

Project Management Institute

PRACTICE STANDARD FOR PROJECT RISK MANAGEMENT



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CHAPTER 1

INTRODUCTION

Project Management Institute (PMI) practice standards are guides to the use of a tool, technique, or process identified in *A Guide to the Project Management Body of Knowledge (PMBOK® Guide – Fourth Edition)* or other PMI standards. Practice standards are targeted at audiences who participate in the management of projects. This includes project managers, project personnel, contract personnel, supervisors, and other project stakeholders.

A PMI practice standard describes processes, activities, inputs, and outputs for a specific Knowledge Area. It provides information on what the significant process, tool, or technique is, what it does, why it is significant, when it should be performed or executed, and, if necessary for further clarification, who should perform the process. A practice standard does not prescribe how the process is to be implemented, leaving that subject for other forums such as handbooks, manuals, and courses.

This chapter includes the following sections:

1.1 Purpose of the Practice Standard for Project Risk Management

1.2 Project Risk Management Definition

1.3 Role of Project Risk Management in Project Management

1.4 Good Risk Management Practice

1.5 Critical Success Factors for Project Risk Management

1.1 Purpose of the *Practice Standard for Project Risk Management*

The purpose of the *Practice Standard for Project Risk Management* is to (a) provide a standard for project management practitioners and other stakeholders that defines the aspects of Project Risk Management that are recognized as good practice on most projects most of the time and (b) provide a standard that is globally applicable and consistently applied. This practice standard has a descriptive purpose rather than one used for training or educational purposes.

The *Practice Standard for Project Risk Management* covers risk management as it is applied to single projects only. Like the *PMBOK® Guide – Fourth Edition*, this practice standard does not cover risk in programs or portfolios of projects.

Chapter 11 of the *PMBOK® Guide – Fourth Edition*, is the basis for the *Practice Standard for Project Risk Management*. This practice standard is consistent with that chapter, emphasizing the concepts and principles relating to Project Risk Management. It is aligned with other PMI practice standards.

Figure 1-1 compares the purposes of this practice standard to those of the *PMBOK® Guide – Fourth Edition* and textbooks, handbooks, and courses.

