Project Risk Management

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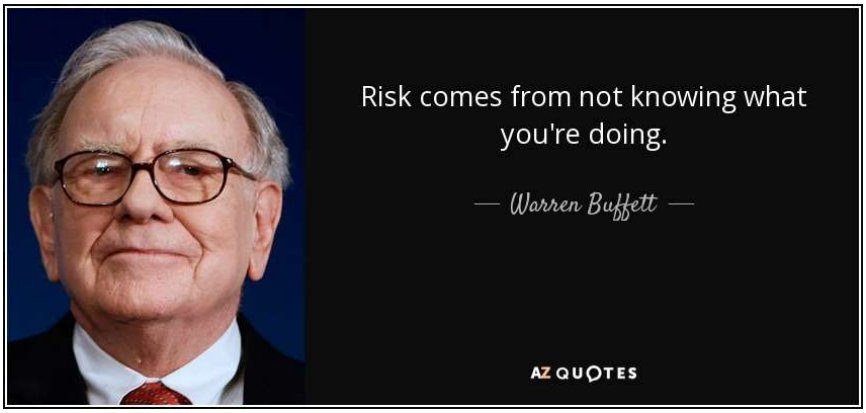

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"Risk management is a culture, not a cult. It only works if everyone lives it, not if it's practiced by a few high priests."
-Tom Wilson

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Project Risk Management

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Project Risk Management

Projects are conducted within an environment of uncertainty, where complete and perfect information relating to a project is never available until the project is complete.

Project managers must make decisions regarding future activities and ensure that the project team is confident in achieving the project's objectives

Risk Management provides a valuable approach for achieving greater certainty in the delivery of projects.

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Positive vs Negative Risks

Positive risk, also called opportunity risks, are **events or occurrences that provide a possible positive impact on a company or project**.

Negative risks are **all those possible events that could harm an organization, where we seek to mitigate, prevent, or reduce the extent of that harm**.

Positive risks, in contrast, are all those events beyond the company's control that can help the company, and are generally exploited to reap the benefit to the project

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Definition..

According to ISO 31000:2018 – Risk management – Guidelines, **Risk** is defined as "effect of uncertainty on objectives".

An effect is a deviation from the expected. It can be positive, negative or both, and can address, create or result in opportunities and threats.

Risk is usually expressed in terms of risk sources, potential events, their consequences and their likelihood.

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Risk management Terminology

With reference to ISO Guide 73:2009 – Risk management – Vocabulary, the following

Consequence – outcome of an event affecting objectives

Control – measure that maintains and/or modifies risk

Event – occurrence or change of a particular set of circumstances

Hazard – source of potential harm

Probability (Likelihood) – chance of something happening, whether defined, measured or determined objectively or subjectively, qualitatively or quantitatively, and described using general terms or mathematically

Residual Risk – risk remaining after risk treatment

Risk Criteria – terms of reference against which the significance of a risk is evaluated

Risk Management – coordinated activities to direct and control an organisation with regard to risk

Risk Management Process – systematic application of management policies, procedures and practices to the activities of communicating, consulting, establishing the context, and identifying, analysing, evaluating, treating, monitoring and reviewing risk

Stakeholder – person or organisation that can affect, be affected by, or perceive themselves to be affected by a decision or activity.

Treatment – process to modify risk

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Key Risk Concepts

Likelihood

Frequency: How often events occur in a set time period

Probability: Ratio of the possibility of a specific outcome over all other possible outcomes

Event

Event: Something that happens at a specific place and/or time

Threat: capable of acting against an objective in a manner that can result in harm

Vulnerability: Weakness in design, implementation, operation or internal control of a process can expose the system to adverse threats from threat events

Impact

Magnitude: Potential severity of loss potential gain from realized events or scenarios

Consequence: The magnitude of loss resulting from a threat exploiting a vulnerability

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Impact of Risk on Projects

Failure to manage the Project risk can have diverse and serious implications to project outcomes, including:

- Exceeding project budgets
- Programme delays
- Failure to achieve required functional requirements
- Failure to achieve the required quality requirements
- Damage to the environment
- Forfeiting the health and safety of personnel involved in the project
- Exposure to litigation
- Damage to the reputation of Government

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Common Sources of Project Risk

