

 POLITECNICO DI MILANO

Dipartimento di  
Elettronica e Informazione

Session 1

# Introduction, Fundamentals, Classic Mistakes

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- 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/>
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# Today

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

- Grades
- Exams
- Assignments
- Project
- Class participation
- Sessions
- Class web site
  - <http://emanueledellavalle.org/Teaching/PMSP-2008-09.html>

- 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/>
  - PMI text
    - “A Guide to the Project Management Body of Knowledge”, Project Management Institute
- 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](http://systemsguild.com/GuildSite/TDM/Tom_DeMarco.html)

- 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?

- 8 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

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

- Jobs: where are they?
- Professional Organizations
  - Project Management Institute (PMI) (pmi.org)
  - Software Engineering Institute (SEI)
  - IEEE Software Engineering Group
- Certifications
  - PMI PMP
- The “PMBOK”    PMI Body of Knowledge
- Tools
  - Recommended (because it is opensource)
    - OpenProj <http://openproj.org/openproj>
  - Optional
    - MS Project <http://office.microsoft.com/project>
    - It should be possible to exchange files among OpenProj and MS Project
  - Other similar tools
    - [http://en.wikipedia.org/wiki/List\\_of\\_project\\_management\\_software](http://en.wikipedia.org/wiki/List_of_project_management_software)

- 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>

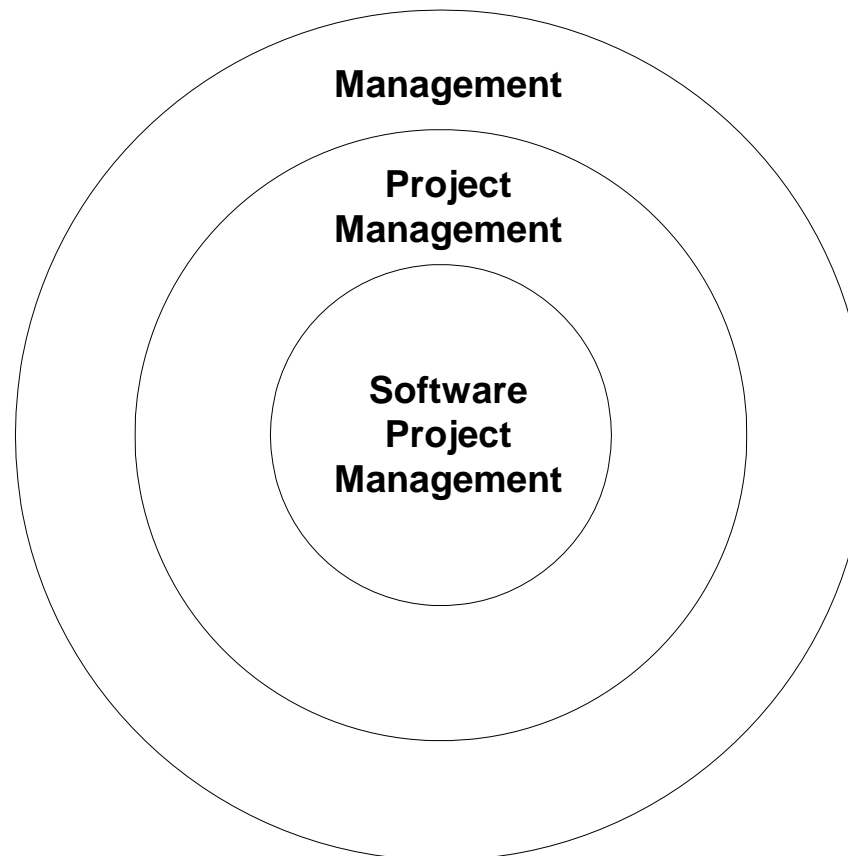
- Skills required
- PM Positions and roles
- The process

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

## Project Manager Positions

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



- Birth of modern PM: Manhattan Project (the bomb)
  - See [http://en.wikipedia.org/wiki/Manhattan\\_Project](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

- What's a project?
- PMI definition
  - A project is a temporary endeavor undertaken to create a unique product or service
- Progressively elaborated
  - With repetitive elements
- A project manager
  - Analogy: conductor, coach, captain

