Risk Matrix

Purpose

- quantify the level of risk existing in a technology
- ensure that all milestones are focused on reducing risk
- identify those milestones most important to reducing risk
- communicate the reduction in risk versus time and cost

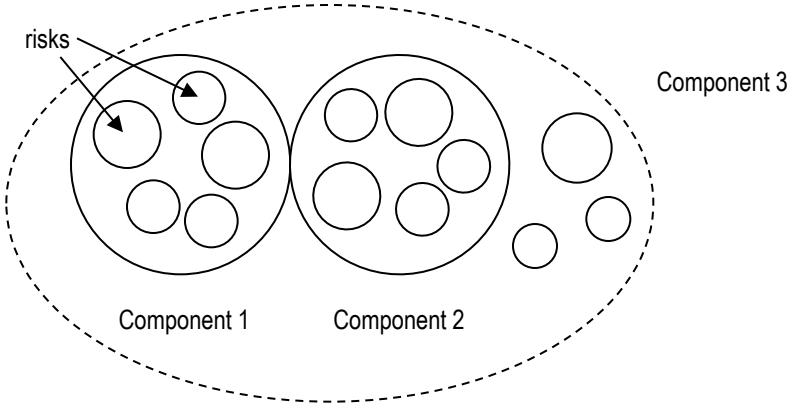
General Approach

1. identify major technical risk areas and failure modes by technology component
2. assign an initial absolute level to each risk
3. lay out a milestone schedule
4. assign a level of risk reduction associated with successful completion of milestone
5. track risk reduction versus time and expenditures

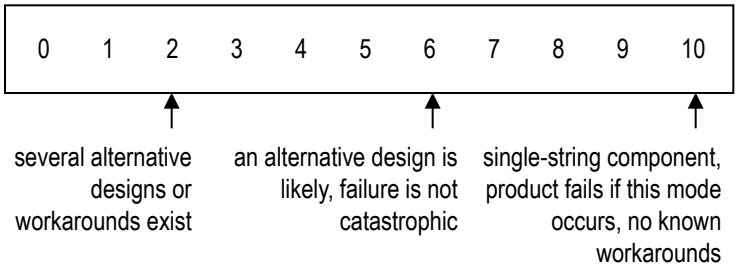
Risk Matrix

Identify Major Technical Risk Areas

First, the critical technical risks or failure modes are identified and categorized by product component. Groups of components can also have additional risks or failure modes.



Each risk is assigned a weighting factor (0 to 10) based on its criticality and relative importance to component performance.



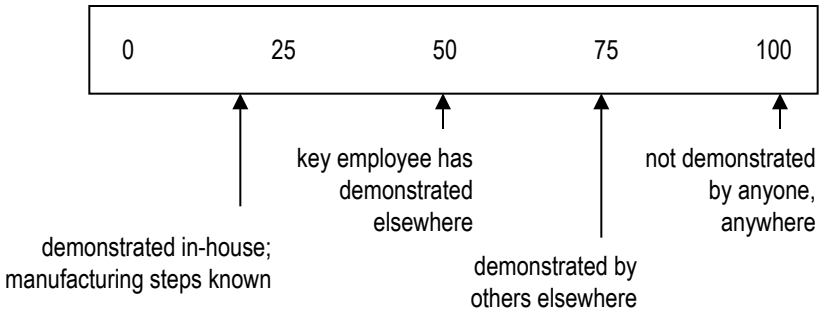
	Criticality Level
Component 1	
failure mode 1	10
failure mode 2	7
failure mode 3	5
Component 2	
failure mode 1	8
failure mode 2	8
Component 3	
failure mode 1	10
failure mode 2	10
failure mode 3	6

Each component or component group can also weighted by its relative importance to product success.

Risk Matrix

Assign Initial Risk Levels

An initial, absolute level (0 to 100) is assigned to each risk based on level of confidence in preventing the failure mode at a manufacturing level.



The total initial level of risk of a component is the weighted average of the risk levels of the failure modes.

	Criticality Level	Initial Risk Level
Component 1		**63**
failure mode 1	10	40
failure mode 2	7	90
failure mode 3	5	70
Component 2		**50**
failure mode 1	8	70
failure mode 2	8	30
Component 3		**54**
failure mode 1	10	80
failure mode 2	10	30
failure mode 3	6	50

Milestone Schedule

Major project milestones (from Gantt chart) are listed.

Each milestone is expected to reduce risk in one or more categories.

