Introduction to Agile and Scrum

Matthew Renze

@matthewrenze

COMS 309 - Software Development Practices

Purpose

- Intro to Agile and Scrum
- Prepare you for the industry
- Questions and answers

Overview

- Intro to Agile
- Waterfall vs. Agile
- Intro to Scrum
- Scrum Team
- Scrum Events
- Scrum Artifacts
- Q & A

About Me

- Independent software consultant
- 14 years of professional 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

Education

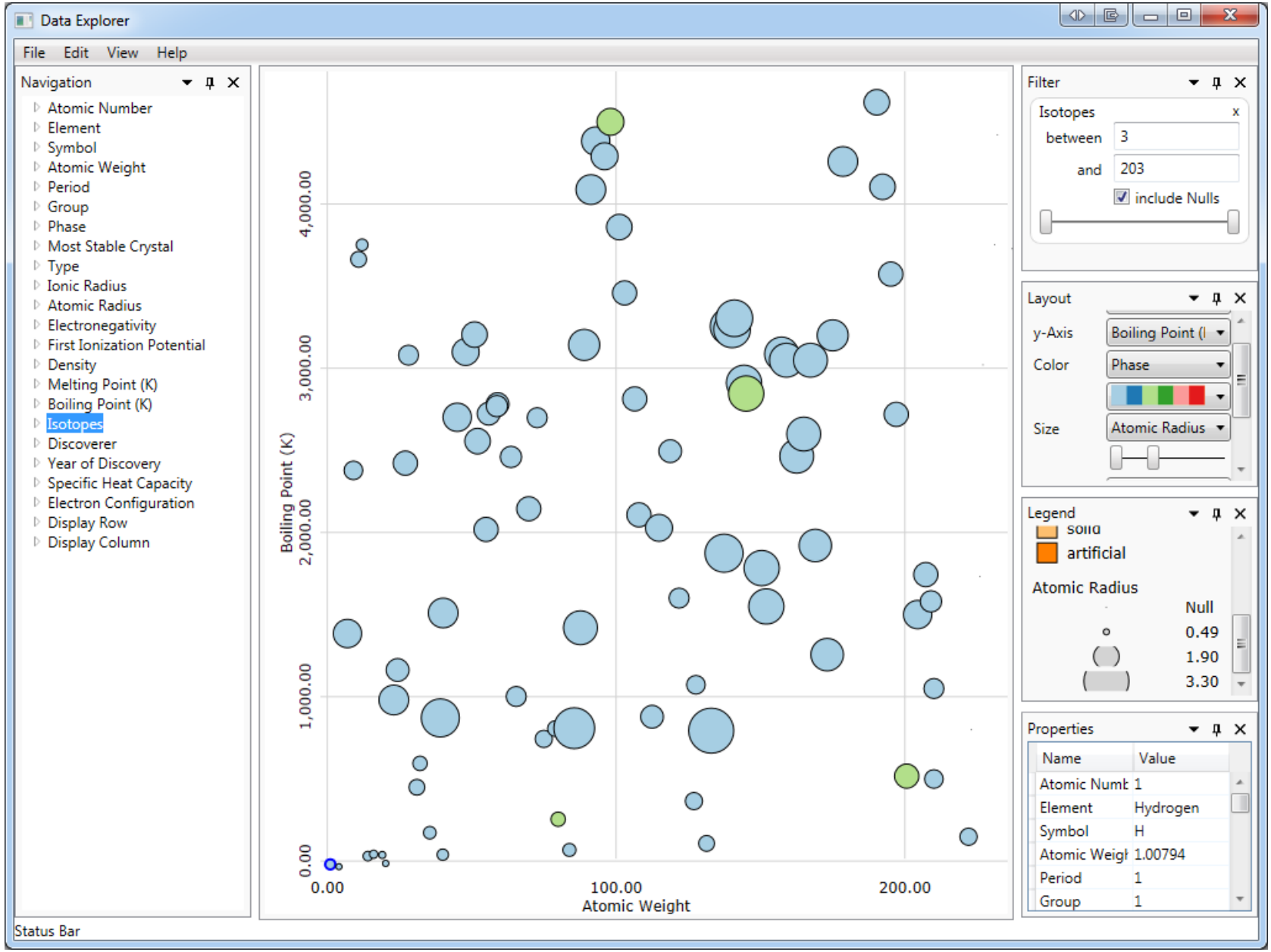
- BS in Computer Science
- BA in Philosophy
  - Minor in Economics
  - Focus on Artificial Intelligence and Machine Learning
- AS in MIS
- AS in Business Administration

IOWA STATE UNIVERSITY

DMACC
DES MOINES AREA COMMUNITY COLLEGE

About Me

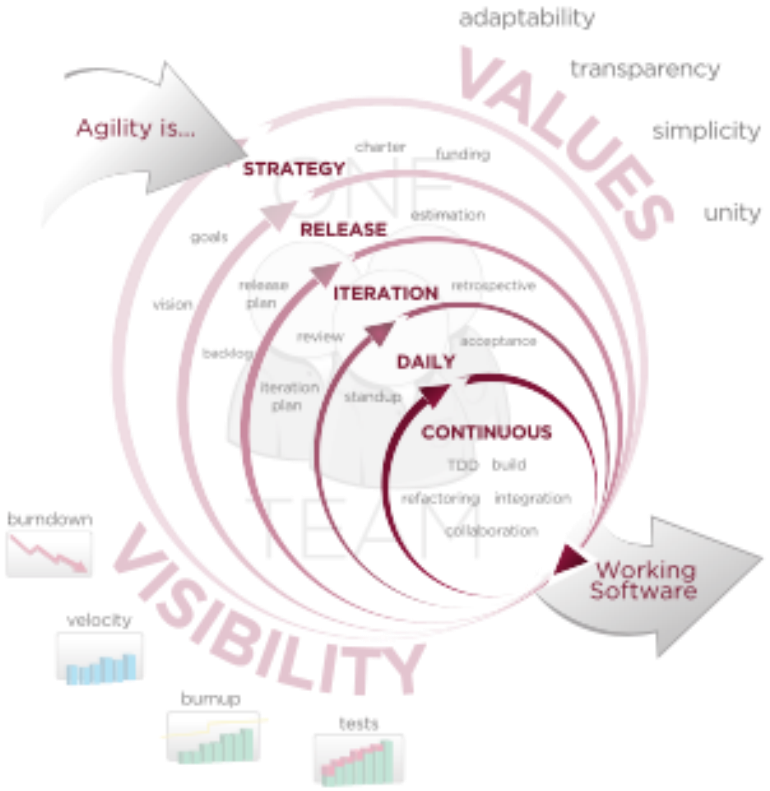
- Agile coaching and mentoring
- Regular public speaking
- Open-source software


