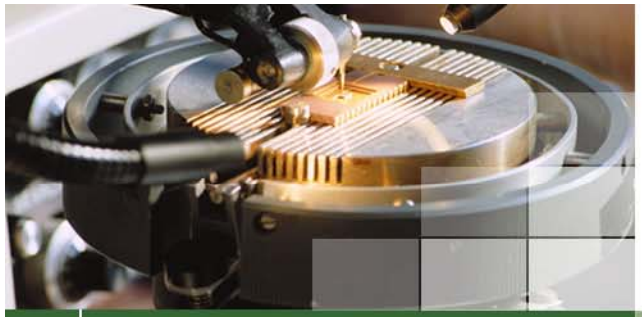

POLITECNICO DI MILANO

Dipartimento di
Elettronica e Informazione

Session 1

Course Overview

Emanuele Della Valle

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Credits

- This 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

- Course basics, administrative items
- Introductions
- Fundamentals
- Classic Mistakes

Syllabus Review

- Class web site
  - http://emanueledellavalle.org/Teaching/PMSP-2009-10.html
- Grades
- Exams
- Assignments
- Project
- Class participation
- Sessions

Textbooks

- Recommended texts (not mandatory)
  - These provide two very different viewpoints
    - In-the-trenches vs. PMI textbook perspective
    - "Rapid Development", Steve McConnell
      - http://www.stevemcconnell.com/rd.htm
    - "Information Technology Project Management", Kathy Schwalbe
      - http://www.kathyschwalbe.com/
- More reading
  - "Quality Software Project Management", D. Shafer
    - http://books.google.com/books?id=YYFEqNz7oKcC&printsec=frontcover
  - "Software Project Survival Guide", Steve McConnell
    - http://www.stevemcconnell.com/sg.htm
  - "Peopleware", T. DeMarco and T. Lister
    - http://systemsguild.com/GuildSite/TDM/Tom_DeMarco.html

Basics

- Essential elements of software project management
- Practical, rapid development focus
- Real-world case studies
  - And other examples like job interviews
- Highly interactive
- Dry as toast?

My Background

- 9 years, +50 projects
- Projects of all shapes and sizes
  - 80% in research 20% for industries
  - 20% lasting 2-3 years 80% lasting 2-6 weeks
- Areas of expertise
  - Web
    - Semantic Web
    - Web Services
    - Web 2.0
  - Information System Integration
    - Service Oriented Architecture
    - Semantic SOA
    - Business Process Management
  - Knowledge Management Systems
    - Information Portals
    - Semantic Search
- Application sectors: healthcare, government, b2b

Your Background

- Name
- Day Job or Equivalent
- Final Project
- Project Management Experience
- Industry Experience
- Expectations & goals from the class

The Field

- Jobs: where are they?
  - http://dice.com PM vs. Developers
- Professional Organizations
  - Project Management Institute (PMI) (pmi.org)
  - Software Engineering Institute (SEI)
  - IEEE Software Engineering Group
- Certifications
  - PMI PMP
    - http://en.wikipedia.org/wiki/Project_Management_Professional
- The “PMBOK” – PMI Body of Knowledge
- Tools
  - MS Project
    - Available in A3.3 where we will go for class 6
    - http://office.microsoft.com/project
  - Other similar tools
    - http://en.wikipedia.org/wiki/List_of_project_management_software

The Field Part 2

- Average PM salary $81,000
- Contract rates for PM's can match techies
- PMI certification adds avg. 14% to salary
- PMI certs, 1993: 1,000; 2002: 40,000
- Other cert: CompTIA Project+
- Links: http://www.projectreference.com/#Certification

Job Fundamentals

- Skills required
- PM Positions and roles
- The process

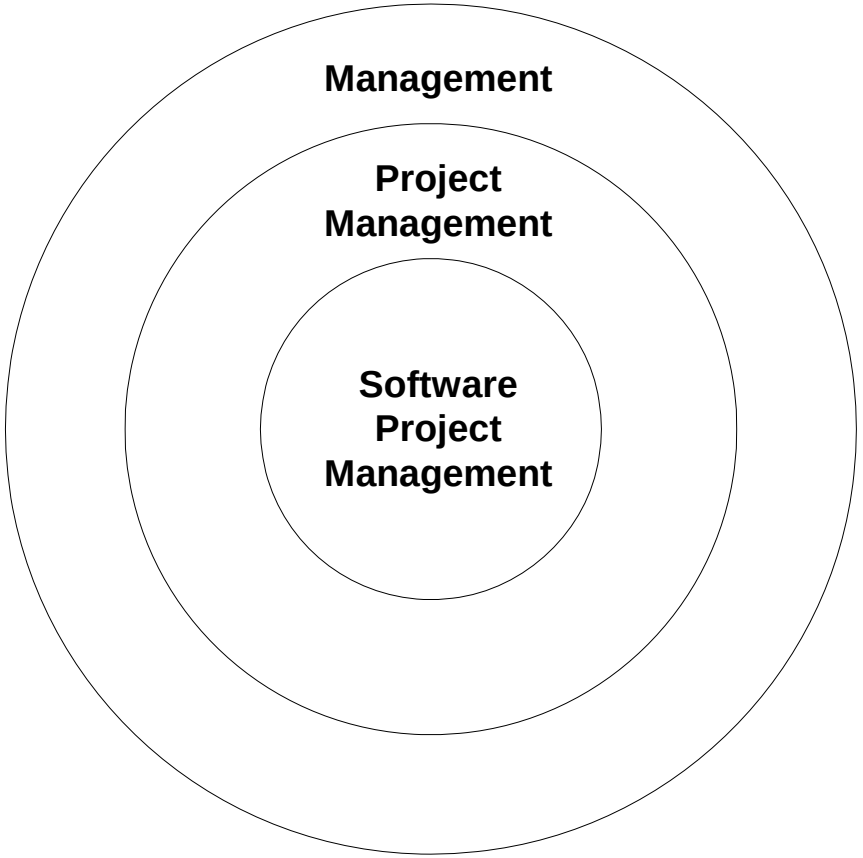
Project Management Skills

- Leadership
- Communications
- Problem Solving
- Negotiating
- Influencing the Organization
- Mentoring
- Process and technical expertise

