Chapter 4

Risk Planning

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Risk Management Critical Success Factors

For project risk management to be successful, the following success factors should exist:

Commitment

Risk management is dependent on both organizational and individual commitment.

Organizationally, the risk management approach should align with the organization's strategic goals, and many risk responses may require upper-management support and approval.

Risk management also involves all members of the project team, from identifying potential risks and analyzing their probable effects to implementation of appropriate risk responses.

Scalability

The level of effort spent on risk management should be scalable and appropriate as it relates to the relative importance of the project to the organization, the organization's risk tolerance, and the project's defined constraints.

Communication

For all aspects of risk management, ongoing dialogue and the ability to communicate honestly is key in not only identifying potential risks but also determining the most appropriate responses for handling those risks.

Integration

Risk management is integrated with project management and is dependent upon the successful implementation of project management processes and practices.

Risk Definitions

As in all of the PMI credentialing exams, there is a high focus on vocabulary and terminology. Keep in mind that you may have used or experienced some of the terms below in a different context that what is described here. On the exam, always stay in the PMI mindset and align with its terminology.

Risk Appetite

Risk appetite is the degree of uncertainty that an organization is willing to take on in anticipation of a reward. An organization's risk appetite is a product of that organization's risk culture, as previously discussed.

For example, a speculative firm will be willing to invest in an initiative of the chance of a large potential payout. Examples abound on *The Discovery Channel*, as depicted in shows such as *Deadliest Catch*, *Bering Sea Gold*, and *Wicked Tuna*.

In contrast, organizations that run more narrow margins, such as healthcare providers, will have lower risk appetites. Taking on risky ventures would not serve to grow their businesses to a degree that the risk would be worth the investment.

Risk Tolerance

Risk tolerance is the degree of risk that an individual stakeholder is willing to withstand. This is highly individualized and can vary and change throughout the project.

A stakeholder's risk tolerance is a product of his or her role, experience, and biases and perspectives. His or her risk tolerance may also vary according to the different project constraints. For example, a stakeholder who is contributing the budget to a project will most likely have lower risk tolerance toward cost risk but may have a higher tolerance toward schedule risk.

It is the responsibility of the project manager to identify the key stakeholders' risk tolerances and revisit/re-evaluate those tolerances throughout the project.

Risk Threshold

A risk threshold is the level of uncertainty or impact at which a stakeholder may have a specific interest. The threshold typically represents the point at which an action may be necessary or be escalated.

The project risk thresholds are typically dictated by the project constraints. The thresholds are agreed upon, documented, and communicated to the appropriate parties to ensure that the full team is aware of them.

For example, an identified project risk that represents a greater-than-$50,000 impact, an agreed-upon threshold, would result in project cancellation.

I observed a fantastic example of a documented and executed risk threshold not too long ago on the show *Dude, You're Screwed* (please excuse the title!). The premise of the show is that a team of highly trained military men selects one individual to drop blindfolded in a remote area with minimal survival gear. He must then make his way to civilization. The stranded "dude" is continually monitored by the other men, who track his core body temperature, heart rate, etc. There is an identified risk threshold set on body temperature, and if the stranded "dude" falls below that threshold, they immediately evacuate him. Everyone on the team knows what the threshold is and also what actions will be taken if that threshold is hit.

Project Risk

A project risk is an uncertain event that, if it occurs, will have an impact on at least one of the project objectives. That impact or effect may be positive or negative. Often, in practice, the focus is on negative risks. From an exam perspective, PMI will expect the candidate to understand both positive and negative risk.

Opportunities

Project risks likely to result in a positive impact are known as opportunities. An opportunity that is realized is known as a benefit. For example, there may be a risk that the project will deliver early, allowing the company to be the first to market.

Threats

Project risks likely to result in a negative impact are known as threats. A threat that is realized is known as an issue or a problem. Generally speaking, an issue is considered a realized negative risk that needs to be escalated for resolution, while a problem is a realized negative risk that the project manager can address without escalation. For example, there may be a risk that the project launch will be delayed, resulting in damage to the company's reputation.

Black Swan Risk

A "black swan" risk is one that is unexpected and unanticipated. It may even have been thought to be impossible. Upon evaluation, a black swan risk would have a probability rating of 0%.