Data Explorer
File
Edit
View
Help
Navigation
Atomic Number
Element
Symbol
Atomic Weight
Period
Group
Phase
Most Stable Crystal
Type
Ionic Radius
Atomic Radius
Electronegativity
First Ionization Potential
Density
Melting Point (K)
Boiling Point (K)
Isotopes
Discoverer
Year of Discovery
Specific Heat Capacity
Electron Configuration
Display Row
Display Column
Boiling Point (K)
4,000.00
3,000.00
2,000.00
1,000.00
0.00
0.00
100.00
200.00
Atomic Weight
Filter
Isotopes
between 3
and 203
include Nulls
Layout
y-Axis Boiling Point (
Color Phase
Size Atomic Radius
Legend
solid
artificial
Atomic Radius
Null
0.49
1.90
3.30
Properties
Name Value
Atomic Numb 1
Element Hydrogen
Symbol H
Atomic Weigh 1.00794
Period 1
Group 1
Status Bar

Introduction to Agile

What is Agile?

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



Source: Wikipedia

What is Agile?

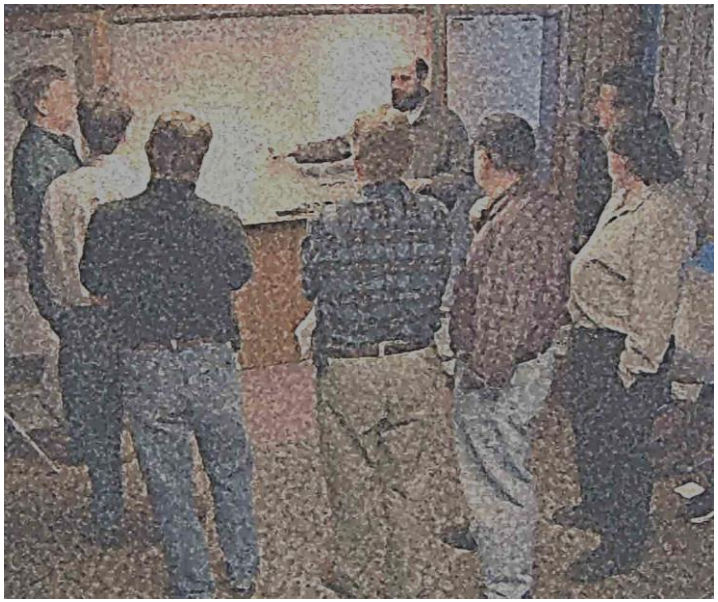
Agile is *not*:

- A software development methodology itself
- A silver bullet for all your software woes

Source: http://www.best-story.net/userfiles/silver-bullets.jpg

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…

Source: http://parkertoddloesch.files.wordpress.com/2011/09/umbrella.jpg

Scrum

- Small teams
- Three roles
- Product backlog
- Sprints
- Daily stand-up

Source: http://blogs.independent.co.uk/wp-content/uploads/2011/09/scrum1.jpg

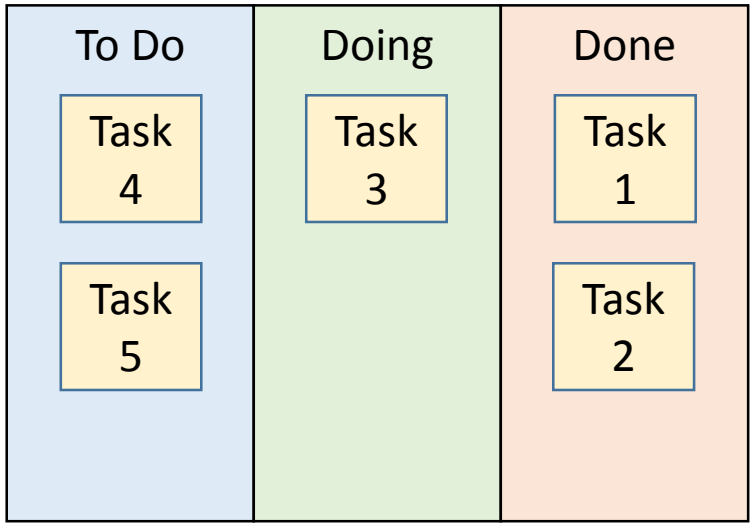
Extreme Programming (XP)

- Small teams
- Customer representative
- Iterative development
- User stories
- Many practices
  - Pair programming
  - Test-driven development
  - Continuous Refactoring

Source: http://static.caloriecount.about.com/images/medium/doritos-extreme-tortilla-chips-29310.jpg