Potential negative risk conditions associated with each knowledge area. *Source: R.M. Wideman

Knowledge Area	Risk Conditions
Integration	Inadequate planning; poor resource allocation; poor integration management;
Scope	Poor definition of scope or work packages; incomplete definition
Time	Errors in estimating time or resource availability
Cost	Estimating errors; inadequate productivity, cost, change, or contingency
Quality	Poor attitude toward quality; substandard design, materials, and workmanship; inadequate quality assurance program
Human resource	Poor conflict management; poor project organization and definition of responsibilities; absence of leadership
Communications	Carelessness in planning or communicating
Risk	Ignoring risk; unclear analysis of risk; poor insurance management
Procurement	Unenforceable conditions or contract clauses; adversarial relations
Stakeholders	Lack of consultation with key stakeholder; poor sponsor engagement

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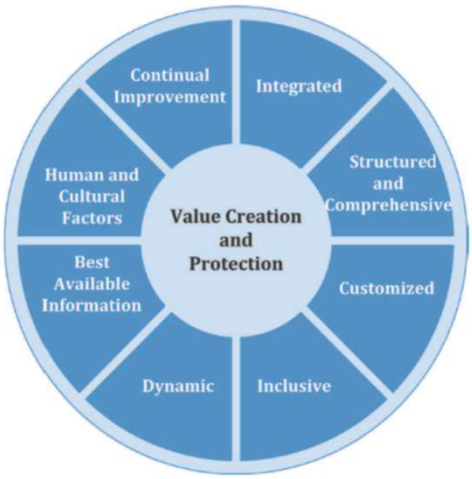
Risk Management Principles



- The principles are the foundation for managing risk and should be considered when establishing the organization's risk management framework and processes.
- These principles should enable an organization to manage the effects of uncertainty on its objectives.

~ ISO 31000:2018

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Systemic Risk Management

SRM comprises of , risk planning, identification, analysis, evaluation and treatment process, which is supported by appropriate monitoring, review and recording of the identified risks, together with effective communication and consultation with stakeholders and project participants.

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Benefits of Risk Management

Management of risk is an integral part of good project management practice.

By implementing a RM process on Government projects, a number of consequential benefits can be realized.

These include:

- Improved planning, performance and effectiveness
- Improved information for decision making
- Greater time and cost certainty
- Fewer surprises
- More efficient use of resources
- Enhanced quality of output
- Improved communication and stakeholder relationships
- Exploitation of opportunities
- Greater certainty in delivery, and the effective realisation of required project outcomes
- Objective comparison of project options
- Optimal placement of risk
- Prioritization of team efforts
- More effective management of change
- Enhanced reputation

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Project Risk Management

Risk management process involves discovering and understanding answers to some key questions regarding the risk associated with the projects :

1. **Where and what is the risk** (risk identification)?
2. **How severe is the current level of risk** (risk analysis)?
3. **Is the current level of risk acceptable** (risk evaluation)?
4. **What needs to be done to bring the risk to an acceptable level** (risk treatment)?

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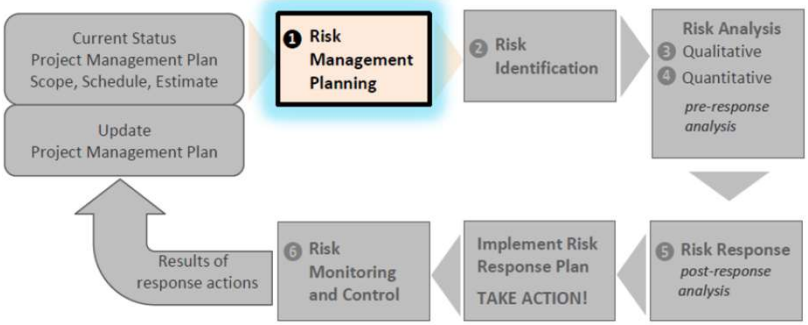
Risk Management Process



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Risk Planning Context

- Establish the external, internal and risk management context in which the rest of the process will take place.
- Establish criteria against which risk will be evaluated
- Project risk management should be conducted methodically, and the intent and structure of the risk management process specified within a Risk Management Plan.

