

Software Engineering – Spring 2016

Lecture 2

Roles / Methodologies

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Class Project

Class Project

- Get 8-12 people
- Form a startup organization
- Create a vision for a product
- Create a business proposal
- Research and define a product
- Design and create that product
- Test and refine that product
- Deploy that product to market

Create a Commercial Product

- Market research – find something useful
- Product proposal
- Requirements analysis
- Creating a work environment
- Story cards and SCRUM
- Deployment

How to Profit

- Charge for using it
- Charge for licensing it
- Place advertising on it
- Put it in your portfolio
 - Consult on similar things
 - Impress a prospective employer
- Build something bigger and better
- Repeat

Create a Commercial Product

- Market research – *expand on a challenge idea*
- Product proposal
- Requirements analysis
- Creating a work environment
- Story cards and SCRUM
- Deployment
- Profit! 😊

Project Challenge

- Create a Sudoku web site
- Challenges:
 - Solve various puzzles
 - Allow visitors to solve puzzles
 - Offer hints and suggestions
 - Allow people to share puzzles
 - Make the user experience enjoyable
 - Include an economic model

Project Challenge

- Create a *better* Sudoku web site
- Considerations
 - We will solicit reviews
 - We will conduct security challenges
 - We will add requirements at a later time
 - We will use responsible practices
 - We will use specific tools and resources

Constraints

- Product must be delivered on the web
 - Web site
 - Web service
- Delivery must be via PythonAnywhere
 - Python
 - Bottle.py
- Use of industry standard tools
 - Github
 - Google Docs

How to Proceed

- Find some people you can work with
- Think about some ideas
- Get familiar with Python and SQLite
- Get PythonAnywhere accounts
- Get GitHub accounts
- Think about Codio, TFS, and other sites
- Sketch out some possibilities
- Details to come

Delivery

- Complete assignments in Blackboard
 - Short documents
 - Links
- Large document deliverables as Google Docs
 - Include a shared link in the assignment
- Internal docs may be in your GitHub wiki
 - Also, include links as necessary
 - Private site if you assign me access to the repo
 - (github id: gregdelozier)

Roles

- President
- Project manager (Scrum master)
- Market analyst / Marketing specialist
- Requirements analyst
- Software Developer
- Test Engineer
- Operations Engineer

President

- Maintain overall vision of the enterprise
- Final approval of business proposal
- Answerable for performance
- Provide motivation
- Arrange role fulfillment
- Does presentations

Market analyst / Marketing specialist

- Identifies business opportunities
- Estimates profitability of ideas
- With president, creates business proposal
 - Potential
 - Risks
 - Profit
 - Timeline
- Markets product before and after deployment

Project manager (Scrum master)

- Manages the todo list and calendar
- Makes sure things are getting done
- Manages the Scrum agile process
 - Assigning small tasks
 - Managing task burndown
 - Managing test coverage
 - Providing status reports to management

Requirements analyst

- Determine the definition of the product
- Write definition in clear, unambiguous terms
- Create customer stories
- Serve as customer representative
- Work with test engineer to verify coverage
- Sign off on requirements met before delivery

Software Developer

- Understand the product being created
- Work with analysts to create stories
- "Task out" stories to create tasks lists
- Execute tasks lists to create software
- Unit test the software to the extent possible
- Deliver unit tested software to QA testing

Test Engineer

- Design testing needed to verify requirements
- Create test plans for verifications
- When software is available, execute tests
- Verify requirements coverage as possible
- Maintain requirements coverage burndown
- Certify production readiness of the product

Operations Engineer

- Specify requirements for environments:
 - Production
 - Testing/QA
 - Development
- Create and support necessary environments
- Create and support development tools
- Manage production deployments
- Ensure security and stability of environments

