Key Benefit: Clear risk statements enable better decision-making.

Formulating Threats: Real-World Examples



Example 1 - Software:

Because of [untested open-source libraries], [security vulnerabilities] may occur, resulting in [3-4 week delay, 10% budget increase]



Example 2 - Construction:

Because of [seasonal rainfall], [concrete pouring stops], resulting in [3-week delay, 8% labor cost increase]



Example 3 - Project:

Because of [inadequate communication], [requirement misalignment] occurs, resulting in [\$200,000 rework, 4-week delay]

Pattern: Weak statements lack specificity; strong statements include cause, event, and measurable impact.

Formulating Opportunities: Capturing Positive Risks



Example 1 – Construction

Because of [unexpected material cost reduction], [budget surplus] available, resulting in [scope expansion, enhanced quality]



Example 2 - Software

Because of [AI-assisted tools], [development acceleration], resulting in [30% faster delivery, market-first advantage]



Example 3 - Marketing

Because of [viral content], [organic reach expansion], resulting in [50% marketing spend reduction, 3x audience growth]

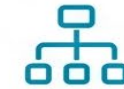
Strategic Value: Opportunities formulated clearly are more likely to be pursued.

Where Risks Come From: A Complete Map



Technical Risks

- Technology Incompatibility (35%)
- Requirement Ambiguity (45%)
- Performance Issues (28%)
- Quality Defects (52%)



Organizational Risks

- Management Changes
- Communication Breakdowns
- Resource Constraints
- Scope Creep



External Risks

- Regulatory Changes
- Market Volatility
- Supply Chain Disruption
- Natural Disasters



People & Commercial Risks

- Key Personnel Loss
- Skill Gaps
- Vendor Failure
- Price Escalation

Bringing It All Together: The Risk Management Foundation

The Complete Picture:

-  1. **Definition** - Risk is uncertain events affecting objectives (PMBOK & ISO 31000)
-  2. **Nature** - Risks can be threats (negative) or opportunities (positive)
-  3. **Characteristics** - Defined by probability, impact, and root cause
-  4. **Communication** - Expressed through structured risk statements
-  5. **Sources** - Originate from technical, organizational, commercial, external, and people domains

Critical Success Factors:

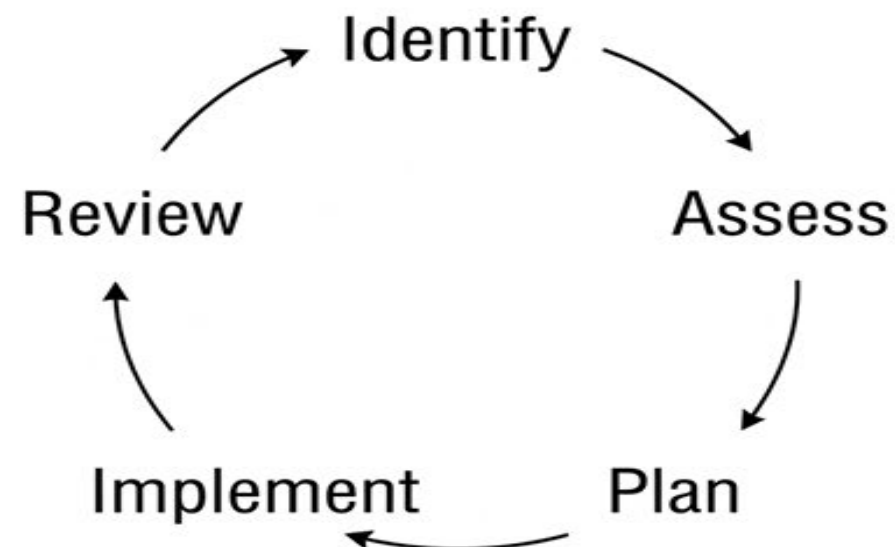
- early identification
- quantification
- understanding root causes
- distinguishing risks from problems
- treating opportunities seriously

Next Steps: With these foundational concepts, organizations can implement systematic risk monitoring.

The Corporate Risk Cycle

A Roadmap Through the Unknown

- **Story:** A ship captain facing a storm doesn't wait for waves to hit; they use a map and radar to navigate.
- **Definition:** Risk management is a continuous, iterative lifecycle of 5 phases, not a one-time event (PMBOK & ISO 31000).



Phase 1: Risk Identification

Mapping the Unknown Before It Happens

Story: Tech-Vision startup brainstormed 20 potential risks before coding their AI app, including "key developer resigns" (threat) and "influencer endorsement" (opportunity).

Definition: The process of determining what might happen, why, and how, documenting them in a Risk Register (PMBOK 7th Ed.).

Example: Brainstorming and SWOT analysis are primary tools for proactive identification.