## Project vs. Program Management

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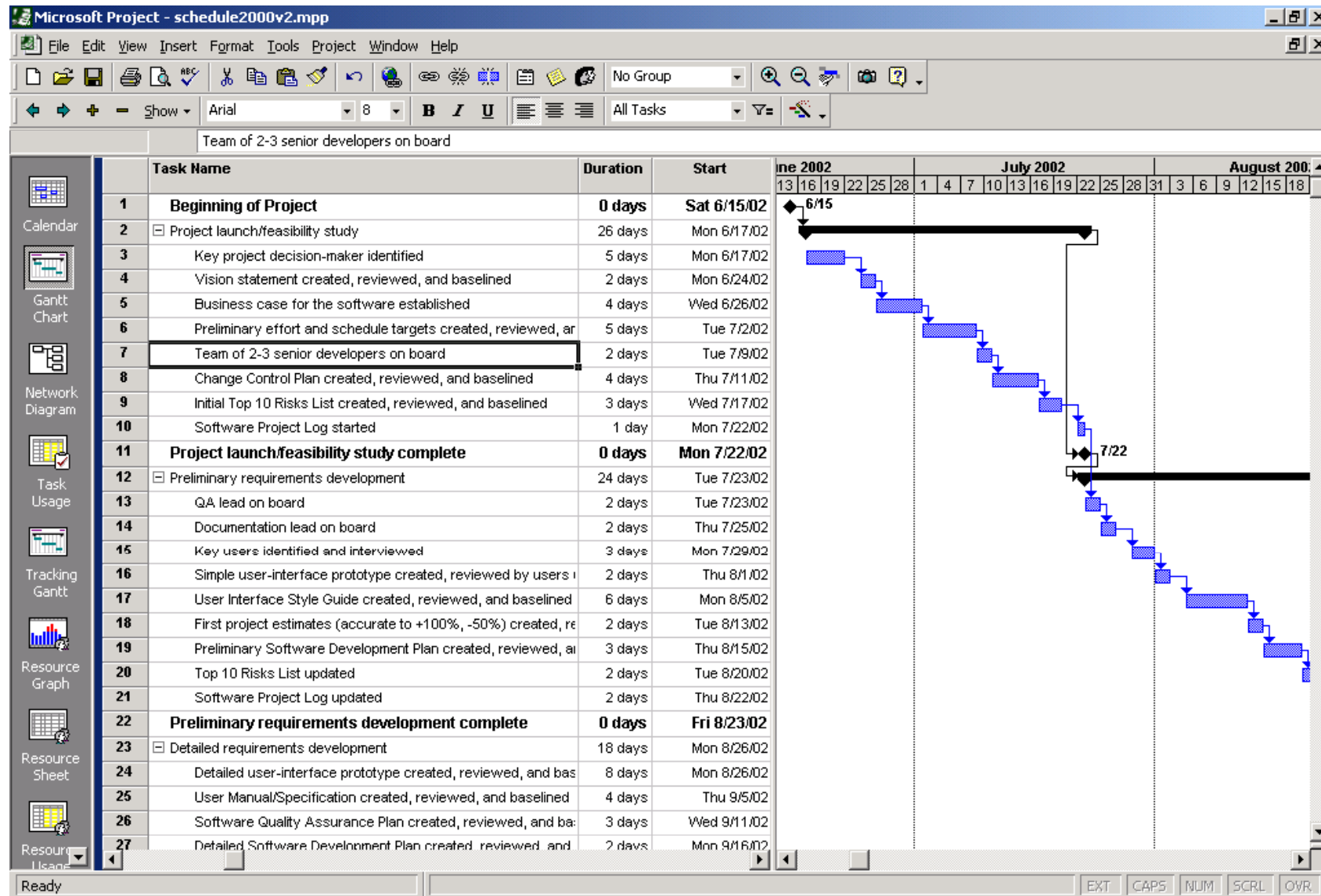
- What's a 'program'?
- Mostly differences of scale
- Often a number of related projects
- Longer than projects
- Definitions vary
- Ex: Program Manager for OpenOffice

- As a PM, who do you interact with?
- Project Stakeholders
  - Project sponsor
  - Executives
  - Team
  - Customers
  - Contractors
  - Functional managers

