PROJECT RISK MANAGEMENT

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“…the process involved with identifying, analyzing, and responding to risk. Risk is part of every project we undertake and the objective is always that to maximise the results of positive risk whilst minimising the impact and consequences of negative events”
Funding the digital agenda, managing risk and reducing costs are possibly today’s true pain points for organisations and businesses.

Addressing the above three aspects effectively will essentially dictate the destiny of each organisation.

Organisations need to ensure that projects and offerings are sensitive to the developments and risks brought about by the new digital age.

Historical data shows that 89% of companies forming part of the Fortune500 list in 1955 no longer exist.
Continuous business transformation and increased adoption of the 3rd platform is rapidly shifting and changing the way projects originate and are implemented. Going forward an effective risk management approach needs to continuously adjust itself to meet the constantly changing business risk.
WHY DO WE MANAGE RISK?

Project setbacks can be reduced substantially by embracing the correct risk methodology as an integral part of project planning. Recent history has indicated that planning and controlling project risk is critical to secure high-quality project outcomes in today’s fast-paced environment.

Some positives include:

- Broader info available during the planning phase
- Improved probability of project success in meeting the intended scope

Perceived negatives include:

- Belief that all risks are accounted for and controlled
- Project cut short due to risk level (negative from a project promoter perspective)
RECENT EVOLUTION OF RISK MANAGEMENT

Customary Approach  More Agile Approach

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phantom Risk</td>
<td>N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>Real Risk</td>
</tr>
<tr>
<td>Reduce</td>
<td>Transfer</td>
</tr>
<tr>
<td>Accept</td>
<td>Avoid</td>
</tr>
</tbody>
</table>
KEY RISK-RELATED TERMS

Risk Factors
- Probability of occurrence
- Range of possible outcomes (impact and stake)
- Expected timing of event
- Anticipated frequency of risk events

Risk Severity - Level of criticality

Risk Tolerance - The amount of acceptable risk

Scope baseline - Approved project scope used during scope change management to prevent scope creep

Risk Adverse - Conservative and unwilling to take risks
ISO 31000 applies to existing legacy management practices to formalise and improve risk management processes. On implementing ISO 31000, attention is to be given to integrating existing risk management processes in the new paradigm addressed in the standard.

The main focus of ISO 31000 is harmonisation of programmes aiming at:

- Transferring accountability gaps in the context of enterprise risk management
- Aligning objectives of the governance framework (as part of the standard)
- Embedding management system reporting mechanisms
- Creating standardisation of risk criteria and evaluation metrics
Main ISO principles identified as part of risk management as an ongoing process include:

- being a **systematic** and **structured** process
- being **dynamic**, **iterative** and **responsive** to change
- being open to **continuous improvement** and enhancement
- being an integral part of organisational **decision making process**
- being based on the best **available** and **dependable** information
HOW DO WE MANAGE RISK?

Using the six risk management processes

- Plan Risk Management
- Identify Risks
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Plan Risk Responses
- Monitor and Control Risks
PLAN RISK MANAGEMENT

Inputs

Project Scope Statement
Cost Management Plan
Schedule Management Plan
Enterprise Environmental Factors
Organizational Process Assets

Planning Meetings and Analysis

Tools & Techniques

Outputs

Risk Management Plan

Plan Risk Management

Identify Risks
Perform Qualitative Risk Analysis
Perform Quantitative Risk Analysis
Plan Risk Responses
Monitor and Control Risks
WHAT IS A RISK MANAGEMENT PLAN?

Methodology – Approach, tools, & data
Roles & Responsibilities
Budgeting – Resources to be put into risk management
Timing – When and how often to review
Risk Categories – Risk Breakdown Structure (RBS)
Definitions – Risk probabilities and impact
Severity and Frequency Matrix
Stakeholder tolerances
Reporting formats
Establish tracking methods
RISK BREAKDOWN STRUCTURE

Listing categories and subcategories where risks may occur

- Project
  - Technical
    - Limited Design Time
    - Specifications Adherence
  - Organizational
    - Funding
    - Prioritization
    - Resource Availability
  - Project Management
    - Estimates
    - Scheduling
    - Communication
IDENTIFY RISKS

Risk Management Plan
Activity Cost Estimates
Activity Duration Estimates
Project Documents
Scope Baseline
Stakeholder Register
Cost Management Plan
Schedule Management Plan
Quality Management Plan
Enterprise Environmental Factors
Organizational Process Assets

**Inputs**
- Documentation Reviews
- Information Gathering Techniques
- Checklist Analysis
- Assumption Analysis
- Diagramming Techniques
- SWOT Analysis
- Expert Judgment

**Tools & Techniques**

**Outputs**
- Risk Register

**Plan Risk Management**

**Identify Risks**

**Perform Qualitative Risk Analysis**

**Perform Quantitative Risk Analysis**

**Plan Risk Responses**

**Monitor and Control Risks**
TYPICAL INFORMATION GATHERING TECHNIQUES

Brainstorming

Delphi technique
- Successive anonymous questionnaires on project risks with responses summarized for further analysis

Interviewing key individuals

Root cause identification

Strengths, weaknesses, opportunities, and threats (SWOT) analysis

Political, Economic Socio-cultural, Technological, Environmental and Legal (PESTEL).
Cause and Effect Diagram (also known as fishbone diagram)

Potential Causes
- Personnel
- Materials
- Insufficient Resources
- Bad Specs
- Inadequate Time
- Project Prioritization

Effect
- Product Delivered Late
The Risk Register is a risk management tool essential to fulfil regulatory compliance (ISO / PRINCE2).