Project Manager Positions

- Project Administrator / Coordinator
- Assistant Project Manager
- Project Manager / Program Manager
- Executive Program Manager
- V.P. Program Development

Software Project Management



PM History in a Nutshell

- Birth of modern PM: Manhattan Project (the bomb)
  - See http://en.wikipedia.org/wiki/Manhattan_Project
    - employed more than 130,000 people and cost nearly $2 billion ($24 billion in 2008 dollars)
- 1970's: military, defense, construction industry were using PM software
- 1990's: large shift to PM-based models
  - 1985: Total quality management
  - 1990-93: Re-engineering, self-directed teams
  - 1996-99: Risk mgmt, project offices
  - 2000: Merge & Acquisition, global projects

Project Management

- What's a project?
- PMI definition
  - A project is a temporary endeavor undertaken to create a unique product or service
    - "Temporary"
      - Can be years
      - Result can be lasting
      - Team can be temporary
    - "Unique"
      - Ex: thousands of buildings, but each is unique
- Progressively elaborated
  - With repetitive elements
  - Scope should be constant even as elaboration happens
- A project manager
  - Analogy: conductor, coach, captain

Project vs. Program Management

- What's a 'program'?
- Mostly differences of scale
- Often a number of related projects
- Longer than projects
- Definitions vary
- Ex: Program Manager for OpenOffice

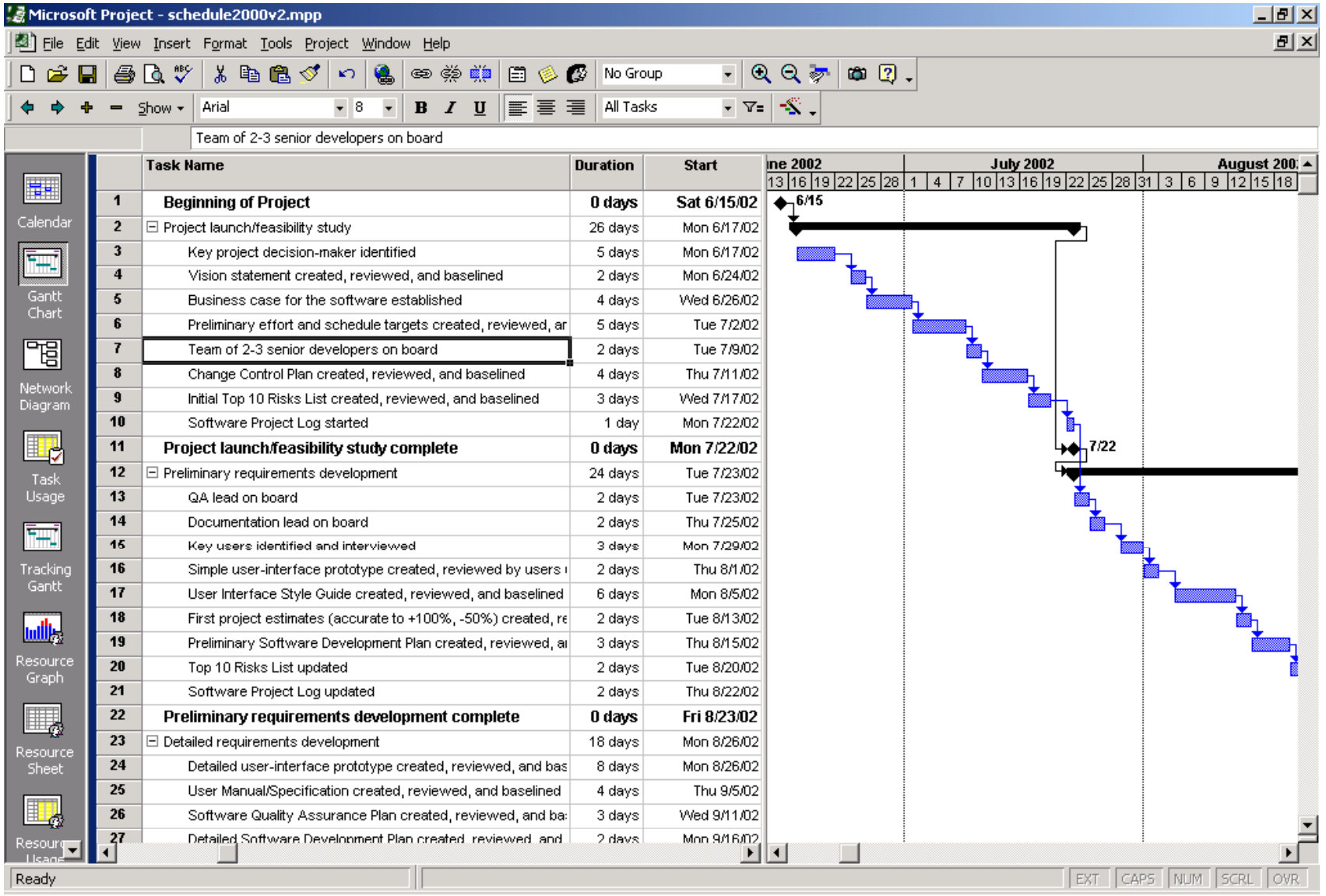
Interactions / Stakeholders

- As a PM, who do you interact with?
- Project Stakeholders
  - Project sponsor
  - Executives
  - Team
  - Customers
  - Contractors
  - Functional managers
- Managing all stakeholder Expectations is challenging
  - conflict