The origin of the name is historical, from Europe, when it was believed that swans could only be white. This belief was dashed when a species of black swans was discovered in Australia.

Emergent Risk

An emergent risk is a risk that arises later in a project and could not have been identified earlier on. For example, if the sponsor of your project has been abruptly fired, a risk arises that your project may not have sponsorship. Because an emergent risk is an unknown risk that occurs, any responses are most likely to be handled using management reserve versus budget contingency reserve.

Secondary Risk

A secondary risk is a risk that arises as a result of implementing a risk response or action. Had that response not been implemented, the risk would not exist. For example, to avoid the risk of falling down the stairwell, you may choose to take the elevator. This choice creates a risk you could get stuck in the elevator.

Cause and Effect

For every risk, there is a cause or causes and an effect or effects. A cause is a given or potential requirement, assumption, constraint, or condition that creates the possibility of negative or positive outcomes. An effect is an impact on one or more of the project objectives.

Risk Statement Construction

The marker of a good risk statement is that it can answer the following questions:

- What could happen?
- Why could it happen?
- Why do we care?

There are a number of risk statement structures using risk metalanguage.

Examples include:

- Because of <one or more causes>, <risk> might occur, which would lead to <one or more effects>
- IF <event>, THEN <consequences>.
- As a result of <definite cause>, <uncertain event> may occur, which would lead to <effect on objective(s)>

Risk Contingency and Management Reserve

A component of project risk management planning is the allocation of a contingency reserve (also known simply as "contingency") and a management reserve. The determination of exact funding dollars is most likely to be validated through a quantitative risk analysis to truly understand the amount of risk exposure and the amount of contingency to be allocated based on the stakeholders' risk tolerances.

Contingency Reserve

A contingency reserve is a risk funding allocation that is established for each activity, work package, or phase based upon the known risk or uncertainty associated with that component.

Contingency is typically managed and controlled by the project manager and is allocated for what are considered "known-unknown" risks. Known-unknown risks are those that have been identified, but it is uncertain whether they will occur.

Contingency allocations are included in the cost baseline and are typically factored into earned value calculations.

Contingency Buffers

Contingency buffers are time allocations at the activity, work package, or phase level based upon the known risk or uncertainty associated with that component. As with contingency reserves, contingency buffers are controlled by the project manager for "known-unknown" risks.

There are a number of methods for determining the contingency buffer allocation. One approach is to use worst-case estimates, which use a second end date for the project further out. The difference in the dates represents the appropriate allocated buffer.

Another approach to buffer allocation is the use of defined contingency plans to dictate needs based on known risks. Using program evaluation and review technique (PERT) or a Monte Carlo simulation can also predict the amount of buffers needed. These are discussed further in the chapter on quantitative risk analysis.

The project manager is responsible for consistently conducting a reserve analysis to evaluate the remaining uncertainty on the project as compared to the amount of contingency budget reserve and time buffers. Theoretically, a project is a risk-declining model, and as such, the need for contingency time and money should decrease as the project progresses.

Any contingency funds that were applied to a risk event that is now obsolete should be reallocated back to the organization, as there is an opportunity cost if the project holds those funds unnecessarily. This may be one of those situations in which real life appears to contradict the PMI way of thinking. Typically, a project manager may actually prefer to hold onto any allocated contingency for future risk events rather than giving it back to the organization. On the exam, be sure to align with the PMI way of thinking!

Management Reserve

A management reserve is a funding allocation established for the overall project, above and beyond contingency reserves. Managed and controlled by the project sponsor, the management reserve is allocated for "unknown-unknown" risks, risks that have not yet been identified, major scope changes that are unexpectedly required, etc. The management reserve is the means for addressing emergent risks.

Unlike contingency reserves, management reserves are not based on known risks. Because of this, there is no way to predict the need for a management reserve based on the current project's information. However, past project experience may yield data and provide guidance on the possible extent of unanticipated risk exposure.

A management reserve is not included in the cost baseline but is considered part of the overall project budget. If the project manager needs to use the management reserve, they would need to seek approval from the sponsor or owner of the project. Not all organizations use management reserves.