Project Homework – Business Plan

▼ **Create Your Business Plan**

Executive Summary

Company Description

Market Analysis

Organization &
Management

Service or Product Line

Marketing & Sales

Funding Request

Financial Projections

Appendix

How to Make Your
Business Plan Stand Out

<https://www.sba.gov/writing-business-plan>

Additional Resources

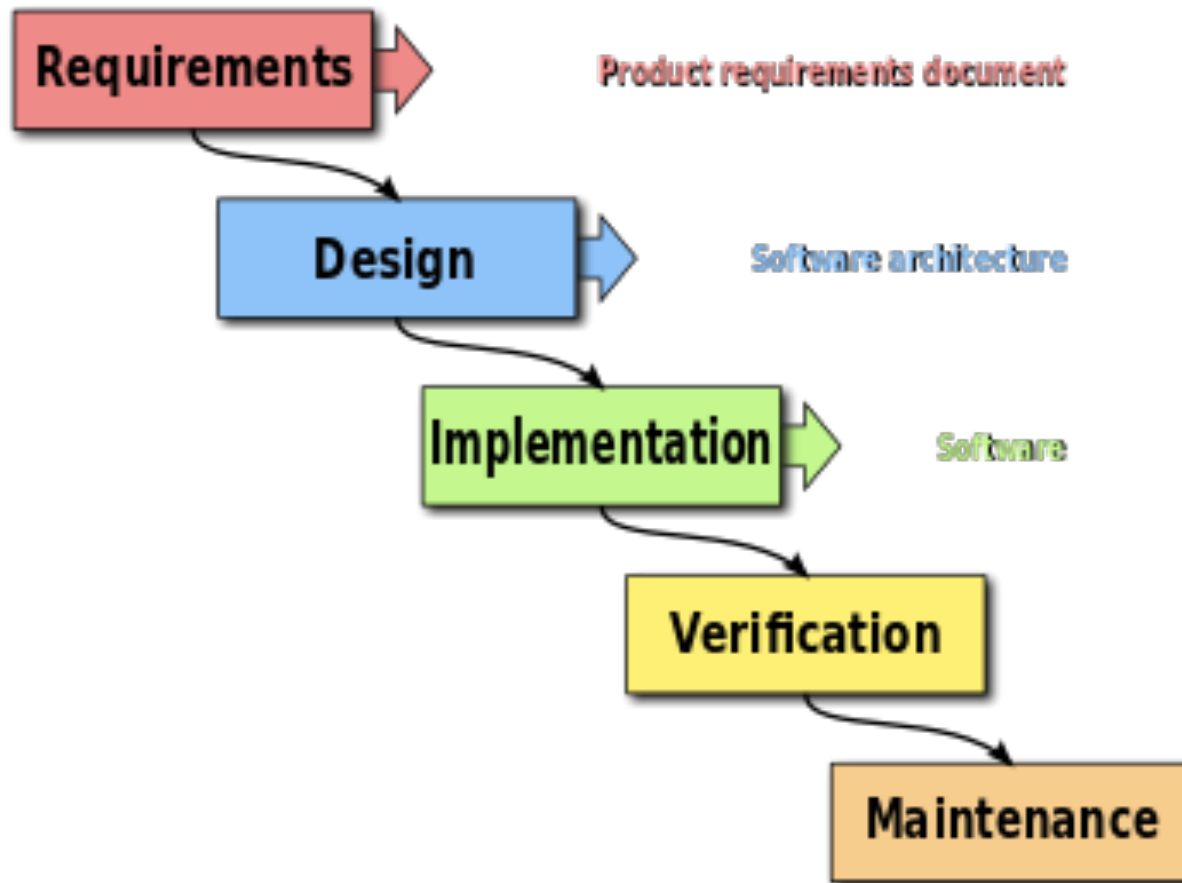
- <http://www.entrepreneur.com/businessplan/index.html>
- <http://articles.bplans.com/writing-a-business-plan/>
- <http://lifehacker.com/5833967/how-do-i-create-a-business-plan>