The Risk Management Plan will include :

1. Responsibilities for implementing the risk management process
2. Resource requirements for administering the process
3. Proposed timing of key risk management activities

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Planning Risk Management

Topic	Questions to Answer
Methodology	How will risk management be performed on this project? What tools and data sources are available and applicable?
Roles and responsibilities	Which people are responsible for implementing specific tasks and providing deliverables related to risk management?
Budget and schedule	What are the estimated costs and schedules for performing risk-related activities?
Risk categories	What are the main categories of risks that should be addressed on this project? Is there a risk breakdown structure for the project?
Risk probability and impact	How will the probabilities and impacts of risk items be assessed? What scoring and interpretation methods will be used for the qualitative and quantitative analysis of risks? How will the probability and impact matrix be developed?
Revised stakeholders' tolerances	Have stakeholders' tolerances for risk changed? How will those changes affect the project?
Tracking	How will the team track risk management activities? How will lessons learned be documented and shared? How will risk management processes be audited?
Risk documentation	What reporting formats and processes will be used for risk management activities?

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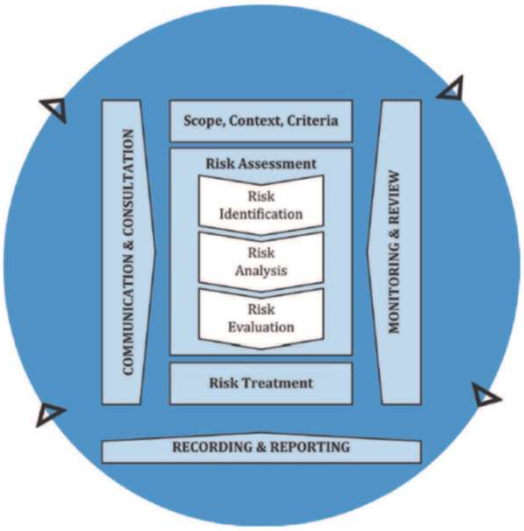
Risk Management Process

Systematic Risk Management (SRM) is a key process for effective project delivery



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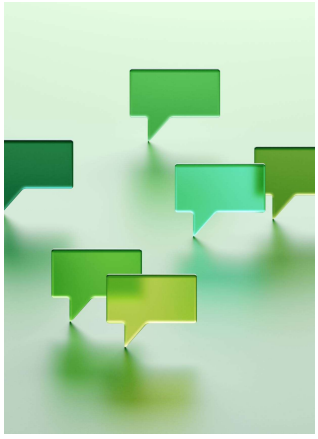
Communication and Consultation

- The purpose of communication and consultation is to assist relevant stakeholders in understanding risk, the basis on which decisions are made and the reasons why particular actions are required.
- Communication seeks to promote awareness and understanding of risk, whereas consultation involves obtaining feedback and information to support decision-making



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Aim of Communication and Consultation

- Bring different areas of expertise together for each step of the risk management process;
- Ensure that different views are appropriately considered when defining risk criteria and when evaluating risks; provide sufficient information to facilitate risk oversight and decision-making;
- Build a sense of inclusiveness and ownership among those affected by risk.

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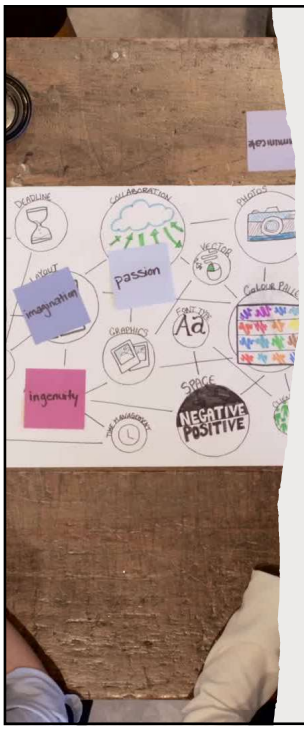

Risk Assessment

- Risk assessment is the overall process of ***risk identification, risk analysis and risk evaluation.***
- Risk assessment should be conducted systematically, iteratively and collaboratively, drawing on the knowledge and views of stakeholders.
- It should use the best available information, supplemented by further enquiry as necessary.

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Risk identification

The purpose of risk identification is to find, recognize and describe risks that might help or prevent an organization achieving its objectives. Relevant, appropriate and up-to-date information is important in identifying risks

The organization can use a range of techniques for identifying uncertainties that may affect one or more objectives.