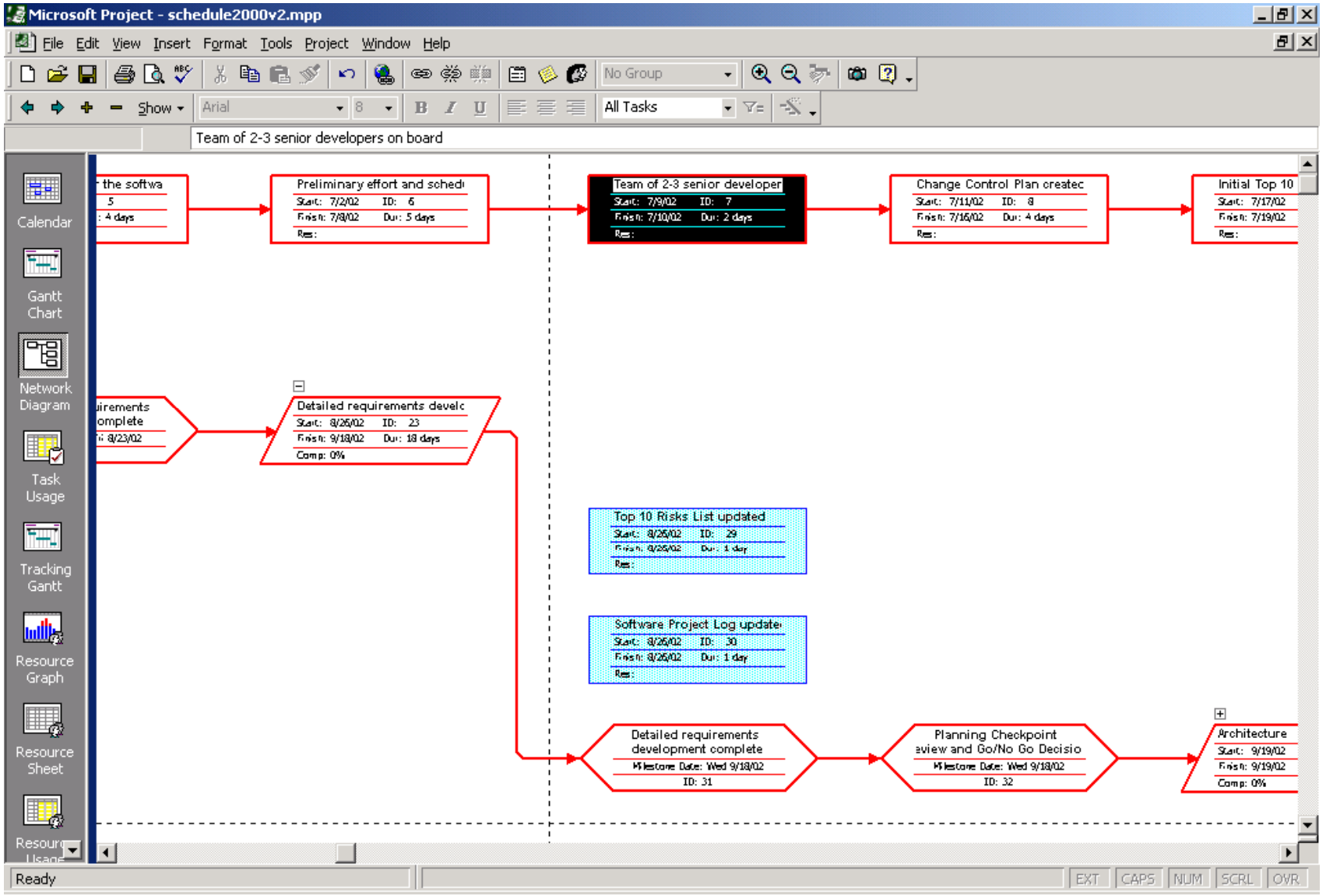
PM Tools: Software

- Low-end
  - Basic features, tasks management, charting
  - A spreadsheet can do, Milestones Simplicity
- Mid-market
  - Handle larger projects, multiple projects, analysis tools
  - MS Project (approx. 50% of market)
  - OpenProj (valid opensource alternative)
- High-end
  - Very large projects, specialized needs, enterprise
  - AMS Realtime http://www.amsrealtime.com/
  - Primavera Project Manager http://www.primavera.com/

Tools: Gantt Chart



Tools: Network Diagram



PMI's 9 Knowledge Areas

- Project integration management
- Scope
- Time
- Cost
- Quality
- Human resource
- Communications
- Risk
- Procurement

First Principles

- One size does not fit all!
- Patterns and Anti-Patterns (see Classic Mistakes later)
- Spectrums
  - Project types
  - Sizes
  - Formality and rigor
- Project are like families, each dysfunctional in it's own "special way"

Our Pattern: Rapid Development

- Faster delivery
- Reduced risk
- Increased visibility to customer
- Don’t forsake quality