- 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/>

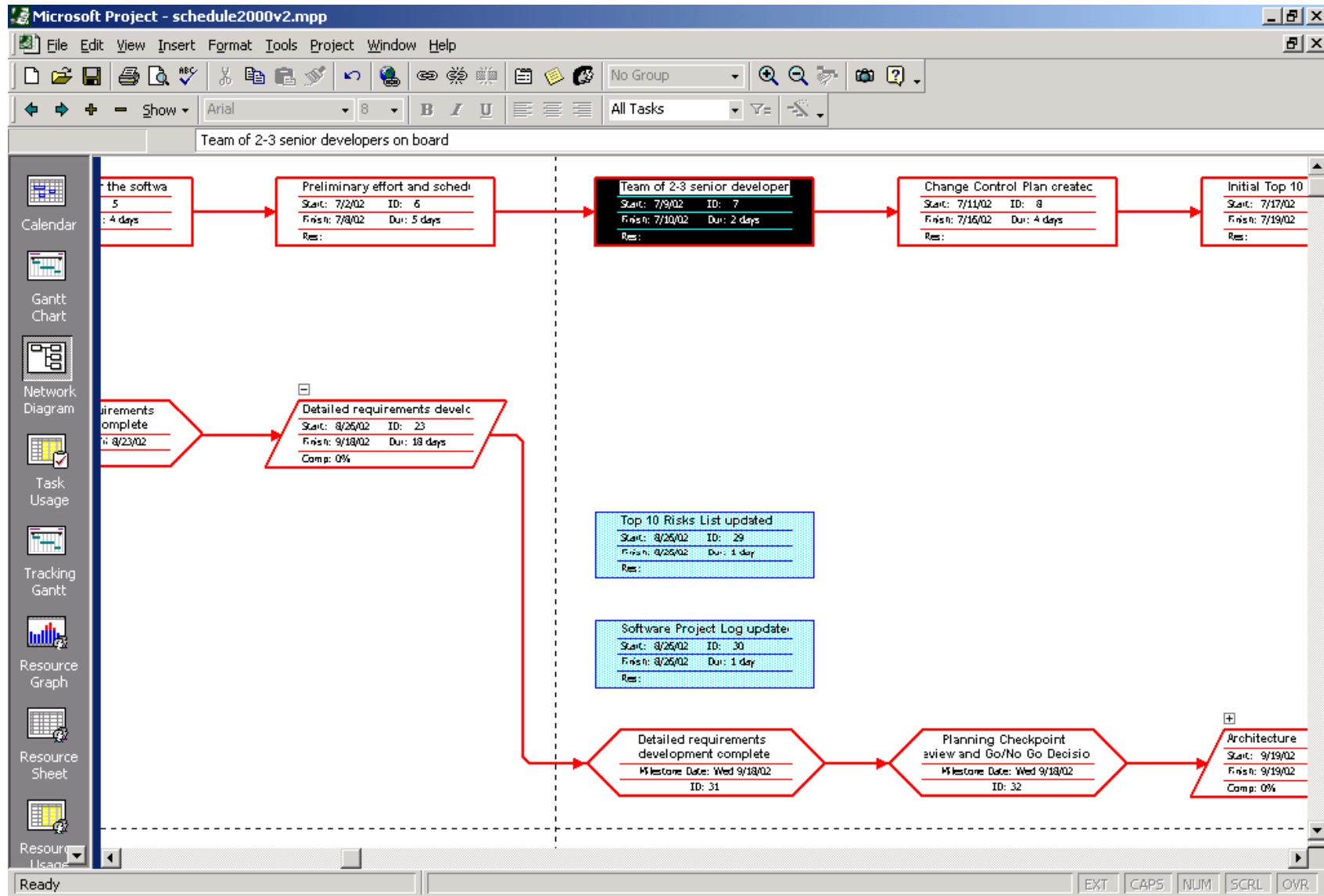
# Tools: Gantt Chart

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# Tools: Network Diagram

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## PMI's 9 Knowledge Areas

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

- One size does not fit all
- Patterns and Anti-Patterns
- Spectrums
  - Project types
  - Sizes
  - Formality and rigor