- tangible and intangible sources of risk;
- causes and events;
- threats and opportunities;
- vulnerabilities and capabilities;
- changes in the external and internal context;
- indicators of emerging risks;
- the nature and value of assets and resources;
- consequences and their impact on objectives;
- limitations of knowledge and reliability of information;
- time-related factors;
- biases, assumptions and beliefs of those involved.

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Identifying Risks

Interviewing

- Fact-finding technique for collecting information in face-to-face, phone, e-mail, or virtual discussions
- Interviewing people with similar project experience is an important tool for identifying potential risks

SWOT analysis

- Strengths, weaknesses, opportunities, and threats
- Helps identify the broad negative and positive risks that apply to a project

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Identifying Risks

Brainstorming

Group attempts to generate ideas or find a solution for a specific problem by amassing ideas spontaneously and without judgment

An experienced facilitator should run the brainstorming session

Be careful not to overuse or misuse brainstorming

- Psychology literature shows that individuals produce a greater number of ideas working alone than they do through brainstorming in small, face-to-face groups
- Group effects often inhibit idea generation

Delphi Technique

Used to derive a consensus among a panel of experts who make predictions about future developments

Provides independent and anonymous input regarding future events

Uses repeated rounds of questioning and written responses and avoids the biasing effects possible in oral methods

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Risk Register

Important output of the risk identification process

- List of identified risks and other information needed to begin creating a risk register
- Contains the results of various risk management processes and that is often displayed in a table or spreadsheet format
- Tool for documenting potential risk events and related information
- Risk events refer to specific, uncertain events that may occur to the detriment or enhancement of the project

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The Risk Register

Risk register contents :

- Identification number for each risk event
- Rank for each risk event
- Name of each risk event
- Description of each risk event
- Category under which each risk event falls
- Root cause of each risk
- Triggers for each risk; indicators or symptoms of actual risk events
- Potential responses to each risk
- Risk owner or person who will own or take responsibility for each risk
- Probability and impact of each risk occurring
- Status of each risk

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The Risk Register

No.	Rank	Risk	Description	Category	Root Cause	Triggers	Potential Responses	Risk Owner	Probability	Impact	Status
R44	1										
R21	2										
R7	3										

Sample risk register

- Risk report contents
  - Sources of overall project risk
  - Important drivers of overall project risk exposure
  - Summary information on risk events

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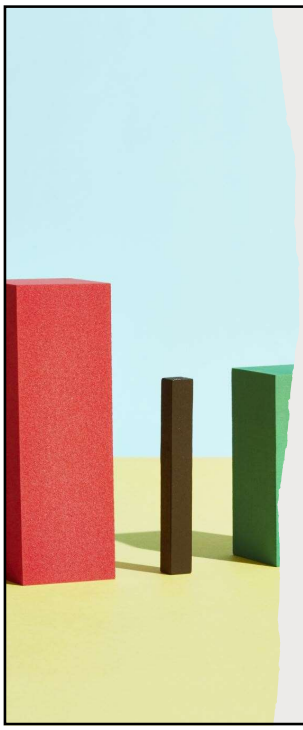

Risk Analysis

Risk analysis involves a detailed consideration of uncertainties, risk sources, consequences, likelihood, events, scenarios, controls and their effectiveness.

An event can have multiple causes and consequences and can affect multiple objectives.

Risk analysis should consider factors such as:
— the likelihood of events and consequences;
— the nature and magnitude of consequences;
— complexity and connectivity;
— time-related factors and volatility;
— the effectiveness of existing controls;
— sensitivity and confidence levels.

Techniques :
- Qualitative
- Quantitative
- Hybrid

Risk analysis provides an input to risk evaluation, to decisions on whether risk needs to be treated and
how, and on the most appropriate risk treatment strategy and methods

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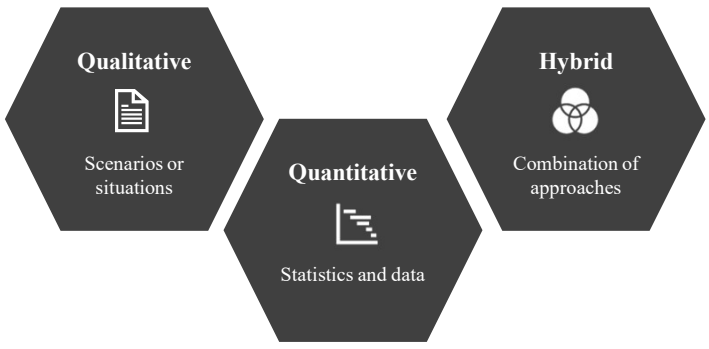
Risk Analysis Methodologies