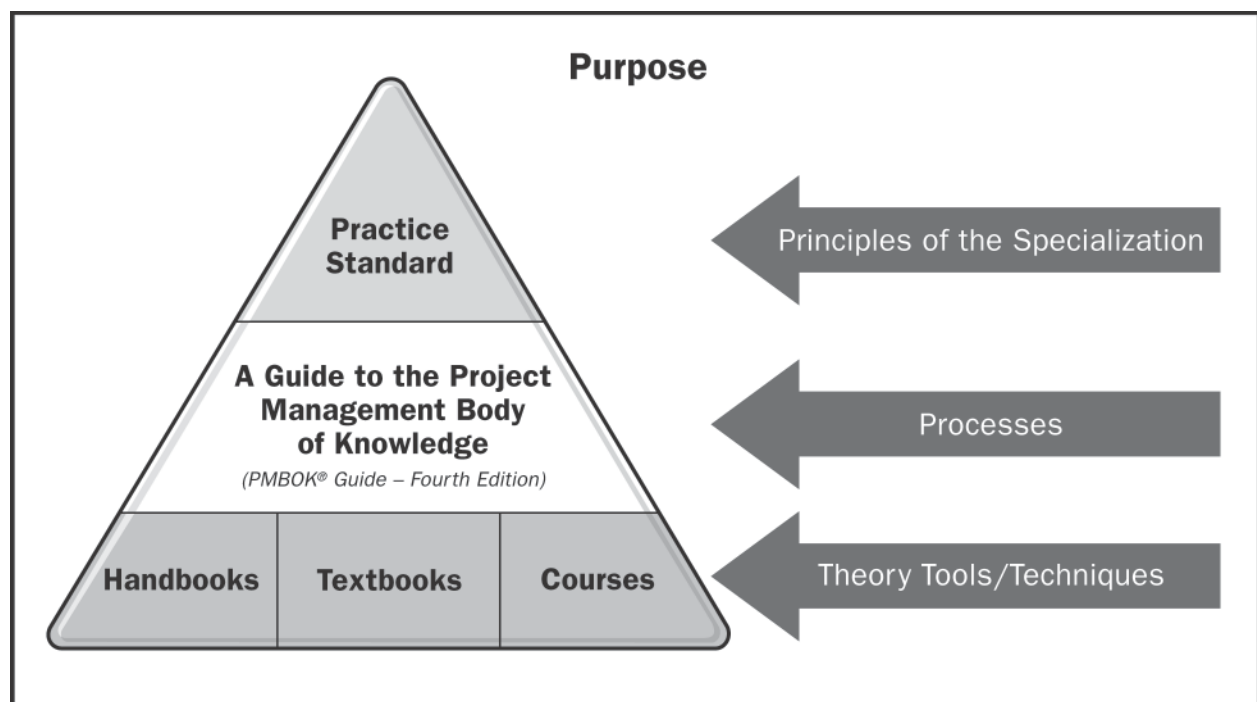


Figure 1-1. Hierarchy of PMI Project Risk Management Resources

This practice standard is organized in three main sections:

1. Introductory material including the framework, purpose, principles, context of, and introduction to Project Risk Management processes as defined in the *PMBOK® Guide – Fourth Edition*.
2. Principles underlying the six Project Risk Management processes in the *PMBOK® Guide – Fourth Edition*. The six processes are as follows:
 - Plan Risk Management,
 - Identify Risks,
 - Perform Qualitative Risk Analysis,
 - Perform Quantitative Risk Analysis,
 - Plan Risk Responses, and
 - Monitor and Control Risks.

Each of these six processes is described in a chapter that addresses the following four topics: (a) purpose and objectives of the process; (b) critical success factors for the process; (c) tools and techniques for the process; and (d) documenting the results of the process.

3. A glossary of terms which are used in this practice standard.

This practice standard emphasizes those principles that are fundamental to effective, comprehensive, and successful Project Risk Management. These principles can and should be stated at a general level for several reasons:

1. Principles are expected to be agreed upon now and to be valid in the future. While tools and techniques are constantly evolving, the principles have more stability and persistence.
2. Different projects, organizations, and situations will require different approaches to Project Risk Management. In particular, risk management is a discipline that contains a series of processes to apply to both large and small projects. Risk management will be more effective if its practice is tailored to the project and congruent with the organizational culture, processes and assets. There are many different ways of conducting risk management that may comply with the principles of Project Risk Management as presented in this practice standard.
3. The principles are applicable to projects carried out in a global context, reflecting the many business and organizational arrangements between participants, for example, joint ventures between commercial and national companies, government and non-government organizations, and the cross-cultural environment often found on these project teams.

The principles described herein can be used as a check for an organization's processes. Practitioners can establish processes specific to their particular situation, project, or organization and then compare them with these principles, thus validating them against good Project Risk Management practice.

1.2 Project Risk Management Definition

The definition of Project Risk Management, as defined in the *PMBOK® Guide – Fourth Edition*, is the basis for this practice standard: “Project Risk Management includes the processes concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on a project.” The *PMBOK® Guide – Fourth Edition* also states: “The objectives of Project Risk Management are to increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project.” In the *PMBOK® Guide – Fourth Edition*, “project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project’s objectives.” Project objectives include scope, schedule, cost, and quality.

Project Risk Management aims to identify and prioritize risks in advance of their occurrence, and provide action-oriented information to project managers. This orientation requires consideration of events that may or may not occur and are therefore described in terms of likelihood or probability of occurrence in addition to other dimensions such as their impact on objectives.

1.3 Role of Project Risk Management in Project Management

Project Risk Management is not an optional activity: it is essential to successful project management. It should be applied to all projects and hence be included in project plans and operational documents. In this way, it becomes an integral part of every aspect of managing the project, in every phase and in every process group.

Many of the project management processes address planning the project, from concept to final design and from procurement through daily management of execution and close-out. These processes often assume an unrealistic degree of certainty about the project and, therefore, they need to include treatment of project risks.

Project Risk Management addresses the uncertainty in project estimates and assumptions. Therefore, it builds upon and extends other project management processes. For instance, project scheduling provides dates and critical paths based on activity durations and resource availability assumed to be known with certainty. Quantitative risk analysis explores the uncertainty in the estimated durations and may provide alternative dates and critical paths that are more realistic given the risks to the project.