Risk Management Planning

The objective of risk management planning is to determine the overall risk management strategy and integrate project risk management with all other project management activities. The risk management plan establishes guidelines for escalating risk-related information, promotes a common understanding of the risk terms and definitions, establishes the type and level of risk detail to be addressed, and determines the appropriate communication protocols both within the team and between the project team and the other stakeholders.

The process of planning risk management should begin as soon as a project is conceived and should be completed early during project planning. However, it is also critical that risk management planning is revisited throughout the project, specifically when there are changes in the environment, realized risks, or other impacts.

Project teams hold planning meetings to develop the risk management plan. Attendees at these meetings may include the project manager, selected project team members and stakeholders, and anyone else in the organization with the responsibility of managing risk planning and execution activities.

In developing the risk management plan, the project manager and attendees consider the budget, resources, and time allocations for risk management activities and determine the success criteria for risk management. Success criteria should include both project-related criteria, such as cost, time, and scope, and process-related criteria, depending on the inherent level of uncertainty in the project.

To be successful, the organization should be committed to addressing risk management proactively and consistently throughout the project. A conscious choice must be made at all levels of the organization to actively identify and pursue effective risk management during the life of the project.

Common Risk Management Errors

Below are some common risk management errors to be aware of, as documented in the *Practice Standard for Project Risk Management*.

1. Risk identification is completed without knowing enough about the project.
2. Project risk is evaluated using only a questionnaire, interview, or Monte Carlo analysis and thus does not provide specific risks.
3. Risk identification ends too soon, resulting in a brief list rather than extensive list of risks.
4. The risks identified are general rather than specific. This makes it extremely difficult to implement effective risk management responses or address root causes.
5. Some things considered to be risks are not uncertain but are facts and are therefore not risks.
6. Whole categories of risks are missed, such as technology, cultural, or marketplace.
7. Only one method is used to identify risks rather than a combination of methods. A combination helps ensure that more risks are identified.
8. The first risk response strategy identified is selected without looking at other options and finding the best option or combination of options.
9. Risk management is not given enough attention during project execution but is rather thought of as a simple planning activity conducted early in the project.
10. Project managers do not explain the risk management process to their team during project planning.
11. Contracts are signed before risks to the project are discussed. This occurs frequently when there is a sales team responsible for closing a deal as quickly as possible. This leaves the project team to deal with the project risks after the fact.

Exercise: Risk Errors

1. Of these common risk errors, how many have you encountered in your project risk management experience?

2. What errors listed above would you consider the most "dangerous" to a project?

3. For one of the errors you identified in #2, explain how you would identify that the error is occurring or has occurred.

4. How would you address the same error you identified above?

Critical Success Factors

Critical success factors for risk management planning include:

Procedural and Policy Compliance

Any rules and guidelines identified for risk management must be compatible with the organization's culture, stakeholder perspectives, and the organization's goals, values, and objectives.

Stakeholder Involvement

Involvement is necessary not only to leverage stakeholders' expertise and experience but also to ensure understanding and commitment to the agreed-upon risk management processes.

Barrier Identification

For risk management to be successful, buy-in and support are necessary from both the stakeholders and the organization. The project manager should proactively identify and address any barriers to risk management.

Organizational Assets

The following organizational assets will increase the chance of risk management success.

- Predefined risk categories
- Established project management methodology
- Standard templates
- Defined roles, responsibilities, and authority levels
- Project documentation

Plan Risk Management Process

The Plan Risk Management process is conducted early in the project with the intention of developing the risk management plan. According to the *PMBOK® Guide*, the Plan Risk Management inputs, tools and techniques, and outputs are:

Plan Risk Management: Inputs, Tools and Techniques, and Outputs

Inputs	Tools and Techniques	Outputs
1. Project management plan	1. Analytical techniques	1. Risk management plan
2. Project charter	2. Expert judgment	
3. Stakeholder register	3. Meetings	
4. Enterprise environmental factors		
5. Organizational process assets		

Figure 4-1: Plan Risk Management ITTOs

PMBOK® Guide, page 313

Plan Risk Management: Inputs

While the *PMBOK® Guide* is not a methodology, there are three documents that PMI states that every project must have: a project management plan, a project charter, and a scope statement.

