RISK DOCTOR BRIEFING

QUANTITATIVE RISK ANALYSIS: WHY BOTHER?

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Many projects overrun their budget and schedule targets, often due to the following causes:

- Project plans are biased, usually towards being over-optimistic.
- Project plans do not fully reflect the impact of uncertainty and risks (including both project-specific risks and systemic risks).

Fortunately, quantitative risk analysis can help to address both of these, through a two-stage analysis. The ***first stage*** addresses the two main causes of unrealistic plans:

- **Optimistic or biased plans.** All project plans include estimates of cost and duration which are based on *assumptions*, and these are often optimistic. For instance, we might assume that problems that affected previous similar projects will not happen on this project. Or we might produce *unrealistic estimates* because of pressure from the customer, management, the competition and the economics of the project, which usually results in optimistic plans that may be unachievable. Ideally, if we could challenge assumptions and remove the effect of optimism or bias, we could ensure that the project starts with a realistic baseline plan. However, it may not be possible to counter estimating bias fully, so the uncertainty component of the risk analysis will usually include a correction for optimistic estimates of cost or duration.
- **Uncertainty and risks.** Project managers must recognize that estimates of cost or duration are uncertain due to *inherent variability, estimating error* and *estimating bias* (if it exists). In addition, there are both *project-specific and systemic risks* that may affect achievement of schedule and cost targets. These risks must be identified and quantified, including their probability, impact and which activities they will affect. When both uncertainty and risks are incorporated in the risk analysis model, results obtained using Monte Carlo simulation will indicate a range of possible project outcomes, including the result that can be expected in the absence of actively managing the risks. These results are more realistic (and usually more pessimistic) for both finish date and total cost, but they are not the end of the story.

In the ***second stage***, quantitative risk analysis results can be used to *guide proactive risk management actions*. Risks can be prioritized using the outputs of a risk analysis model, which indicate where risk management action would lead to the greatest improvement in project outcome. The prioritized risk list forms the input to a workshop or a set of interviews, where effective risk responses can be developed. Implementing these responses will result in improved project outcomes, although there will probably still be residual risks that need further action, since relatively few risks can be managed completely.

Overall, quantitative risk analysis helps the project manager in at least two ways:

- It produces a more realistic set of predicted project outcomes for finish date and final cost, as well as an estimate of the probability of meeting the planned project schedule and cost targets.
- It identifies those risks where risk management action would be most effective, and guides development of effective risk responses that will improve project performance if they are implemented.

The main benefit of implementing only the first stage of quantitative risk analysis is that it produces more realistic estimates of finish date and final cost, rather than having to rely on initial deterministic values that are subject to optimism, bias, uncertainty and risk. But improved project

performance only comes from implementing the second stage, including risk prioritization and proactive response implementation, and this is the real answer to the question “Why Bother?”