Risk Management Training

A Zühlke Software Engineering Training Course

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Goals

- Understand the basic elements of risk management
- Know best practice risk management processes
- Understand risk identification and appraisal
- Know how to select and use adequate tools
- Know how to control risk
- Improve how you deal with risk

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Agenda

1. Introduction
2. Risk Management Basics
3. Risk Management Process
4. Risk Identification
5. Risk Evaluation
6. Risk Appraisal
7. Risk Treatment
8. Risk Monitoring
9. Communication
10. Implementing Risk Management
11. Case Study

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1. Introduction

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Motivation

Why Risk Management?

- "no risk, no fun, no earnings"
  → risk is inherent in any undertaking
  → often risk is proportional to the expected profit of an undertaking
- "the Titanic is unsinkable"
  → insufficient risk awareness
- 2 NASA space shuttle losses
  → insufficient risk identification, appraisal and communication
  - Challenger 1986: o-ring damage after freezing not researched
  - Discovery 2003: wing damage not researched
- there is no reason to accept unnecessary risk
- controlling risk is a critical success factor for any project

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Motivation

Why No Risk Management

- "shit happens"
  → risk management can't evade all problems, issues (best case 70%)
- risk management costs money (von Moltke: "first count, then risk")
  - risk management activities
  - implementation of measures from risk management

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Conclusion

**Risk management costs money,
no risk management costs even more money**

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Risk Management is a Mindset

- accept risk - but show awareness
- incorporate risk management strategy
- collect as much as possible information about potential risks
- carefully evaluate and appraise risk
  - evaluate = systematic assessment, rating of some object on a scale
  - appraise = judge the need of action based on the evaluation result
- implement the necessary measures to avoid, transfer or mitigate risk
- standard management process
  (business, project, sales, operations, …)

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2. Risk Management Basics

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Definitions

Risk, from Italian *risco* (SEI: www.sei.cmu.edu)

- Risk is the possibility of suffering loss

Loss

- An event with unwanted consequences
- The loss describes the impact to the project which could be in the form of
  - diminished quality of the end product
  - increased costs
  - delayed completion
  - or failure

Uncertainty

- An event may or may not happen

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Definitions

Risk

Risk refers to any factor (or threat) that may adversely affect the successful completion of the project in terms of achievement of its outcomes, delivery of its outputs, or adverse effects upon resources, time, cost and quality.

It should be noted that sometimes risks may also be associated with opportunities, such as the use of a new technology, and acceptance of the risk needs to be based upon the costs of rectifying the potential consequences versus the opportunities afforded by taking the risk.

Risk Management

Risk Management describes the processes concerned with identifying, analyzing and responding to project risk. It consists of risk identification, risk analysis, risk evaluation and risk treatment. The processes are iterative throughout the life of the project and should be built into the project management activities.

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Risk vs. Issue

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Issue, Problem

Risk

→ might become an issue

- it has happened, materialized
- compare actual with goal
- Reaction
  - reduce effect of the issue
  - live with the new situation
  - adjust planning

- it may happen, materialize
- compare future with goal
- Action
  - reduce effect
  - transfer effect
  - avoid occurrence
  - move occurrence
  - prepare

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Risk vs. Crisis Management

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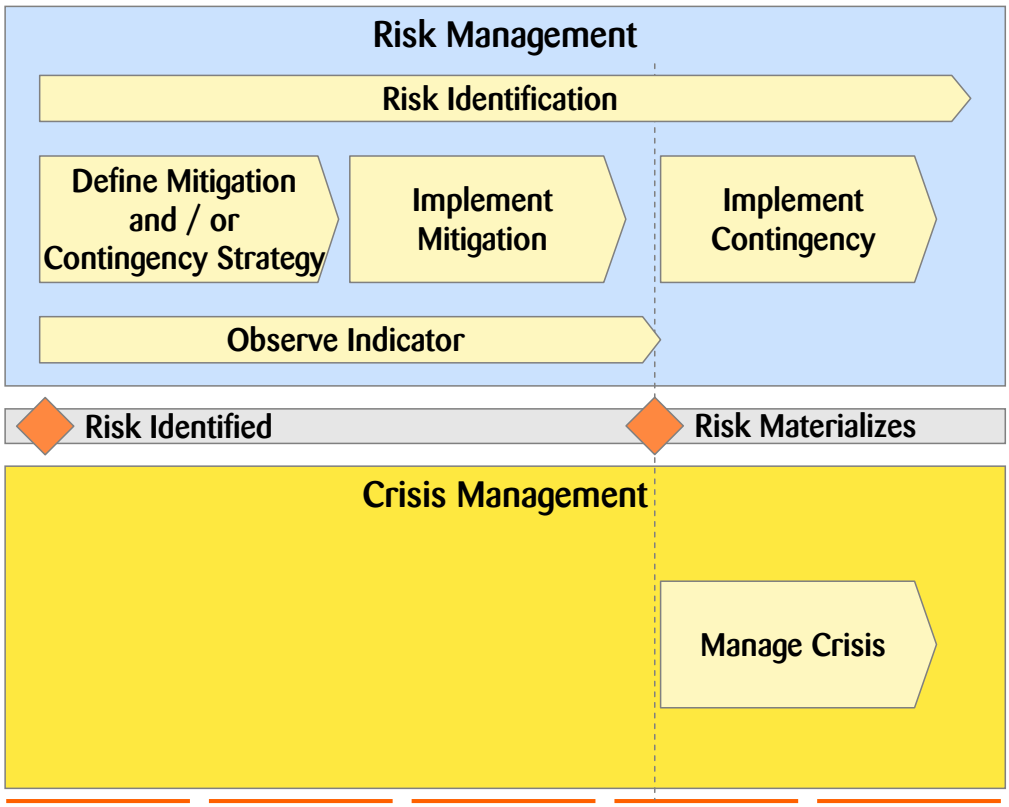

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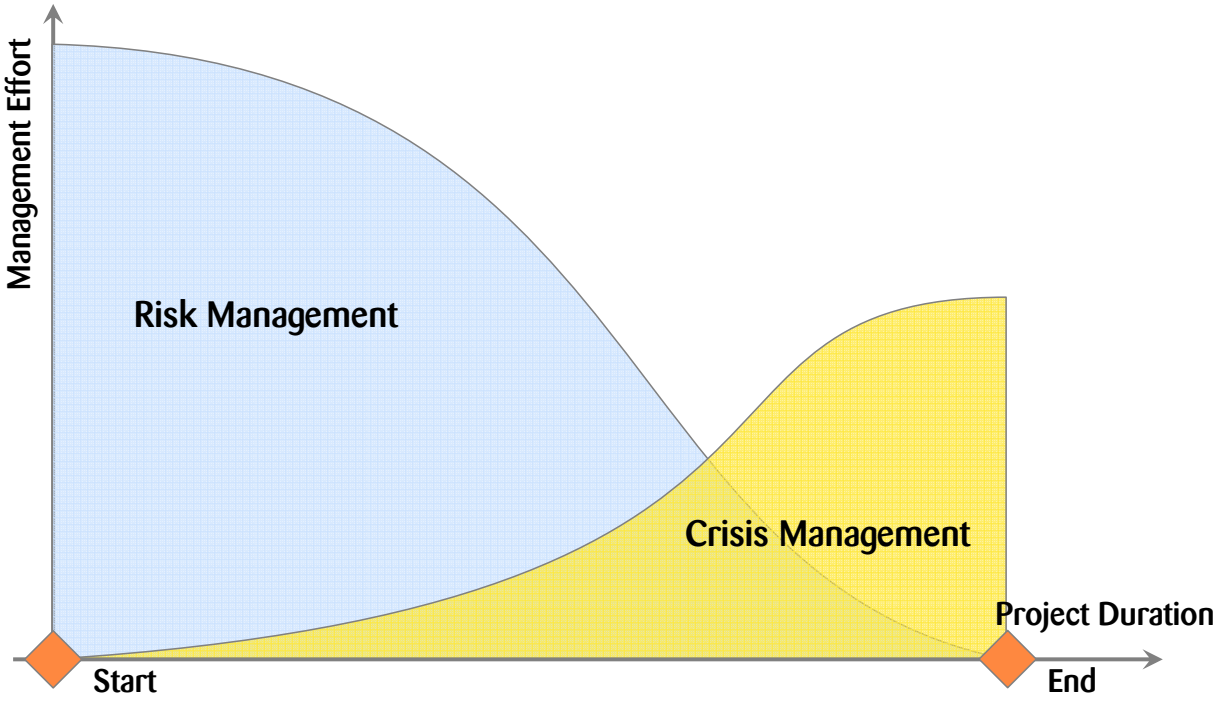
Risk vs. Crisis Management

Balance risk and crisis management, there is always both



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Goals of Risk Management

Establish risk awareness

- questioning of assumptions for project plan, budget, results, etc.

