Schedule Risk Analysis

Purposes

Schedule risk analysis provides a risk-based forecast for the completion of key project milestones. It may be a particularly useful input to key project authorisation decision points. It can also be used to:

1. Identify which risks and activities to focus management attention on in order to control schedule risk.
2. Quantify the implications of introducing new risk responses and changes to the schedule.
3. Support cost risk estimates for which costs tend to be driven by schedule performance.
4. Quantify appropriate schedule contingency periods into the project's master schedule.

Warning

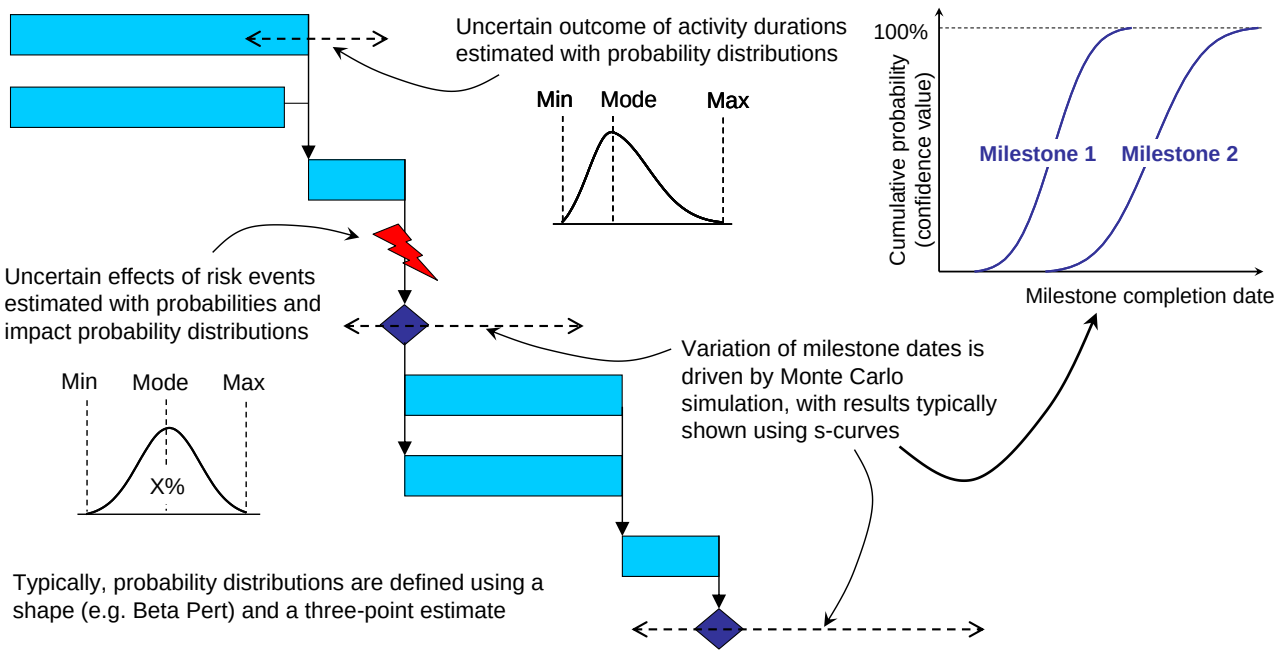
Whilst schedule risk analysis has been proven to be a very useful and powerful technique when conducted to high standards, its results may be misleading if used naively. Although there are a number of good analysis tools on the market, it is easy to use them inappropriately. A capable approach to analysis will be structured to avoid the list of common faults at the bottom of this sheet.

Techniques

PERT (Project Evaluation of Risk Technique) used to be used to calculate schedule risk deterministically. However, Monte Carlo simulation is a better approach and has been made accessible with the advent of modern computer-based tools. A Monte Carlo schedule risk model will be based on a network of activities connected by dependencies and with risk based duration estimates defined by probability distributions. The model will usually include features 1. and 2. from the list below and may also include features 3 and/or 4:

1. Risk events (activities that may or may not occur), with associated probability and impact estimates.
2. Correlation between the outcomes of groups of activities and/or risk events.
3. Probabilistic or conditional branching to simulate uncertainties associated with dependencies.
4. Risk-based calendars to simulate the potential variation of conditions (e.g. weather) over different periods.

Illustration of Monte Carlo schedule risk model



Common faults

Inclusion of too many activities in the model. Use a maximum 200 activities – and only for the largest and most mature schedules. Expect most models to have considerably fewer activities.

Use of inappropriate logic or constraint dates in the network that subvert or override the model.

Inclusion of non-time-driving support activities in the model e.g. routine meetings or project management.

Use of ill-defined activities that provide an inadequate basis on which to make good quality estimates.

Copying the project master schedule to use as the risk model, disregarding the four common faults above.

Inappropriate linkage with the risk register e.g. adding risks that are already inherent to the activity network.

Failure to use robust risk estimating techniques when developing inputs – a typical example of bad practice is the default assumption that planned values are the mode and that max and min are the mode +/- x%.

Failure to report key framing assumptions inherent to the model when reporting the results.