Software Engineering – Spring 2018
Lecture 3
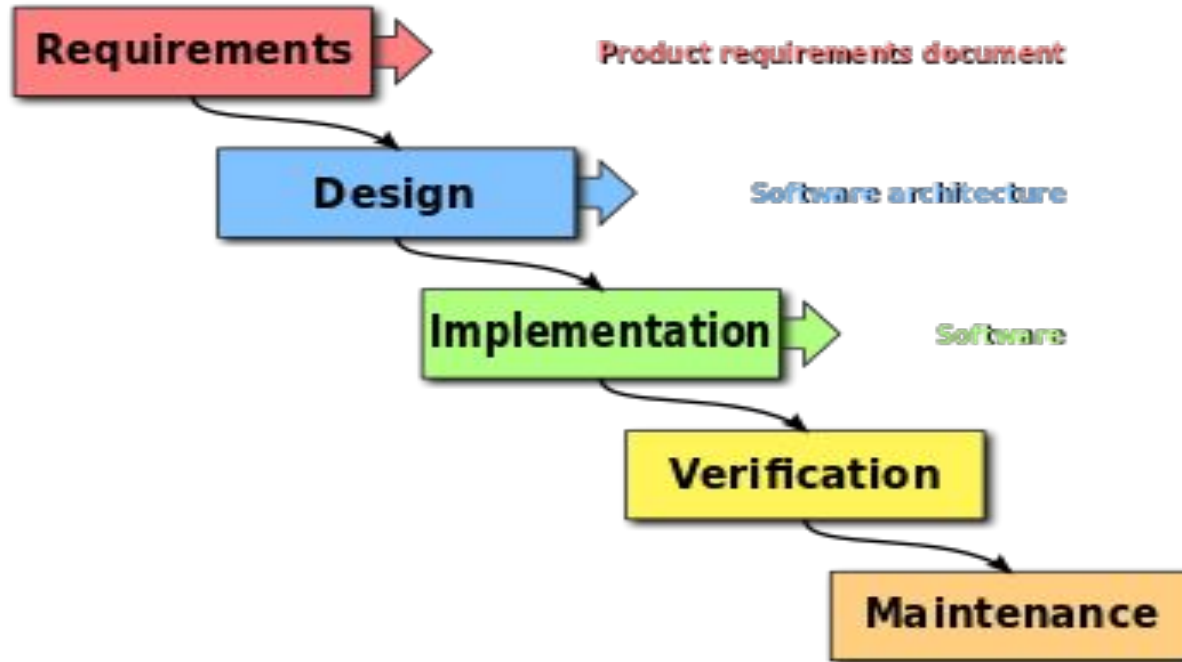# Development Methodologies

Gregory S. DeLozier, Ph.D.

gdelozie@kent.edu

Development Methodologies

Waterfall Models

- Based on industrial design
- Based on increased cost of change
- Divide into stages
- Problem is that change is (nearly) inevitable
  - Causes return to previous stages
  - When change is impossible, waterfall is helpful
- Methodology isn't common, but the terms are.