Kanban

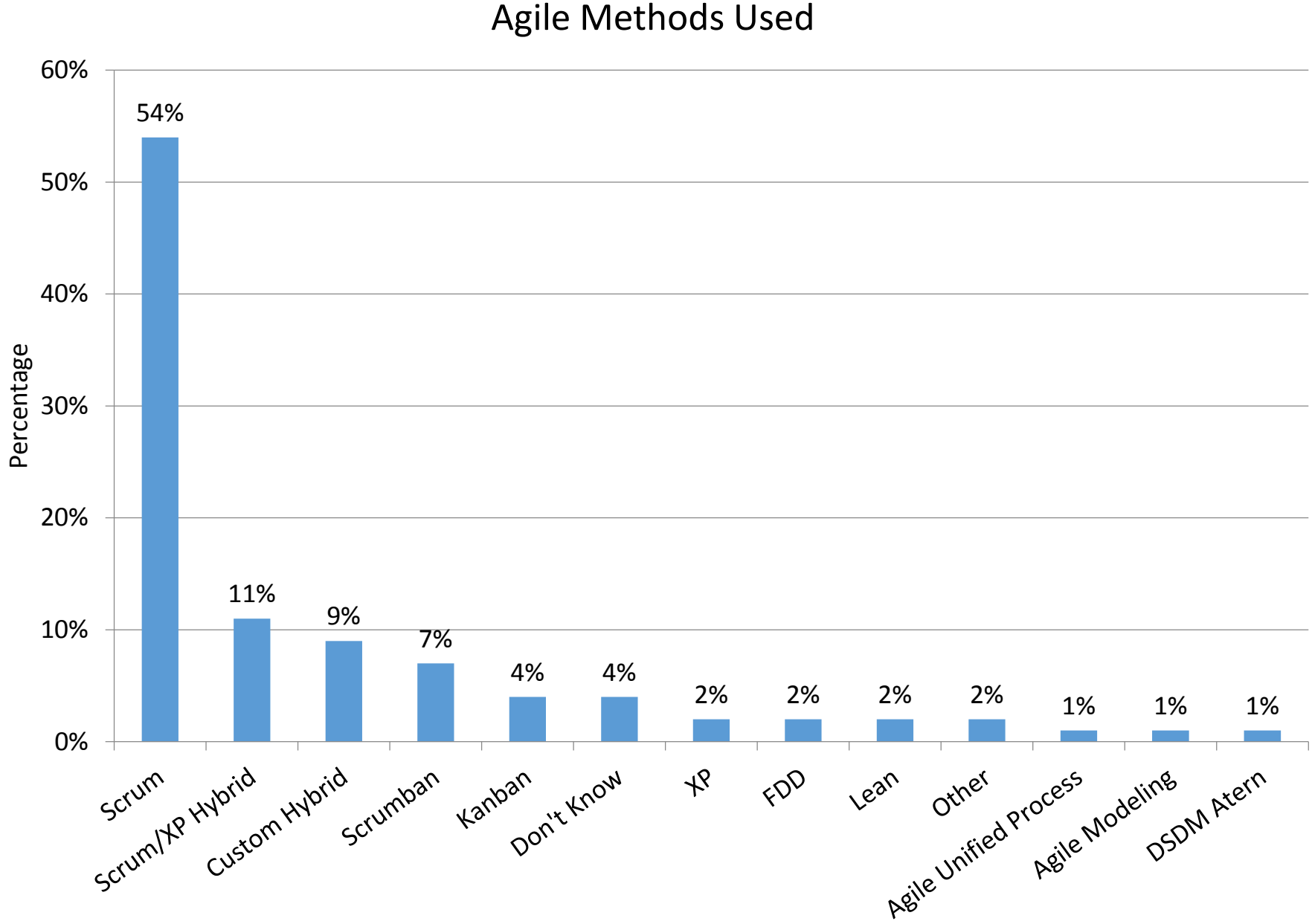
- Visualize the workflow
- Limit work-in-progress
- Manage flow
- Feedback loops



Lean

- Eliminate waste
- Focus on value
- Reduce inventory and cycle times
- Continuous process improvement

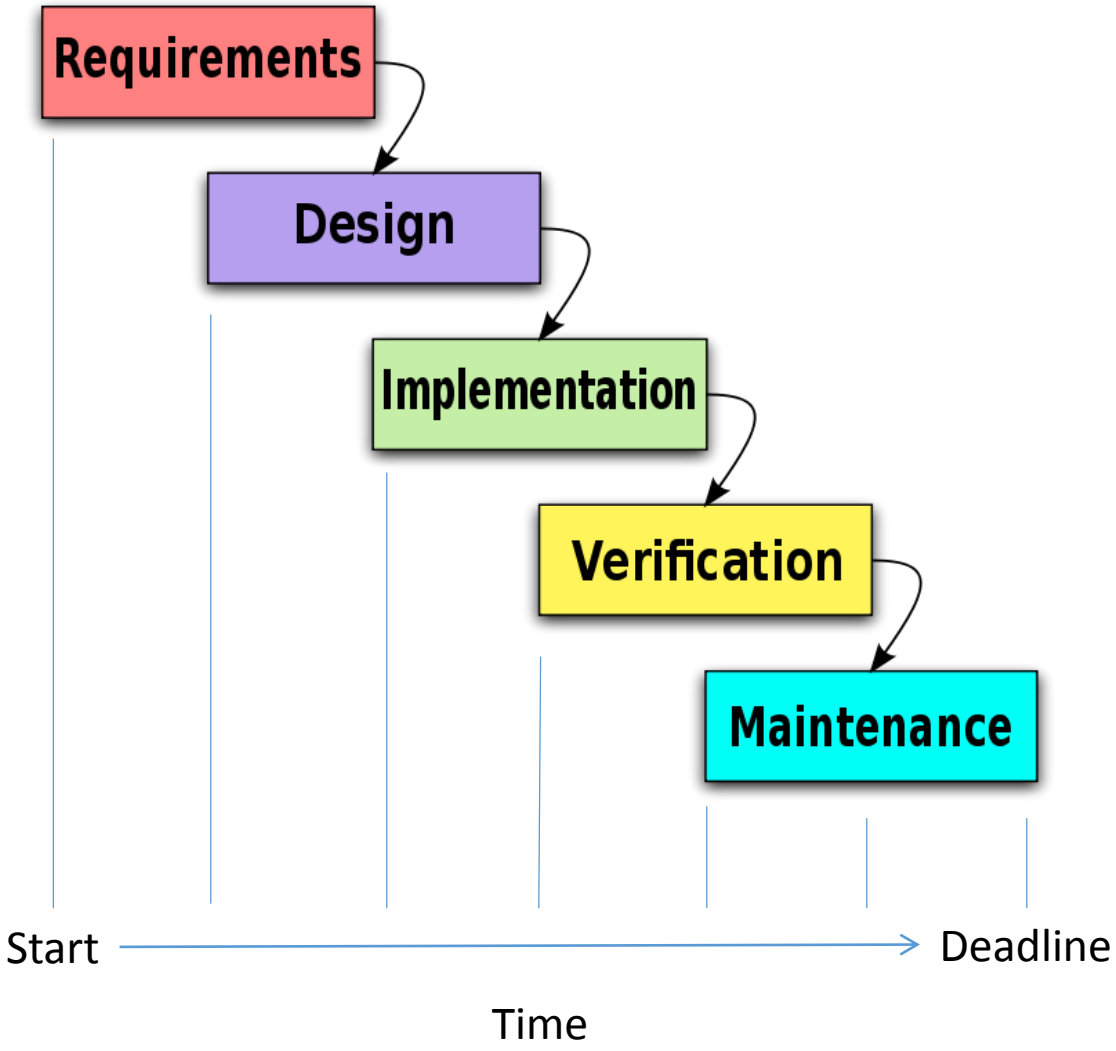
Source: http://www.optinest.com/optiblog/wp-content/uploads/2011/09/optimation_eliminate_waste.jpg



