Agile Software Requirements

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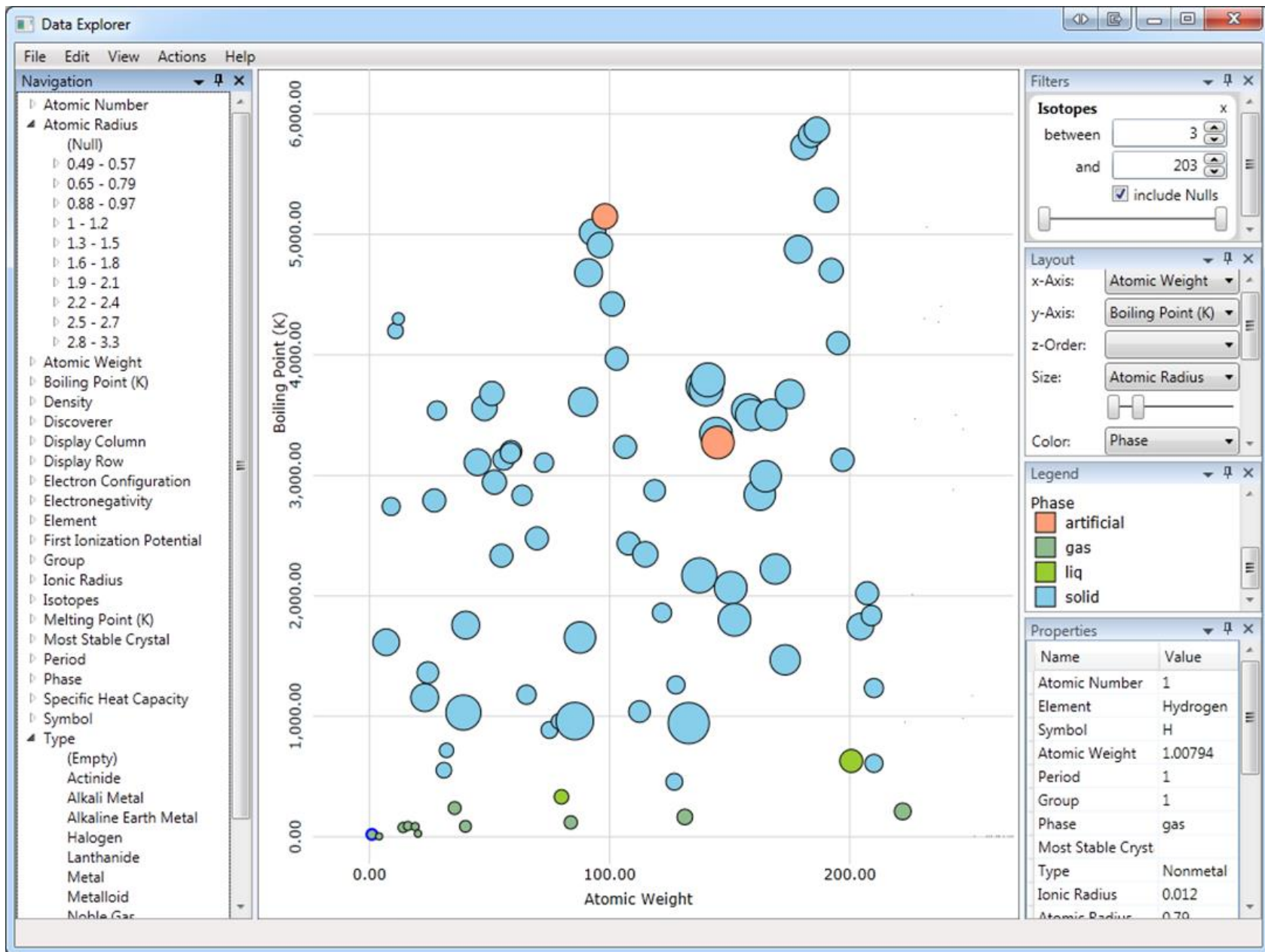
COMS 409 – Software Requirements