Rapid Development Strategy

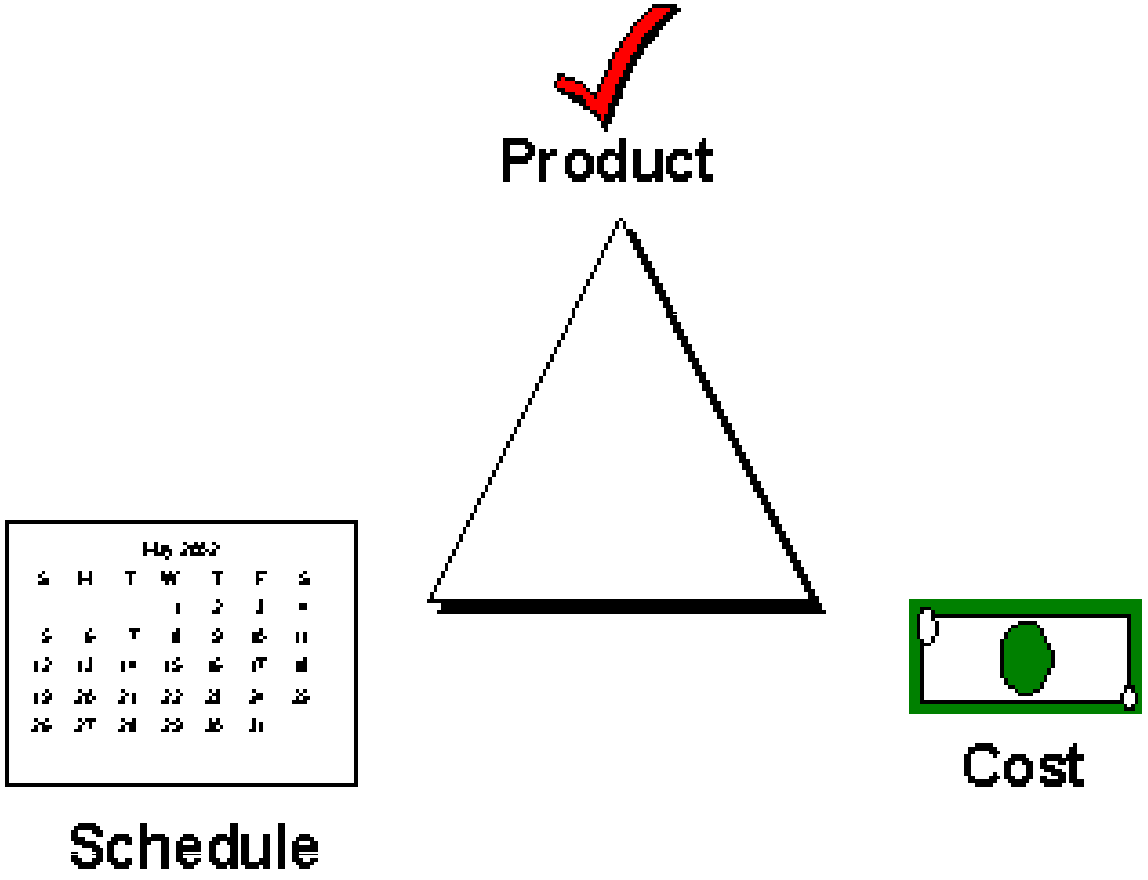
- Classic Mistake Avoidance
- Development Fundamentals
- Risk Management
- Schedule-Oriented Practices

Four Project Dimensions

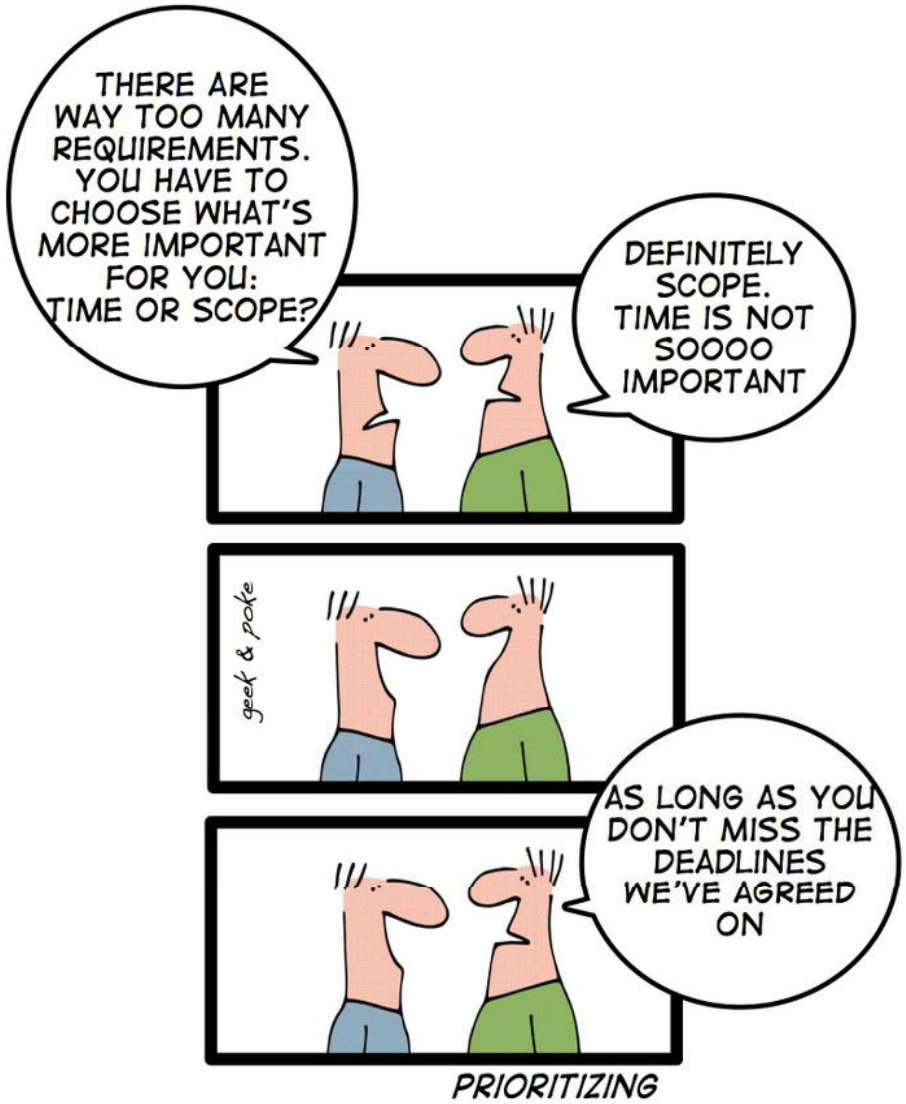
- People
- Process
- Product
- Technology

Trade-off Triangle

- Fast, cheap, good. Choose two.



