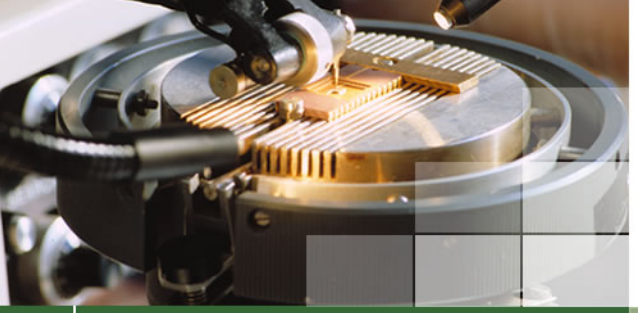

POLITECNICO DI MILANO

Dipartimento di
Elettronica e Informazione

Planning and Managing Software Projects 2011-12

Class 11

Risk Management

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http://emanueledellavalle.org

Credits

- These slides are largely based on Prof. John Musser class notes on “Principles of Software Project Management”
  - Original slides are available at http://www.projectreference.com/
- Reuse and republish permission was granted

Today

- Exam Review
- Risk 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

Definitions

- Project Risk
  - Characterized by:
    - Uncertainty (0 < probability < 1)
      - NOTE: If the probability is high, you may have planed the project in a wrong way.
    - 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

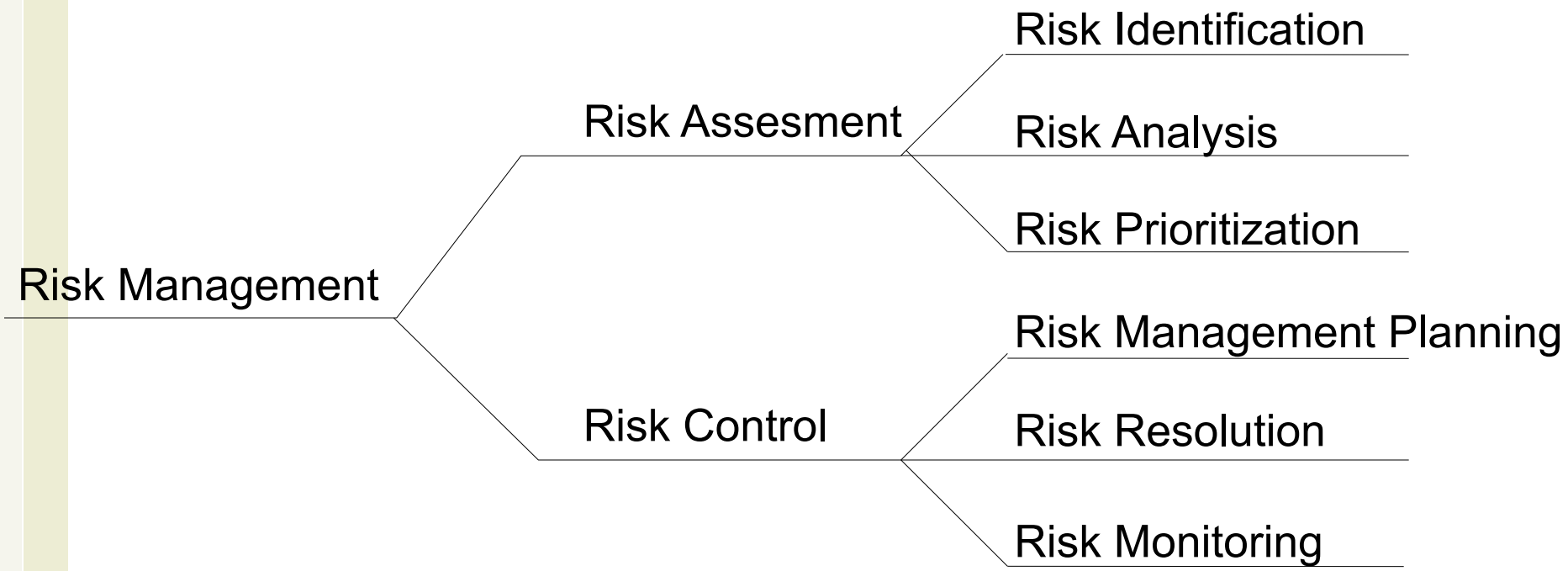
Types of Risks

- Schedule Risks
  - Schedule compression (customer, marketing, etc.)
- Cost Risks
  - Unreasonable budgets
- Requirements Risks
  - Incorrect
  - Incomplete
  - Unclear or inconsistent
  - Volatile
- Quality Risks
- Operational Risks
- Most of the “Classic Mistakes”
  - Classic mistakes are made more often