Original Source: Version One - State of Agile Survey 2012

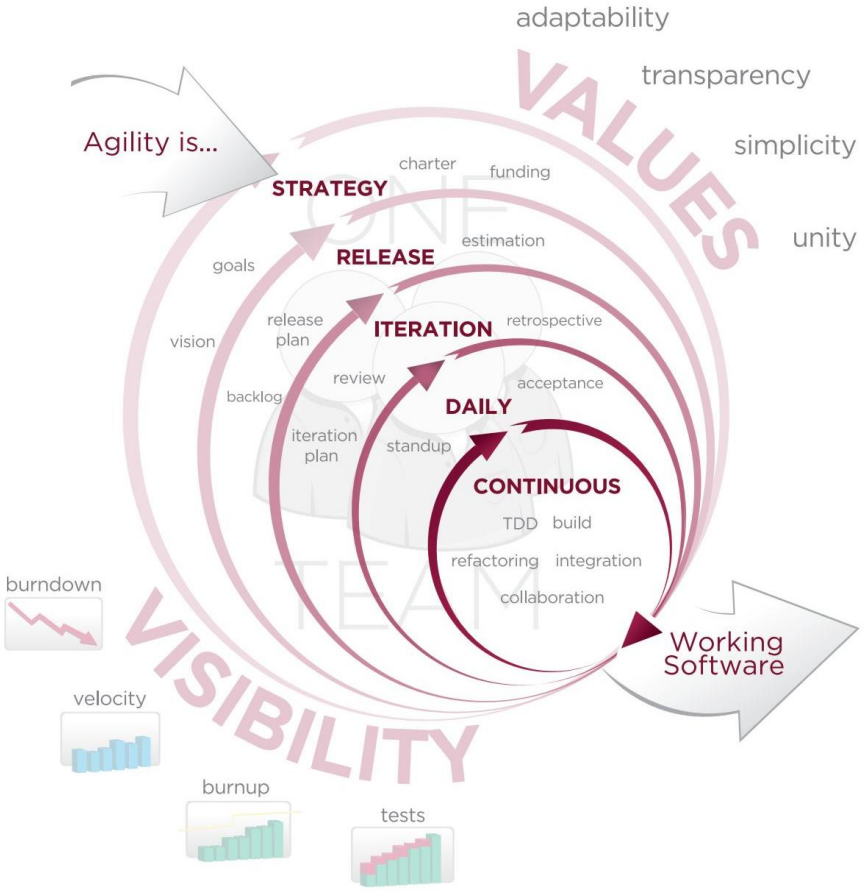
Waterfall vs. Agile

The Waterfall Method



The Agile Method

- Frequently deliver small incremental units of functionality
- Define, build, test and evaluate cycles
- Maximize speed of feedback loop



