Project Management Professional (PMP)

Section (11)
Project Risk Management

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PMBOK 5th. Edition

Project Risk Management

- The processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project.
  - The objectives of project risk management are to:
    - Increase the likelihood and impact of positive events.
    - Decrease the likelihood and impact of negative events.

Project Risk Management

- The Project Risk Management processes, which are as follows:
  - 11.1 Plan Risk Management
  - 11.2 Identify Risks
  - 11.3 Perform Qualitative Risk Analysis
  - 11.4 Perform Quantitative Risk Analysis
  - 11.5 Plan Risk Responses
  - 11.6 Control Risks

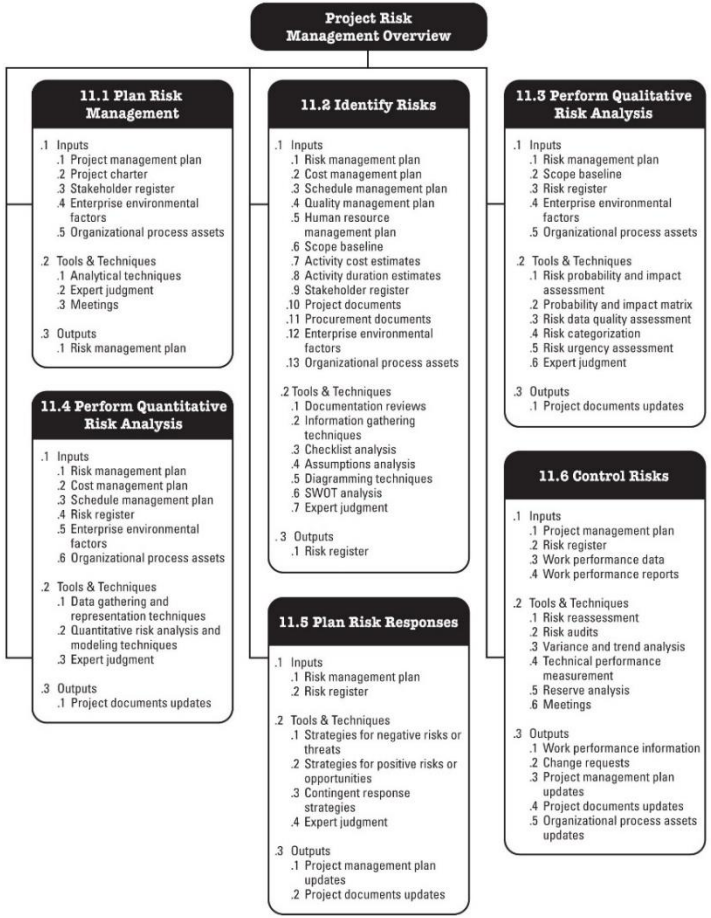

Figure 11-1. Project Risk Management Overview

Plan Risk Management

- The process of defining how to conduct risk management activities for a project.
  - The key benefit of this process is:
    - It ensures that the degree, type, and visibility of risk management are commensurate with both the risks and the importance of the project to the organization.

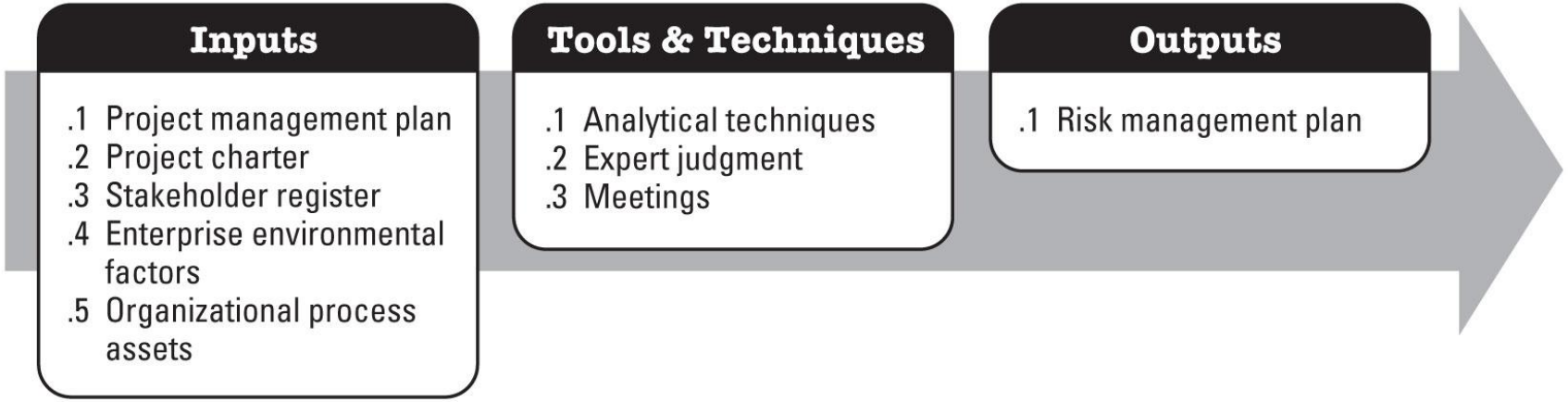

Figure 11-2. Plan Risk Management: Inputs, Tools & Techniques, and Outputs

11.1.1 Plan Risk Management: Inputs

- 11.1.1.1 Project Management Plan
- 11.1.1.2 Project Charter (Out: 4.1)
- 11.1.1.3 Stakeholder Register (Out: 13.1)
- 11.1.1.4 Enterprise Environmental Factors (Out: 2.1.5)
- 11.1.1.5 Organizational Process Assets (Out: 2.1.4)

11.1.1 Plan Risk Management: Inputs

- 11.1.1.1 Project Management Plan
  - In planning risk management
    - All approved subsidiary management plans and baselines should be taken into consideration in order to make the risk management plan consistent with them.
    - The risk management plan is also a component of the project management plan.
    - The project management plan provides baseline or current state of risk-affected areas including scope, schedule, and cost.