Types of Unknowns

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

Processes

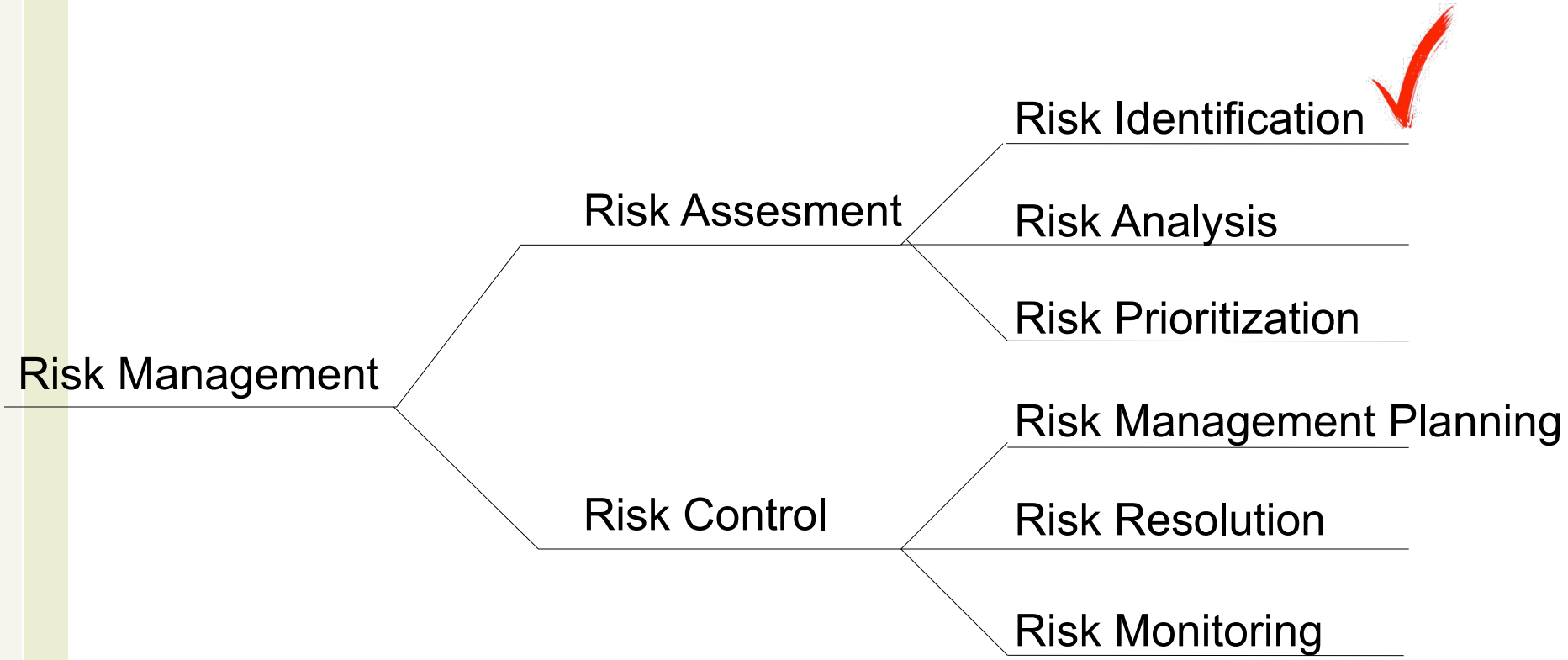


[Source: "Software Risk Management", Boehm, 1989]