Waterfall Phases

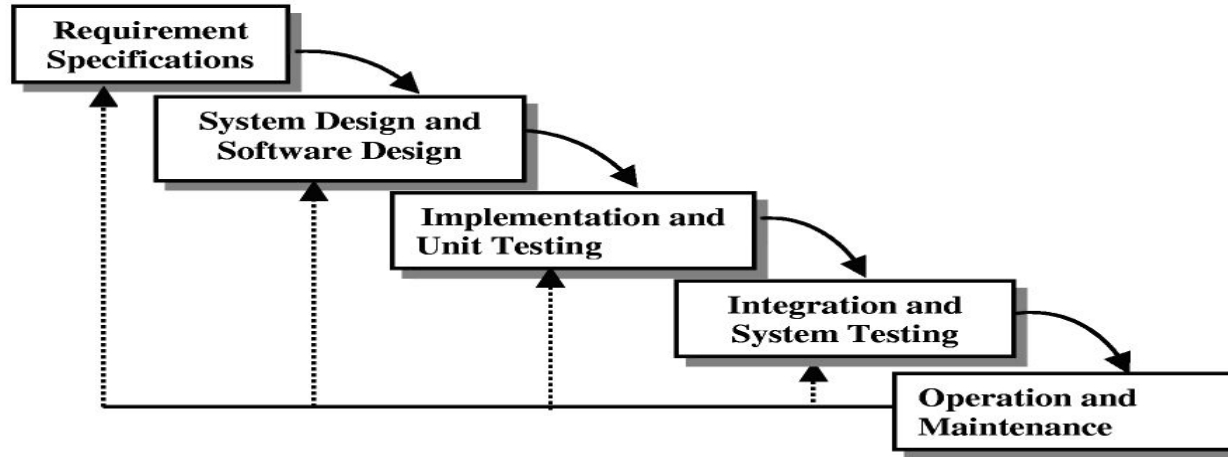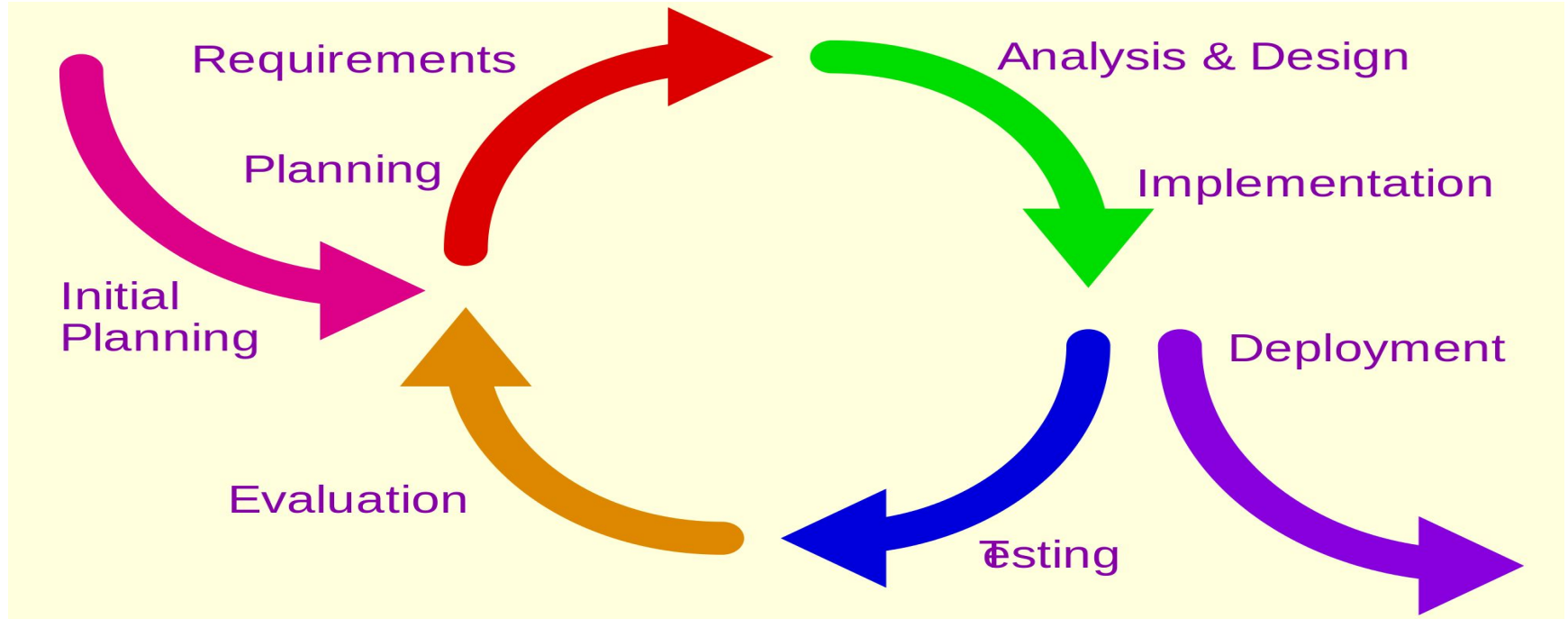# Waterfall with Loops

