

Risk Assessment

The assessment of risk is a very personal process, what is acceptable to one person may be far too risky for another to consider. The appreciation and assessment of risk and a person's decision making are heavily influenced by the way the mind works¹. A person's risk attitude is defined as their chosen state of mind with regard to those uncertainties that could have a positive or negative effect on a project's objectives. A range of possible attitudes can be adopted by a person towards the same situation, and these result in differing behaviours, which lead to different consequences, both intended and unintended².

Factors Affecting Risk Assessment

The assessment of risk is multidimensional; the *PMBOK® Guide* focuses on Probability and Impact, but there are other important characteristics to consider, a more complete set of risk attributes include:

- **Probability** - How likely the uncertain risk is to occur³.
- **Impact** - How significant the effect of the risk event would be if it actually happened, measured in time, cost and/or safety.
- **Manageability** - How easy is it to do something about the risk? We may decide that a medium-probability/medium-impact risk that we can do nothing about is more risky than a high-probability/high-impact risk which is simple to deal with.
- **Proximity** - If the risk happens, how soon do we expect that to be? A risk that might happen tomorrow should be treated as more important than one which might not occur until next month or next year.
- **Propinquity** - How important is the risk to me personally, or to my team or our business? We are more sensitive to risks that affect us directly, and view risks to others as less important.
- **Urgency** - How much time do we have in order to implement an effective response to the risk? If we must act now to address the risk, we should give it higher priority than one where we have longer to respond.
- **Relatedness** - Is this risk related to other risks? A risk with complex links or dependencies with many other risks should be treated as higher priority than a simple independent risk.

For more on these additional dimensions of risk assessment, see the *Prioritising Project Risks* guide published by the UK Association for Project Management (APM)⁴.

Because the effect of the risk is in the future, its affects have to be imagined and are therefore subject to a range of cognitive biases⁵. Cognitive bias is a pattern of deviation in judgment that occurs in particular situations; we are all subject to an extensive range of observed biases, Wikipedia offers a comprehensive list⁶.

Assessing the impact of Variability and Events

Assessing the Impact of a risk typically falls into one of two processes, assessing the affect of variability or assessing the consequences of an event. These assessment processes should not be confused.

¹ For more on neuroscience see: <http://scienceblogs.com/cortex/>

² For more on risk attitude see: <http://www.risk-doctor.com/pdf-files/umraNov04.pdf>

³ For more on probability see: http://www.mosaicprojects.com.au/WhitePapers/WP1037_Probability.pdf

⁴ Full details at <http://www.apm.org.uk/PrioritisingProjectRisk.asp>

⁵ For more on bias see: http://www.mosaicprojects.com.au/WhitePapers/WP1069_Bias.pdf

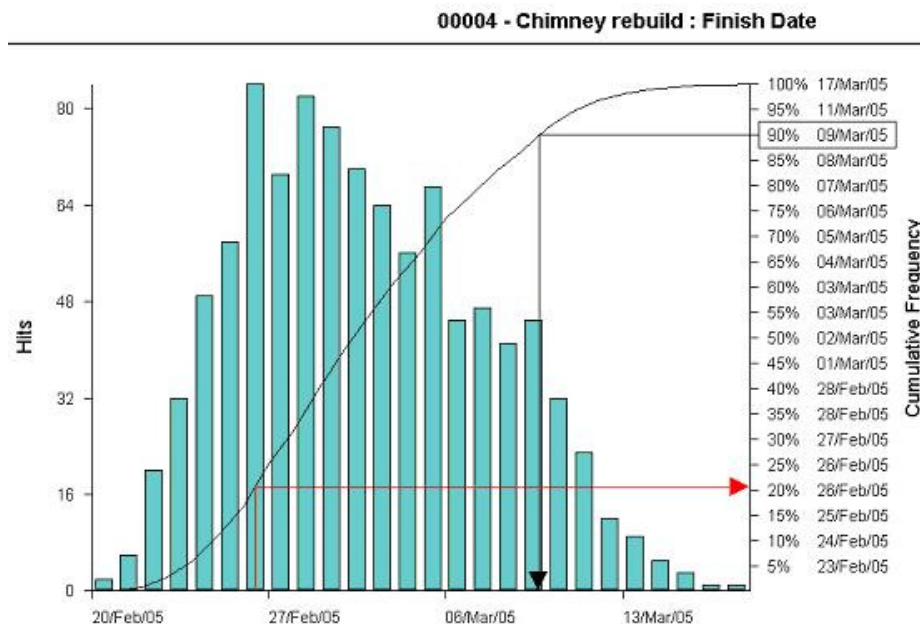
⁶ Wikipedia's list of cognitive biases see: http://en.wikipedia.org/wiki/List_of_cognitive_biases

Event impact. Some risks will either occur or not occur; eg, a test failure. Assessing the likely impact of this type of risk requires data and a calculation based on the probability of the event occurring and its effect on project objectives (usually time and cost). The ‘expected value’ of the event is assessed by multiplying the impact by the probability.

There is a 30% probability a test will fail and the rework will cost \$5,000. The ‘expected value’ of this event is $30\% \times -\$5,000 = -\$1,500.00$ therefore a provision of \$1500 to cover the expected loss is desirable.

Allowances. Some risk events are virtually inevitable; you just do not know when they will occur. Inclement weather is normal, it rains, gets too hot, too cold or too windy to work depending on your location. Assessing appropriate provisions for this type of risk requires understanding the project’s exposure to the risk and having access to historical data. A provision based on the normal/expected occurrence over the time of exposure.

Variability. All processes are subject to normal variability, including estimating the duration and cost of project activities. Assessing an appropriate allowance for the variability embedded in the estimating process is best done by using *Monte Carlo*. Monte Carlo simulation involves running the project many hundreds (if not thousands) of times with different values selected for each element based on the range of options defined by the subject matter expert’s (SMEs) for that element. This example looks at time. A similar analysis can be done for costs.



It is important to ensure specific risk events are not included twice. The allowance for variability calculated using Monte Carlo and the allowances for specific events are combined to assess the overall contingency allowance that needs to be held in management reserves for the project.

Conclusion

Determining the acceptable level of risk for a project based on the multiple dimensions discussed above and the level of contingency needed to make the project ‘acceptable’ depends on the risk attitude of the decision makers. These processes should form part of an overall risk management⁷ system. However, it is also important to recognise there are likely to be unpredictable events occur that cannot be assessed because we ‘don’t know what we don’t know’⁸.

⁷ For more on risk management see: http://www.mosaicprojects.com.au/WhitePapers/WP1047_Risk_Management.pdf

⁸ For more on unknown unknowns see: http://www.mosaicprojects.com.au/WhitePapers/WP1057_Types_of_Risk.pdf