3 Qualitative Risk Analysis

- Qualitative risk analysis is the application of methods for ranking the identified risks according to their potential effect on project objectives.
- This process **prioritizes** risks according to their potential effect on project objectives.
- Qualitative risk analysis is one way of determining the importance of addressing specific risks and guides risk response measures

3 Qualitative Risk Analysis (Continued)

- Definitions of the levels for *probability* and *impact* and expert opinion help correct biases in the data used in qualitative analysis.
- Qualitative risk analysis should be reviewed during the project's life cycle to stay current with changes in project risks.
- The process can lead to further analysis in quantitative risk analysis or directly to risk response planning.

3.1 Inputs to Qualitative Risk Analysis

1. *Organizational Process Assets.* Information from past projects (Project files, lessons learned)
2. *Project Scope Statement.* Projects of a common or recurrent type tend to have less risk. Projects using state-of-the-art or first-of-a-kind technology or highly complex projects tend to have more risk.
3. *Risk Management Plan.* (Refer to RMP Section). Major items for qualitative risk analysis include roles & responsibilities, budgets and schedule for risk management activities, risk categories, definitions of probability & impact, and the stakeholders' tolerance.
4. *Risk Register.* List of the identified risks.

3.2 Tools and Techniques for qualitative Risk Analysis

1. ***Risk probability and impact Assessment***. Risk probability and risk impact may be described in qualitative terms such as very high, high, moderate, low and very low.
   - ***Risk probability*** is the likelihood that a risk will occur.
   - ***Risk impact*** is the effect on project objectives if the risk occurs, which may be a negative effect (threat) or a positive effect (opportunity).
   - These two dimensions of risk are applied to specific risks, not to the overall project.

3.2 Tools and Techniques for qualitative Risk Analysis

- The levels of probability and impact are assessed in meetings or by interviews. Participants include subject matter (area of risk) experts and project team members.
- Details justifying the assessment should be documented.
- Risks are rated according to the definitions given in the risk management plan

Evaluating Impact of a Risk on Major Project Objectives (ordinal scale or cardinal, non-linear scale)					
Project Objective	**Very Low .05**	**Low .1**	**Moderate .2**	**High .4**	**Very High .8**
Cost	Insignificant Cost Increase	<5% Cost Increase	5–10% Cost Increase	10–20% Cost Increase	>20% Cost Increase
Schedule	Insignificant Schedule Slippage	Schedule Slippage <5%	Overall Project Slippage 5–10%	Overall Project Slippage 10–20%	Overall Project Schedule Slips >20%
Scope	Scope Decrease Barely Noticeable	Minor Areas of Scope Are Affected	Major Areas of Scope Are Affected	Scope Reduction Unacceptable to the Client	Project End Item Is Effectively Useless
Quality	Quality Degradation Barely Noticeable	Only Very Demanding Applications Are Affected	Quality Reduction Requires Client Approval	Quality Reduction Unacceptable to the Client	Project End Item Is Effectively Unusable

The impacts on project objectives can be assessed on a scale from Very Low to Very High or on a numerical scale. The numerical (cardinal) scale shown here is non-linear, indicating that the organization wishes specifically to avoid risks with high and very-high impact.

Figure 11–2. Rating Impacts for a Risk

3.2 Tools and Techniques for qualitative Risk Analysis

2. ***Probability / impact risk rating matrix.*** A matrix may be constructed that assigns risk ratings (low, moderate or high) to risks based on combining probability and impact scales of a risk on a project objective.
   - The organization must determine which combinations of probability and impact result in a risk's being classified as high risk (red condition), moderate risk (yellow condition), and low risk (green condition). The risk score helps put the risk into a category that will guide risk response actions.

The Probability–Impact matrix

- Risks with high probability and high impact are likely to require further analysis, including quantification, and aggressive risk management (both threats & opportunities).
- Lower Risks would require less emphasis and it may be enough to include them in a watch list for monitoring

Probability-Impact Matrix

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 on an Objective (e.g. cost, time, or scope) (Ratio Scale)									

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 risk determine whether the risk is scored as high, moderate or low for that objective.

Probability-Impact Matrix

Risk Score for a Specific Risk: THREATS					
Probability	*Risk Score = P x I*				
0.9	0.05	0.09	0.18	.36	0.72
0.7	0.04	0.07	0.14	0.28	0.56
0.5	0.03	0.05	0.10	0.20	0.40
0.3	0.02	0.03	0.06	0.12	0.24
0.1	0.01	0.01	0.02	0.04	0.08
	0.05	0.10	0.20	0.40	0.80
	Impact on an Objective (e.g. cost, time, or scope) (Ratio Scale)				

Probability-Impact Matrix

Risk Score for a Specific Risk: OPPORTUNITY					
Probability	*Risk Score = P x I*				
0.9	0.72	0.36	0.18	.09	0.05
0.7	0.56	0.28	0.14	0.07	0.04
0.5	0.40	0.20	0.10	0.05	0.03
0.3	0.24	0.12	0.06	0.03	0.02
0.1	0.08	0.04	0.02	0.01	0.01
	0.80	0.40	0.20	0.10	0.05
	Impact on an Objective (e.g. cost, time, or scope) (Ratio Scale)				

3.2 Tools and Techniques for qualitative Risk Analysis

3. ***Risk Data Quality Assessment.***
   The use of accurate data is necessary for a reliable qualitative risk analysis. Assessment involves examining:
   - Extent of understanding of a risk
   - Data available about the risk
   - Reliability of data

- The use of data of low precision data, for instance if a risk is not well understood, may lead to a qualitative risk analysis of little use to the project manager. It may be necessary to gather better data.

3.2 Tools and Techniques for qualitative Risk Analysis

4. ***Risk Urgency Assessment.***
   Urgent risks require urgent responses. Urgency can be addressed by including time of response as an indicator of priority. Other indicators may include symptoms and warning signs, as well as the risk rating.

3.3 Outputs from Qualitative Risk Analysis

- *Risk Register Updates*
  - Relative ranking or priority list of project risks. Risks and conditions may be prioritized by their group category (high, moderate, and low)
  - Risks grouped by categories. Responses can be more effective if root causes are dealt with directly.
  - Urgent risks. List of risks requiring response in the near-term.
  - List of risks for additional analysis and response. Some risks might warrant more analysis, including Quantitative Risk Analysis, as well as response action.
  - Watch lists of low priority risks.
  - Trends in qualitative risk analysis results. As the analysis is repeated, a trend for particular risks may become apparent, and can make risk response or further analysis more or less urgent/important.