Balance risk and return

- balance the possible negative consequences of risk against the potential benefits of its associated opportunities
- NO minimization of risk (that's not economical)

Make informed and explicit decisions

- prioritization
- utilization of scarce resources

Act before you have to react

- better planning and control of project

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3. Risk Management Process

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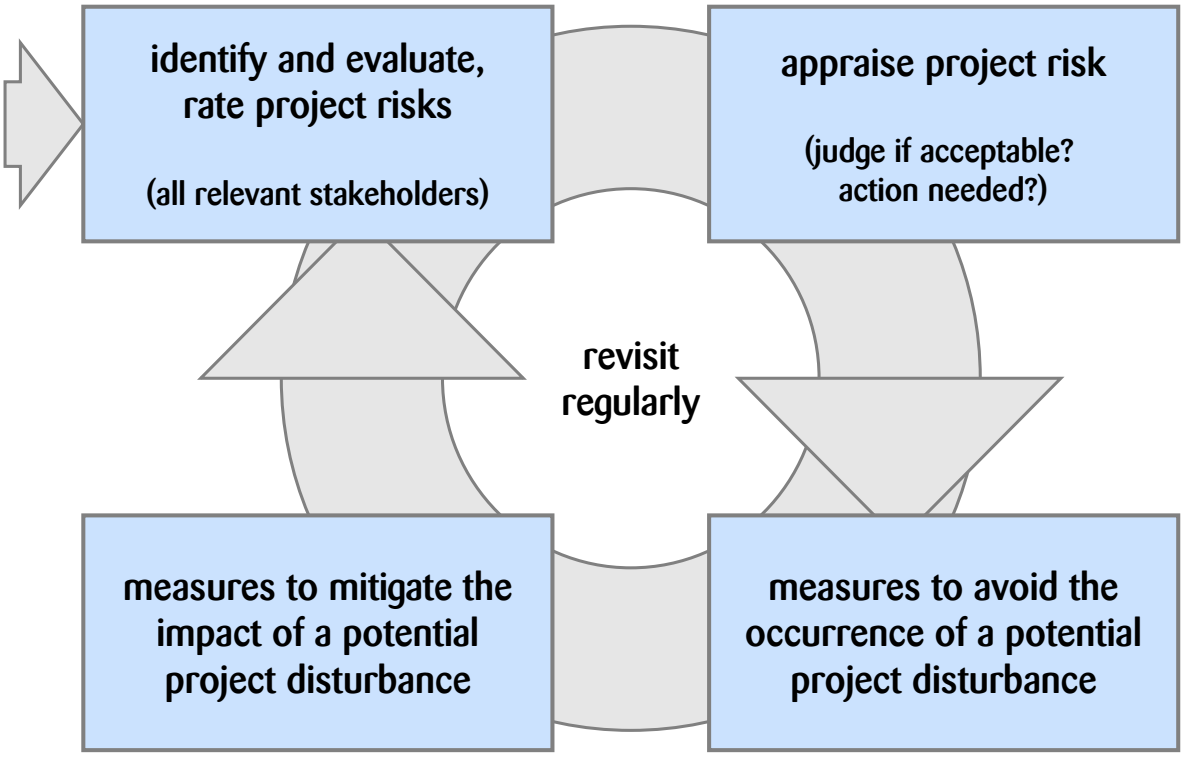
Basic Risk Management Process



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ISO Risk Management Process

1. **Risk Analysis**
   - identification of possible risk
   - risk evaluation / rating
2. **Risk Appraisal**
   - is this risk acceptable?
   - need for mitigation measures and contingency plans
3. **Risk Control**
   - possible mitigation measures
   - evaluation of residual risk if mitigation measures are implemented
   - plan and implement mitigation measures
   - contingency plans for top n risks (n is to be defined, often 5 … 10)
   - risk indicators for top n risks (criterions for risk to become reality)
   - appraisal of planned total risk
4. **Risk Tracking**
   - regularly re-visit / re-assess risk
   - track implementation of mitigation measures

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SEI Continuous Risk Management Procedure

1. **Identify**
   - Search for and locate risks before they become problems
2. **Analyze**
   - Transform risk data into decision-making information. Evaluate impact, probability and timeframe, classify and prioritize risks
3. **Plan**
   - Translate risk information into decisions and mitigating actions (both present and future) and implement those actions
4. **Track**
   - Monitor risk indicators and mitigation actions
5. **Control**
   - Correct for deviations from the risk mitigation plans
6. **Communicate**
   - Provide information and feedback internal and external to the project on risk activities, current risks and emerging risks

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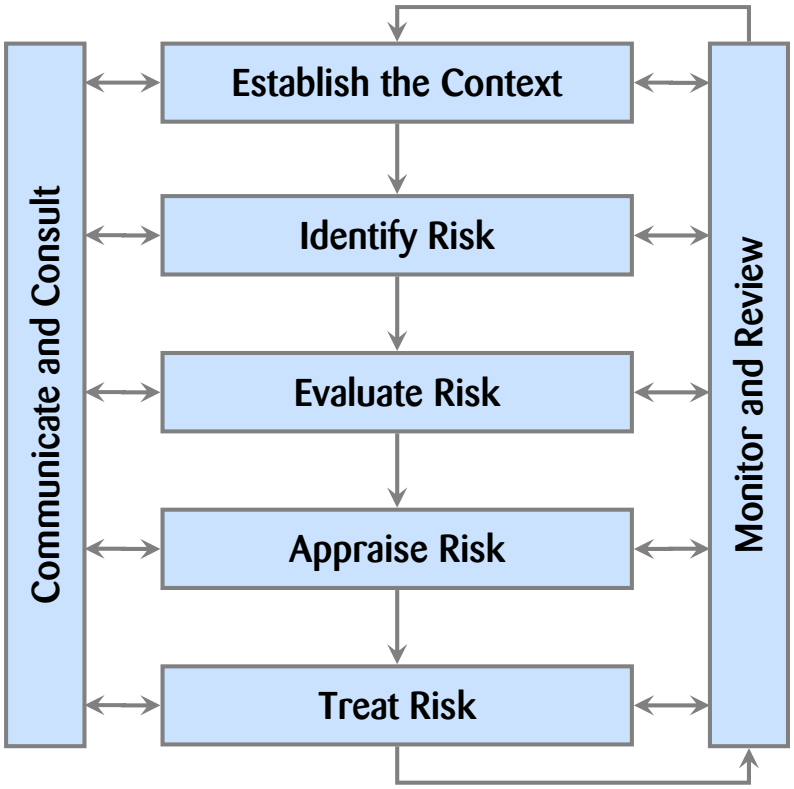
Risk Management Process Best Practice



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Establish the Context

Project Environment and Context

- political
- organizational
- strategic

Project Scope

- outcomes
- customers
- outputs
- work
- resources

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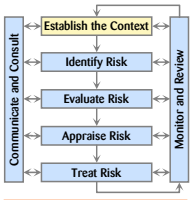

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4. Risk Identification

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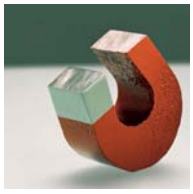

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Risk Identification

Risk Identification is a Team Effort (all aspects, dependencies)

- line manager(s)
- program manager
- project manager(s)
- product manager
- solution architect
- system architect(s)
- mechanical, electrical, electronics, IT engineers

2 Methods

- Method 1: from serious consequences to source, root causes
- Method 2: checklist based identification

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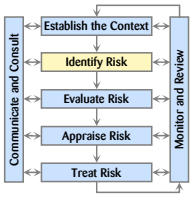

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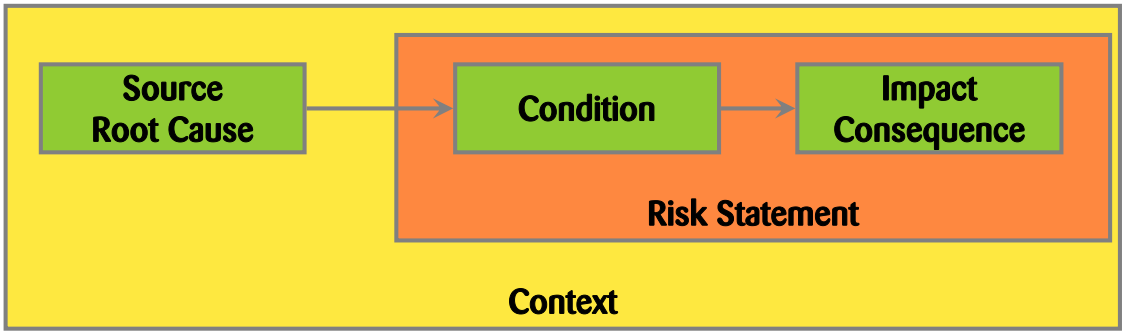
A good Risk Statement

State risk in a way it can be addressed

State risk & consequences in objective & understandable terms



Example of a good risk statement

The commercial off-the-shelf (COTS) high-speed data link selected for the project was never envisioned by the vendor to be used in a hardened environment.
It may not perform as needed, causing rework and integration slips.