Source: Wikipedia

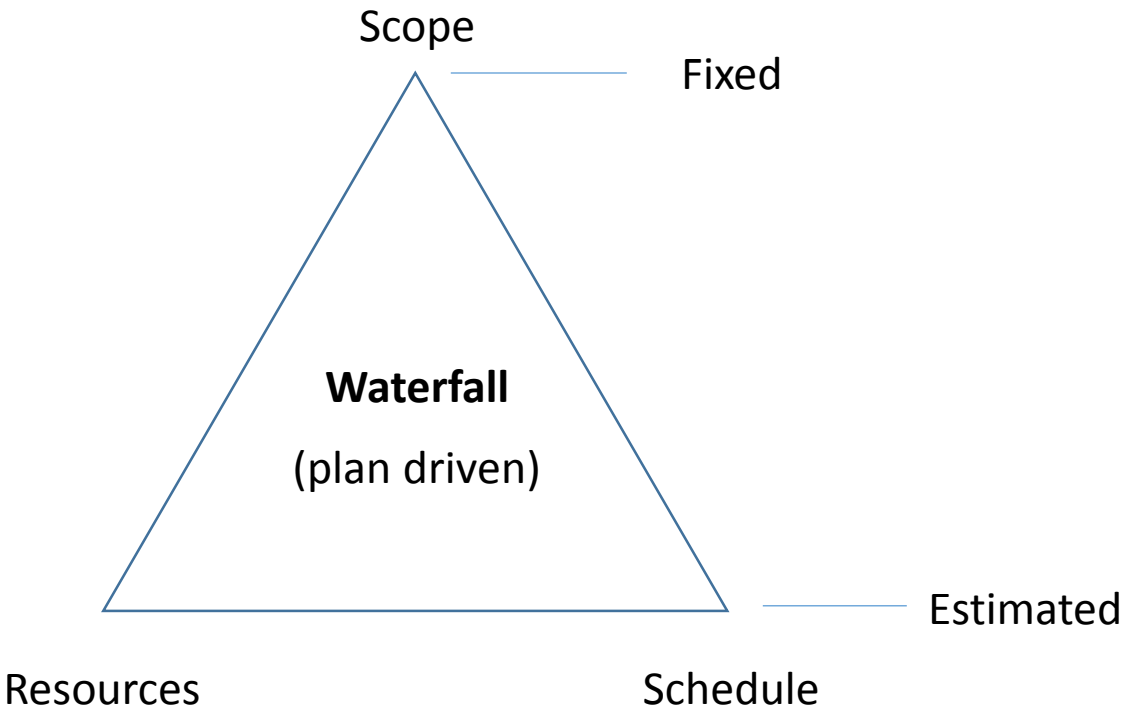
Waterfall Assumptions

- All requirements for a project can be defined given enough time
- Changes to requirements will be small and manageable
- Architecture and planning can create predictable system integration outcome
- Software unknowns can be eliminated on a predictable schedule

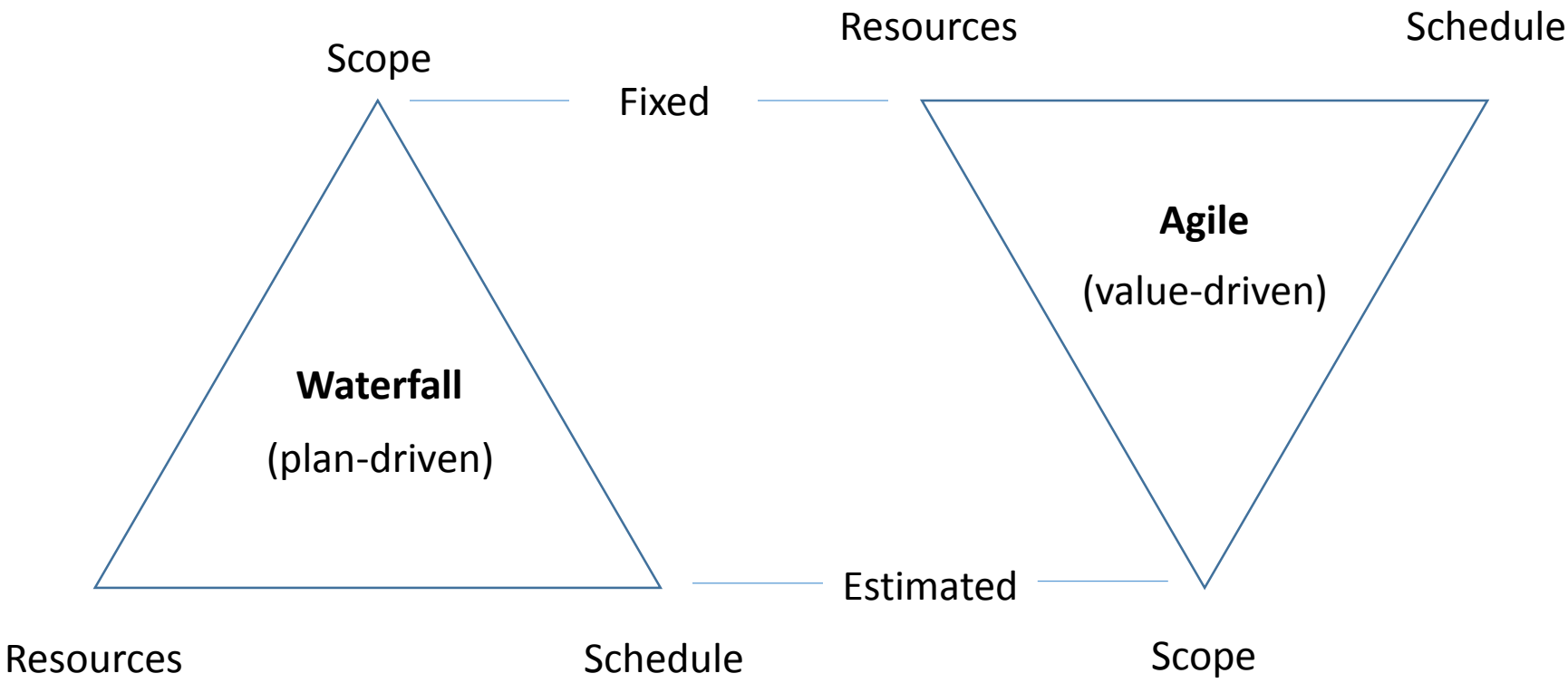
Agile Assumptions

- Requirements are just assumptions until they are validated
- Requirements can and will changes over time
- We need continuous integration of all of the pieces to avoid late-integration issues
- There is a high degree of uncertainty when creating new software projects