Purpose

- Introduce you to Agile software development

- Discuss Agile software requirements

Overview

- What is Agile?
- Waterfall vs. Agile
- User Stories
- Embedded Documentation
- Non-functional Requirements
- Q & A

About Me

- Independent software consultant
- 14 years of professional Agile software development experience
- Data-driven desktop, server, and web apps
  - Web-based GIS data warehouse
  - Energy data ETL application
  - Global data management system
  - Intelligent lighting control systems
  - Open source data explorer

Data Explorer

File   Edit   View   Actions   Help

Navigation

- Atomic Number
- Atomic Radius
  - (Null)
  - 0.49 - 0.57
  - 0.65 - 0.79
  - 0.88 - 0.97
  - 1 - 1.2
  - 1.3 - 1.5
  - 1.6 - 1.8
  - 1.9 - 2.1
  - 2.2 - 2.4
  - 2.5 - 2.7
  - 2.8 - 3.3
- Atomic Weight
- Boiling Point (K)
- Density
- Discoverer
- Display Column
- Display Row
- Electron Configuration
- Electronegativity
- Element
- First Ionization Potential
- Group
- Ionic Radius
- Isotopes
- Melting Point (K)
- Most Stable Crystal
- Period
- Phase
- Specific Heat Capacity
- Symbol
- Type
  - (Empty)
  - Actinide
  - Alkali Metal
  - Alkaline Earth Metal
  - Halogen
  - Lanthanide
  - Metal
  - Metalloid
  - Noble Gas

Filters

Isotopes   x

between   3

and   203

☑ include Nulls

Layout

x-Axis: Atomic Weight   ▼

y-Axis: Boiling Point (K)   ▼

z-Order: ▼

Size: Atomic Radius   ▼

Color: Phase   ▼

Legend

Phase
- artificial
- gas
- liq
- solid

Properties

Name	Value
Atomic Number	1
Element	Hydrogen
Symbol	H
Atomic Weight	1.00794
Period	1
Group	1
Phase	gas
Most Stable Cryst	
Type	Nonmetal
Ionic Radius	0.012
Atomic Radius	0.79

Boiling Point (K)

6,000.00

5,000.00

4,000.00

3,000.00

2,000.00

1,000.00

0.00

0.00   100.00   200.00

Atomic Weight

Education

- BS in Computer Science

- BA in Philosophy
  - Minor in Economics
  - Focus on Artificial Intelligence and Machine Learning