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A good Risk Statement
Industry Top 10 Risk Statements

E.M. Hall

- Resources: Aggressive schedules on fixed budgets • almost certainly will cause • a schedule slip and a cost overrun
- Requirements: Poorly defined user requirements • almost certainly will cause • existing system requirements to be incomplete (more design effort)
- Development Process: Poorly conceived development process • is likely to cause • implementation problems (more effort for construction)
- Project Interfaces: Dependence on external software delivery • has a very good chance • of causing a schedule slip
- Management Process: Poor planning • is highly likely to cause • an increase in development risk
- Development System: Inexperience with the development system • will probably cause • lower productivity in the short term
- Design: Unproven Design • will likely cause • system performance problems and inability to meet performance requirements
- Management Methods: Lack of management controls • will probably cause • an increase in project risk and a decrease in customer satisfaction
- Works Environment: Remote location of project team • we believe will • make organizational support difficult and cause downtime
- Integration and Test: Optimistic integration schedule • has a better than even chance of • accepting an unreliable system

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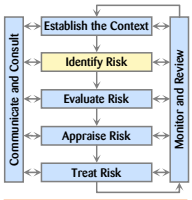

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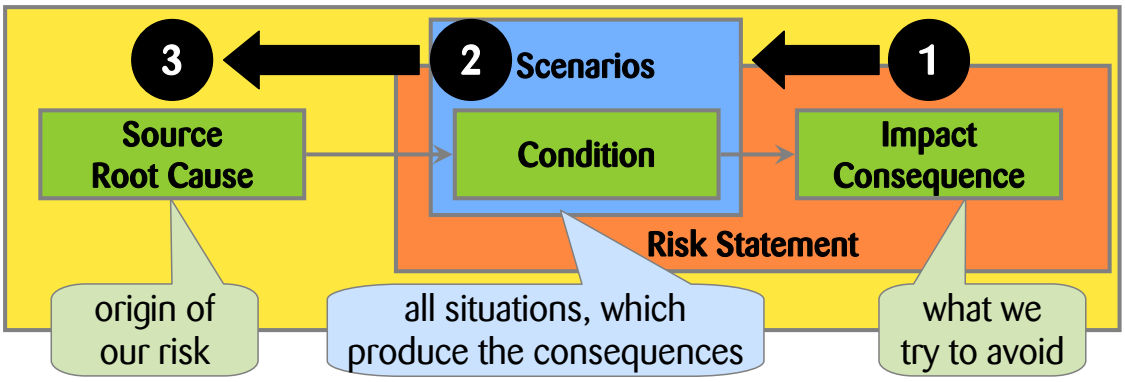
Method 1
From serious consequences to sources, root causes



- the procedure goes the other way round (than the risk statement)
- start with a brainstorming about consequences, impacts, catastrophes
- then think about possible scenarios and the conditions for consequences
- analyze and deduce the sources, root causes (where measures might start)

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Method 1
From serious consequences to sources, root causes

The Right Mindset

- most enterprise cultures do not support pessimistic thinking (what is good in most cases, but inappropriate for risk identification)
- unwritten (and usually well justified) rules are
  - avoid negative thinking
  - don't bring up a problem unless you can resolve it
  - don't be a spoilsport
  - don't call it a problem unless you can prove that it's a problem
  - we'll make it …

But

- risk identification requires some negative thinking
- thus for the application of method 1, above rules have to be declared temporarily invalid

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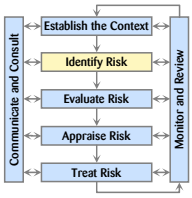

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Method 1
From serious consequences to sources, root causes

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Step 1: Impact and Consequence Brainstorming

- which are the serious consequences, impacts you worry about? (project)
  - how could the project fail?
- change your perspective: which is your project dream outcome?
  - describe it and then discuss the direct opposite
- do not reject risk before it has been evaluated (chapter 5)
- risk management covers project risk, not product risk (FMEA)
- there are probably risks that you can do nothing about but accept
  - project preconditions outside reach & responsibility of the project team
  - should be monitored and adequately communicated (chapter 8 and 9)
- stay within the boundaries of the project
  (exclude irrelevant risk like earth quakes, server disk crash, etc.)

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Method 1
From serious consequences to sources, root causes

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Step 2: Identify Scenarios and Condition of Impact Materializing

- which scenarios could cause the consequences to materialize?
- what is the condition for the consequence to materialize?
  (a clear statement of the condition is the prerequisite to evaluate the probability of occurrence later)

Step 3: Analyze and Deduce the Source, Root Cause

- which are the sources, root causes for the scenarios?

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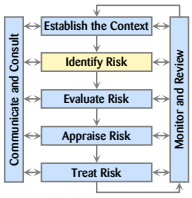

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Method 2
Checklist based identification

Use a Checklist for the Identification

- checklist is based on experiences from past projects
- candidates for a checklist
  - the five fundamental risks / top project lists (from literature)
  - SEI risk taxonomy
  - issues, problems from past projects in your organization
  - categorization of issues, problems
    - stakeholder / dependency / …
    - organizational / resources / …
    - schedule / …
    - requirements / acceptance / …
    - technical / …

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Method 2
Checklist based identification
The five fundamental risks

- error in original sizing
- effect of employee turnover
- requirements / function growth or change
- failure to reach consensus among stakeholders (fatal)
- effect of productivity variance

Best Practice

- these risks normally occur in every project
- check your risk list if they are covered

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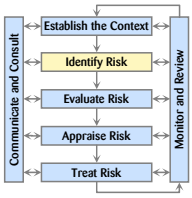

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Method 2
Checklist based identification
SEI Risk Taxonomy – Overview

Class
Element
Attribute

A. Product Engineering
1. Requirements
   a. Stability
   b. Completeness
   c. Clarity
   d. Validity
   e. Feasibility
   f. Precedent
   g. Scale
2. Design
   a. Functionality
   b. Difficulty
   c. Interfaces
   d. Performance
   e. Testability
   f. Hardware Constraints
   g. Non-Developmental Software
3. Code and Unit Test
   a. Feasibility
   b. Testing
   c. Coding/Implement-ation
4. Integration and Test
   a. Environment
   b. Product
   c. System
5. Engineering Specialties
   a. Maintainability
   b. Reliability
   c. Safety
   d. Security
   e. Human Factors
   f. Specifications

B. Development Environment
1. Development Process
   a. Formality
   b. Suitability
   c. Process Control
   d. Familiarity
   e. Product Control
2. Development System
   a. Capacity
   b. Suitability
   c. Usability
   d. Familiarity
   e. Reliability
   f. System Support
   g. Deliverability
3. Management Process
   a. Planning
   b. Project Organization
   c. Management Experience
   d. Program Interfaces
4. Management Methods
   a. Monitoring
   b. Personnel Management
   c. Quality Assurance
   d. Configuration Management
5. Work Environment
   a. Quality Attitude
   b. Cooperation
   c. Communication
   d. Morale

C. Program Constraints
1. Resources
   a. Schedule
   b. Staff
   c. Budget
   d. Facilities
2. Contract
   a. Type of Contract
   b. Restrictions
   c. Dependencies
3. Program Interfaces
   a. Customer
   b. Associate Contractors
   c. Subcontractors
   d. Prime Contractor
   e. Corporate Management
   f. Vendors
   g. Politics

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Method 2
Checklist based identification
SEI Risk Taxonomy – Questionnaire

The questionnaire leads through the taxonomy, suggesting areas for further discussion

C. Program Constraints

1. Resources

a. Schedule (*Is the schedule inadequate or unstable?)*

[144] Is the schedule realistic?
(Yes) (144.a) Is the estimation method based on historical data?
(Yes) (144.b) Has the method worked well in the past?