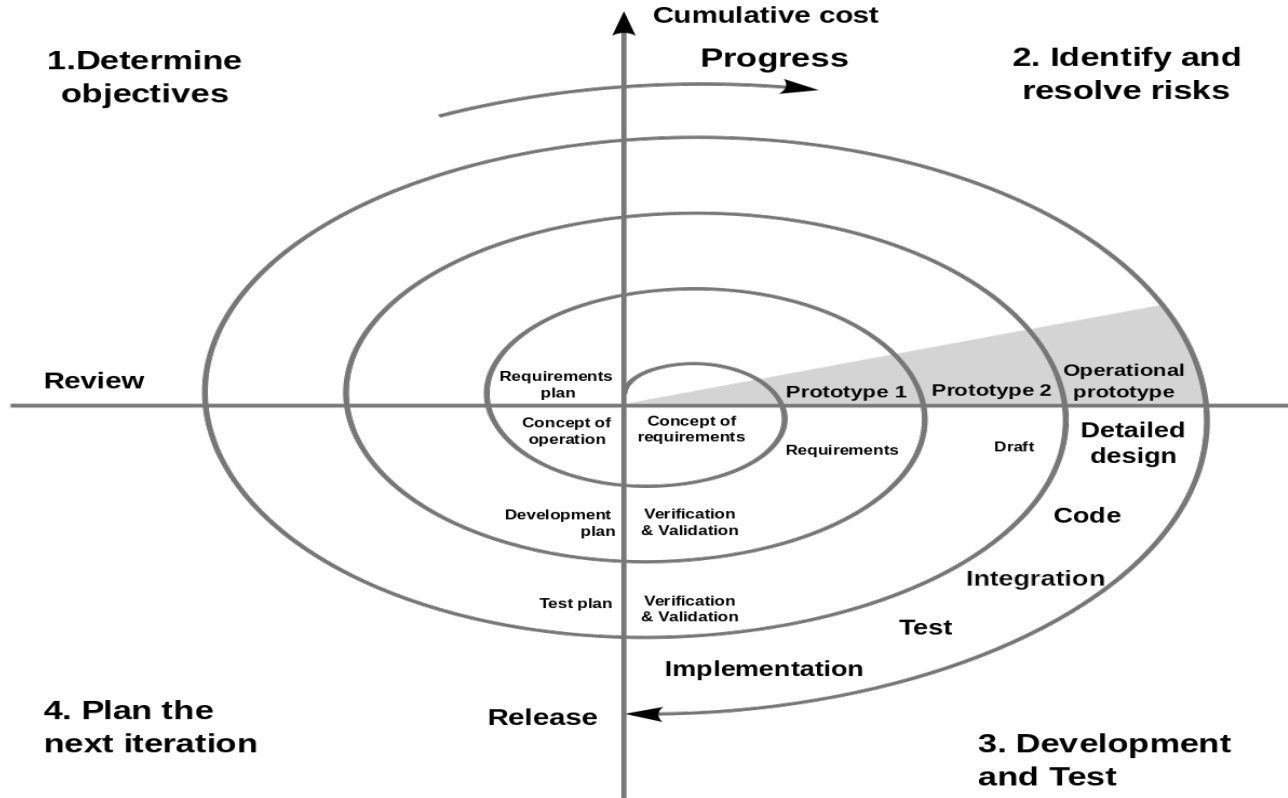Fig. 1 Waterfall model

Iterative Approaches

- *Plan* for the loops
- Small increments
    - Verifiable
    - Testable
    - Deliverable
- This led to...
    - Agile methodologies (development by iterations)
    - Test-driven methods

