

Foundations of Project Management

PMG 101
Managing Risk
Part 2

Lecture 9



Managing Risk

Risk Management Process

Step 1: Risk Identification

Step 2: Risk Assessment

Step 3: Risk Response Development

Opportunity Management

Contingency Planning

Contingency Funding and Time Buffers

Step 4: Risk Response Control

Change Control Management

Learning objectives

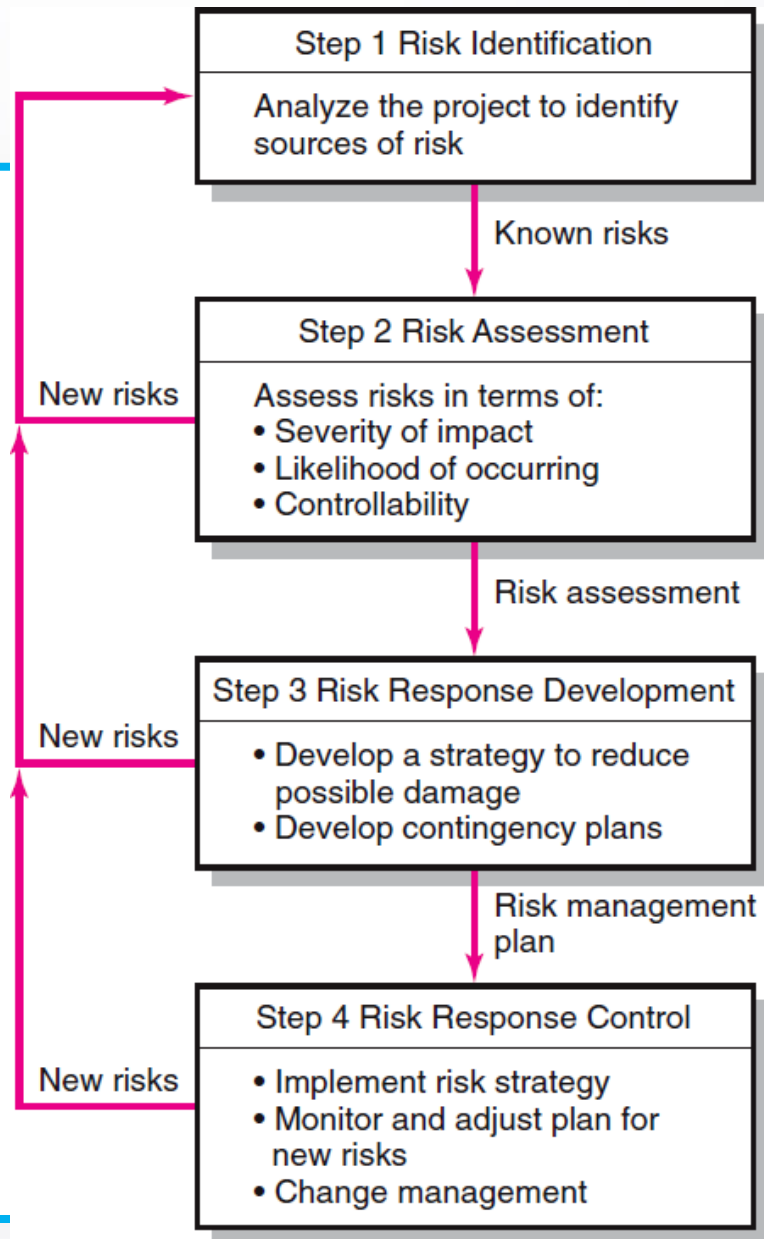


FIGURE 7.2
The Risk
Management Process

Contingency plan

A contingency plan is an alternative plan that will be used if a possible foreseen risk event becomes a reality. The contingency plan represents actions that will reduce or mitigate the negative impact of the risk event. Like all plans, the contingency plan answers the questions of what, where, when, and how much action will take place.

A key distinction between a **risk response** and a **contingency plan** is that a **response is part of the actual implementation plan and action is taken before the risk can materialize**, while a **contingency plan is not part of the initial implementation plan and only goes into effect after the risk is recognized**.