[145] Is there anything for which adequate schedule was not planned?
- Analysis and studies
- QA
- Training ...

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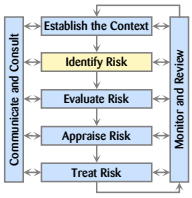

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Top Project Risks
… and possible measures

W.B. Boehm

- Personnel Shortfall
  staffing with appropriate personnel, job matching, team building, securing key personnel agreements, cross-training, re-scheduling key people, subcontracting
- Unrealistic Schedule and Budget
  detailed multi-source cost and schedule estimation (no bazaar!), designing to cost, incremental development, software reuse, requirement scrubbing, re-negotiation with client
- Developing the wrong (Software) Functions
  organization analysis, mission analysis, ops-concept formulation, user surveys, prototyping, early user manual development, development of and agreement to acceptance criteria
  YAGNI: "You Aren't Gonna Need It"
- Developing the wrong User Interface
  prototyping, operational scenarios, task analysis, user characterization (functionality, style, workload)

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Top Project Risks
… and possible measures

W.B. Boehm

- Gold Plating
  requirement scrubbing, prototyping, cost benefit analysis, designing to cost
- Continuing Stream of Requirement Changes
  high change threshold, information hiding, incremental development, deferral of changes to later increment, tight change control, agreement to acceptance criteria
- Shortfalls in Externally Furnished Components (Procured SW)
  benchmarking, inspection, reference checking, compatibility analysis, prototyping
- Shortfalls in Externally Performed Tasks (Subcontractors, Client)
  reference checking, pre-award audits, award-fee contracts, competitive design or prototyping, team building
- Straining Computer Science Capabilities
  technical analysis, cost benefit analysis, prototyping, reference checking, performance analysis, sizing analysis

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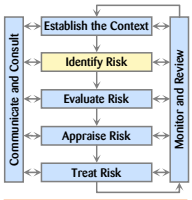

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Risk Management Tools
Risk List

- Zühlke Risk List Template

Risk List — Risk Index (Sum): — Risk Index (Avg.):

Project: — Version: — Risk is inoffensive if Exposure is lower than 60
Project-Number: — Date: — Risk is critical if Exposure is higher than 100
Customer: — Doc.-No.: — Risk is very critical if Exposure is higher than 240
Author:

ID	Risk & Realization Condition	Possible Cause	Impact	P (%)	E (1…5)	Exposure P x E	Mitigation Measure / Contingency Plan	Respon-sible	Deadline	Status last Evaluation
	Identify Risk			*Evaluate Risk*		*Appraise*	*Treat Risk*			*Monitor*
Management & Stakeholder Risks										
Commercial Risks										
Legal Risks										
Resource Risks										
Technical Risks										
Warranty Risks										
Maintenance Risks										
Other Risks										

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Exercise 1

Risk Statements

- formulate 3 to 5 good, real risk statements — 10’
  - source, root cause • condition • impact, consequence
  - individual, i.e. every participant himself
  - select a project from your work environment
- present 1 of your risk statements on the pin board — 5’
  - write it down in large letters on the cardstock distributed
- discuss your experiences gained — 10’
  - what difficulties have you experienced in creating risk statements?
  - what makes a good risk statement? how do you recognize quality?
  - what are your recommendations?

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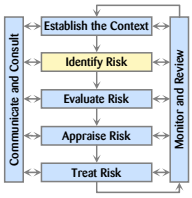

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Homework

Create a Risk Checklist

- for typical projects that run in your work environment
  - hardware development project
  - software development project
  - organizational development project
  - business process reengineering project
  - …
- apply the lessons learned to your work environment
  - create reasonable risk categories
  - identify the most important, frequent risks for each category
  - properly state each risk

- see separate document for further information

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5. Risk Evaluation

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Risk Evaluation

Risk Evaluation is a Team Effort

- reduces individual interpretation of classification
- reduces some common biases
  - representative bias
  - availability bias
  - fear of disaster
  - cognitive bias
  - motivational bias
  - (cannot reduce organizational and anchoring/adjusting bias)
- better consistency of rating / classification
- include all dependencies and consequences
- allows to develop a common understanding of risk

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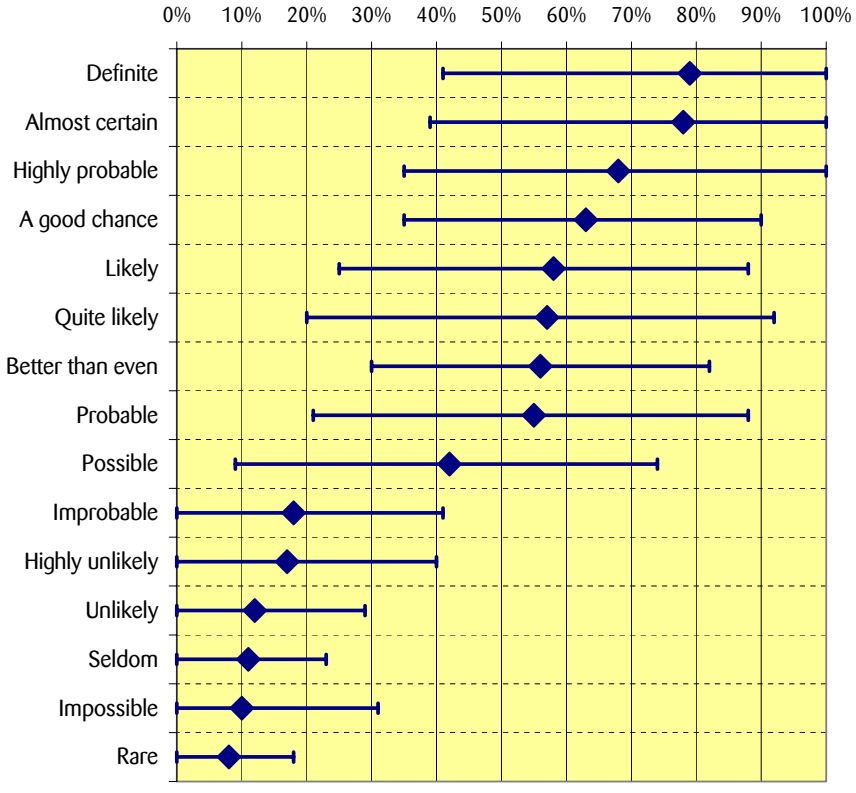
Risk Evaluation
Interpretation of Probability

D. A. Hillson 2004



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Evaluate Impact / Consequences

Impact

- classify the consequences in case the risk has become reality

Classification

	Cost	Schedule	Performance	Safety
Catastrophic	. . .	. . .	. . .	. . .
Critical	. . .	. . .	. . .	. . .
Major	. . .	. . .	. . .	. . .
Minor	. . .	. . .	. . .	. . .

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Evaluate Impact / Consequences

Impact

- classify the consequences in case the risk has become reality

Classification

	Cost	Revenue	Schedule	Scope	Quality
8 = Critical endangers project success	. . .	. . .	. . .	. . .	. . .
4 = Major major impairment	. . .	. . .	. . .	. . .	. . .
2 = Minor minor impairment	. . .	. . .	. . .	. . .	. . .
1 = Low locally limited impairment	. . .	. . .	. . .	. . .	. . .

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Evaluate Probability

Probability of Occurrence

- statistical probability of the risk materializing and becoming a problem

Classification (Example)

	Probability	Range		Value
–	Rare	0 -	15%	10%
–	Unlikely	16 -	30%	20%
–	Possible	31 -	50%	40%
–	Probable	51 -	100%	80%

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Exercise 2

Classification of Impact, Consequences

- create a complete impact, consequence table 20’
  - determine impact categories and impact levels (x-/y-axis of table) (see examples on slides 41/42)
  - specify as unambiguously as possible the impact for each category and level (try to use measurable terms)
  - teams of 3 participants
- each team presents its results using the overhead projector 5’
  - write it down on the transparency distributed
- discuss your experiences gained 10’
  - what difficulties have you experienced in creating the table?
  - what does it take to achieve an unambiguous classification?
  - what are your recommendations?