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 vocabulary is

Waterfall Phases



Waterfall with Loops

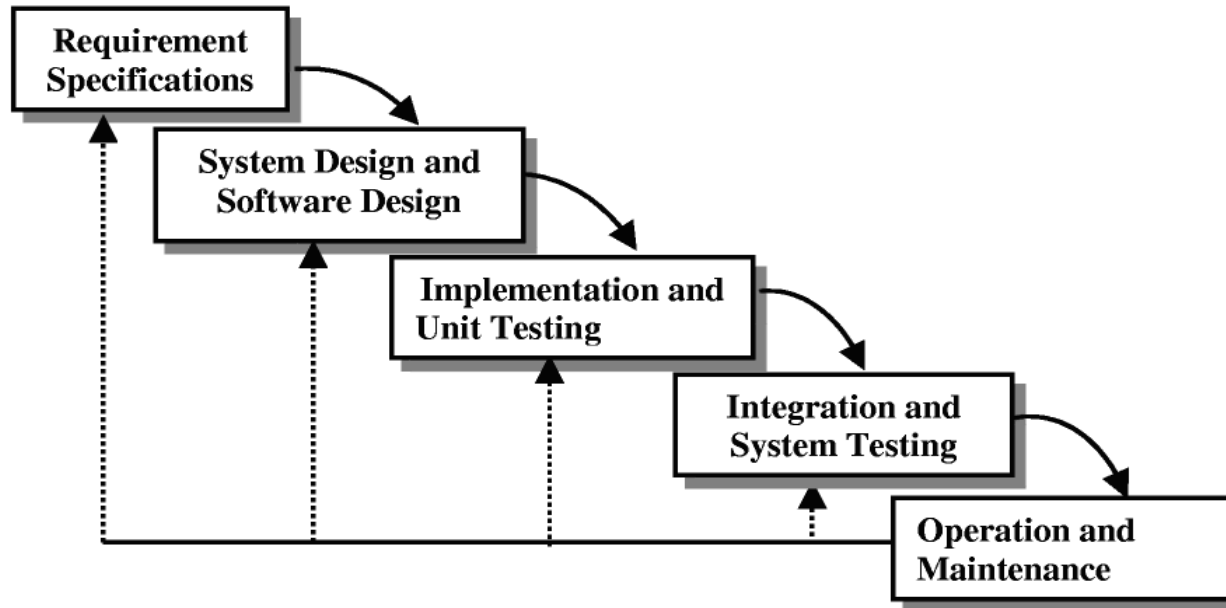
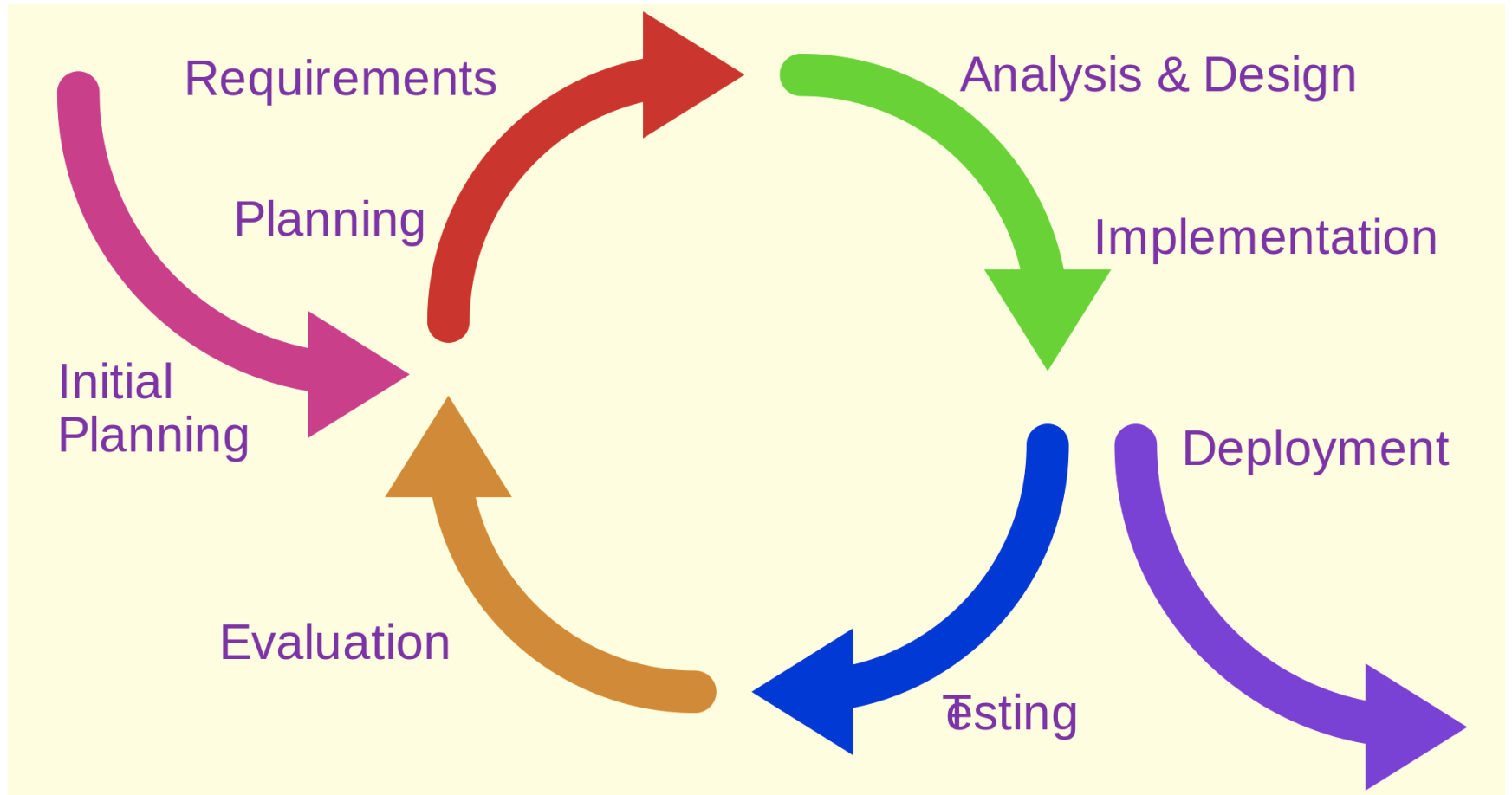


Fig. 1 Waterfall model

Iterative Approaches

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

Iterative Models



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 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&ie=UTF8&qid=1423518165&sr=1-1&keywords=extreme+programming



The Scrum Guide

A thick blue horizontal bar with a curved bottom edge, spanning the width of the slide.