Importance of Contingency plan

- The absence of a contingency plan, when a risk event occurs, can cause a manager to delay or postpone the decision to implement a remedy. This postponement can lead to panic, and acceptance of the first remedy suggested. Such after-the-event decision making under pressure can be potentially dangerous and costly.
- Contingency planning evaluates alternative remedies for possible foreseen events before the risk event occurs and selects the best plan among alternatives. This early contingency planning facilitates a smooth transition to the remedy or work-around plan.
- The availability of a contingency plan can significantly increase the chances for project success.

An example on contingency plan

A high-tech niche computer company intends to introduce a new “platform” product at a very specific target date. The project’s 47 teams all agree delays will not be acceptable. Their contingency plans for two large component suppliers demonstrate how seriously risk management is viewed. One supplier’s plant sits on the San Andreas Fault, which is prone to earthquakes.

The contingency plan has an alternative supplier, who is constantly updated, producing a replica of the component in another plant. Another key supplier in Toronto, Canada, presents a delivery risk on their due date because of potential bad weather.

This contingency plan calls for a chartered plane (already contracted to be on standby) if overland transportation presents a delay problem. To outsiders these plans must seem a bit extreme, but in high-tech industries where time to market is king, risks of identified events are taken seriously.

Risk response matrices such as the one shown in Figure 7.8 are useful for summarizing how the project team plans to manage risks that have been identified.

FIGURE 7.8 Risk Response Matrix

Risk Event	Response	Contingency Plan	Trigger	Who Is Responsible
Interface problems	Mitigate: Test prototype	Work around until help comes	Not solved within 24 hours	Nils
System freezing	Mitigate: Test prototype	Reinstall OS	Still frozen after one hour	Emmylou
User backlash	Mitigate: Prototype demonstration	Increase staff support	Call from top management	Eddie
Equipment malfunctions	Mitigate: Select reliable vendor Transfer: Warranty	Order replacement	Equipment fails	Jim

Steps to manage risk:

- 1- The team has to identify whether to reduce, share, transfer, or accept the risk.
- 2- The next step is to identify contingency plans in case the risk still occurs.
- 3- The team also needs to discuss and agree what would “trigger” implementation of the contingency plan.
- 4- Finally, the individual responsible for monitoring the potential risk and initiating the contingency plan needs to be assigned.

Smart project managers establish protocols for contingency responses before they are needed.

Taking risks stage by stage

- **Risks during the project/idea initiation phase:**
 - **Unavailable subject matter experts**
 - **Poor definition of problem or project**
 - **No feasibility study**
 - **No or unclear objectives**

Taking....cont'd

❑ Risks during the project planning phase:

- No risk management plan
- Spotty planning
- Underdeveloped requirements and specifications
- Unclear statement of work
- No management or stakeholder support
- Poor role definition
- Inexperienced team
- Definite lack of skills

....cont'd

□ Risks during the project execution phase

- ✓ Changes in schedule
- ✓ No control systems in place
- ✓ Unskilled labour
- ✓ Material availability or poor quality material
- ✓ Unreliable suppliers
- ✓ Unexpected price increase (not budget for it)
- ✓ Strikes
- ✓ Weather
- ✓ Regulatory requirements

....cont'd

➤ **Risks during the project close-out / termination phase:**

- Unacceptable to customer
- Poor quality product/project
- Budget problems
- Penalties to be paid for exceeding the time parameter of the project

Opportunity management

An **opportunity** is an event that can have a positive impact on project objectives. For example, unusually favorable weather can accelerate construction work, or a drop in fuel prices may create savings that could be used to add value to a project.

Essentially the same process that is used to manage negative risks is applied to positive risks. Opportunities are identified, assessed in terms of likelihood and impact, responses are determined, and even contingency plans and funds can be established to take advantage of the opportunity if it occurs. The major exception between managing negative risks and opportunity is in the responses.

ifferent types of response to an opportunity:

Exploit. This tactic seeks to eliminate the uncertainty associated with an opportunity to ensure that it definitely happens. Examples include assigning your best personnel to a critical burst activity to reduce the time to completion or revising a design to enable a component to be purchased rather than developed internally.

Share. This strategy involves allocating some or all of the ownership of an opportunity to another party who is best able to capture the opportunity for the benefit of the project. Examples include establishing continuous improvement incentives for external contractors or joint ventures.

Enhance. Enhance is the opposite of mitigation in that action is taken to increase the probability and/or the positive impact of an opportunity. Examples include choosing site location based on favorable weather patterns or choosing raw materials that are likely to decline in price.