11.1.1 Plan Risk Management: Inputs

- 11.1.1.2 Project Charter (Out: 4.1)
  - The project charter can provide various inputs such as high-level risks, high-level project descriptions, and high-level requirements.

- 11.1.1.3 Stakeholder Register (Out: 13.1)
  - The stakeholder register, which contains all details related to the project's stakeholders, provides an overview of their roles.

11.1.1 Plan Risk Management: Inputs

- 11.1.1.4 Enterprise Environmental Factors (Out: 2.1.5)
  - The enterprise environmental factors that can influence the Plan Risk Management process include, but are not limited to, risk attitudes, thresholds, and tolerances that describe the degree of risk that an organization will withstand.

11.1.1 Plan Risk Management: Inputs

- 11.1.1.5 Organizational Process Assets (Out: 2.1.4)
  - The organizational process assets that can influence the Plan Risk Management process include:
    - Risk categories.
    - Common definitions of concepts and terms.
    - Risk statement formats.
    - Standard templates.
    - Roles and responsibilities.
    - Authority levels for decision making.
    - Lessons learned.

11.1.2 Plan Risk Management: Tools and Techniques

- 11.1.2.1 Analytical Techniques
- 11.1.2.2 Expert Judgment
- 11.1.2.3 Meetings

11.1.2 Plan Risk Management: Tools and Techniques

- 11.1.2.1 Analytical Techniques
  - Analytical techniques are used to understand and define the overall risk management context of the project.
  - Risk management context is a combination of stakeholder risk attitudes and the strategic risk exposure of a given project based on the overall project context.

11.1.2 Plan Risk Management: Tools and Techniques

- 11.1.2.2 Expert Judgment
  - To ensure a comprehensive establishment of the risk management plan, judgment and expertise should be considered from groups or individuals with specialized training or knowledge on the subject area, such as:
    - Senior management.
    - Project stakeholders.
    - Project managers who have worked on projects in the same area (directly or through lessons learned).
    - Subject matter experts (SMEs) in business or project area.
    - Industry groups and consultants.
    - Professional and technical associations.

11.1.2 Plan Risk Management: Tools and Techniques

- 11.1.2.3 Meetings
  - Project teams hold planning meetings to develop the risk management plan.
  - High-level plans for conducting the risk management activities are defined in these meetings.

11.1.3 Plan Risk Management: Outputs

- 11.1.3.1 Risk Management Plan
  - The risk management plan is a component of the project management plan and describes how risk management activities will be structured and performed.
  - The risk management plan includes the following:
    - Methodology
    - Budgeting
    - Risk categories
    - Probability and impact matrix.
    - Reporting formats
    - Roles and responsibilities
    - Timing
    - Definitions of risk probability and impact
    - Revised stakeholders' tolerances.
    - Tracking

11.2 Identify Risks

- The process of determining which risks may affect the project and documenting their characteristics.
  - The key benefit of this process is:
    - The documentation of existing risks and the knowledge and ability it provides to the project team to anticipate events.