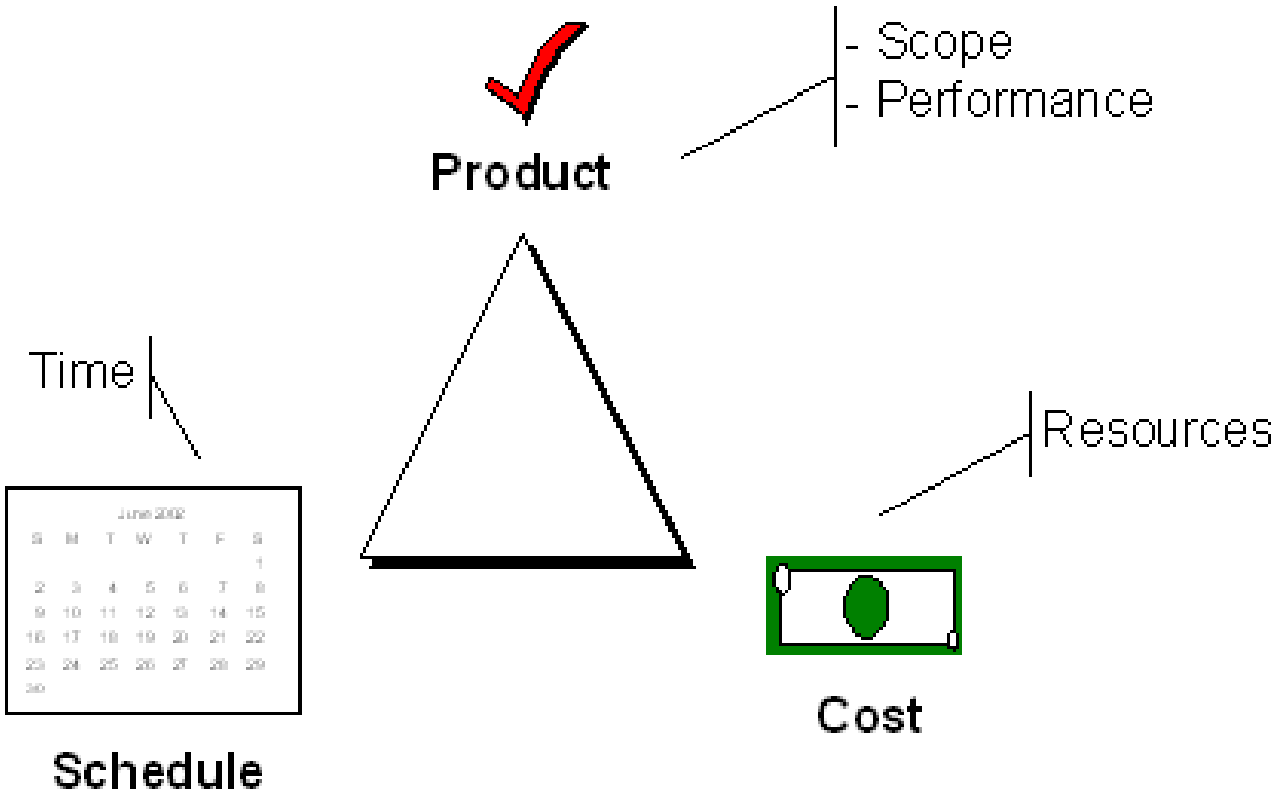
Comics



Source: http://geekandpoke.typepad.com/geekandpoke/2009/11/thats-why-we-love-this-job.html

Trade-off Triangle

- Know which of these are fixed & variable for every project



People

- “It’s always a people problem”

  - Gerald Weinberg, “The Secrets of Consulting”

- Developer productivity: 10-to-1 range
  - Read more: http://forums.construx.com/blogs/stevemcc/archive/2008/03/27/productivity-variations-among-software-developers-and-teams-the-origin-of-quot-10x-quot.aspx

- Improvements:
  - Team selection
  - Team organization
  - Motivation

People 2

- Other success factors
  - Matching people to tasks
  - Career development
  - Balance: individual and team
  - Clear communication

Process

- Is process stifling?
- 2 Types: Management & Technical
- Development fundamentals
- Quality assurance
- Risk management
- Lifecycle planning
- Avoid abuse by neglect

Process 2

- Customer orientation
- Process maturity improvement
- Rework avoidance

Product

- The “tangible” dimension
- Product size management
- Product characteristics and requirements
- Feature creep management

Technology

- Often the least important dimension
- Language and tool selection
- Value and cost of reuse

Planning

- Determine requirements
- Determine resources
- Select lifecycle model
- Determine product features strategy

Tracking

- Cost, effort, schedule
- Planned vs. Actual
- How to handle when things go off plan?

Measurements

- To date and projected
  - Cost
  - Schedule
  - Effort
  - Product features
- Alternatives
  - Earned value analysis
  - Defect rates
  - Productivity (ex: SLOC)
  - Complexity (ex: function points)