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 (but also budget, quality, …)
- Use a checklist or similar source to brainstorm possible risks
  - http://www.construx.com/Page.aspx?hid=1134
  - Cached version available
    - http://www.emanueledellavalle.org/slides/P&MSP2012_11b_Complete-List-of-Schedule-Risks-by-McConnel.pdf

Processes



[Source: "Software Risk Management", Boehm, 1989]

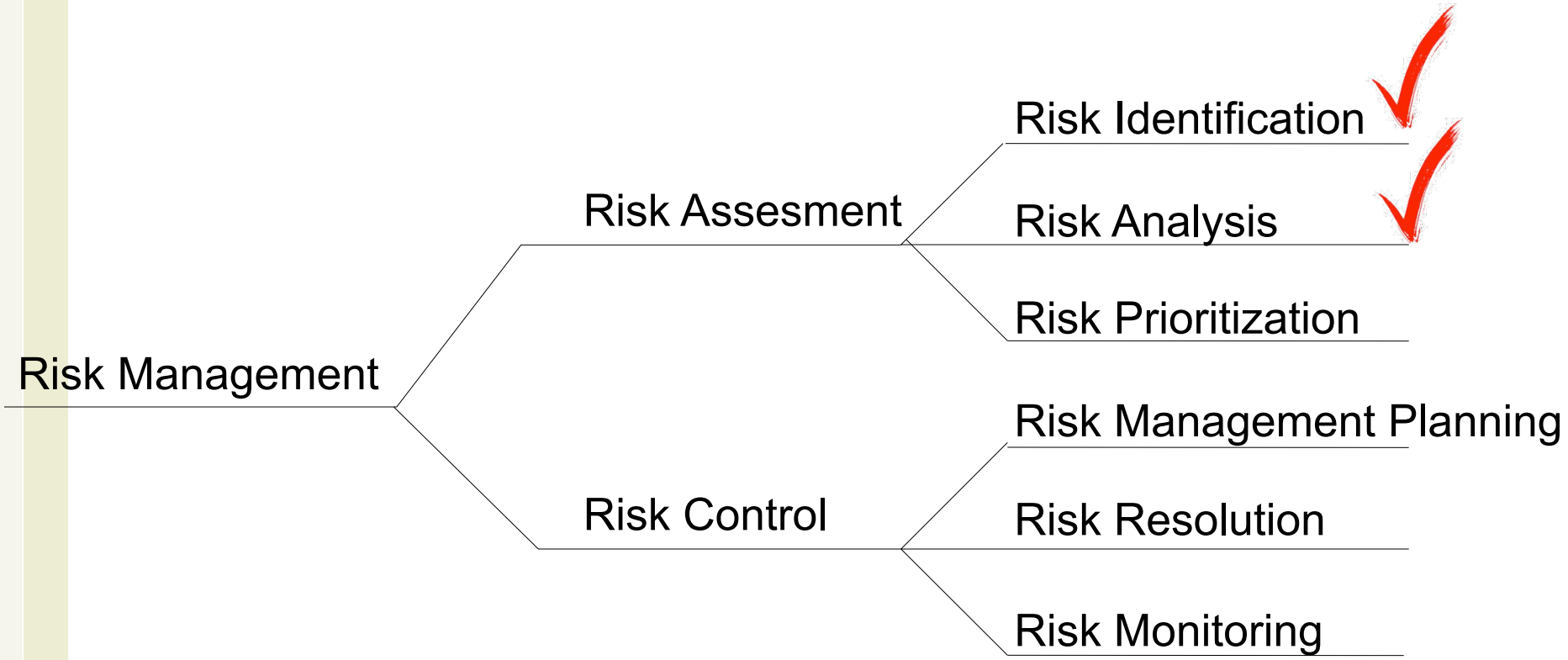
Risk Analysis 1/2

- Determine impact of each risk
- Risk Exposure (RE)
  - RE = Probability of loss * size of loss
- Examples
  - risk is “Facilities not ready on time”
    - Probability is 25%, size is 4 weeks, RE is 1 week
  - 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 2/2

