

## **Planning Process Group Artifacts**

### 11.4 Perform Quantitative Risk Analysis

#### 11.4.2 Expert Judgment

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**11.4.2 Expert Judgment (Tools and Techniques):** Expert judgment are used to assist in identifying impacts, evaluate probabilities and contingency plans, and to define inputs such as probability distributions into the tools. This artifact was taken from a paper written in PMGT 613 explaining risk analysis in general and then comparing different techniques used specifically in the quantitative method.

## **Risk Analysis**

Project Risk Analysis is a process which enables the analysis and management of risks associated with a project. Properly undertaken it will increase the likelihood of successful completion of a project to cost, time and scope. Risk Analysis is the stage of the process that is generally split into two ‘sub-stages’; a qualitative analysis that focuses on identification and subjective assessment of risks and a quantitative analysis that focuses on an objective assessment of the risk (Perry, 2000).

### Qualitative Risk Analysis

Performing Qualitative Risk Analysis is the process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact (PMI, 2013). This will reduce the level of uncertainties pertaining to high level risks. This process is assesses the priority of identified risk by using how likely they will occur and how much it will impact the project. The Qualitative Risk Analysis process is performed regularly throughout the project life cycle, as defined in the risk management plan.

Inputs would include reference to the risk management plan. Specifically, roles and responsibilities, budgets, definitions, impact matrix, and revised stakeholder risk tolerances.

These can be further developed or tailored throughout the project life cycle. The scope baseline, gives insight on what the project is about. This would include the project scope statement and the WBS. Other key inputs to the qualitative risk analysis would include the risk register, enterprise environmental factors and the organizational processes assets.

Tools and techniques used for Qualitative Risk Analysis would include assessing the probability or likelihood of the risk, and the impact it could have. The probability and impact matrix evaluates each risk's importance and priority for attention using a look-up table (Fig.1).

Fig. 1 Probability and Impact Matrix, (PMI, 2013)

Probability and Impact Matrix										
Probability	Threats					Opportunities				
0.90	0.05	0.03	0.18	0.36	0.12	0.72	0.30	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.08	0.56	0.20	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	0.34	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

Project numerical scales 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 thresholds 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 data quality assessment is a technique to evaluate the degree to which the data is understood, and the data pertaining to the risk is accurate. The risk break down structure (RBS) can be used to categorize sources of each risk. Risk can also be categorized by their root causes. This technique is helpful in developing effective risk responses.

Outputs from the Qualitative Risk Analysis would include updating project documents. The risk register will need to be continuously monitored and updated throughout the life cycle of the project. Other updates would include the assumption log. When risks become more identifiable through performing the risk analysis, assumptions could change. This will need to be updated as well.

### Quantitative Risk Analysis

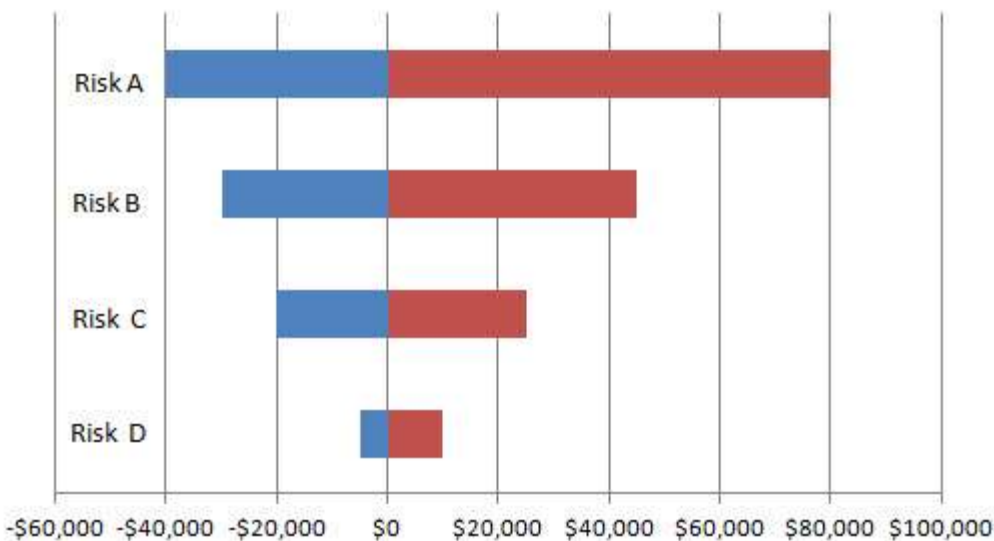
This process numerically analyzing the effect of identified risks on project objectives. This process typically follow the Qualitative Risk Analysis process. Once risks have been prioritized by performing the Qualitative Risk Analysis, the Quantitative Risk Analysis process analyzes the effect of those risk on project objective (PMI, 2013). This is effective when considering risks simultaneously. The inputs to take into consideration for this process would include the risk management plan, cost management plan, schedule management plan, risk register, enterprise environmental factors and organizational process assets.

Tools and techniques that refer to each of the inputs would include the collection of data and representation techniques, quantitative modeling techniques and expert judgement (PMI, 2013). The tools that would be beneficial for Team 3 project would be interviewing of personnel from various departments. The PMBOK states that interviewing techniques draw on experience and historical data to quantify the probability and impact of risks on project objectives. It is important to use the appropriate model of the quantitative risk analysis. The most frequently used would include schedules, line item cost-estimates and decision tree's (PMI, 2009).

Sensitivity analysis helps to determine which risks have the most potential impact on the project. This model could be utilized after identifying potential risks for Team 3. This analysis

help understand how the variations in project's objectives correlate with variations in different uncertainties (PMI, 2013).

Fig. 2 Tornado Diagram



Expert judgement is required to identify impacts and evaluate probabilities. This judgment also comes into play with interpreting data. Expert judgment usually refers to project management team or key stakeholders that hold credible experience.

Outputs from performing quantitative risk analysis would be updates to project documents. The first document is how probable the project will be on time and under budget. The risks that are identified must be acceptable for the project team and stakeholders. The list of prioritized quantified risks, which include risks that may have the greatest effect on cost

contingency and those that are most likely to influence the critical path (PMI, 2013). The last document would recognize trends and add to historical data and lessons learned. This would provide new insights to the various risks identified through the Quantitative Risk Analysis.

## Reference List

Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge* (PMBOK Guide, 5<sup>th</sup> ed) Newton Square, PA: PMI Inc.

Project Management Institute (2009) *Practice Standard For Project Risk Management*. Newton Square, PA: PMI Inc.

Perry J. (2000) "Project Risk Analysis and Management" A Guide by: *The Association for Project Management*, 85 Oxford Rd, High Wycombe, Buckinghamshire HP 11 2DX

