

Software Project Management

Session 7: Risk and Change Management

Today

- Risk Management
- Change Control
- Configuration Management

Risk Management

- Problems that haven't happened yet
- Why is it hard?
- Some are wary of bearing bad news
 - No one wants to be the messenger
 - Or seen as “a worrier”
- You need to define a strategy early in your project

Risk Management

- Identification, Analysis, Control
- Goal: avoid a crisis
- Thayer: Risk Mgmt. vs. Project Mgt.
 - For a specific vs. all projects
 - Proactive vs. reactive

Project Risk

- Characterized by:
 - Uncertainty ($0 < \text{probability} < 1$)
 - An associated loss (money, life, reputation, etc)
 - Manageable – some action can control it
- Risk Exposure
 - Product of probability and potential loss
- Problem
 - A risk that has materialized

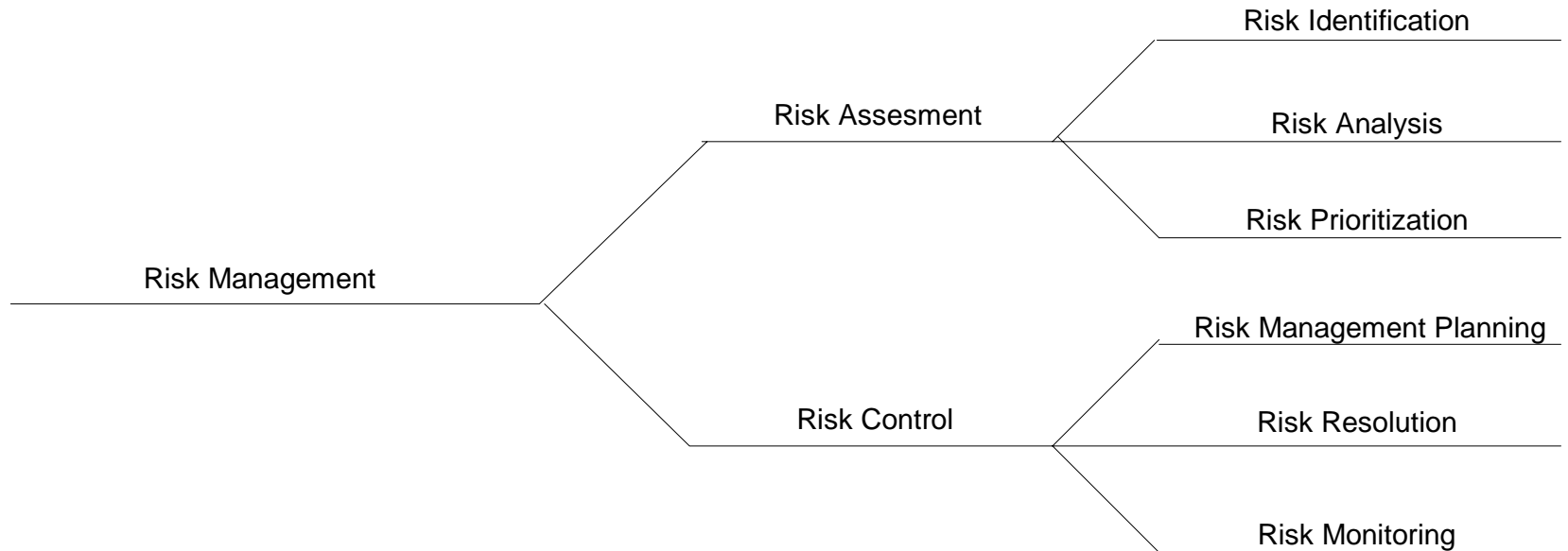
Types of Risks

- **Schedule Risks**
 - Schedule compression (customer, marketing, etc.)
- **Cost Risks**
 - Unreasonable budgets
- **Requirements Risks**
 - Incorrect
 - Incomplete
 - Unclear or inconsistent
 - Volatile

Types of Risks

- Quality Risks
- Operational Risks
- Most of the “Classic Mistakes”
 - Classic mistakes are made more often

Risk Management Process



“Software Risk Management”, Boehm, 1989

Risk Identification

- Get your team involved in this process
 - Don't go it alone
- Produces a list of risks with potential to disrupt your project's schedule
- Use a checklist or similar source to brainstorm possible risks

Gängige Risiken in IT-Projekten

- Personal-Versagen **B. Boehm, 2000**
- Unrealistische Zeitpläne und Budgets
- Entwicklung der falschen Funktionen
- Entwicklung falscher Benutzer-Schnittstellen
- Vergolden
- Fortlaufende Anforderungsänderungen
- Versagen von extern bezogenen Komponenten
- Versagen von extern bezogenen Leistungen
- Versagen von real-time performance
- Überschätzen der eigenen IT- Skills/Erfahrungen

Risk Analysis

- Determine impact of each risk
- Risk Exposure (RE)
 - a.k.a. “Risk Impact”
 - $RE = \text{Probability of loss} * \text{size of loss}$
 - Ex: risk is “Facilities not ready on time”
 - Probability is 25%, size is 4 weeks, RE is 1 week
 - Ex: risk is “Inadequate design – redesign required”
 - Probability is 15%, size is 10 weeks, RE is 1.5 weeks
 - Statistically are “expected values”
 - Sum all RE’s to get expected overrun
 - Which is pre risk management

Risk Analysis

- Estimating size of loss
 - Loss is easier to see than probability
 - You can break this down into “chunks” (like WBS)
- Estimating probability of loss
 - Use team member estimates and have a risk-estimate review
 - Use Delphi or group-consensus techniques
 - Use gambling analogy” “how much would you bet”
 - Use “adjective calibration”: highly likely, probably, improbable, unlikely, highly unlikely