Project Risk Management is not a substitute for the other project management processes. On the contrary, Project Risk Management requires that these project management processes (e.g. scheduling, budgeting, and change management) be performed at the level of the best practices available. Project Risk Management adds the perspective of project risk to the outputs of those other processes and adds to their value by taking risk into account. For instance, risk management provides the basis upon which to estimate the amount of cost and schedule contingency reserves that are needed to cover risk response actions to a required level of confidence for meeting project objectives.

There is a paradox about project risk that affects most projects. In the early stages of a project, the level of risk exposure is at its maximum but information on the project risks is at a minimum. This situation does not mean that a project should not go forward because little is known at that time. Rather, there may be different ways of approaching the project that have different risk implications. The more this situation is recognized, the more realistic the project plans and expectations of results will be.

A risk management approach is applicable throughout a project's life cycle. The earlier in the project life cycle that the risks are recognized, the more realistic the project plans and expectations of results will be. Risk management continues to add value as project planning progresses and more information becomes available about all aspects and components of the project and its environment, such as stakeholders, scope, time, and cost, as well as the corresponding assumptions and constraints. The balance between project flexibility and knowledge about project risk needs to be reviewed regularly and optimized as the plans develop.

It is true that as the project plan becomes set with fundamental decisions, agreements, and contracts in place, the options for making substantial changes to capture opportunities or mitigate threats are reduced. During project execution, risk management processes monitor the changes the project undergoes for new risks that may emerge so that appropriate responses to them can be developed, as well as check for existing risks that are no longer plausible. Project Risk Management plays a role in providing realistic expectations for the completion dates and cost of the project even if there are few options for changing the future.

Finally, throughout the project and during project closure, risk-related lessons are reviewed in order to contribute to organizational learning and support continuous improvement of Project Risk Management practice.

1.4 Good Risk Management Practice

Project Risk Management is a valuable component of project management and it enhances the value of the other project management processes. As with all of these processes, Project Risk Management should be conducted in a manner consistent with existing organizational practices and policies. In addition, like the other processes involved in project management, Project Risk Management should be conducted in a way that is appropriate to the project. Project Risk Management should recognize the business challenges as well as the multi-cultural environment associated with an increasingly global environment including many joint venture projects and customers, suppliers, and workforces spread around the globe.

Changes in the project management plan that result from the Project Risk Management process may require decisions at the appropriate level of management to reassign personnel, establish or modify budgets, make commitments to others outside the project, interact with regulators, and comply with the rules of accounting and law. Project Risk Management should be conducted in compliance with these internal and external requirements.

Project Risk Management should always be conducted on an ethical basis, in keeping with the Project Management code of ethics or conduct. Honesty, responsibility, realism, professionalism and fair dealing with others are among the characteristics of successful Project Risk Management. Effective Project Risk Management benefits from robust communication and consultation with stakeholders. This enables agreement among stakeholders that Project Risk Management in general, and risk identification, analysis, and response, in particular, should be carried out in a realistic and objective way and should not be subject to political or other unreasonable influences.

Project Risk Management should be conducted on all projects. The degree, level of detail, sophistication of tools, and amount of time and resources applied to Project Risk Management should be in proportion to the characteristics of the project under management and the value that they can add to the outcome. Thus, a large project that provides value to an important customer would theoretically require more resources, time, and attention to Project Risk Management than would a smaller, short-term, internal project that can be conducted in the background with a flexible deadline.

Each of the Project Risk Management processes should be scaled to be appropriate to the project under management during the Plan Risk Management process and reviewed periodically to determine if the decisions made in that process remain appropriate.

1.5 Critical Success Factors for Project Risk Management



Figure 1-2. Critical Success Factors for Project Risk Management

Specific criteria for success of each Project Risk Management process are listed in the chapters dealing with those processes. The general criteria for success include:

- *Recognize the Value of Risk Management*—Project Risk Management should be recognized as a valuable discipline that provides a positive potential return on investment for organizational management, project stakeholders (both internal and external), project management, and team members.
- *Individual Commitment/Responsibility*—Project participants and stakeholders should all accept responsibility for undertaking risk-related activities as required. Risk management is everybody's responsibility.
- *Open and Honest Communication*—Everyone should be involved in the Project Risk Management process. Any actions or attitudes that hinder communication about project risk reduce the effectiveness of Project Risk Management in terms of proactive approaches and effective decision-making.
- *Organizational Commitment*—Organizational commitment can only be established if risk management is aligned with the organization's goals and values. Project Risk Management may require a higher level of managerial support than other project management disciplines because handling some of the risks will require approval of or responses from others at levels above the project manager.
- *Risk Effort Scaled to Project*—Project Risk Management activities should be consistent with the value of the project to the organization and with its level of project risk, its scale, and other organizational constraints. In particular, the cost of Project Risk Management should be appropriate to its potential value to the project and the organization.
- *Integration with Project Management*—Project Risk Management does not exist in a vacuum, isolated from other project management processes. Successful Project Risk Management requires the correct execution of the other project management processes.

These critical success factors for Project Risk Management are illustrated in Figure 1-2.

1.6 Conclusion

The principles of Project Risk Management described in this practice standard should be appropriately applied based on the specifics of a project and the organizational environment. Project Risk Management provides benefits when it is implemented according to good practice principles and with organizational commitment to taking the decisions and performing actions in an open and unbiased manner.

CHAPTER 2

PRINCIPLES AND CONCEPTS

2.1 Introduction

This chapter introduces the key ideas required to understand and apply Project Risk Management to projects following the approach described in Chapter 11 of the *PMBOK® Guide – Fourth Edition*. These principles and concepts are generally consistent with other approaches to Project Risk Management commonly used although the terminology may differ in some details.

The execution of the Project Risk Management process is dealt with in subsequent chapters of this practice standard and so is not discussed here.

2.2 Definition of Project Risk

The word “risk” is used in many ways in everyday language and in various specialist disciplines. Its use in the *PMBOK® Guide – Fourth Edition* is consistent with other risk management standards and process descriptions. The definition of project risk given in the *PMBOK® Guide – Fourth Edition* is as follows:

Project risk is an uncertain event or condition that, if it occurs, has a positive or a negative effect on a project’s objectives.

This definition includes two key dimensions of risk: uncertainty and effect on a project’s objectives. When assessing the importance of a project risk, these two dimensions must both be considered. The uncertainty dimension may be described using the term “probability” and the effect may be called “impact” (though other descriptors are possible, such as “likelihood” and “consequence”).

The definition of risk includes both distinct events which are uncertain but can be clearly described, and more general conditions which are less specific but also may give rise to uncertainty. The definition of project risk also encompasses uncertain events which could have a negative effect on a project’s objectives, as well as those which could have a positive effect. These two types of risk are called, respectively, threats and opportunities. It is important to address both threats and opportunities within a unified Project Risk Management process. This allows for the gain of synergies and efficiencies such as addressing both in the same analyses and coordinating the responses to both if they overlap or can reinforce each other.

Risks are uncertain future events or conditions which may or may not occur, but which would matter if they did occur. It is important to distinguish risks from risk-related features, such as cause and effect. Causes are events or circumstances which currently exist or are certain to exist in the future and which might give rise to risks. Effects are conditional future events or conditions which would directly affect one or more project objectives if the associated risk occurs. The cause-risk-effect chain can be used in a structured risk statement or risk description to ensure that each of these three elements is properly described (see Section 5.3).

When a risk event occurs, it ceases to become uncertain. Threats which occur may be called issues or problems; opportunities which occur may be called benefits. Both issues/problems and benefits entail project management actions that are outside the scope of the Project Risk Management process.

2.3 Individual Risks and Overall Project Risk

It is useful to consider project risk at two levels: individual risks and overall project risk.

Individual risks are specific events or conditions that might affect project objectives. An individual risk may positively or negatively affect one or more of the project objectives, elements, or tasks. Understanding individual risks can assist in determining how to apply effort and resources to enhance the chances of project success. Day-to-day Project Risk Management focuses on these individual risks in order to enhance the prospects of a successful project outcome.

Overall project risk represents the effect of uncertainty on the project as a whole. Overall project risk is more than the sum of individual risks on a project, since it applies to the whole project rather than to individual elements or tasks. It represents the exposure of stakeholders to the implications of variations in project outcome. It is an important component of strategic decision-making, program and portfolio management, and project governance where investments are sanctioned or cancelled and priorities are set. At these higher levels, it is necessary to set realistic targets for the cost and duration of a project, establish the contingency reserve levels required to protect the project stakeholders, set appropriate project priorities, and judge whether the risk of overall success is increasing or decreasing as implementation advances.