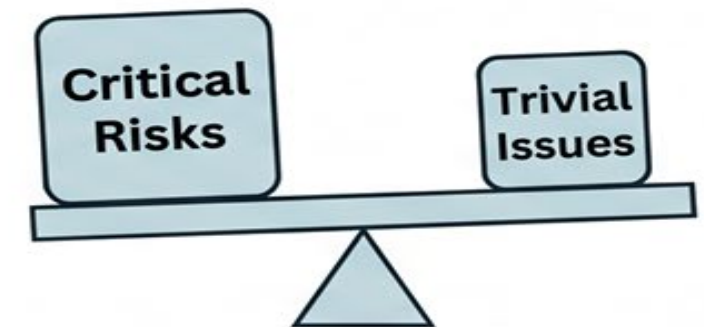
Phase 2: Risk Assessment

Separating the Critical from the Trivial

Story: With limited resources, the startup weighed risks. “Developer resigning” had 80% probability and high impact, making it a top priority over minor issues.

Definition: Measuring and prioritizing identified risks using Qualitative (Probability & Impact matrix) and Quantitative (cost/time in numbers) analysis.

Example: Focusing resources only on High-Priority risks saves project budgets.



Phase 3: Response Planning

Forging Shields and Seizing Opportunities

Story: For the developer risk, they planned ‘Mitigation’ by hiring a junior dev. For the influencer opportunity, they planned ‘Exploitation’ with an early-access budget.

Definition: Developing options and determining actions to enhance opportunities and reduce threats to project objectives.



Example: Assigning a ‘Risk Owner’ for each response plan ensures accountability (ISO 31000).

Phase 4: Implementation

From Paper to Reality

Story: The startup didn't just write the plan; they actually hired the junior dev and sent the app to influencers immediately.

Definition: Executing the agreed-upon risk response plans and integrating them into the project schedule (PMBOK 7th Ed.).

Example: The biggest trap is creating excellent response plans but failing to execute them due to daily project pressures.



Phase 5: Review & Improve

The Radar That Never Sleeps

Story: During a bi-weekly review, they found the senior dev was happy (risk decreased), but spotted a new threat: "App store policy change"

Definition: Monitoring implemented risk responses, tracking identified risks, and identifying new emerging risks (ISO 31000)

Example: Risk management is not linear; it is (an iterative loop. Continuous monitoring monitors neerated)



The Pulse of the Project

- Identify without Assess = Scattered efforts.
- Assess without Plan = Just theory.
- Plan without Implement = Wasted time.
- Implement without Review = Blind to changes.



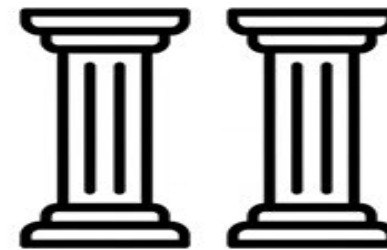
By adopting this continuous cycle, a PM transforms from a 'firefighter' to an 'architect' who prevents fires.

Standards Comparison

PMBOK vs. ISO 31000

PMBOK (Project Focus):

1. Identify Risks
2. Perform Analysis
3. Plan Responses
4. Implement Responses
5. Monitor Risks



ISO 31000 (Organizational Focus):

1. Risk Identification
2. Risk Analysis & Evaluation
3. Risk Treatment
4. Implementation
5. Monitoring & Review

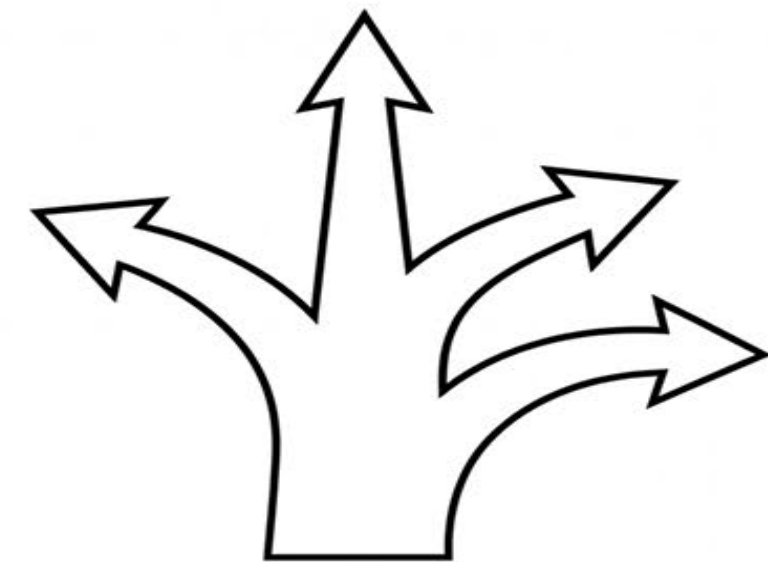
Note: Both agree it's a **continuous, 5-step cycle**.

