FT PRESS PROJECT MANAGEMENT SERIES

MASTERING RISK AND PROCUREMENT IN PROJECT MANAGEMENT

A Guide to Planning, Controlling, and Resolving Unexpected Problems

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Qualitative Analysis

Information gathered on specific risks might be in more generalized terms using less specific descriptors, such as *high*, *medium*, or *low*; *pass* or *fail*; *hot* or *cold*; *good* or *bad*. Although these are descriptive enough for understanding risk, they do not have any numerical value and thus are more subjective in articulating the attributes of a risk. In some cases, this might be all the information that is available to assess risk. Depending on the size and complexity of the project and work activity the risk is associated with, this level of analysis might or might not be suitable.

Some aspects of work activity are simple in nature and do not pose much of a threat to the overall project, so a simple qualitative assessment of risk may be sufficient and no further analysis is required. Other tasks that have to be performed within a work activity might be critical to the project and require more detailed analysis to accurately and specifically define the probability, severity, and impact the risk will have, referred to as quantitative analysis.

On smaller projects, the project manager is typically responsible for gathering and analyzing risk information, and anything that can help expedite the process of risk identification, analysis, and response planning is helpful. The benefit of qualitative analysis is that the information is easy to obtain and the analysis can be performed quickly.

Simple and Fast

The benefit of a qualitative analysis is that subjective assessments can be quickly obtained in reviewing work activity information and can be easily categorized. Project managers, in reviewing information gathered from work activities, must first ascertain the importance of the activity relative to the overall project, as this helps determine if a simplified qualitative assessment of risks is sufficient or if a more quantitative in-depth analysis is required. If it can be determined that qualitative assessment is sufficient, this can help expedite the overall evaluation of risk for that activity. For qualitative risk analysis and prioritization, a basic matrix can be developed to list risk information that can be used to quickly determine which risks need further

analysis and which should just be noted that a basic response plan was identified but no further action is required.

Risk Assessment Matrix

The *qualitative risk assessment matrix*, sometimes referred to as a *probability and impact matrix*, can be a simple document to effectively analyze risk. It can be used as a summarizing tool to see how risks compare with each other within certain larger blocks of categorization and how simple and easy prioritization of risks can actually be accomplished. The matrix uses a qualitative assessment of both probability and impact in terms of low, medium, and high. It can also include a weighting factor to help in prioritizing risks. An example of a qualitative risk assessment matrix is shown in Figure 3.1.

Risk Assessment Matrix			
Risk	**Impact**	**Likelihood**	**Sum of Weight**
Shipments delayed	High	High	6
Long lead time (hardware)	High	Med	5
Resources unavailable	Low	High	4
Rework problems	Low	Med	3
	Low = 1	Med = 2	High = 3

Figure 3.1 Qualitative risk assessment matrix

As the project manager continues to identify risks where qualitative analysis is appropriate to use for assessment, it might be necessary to understand how the outcome of a risk can change if influenced by other factors within a work activity or other activities on a project. This is an important factor, as in many cases problems are further complicated by activities being performed simultaneously or by other areas within the organization that can influence the probability and severity of a risk. In this case, other forms of qualitative risk assessment can be utilized in risk analysis, such as diagramming methods. Although diagramming methods were used in Chapter 2 for risk identification, they can also be powerful tools used to analyze how risks can be influenced by other risks, other activities, and other organizational influences.

Diagramming Methods

If diagramming methods are used by the project manager and project staff in identifying risks, then these tools will be familiar, and information may already be in place to use these tools for risk analysis. In risk identification, these tools were used where information revealed the potential of a risk. In risk assessment, the same tools and information can now be used to ascertain general levels of risk information, such as probability of occurrence, severity, and impact, as well as ideas for mitigation or elimination responses. These tools often reveal the opportunity to proactively eliminate a risk before the project begins. In most cases, these tools are useful in determining basic qualitative assessments of risks. These tools can be efficient as well as effective if they have already been previously used in risk identification, and, in the case of network diagramming, used to analyze the sequencing of work activities. Three common diagramming methods are listed next.