- AS in MIS

- AS in Business Administration

IOWA STATE UNIVERSITY

DMACC
DES MOINES AREA
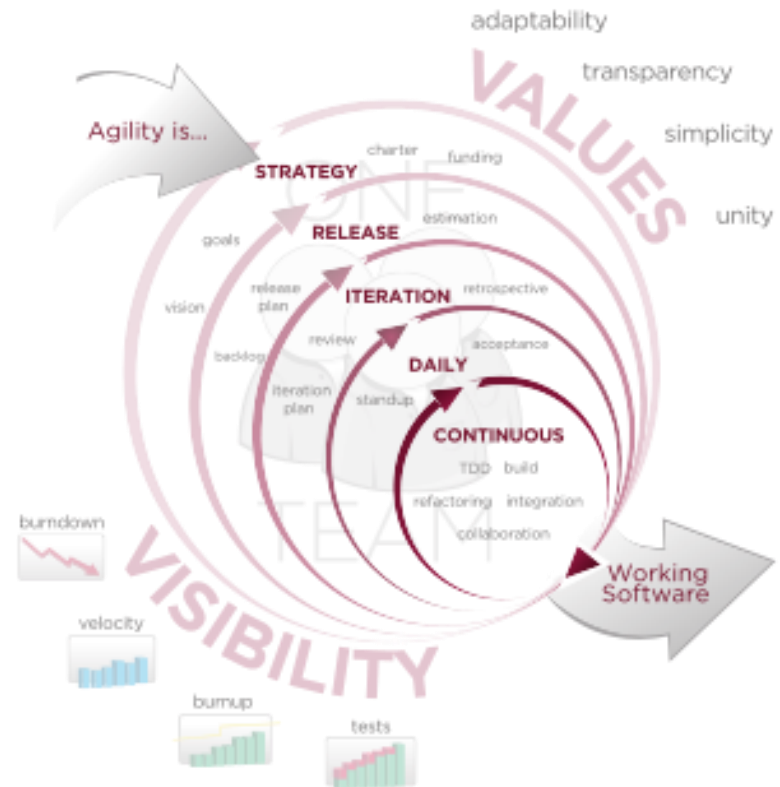COMMUNITY COLLEGE

Public Speaking

- Events:
    - Iowa Code Camp
    - Nebraska Code Camp
    - Iowa .NET Users Group
    - Agile Iowa
- Topics:
    - Lean / Agile
    - Data Analysis
   - Patterns, Practices, and Principles

What is Agile?

What is Agile?

- Started with the Agile Manifesto
  - 4 value propositions
  - 12 principles
- Common set of practices across several methodologies

Source: Wikipedia

Agile Values

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

Source: http://agilemanifesto.org/
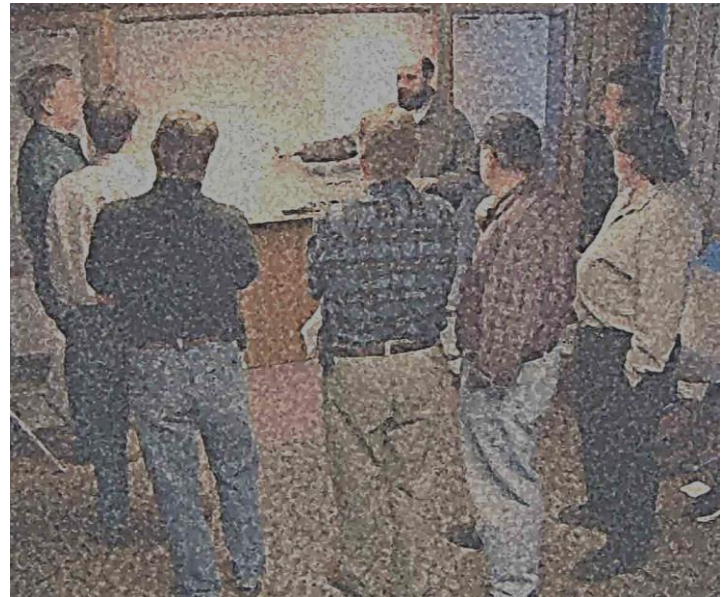
12 Principles of Agile

1. Continuous delivery of value
2. Embrace changing requirements
3. Frequent deployment
4. Customer collaboration
5. Motivated individuals
6. Face-to-face conversation

12 Principles of Agile

7. Working software as measure of progress
8. Sustainable development
9. Technical excellence
10. Simplicity
11. Self-organization
12. Continuous improvement