## Why Rapid Development

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

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

## Four Project Dimensions

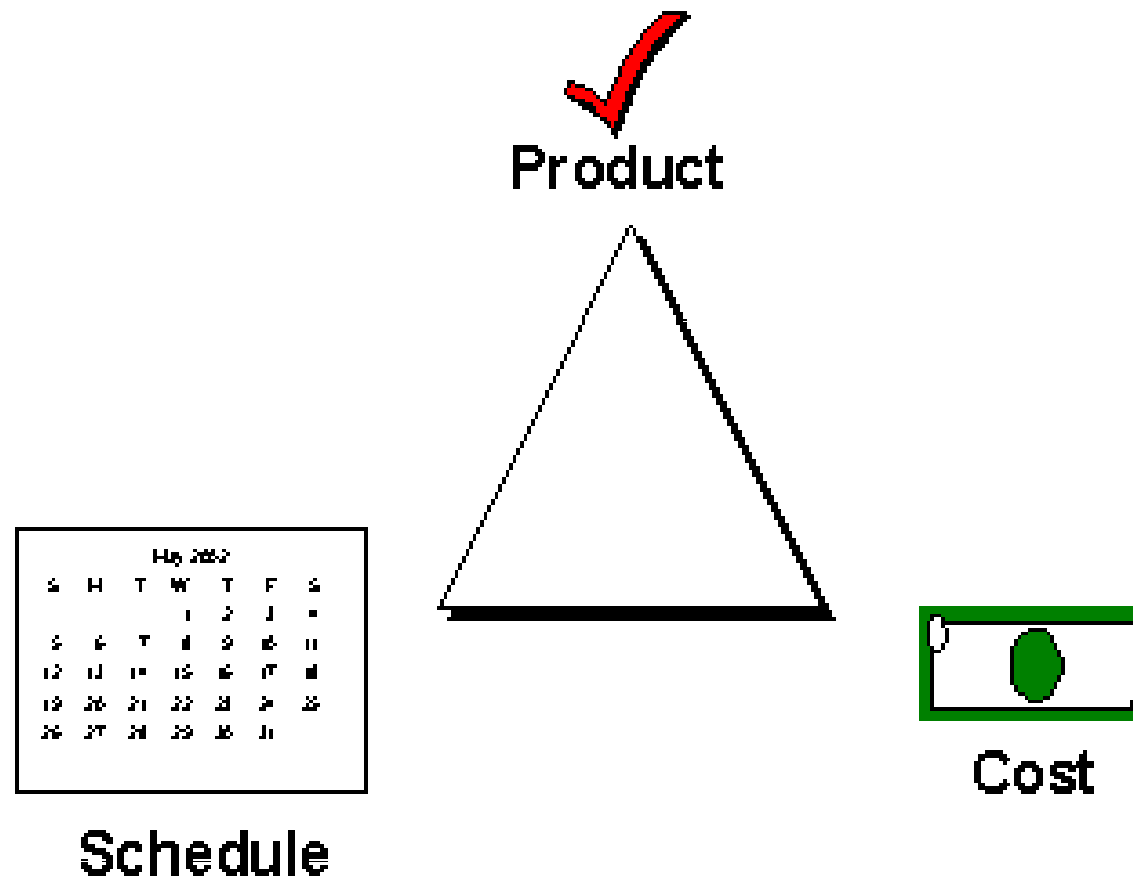
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- People
- Process
- Product
- Technology