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Performing Quantitative Risk Analysis

Most of the projects often follows qualitative risk analysis,

However, Large, complex projects often require extensive quantitative risk analysis

Main techniques

- Decision tree analysis
- Simulation
- Sensitivity analysis

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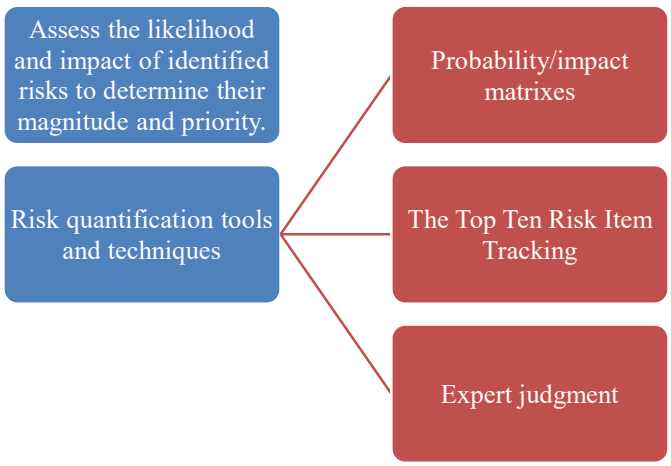
Performing Risk Analysis



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Risk - Consequence Criteria (example)

Descriptor	Insignificant	Minor	Moderate	Major	Catastrophic
Financial (Costs & Revenue)	Negligible financial consequence (< 1% of budget or revenue)	Minor financial consequence (1 to 5% of budget or revenue)	Moderate financial consequence (5 to 10% of budget or revenue)	Major financial consequence (10 to 25% of budget or revenue)	Huge financial consequence (>25% of budget or revenue)
Programme	Little or no delay	Short delay (increases duration by >2.5%)	Significant delay (increases duration by >10%)	Major delay (increases duration by >25%)	Project halted or huge delay (increases duration by >100%)
Safety	No injuries	First aid treatment / out-patients	A number of injuries / hospitalisation	Extensive injuries / hospitalisation / long-term treatment	Fatality / significant irreversible effects to a number of persons
PR / Profile	Some complaints but project, client, stakeholder reputation intact	Adverse local publicity or media attention	Attention from media and/or significant concern by local community / criticism by NGOs	Significant adverse regional and State media coverage / community and NGO outcry	Serious adverse international and/or national coverage / community and NGO outrage
Relationships	Stakeholders irritated but no formal complaints	Resolved at working level	Resolved at senior management level	Legal recourse or Departmental Head intervention	Government level intervention
Build Quality	Cosmetic repairs / rectification	Minor repairs / rectification	Major repairs / rectification - including structural	Substantial re-build	Total replacement
Operational Impacts	Negligible impact / no significant impact on personnel	Minor change to operations / some inconvenience to personnel	Requires a change in operations, work routines and schedules	Major disruption to operations, work routines and practices - additional resources may be required	Operations not possible or facility closed / impact on the well-being of personnel
Environment	No effects or effects which are below levels of perception, within normal bounds of variation or within the margin of forecasting error.	These effects may be raised as local issues but are unlikely to be of importance in the decision making process. However, they are of relevance in enhancing the subsequent design of the project and consideration of mitigation measures.	Important considerations at a local level but are not likely to be key decision making issues. Mitigation measures and detailed design may ameliorate some of the consequences upon the affected communities or interests.	Important considerations at a local or regional scale. Mitigation measures and detailed design work are unlikely to remove all of the effects upon the affected communities or interests.	Associated with sites and features of national or state importance. Typically mitigation measures are unlikely to remove such effects.
Property / Assets	Negligible damage to or loss of assets	Minor damage to or loss of assets - some repairs may be required	Moderate to high damage to or loss of assets - requires specialist / contract equipment to repair or replace	Significant / permanent damage to assets and/or infrastructure	Widespread, substantial / permanent damage to assets and/or infrastructure
Social / Cultural Heritage	Negligible social or cultural impacts	Minor medium term social impacts on local population, mostly repairable with appropriate management/remediation	On-going social issues / permanent damage to structures or items of cultural significance	On-going, serious social impacts / significant damage to structures or items of cultural significance	Widespread, on-going, significant serious, irreversible social impacts
Legal	Some minor non-compliances and breaches of regulation	Minor legal issues, non-compliances and breaches of regulation with option for legal recourse	Serious breach of regulation with investigation or report to authority with prosecution and/or moderate fines possible	Major breach of regulation / major litigation	Significant prosecution and fines / very serious litigation including class actions
Systems, Information and Data	Negligible loss of or damage to IT and communications - no loss of data	Minor loss of or damage to IT and communications - some data retrieval may be required	Moderate to high loss / damage to IT and communications - some data may be permanently lost & workarounds may be required	Major loss / damage to IT and communications - data permanently lost, significant catch-up, business continuity plans required to be implemented	Extensive loss / damage to IT and communications assets and infrastructure - data permanently lost, widespread disruption to business