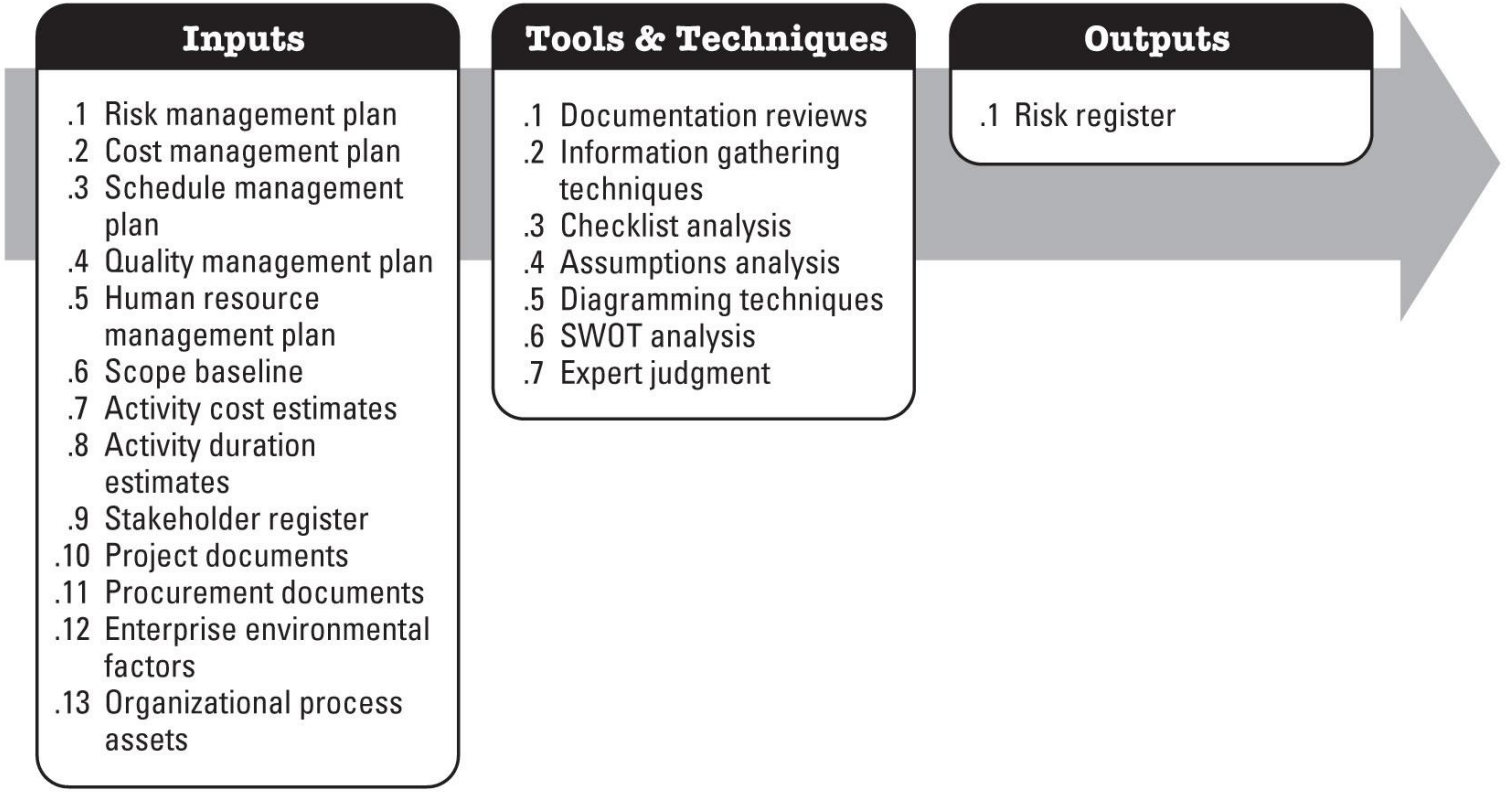

Figure 11-5. Identify Risks: Inputs, Tools & Techniques, and Outputs

11.2.1 Identify Risks: Inputs

- 11.2.1.1 Risk Management Plan (Out: 11.1)
- 11.2.1.2 Cost Management Plan (Out: 7.1)
- 11.2.1.3 Schedule Management Plan (Out: 6.1)
- 11.2.1.4 Quality Management Plan (Out: 8.1)
- 11.2.1.5 Human Resource Management Plan (Out: 9.1)
- 11.2.1.6 Scope Baseline (Out: 5.4)
- 11.2.1.7 Activity Cost Estimates (Out: 7.2)

11.2.1 Identify Risks: Inputs

- 11.2.1.8 Activity Duration Estimates (Out: 6.5)
- 11.2.1.9 Stakeholder Register (Out: 13.1)
- 11.2.1.10 Project Documents
- 11.2.1.11 Procurement Documents (Out: 12.1)
- 11.2.1.12 Enterprise Environmental Factors (Out: 2.1.5)
- 11.2.1.13 Organizational Process Assets (Out: 2.1.4)

11.2.1 Identify Risks: Inputs

- 11.2.1.1 Risk Management Plan (Out: 11.1)
  - Key elements of the risk management plan that contribute to the Identify Risks process are the assignments of roles and responsibilities, provision for risk management activities in the budget and schedule, and categories of risk, which are sometimes expressed as a risk breakdown structure (Figure 11-4).

11.2.1 Identify Risks: Inputs

- 11.2.1.2 Cost Management Plan (Out: 7.1)
  - The cost management plan provides processes and controls that can be used to help identify risks across the project.

- 11.2.1.3 Schedule Management Plan (Out: 6.1)
  - The schedule management plan provides insight to project time/schedule objectives and expectations which may be impacted by risks (known and unknown).

11.2.1 Identify Risks: Inputs

- 11.2.1.4 Quality Management Plan (Out: 8.1)
  - The quality management plan provides a baseline of quality measures and metrics for use in identifying risks.

- 11.2.1.5 Human Resource Management Plan (Out: 9.1)
  - The human resource management plan provides guidance on how project human resources should be defined, staffed, managed, and eventually released.

11.2.1 Identify Risks: Inputs

- 11.2.1.6 Scope Baseline (Out: 5.4)
  - Project assumptions are found in the project scope statement.
  - Uncertainty in project assumptions should be evaluated as potential causes of project risk.
  - The WBS is a critical input to identifying risks as it facilitates an understanding of the potential risks at both the micro and macro levels. Risks can be identified and subsequently tracked at summary, control account, and/or work package levels.

11.2.1 Identify Risks: Inputs

- 11.2.1.7 Activity Cost Estimates (Out: 7.2)
  - Activity cost estimate reviews are useful in identifying risks as they provide a quantitative assessment of the likely cost to complete scheduled activities and ideally are expressed as a range, with the width of the range indicating the degree(s) of risk.

- 11.2.1.8 Activity Duration Estimates (Out: 6.5)
  - Activity duration estimate reviews are useful in identifying risks related to the time allowances for the activities or project as a whole, again with the width of the range of such estimates indicating the relative degree(s) of risk.

11.2.1 Identify Risks: Inputs

- 11.2.1.9 Stakeholder Register (Out: 13.1)
  - Information about the stakeholders is useful for soliciting inputs to identify risks, as this will ensure that key stakeholders, especially the stakeholder, sponsor, and customer are interviewed or otherwise participate during the Identify Risks process.

11.2.1 Identify Risks: Inputs

- 11.2.1.10 Project Documents
  - Project documents provide the project team with information about decisions that help better identify project risks. Project documents improve cross-team and stakeholder communications and include:
    - Project charter.
    - Project schedule.
    - Schedule network diagrams.
    - Issue log.
    - Quality checklist.
    - Other information proven to be valuable in identifying risks.

11.2.1 Identify Risks: Inputs

- 11.2.1.11 Procurement Documents (Out: 12.1)
  - If the project requires external procurement of resources, procurement documents become a key input to the Identify Risks process.

11.2.1 Identify Risks: Inputs

- 11.2.1.12 Enterprise Environmental Factors (Out: 2.1.5)
  - Enterprise environmental factors that can influence the Identify Risks process include:
    - Published information, including commercial databases.
    - Academic studies.
    - Published checklists.
    - Benchmarking.
    - Industry studies.
    - Risk attitudes.

11.2.1 Identify Risks: Inputs

- 11.2.1.13 Organizational Process Assets (Out: 2.1.4)
  - Organizational process assets that can influence the Identify Risks process include:
    - Project files, including actual data.
    - Organizational and project process controls.
    - Risk statement formats or templates.
    - Lessons learned.

11.2.2 Identify Risks: Tools and Techniques

- 11.2.2.1 Documentation Reviews
- 11.2.2.2 Information Gathering Techniques
- 11.2.2.3 Checklist Analysis
- 11.2.2.4 Assumptions Analysis
- 11.2.2.5 Diagramming Techniques
- 11.2.2.6 SWOT Analysis
- 11.2.2.7 Expert Judgment

11.2.2 Identify Risks: Tools and Techniques

- 11.2.2.1 Documentation Reviews
  - A structured review of the project documentation may be performed, including plans, assumptions, previous project files, agreements, and other information.
  - The quality of the plans, as well as consistency between those plans and the project requirements and assumptions, may be indicators of risk in the project.