- 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

Processes

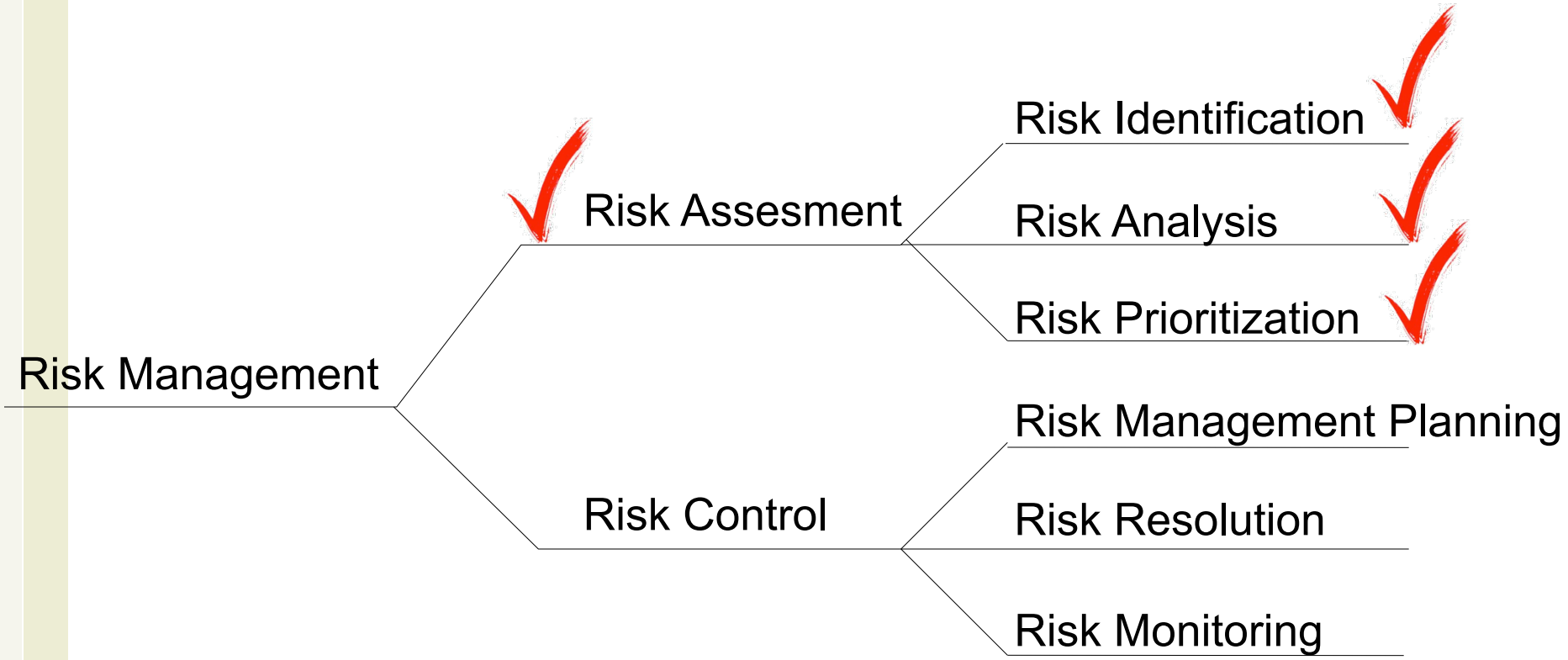


[Source: "Software Risk Management", Boehm, 1989]

