

Risk Management

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What is Risk?

- Definition
 - An uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives.

Project Risk Management

- Risk Management Planning
- Risk Identification
- Risk Analysis
- Risk Response Planning
- Risk Monitoring and Control

Risk Management Planning

- The process of deciding how to approach and conduct the risk management activities for a project.
- Risk Plan
 - Methodology
 - Roles and Responsibilities
 - Timing
 - Risk Categories
 - Definitions of Risk Probability and Impact
 - Probability and Impact Matrix
 - Reporting Formats
 - Tracking

Risk Identification

- The process of determining which risks might affect the project and documenting their characteristics.
 - Bottoms Up and Top Down.
 - Review the schedule activities and identify what events that could occur that would impact the completion of the activity in time and/or cost.
 - Identify the triggers that will indicate that a risk event has occurred or is likely to occur.
 - Record in Risk Register
 - Performed throughout the project lifecycle

Risk Analysis

- Qualitative Risk Analysis – The process of prioritizing risks for subsequent further analysis or action by assessing and combining their probability of occurrence and impact.
- Quantitative Risk Analysis – The process of numerically analyzing the effect on the overall project objectives of the identified risks.

(The above two analysis can be done together or separately) Some tools that can be used are Probability-Impact Matrix, Sensitivity Analysis, Decision Tree Analysis and Simulations (Monte Carlo)

Techniques for Risk Analysis

- Identify the impact to the project if a risk would occur.
- Identify the probability that a risk might occur.
- Base on the product of these two factors you determine if additional actions are required.

Impact Factors

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 11-5. Definition of Impact Scales for Four Project Objectives

PMBOK Guide – Third Edition

Probability and Impact Matrix

Probability and Impact Matrix

Probability	Threats					Opportunities				
	0.05	0.10	0.20	0.40	0.80	0.80	0.40	0.20	0.10	0.05
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 (ratio 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 threshold for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

Risk Response Planning

- The process of developing options and actions to enhance opportunities and to reduce threats to the project objectives.
 - Identify what actions can be taken to increase the likelihood of a positive risk occurring or to reduce/eliminate a negative risk event from occurring.
 - The following are different strategies that can be applied to a risk response
 - Avoidance - Change the project plan to eliminate the risk event.
 - Transference - Shift the consequence of a risk to a third party, usually by contracts. Insurance, options, guarantees, and fixed prices are examples.
 - Mitigation - Reduce the probability or consequences of an adverse risk event
 - Acceptance - Decide not to change the project plan and live with the risk
 - Adding Contingency \$ is not the only response.

Risk Monitoring and Control

- The Process of tracking identified risks, monitoring residual risks, identifying new risks, executing risk response plans, and evaluating their effectiveness throughout the project life cycle.
 - This is an ongoing process that is updated and maintained by the Project Management Team.
 - The repository of the risks and actions is maintained in a database (Risk Register).
 - Risk Register – The document containing the results of the qualitative risk analysis, quantitative risk analysis, and risk response planning. The risk register details all identified risks, including description, category, cause, probability of occurring, impact(s) on objectives, proposed responses, owners, and current status.

DOE M 413.3-1 Excerpts:

2.3 RISK MANAGEMENT

Effective risk management is an essential element of every project. The DOE risk management concept is based on the principles that risk management must be analytical, forward-looking, structured, informative, and continuous. Risk assessments should be performed as early as DOE M 413.3-1 2-7 3-28-03 and cost risks. Once risks are identified, sound risk mitigation strategies and actions should be developed and documented. As a project progresses, new information improves additional insight into risk areas and allows the continuous refinement of the risk mitigation strategies. Risk mitigation plans should not use contingency as the only mitigation strategy. They should be primarily focused on reduction and prevention risks, not on the resultant cost should a specific risk occur. Effective risk management requires involvement of the entire project team. The project team may be augmented, if necessary, by outside experts knowledgeable in critical risk areas such as technology, design, and cost, to assist in risk identification and assessment. In addition, the risk management process must address every element of the project throughout all phases of the project. It is important that all stakeholders participate in the assessment process so that an acceptable balance between cost, schedule, performance, and risk can be reached. A close relationship between the Federal project management staff and the contractor promotes a better understanding of program risks and assists in developing and executing the management efforts. Risk management shall be performed on all projects throughout the project life cycle. A formal Risk Management Plan is required for all Major System projects and for other projects having significant risk as determined by the Acquisition Executive. For projects where a formal Risk Management Plan is not required, the plan for managing and mitigating risks must be addressed in the Project Execution Plan.

DOE M 413.3-1

Excerpts: (cont.)

CHAPTER 14. RISK MANAGEMENT

14.3 RISK MANAGEMENT PROCESS

There are four key functions that comprise the risk management process.

- Planning – The process of developing and documenting an organized, comprehensive, and interactive strategy, as well as methods for identifying and tracking risk areas, developing risk handling plans, performing continuous risk assessments to determine how risks have changed, and assigning adequate resources.
- Assessment (includes risk identification and analysis) - Should be deliberately performed prior to each phase, assessing the risks must be a continuous conscious, activity as the project evolves.
- Handling - For each identified risk, the risk handling strategy is formulated to ensure that the necessary actions are being developed and implemented.
- Monitoring – Risk Reporting, Tracking and Closeout
 - Risk reporting involves documenting risk identification, risk quantification, risk handling strategies, impact determination, and risk closeout.
 - Risk tracking involves monitoring action items from risk handling strategies/responses, identifying a need to evaluate new risks, and re-evaluating changes to previous risks.
 - Risk closeout is assigning risk associated action items to a responsible individual and identifying a completion date.

DOE M 413.3-1 Excerpts: (cont.)

14.5 RISK MANAGEMENT PLAN

The Risk Management Plan is the road map that tells the Federal and contractor team within the risk environment how to effectively implement a new capital asset that meets the mission need. The key to writing a good plan is to provide the necessary information so the Integrated Project Team understands the objectives, goals, and the risk management process. Since it is a map, it may be specific in some areas, such as the assignment of responsibilities for Government and contractor participants and definitions, and general in other areas to allow users to choose the most efficient way to proceed. For example, a description of techniques that suggests several methods for evaluators to use to assess risk is appropriate, since every technique has advantages 14-14 DOE M 413.3-1 3-28-03 Risk Management Plans often erroneously contain just process information on how the project intends to perform risk management. The Risk Management Plan should contain plan for managing specific project risks that were identified and assessed as part of the risk management process. The plan should identify those specific risks and articulate specific plans to handle the risk whether the chosen method for a specific risk is avoiding the risk, pursuing alternative technologies, second sourcing, or additional research and development. The plan is intended to be specific for that project and those identified risks. The contents of the Risk Management Plan should address the following topics. The list is not all inclusive and only provides the top level topics.

- Introduction
- Project summary
- Definitions
- Identified risks and analysis
- Occurrence and impact determination
- Management approach and strategy
- Responsibilities
- Process and procedures

Summary

- Identifying and managing risk is important to project success.
- Risk Management is an ongoing process throughout the life of a project.