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Evaluate Impact / Consequences
Example 1

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	Cost	Schedule	Performance	Safety
8 = Critical endangers project success	cost overshoot greater than risk reserves from bid	milestone with penalty payment not reached	system acceptance endangered	danger of death or major injury
4 = Major major impairment	cost overshoot ≥ 25% of risk reserves from bid	major milestone not reached	single system acceptance criterion endangered	danger of minor injury
2 = Minor minor impairment	cost overshoot 10 - 25% of risk reserves from bid	minor milestone not reached	major functio-nality not met, without endange-ring acceptance	no danger of injury
1 = Low locally limited impairment	cost overshoot < 10% of risk reserves from bid	task late without endangering milestone	minor functio-nality not met, incomplete documentation	no danger of injury

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Evaluate Impact / Consequences
Example 2

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	Cost	Revenue	Schedule	Scope	Quality
8 = Critical endangers project success	cost overshoot greater than risk reserves from project budget	≥ 50% of forecasted revenue is deferred	milestone with penalty payment not reached	scope change makes system architecture invalid	system acceptance endangered
4 = Major major impairment	cost overshoot ≥ 25% of risk reserves from project budget	35 - 50% of forecasted revenue is deferred	major milestone not reached (tied to revenue)	scope change creates change of major components	single system acceptance criterion endangered
2 = Minor minor impairment	cost overshoot 10 - 25% of risk reserves from project budget	15 - 35% of forecasted revenue is deferred	minor milestone not reached (not tied to revenue)	scope change creates change of features	major functio-nality not met, without endangering acceptance
1 = Low locally limited impairment	cost overshoot < 10% of risk reserves from project budget	< 15% of forecasted revenue is deferred	task late without endangering milestone	scope change creates cosmetic changes	minor functio-nality not met, incomplete documentation

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6. Risk Appraisal

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Risk Appraisal

Basis to Make Decisions

- ranking based upon a criterion
- select top N risks (N depends on project size, normally 5 to 15)
  - review monthly with project team, stakeholders, customer
  - review monthly in project steering, executive management review
  - plan mitigation measures or contingency plan (mandatory)
  - define risk indicator as a measurement to when risk might realize
- at most between 20 and 50 risks can be treated and traced (even large projects rarely have more then 35 risks to control)
- optimize which risk first when allocating resources
  - risk prioritization ($\Rightarrow$ save resources)

Making Decisions is a Management Effort

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Risk Appraisal
Risk Exposure

Definition

Risk exposure is the product of the probability of occurrence and the risk impact rating, e.g.

Exposure = P(%) * E(1…8) * 100

(sometimes also called Risk Priority Number RPN)

Risk evaluation result and basis for judgment

risk rating	min. exposure		max. exposure
– inoffensive risk	0	…	60
– average risk	61	…	100
– major risk	101	…	240
– critical risk	241	…	800

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Risk Appraisal
Risk Exposure

Risk rating defines threshold for action, e.g.

- inoffensive risk
  → no treatment of risk
- average risk
  → treatment is optional
- major risk
  → must be actively controlled
  → normally treatment is required, but might be deferred
- critical risk
  → must be addressed immediately
  → normally immediate treatment is required

Good judgment should allow to override the mechanistic application of risk rating based on risk exposure interval

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Risk Appraisal Example

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Exposure = P(%) * E(1…8) *100

- critical if ≥ 240
- major if > 100
- inoffensive if ≤ 60

- must be addressed immediately
- must be actively controlled
- treatment is optional
- acknowledge, but do not treat

Probability / Impact	Probable 80%	Possible 40%	Unlikely 20%	Rare 10%
8 = Critical	640	320	160	80
4 = Major	320	160	80	40
2 = Medium	160	80	40	20
1 = Low	80	40	20	10

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Risk Appraisal

Tasmanian Government Project Management Guidelines

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Likelihood	Seriousness		
	high	medium	low
high	A	B	C
medium	B	C	D
low	C	D	E

Grade	Risk Mitigation Actions
A	Mitigation actions, to reduce the likelihood and seriousness, to be identified and implemented as soon as the project commences
B	Mitigation actions, to reduce the likelihood and seriousness, to be identified and appropriate actions implemented during project execution
C	Mitigation actions, to reduce the likelihood and seriousness, to be identified and costed for possible action if funds permit
D&E	To be noted; no action is needed unless grading increases over time

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Indicator of Occurrence

Quantified Monitoring of Top N Risks

- indicator = criterion for a risk to become reality, materialize
- early and quantitative indicators are preferred
- determine risk indicators for each managed risk
- observe the indicators to start the contingency plan in time
- include them in your project controlling

Example

- a rolling ball is an indicator for a car driver that a child might follow

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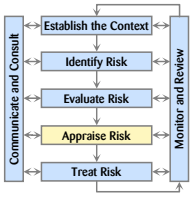

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7. Risk Treatment

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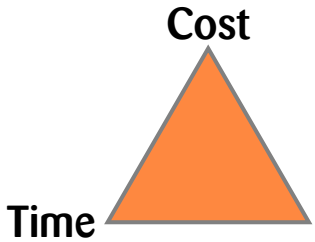
The Magic Triangle
(Action Strategy → addressed to Management)



Target \ Action	Accept	Optimize / Compromise	Constrain
Cost	O		
Time			O
Scope / Quality		O	

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Treatment of Risk

- **Accept Risk**
  - if no efficient and effective measure can be taken to avoid, transfer or mitigate risk
  - document and memorize the acceptance
- **Avoid Risk**
  - Customer: contractual measures, risk sharing, etc.
  - abort part of or the whole project (scope changes)
- **Transfer Risk**
  - Customer: contractual measures, transfer tasks, etc.
  - Insurance
  - Supplier: contractual measures, penalties, etc.

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Treatment of Risk

- **Contingency Plan** (i.e. Plan "B")
  - usually risks that have a critical or catastrophic impact and a minimum probability after mitigation measures have been implemented, need contingency plans
  - plan and prepare corrective actions for the emergency

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Treatment of Risk

- **Mitigate Risk**
  - reduce the probability of the risk becoming reality
  - reduce the impact of the risk if it becomes reality
  - measures need to be feasible and effective (return on action)
  - measures need to be economically efficient (effort < cost of impact)
  - actions need to be allotted to a beneficial level (as much as needed)
  - actions need to be planned for their best time of implementation (not all mitigation measures have to be realized immediately)