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

Processes

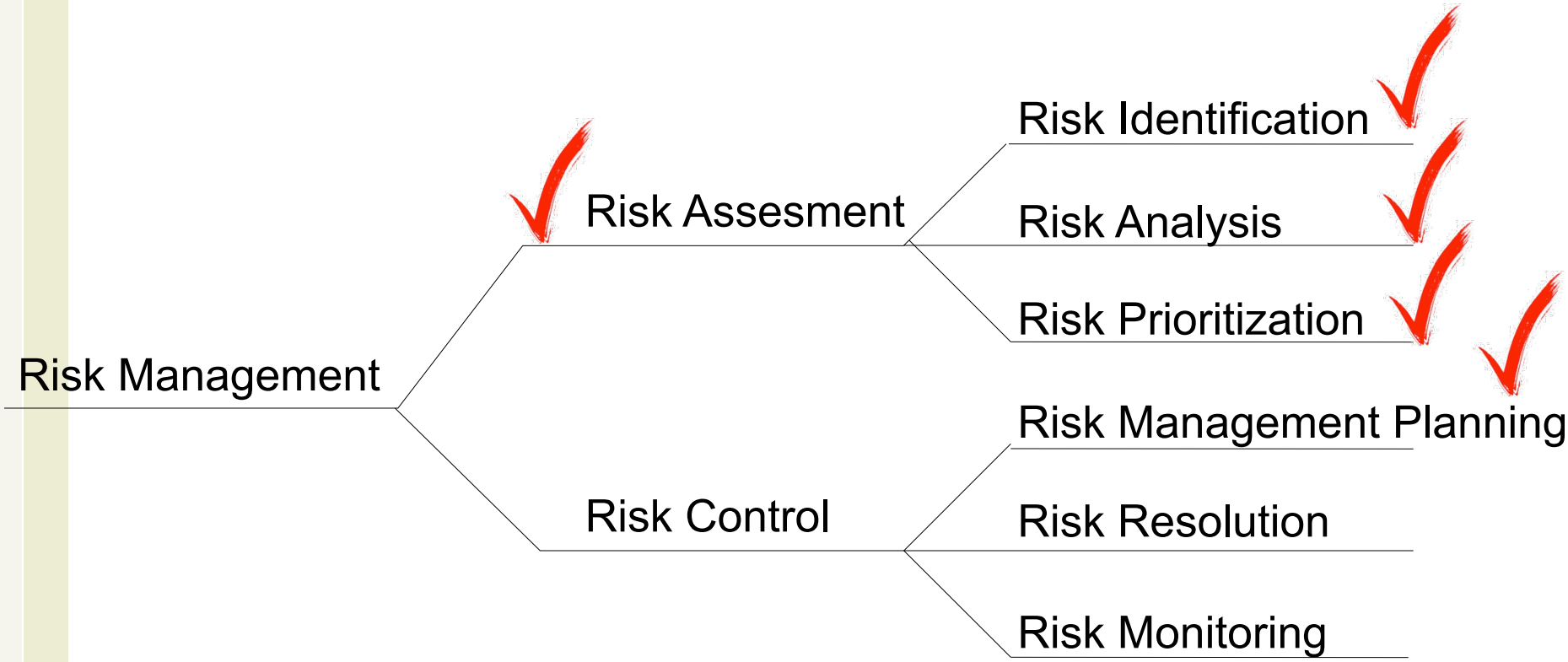


[Source: "Software Risk Management", Boehm, 1989]

Risk Management Planning

- Can be 1 paragraph per risk
  - For an example see Service-Finder's "Risk Management and contingency plan"
  - http://www.emanueledellavalle.org/slides/P&MSP2012_11c_Service-Finder_Risk-Management.pdf
- McConnell's example
  - http://www.construx.com/Page.aspx?cid=1294
  - Cached version available
    - http://www.emanueledellavalle.org/slides/P&MSP2012_11d_Risk-Management-Plan-by-McConnell.pdf

Processes



[Source: "Software Risk Management", Boehm, 1989]

