



## Qualitative versus Quantitative Risk Analysis

### *Which is Better?*

Both Qualitative and Quantitative risk assessments are effective when used for the appropriate applications. Quantitative risk analysis is focused on the “quantity” of an object, event, or action. Quantitative risk analysis typically uses numerical data to analyze combined risks and uncertainty on a project. Qualitative risk analysis, on the other hand, is focused on the “quality” of that object, event, or action. Qualitative risk analysis is a quicker way of the two to establishing risk priorities.

<b>Qualitative Risk Analysis</b>	<b>Quantitative Risk Analysis</b>
Typically, is completed prior to Quantitative risk analysis	Excellent method to add more specificity after Qualitative risk analysis if required
Can assess individual risks	Can be used to evaluate combined effects of risk and provide an overall project risk assessment
Easy to implement across multiple areas of a business	Used on larger projects
Quick; information is more subjective used to evaluate individual risks	Time consuming; more detailed information required to be effective
Risk levels can be in text (Low, Medium, High), color coded, numerical (1-5) or a combination	Risk values are quantitative and has analyze the population with some sampling methodology

Regardless of the risk analysis (system) established and implemented, it is important that Senior Management assure that the process:

1. Identifies hazards and/or situations associated with that activity or event
2. Evaluates an associated risks
3. Controls risks
4. Monitors the effectiveness of actions taken to effectively manage the risk.

Senior Management also needs to provide adequate resources and assign appropriate personnel. They also need to review the risk management process at planned intervals to access effectiveness of actions taken. Without a focus by Senior Management, any risk management process will not add value to risk reduction over the product/process life cycle.

### Qualitative Risk Analysis Details

Qualitative risk analysis tends to be subjective. It identifies risks based on likelihood/probability of an event happening and its impact/severity it will have. Many organizations use risk registers to document risks. Many matrices are 5x5, but some organization have opted for 4x4 or even 3x3 (See examples).

Risk is the combination probability of occurrence of harm and the severity of that harm. It allows an organization to determine which risks are to be eliminated, mitigated, assumed, avoided, or shared with a customer or supplier.

RISK OUTCOME					
Low					
Moderate					
Significant					
High					
Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
	1	2	3	4	5
Almost Certain 5	5	10	15	20	25
Likely 4	4	8	12	16	20
Possible 3	3	6	9	12	15
Unlikely 2	2	4	6	8	10
Rare 1	1	2	3	4	5

Risk Matrix Example (5x5)

		Probability		
		L	M	H
Severity	L	L	L	M
	M	L	M	H
	H	M	H	H

(3x3)

**Tip #1** Most organizations use multi-functional teams to construct a risk matrix. In some situations, organizations use risk registers for all value-added processes in the product value stream. It is important that all employees agree on ranges of severity and probability at each level

A risk register is similar to a risk matrix but has additional features, it allows the organization to document what actions will be taken after the risk has been initially assessed. After the completion of any actions items the risk is reassessed to determine effectiveness.

**Deysher Manufacturing LLC - Risk Register**  
Date -

Key Process Step	Name	Initial Date	Update Date	Risk Item	Sev	Prob	Risk	Action Plan	New Sev	New Prob	New Risk
Step 1				Risk Item 1-1	3	3	9	No plan required	3	3	9
				Risk Item 1-2	2	2	4	No Plan Required	2	2	4
				Risk Item 1-3	4	5	20	Action Plan Required	3	4	12
				Risk Item 1-4	1	5	5	Verify Probability; if OK then no plan required	1	5	5
Step 2				Risk Item 2-1	5	3	15	Action Plan Required	3	3	9
				Risk Item 2-2	3	2	6	No plan required	3	2	6
				Risk Item 2-3	1	4	4	Verify Probability; if OK then no plan required	1	4	4
							0				0
Step 3				Risk Item 3-1	4	4	16	Action Plan Required	2	4	8
				Risk Item 3-2	3	3	9	No plan required	3	3	9
				Risk Item 3-3	2	5	10	Verify Probability, then No Plan Required	2	5	10
				Risk Item 3-4	2	2	4	No Plan Required	2	2	4
				Risk Item 3-5	3	1	3	No Plan Required	3	1	3

Cell Value Between 4 and 5 AaBbCcYyZz

Cell Value Between 0 and 4 AaBbCcYyZz

Cell Value Between 5 and ... AaBbCcYyZz

Cell Value Between 15 an... AaBbCcYyZz

New Risk Value  
Post Action Plans

Risk Register Example

**Tip #2** This tool, risk register, is a convenient and simple tool that can be used at the organization’s Management Reviews focusing on the risks that have a higher likelihood of occurrence as well as its impact or severity.

**Tip #3.** Most organizations use financial risks in qualitative risk analysis. Consider other risks such as customer satisfaction, business interruption, employee morale or safety. The reason is that financial metrics, while important, are lagging indicators and the result of another risk category. Some organizations have used reputation as a risk category.

### Quantitative Risk Analysis Details

Quantitative risk analysis relies on verifiable data to analyze the effects of risk in terms of costs, project scope, resource usage or project schedule delays. It is process for assigning a numerical value to the probability of an overall loss based on known risks and available quantifiable data. It does provide objective information than qualitative risk analysis.

It is important to identify when to perform quantitative risk analysis. Step 1 is usually to do allow both qualitative and quantitative risk assessments. Consider the quantitative risk analysis if:

- Risks to either/both project budget and schedule demand a contingency plan
- Large projects that require key decisions at multiple program times to continue
- Projects when management demands more details about probability finishing a project on time and within budget

**Tip #4.** Employees who manage the quantitative risk management process are competent based on education, training, skills and experience in Project management. Risk

management tasks can be performed by representatives of several functions, each contributing their specialist knowledge.

Numerous quantitative risk analysis tools and techniques are available. A few are:

- **Three Point Estimate** – a technique that uses the optimistic (O), most likely (M), and pessimistic (P) values to determine the best estimate.

Example - Best Estimate =  $(O + 4M + P)/6$

- **Monte Carlo Analysis** – a technique that uses optimistic, most likely, and pessimistic estimates to determine the total project cost and project completion dates.

- **Expected Monetary Value (EMV)** – a method used to establish the contingency reserves for a project budget and schedule

Risk	Probability	Cost Impact	EMW
Event based on Potential Hazard	25%	\$200,000	\$50,000
	Team Estimate based on data	Team Estimate based on data	Contingency Reserve

- **Sensitivity Analysis** – a technique used to determine which risks have the greatest impact on a project.

**Tip #5.** Update risk matrices with the quantitative risk analysis data to maintain a current record of risk levels

**Which is Better?**

Both qualitative and quantitative risk analyzes are valuable tools that organizations can use to assess the probability and severity to processes and projects. The key is to recognize when to use either one. Qualitative risk analysis is effective in classifying probability and prioritizing risk in most situations. It is simple and can be understood by employees in different functions. Quantitative risk analysis is a better method to understand how risk and uncertainty can affect a project. It is more accurate but more complex than qualitative risk analysis. The result is a more robust assessment. Quantitative risk analysis is a better tool for high-risk industries.

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