Definition of Measures is a (Project) Management Effort

Result: Action Plan with Effort, Responsible, Deadline and Status

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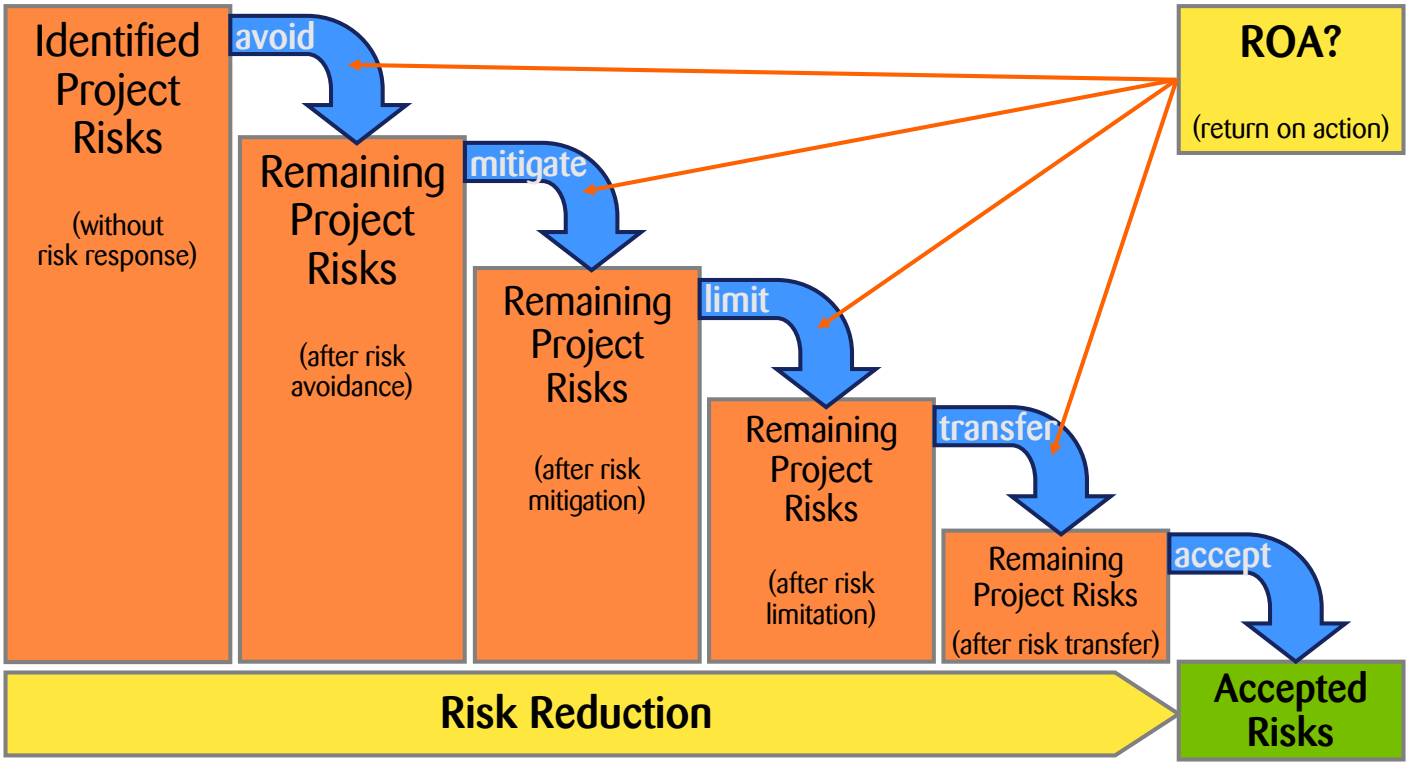
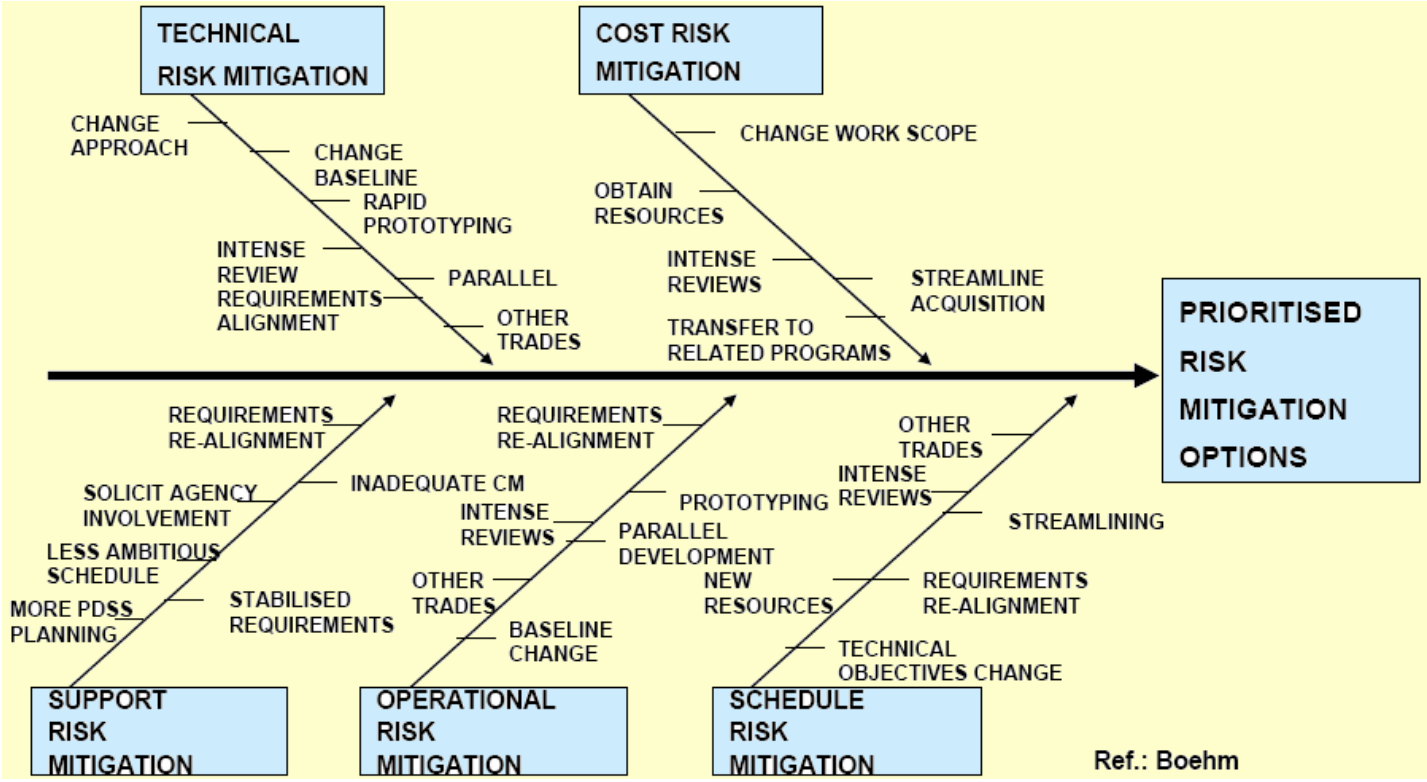
Risk Reduction Stair ON 49000



Mitigation Options



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Risk Monitoring

- **Track Implementation of Actions / Measures**
  - check status with responsible
  - update status in table

- **Observe Risk Indicators**
  - watch the progress of the specified risk indicators
  - determine whether additional measures are necessary
  - decide about start of contingency measures

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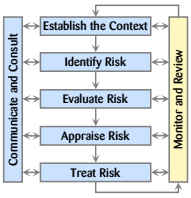

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Risk Monitoring

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- **Revisit Risk List**
  - at each progress meeting
  - identify new risks and add them to the list
  - reevaluate existing and new risks
  - reappraise risk
  - plan and implement treatment of risk (each planning needs rework)

- **Improve Risk Management and Awareness**
  - input to quality management

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Risk Monitoring

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empowering ideas

- **Risk Driven Development Process**
  - e.g. Rational Unified Process RUP®
  - determine priority of project tasks by their potential to reduce risk
  - solve open points with highest risk first
    ⇒ maximum reduction of risk
    ≠ "Caterpillar Proceeding"
    (bulldozer pushes all dirt in front of itself, where it builds up)
  - reduction of risk and uncertainty during project execution is a major project planning and management focus
  - prototype, test and iterate

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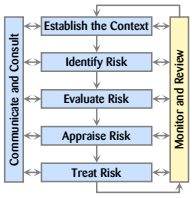