11.2.2 Identify Risks: Tools and Techniques

- 11.2.2.2 Information Gathering Techniques
  - Brainstorming
  - Delphi technique
  - Interviewing
  - Root cause analysis

11.2.2 Identify Risks: Tools and Techniques

- 11.2.2.3 Checklist Analysis
  - Risk identification checklists are developed based on historical information and knowledge that has been accumulated from previous similar projects and from other sources of information.

- 11.2.2.4 Assumptions Analysis
  - Every project and its plan is conceived and developed based on a set of hypotheses, scenarios, or assumptions.

11.2.2 Identify Risks: Tools and Techniques

- 11.2.2.5 Diagramming Techniques
  - Risk diagramming techniques may include:
    - **Cause and effect diagrams**
      - These are also known as **Ishikawa** or **fishbone diagrams** and are useful for identifying causes of risks.
    - **System or process flow charts**
      - These show how various elements of a system interrelate and the mechanism of causation.
    - **Influence diagrams (Decision diagram or Decision network)**
      - These are graphical representations of situations showing causal influences, time ordering of events, and other relationships among variables and outcomes.

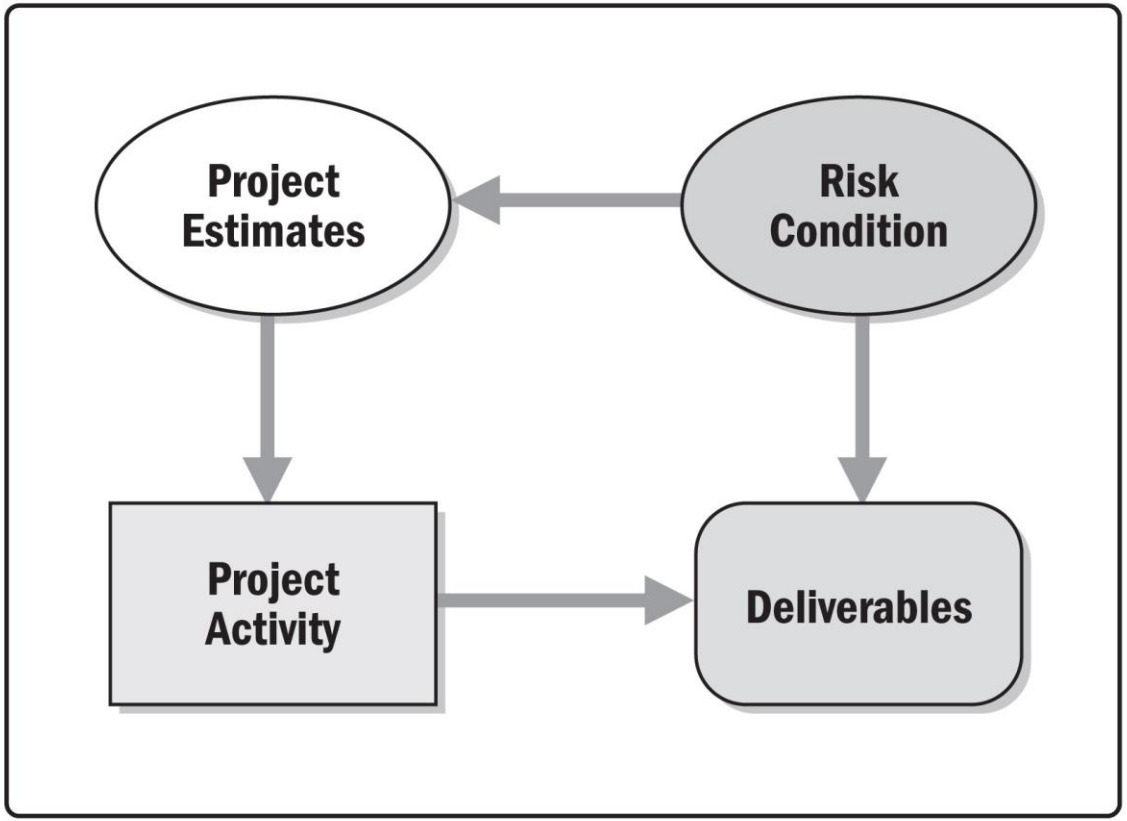

Figure 11-7. Influence Diagram

11.2.2 Identify Risks: Tools and Techniques

- 11.2.2.6 SWOT Analysis
  - This technique examines the project from each of the strengths, weaknesses, opportunities, and threats (SWOT) perspectives to increase the breadth of identified risks by including internally generated risks.

- 11.2.2.7 Expert Judgment
  - Risks may be identified directly by experts with relevant experience with similar projects or business areas.

11.2.3 Identify Risks: Outputs

- 11.2.3.1 Risk Register
  - The primary output from Identify Risks is the initial entry into the risk register.
  - The risk register is a document in which the results of risk analysis and risk response planning are recorded.
    - List of identified risks
    - List of potential responses

11.3 Perform Qualitative Risk Analysis

- The process of **prioritizing risks** for further analysis or action by assessing and combining their probability of occurrence and impact.

- The key benefit of this process is
  - It enables project managers to reduce the level of uncertainty and to focus on high-priority risks.