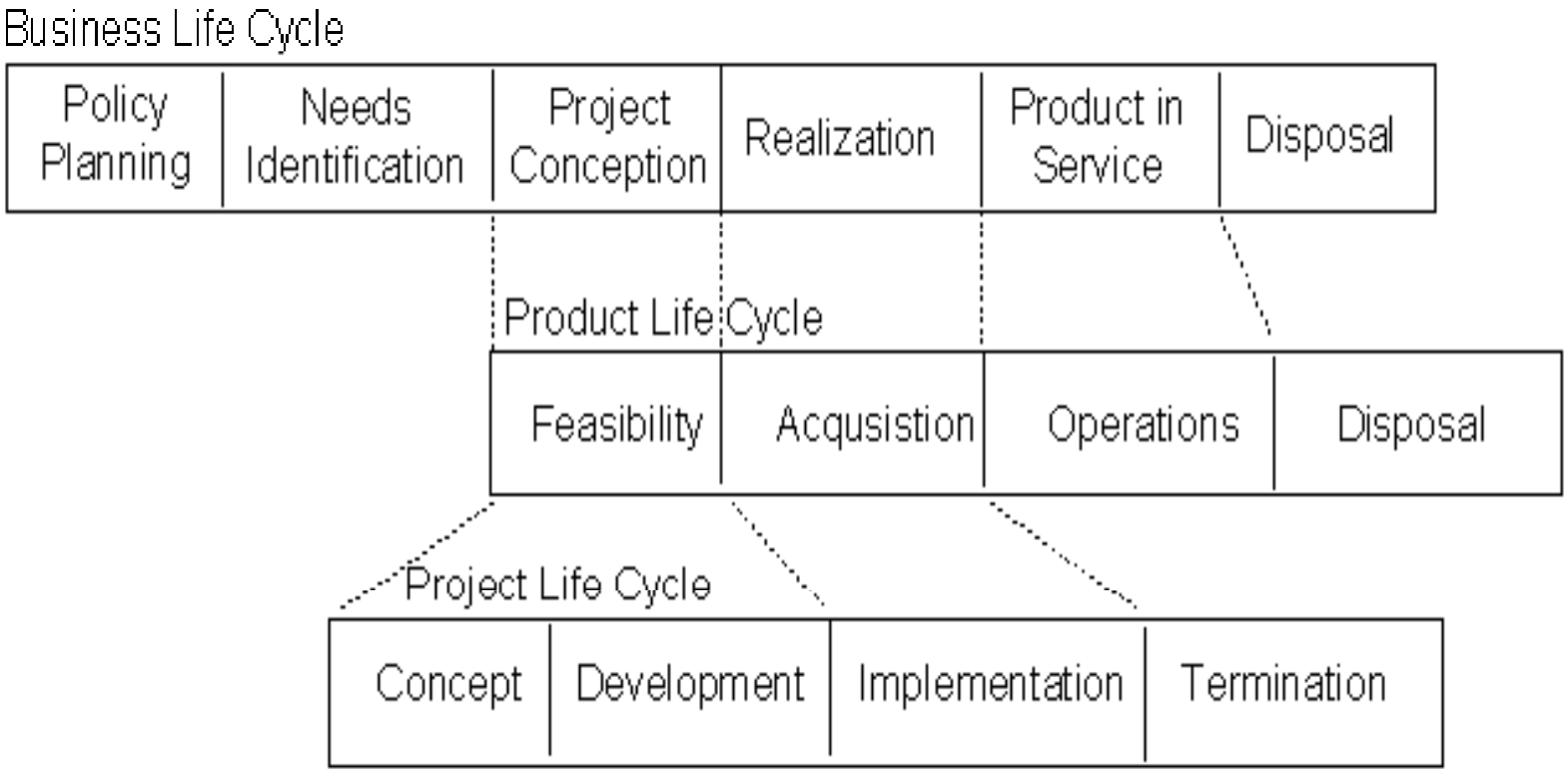
Technical Fundamentals

- Requirements
- Analysis
- Design
- Construction
- Quality Assurance
- Deployment