Risk Prioritization

- Remember the 80-20 rule
- Often want larger-loss risks higher
 - Or higher probability items
- Possibly group ‘related risks’
- Helps identify which risks to ignore
 - Those at the bottom

Types of Unknowns

- Known Unknowns
 - Information you know someone else has
- Unknown Unknowns
 - Information that does not yet exist

Risk Control

- Risk Management Plan
 - Can be 1 paragraph per risk
 - McConnell's example

Risk Resolution

– Risk Avoidance

- Don't do it
- Scrub from system
- Off-load to another party
 - McConnell: design issue: have client design

– Risk Assumption

- Don't do anything about it
- Accept that it might occur
- But still watch for it

Risk Resolution

- Problem control
 - Develop contingency plans
 - Allocate extra test resources
 - See McConnell pg. 98-99
- Risk Transfer
 - To another part of the project (or team)
 - Move off the critical path at least
- Knowledge Acquisition
 - Investigate
 - Ex: do a prototype
 - Buy information or expertise about it
 - Do research

Risk Monitoring

- Top 10 Risk List
 - Rank
 - Previous Rank
 - Weeks on List
 - Risk Name
 - Risk Resolution Status
- A low-overhead best practice
- Interim project post-mortems
 - After various major milestones
- McConnell's example

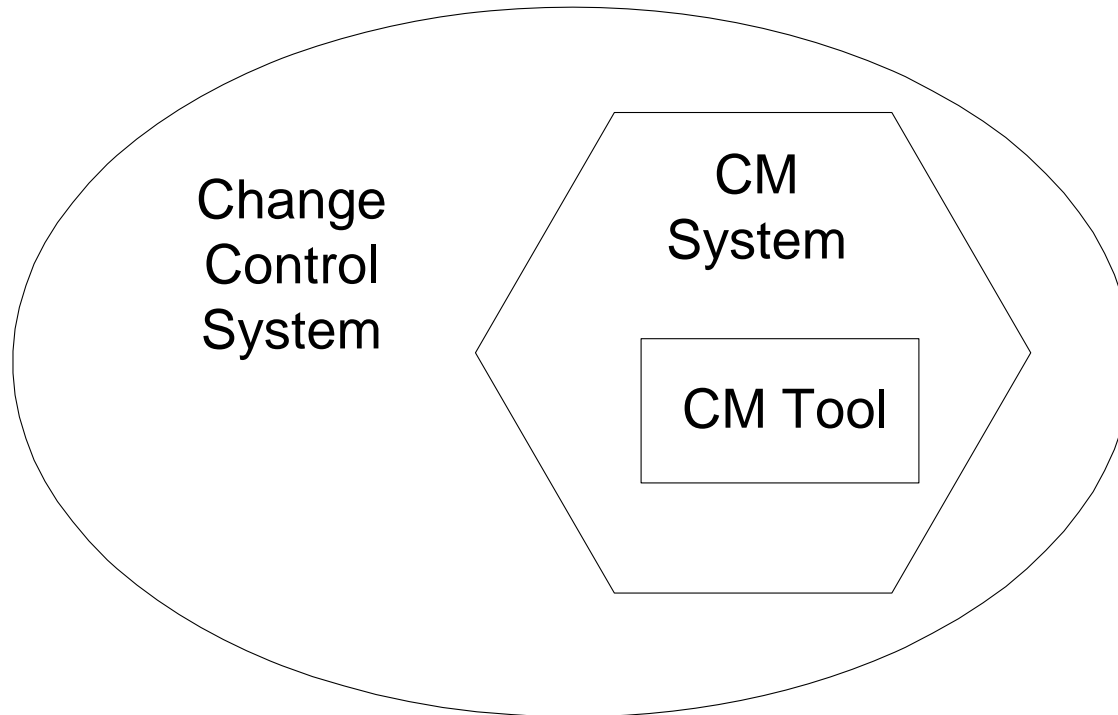
Risk Communication

- Don't be afraid to convey the risks
- Use your judgment to balance
 - Sky-is-falling whiner vs. information distribution

Change Control Board (CCB)

- McConnell “best practice”
- Structure: representatives from each stakeholder party
 - Dev., QA, Marketing, Mgmt., Customer support
- Perform “change analysis”
 - Importance, priority, cost, benefit
- Triage
 - Allocating scarce resources
 - Some will not receive treatment
 - Life-critical to the project
- Will say “No” more than “Yes”
- Watch for bureaucracy

Change Control



“Quality Software Project Management”, Futrell, Shafer, Shafer

Configuration Control

- A management support function
- Includes
 - Program code changes
 - Requirements and design changes
 - Version release changes
- Essential for developed items
 - Code, documentation, etc.
- Example
 - The case of the code that used to work
 - But didn't in time for the demo

Configuration Control Terminology

- Software Configuration Control Item (SCCI)
 - a.k.a. Source Item (SI)
 - Anything suitable for configuration control
 - Source code, documents, diagrams, etc.
- Change Control: process of controlling changes
 - Proposal, evaluation, approval, scheduling, implementation, tracking
- Version Control: controlling software version releases
 - Recording and saving releases
 - Documenting release differences
- Configuration Control: process of evaluating, approving and disapproving, and managing changes to SCCIs.

SCM

- Software Configuration Management
- Formal engineering discipline
- Methods and tools to identify & manage software throughout its use

Configuration Control Needs

- Establish clearly defined mgmt. Authority
- Setup control standards, procedures and guidelines
 - All team members must be aware of these
- Requires appropriate tools and infrastructure
- Configuration Management Plan must be produced during planning phase
 - Often part of Software Development Plan

Maintenance

- SCM is very important during all phases starting with Requirements
- Continues to be important during Maintenance

Questions?