2.4 Stakeholder Risk Attitudes

The risk attitudes of the project stakeholders determine the extent to which an individual risk or overall project risk matters. A wide range of factors influence risk attitude. These include the scale of the project within the range of stakeholders' overall activities, the strength of public commitments made about the performance of the project, and the stakeholders' sensitivity to issues such as environmental impacts, industrial relations, and other factors. Stakeholder risk attitudes usually result in a desire for increased certainty in project outcomes, and may express a preference for one project objective over another. How risk is regarded is usually also strongly influenced by an organization's culture. Different organizations are more or less open, and this often impacts the way risk management can be applied.

Understanding stakeholders' attitudes toward risk is an important component of risk management planning that precedes risk identification and analysis, in order to optimize both project success and stakeholder satisfaction with the project's results. These attitudes should be identified and managed proactively and deliberately throughout the Project Risk Management process. They may differ from one project to another for the same stakeholders and will usually differ from one group of stakeholders to another. In fact a single stakeholder may adopt different risk attitudes at various stages in the same project.

It is also important to understand the particular implications of stakeholder risk attitudes on projects where the team is international, cross-industry, or multi-organizational.

2.5 Iterative Process

It is the nature of projects that circumstances change as they are being planned and executed. The amount of information available about risks will usually increase as time goes on. Some risks will occur while others will not, new risks will arise or be discovered, and the characteristics of those already identified may change. As a result, the Project Risk Management processes should be repeated and the corresponding plans progressively elaborated throughout the lifetime of the project.

To ensure that Project Risk Management remains effective, the identification and analysis of risks should be revisited periodically, the progress on risk response actions should be monitored, and the action plans adjusted accordingly. If external circumstances change significantly, it may also be necessary to revisit the risk management planning process.

The development of an initial risk management plan and risk assessment is the start of the process, not the end. The frequency and depth of reviews and updates will depend on the nature of the project, the volatility of the environment in which the project is being implemented, and the timing of other project management reviews and updates.

2.6 Communication

Project Risk Management cannot take place in isolation. Success relies heavily on communication throughout the process.

Risk identification and analysis depend on comprehensive input from stakeholders in a project to ensure that nothing significant is overlooked and that risks are realistically assessed. The credibility of the process and the commitment of those who should act to manage risks can be assured only if the way the process operates and the conclusions it produces are understood and seen as credible by all concerned. This demands effective and honest communication from the Project Risk Management process to the rest of the project team and other project stakeholders. Communication of the results of the Project Risk Management process should be targeted to meet the specific needs of each stakeholder and should be reflected within the overall project communications strategy with each stakeholder's responsibility and role in risk management identified and agreed-upon.

2.7 Responsibility for Project Risk Management

It may be considered simplistic to say “risk management is everyone’s responsibility” as previously stated. However it is important that management of project risk is not left to a few risk specialists. Project Risk Management should be included as an integral part of all other project processes. Since project risks can affect project objectives, anyone with an interest in achieving those objectives should play a role in Project Risk Management. The specific roles depend on the project team members’ and other stakeholders’ place within the project and their relation to project objectives. Roles and responsibilities for Project Risk Management should be clearly defined and communicated, and individuals should be held responsible and accountable for results. This includes allocating responsibility for specific activities within the risk process, as well as for resulting actions required to implement agreed-upon responses. Responsibility should also be allocated for ensuring that risk-related lessons are captured for future use.