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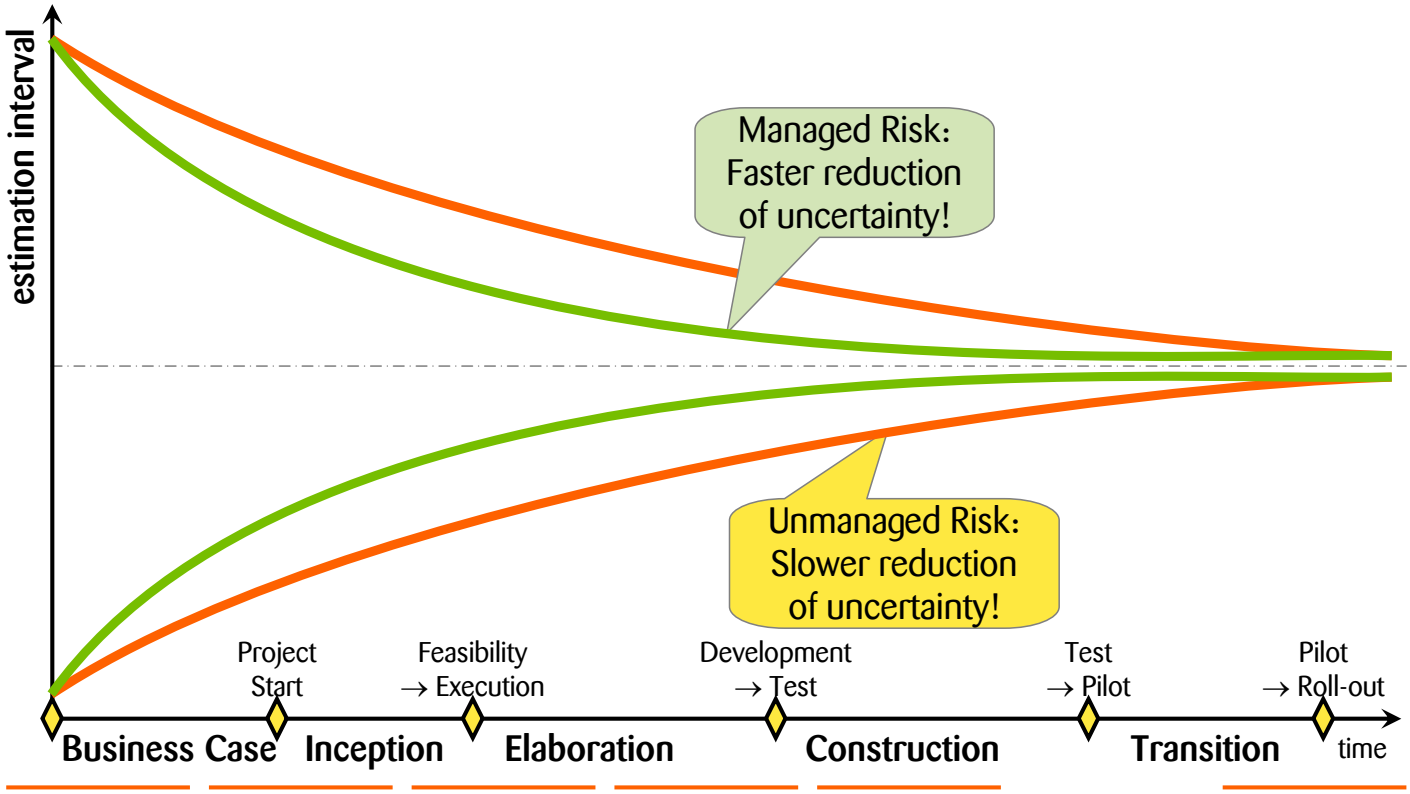
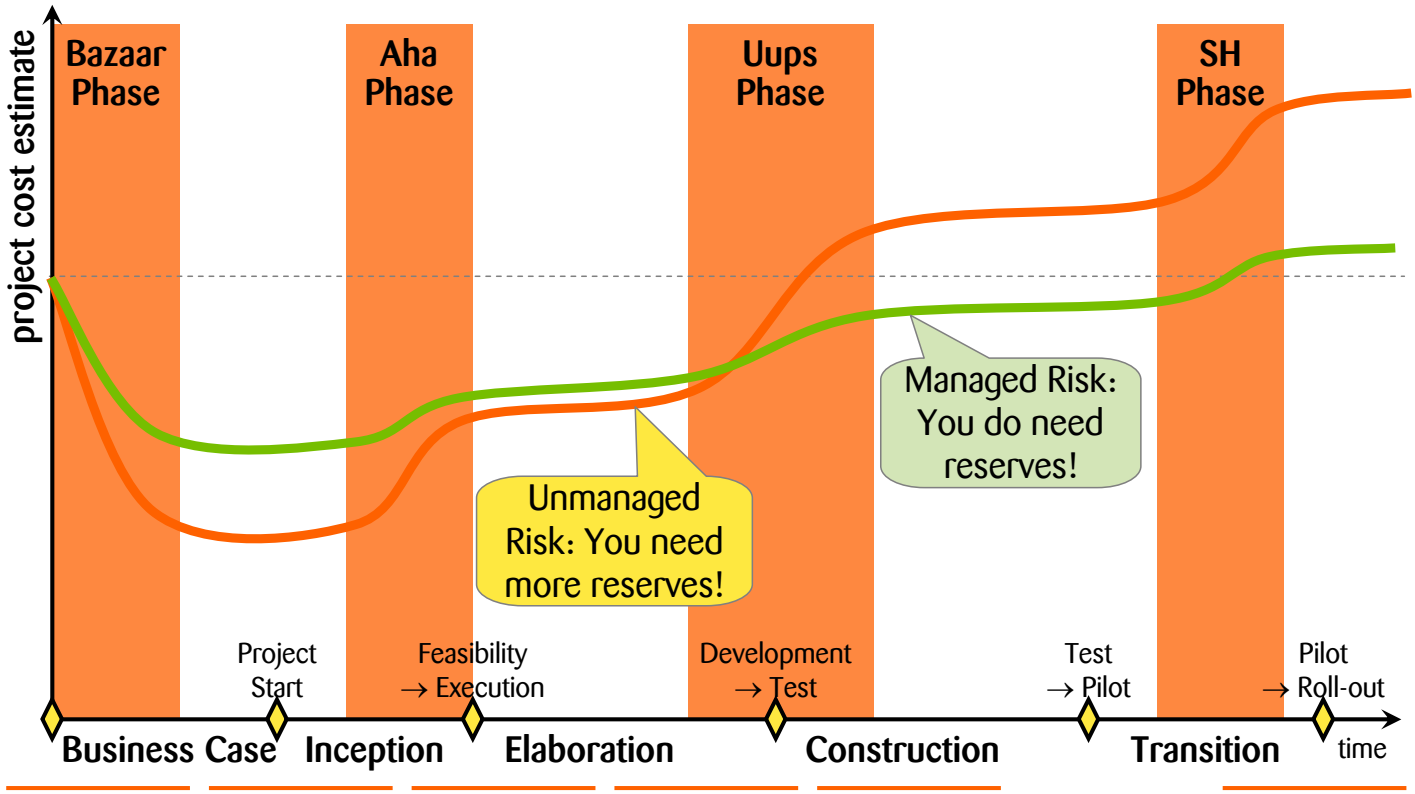
Cost Estimation



Cost Estimation

J. Gubelmann 2004



9. Communication

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Communicate

Communication has to be planned and organized

- part of project reporting (to management, to customer)
- part of project marketing (to team, to stakeholders)

- **Management**
  - needs to know about project status and risk
  - needs to understand and challenge project risk
  - needs to assign resources to risk management and actions
  - might need to carry out certain actions
  - needs to build risk awareness and organizational basis
  - avoid bazaar
    (first cost and schedule estimate is often correct)

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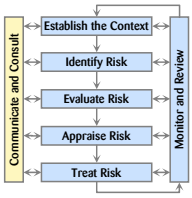

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Communicate

- **Team**
  - needs to know and understand the priorities
  - needs to understand and execute the actions
  - the team is always right
  - if the team isn't right, they will make it right

- **Stakeholder**
  - include all stakeholders in your communication plan, even if you decide not to correspond with them (formally record your decision)
  - acknowledge and consider the different information needs of various stakeholders
    ⇒ differentiated communication means and content

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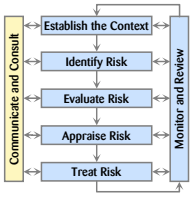

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Communicate

- **Customer**
  - needs to know about project status and risk
  - "the sound makes the music"
  - doesn't need to know about every problem / risk
    (not everything has to be / can be disclosed)
  - is often part of the problem / risk
  - open communication helps the customer understand risk and therefore supports the negotiation with the customer about necessary measures
  - often needs to approve / authorize measures

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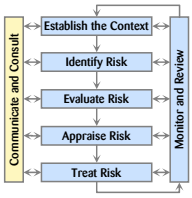

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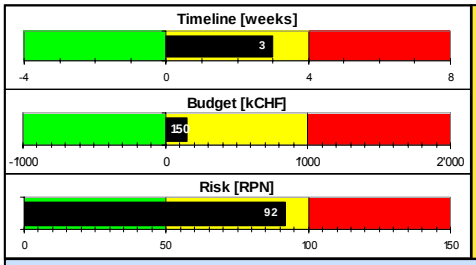
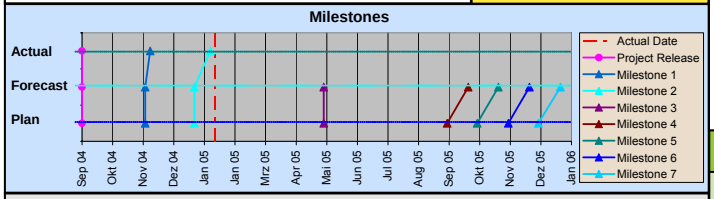
Project Cockpit