- **Cause and effect analysis—**Useful in not only identifying but analyzing risks relative to a specific work activity and how the components of that activity cannot only generate a risk, but can offer more information, such as the probability and potential impact each risk can have on the activity as well as the project in general. It can also help determine if further quantitative analysis should be required of a particular risk. An example of deriving information for qualitative risk assessment is shown in Figure 3.2.
- **Influence diagrams—**Also used in risk identification and can be utilized effectively as a qualitative assessment tool. Much like the cause and effect diagram, if it was used in risk identification, information will already be in place and can also be used to assess the general probability and impact each identified risk could have on a work activity or the project in general. The influence diagram is unique as it, by its design, reveals influences and can easily provide a quick assessment for probability and impact for each risk identified.
- **Network diagram analysis—**One of the most powerful tools used by a project manager to identify the effects each work

activity has in relation to other activities and the overall project. The network diagram is used not only to graphically illustrate the connections and flow of all work activities on the project, but it can be used to identify and quickly ascertain the impact of certain risks. An example of how the network diagram can be used in risk analysis is shown in Figure 3.3.

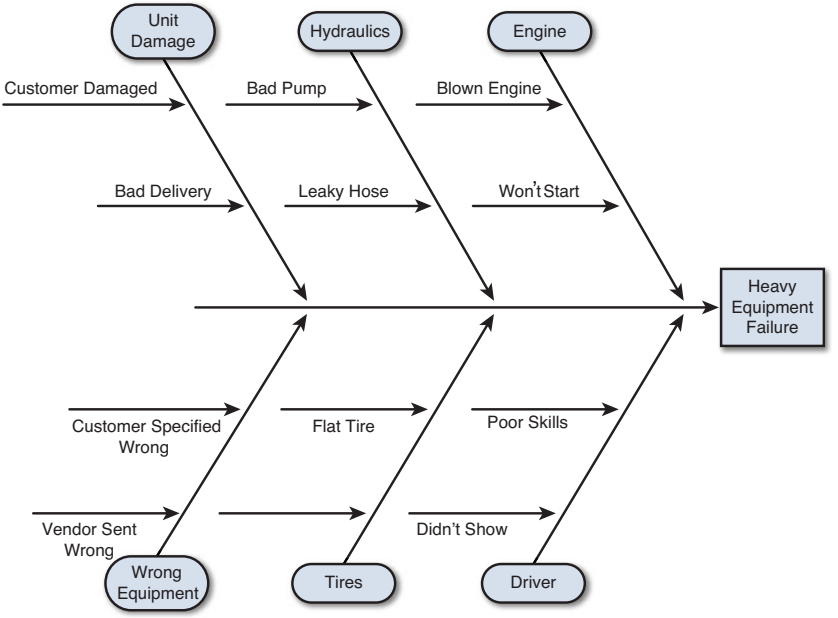

Figure 3.2 Cause and effect diagram for qualitative risk analysis

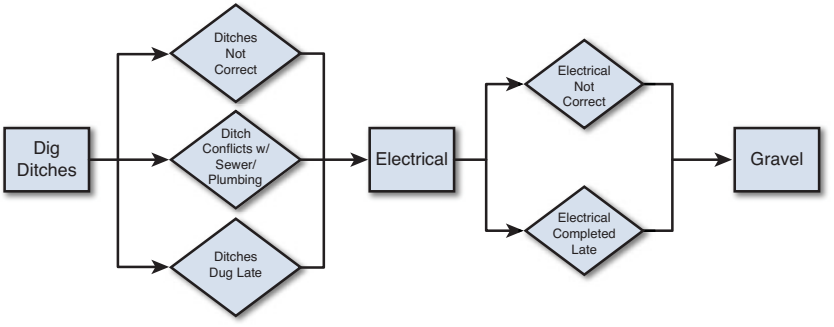

Figure 3.3 Network diagram for qualitative risk analysis

Decision Tree Analysis (Non-numerical)