2.8 Project Manager’s Role for Project Risk Management

The project manager has particular responsibilities in relation to the Project Risk Management process. The project manager has overall responsibility for delivering a successful project which fully meets the defined objectives. The project manager is accountable for the day-to-day management of the project, including effective risk management. The role of the project manager may include:

- Encouraging senior management support for Project Risk Management activities.
- Determining the acceptable levels of risk for the project in consultation with stakeholders.
- Developing and approving the risk management plan.
- Promoting the Project Risk Management process for the project.
- Facilitating open and honest communication about risk within the project team and with management and other stakeholders.
- Participating in all aspects of the Project Risk Management process.
- Approving risk responses and associated actions prior to implementation.
- Applying project contingency funds to deal with identified risks that occur during the project.
- Overseeing risk management by subcontractors and suppliers.
- Regularly reporting risk status to key stakeholders, with recommendations for appropriate strategic decisions and actions to maintain acceptable risk exposure.
- Escalating identified risks to senior management where appropriate: such risks include any which are outside the authority or control of the project manager, any which require input or action from outside the project, and any for which the release of management reserve funds might be appropriate.
- Monitoring the efficiency and effectiveness of the Project Risk Management process.
- Auditing risk responses for their effectiveness and documenting lessons learned.

CHAPTER 3

INTRODUCTION TO PROJECT RISK MANAGEMENT PROCESSES

3.1 Project Risk Management and Project Management

All projects are uncertain. Uncertainty is inevitable since projects are unique and temporary undertakings based on assumptions and constraints, delivering project results to multiple stakeholders with different requirements. Project management can be seen as an attempt to control this uncertain environment, through the use of structured and disciplined techniques such as estimating, planning, cost control, task allocation, earned value analysis, monitoring and review meetings, etc. Each of these elements of project management has a role in defining or controlling the uncertainty which is inherent in all projects.

Project Risk Management provides an approach by which uncertainty can be understood, assessed, and managed within projects. As such it forms an integral part of project management, and effective Project Risk Management is a critical success factor for project success.

For project management to be fully effective, however, it is important that Project Risk Management is not viewed as an optional process or performed as an additional overhead task. Since many elements of project management address inherent uncertainty, the interface between structured Project Risk Management and the other processes of project management needs to be clear. The outputs of Project Risk Management should be taken into account within many of the project management processes. They can, for example, impact:

- Estimating resource requirements, cost, or duration;
- Assessing the impact of proposed scope changes;
- Planning or re-planning the forward strategy of the project;
- Allocating resources to tasks; and
- Reporting progress to stakeholders.

None of these actions can be performed properly without a clear view of the risk involved, as determined during the Project Risk Management process. In other words, project management process effectiveness is increased by using the information and results from Project Risk Management.

In addition, effective Project Risk Management requires input from other project management processes. Outputs such as the work breakdown structure (WBS), estimates, the project schedule, assumptions list, etc. are all important prerequisites for effective Project Risk Management.

3.2 Project Risk Management Processes

The defined steps of Project Risk Management describe a structured approach for understanding and managing risk on a project. This chapter outlines the steps required for effective Project Risk Management. Each step is described in more detail in subsequent chapters.

As previously defined, project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives. From this definition, it is clear that risks only exist in relation to objectives. It is therefore essential at the start of the Project Risk Management process to clearly define the objectives. It is also clear that different projects are exposed to different levels of risk, so each step in the Project Risk Management process should be scalable to meet the varying degrees of risk. Scalable elements of the process include:

- Available resources,
- Methodology and processes used,
- Tools and techniques used,
- Supporting infrastructure,
- Review and update frequency, and
- Reporting requirements.

As a precondition for a successful Project Risk Management implementation, it is important to have a clear understanding of the risk thresholds that define the key stakeholders' views on acceptable levels of risk, as well as a framework against which identified risks can be assessed.

As a result, the Project Risk Management process always starts with an initiation step. This is required in order to ensure a common understanding and agreement of the team and other stakeholders on the approach and parameters that will be applied in managing risk in this project, as well as the scope and objectives of the Project Risk Management process itself. Project Risk Management activities, resources, and attention should be appropriate to the project since different projects warrant different levels of risk management application. The main actions to provide the required tailoring are as follows:

- Define those objectives against which risks will be identified,
- Define how the elements of the Project Risk Management process will be scaled for this project, and
- Define risk thresholds, tolerances, and the assessment framework.

The outputs from this initial step should be documented, communicated, and then reviewed by the stakeholders to ensure a common understanding of the scope and objectives for the Project Risk Management process. The document should be formally approved at a senior level.