Accept. Accepting an opportunity is being willing to take advantage of it if it occurs, but not taking action to pursue it.

► Positive Risks (or Opportunities)

- Exploit
- Share
- Enhance
- Acceptance

► Negative Risks (or Threats)

- Avoid
- Transfer
- Mitigate
- Acceptance (Retain)

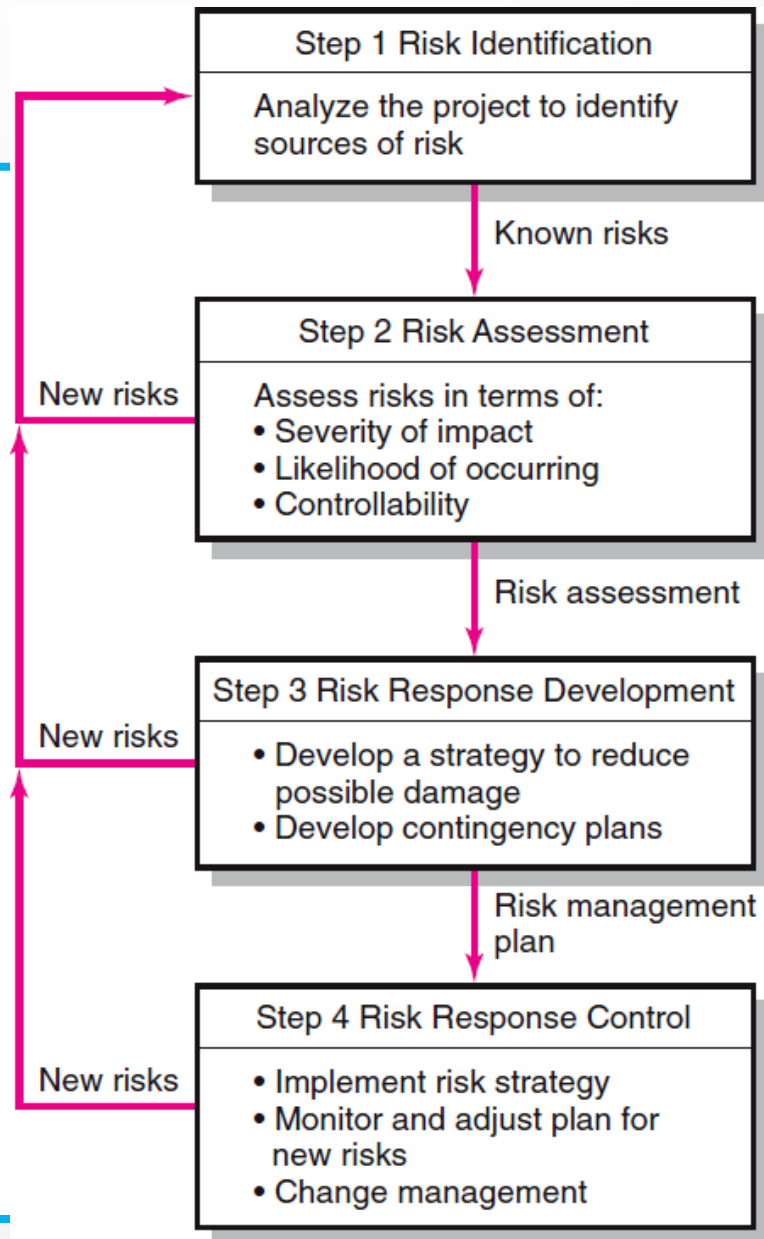


FIGURE 7.2
The Risk
Management Process

Probability and Impact Matrix

Probability	Threats					Opportunities				
0.9	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.7	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.5	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.3	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.1	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
<i>Impact</i>	0.05	0.1	0.2	0.4	0.8	0.8	0.4	0.2	0.1	0.05

High Risk

Medium Risk

Low Risk

Contingency funding

Contingency funds are established to cover project risks that are identified and unknown. When, where, and how much money will be spent is not known until the risk event occurs.

Project “owners” are often reluctant to set up project contingency funds that seem to imply the project plan might be a poor one. Some perceive the contingency fund as an add-on slush fund. Others say they will face the risk when it materializes. Usually, such reluctance to establish contingency reserves can be overcome with documented risk identification, assessment, contingency plans, and plans for when and how funds will be disbursed.