No.	Milestones	Original Date
1000	**Component 1 Tests**	
1100	milestone X1.1	03/31/05
1200	milestone X1.2	04/25/05
2000	**Component 2 Tests**	
2100	milestone X2.1	03/31/05
2200	milestone X2.2	05/15/05
2300	milestone X2.3	06/15/05
2400	milestone X2.4	06/30/05
3000	**Component 3 Tests**	
3100	milestone X3.1	03/15/05
3200	milestone X3.2	04/30/05
3300	milestone X3.3	05/15/05
3400	milestone X3.4	05/30/05

Risk Matrix

Risks and Milestones

Risks and milestones are laid out in a matrix. Each milestone reduces the risk of a particular failure mode by some percentage.

When a milestone is achieved, the absolute risk associated with a component falls.

This translates into a reduction in the overall product risk (average of all component risks)

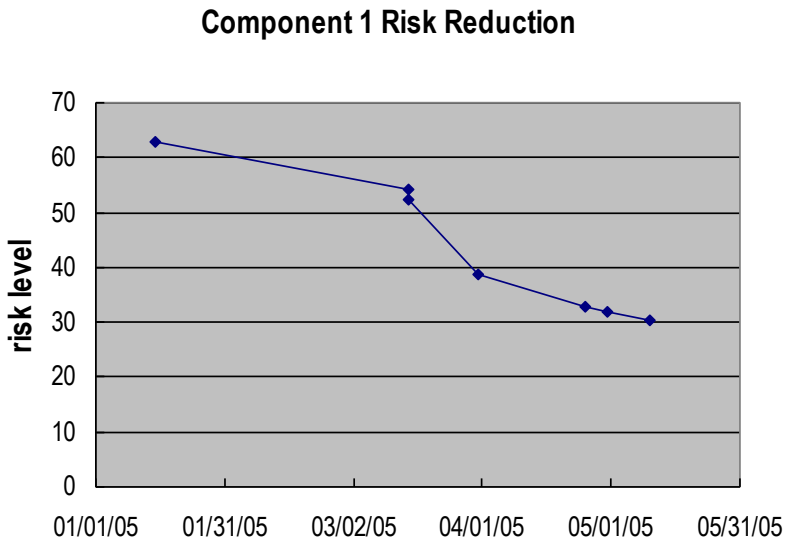
Milestone			milestone X2.1	milestone X3.1	milestone X1.1	milestone X1.2	milestone X3.2	milestone X2.2
Milestone Number			2100	3100	1100	1200	3200	2200
Date		01/15/05	03/15/05	03/15/05	03/31/05	04/25/05	04/30/05	05/10/05
Component 1		**63**	**54.1**	**52.3**	**38.8**	**32.7**	**31.8**	**30.2**
failure mode 1	10	40		10%	50%		5%	
failure mode 2	7	90	30%		10%	10%		
failure mode 3	5	70			10%	20%		10%
Component 2		**50**	**43.0**	**41.3**	**41.3**	**39.8**	**38.3**	**27.0**
failure mode 1	8	70	20%	5%				30%
failure mode 2	8	30				10%	10%	5%
Component 3		**54**	**47.7**	**34.8**	**34.8**	**30.2**	**24.2**	**22.1**
failure mode 1	10	80	20%	40%			10%	5%
failure mode 2	10	30				20%	20%	5%
failure mode 3	6	50		5%		20%	5%	
Product		**56**	**48**	**43**	**38**	**34**	**31**	**26**

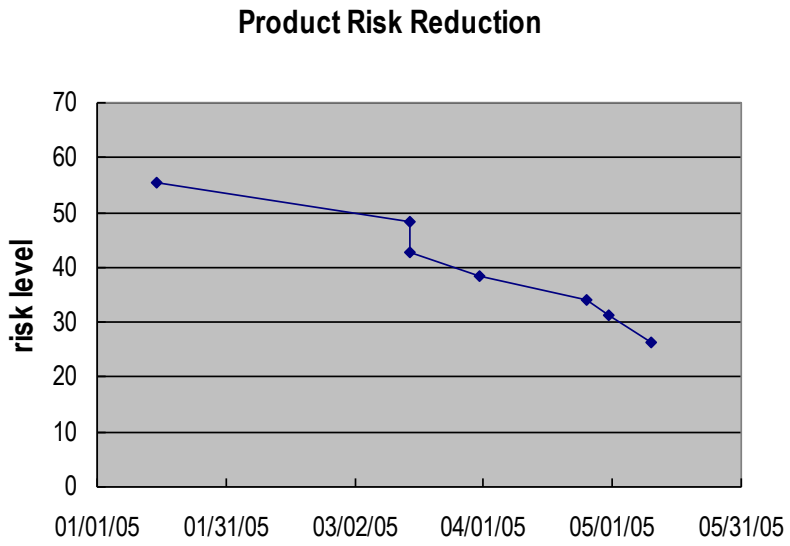
Risk Matrix

Charts

For any component (and for Product Risk), Risk Reduction can be plotted vs time and milestones.

Expenditures might also be plotted versus time on the same charts.





Risk Matrix

Example from an Actual Project