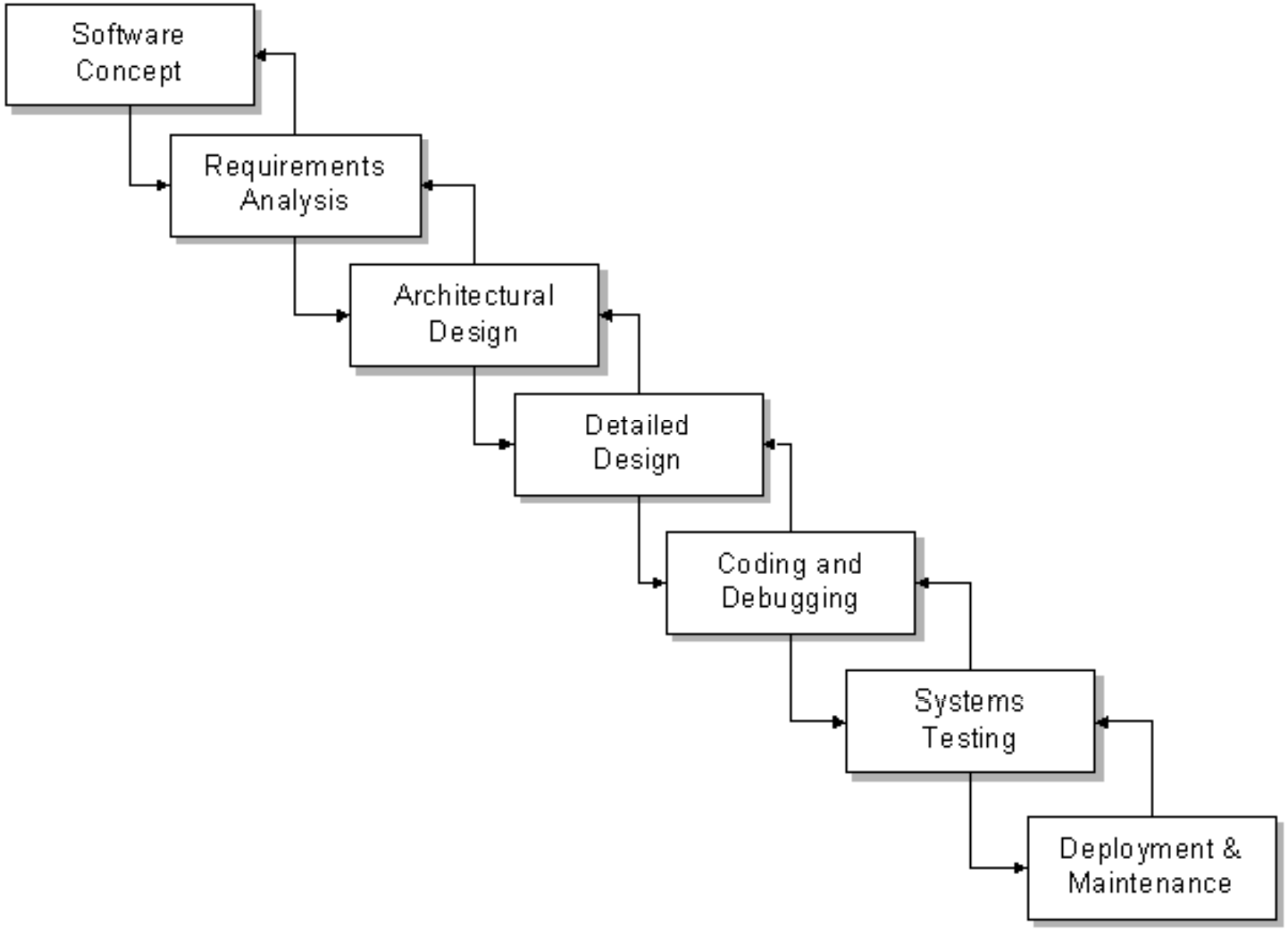
Project Phases

- All projects are divided into phases
- All phases together are known as the Project Life Cycle
- Each phase is marked by completion of Deliverables
- Identify the primary software project phases