Agile Methodologies
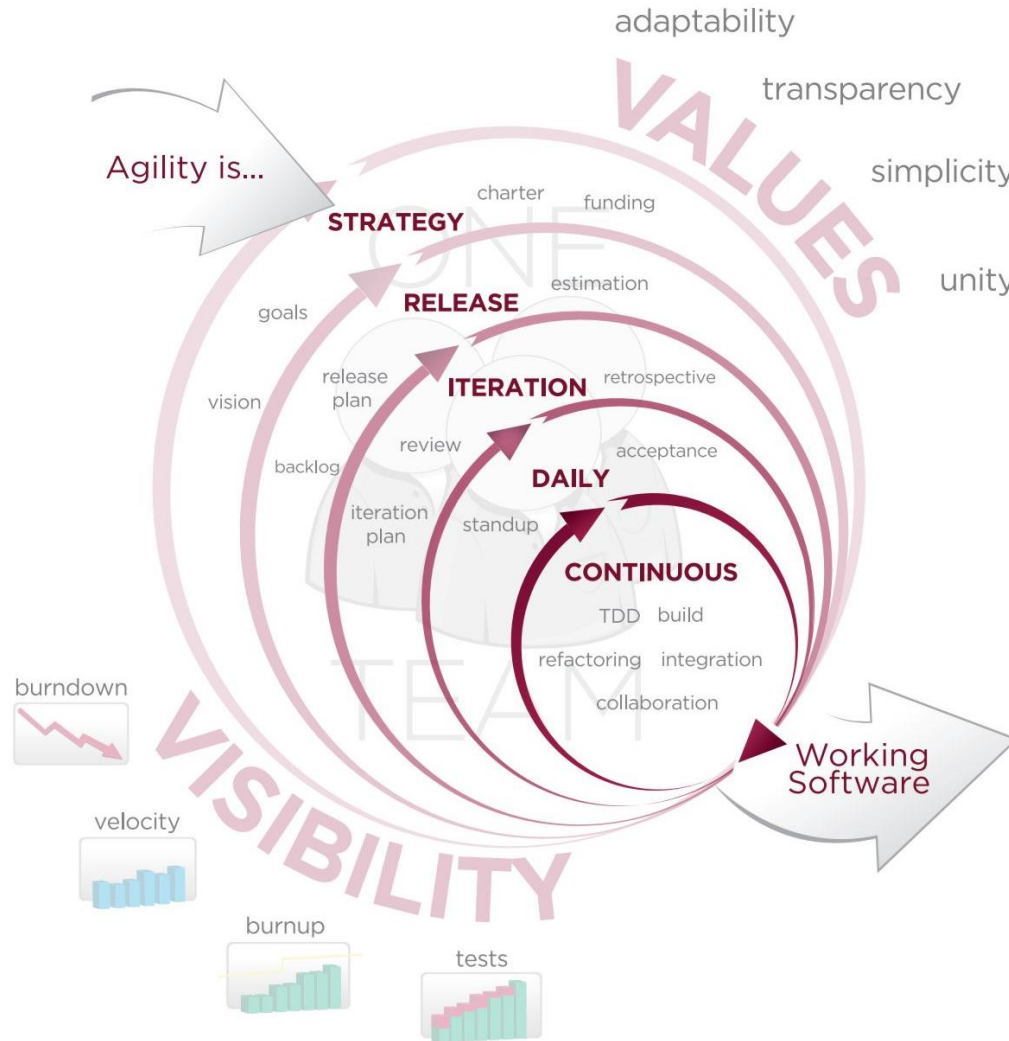
- Scrum
- XP
- Kanban
- Lean
- And many more...