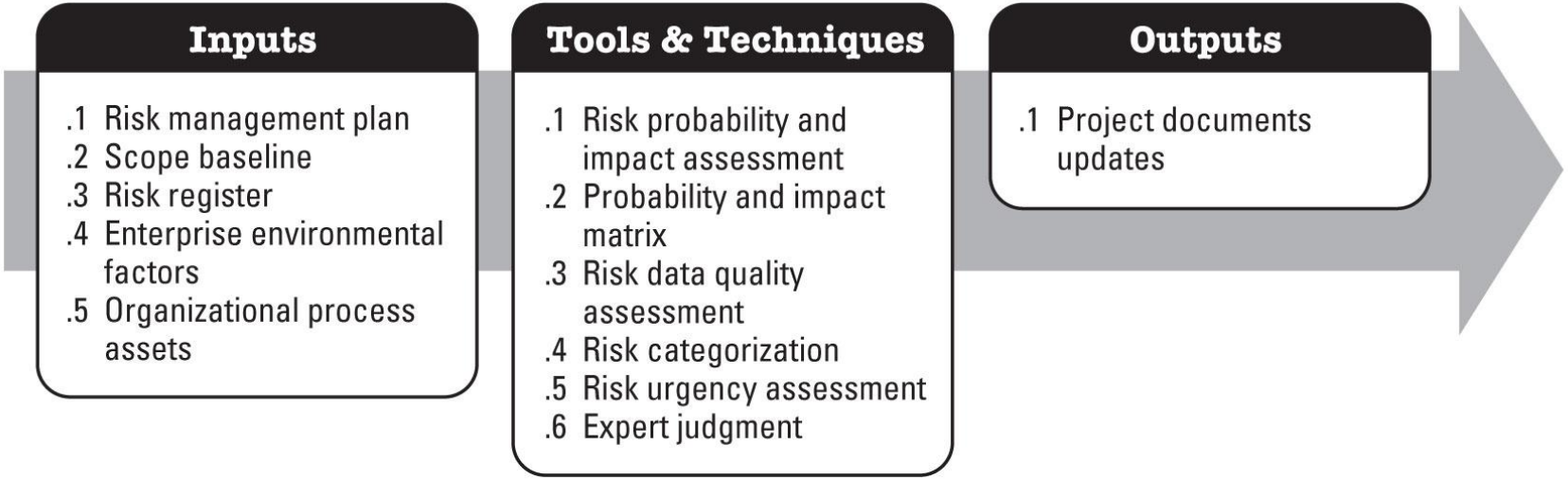

Figure 11-8. Perform Qualitative Risk Analysis: Inputs, Tools & Techniques, and Outputs

11.3.1 Perform Qualitative Risk Analysis: Inputs

- 11.3.1.1 Risk Management Plan (Out: 11.1)
- 11.3.1.2 Scope Baseline (Out: 5.4)
- 11.3.1.3 Risk Register (Out: 11.2)
- 11.3.1.4 Enterprise Environmental Factors (Out: 2.1.5)
- 11.3.1.5 Organizational Process Assets (Out: 2.1.4)

11.3.1 Perform Qualitative Risk Analysis: Inputs

- 11.3.1.1 Risk Management Plan (Out: 11.1)
  - Key elements of the risk management plan used in the Perform Qualitative Risk Analysis process include:
    - Roles and responsibilities for conducting risk management
    - Budgets
    - Schedule activities for risk management
    - Risk categories
    - Definitions of probability and impact
    - The probability and impact matrix
    - Revised stakeholders' risk tolerances

11.3.1 Perform Qualitative Risk Analysis: Inputs

- 11.3.1.2 Scope Baseline (Out: 5.4)
  - Projects of a common or recurrent type tend to have more well-understood risks.
  - Projects using state-of-the-art or first-of-its-kind technology, and highly complex projects, tend to have more uncertainty.
  - This can be evaluated by examining the scope baseline.

- 11.3.1.3 Risk Register (Out: 11.2)
  - The risk register contains the information that will be used to assess and prioritize risks.

11.3.1 Perform Qualitative Risk Analysis: Inputs

- 11.3.1.4 Enterprise Environmental Factors (Out: 2.1.5)
  - Enterprise environmental factors may provide insight and context to the risk assessment, such as:
    - Industry studies of similar projects by risk specialists.
    - Risk databases that may be available from industry or proprietary sources.

- 11.3.1.5 Organizational Process Assets (Out: 2.1.4)
  - The organizational process assets that can influence the Perform Qualitative Risk Analysis process include information on prior, similar completed projects.

11.3.2 Perform Qualitative Risk Analysis: Tools and Techniques

- 11.3.2.1 Risk Probability and Impact Assessment
- 11.3.2.2 Probability and Impact Matrix
- 11.3.2.3 Risk Data Quality Assessment
- 11.3.2.4 Risk Categorization
- 11.3.2.5 Risk Urgency Assessment
- 11.3.2.6 Expert Judgment

11.3.2 Perform Qualitative Risk Analysis: Tools and Techniques

- 11.3.2.1 Risk Probability and Impact Assessment
  - **Risk probability assessment**
    - Investigates the likelihood that each specific risk will occur.
  - **Risk impact assessment**
    - Investigates the potential effect on a project objective such as:
      - Schedule
      - Cost
      - Quality
      - Performance
      - Including both negative effects for threats and positive effects for opportunities.

11.3.2 Perform Qualitative Risk Analysis: Tools and Techniques

- 11.3.2.2 Probability and Impact Matrix
  - **Risks can be prioritized** for further quantitative analysis and planning risk responses based on their **risk rating**.
  - **Ratings are assigned** to risks based on their **assessed probability and impact**.

11.3.2 Perform Qualitative Risk Analysis: Tools and Techniques

- 11.3.2.3 Risk Data Quality Assessment
  - A technique to **evaluate the degree** to which the data about risks is useful for risk management.

- 11.3.2.4 Risk Categorization
  - Risks to the project can be categorized by:
    1. Sources of risk
    2. The area of the project affected
    3. Other useful categories

11.3.2 Perform Qualitative Risk Analysis: Tools and Techniques

- 11.3.2.5 Risk Urgency Assessment
  - Risks requiring near-term responses may be considered more urgent to address.
  - Indicators of priority may include:
    1. Probability of detecting the risk.
    2. Time to affect a risk response.
    3. Warning signs.
    4. The risk rating.

11.3.2 Perform Qualitative Risk Analysis: Tools and Techniques

- 11.3.2.6 Expert Judgment
  - Expert judgment is required to assess the probability and impact of each risk to determine its location in the matrix shown in Figure 11-10.
  - Experts generally are those having experience with similar, recent projects.
  - Gathering expert judgment is often accomplished with the use of risk facilitation workshops or interviews.
  - The experts' bias should be taken into account in this process.