Once the Project Risk Management scope and objectives are agreed upon, it is possible to start identifying risks, being careful to distinguish genuine risks from non-risks (such as causes, effects, problems, issues etc.). A variety of risk identification techniques is available, each with its own strengths and weaknesses. One or more techniques should be selected as appropriate for meeting the needs of the specific project. The aim is to expose and document all knowable risks, recognizing that some risks will be inherently unknowable and others will emerge later in the project. The emergent nature of risk requires the Project Risk Management process to be iterative, repeating the Identify Risks process in order to find risks which were not evident earlier in the project. Input should be sought from a wide range of project stakeholders when identifying risks, since each will have a different perspective on the risks facing the project. Historical records and project documents should also be reviewed to identify risks for this project.

All identified risks are recorded. Ideally, a risk owner is designated for each identified risk. It is the responsibility of the risk owner to manage the corresponding risk through all of the subsequent Project Risk Management processes.

Following risk identification, it is necessary to evaluate the importance of each risk, in order to prioritize individual risks for further attention, evaluate the level of overall project risk, and determine appropriate responses. Risk evaluation can be performed using qualitative techniques to address individual risks, using quantitative techniques to consider the overall effect of risk on the project outcome, or using both in combination. These two approaches require different types of data, but where both qualitative and quantitative techniques are used, an integrated approach should be adopted.

Qualitative techniques are used to gain a better understanding of individual risks, considering a range of characteristics such as probability of occurrence, degree of impact on project objectives, manageability, timing of possible impacts, relationships with other risks, common causes or effects, etc. Understanding and prioritizing risks is an essential prerequisite to managing them, so qualitative techniques are used on most projects. The outputs from qualitative assessments should be documented and communicated to key project stakeholders and form a basis for determining appropriate responses.

Quantitative techniques provide insights into the combined effect of identified risks on the project outcome. These techniques take into account probabilistic or project-wide effects, such as correlation between risks, interdependency, and feedback loops, thereby indicating the degree of overall risk faced by the project. The result is an indication of the degree of overall risk faced by the project. The results of quantitative analysis should be used to focus the development of appropriate responses, particularly the calculation of required contingency reserve levels, and must be documented and communicated to inform subsequent actions. Quantitative techniques may not be required for all projects to ensure effective management of risk.

Once individual risks have been prioritized and the degree of overall project risk exposure is understood, appropriate risk responses should be developed using an iterative process which continues until an optimal set of responses has been developed. A range of possible response strategies exists for both threats and opportunities. The risk owner should select a suitable strategy for each individual risk, based on its characteristics and assessed priority, ensuring that the strategy is achievable, affordable, cost effective, and appropriate. The use of a single strategy that addresses several related risks should be considered whenever possible. The risk owner is responsible for defining actions to implement the chosen strategy. These actions may be delegated to action owners as appropriate. The risk owner should monitor actions to determine their effectiveness, and also to identify any secondary risks which may arise because of the implementation of risk responses. In addition to individual risk responses, actions may be taken to respond to overall project risk. All response strategies and actions should be documented and communicated to key project stakeholders and incorporated into the project plan.

It is essential that agreed-upon actions are implemented; otherwise the risk exposure of the project remains unchanged. It is also vital that the Project Risk Management process be repeated at regular intervals throughout the life of the project. This will enable the project team to reevaluate the status of previously identified risks, to identify emergent and secondary risks, and to determine the effectiveness of the Project Risk Management process.

The steps outlined previously form the Project Risk Management process. These are detailed in subsequent chapters, as follows:

- **Plan Risk Management (Chapter 4)**—Defines the scope and objectives of the Project Risk Management process, and ensures that the risk process is fully integrated into wider project management.
- **Identify Risks (Chapter 5)**—Identifies as many knowable risks as practicable.
- **Perform Qualitative Risk Analysis (Chapter 6)**—Evaluates key characteristics of individual risks enabling them to be prioritized for further action.
- **Perform Quantitative Risk Analysis (Chapter 7)**—Evaluates the combined effect of risks on the overall project outcome.
- **Plan Risk Responses (Chapter 8)**—Determines appropriate response strategies and actions for each individual risk and for overall project risk, and integrates them into a consolidated project management plan.
- **Monitor and Control Risks (Chapter 9)**—Implements agreed-upon actions, reviews changes in project risk exposure, identifies additional risk management actions as required, and assesses the effectiveness of the Project Risk Management process.

Figure 3-1 shows the flow of control and information between the various steps within the Project Risk Management process.