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Contingency funding

In practice, contingencies run from 1 to 10 percent in projects similar to past projects. However, in unique and high-technology projects it is not uncommon to find contingencies running in the 20 to 60 percent range. Use and rate of consumption of reserves must be closely monitored and controlled.

In practice, the contingency reserve fund is typically divided into **budget** and **management reserve funds** for control purposes. Budget reserves are set up to cover identified risks; these reserves are those allocated to specific segments or deliverables of the project. Management reserves are set up to cover unidentified risks and are allocated to risks associated with the total project.

Contingency funding

1. Budget reserves

These reserves are identified for specific work packages or segments of a project found in the baseline budget or work breakdown structure. **For example,** a reserve amount might be added to “computer coding” to cover the risk of “testing” showing a coding problem.

The budget reserve should be communicated to the project team. This openness suggests trust and encourages good cost performance. However, distributing budget reserves should be the responsibility of both the project manager and the team members responsible for implementing the specific segment of the project. If the risk does not materialize, the funds are removed from the budget reserve. Thus, budget reserves decrease as the project progresses.

Contingency funding

2. Management Reserves

These reserve funds are needed to cover major unforeseen risks and, hence, are applied to the total project. For example, a major scope change may appear necessary midway in the project. Because this change was not anticipated or identified, it is covered from the management reserve.

Management reserves are established *after* budget reserves are identified and funds established.

These reserves are independent of budget reserves and are controlled by the project manager and the “owner” of the project. The “owner” can be internal (top management) or external to the project organization. Most management reserves are set using historical data and judgments concerning the uniqueness and complexity of the project.

Table 7.1 shows the development of a contingency fund estimate for a hypothetical project. Note how budget and management reserves are kept separate; control is easily tracked using this format.

TABLE 7.1
Contingency Fund
Estimate (Thousands
of Dollars)

Activity	Budget Baseline	Budget Reserve	Project Budget
Design	\$500	\$15	\$515
Code	900	80	980
Test	20	2	22
Subtotal	\$1,420	\$97	\$1,517
Management reserve	—	—	50
Total	\$1,420	\$97	\$1,567

Time Buffer

Just as contingency funds are established to absorb unplanned costs, managers use time buffers to cushion against potential delays in the project. And like contingency funds, the amount of time is dependent upon the inherent uncertainty of the project. The more uncertain the project the more time should be reserved for the schedule. The strategy is to assign extra time at critical moments in the project. Like management reserves, this buffer typically requires the authorization of top management.