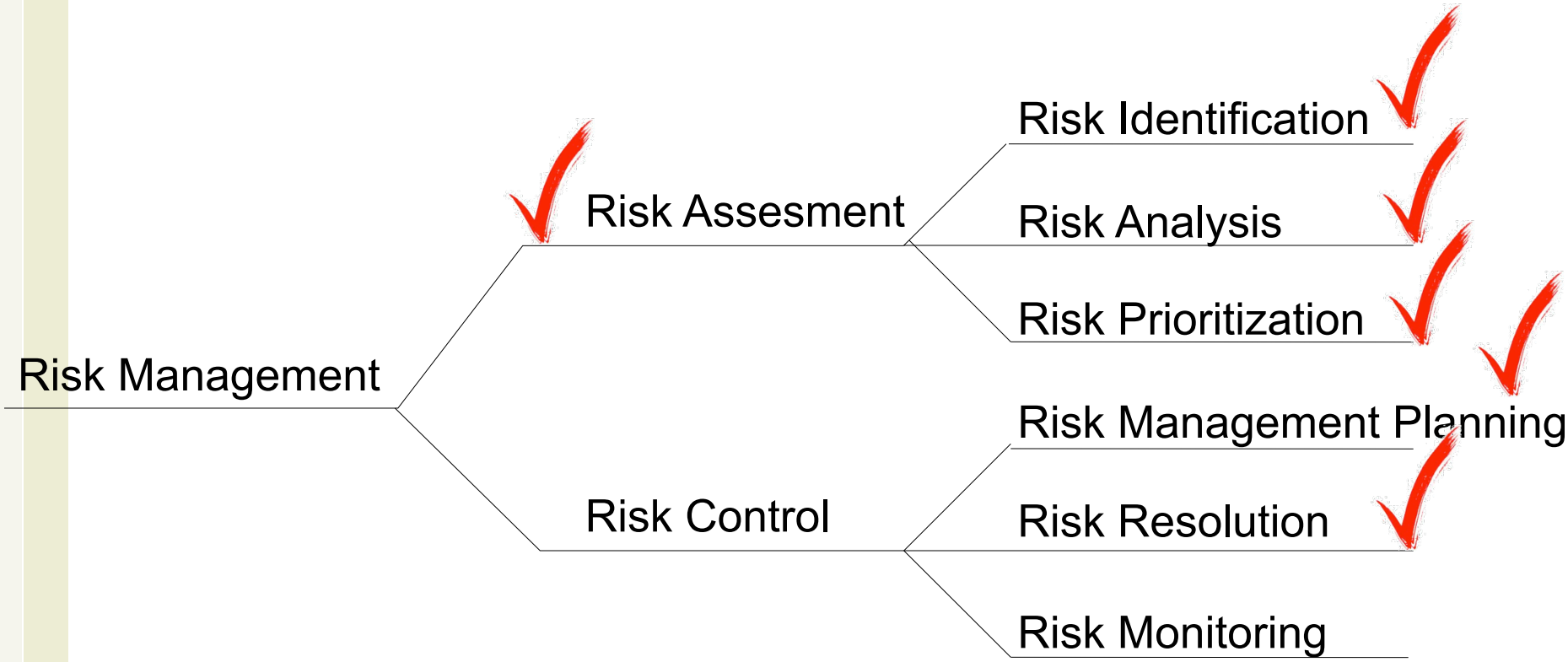
Risk Resolution 1/2

- Risk Avoidance
  - Don't do it
  - Scrub from system
- Risk Assumption
  - Don't do anything about it
  - Accept that it might occur
  - But still watch for it
- Problem control
  - Develop contingency plans
  - E.g., allocate extra test resources
- Risk Transfer
  - To another part of the project (or team)
  - Move off the critical path at least

Risk Resolution 2/2

- Knowledge Acquisition
  - Investigate
    - Ex: do a prototype
  - Buy information or expertise about it
  - Do research