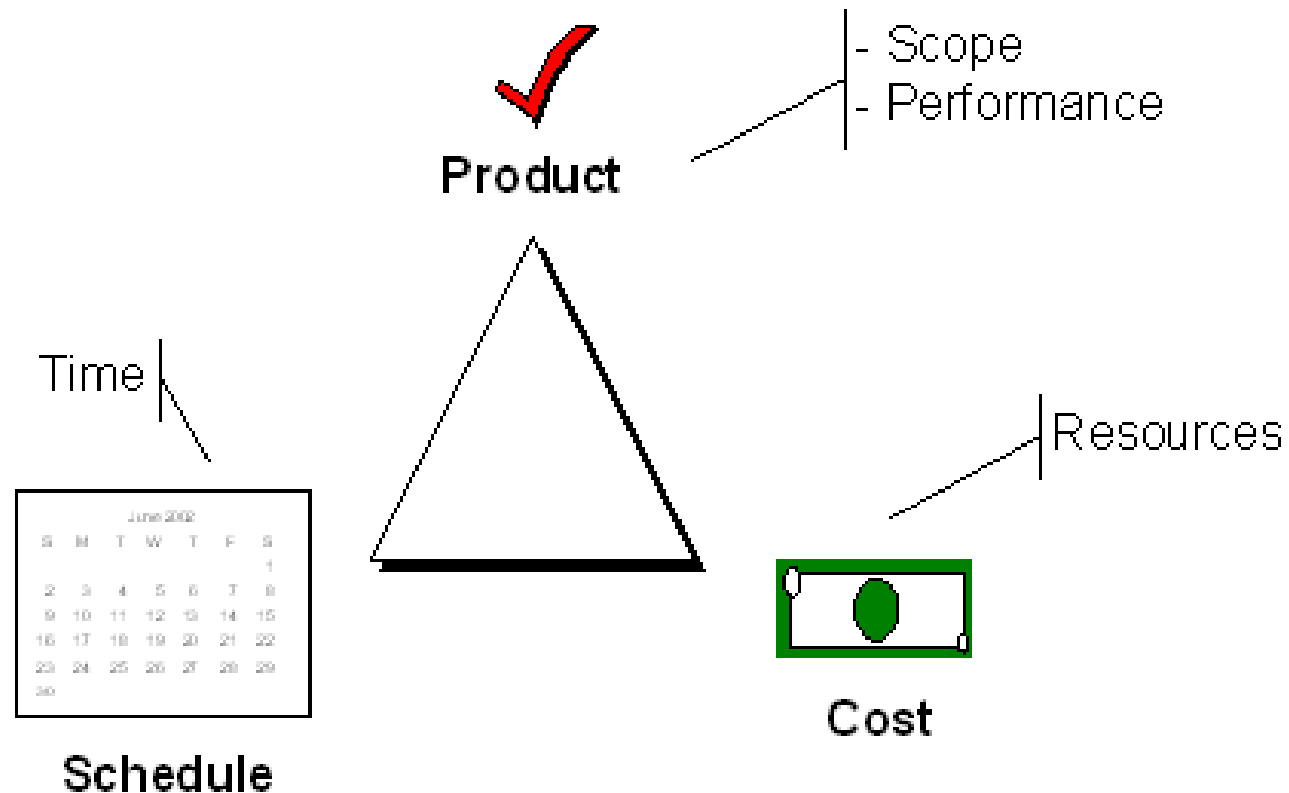
# Trade-off Triangle

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- Fast, cheap, good. Choose two.



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



- “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

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

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

## Process 2

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- Customer orientation
- Process maturity improvement
- Rework avoidance

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

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

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

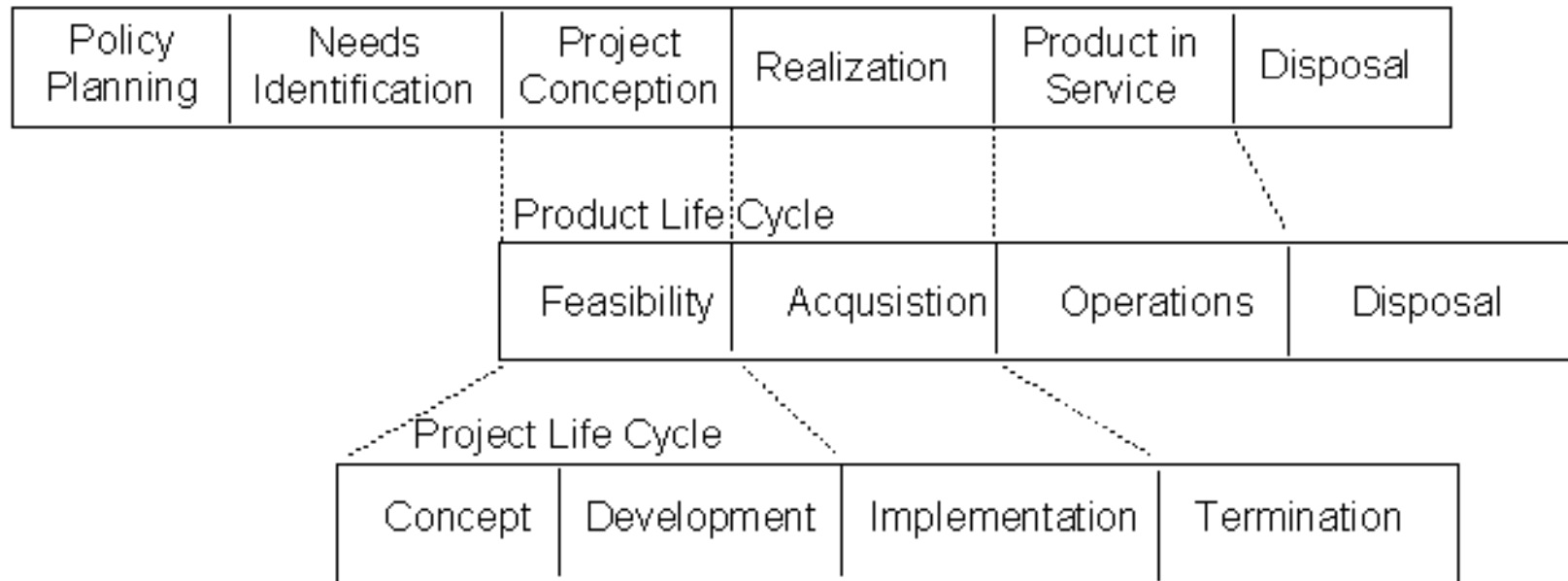
- Cost, effort, schedule
- Planned vs. Actual
- How to handle when things go off plan?