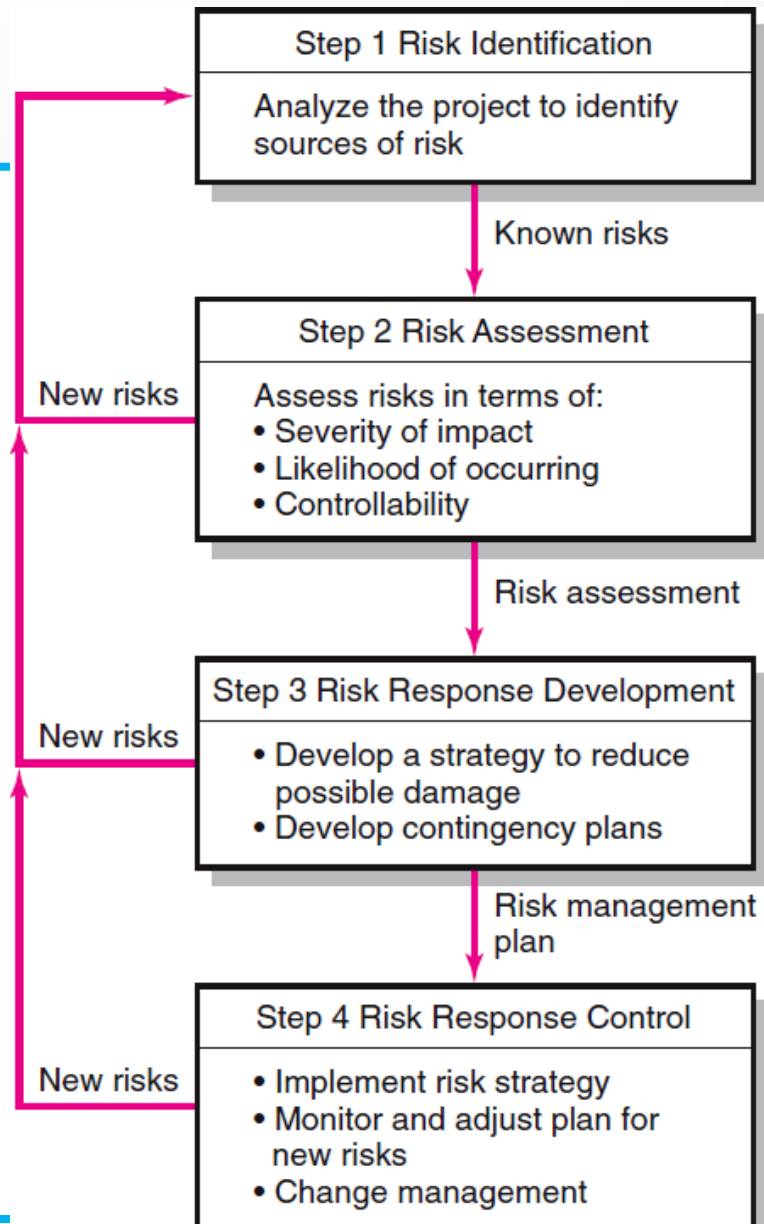


FIGURE 7.2
The Risk
Management Process

Step 4: Risk response control

Typically, the results of the first three steps of the risk management process are summarized in a formal document often called the **risk register**. A **risk register** details all identified risks, including descriptions, category, and probability of occurring, impact, responses, contingency plans, owners, and current status. The register is the backbone for the last step in the risk management process: risk control.

Risk control involves executing the risk response strategy, monitoring triggering events, initiating contingency plans, and watching for new risks. Establishing a **change management system** to deal with events that require formal changes in the scope, budget, and/or schedule of the project is an essential element of risk control.

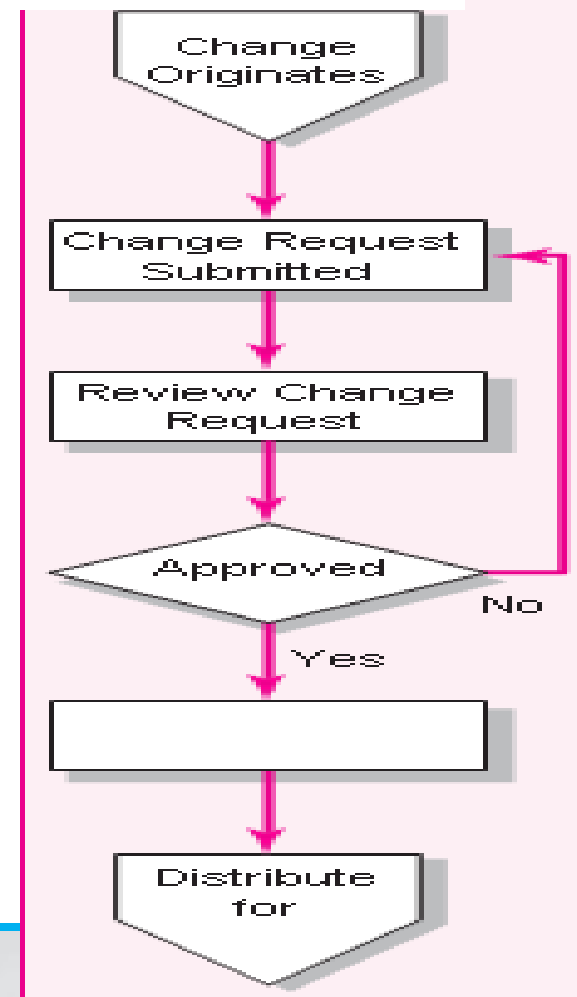
Step 4: Risk response control

A key for controlling the cost of risks is documenting responsibility. This can be problematic in projects involving multiple organizations and contractors. Responsibility for risk is frequently passed on to others with the statement, “That is not my worry.” This mentality is dangerous. Each identified risk should be assigned (or shared) by mutual agreement of the owner, project manager, and the contractor or person having line responsibility for the work package or segment of the project.