Waterfall vs. Agile

Waterfall

Agile

Source: Wikipedia
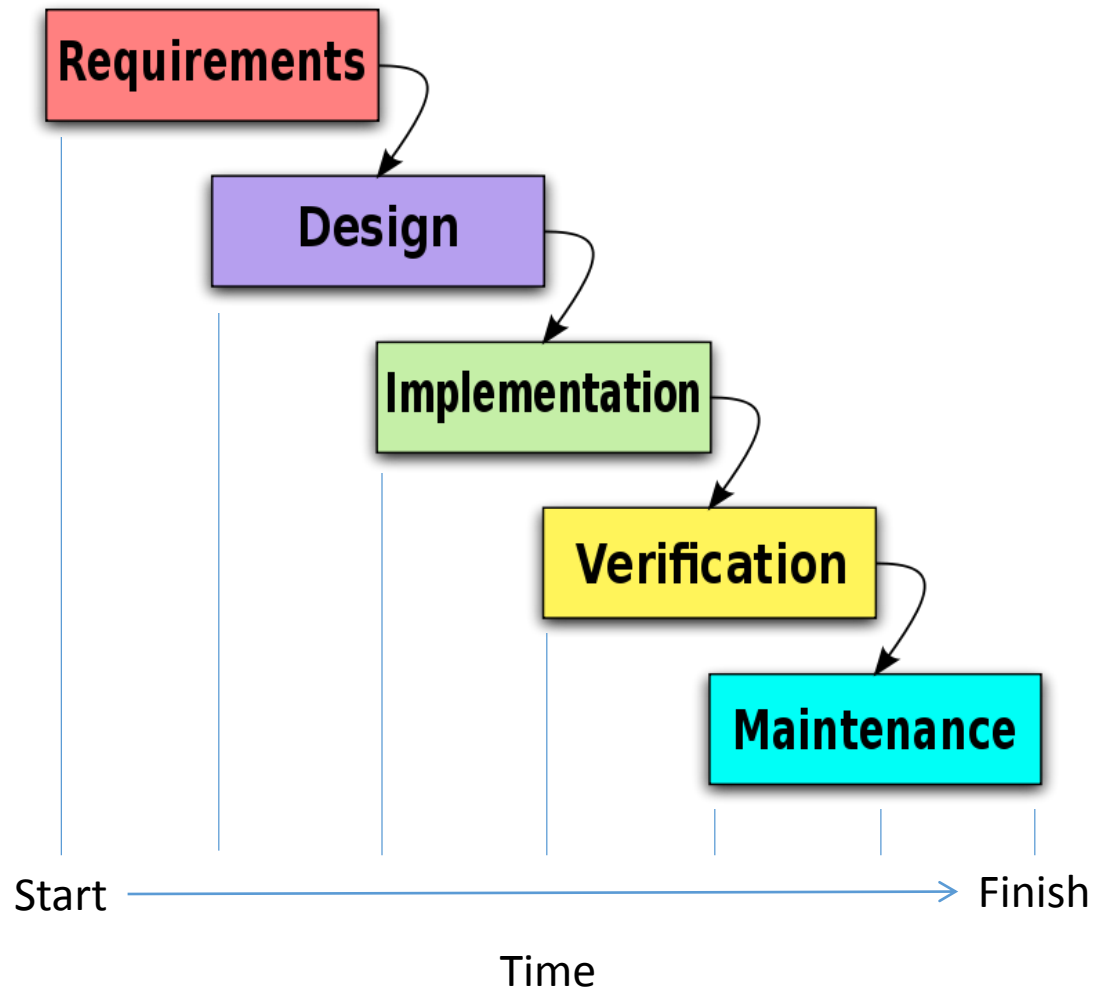
Waterfall vs. Agile Processes

	Waterfall	Agile
Measure of Success	Execution of the plan	Working software
Management Culture	Command and control	Self-organization
Requirements / Design	Big and upfront	Just-in-time / minimal
Code / Implementation	Code first and test later	Test and code together
Testing and QA	Big test plan / test last	Test early / continuously
Planning and Scheduling	Large detailed plan	Short, iterative increments

User Stories

User Story

- Short description of functionality that will provide value to a user

- Contains:
  - Title
  - Description
  - Acceptance Criteria

- Placeholder for a conversation to occur

Enter PIN Number

As an ATM user

I want to enter my PIN

So that I can withdraw cash

User Story Example

Title: Enter Personal Identification Number (PIN)

Description:

As an ATM user

I want to enter my PIN

So that I can withdraw cash

Acceptance Criteria:

PIN must be four digits long

PIN must not allow alpha or special characters

PIN must be entered within 30 seconds
or the transaction will be canceled

Agile Requirements

- Feature requests captured in user stories

- User stories are prioritized in product backlog

- Work on user stories in priority order

High

Priority

Low

Product Backlog
Feature 1
Feature 2
Feature 3
…
…
…
…
…
Feature n
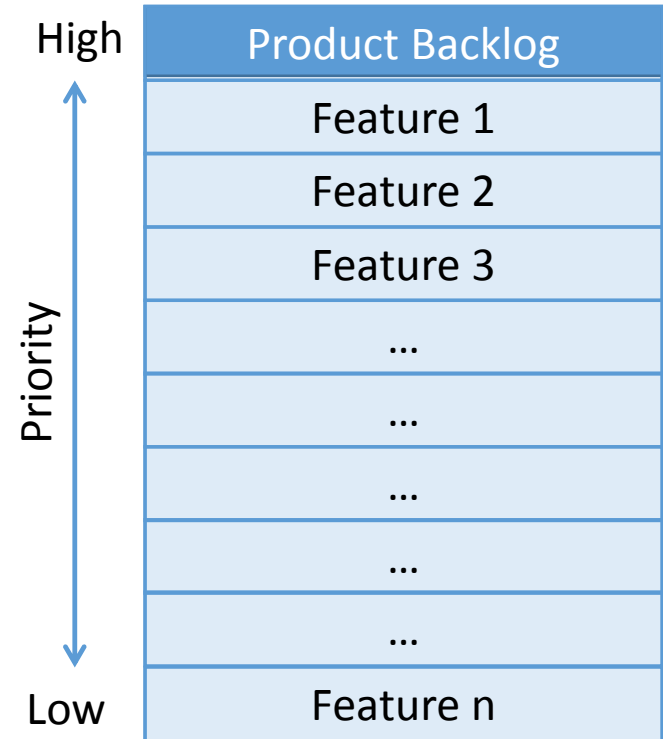
Agile Requirements

- For each user story:
  - Gather requirements through collaboration
  - Implement functionality using Agile practices
  - Requirements become embedded in code

Priority	Product Backlog
High	Feature 1
	Feature 2
	Feature 3
	...
	...
	...
	...
	...
Low	Feature n
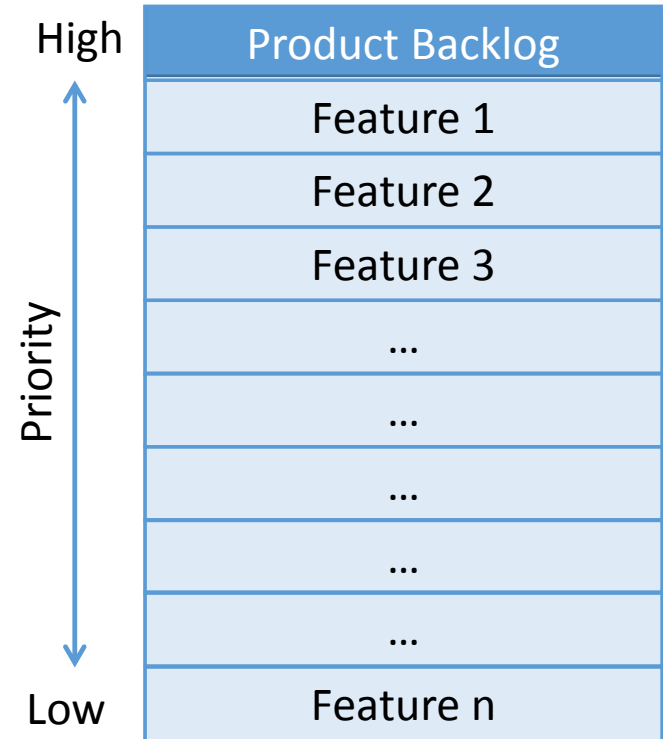
Agile Requirements Gathering