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

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

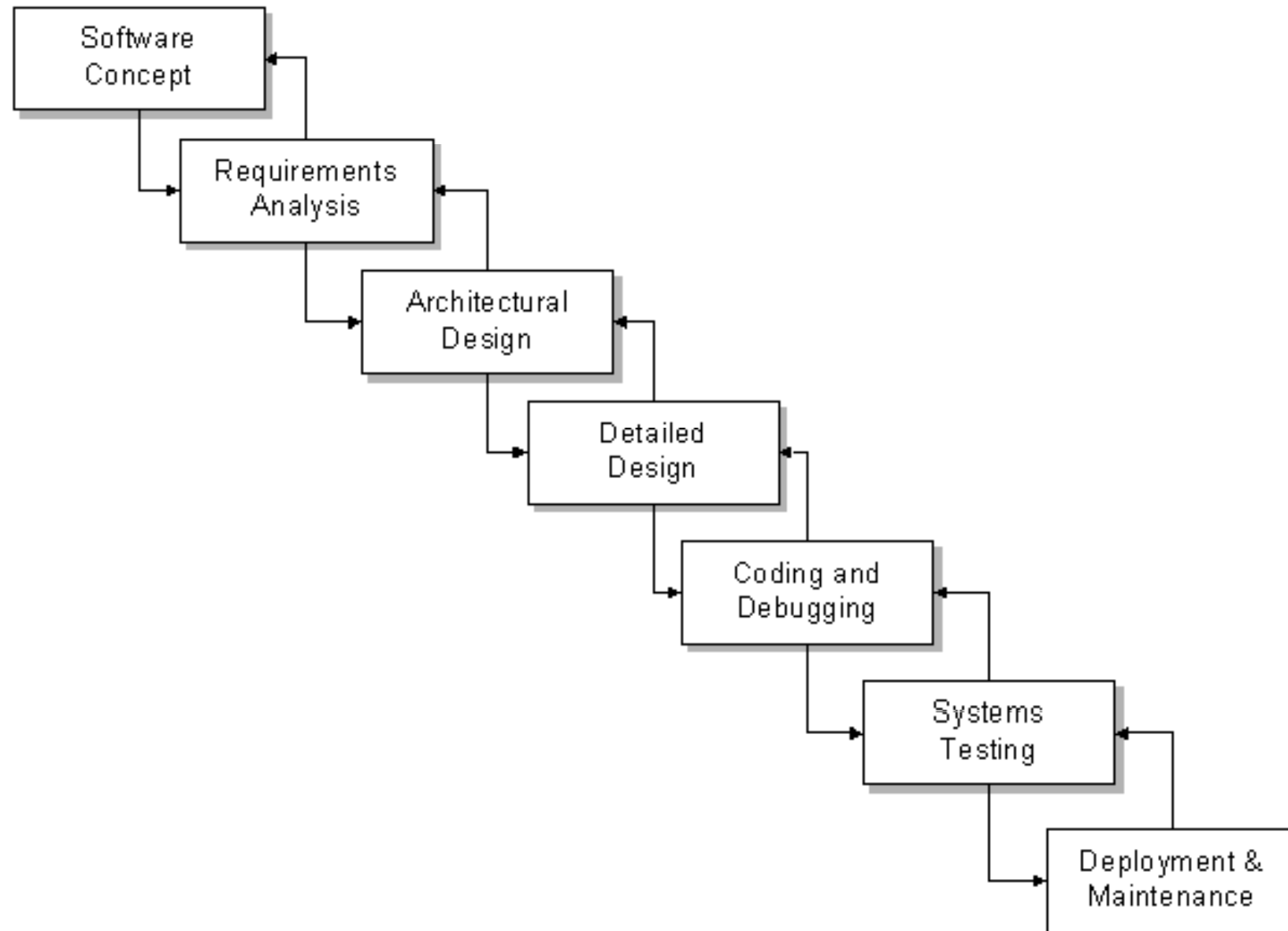
- All projects are divided into phases
- All phases together are known as the Project Life Cycle
- Each phase is marked by completion of Deliverables
- Identify the primary software project phases