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

- <http://dspace.mit.edu/bitstream/handle/1721.1/2593/SWP-3844-33836288.pdf>

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

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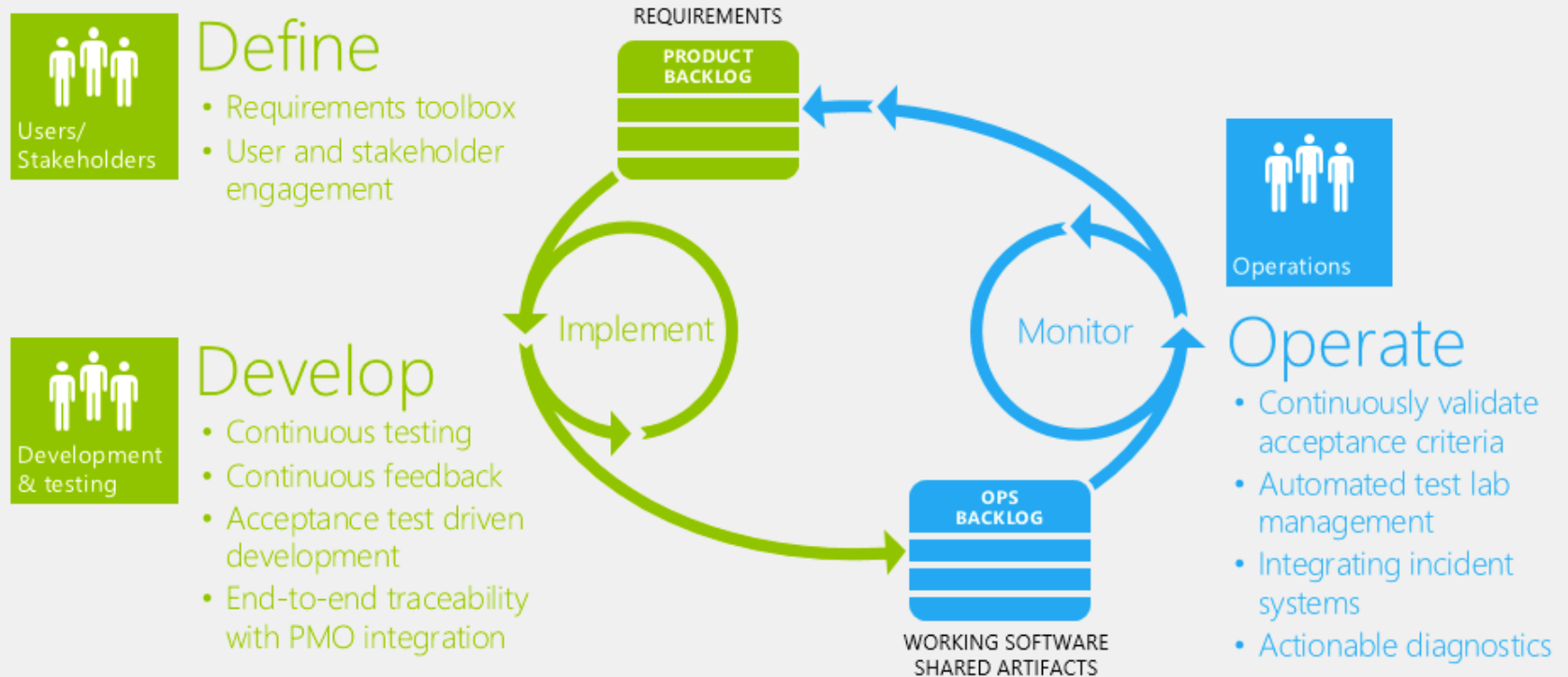


Waterfalls: picturesque in nature, less so in development.

- <https://www.oreilley.com/news/2014/08/microsoft-agile-development-practices-into-the-21st-century/>

Current Microsoft

Continuous value without barriers



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.

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Office Hours

- I will be setting up online office hours.
- Time suggestions?
- Instructions will be sent out.