11.3.3 Perform Qualitative Risk Analysis: Outputs

- 11.3.3.1 Project Documents Updates
  - Project documents that may be updated include:
    - Risk register updates.
    - Assumptions log updates.

11.4 Perform Quantitative Risk Analysis

- The process of **numerically** analyzing the effect of identified risks on overall project objectives.

  - The key benefit of this process is
    - It produces quantitative risk information to support decision making in order to reduce project uncertainty.

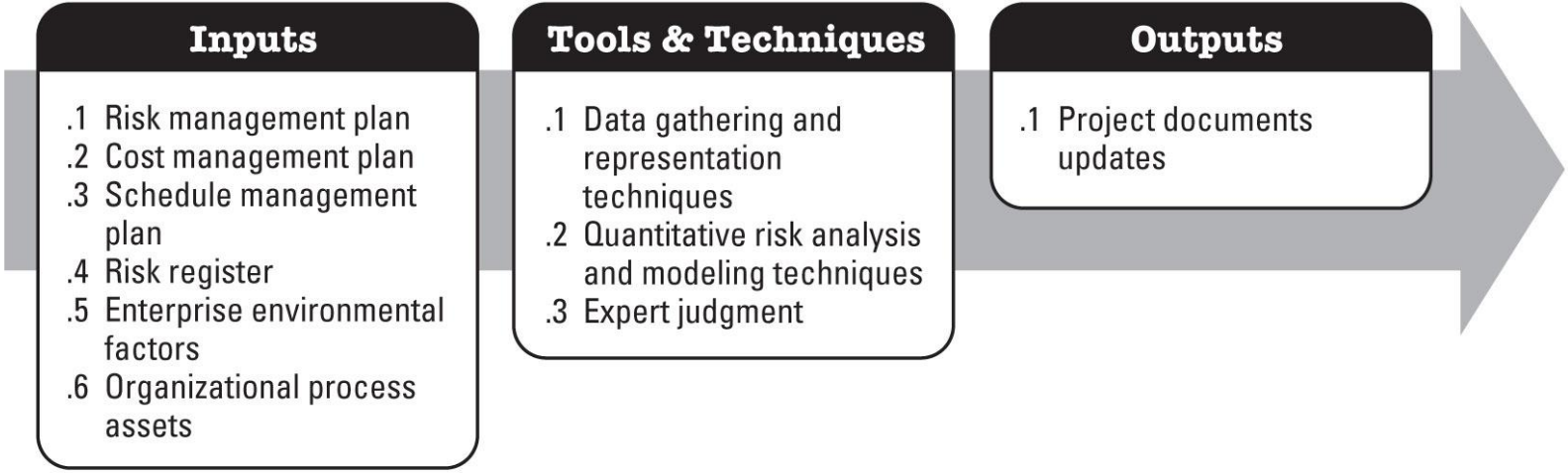

Figure 11-11. Perform Quantitative Risk Analysis: Inputs, Tools & Techniques, and Outputs

11.4.1 Perform Quantitative Risk Analysis: Inputs

- 11.4.1.1 Risk Management Plan (Out: 11.1)
- 11.4.1.2 Cost Management Plan (Out: 7.1)
- 11.4.1.3 Schedule Management Plan (Out: 6.1)
- 11.4.1.4 Risk Register (Out: 11.2)
- 11.4.1.5 Enterprise Environmental Factors (Out: 2.1.5)
- 11.4.1.6 Organizational Process Assets (Out: 2.1.4)

11.4.1 Perform Quantitative Risk Analysis: Inputs

- 11.4.1.1 Risk Management Plan (Out: 11.1)
  - The risk management plan provides guidelines, methods, and tools to be used in quantitative risk analysis.

- 11.4.1.2 Cost Management Plan (Out: 7.1)
  - The cost management plan provides guidelines on establishing and managing risk reserves.

11.4.1 Perform Quantitative Risk Analysis: Inputs

- 11.4.1.3 Schedule Management Plan (Out: 6.1)
  - The schedule management plan provides guidelines on establishing and managing risk reserves.

- 11.4.1.4 Risk Register (Out: 11.2)
  - The risk register is used as a reference point for performing quantitative risk analysis.

11.4.1 Perform Quantitative Risk Analysis: Inputs

- 11.4.1.5 Enterprise Environmental Factors (Out: 2.1.5)
  - Enterprise environmental factors may provide insight and context to the risk analysis, such as:
    - Industry studies of similar projects by risk specialists.
    - Risk databases that may be available from industry or proprietary sources.

- 11.4.1.6 Organizational Process Assets (Out: 2.1.4)
  - The organizational process assets that can influence the Perform Quantitative Risk Analysis process include information from prior, similar completed projects.

11.4.2 Perform Quantitative Risk Analysis: Tools and Techniques

- 11.4.2.1 Data Gathering and Representation Techniques
- 11.4.2.2 Quantitative Risk Analysis and Modeling Techniques
- 11.4.2.3 Expert Judgment

11.4.2 Perform Quantitative Risk Analysis: Tools and Techniques

11.4.2.1 Data Gathering and Representation Techniques

Interviewing

- Interviewing techniques draw on **experience and historical data to quantify the probability and impact of risks** on project objectives.
- The information needed depends upon the type of probability distributions that will be used.

Probability distributions

- Continuous probability distributions, which are used extensively **in modeling and simulation, represent the uncertainty in values** such as:
  - Durations of schedule activities.
  - Costs of project components.

11.4.2 Perform Quantitative Risk Analysis: Tools and Techniques

- 11.4.2.2 Quantitative Risk Analysis and Modeling Techniques
  - Commonly used techniques use both event-oriented and project-oriented analysis approaches, including:
    - Sensitivity analysis
      - Sensitivity analysis helps to determine which risks have the most potential impact on the project.
    - Expected monetary value analysis (EMV)
      - A statistical concept that calculates the average outcome when the future includes scenarios that may or may not happen (i.e., analysis under uncertainty).
    - Modeling and simulation
      - A project simulation uses a model that translates the specified detailed uncertainties of the project into their potential impact on project objectives.