- Minimal documentation
- Communication and collaboration are critical
- Uses whole-team approach
- On-site user representation
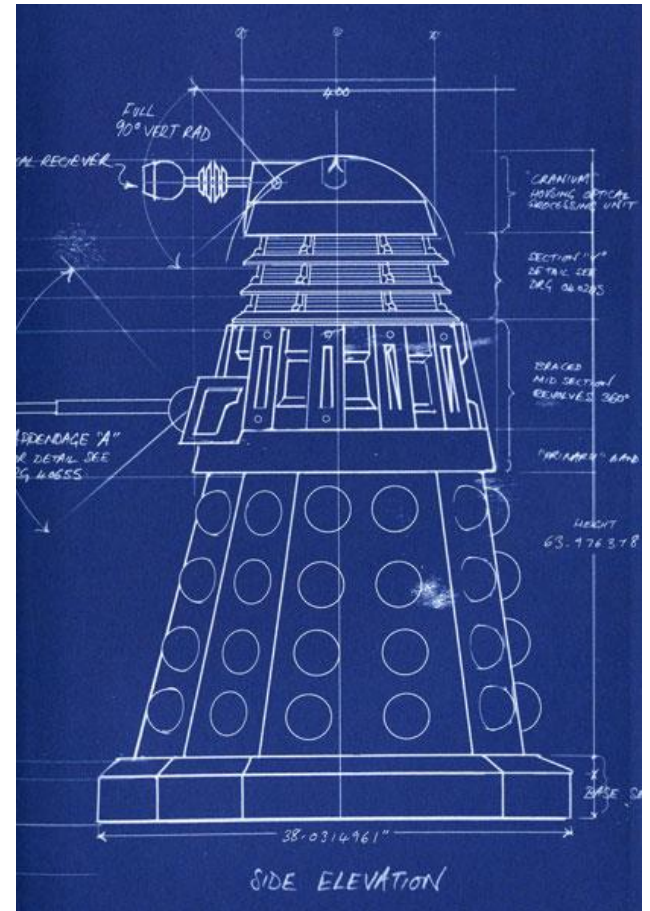- Rapid feedback loop is critical to success

Source: http://www.dvdizzy.com/peanuts-1970s-vol2.html

Embedded Documentation

Waterfall Requirements Documentation

- In Waterfall:
  - Documentation is the blueprint
  - Code is the product being produced

- Documentation is:
  - Often out of date
  - Not read frequently
  - Not executable

Agile Requirements Documentation

- In Agile:
    - Code is the blueprint
    - Working software is the product being produced

- Code is:
    - Always up to date
    - Continuously read
    - Executable

- Requirements are embedded in the code

Agile Practices for Embedded Documentation

Practice	Purpose
Test-Driven Development (TDD)	Low-level Behaviors
Behavior-Driven Development (BDD)	High-level Behaviors
Domain-Driven Design (DDD)	High-level Policy / Domain Logic
Domain-Specific Languages (DSL)	Human-readable code for business
Clean Code	Reader-centered code for devs.

