

Risk Overview

Excerpted from Pfleeger and Atlee, 4e

(revised by B. Cheng and D. Phillips)

3.4 Risk Management

What is a Risk?

- Risk is an unwanted event that has negative consequences
- Distinguish risks from other project events
 - **Risk impact:** the loss associated with the event
 - **Risk probability:** the likelihood that the event will occur
- Quantify the effect of risks
 - $Risk\ exposure = (risk\ probability) \times (risk\ impact)$
- Risk sources: generic and project-specific

3.4 Risk Management

Quantifying Risk Impact

- The impact risk (severity) is an estimate of the impact to technical performance, cost, and schedule if the risk occurs.
- Impact can be quantized to low, medium, and high.

Impact	Performance	Schedule	Cost
Low	Minimal or no impact, unimportant	Minimal or no impact	Minimal or no impact
Medium	Acceptable with reduction in margin	Additional resources required, Minor slip in key milestones (<20% slip in total schedule)	Cost estimates exceed budget by <7%
High	Acceptable with no remaining margin; Unacceptable	Major slip in key milestones or Critical Path impacted (>20% slip in total schedule) Can not achieve major program milestones	Cost estimates exceed budget by >7%

3.4 Risk Management

Quantifying Risk Probability

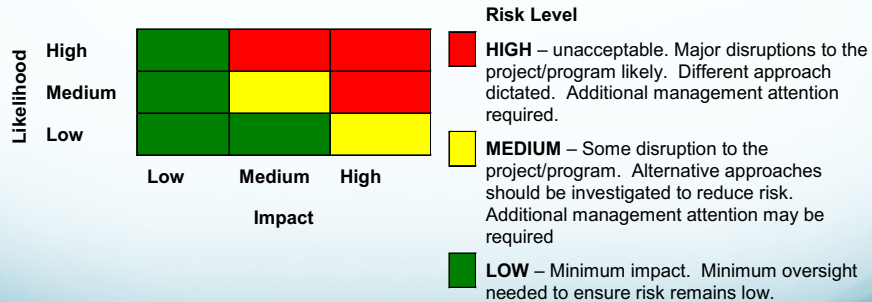
- Risk Probability – likelihood an event will occur
- Risk Probability can be quantized to low, medium, and high.

Likelihood of Occurrence	Description
Low	0 – 30% chance this risk will occur
Medium	30% - 80% chance this risk will occur
High	80% - 100% chance this risk will occur

3.4 Risk Management

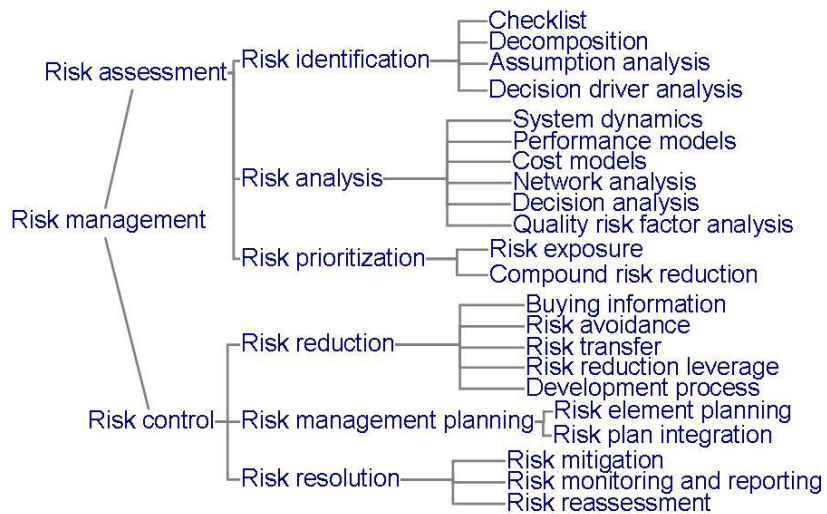
Prioritizing Risk

- Focus on those items with the highest risk level



3.4 Risk Management

Risk Management Activities



3.4 Risk Management

Risk Management Activities (continued)

- Three strategies for risk reduction
 - *Avoiding the risk*: change requirements for performance or functionality
 - *Transferring the risk*: transfer to other system, or buy insurance
 - *Assuming the risk*: accept and control it
- Cost of reducing risk
 - $Risk\ leverage = \frac{(risk\ exposure\ before\ reduction - risk\ exposure\ after\ reduction)}{(cost\ of\ risk\ reduction)}$

3.4 Risk Management

Sidebar 3.4 Boehm's Top Ten Risk Items

- Personnel shortfalls
- Unrealistic schedules and budgets
- Developing the wrong functions
- Developing the wrong user interfaces
- Gold-plating
- Continuing stream of requirements changes
- Shortfalls in externally-performed tasks
- Shortfalls in externally-furnished components
- Real-time performance shortfalls
- Straining computer science capabilities

Risks for your Project

- What risks do you have?
 - Impact levels (low, medium, high)
 - Likelihood (low, medium, high)
- What risks have already occurred?
 - Mitigation?
 - Impact on project?
 - Risk reduction strategy?

Risks for your Project

- What risks do you have?
- What risks have already occurred?
 - Mitigation?
 - Impact on project?
 - Take home message?

3.5 Project Plan

Project Plan Contents

- Project scope
- Project schedule
- Project team organization
- Technical description of system
- Project standards and procedures
- Quality assurance plan
- Configuration management plan
- Documentation plan
- Data management plan
- Resource management plan
- Test plan
- Training plan
- Security plan
- Risk management plan
- Maintenance plan

3.5 Project Plan

Project Plan Lists

- List of the people in development team
- List of hardware and software
- Standards and methods, such as
 - algorithms
 - tools
 - review or inspection techniques
 - design language or representations
 - coding languages
 - testing techniques