11.4.2 Perform Quantitative Risk Analysis: Tools and Techniques

- 11.4.2.3 Expert Judgment
  - Expert judgment is required to identify potential cost and schedule impacts, to evaluate probability, and to define inputs such as probability distributions into the tools.
  - Expert judgment also comes into play in the interpretation of the data.
  - Experts should be able to identify the weaknesses of the tools as well as their strengths.
  - Experts may determine when a specific tool may or may not be more appropriate given the organization's capabilities and culture.

11.4.3 Perform Quantitative Risk Analysis: Outputs

- 11.4.3.1 Project Documents Updates
  - Project documents are updated with information resulting from quantitative risk analysis, For example:
    - Probabilistic analysis of the project
    - Probability of achieving cost and time objectives
    - Prioritized list of quantified risks
    - Trends in quantitative risk analysis results

11.5 Plan Risk Responses

- The process of **developing options and actions to enhance opportunities & to reduce threats** to project objectives.

  - The key benefit of this process is:
    - It addresses the risks by their priority, inserting resources and activities into the budget, schedule and project management plan as needed.

Figure 11-18. Plan Risk Responses: Inputs, Tools & Techniques, and Outputs

11.5.1 Plan Risk Responses: Inputs

- 11.5.1.1 Risk Management Plan
  - Important components of the risk management plan include:
    - Roles and responsibilities.
    - Risk analysis definitions.
    - Timing for reviews (and for eliminating risks from review).
    - Risk thresholds for low.
    - Moderate.
    - High risks.

11.5.1 Plan Risk Responses: Inputs

- 11.5.1.2 Risk Register
  - The risk register refers to:
    - identified risks
    - root causes of risks
    - lists of potential responses
    - risk owners
    - symptoms and warning signs
    - the relative rating or priority list of project risks
    - risks requiring responses in the near term
    - risks for additional analysis and response

11.5.2 Plan Risk Responses: Tools and Techniques

- 11.5.2.1 Strategies for Negative Risks or Threats
  - The four strategies for dealing with negative risks or threats are further described as follows:
    - Avoid.
    - Transfer.
    - Mitigate.
    - Accept.

11.5.2 Plan Risk Responses: Tools and Techniques

- 11.5.2.2 Strategies for Positive Risks or Opportunities
  - Three of the four responses are suggested to deal with risks with potentially positive impacts on project objectives.
  - The fourth strategy, accept, can be used for negative risks or threats as well as positive risks or opportunities, These strategies:
    - Exploit
    - Enhance
    - Share
    - Accept

11.5.2 Plan Risk Responses: Tools and Techniques

- 11.5.2.3 Contingent Response Strategies
  - Some responses are designed for use only if certain events occur.
  - Risk responses identified using this technique are often called contingency plans or fallback plans and include **identified triggering events that set the plans in effect.**

- 11.5.2.4 Expert Judgment
  - Expert judgment is input from knowledgeable parties pertaining to the actions to be taken on a specific and defined risk.

11.5.3 Plan Risk Responses: Outputs

- 11.5.3.1 Project Management Plan Updates
  - Elements of the project management plan that may be updated as a result of carrying out this process include:
    - Schedule management plan
    - Cost management plan
    - Quality management plan
    - Procurement management plan
    - Human resource management plan
    - Scope baseline
    - Schedule baseline
    - Cost baseline

11.5.3 Plan Risk Responses: Outputs

- 11.5.3.2 Project Documents Updates
  - In the Plan Risk Responses process, several project documents are updated as needed.
  - Risks judged to be of low priority are included in a watch list for periodic monitoring.

11.6 Control Risks

- The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

  - The key benefit of this process is:
    - It improves **efficiency** of the risk approach throughout the project life cycle to continuously optimize risk responses.

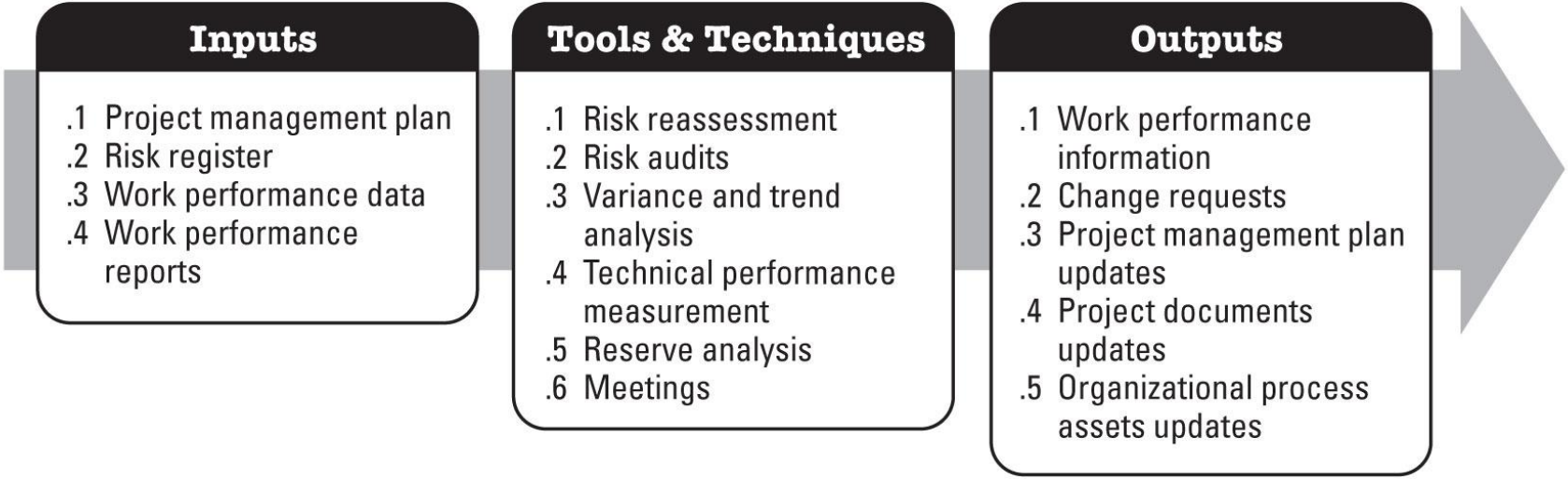

Figure 11-20. Control Risks: Inputs, Tools & Techniques, and Outputs

11.6.1 Control Risks: Inputs

- 11.6.1.1 Project Management Plan (Out: 4.2)
- 11.6.1.2 Risk Register (Out: 11.2)
- 11.6.1.3 Work Performance Data (Out: 4.3)
- 11.6.1.4 Work Performance Reports (Out: 4.4)