The decision tree analysis can be used as a simple tool to perform qualitative risk analysis using a non-numerical chain-of-events type of approach that can help a project manager assess the impact certain risk events can have on a work activity or the overall project. The decision tree in some cases can be used in conjunction with a work breakdown structure that indicates all the levels of work broken down into their smallest components. The smallest component of work can start the decision tree, and based on the outcome of various risk events can indicate what effect risks have on larger components of a project deliverable. If one direction in risk response is chosen, the decision tree can then go in a direction of response planning that would yield one particular outcome. Going in another direction using alternative risk responses can reveal possible outcomes that are more or less favorable and thus allow the project manager the opportunity to make more informed decisions as to the best response plan for a particular risk. As shown in Figure 3.4, an example of the decision tree analysis would be using non-numerical values to illustrate evaluating levels of probability and impact as well as possible responses.

3.2 Quantitative Analysis

Quantitative risk analysis is much more detailed and objective and usually results in percentages or other numerical values to describe risk assessment. If this level of information is available, it is best to use a quantitative assessment, as it allows for more accurate assessment and effective response planning of budgetary and schedule impact in terms of measurable values. This type of analysis requires different tools that are capable of processing numerical values and output objectively, as well as absolute values describing risk probability, severity, and specific impact. The project manager needs to assess how much time it will take to process this kind of analysis and which risks require the time to perform this level of analysis. If the project manager has the time and resources available, and objective numerical type information is available, quantitative analysis should be performed when possible, as this does provide the most accurate risk assessment.

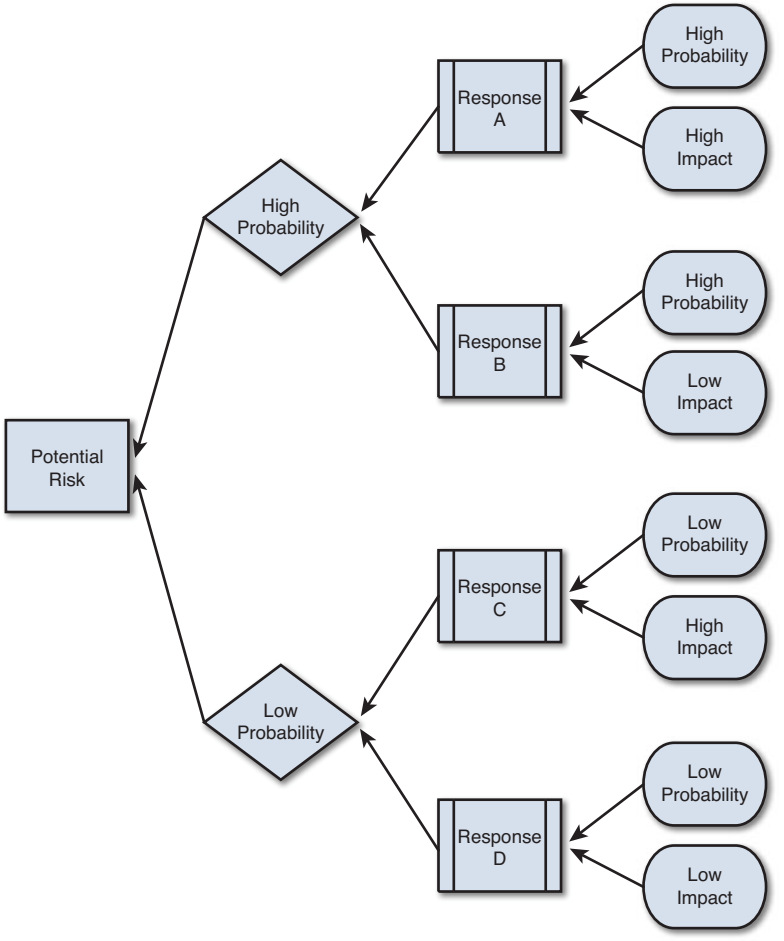

Figure 3.4 Decision tree analysis (non-numerical)

Data Gathering

The most important component of quantitative assessment is the information. Any form of risk assessment is only as good as the information available and the type of tools used to analyze information. It is vitally important the project manager understand that accurate and reliable information is required for effective quantitative analysis. The project manager and others assisting in information gathering, when confronted with more objective and specific numerical data that