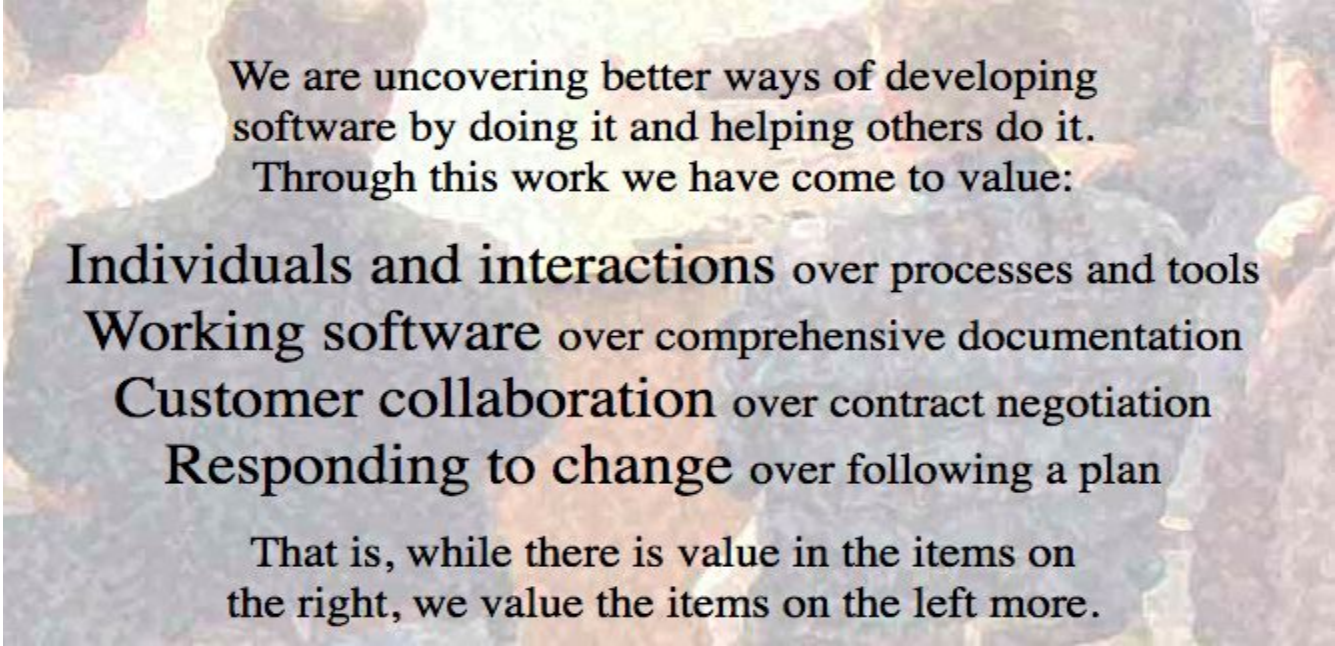# Iterative Models

Boehm's Spiral Model

Purpose?
Assumptions?
Value?

What are we missing here?

Agile Methodologies

- Small increments of development
  - Plan an increment
    - What's the most valuable thing(s) we can do?
    - What do we need to do to deliver that?
  - Develop it
  - Test it
  - Deliver it
  - Record your learning and progress
  - Repeat until nothing left to do
    - Customer is happy, or you're out of resources
    - If the latter, you did the best you could

Agile Manifesto

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
**Customer collaboration** over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

http://agilemanifesto.org/

Agile Resources

- http://en.wikipedia.org/wiki/Agile_software_development

- http://martinfowler.com/agile.html

- http://www.amazon.com/Extreme-Programming-Explained-Embrace-Change/dp/0321278658/ref=sr_1_1?s=books&i=1-1&keywords=extreme+programming
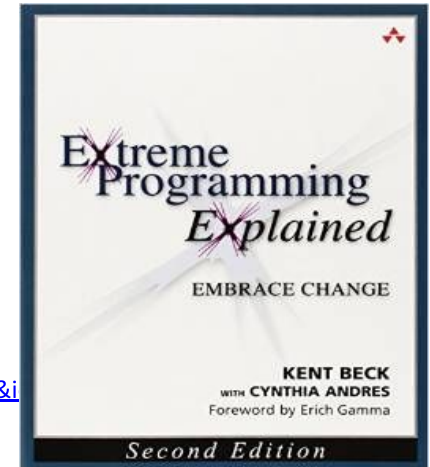
The Scrum Guide

The Scrum Guide™

The Definitive Guide to Scrum:
The Rules of the Game

Scrum Definition

Definition of Scrum

Scrum (n): A framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value.