The register acts as a repository for all risks identified and includes additional details about each risk including:

- Identified risks
- Potential responses
- Root causes

Updating risk categories (if required)
PERFORM QUALITATIVE RISK ANALYSIS

**Inputs**
- Risk Register
- Risk Management Plan
- Project Scope Statement
- Organizational Process Assets

**Tools & Techniques**
- Risk probability and impact statement
- Frequency and Severity matrix
- Risk data quality assessment
- Risk categorization
- Risk urgency assessment
- Expert Judgement

**Outputs**
- Risk Register Updates

**Plan Risk Management** ➔ **Identify Risks** ➔ **Perform Qualitative Risk Analysis** ➔ **Perform Quantitative Risk Analysis** ➔ **Plan Risk Responses** ➔ **Monitor and Control Risks**
COMMONLY USED METHODOLOGIES

- Based on Failure Modes and Effects Analysis (FMEA)
- Frequency and Severity Matrix
- What-If Analysis
- Hazard and operability study (HAZOP)
- Fault tree analysis (FTA)
FREQUENCY AND SEVERITY MATRIX

In a typical frequency and severity matrix each risk is rated in line with the frequency rating and expected severity.

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>SEVERITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>Seldom</td>
<td>Very Low</td>
</tr>
<tr>
<td>Often</td>
<td>Low</td>
</tr>
<tr>
<td>Quarterly</td>
<td>Low</td>
</tr>
<tr>
<td>Weekly/Daily</td>
<td>Medium</td>
</tr>
</tbody>
</table>
**RISK REGISTER**

Typical Risk Register - Model to be aligned to the risk profile of the project

![Project Consolidated Risks](image_url)
As part of the risk register updating process it is important to:

- Add severity and frequency matrix results
- Perform quality check on results
- Categorize the risks to make them easier to handle
- Perform urgency assessment (prioritization) to determine which risk need immediate attention
PERFORM QUANTITATIVE RISK ANALYSIS

Risk Register
Risk Management Plan
Cost Management Plan
Schedule Management Plan
Organizational Process Assets

**Inputs**
- Data gathering and representation techniques
- Quantitative risk analysis and modeling
- Expert Judgment

**Outputs**
- Risk Register Updates

**Tools & Techniques**

Plan Risk Management → Identify Risks → Perform Qualitative Risk Analysis → Perform Quantitative Risk Analysis → Plan Risk Responses → Monitor and Control Risks
QUANTITATIVE RISK ANALYSIS

- Analyze numerically the probability and consequence of each risk
- Decision Tree analysis
- Expected Monetary Value Analysis (EMV)
## EXPECTED MONETARY VALUE (EMV)

### Simple EMV example

<table>
<thead>
<tr>
<th></th>
<th>Building Cost</th>
<th>Probability</th>
<th>Expected Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimistic Outcome</td>
<td>€150k</td>
<td>0.2</td>
<td>€30k</td>
</tr>
<tr>
<td>Likely Outcome</td>
<td>€225k</td>
<td>0.5</td>
<td>€113k</td>
</tr>
<tr>
<td>Pessimistic Outcome</td>
<td>€300k</td>
<td>0.3</td>
<td>€100k</td>
</tr>
<tr>
<td><strong>Expected Value</strong></td>
<td></td>
<td></td>
<td><strong>€243k</strong></td>
</tr>
</tbody>
</table>
Typical Decision Tree Analysis

```
Decision Tree Analysis

- Decision
- Uncertainty (external event)
```

Diagram:
```
1
/|
A B
/|
/|
Outcome 2 Outcome 5
/|
/|
Outcome 1 Outcome 3
/|
/|
B C
/|
/|
Outcome 4 Outcome 6
/|
/|
Outcome 7
```
PLAN RISK RESPONSES

**Inputs**
- Risk Register
- Risk Management Plan

**Strategies for negative risks or threats**
- Strategies for positive risks or opportunities
- Contingent response strategy
- Expert Judgment

**Outputs**
- Risk Register Updates
- Risk-related Contract Decisions
- Project Management Plan Updates

**Tools & Techniques**
- Plan Risk Management
- Identify Risks
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Plan Risk Responses
- Monitor and Control Risks
DRAWING UP STRATEGIES BASED ON RISK

Negative Risk (or Threats)
- Avoid
- Transfer
- Mitigate
- Accept

Positive Risk (or Opportunities)
- Exploit
- Share
- Enhance
- Accept
**MONITOR AND CONTROL RISKS**

**Inputs**
- Risk Register
- Project Management Plan
- Work Performance Information
- Performance Reports

**Tools & Techniques**
- Risk reassessment
- Risk audits
- Variance and trend analysis
- Technical performance measurement
- Reserve analysis
- Status meetings

**Outputs**
- Risk Register Updates
- Organizational Process Assets
- Change Requests
- Project Management Plan Updates
- Project Document Updates

**Plan Risk Management** → **Identify Risks** → **Perform Qualitative Risk Analysis** → **Perform Quantitative Risk Analysis** → **Plan Risk Responses** → **Monitor and Control Risks**
Questions?

Thank you for your time