Probability – Impact Matrix (PIM)

Purpose

Prioritise a list of risks into a rank order of significance

Warning

Whilst the PIM is the most commonly used technique in project risk management, its limitations and drawbacks are often not understood. Incorrect or inappropriate use of a PIM may harm your project's risk management capability, particularly if it causes some of the common faults listed at the bottom of this sheet.

Limitations

The PIM is designed to assess risks in the context of managing risk on a risk-by-risk basis e.g. using a risk register. It cannot assess overall project risk, or the implications of interactions between risks.

The PIM is designed around an event-orientated concept of risks. Other valid conceptualisations of risks e.g. variability risks, ambiguity risks and project strategy risks often cannot be mapped to a PIM.

PIM results are dependent upon the level to which the various risks have been broken down by description.

PIM assessments are often not practical until the project plan has reached a minimum level of maturity – by which time some of the best opportunities for risk management to add value may have already passed.

Technique

The PIM is based on a simplistic approach to expected value i.e. that the significance of a risk is proportional to its Probability x Impact.

The probability and impact of each risk is classified into a pair of bands using a risk classification criteria table, typically 5 bands per scale. (See separate Guidance Sheet)

The index numbers associated with the pair of bands are multiplied to produce a risk score - a proxy for expected value that can be used for prioritising the risk relative to other risks.

Probability	V High	0.8	2.4	5.6	12.8	32	80
	High	0.6	1.8	4.2	9.6	24	60
	Med	0.4	1.2	2.8	6.4	16	40
	Low	0.2	0.6	1.4	3.2	8	20
	V Low	0.1	0.3	0.7	1.6	4	10
Index numbers			3	7	16	40	100
			V Low	Low	Med	High	V High
			Impact				

Handling threats and opportunities

Opportunities might be conceptualised as being positive risk events – benefits to the project outcome that might occur. Whilst the above example of a PIM is designed to handle just threats, a mirror-imaged extension, as shown below, can be used to produce a PIM that handles both threats and opportunities.

		Threats					Opportunities						
Probability	V High	2.4	5.6	12.8	32	80	80	32	12.8	5.6	2.4	V High	Probability
	High	1.8	4.2	9.6	24	60	60	24	9.6	4.2	1.8	High	
	Med	1.2	2.8	6.4	16	40	40	16	6.4	2.8	1.2	Med	
	Low	0.6	1.4	3.2	8	20	20	8	3.2	1.4	0.6	Low	
	V Low	0.3	0.7	1.6	4	10	10	4	1.6	0.7	0.3	V Low	
		V Low	Low	Med	High	V High	V High	High	Med	Low	V Low		
		Impact					Benefit						

Common faults

Neglect of the advantages of using an early and/or multi-pass approach to the risk management process caused by over-reliance on a PIM-based approach and the associated need for a planning baseline.

Failure to include risks in the risk register on the grounds that they do not fit the PIM-based concept of a risk.

Failure to take into account other risk attributes that may be important to risk prioritisation, e.g. urgency of response, value of risk responses, clarity of risk ownership or relationships with other risks.

Inappropriate linking of the PIM to risk tolerance rules – you can appear to reduce any risk to within PIM tolerance boundaries if you subdivide it into enough child risks!

Inappropriate design or application of a risk classification criteria table – see the separate Risk Classification Criteria Table Capability Guidance sheet for more information on this.

Performing additional arithmetic using the risk scores – e.g. summing them to calculate overall risk.