11.6.1 Control Risks: Inputs

- 11.6.1.1 Project Management Plan (Out: 4.2)
  - The project management plan, which includes the risk management plan, provides guidance for risk monitoring and controlling.

11.6.1 Control Risks: Inputs

- 11.6.1.2 Risk Register (Out: 11.2)
  - The risk register has key inputs that include identified risks and risk owners, agreed-upon risk responses, control actions for assessing the effectiveness of response plans, risk responses, specific implementation actions, symptoms and warning signs of risk, residual and secondary risks, a watch list of low-priority risks, and the time and cost contingency reserves.

11.6.1 Control Risks: Inputs

- 11.6.1.3 Work Performance Data (Out: 4.3)
  - Work performance data related to various performance results possibly impacted by risks includes:
    - Deliverable status.
    - Schedule progress.
    - Costs incurred.

11.6.1 Control Risks: Inputs

- 11.6.1.4 Work Performance Reports (Out: 4.4)
  - Work performance reports take information from performance measurements and analyze it to provide project work performance information including variance analysis, earned value data, and forecasting data.

11.6.2 Control Risks: Tools and Techniques

- 11.6.2.1 Risk Reassessment
- 11.6.2.2 Risk Audits
- 11.6.2.3 Variance and Trend Analysis
- 11.6.2.4 Technical Performance Measurement
- 11.6.2.5 Reserve Analysis
- 11.6.2.6 Meetings

11.6.2 Control Risks: Tools and Techniques

- 11.6.2.1 Risk Reassessment
  - Control Risks often results in identification of **new risks, reassessment of current risks,** and **the closing of risks** that are outdated.
  - Project risk reassessments should be regularly scheduled.
  - The amount and detail of repetition that are appropriate depends on how the project progresses relative to its objectives.

11.6.2 Control Risks: Tools and Techniques

- 11.6.2.2 Risk Audits
  - Risk audits examine and document the effectiveness of risk responses in dealing with identified risks and their root causes, as well as the effectiveness of the risk management process.
  - The project manager is responsible for ensuring that risk audits are performed at an appropriate frequency, as defined in the project's risk management plan.

11.6.2 Control Risks: Tools and Techniques

- 11.6.2.3 Variance and Trend Analysis
  - Many control processes employ **variance analysis** to compare the planned results to the actual results.
  - For the purposes of controlling risks, trends in the project's execution should be reviewed using performance information.
  - Earned value analysis and other methods of project variance and trend analysis may be used for monitoring overall project performance.

11.6.2 Control Risks: Tools and Techniques

- 11.6.2.4 Technical Performance Measurement
  - Compares technical accomplishments during project execution to the schedule of technical achievement.
  - It requires the definition of objective, quantifiable measures of technical performance, which can be used to compare actual results against targets.

11.6.2 Control Risks: Tools and Techniques

- 11.6.2.5 Reserve Analysis
  - Throughout execution of the project, some risks may occur with positive or negative impacts on budget or schedule contingency reserves.
  - Reserve analysis compares the amount of the contingency reserves remaining to the amount of risk remaining at any time in the project in order to determine if the remaining reserve is adequate.

11.6.2 Control Risks: Tools and Techniques

- 11.6.2.6 Meetings
  - Project risk management should be an agenda item at periodic status meetings.
  - The amount of time required for that item will vary, depending upon the risks that have been identified, their priority, and difficulty of response.
  - The more often risk management is practiced, the easier it becomes.
  - Frequent discussions about risk make it more likely that people will identify risks and opportunities.

11.6.3 Control Risks: Outputs

- 11.6.3.1 Work Performance Information
- 11.6.3.2 Change Requests
- 11.6.3.3 Project Management Plan Updates
- 11.6.3.4 Project Documents Updates
- 11.6.3.5 Organizational Process Assets Updates

11.6.3 Control Risks: Outputs

- 11.6.3.1 Work Performance Information
  - Work performance information, as a Control Risks output, provides a mechanism to communicate and support project decision making.

- 11.6.3.2 Change Requests
  - Implementing contingency plans or workarounds sometimes results in a change request.
  - Change requests are prepared and submitted to the Perform Integrated Change Control process (Section 4.5).

11.6.3 Control Risks: Outputs

- 11.6.3.3 Project Management Plan Updates
  - If the approved change requests have an effect on the risk management processes, the corresponding component documents of the project management plan are revised and reissued to reflect the approved changes.
  - The elements of the project management plan that may be updated are the same as those in the Plan Risk Responses process.

11.6.3 Control Risks: Outputs

- 11.6.3.4 Project Documents Updates
  - Project documents that may be updated as a result of the Control Risk process include, but are not limited to the risk register.
  - Risk register updates may include:
    - Outcomes of risk reassessments, risk audits, and periodic risk reviews.
    - Actual outcomes of the project's risks and of the risk responses

11.6.3 Control Risks: Outputs

- 11.6.3.5 Organizational Process Assets Updates
  - The risk management processes produce information that may be used for future projects, and should be captured in the organizational process assets.
  - The organizational process assets that may be updated include:
    - Templates for the risk management plan, including the probability and impact matrix and risk register.
    - Risk breakdown structure.
    - Lessons learned from the project risk management activities.

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