Processes

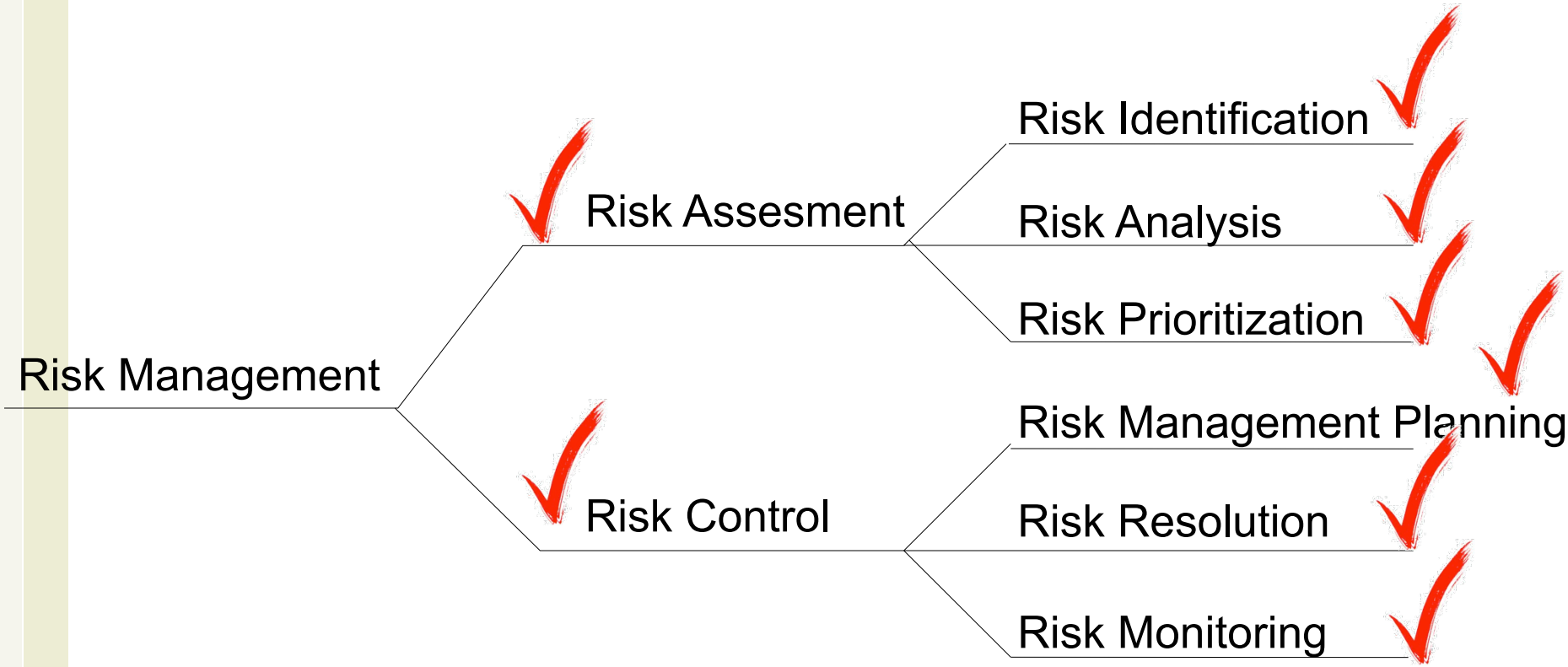


[Source: "Software Risk Management", Boehm, 1989]

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
  - http://www.construx.com/Page.aspx?cid=1293
  - Cached version available
    - http://www.emanueledellavalle.org/slides/P&MSP2012_11e_Sample-Top-10-Risks-List-by-McConnel.pdf

Processes



[Source: "Software Risk Management", Boehm, 1989]

Risk Communication

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

Miniature Milestones 1/3

- A risk-reduction technique
- Use of small goals within project schedule
  - One of McConnell's Best Practices (Ch. 27)
- Fine-grained approach to plan & track
- Reduces risk of undetected project slippage
- Pros
  - Enhances status visibility
  - Good for project recovery
- Cons
  - Increase project tracking effort

Miniature Milestones 2/3

- Can be used throughout the development cycle
- Works with hard-to-manage project activities or methods
  - Such as with evolutionary prototyping
- Reduces unpleasant surprises
- Success factors
  - Overcoming resistance from those managed
  - Staying true to ‘miniature’ nature
- Can improve motivation through achievements

Miniature Milestones 3/3

- Requires a detailed schedule
- Have early milestones
- McConnell says 1-2 days
  - Longer is still good (1-2 weeks)
- Encourages iterative development
- Use binary milestones
  - Done or not done (100%)

Optional Readings

- McConnell: 11 "Motivation", 13 "Team Structure"
- Schwalbe, 8, "Project Human Resource Management"

Questions?