Risk Response Strategies: Navigating the Unknown

How Project Managers Handle Threats and Opportunities

Story: A bridge construction faces a potential 6-week delay due to rain. The PM must decide: Ignore? Change schedule? Buy insurance? Add budget buffer?

Risk Response: Systematic choices to handle **identified** risks (Threats or Opportunities).



Threat Strategy 1: Avoid

Story: NASA avoided a \$300M mission failure by switching from an untested cooling system to a proven one.

Eliminate the threat entirely by changing the project plan, scope, or schedule.

When to use:

- High probability (>70%)
- Catastrophic impact
- Practical alternatives exist



Example: Removing untested technology from critical projects increases success by 28% (Standish Group).

Threat Strategy 2: Mitigate (Reduce)

Story: Toyota survived the 2011 tsunami supply chain crisis because they had already diversified suppliers and built strategic reserves.

Reduce the probability or impact of a threat without eliminating it completely.

When to use:

- Cannot be avoided
- Cost of mitigation is lower than impact
- Preventive actions exist

Example: Using Proof of Concept (POC) reduces technical failure risk by 60% (Dandage & Mirji, 2021).



Threat Strategy 3: Transfer

Story: Boeing transferred manufacturing risks of the 787 Dreamliner to specialized international partners.

Shift the financial or operational responsibility of a threat to a third party (insurance, subcontractors).

When to use:

- Lack of internal expertise
- Financial impact is too high
- Third party is more capable

Example:

78% of major Asian construction projects use specialized insurance for natural disasters (Ling et al., 2009).



Threat Strategy 4: Accept

Story: SpaceX expected their Starship test rocket to explode. They accepted the risk because the data gathered was worth the cost.

Definition: Acknowledge the threat without proactive action.

Active: allocate reserves. **Passive:** document only.

When to use:

- Low probability/impact
- No cost-effective response exists
- Within risk tolerance



Example:

Tech startups allocate 10-15% contingency funds to accept expected testing failures (Hillson, 2003).

Opportunity Strategy 1: Exploit

Story: Apple saw the smartphone opportunity in 2007 and allocated its best resources to ensure iPhone launched before competitors.

Definition: Ensure the opportunity is realized by removing uncertainty and allocating necessary resources.

When to use:

- High impact on project goals
- Sufficient resources available
- Cost is justified by return

Example: Exploiting AI in software development speeds up time-to-market by 6 weeks (McKinsey, 2023).



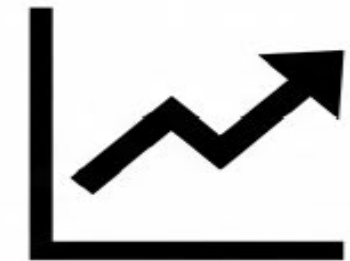
Opportunity Strategy 2: Enhance

Story: An app developer enhanced their chance of success in the Middle East by hiring an Arabic interface specialist.

Definition: Increase the probability or positive impact of an opportunity without guaranteeing it.

When to use:

- Promising but uncertain opportunity
- Can influence probability cost-effectively
- Resources insufficient for full exploit



Example: Training teams increases the chance of winning government bids by 28% (Hillson, 2003).

Opportunity Strategy 3: Share

Story: Uber shared the Chinese market opportunity with Didi to overcome cultural and regulatory barriers.

Allocate partial or full ownership of the opportunity to a **third party** better able to capture it.

When to use:

- Opportunity exceeds internal capabilities
- Third party has better resources/expertise
- Collaboration is more effective

Example:

67% of major infrastructure projects use Public-Private Partnerships to share opportunities (PMI, 2021).



Opportunity Strategy 4: Accept

Story: A PM noticed material prices might drop next quarter. They accepted the opportunity by monitoring prices without spending money.

Acknowledge the opportunity without proactive action, but be ready to benefit if it occurs.

When to use:

- Low priority or low probability
- Cost of exploitation is not justified
- Resources needed for higher priorities



Example: Documenting potential favorable exchange rates in the risk register without hedging.

Summary: Choosing the Right Strategy

Three Core Principles:

1. **Assess the Risk:** High probability/impact requires more investment.
2. **Cost vs. Benefit:** Never spend more on the response than the cost of the risk. Balancing saves up to 22% of risk budgets (Zhang & Fan, 2014).
3. **Organizational Capability:** The best theoretical strategy must match your actual resources and expertise.



‘The goal is not to eliminate all risks, but to make informed decisions on which risks to respond to, and how.’ - PMBOK 7th Ed..

Thank You