

Risk Analysis



What are risks?

- For every item in your WBS, consider what might prevent you from completing it
- Each of these is a risk



Expected Cost

- Try to quantify each risk in terms of:
 - It's probability (the likelihood of it happening)
 - It's cost (the impact on your project if it happens)
- The product of these is the expected cost of that risk
- Exercise: what are the units of expected cost?



Risk Heat Map

- In many cases it's difficult to quantify either the probability or the cost
- Instead we can define broad categories of probabilities and costs
- For example:
 - Likelihood: likely, possible, or unlikely
 - Impact: catastrophic, significant, insignificant
- We can represent these combinations in a “risk heat map”:

		Severity				
		Very low	Low	Medium	High	Very high
Probability	Very high					
	High					
	Medium					
	Low					
	Very Low					

From [Wikimedia](#)

- Each box is assigned a color based on the likelihood and impact
- Each risk will fall into one of the boxes depending on the estimate of its likelihood and impact
- This is mathematically justified if the probability and cost bins increase exponentially
- Exercise: work out the expected cost in each square of a 3x3 risk matrix with probabilities of 10^{-1} , 10^{-4} , and 10^{-7} and costs of \$10, \$10k, \$10M

Dealing with Risk

- Often a corporate policy will determine how you must deal with each color of box (expected cost)
- For example, a project may require executive approval if any risks fall into a “red” box
- However, in most cases you will be expected to add risk mitigation tasks to your project plan
- The cost of mitigating a risk should not exceed its expected cost (!)

- Estimating the costs of risk is often difficult; you can try:
 - Assign bounds (minimums and maximums)
 - Compare them and rank them
 - Group them into categories with similar costs
- Exercise: The likelihood that a \$10 component will fail is 10%. If you don't have a spare, the shipping delay will cost \$200 in lost work-hours. What is the expected cost of this risk? What is the expected cost if you buy a spare? Would purchasing a spare be a good mitigation strategy?

- You should have a plan for dealing with risks that have high expected costs
- Some strategies (from the text):
 - *Transfer the risk: Shift it to a third party.*
 - *Accept the risk: Acknowledge it and deal with it if it occurs.*
 - *Mitigate the risk: Reduce its probability or impact.*
 - *Eliminate the risk: Do what you must to make it go away.*
- Exercise: You're building something for a client and have identified their bankruptcy as a risk. What strategies could be used to deal with this risk?

ELEX 4560 Risk Analysis Assignment

- Prepare a list of at least a dozen risks for your project
- Assign a likelihood and an impact to each risk (either a numeric or one of a set of categories you define)
- Rank them according to expected cost
- List risk mitigation tasks you will add to your project plan
- Submit to the appropriate Learning Hub dropbox in PDF format.

	A	B	C	D	
1					
2					
3					
4					
5					
6					
7					
8					