Project Management Plan

The project management plan provides direction and instruction to the project team regarding how the project will be managed, executed, controlled, and closed. The project management plan may be summary or detailed, depending on the context of the project and the environment.

The project management plan may contain one or more subsidiary plans. Subsidiary plans provide additional information or details regarding a specific area of focus, such as the scope management plan, quality management plan, or communication management plan.

In addition, the project management plan contains the project baselines, which are the scope baseline, schedule baseline, and cost baseline. These baselines are the intended results of the project and can be considered the "frozen" measuring sticks by which the project's progress can be monitored and measured. Variances from the baseline give the project manager and team insight into the health and technical risk exposure of the project.

Because the intention of the project baselines is to measure the progress and health of the project, the only time they should be modified or updated is when there is a significant authorized change to the project scope.

The reason PMI considers the project management plan mandatory ties in to project risk management. Because the project management plan is a "how-to" guide for the project, it provides some level of redundancy for the project and the organization. Should the project manager or a key team member leave, someone else could theoretically step in and take over the project by leveraging the project management plan.

From a risk management perspective, the risk management plan is the subsidiary plan that documents how risk will be managed for the project. Failing to create a risk management plan during the development of the project management plan makes it difficult to conduct future project risk management processes successfully.

Project Charter

Another mandatory document, the project charter formally authorizes the project and details the business needs that the new product, service, or result will satisfy. The charter is signed by the sponsor and provides the project manager with the authority to use organizational resources for project activities. Depending on the organization and the project, the project manager may be assigned before or after the project is chartered.

The charter links the project to the ongoing work and strategic plan of the organization. It is not continually updated throughout the project or iteratively developed as other project documents are.

The project charter may include such information as:

- Project justification, measureable objectives, and success criteria
- High-level requirements, project description, and risks
- Summary milestone schedule and budget
- Project approval requirements, including what constitutes success, who decides whether the project is a success, and who is to sign off on the project once it is completed
- Project manager assignment (if the PM has been assigned), responsibility, and level of authority
- Project sponsor name and level of authority

Stakeholder Register

The stakeholder register contains pertinent information on each of the stakeholders, such as their identification information, major requirements, main expectations, and potential influence, as well as a classification of them as internal/external, supporter/neutral/resistor, etc.

The stakeholder register is used to identify stakeholders who should be involved with risk management planning and should participate in the risk planning meetings. Because this is not risk identification, not all stakeholders will be involved.

Enterprise Environmental Factors

Enterprise environmental factors are internal and external factors that can influence a project's success, including:

- Organizational culture
- Organizational structure
- Internal and external political climate
- Existing human resources
- Available capital resources
- Regulatory environment
- Financial and market conditions

These factors are things that we must consider and assess as to how they will impact the project. For example, when planning project risk management, it is important to consider the organizational culture. Is the culture risk-averse, risk-neutral, risk-tolerant, or risk-seeking? What are the risk characteristics of the industry? What resources are available that can be applied to project risk management?

Organizational Process Assets

Organizational process assets include any of the organization's assets that may be used to enable project success. Leveraging organizational process assets typically increases your efficiency as a project manager. Organizational process assets generally fall into two categories:

- Processes, guidelines, and procedures
  - Organizational standard processes
  - Standardized guidelines
  - Templates
- The corporate knowledge base
  - Lessons learned
  - Historical information
  - Past project files

For example, for planning risk management, organizational process assets that could be used include a project risk management plan template, organizational definitions of risk probability and impact, a risk breakdown structure template, past project files, other historical information that reveals how risk management was implemented on past projects, etc.

Plan Risk Management: Tools and Techniques

Planning meetings and analysis are the primary techniques used for planning risk management, and these techniques encompass the three *PMBOK® Guide* tools and techniques: analytical techniques, expert judgment, and meetings.

Planning Meetings and Analysis

Participants in the planning meetings may include:

- Project manager
- Selected project team members
- Selected stakeholders
- Members of the organization with risk responsibility
- Subject matter experts
- Facilitators

Objectives of the planning meetings are to establish:

- Methodology
- Templates
- Roles and responsibilities
- Terms and definitions
- Schedules and budgets

These planning meetings involve certain key team members in the process, increasing engagement and buy-in. The participants' past experience and knowledge are taken into consideration and evaluated as relative, timely, and comprehensive. If there are gaps in the participants' experience and/or knowledge, it may be necessary to augment the group with outside experts, if available.