Non-Functional Requirements

Non-Functional Requirements

- Maintainability

- Performance

- Reliability

- Security

- Testability

- Usability

Agile NFRs

Driven by Users:
- Performance
- Security
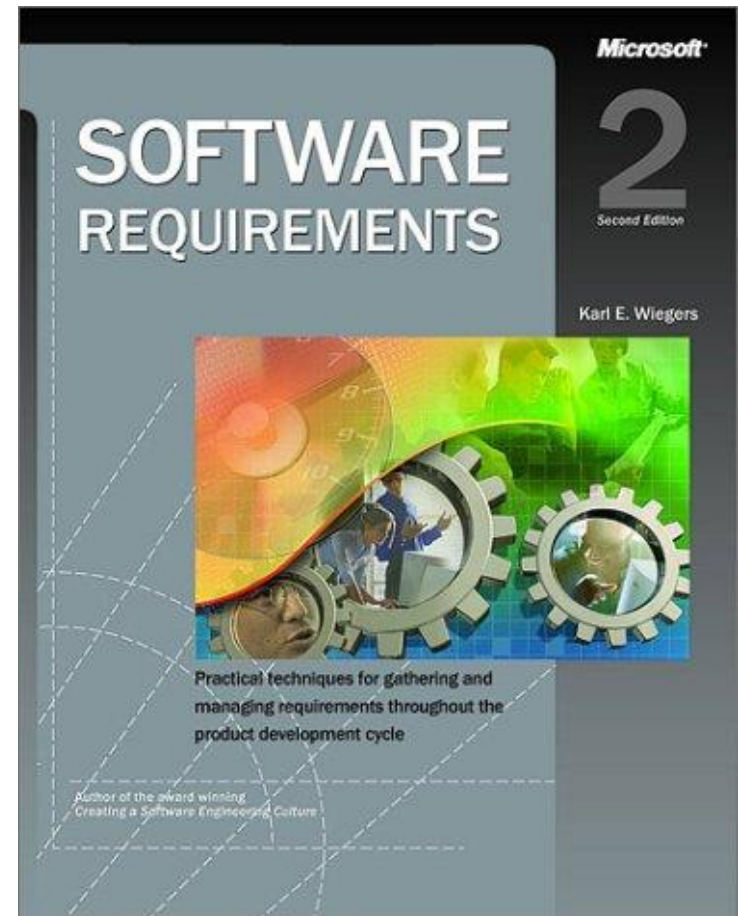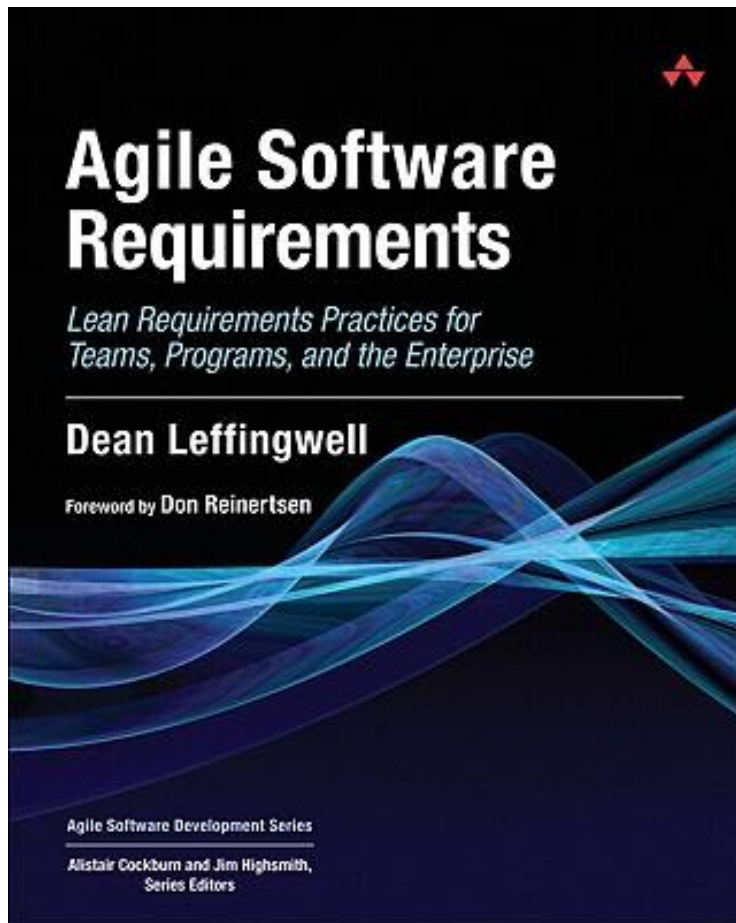- Usability

Driven by Developers:
- Maintainability
- Readability
- Testability

Conclusion

Conclusion

- What is Agile?
- Waterfall vs. Agile
- User Stories
- Embedded Documentation
- Non-functional Requirements

Recommended Reading

Contact Info

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Data Explorer
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Q & A