TABLE 1 – EXAMPLE CONSEQUENCE CRITERIA

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Risk Likelihood and Frequency (example)

Descriptor	Description of Frequency
Rare	May occur only in exceptional circumstances - can be assumed not to occur during period of the project (or life of the facility)
Unlikely	Event is unlikely to occur, but it is possible during period of the project (or life of the facility)
Possible	Event could occur during period of the project (or life of the facility)
Likely	Event likely to occur once or more during period of the project (or life of the facility)
Frequent / Almost Certain	Event occurs many times during period of the project (or life of the facility)

TABLE 2 – EXAMPLE PROBABILITY (LIKELIHOOD) CRITERIA

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Risk Analysis Matrix (example)

Probability (Likelihood)	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	Low	Low	Low	Medium	Medium
Unlikely	Low	Low	Medium	Medium	High
Possible	Low	Medium	Medium	High	High
Likely	Medium	Medium	High	High	Very High
Frequent	Medium	High	High	Very High	Extreme

TABLE 3 – EXAMPLE RISK ANALYSIS MATRIX

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Using Probability/Impact Matrixes to Calculate Risk Factors

Lists relative probability of a risk occurring on one side of a matrix or axis on a chart and the relative impact of the risk occurring

- List the risks and then label each one as high, medium, or low in terms of its probability of occurrence and its impact if it did occur

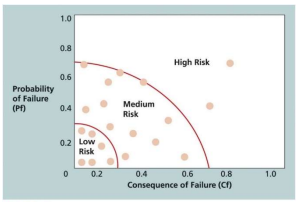

FIGURE 11-6 Chart showing high-, medium-, and low-risk technologies

Calculates risk factors

- Numbers that represent the overall risk of specific events based on their probability of occurring and the consequences to the project if they do occur

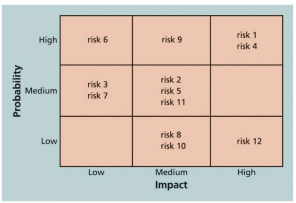

FIGURE 11-5 Sample probability/impact matrix

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Top Ten Risk Item Tracking

Qualitative risk analysis tool helps to identify risks and maintain an awareness of risks

- Involves *establishing a periodic review of the top ten project risk items*
- Includes the *current ranking, previous ranking, number of times the risk appears on the list over a period of time, and a summary of progress made in resolving the risk item*

A watch list is a list of risks that are low priority, but are still identified as potential risks

- Qualitative analysis can also identify risks that should be evaluated quantitatively

	Monthly Ranking	**Monthly Ranking**	**Monthly Ranking**	
Risk Event	Rank This Month	Rank Last Month	Number of Months in Top Ten	Risk Resolution Progress
Inadequate planning	1	2	4	Working on revising the entire project management plan
Poor definition	2	3	3	Holding meetings with project customer and sponsor to clarify scope
Absence of leadership	3	1	2	Assigned a new project manager to lead the project after the previous one quit
Poor cost estimates	4	4	3	Revising cost estimates
Poor time estimates	5	5	3	Revising schedule estimates

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Risk evaluation

The purpose of risk evaluation is to support decisions. Risk evaluation involves comparing the results of the risk analysis with the established risk criteria to determine where additional action is required.