Scrum is:

- Lightweight
- Simple to understand
- Difficult to master

The Scrum Team

- The Product Owner

- The Development Team

- The Scrum Master

- (Notice the lack of business context…)

Scrum Events

- The Sprint
- Sprint Planning (what and how)
- Daily Scrum (yesterday,today,problems)
- Sprint Review (review with Product Owner)
- Sprint Retrospective (introspection)
- (Again, no business context)

Scrum Artifacts

- Product Requests (Perhaps outside of Scrum)
- Product Backlog
- Sprint Backlog
- Increment

Historic Microsoft

Beyond the Waterfall:
Software Development at Microsoft

Michael A. Cusumano* and Stanley Smith**
*MIT Sloan School of Management
**International Business Machines

Working Paper #3844-BPS-95
Draft: August 16, 1995

Scrum Documentation

- https://www.scrum.org/

- http://www.scrumguides.org/

Agile at Microsoft

How Microsoft dragged its development practices into the 21st century

In the Web era of development, Waterfalls are finally out. Agile is in.
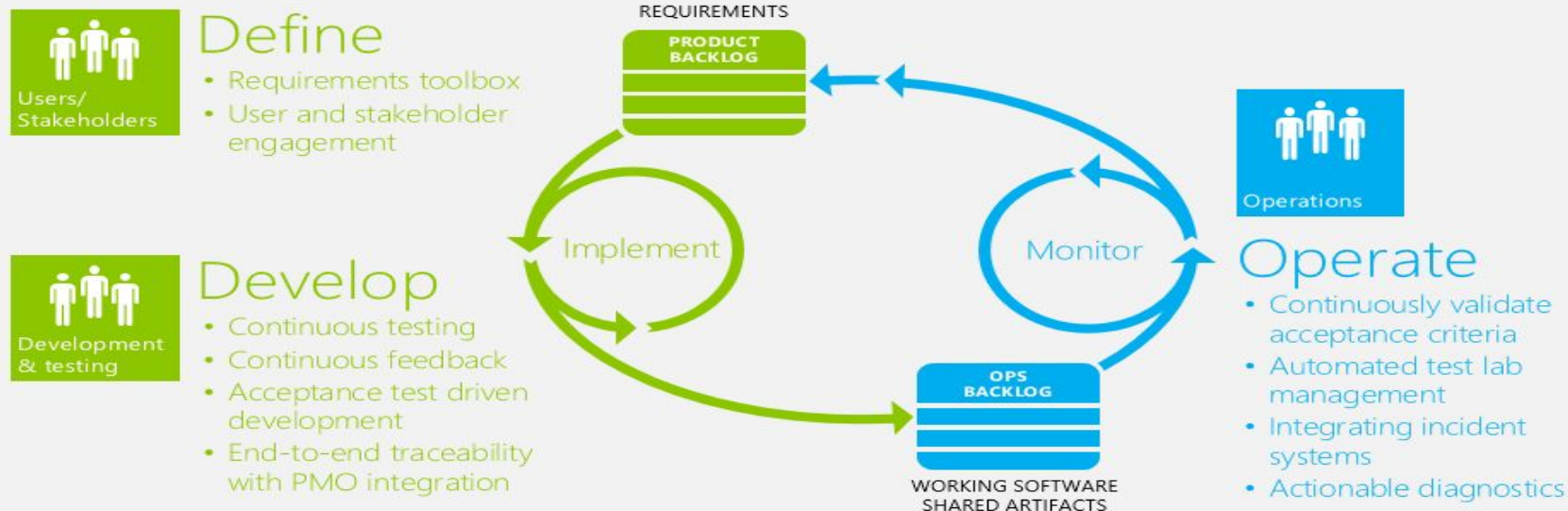
by Peter Bright - Aug 5 2014, 9:00pm EDT

Waterfalls: picturesque in nature, less so in development.

Current Microsoft

Assignments

- Read the two discussions linked above.
- Write a few paragraphs online about what adaptations Microsoft made in those 20 years or so. What were most valuable?

- also –

- Rosters and role assignments: get them in.