Plan Risk Management: Output

Risk Management Plan

The risk management plan, a subsidiary plan to the project management plan, includes information on the stakeholders, planning processes, project tools, and metrics, and it states the standards and objectives for risk management for the project.

The risk management plan may be developed generally for projects in an organization, but each specific project has some unique risk elements that should be reflected.

A risk management plan should include the following components.

- Project description – Documents the project objectives, the external dependencies, and the results of the stakeholder analysis
- Risk management scope and objectives – May include variance thresholds and prioritization of the project objectives
- Methodology – Defines the approaches, tools, and data sources that may be used to perform risk management on the project and includes the key risk deliverables
- Roles and responsibilities – Defines the lead, support, and risk management team members for each type of activity in the risk management plan and clarifies their responsibilities, determines the rules of escalation, and outlines the governance-related rules for reporting and disclosures
- Budgeting – Assigns resources, estimates funds needed for risk management for inclusion in the cost performance baseline, and establishes protocols for the application of the contingency reserve
- Timing – Determines when and how often the risk management process will be performed during the project life cycle, establishes protocols for the application of the schedule contingency reserve, and establishes risk management activities to be included in the project schedule

- Definitions of risk probability and impact – Tailors general definitions of probability levels and impact levels to the individual project and defines different levels of the risks' probabilities and impacts

Defined Conditions for Impact Scales of a Risk on Major Project Objectives
(Examples are shown for negative impacts only)

Project Objective	Relative or numerical scales are shown				
	Very low .05	Low .10	Moderate .20	High .40	Very High .80
Cost	Insignificant cost increase	<10% cost increase	10-20% cost increase	20-40% cost increase	>40% cost increase
Time	Insignificant time increase	<5% time increase	5-10% time increase	10-20% time increase	>20% time increase
Scope	Scope decrease barely noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item is effectively useless
Quality	Quality degradation barely noticeable	Only very demanding applications are affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item is effectively useless

This table presents examples of risk impact definitions for four different project objectives. They should be tailored in the Risk Management Planning process to the individual project and to the organization's risk thresholds. Impact definitions can be developed for opportunities in a similar way.

Figure 4-2: Risk Impact Definitions

PMBOK® Guide, page 318

- Risk categories – Provides a structure that ensures a comprehensive process with a consistent level of detail for systematically identifying risks and contributes to the effectiveness and quality of the risk identification process
    - An organization can use a previously prepared categorization framework. This might take the form of a simple list of categories or might be structured into a risk breakdown structure (RBS). A RBS is a hierarchically organized depiction of identified project risks arranged by risk categories and subcategories that identifies the various areas and causes of potential risks.
- Probability and impact matrix – Prioritizes risks according to their potential effects on the project's objectives
    - A typical approach to prioritizing risks is to use a probability and impact matrix. The specific combinations of probability and impact that lead to a risk being rated as of high, moderate, or low importance are usually established by the organization.

Probability	Threats					Opportunities				
0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05	0.10	0.20	0.40	0.80	0.80	0.40	0.20	0.10	0.05
Impact (numerical scale) on an objective (e.g.. cost, time, scope, or quality)										
Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate, or high risks are shown in the matrix and will determine whether the risk is scored as low, moderate, or high for that objective.										

Figure 4-3: Probability and Impact Matrix

PMBOK® Guide, page 331

- Stakeholders' risk tolerances – Provides documentation regarding the stakeholders' risk tolerances as they pertain to this particular project
- Reporting formats – Defines how the outcomes of the risk management process will be documented, analyzed, and communicated and describes the content and format of the risk register, as well as any other risk reports required
    - A common problem found in standard reporting templates is field size limitations on what is reported. For example, a typical template may ask for the top five risks and top five issues for that period. However, stakeholder communication must be based on what is important to convey that particular period, and for one week, this may include three risks, but the next week it may include twelve. Limiting reporting is not appropriate. This may be a question on the exam!
- Tracking – Notes how risk activities will be recorded for the benefit of the current project, for future needs, and for lessons learned, as well as whether and how risk management processes will be audited