Waterfall Constraints

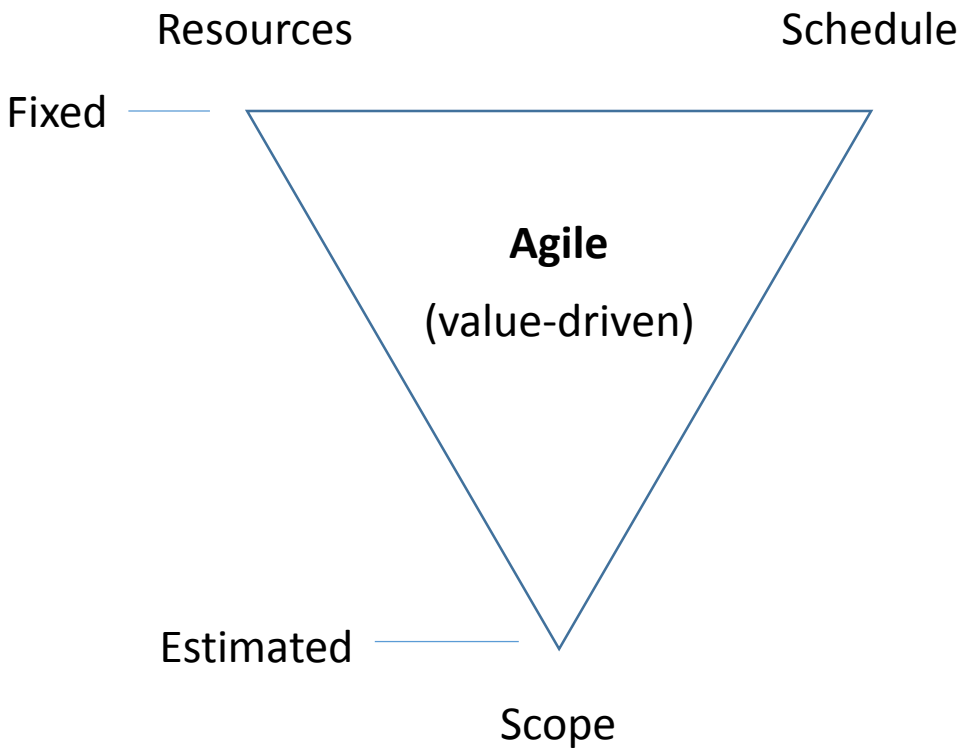


Agile Constraints



Agile Constraints

- Fixed team size
- Fixed releases
- Estimated features
- Team controls quality

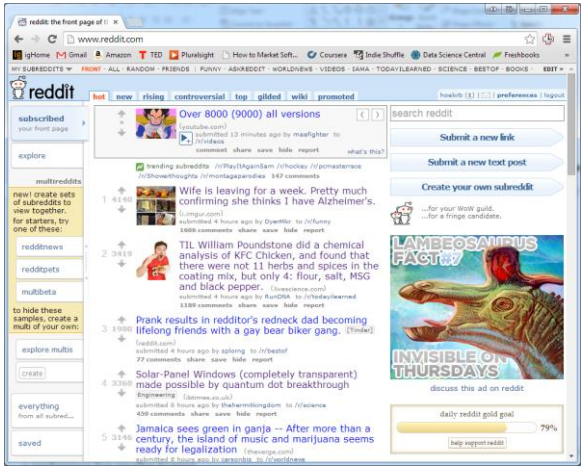


Waterfall vs. Agile Processes

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

Context is Important

- Neither Agile nor Waterfall is better than the other
- Context is critical
- Examples:
  - Novel web app => Agile
  - Space shuttle control software => Waterfall



Intro to Scrum

What is Scrum?

- Rugby term
- Process framework
- Agile methodology
- Empirical Process Control vs. Command and Control

Source: http://blogs.independent.co.uk/wp-content/uploads/2011/09/scrum1.jpg

What is Scrum?

- Iterative / incremental
- Frequent delivery
- Working software
- Continuous feedback
- Dev-team oriented
- Consists of:
  - Team
  - Events
  - Artifacts

Source: http://www.telegraph.co.uk

Three Pillars of Scrum

- Transparency
- Inspection
- Adaptation

Transparency

- Visibility into the project
- Information radiators
- End-of-sprint demos
- Common definition of “Done”

Inspection

- Frequent inspection of progress
- Detection of undesirable variance
- Not frequent enough to cause interference
- Requires the right people doing the inspection

Adaptation

- Adjustments are made to correct undesired variances
- Adjusting earlier minimizes further deviations
- Inspection and adaptation occurs during scrum events
- Purpose is continuous improvement

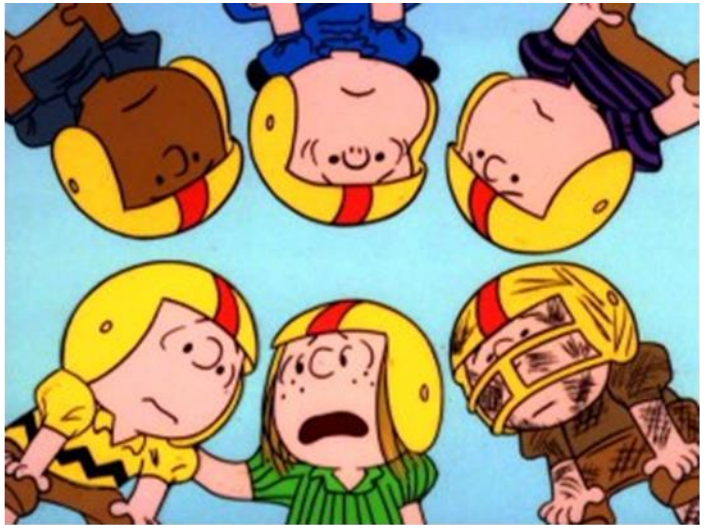
Scrum Team

Scrum Team Roles

- Development Team
- Product Owner
- Scrum Master

Development Team

- Does work and creates value
- Small teams (7 ± 2)
- Self-organizing
- Cross-functional
- No titles (preferably)



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

Product Owner

- Responsible for ROI of project
- Represents users and stakeholders
- One person, not a committee
- Manages product backlog

Source: Wikipedia

Scrum Master

- Responsible for scrum process
- Facilitates ceremonies
- Coaches the team
- Removes impediments
- Is *not* a project manager

Source: http://www.cbssports.com/

Scrum Events

Scrum Events

- Sprint
- Sprint Planning
- Daily Stand-up Meeting
- Sprint Review
- Sprint Retrospective

Sprint

- Time box of iteration
- Fixed interval
- 1-4 weeks
- Team works on items in sprint backlog
- Ends with potentially shippable software

Source: Wikipedia

Sprint Planning

- Start of sprint
- Goals defined
- Tasks identified
- Timeboxed (2hr / wk)
- PO presents prioritized backlog items
- Team pulls items into sprint backlog

Source: http://www.selfishprogramming.com/wp-content/uploads/2009/09/1-bvg-1.jpg

Daily Stand-up Meeting

- Occurs each day
- Short daily meeting
- Synchronize the team
- Timebox 15 min / day
- Same place and time
- It is *not* a status update meeting

Source: Wikipedia

Daily Stand-up

Three questions:

1. What have you done since the last stand-up?
2. What do plan to do today?
3. Do you have any impediments / blockers?

Sprint Review

- End of sprint
- Opportunity to inspect
- Timebox (1 hr/wk)
- PO identifies what has been completed
- Dev team demos completed functionality
- Stakeholders observe and provide feedback

Source: http://pic.twitter.com/gfzYl0XG8c

Sprint Retrospective

- End of sprint
- Inspection and adaptation
- Timebox (3 hr / 4 wk)
- Two questions:
  - What went well in the past sprint?
  - What could be improved for the next sprint?
- Continuous improvement

Source: http://spin.atomicobject.com/2014/04/07/improve-retrospective/

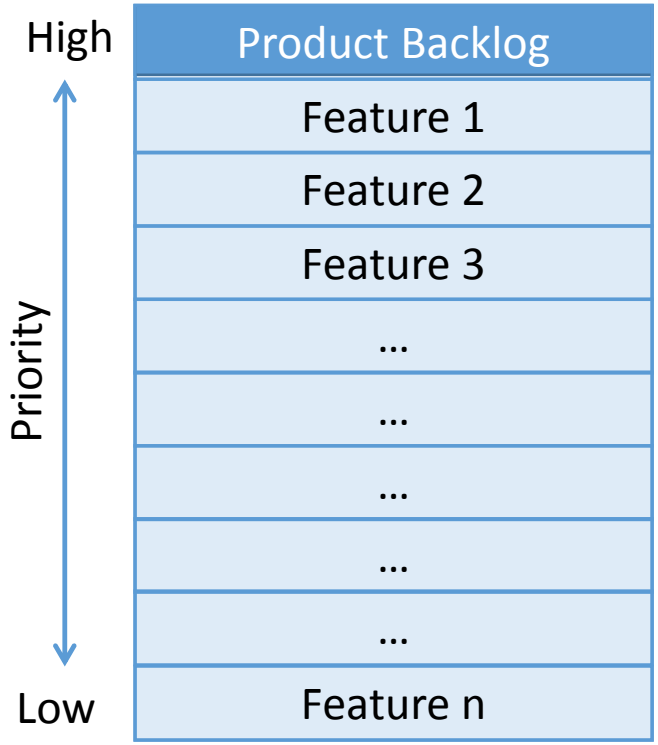
Scrum Artifacts

Scrum Artifacts

- Product Backlog
- Sprint Backlog
- User Stories
- Scrum Board

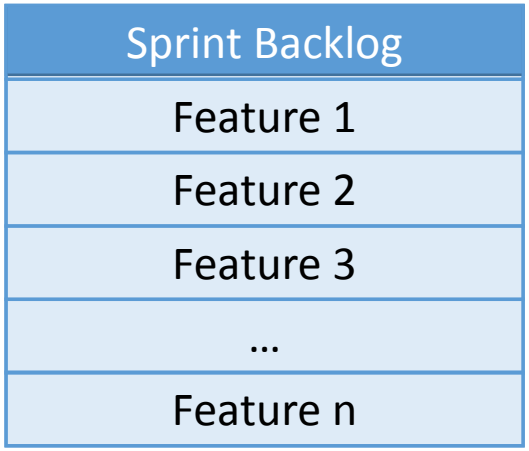
Product Backlog

- List of features for product
- Ordered by business value or ROI
- Highest priority on top
- Create and deliver features in order
- Owned by product owner



Sprint Backlog

- List of features to be completed during sprint
- Owned by the development team
- No work can be added without team's approval
- Highly visible to everyone

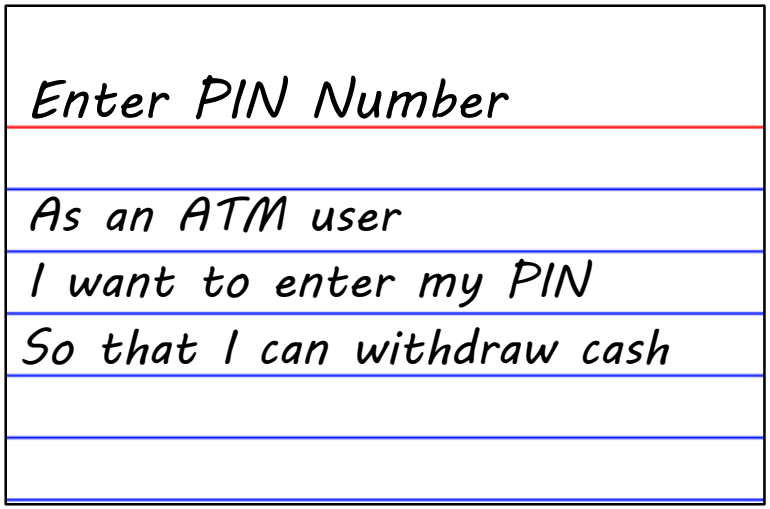


Backlog Items

- User Stories
- Bugs / Defects
- Architecture / Infrastructure
- Technical Debt
- Research (aka. Spikes)

User Story

- Short description of functionality that will provide value to a user
- Contains:
  - Title
  - Description
  - Acceptance Criteria
- Placeholder for a conversation to occur



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:

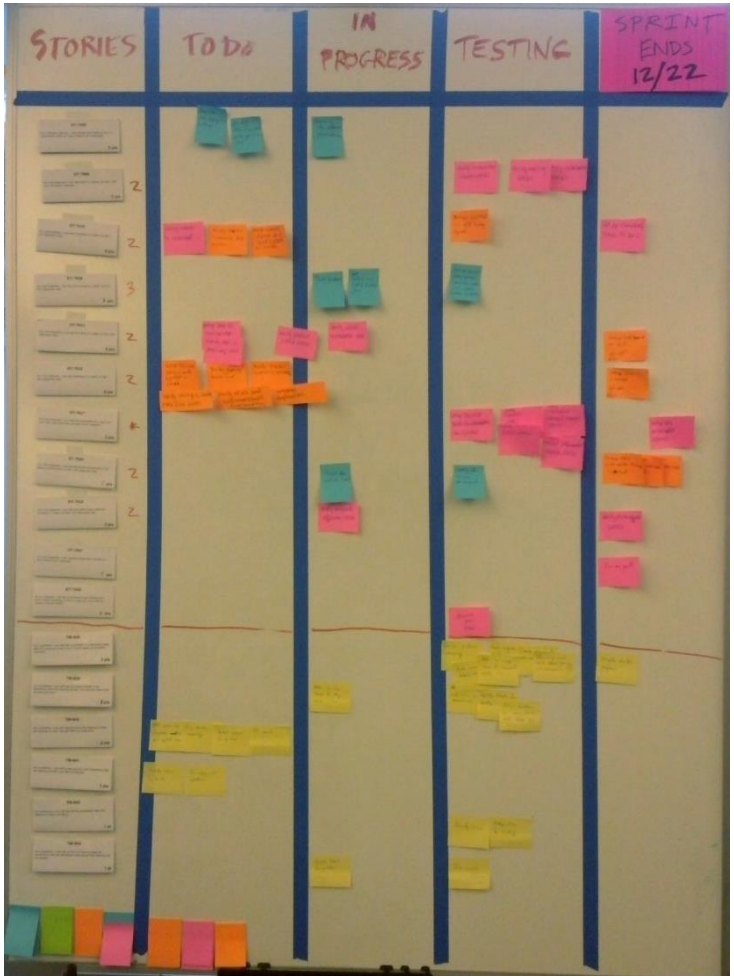
PIN must be four digits long

PIN must not allow alpha or special characters

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

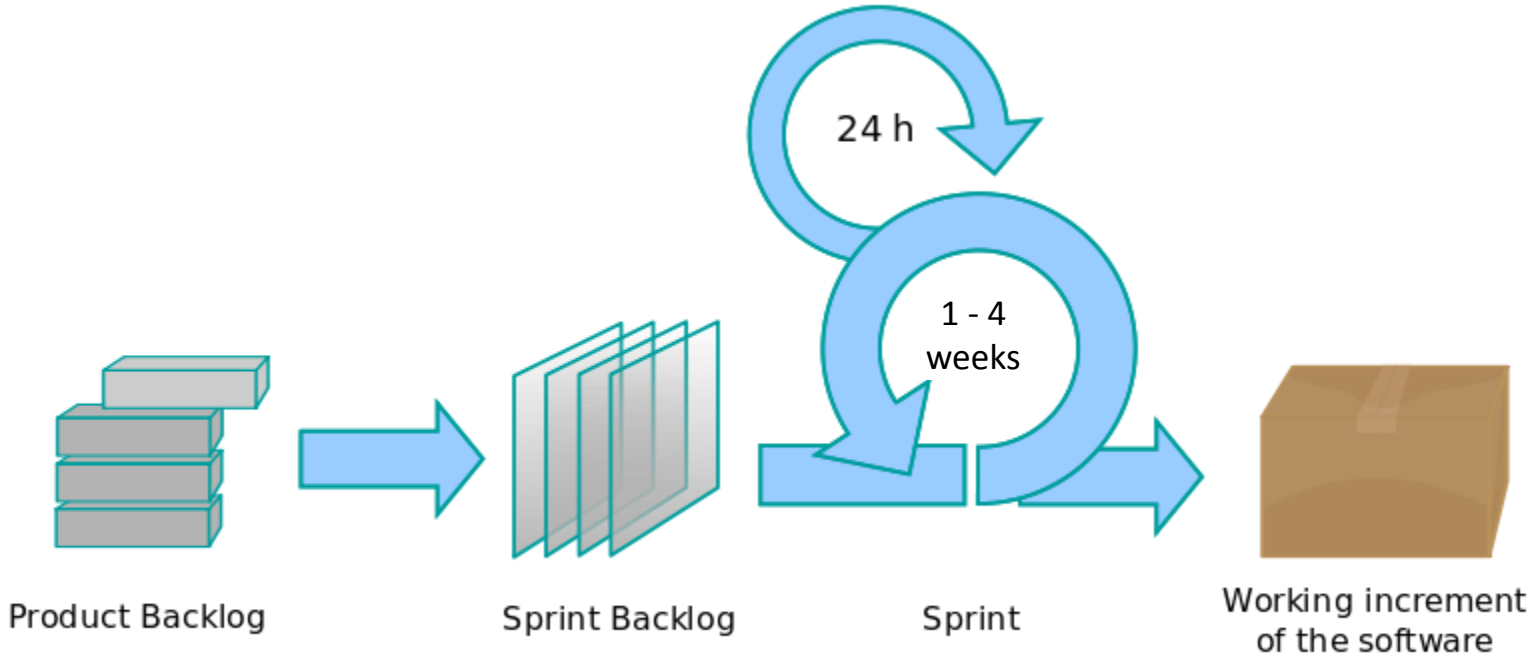
Scrum Board

- Tool to visualize progress within sprint
- User stories and tasks written on post-it notes
- Tasks moved from:
  - To do
  - In progress
  - Done



Source: Wikipedia

The Whole Process



Source: Wikipedia

Conclusion

Agile is:

Individuals and interactions

- over processes and tools

Working software

- over comprehensive documentation

Customer collaboration

- over contract negotiation

Responding to change

- over following a plan

Scrum is:

3 Roles

- Development Team
- Product Owner
- Scrum Master

Scrum is:

4 Events

- Sprint Planning
- Daily Stand-up Meeting
- Sprint Review
- Sprint Retrospective

Scrum is:

4 Artifacts

- Product Backlog
- Sprint Backlog
- User Stories
- Scrum Board

Questions / Feedback

- What was one thing you thought was valuable?
- What is one thing you would change?

Contact Info

Matthew Renze

- Twitter: @matthewrenze
- Email: matthew@renzeconsulting.com
- Website: www.matthewrenze.com

Renze Consulting

www.renzeconsulting.com