It is best to have the line person responsible approve the use of budget reserve funds and monitor their rate of usage. If management reserve funds are required, the line person should play an active role in estimating additional costs and funds needed to complete the project. Having line personnel participate in the process focuses attention on the management reserve, control of its rate of usage, and early warning of potential risk events.

Step 4: Risk response control

FIGURE 7.9
Change Control
Process



Change control management

A major element of the risk control process is change management. Every detail of a project plan will not materialize as expected. Coping with and controlling project changes present a formidable challenge for most project managers.

Changes come from many sources such as the project customer, owner, project manager, team members, and occurrence of risk events.

Step 4: Risk response control

Change control management

Most changes easily fall into three categories:

- 1- Scope changes in the form of design or additions represent big changes; for example, customer requests for a new feature or a redesign that will improve the product.
- 2- Implementation of contingency plans, when risk events occur, represent changes in baseline costs and schedules.
- 3- Improvement changes suggested by project team members represent another category.

Because change is inevitable, a well-defined change review and control process should be set up early in the project planning cycle.

Step 4: Risk response control

Change management systems involve reporting, controlling, and recording changes to the project baseline. In practice most change management systems are designed to accomplish the following:

1. Identify proposed changes.
2. List expected effects of proposed change(s) on schedule and budget.
3. Review, evaluate, and approve or disapprove changes formally.
4. Negotiate and resolve conflicts of change, conditions, and cost.
5. Communicate changes to parties affected.
6. Assign responsibility for implementing change.
7. Adjust master schedule and budget.
8. Track all changes that are to be implemented.

Step 4: Risk response control

Organizations use **change request forms and logs** to track proposed changes. An example of a simplified change request form is depicted in Figure 7.10. Typically change request forms include a description of the change, the impact of not approving the change, the impact of the change on project scope/schedule/cost, and defined signature paths for review as well as a tracking log number.

These logs are used to monitor change requests. They typically summarize the status of all outstanding change requests and include such useful information as source and date of the change, document codes for related information, cost estimates, and the current status of the request.

Change Request Form Template

Project Name	Name of project		
Requested By	Name of requestor	Date	Date request was raised
Request No	Request Number	Name of Request	Brief name of request
Change Description	Description of the change		
Change Reason	Give the justification for the change		
Impact of change	Specify the impact of the change in terms of cost impact, budget impact, schedule impact, and impact on other projects.		
Proposed Action	Does the project manager propose this change is accepted/rejected and why		
Status	In review	Approved	Rejected
Approval Date	The date the change was approved or rejected		
Approved By	Who approved the change (usually the project manager or project sponsor)		

Figure 7.11: Change Request log

CR-ID	CR Name	Description	Status	Origination Date	Closed Date	Priority	Triple Constraint Impact (Scope, Time and/or Cost)	Follow up Action Needed	Responsible Party	Updates

The benefits derived from change control systems are the following:

- 1- Inconsequential changes are discouraged by the formal process.
- 2- Costs of changes are maintained in a log.
- 3- Integrity of the WBS and performance measures is maintained.
- 4- Allocation and use of budget and management reserve funds are tracked.
- 5- Responsibility for implementation is clarified.
- 6- Effect of changes is visible to all parties involved.
- 7- Implementation of change is monitored.
- 8- Scope changes will be quickly reflected in baseline and performance measures

Balancing the Portfolio for Risks and Types of Projects

A major responsibility of the priority team is to balance projects by type, risk, and resource demand. This requires a total organization perspective. Hence, a proposed project that ranks high on most criteria may not be selected because the organization portfolio already includes too many projects with the same characteristics— e.g., project risk level, use of key resources, high cost, nonrevenue producing, long durations.

Balancing the portfolio of projects is as important as project selection. Organizations need to evaluate each new project in terms of what it adds to the project mix. Short-term needs need to be balanced with long-term potential. Resource usage needs to be optimized across all projects, not just the most important project.

Two types of risk are associated with projects. First are **risks associated with the total portfolio of projects**, which should reflect the organization's risk profile. Second are **specific project risks** that can inhibit the execution of a project.

Key terms

Avoiding risk

Budget reserve

Change management
system

Contingency plan

Management
reserve

Mitigating risk

Opportunity

Retaining Risk

Risk

Risk breakdown
structure (RBS)

Risk register

Risk profile

Risk severity matrix

Scenario analysis

Time buffer

Transferring risk



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Thank You