Achievements / Remarks

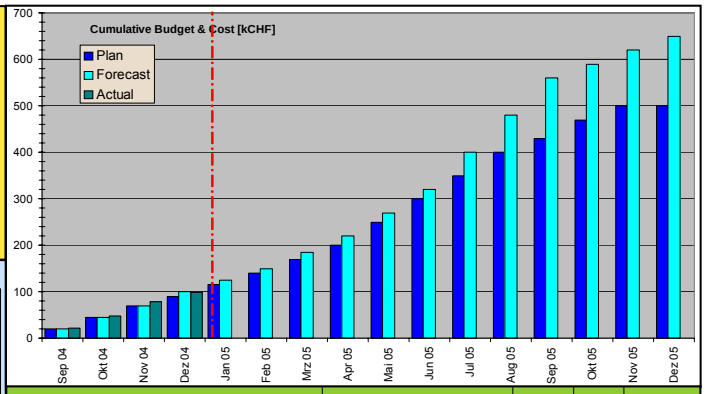
- Achievement 1 …
- Achievement 2 …
- Achievement 3 …
- Achievement 4 …
- Remark 1 …
- Remark 2…



Bottlenecks

- Bottleneck 1 …
- Bottleneck 2 …
- Bottleneck 3 …

Top 5 Risk Description	RPN	Mitigation Measures / Contingency	Status
Risk 1 …	9.8	Measure 1 Contingency 1	
Risk 2 …	9.7	Measure 2 Contingency 2	
Risk 3 …	9.1	Measure 3 Contingency 3	
Risk 4 …	9.1	Measure 4	
Risk 5 …	8.5	Measure 5	



Actions to be taken	Decision	Status	Resp.	Deadline
Action 1 …	Decision 1 …		XYZ ABC	99.99.99
Action 2 …	Decision 2 …		XYZ ABC	
Action 3 …	Decision 3 …		XYZ ABC	
Action 4 …	Decision 4 …		XYZ ABC	
Action 5 …	Decision 5 …		XYZ ABC	

10. Implementing Risk Management

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The Risk Management Capability

- Big bang approach in risk management is disastrous!
  - It simply won't work!
- Build up risk management in stages
  - You need to learn, adopt and improve iteratively
- Consider the implementation of risk management as a journey from novice to expert
  - Novice, Beginner, Intermediate, Advanced, Expert
- Check your current Risk Management Capability before you start
- For each stage, lay the foundation first to ease the transition
  - Vision, Goals, Strategy

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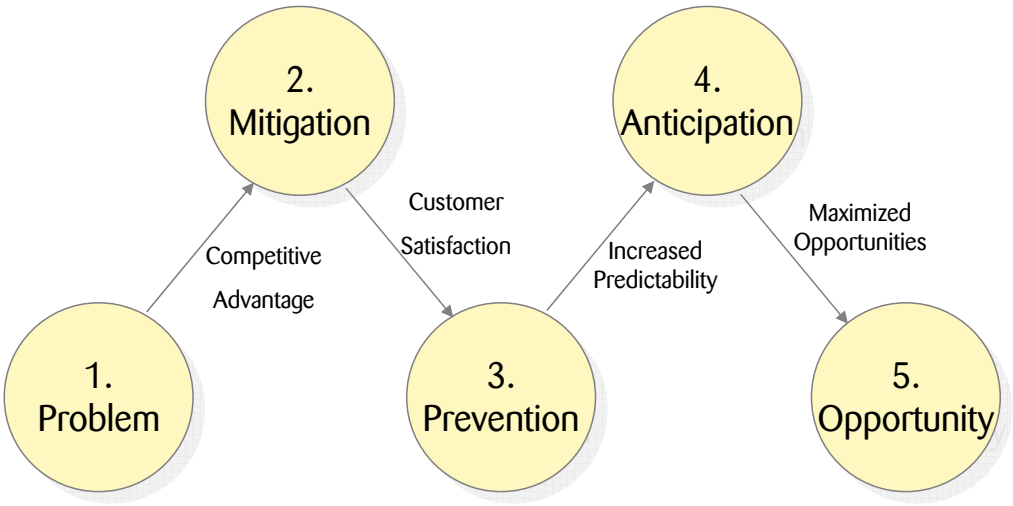
The Risk Management Capability
Risk Management Map

E.M. Hall

- Practical guide to understanding the path to increasing your ability to manage risk by transitions through five stages
- At each stage, a vision provides the direction for your journey



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The Risk Management Capability
Risk Management Matrix

E.M. Hall

	Stage 1: Problem	Stage 2: Mitigation	Stage 3: Prevention	Stage 4: Anticipation	Stage 5: Opportunity
Envision	I am tired of fighting fires.	I want to know what can go wrong.	I want to act so that I have no regrets.	I want to know the chances for success.	I want to exceed my own expectations.
Discover	I am too busy solving problems to think about future.	I am aware of risks, but I am unsure how to tell my supervisor.	I try to find the cause of my potential problems.	I can predict a bad outcome by projecting work status.	I identify chances to do better than planned.
Plan	I am too busy to take on plans for things that might not happen.	I make backup plans.	I make plans to avoid problems.	I quantify risk with a reasonable accuracy to focus on the right priority.	I revise plans as needed to take advantage of current information.
Work	I have no fear.	I do not like to disclose my problems.	I will share my concerns when I am asked.	If risk can be quantified, we can manage it.	What I identify we will conquer.
Measure	I believe risk management is too imprecise to be of value.	I track my critical risks.	I use a personal process, and I collect data on my status.	I use status to trigger the implementation of risk action plans.	I calculate the loss of missed opportunities.
Improve	I am too busy to improve.	I avoid big "career threatening" mistakes.	I prevent problems and surprises for my team.	I take corrective action to stay on target.	My ideas make a difference.

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The Risk Management Capability
Risk Management Matrix

E.M. Hall

- Scoring
  - Give yourself a point from 1 to 5 depending on the stage you currently perform at, and then total your points.
  - Score 6 or less:
    Get the book "Thriving on Chaos", you are going to need it!
  - Score 7 to 12:
    Awareness makes you uncomfortable, keep working on it!
  - Score 13 to 18:
    You are more proactive than most others and are an asset to any team.
  - Score 19 to 24:
    You are more quantitative than most others and are an asset to any team.
  - Score 25 to 30:
    Your are self motivated and have a great attitude.

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The Risk Management Implementation Organization Level

- Develop a Risk Management Policy
  - Obtain commitment
  - Allocate resources
  - Survey existing internal and external practices
  - Define and review the draft Risk Management Policy
  - Document, approve and communicate Risk Management Policy
- Define a Standard Process
  - Containing a minimum set of procedures defined and approved
  - For use by the organization
  - Defines roles, responsibilities and artifacts (risk list, contingency plan, etc.)

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The Risk Management Implementation Project Level

- All activities must follow organizational process guidelines (if they exist)
- Activities to implement risk management on project level

1. Review project specific risk management requirements
2. Plan risk management activities
3. Budget risk management activities
4. Schedule risk management activities
5. Staff risk management activities
6. Coordinate risk management training

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Case Study

- Objective
  - Apply risk management concepts to the project presented in the case study
- Tasks
  - Build teams of about 4 course participants to work on the case study
  - Read the case study carefully
  - Work sequentially through exercises
  - Discuss the questions within your team
  - Present the results of each exercise to the group before you continue with the next exercise
- Time Budget
  - 3 hours

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Conclusions

- Good risk management can help you avoid running into some – but not all of the possible problems during project execution
- Identifying the potential issues requires the consultation of all relevant stakeholders
- Rating risk supports you in selecting the most important risks and to focus action and resources on mitigation measures with the greatest effect
- Mitigation measures don't take effect, if they are not assigned, scheduled, carried out and followed
- Communication of risk is most effective if done in the course of standard project reporting to management, customer and team
- Good risk management improves the professional standing and the negotiation position of the project manager

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Risk Management Tools Overview

- Risk List
- Risk Identification Checklist
  - company, organization proprietary (→ homework)
  - SEI Risk Taxonomy
- Risk Impact Evaluation Classification
  - example 2
- Risk Appraisal Scale
- Project Cockpit → Reporting, Communication

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Your Questions

- Your Questions
- Your Remarks
- Your Feedback

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