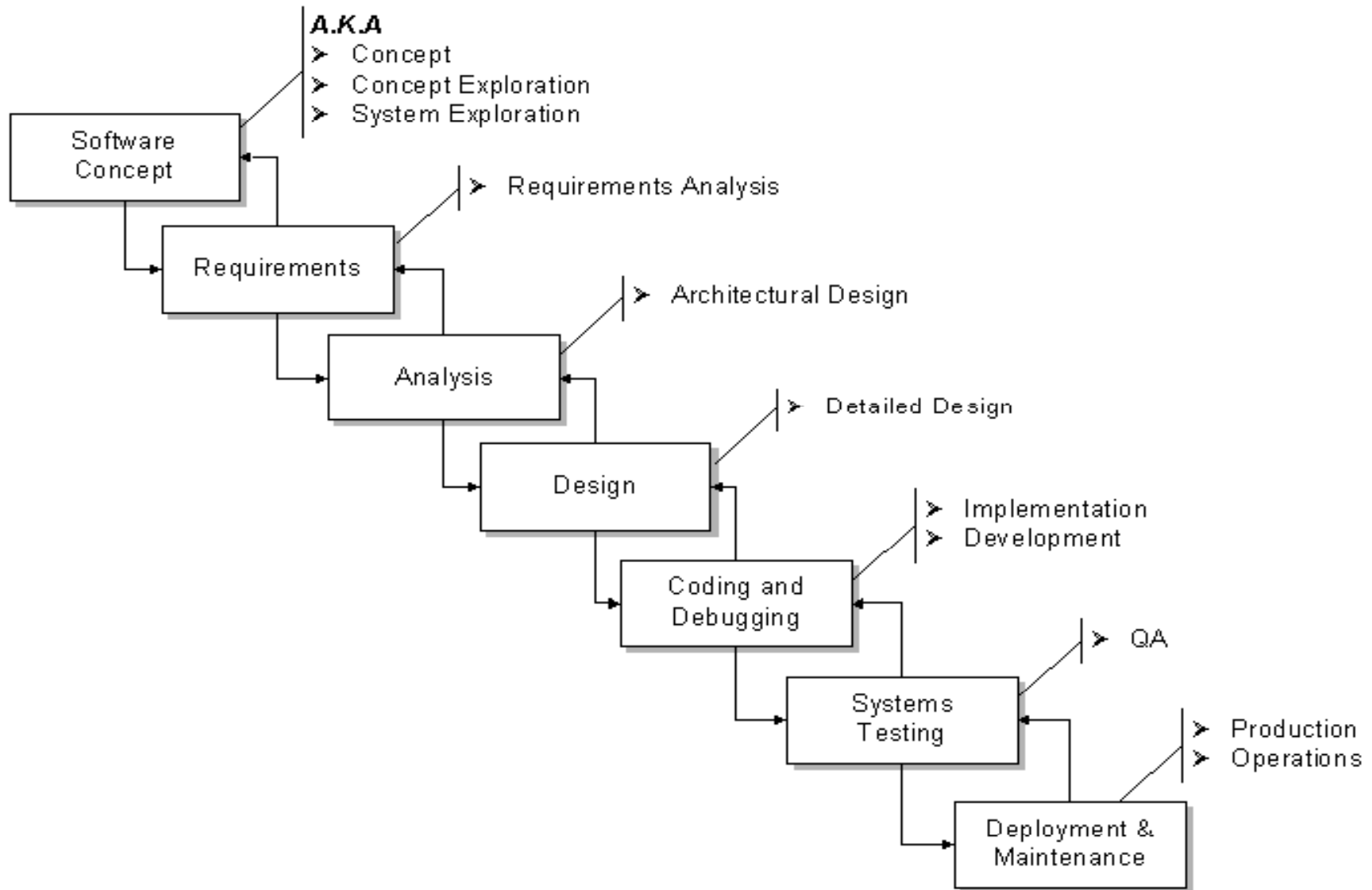
## Business Life Cycle

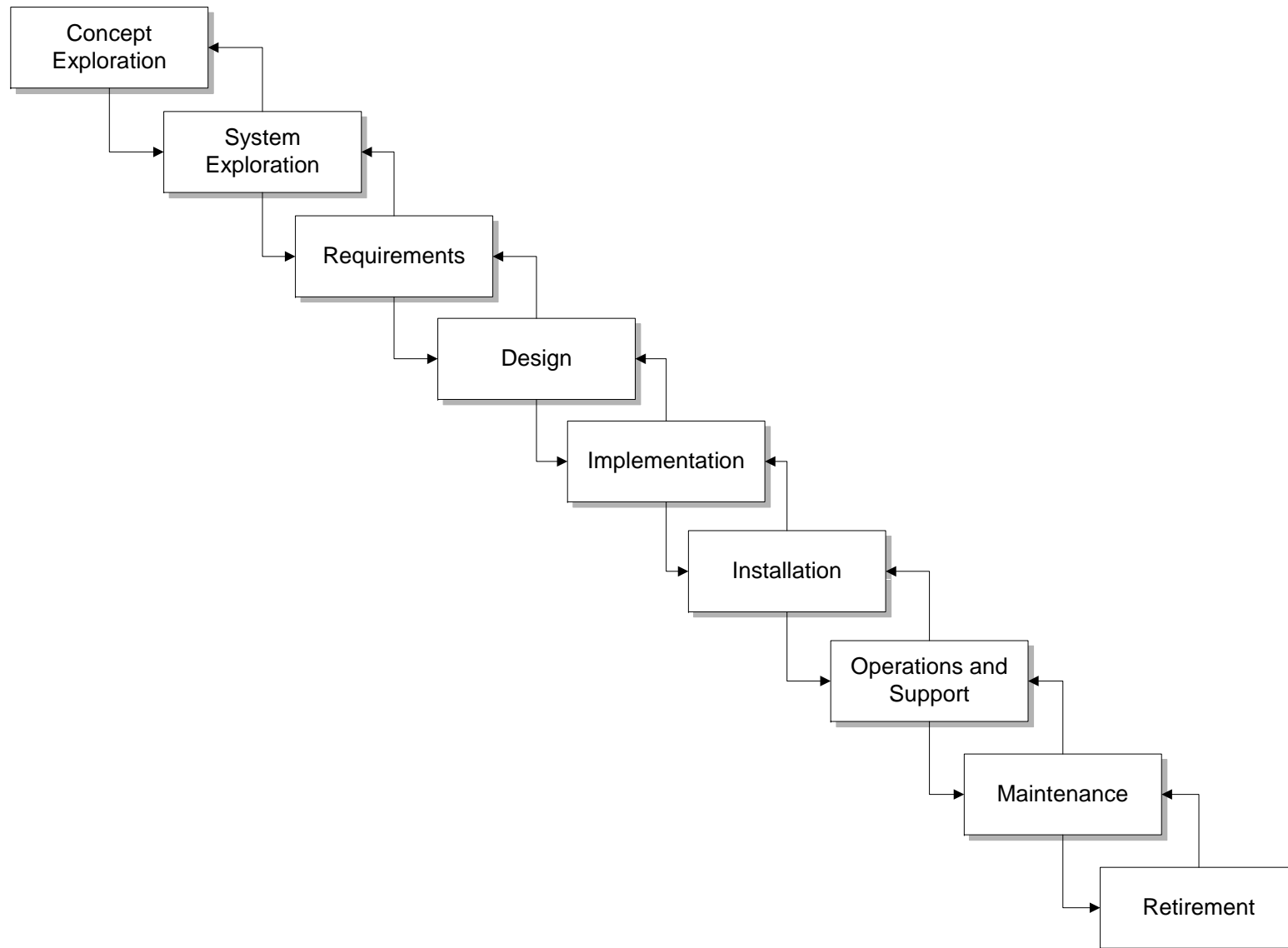


# Seven Core Project Phases

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- 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
  - See <http://www.codinghorror.com/blog/archives/000889.html>

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

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

## People-Related Mistakes Part 3

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

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

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

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

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

- Silver-bullet syndrome
- Overestimated savings from new tools and methods
  - Fad warning
- Switching tools in mid-project
- Lack of automated source-code control

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