This can lead to a decision to:

— do nothing further;

— consider risk treatment options;

— undertake further analysis to better understand the risk;

— maintain existing controls;

— reconsider objectives.

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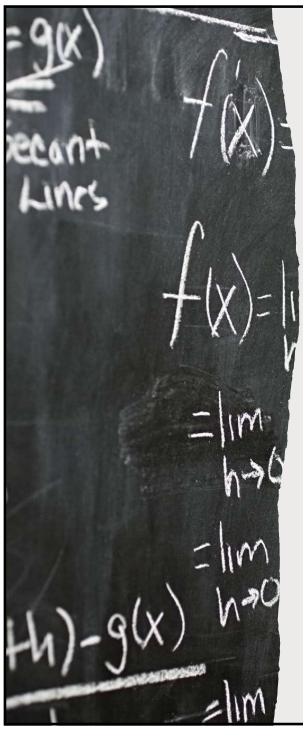

Risk Treatment

The purpose of risk treatment is to select and implement options for addressing risk.

Risk treatment involves an iterative process of:

1. formulating and selecting risk treatment options;
2. planning and implementing risk treatment;
3. assessing the effectiveness of that treatment;
4. deciding whether the remaining risk is acceptable;
5. if not acceptable, taking further treatment.

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Risk treatment options

Selecting the most appropriate risk treatment option(s) involves balancing the potential benefits derived in relation to the achievement of the objectives against costs, effort or disadvantages of implementation.

Options for treating risk may involve one or more of the following:

- avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk;
- taking or increasing the risk in order to pursue an opportunity;
- removing the risk source;
- changing the likelihood;
- changing the consequences;
- sharing the risk (e.g. through contracts, buying insurance);
- retaining the risk by informed decision.

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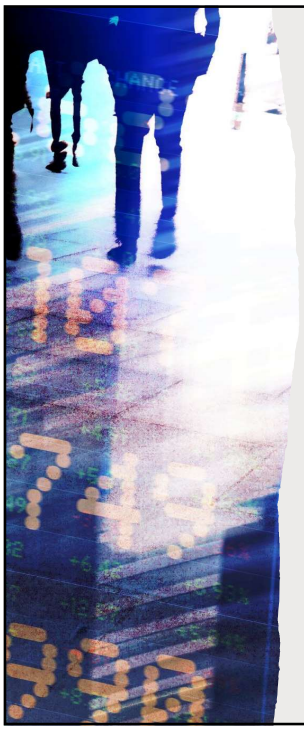

Planning Risk Responses

After identifying and quantifying risks, the organization must decide how to respond to them

Basic response strategies for risks

- Risk avoidance
- Risk acceptance
- Risk transference
- Risk mitigation

It's also important to identify residual risks

Residual risks: risks that remain after all the response strategies have been implemented

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Risk Treatment Plans

The purpose of risk treatment plans is to specify how the chosen treatment options will be implemented, so that arrangements are understood by those involved, and progress against the plan can be monitored.

The information provided in the treatment plan should include:

— the rationale for selection of the treatment options, including the expected benefits to be gained;

— those who are accountable and responsible for approving and implementing the plan;

— the proposed actions;

— the resources required, including contingencies;

— the performance measures;

— the constraints;

— the required reporting and monitoring;

— when actions are expected to be undertaken and completed.

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Monitoring and Review

- The purpose of monitoring and review is to assure and improve the quality and effectiveness of process design, implementation and outcomes.
- Ongoing monitoring and periodic review of the risk management process and its outcomes should be a planned part of the risk management process, with responsibilities clearly defined.
- Monitoring and review should take place in all stages of the process. Monitoring and review includes planning, gathering and analysing information, recording results and providing feedback.
- The results of monitoring and review should be incorporated throughout the organization's performance management, measurement and reporting activities.

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Recording and Reporting

The risk management process and its outcomes should be documented and reported through appropriate mechanisms. Recording and reporting aims to:

— communicate risk management activities and outcomes across the organization;

— provide information for decision-making;

— improve risk management activities;

— assist interaction with stakeholders, including those with responsibility and accountability for risk

management activities.

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Thank You

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