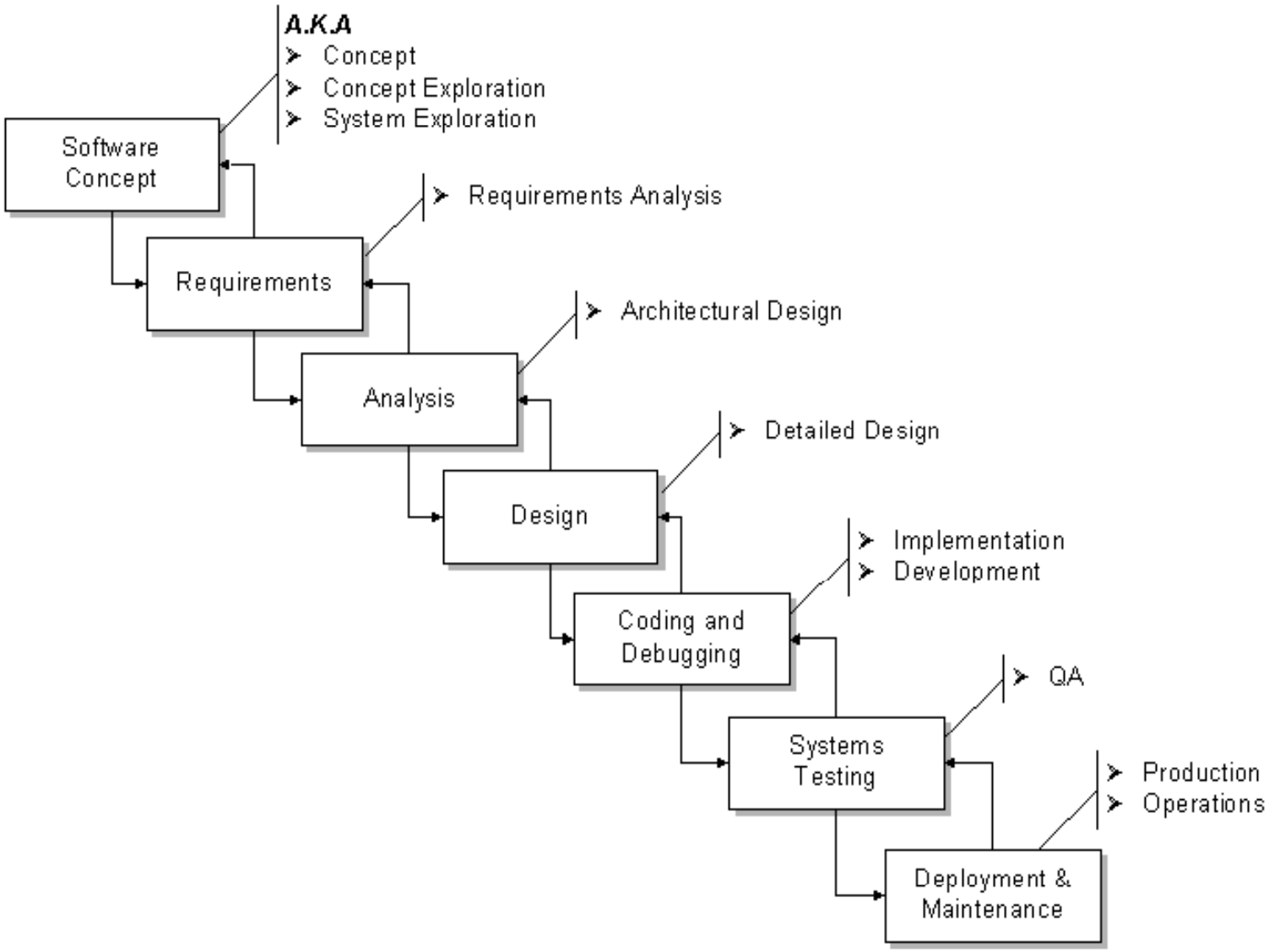
Lifecycle Relationships



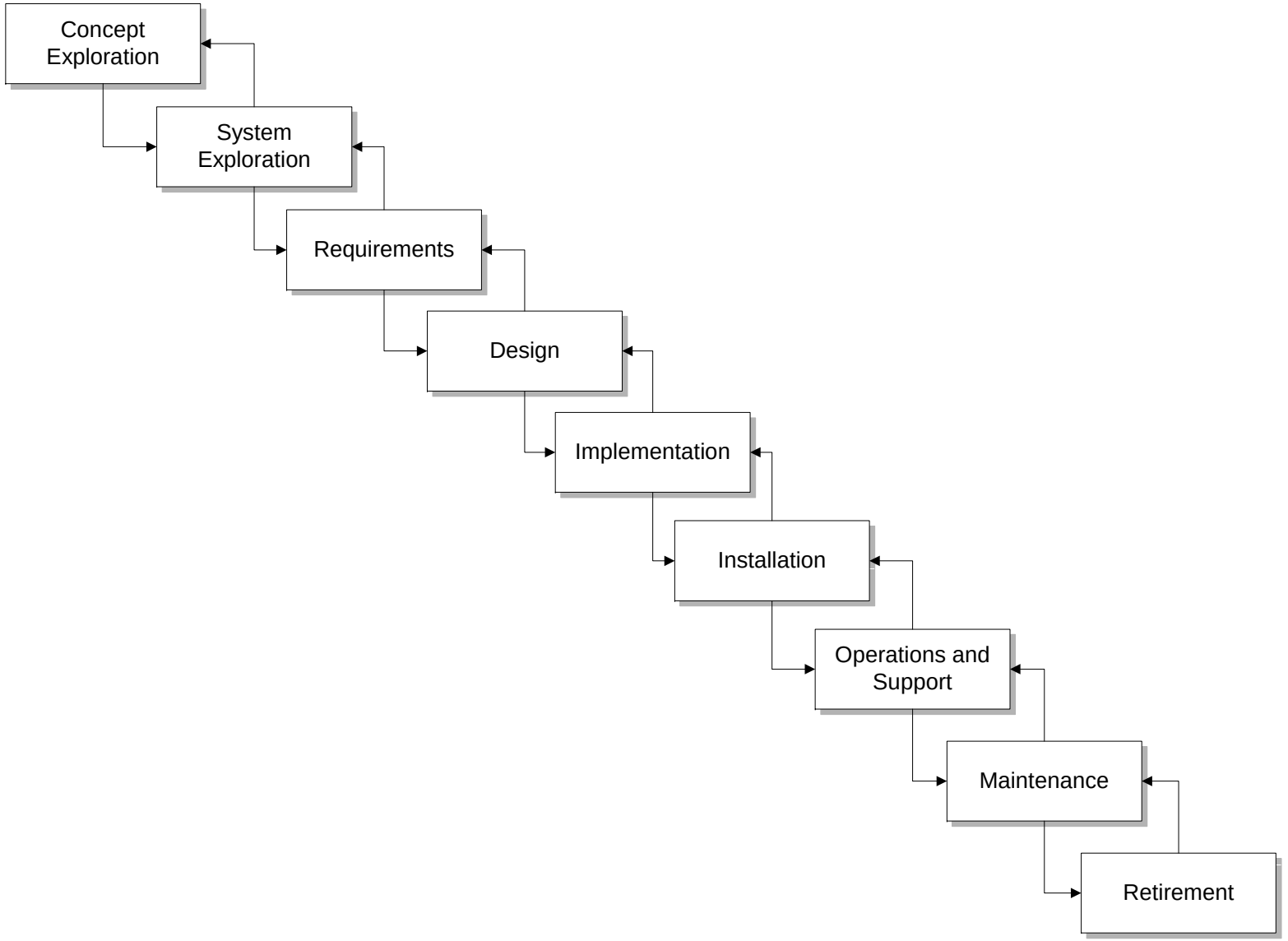
Seven Core Project Phases



Project Phases A.K.A.



Phases Variation



36 Classic Mistakes

- McConnell's Anti-Patterns
  - The mistakes http://www.stevemcconnell.com/rdenum.htm
  - A case study http://www.stevemcconnell.com/rdmistak.htm
- Seductive Appeal
- Types
  - People-Related
  - Process-Related
  - Product-Related
  - Technology-Related
- Gilligan's Island
  - Every week there's some new, crazy scheme to escape the island, but at the end of the episode, the castaways always end up stuck on the island for yet another week.
  - See http://www.codinghorror.com/blog/archives/000889.html

People-Related Mistakes Part 1

- Undermined motivation
- Weak personnel
  - Weak vs. Junior
- Uncontrolled problem employees
- Heroics
- Adding people to a late project

People-Related Mistakes Part 2

- Noisy, crowded offices
- Customer-Developer friction
- Unrealistic expectations
- Politics over substance
- Wishful thinking

People-Related Mistakes Part 3

- Lack of effective project sponsorship
- Lack of stakeholder buy-in
- Lack of user input

Process-Related Mistakes Part 1

- Optimistic schedules
- Insufficient risk management
- Contractor failure
- Insufficient planning
- Abandonment of plan under pressure

Process-Related Mistakes Part 2

- Wasted time during fuzzy front end
- Shortchanged upstream activities
- Inadequate design
- Shortchanged quality assurance

Process-Related Mistakes Part 3

- Insufficient management controls
- Frequent convergence
- Omitting necessary tasks from estimates
- Planning to catch-up later
- Code-like-hell programming

Product-Related Mistakes

- Requirements gold-plating
  - Gilding the lily
- Feature creep
- Developer gold-plating
  - Beware the pet project
- Push-me, pull-me negotiation
- Research-oriented development

Technology-Related Mistakes

- Silver-bullet syndrome
- Overestimated savings from new tools and methods
  - Fad warning

[source http://blogs.infosupport.com/blogs/richardz/archive/2010/02/26/dilbert-on-changing-methodology-during-a-project.aspx]

- Switching tools in mid-project
- Lack of automated source-code control

Optional Reading

- McConnell: Chapters 1-4
  - We covered most of Ch 3 today
- Schwalbe: chapters 1-2, 11 (344-345)