



European Master in
Building Information Modelling

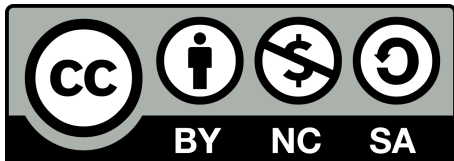
Agile methodologies

Topic 2: Fundamentals of programming

BIM A+3: Parametric Modelling in BIM

Matevž Dolenc

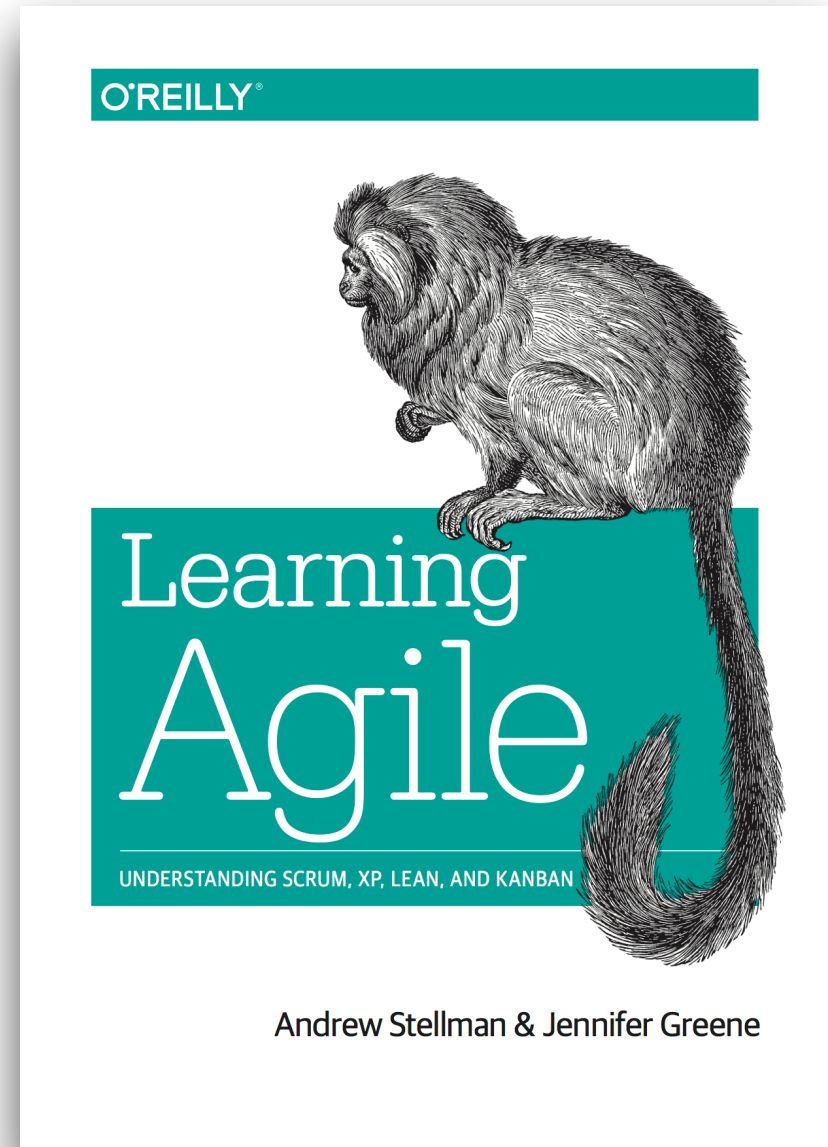
Univerza v Ljubljani



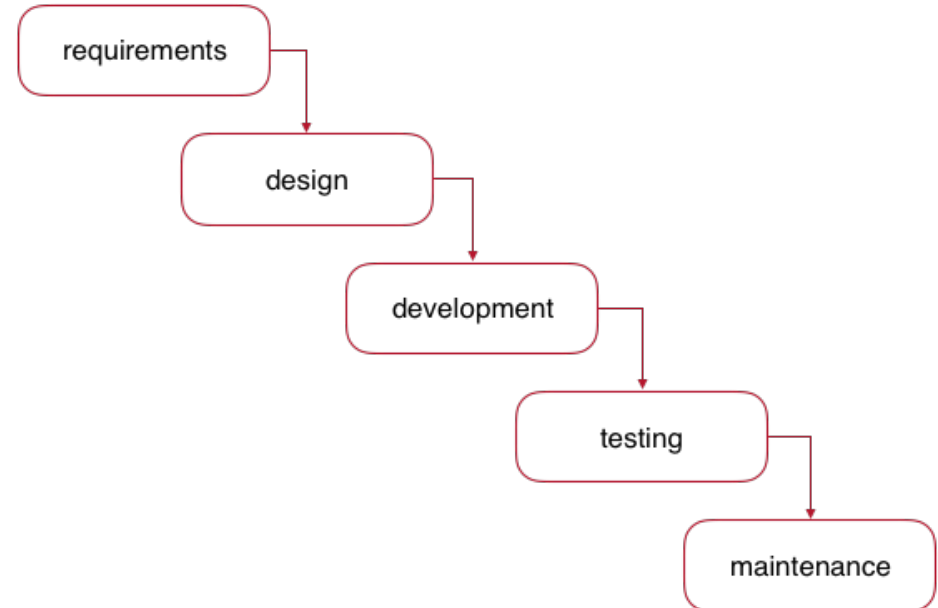
© 2019 by authors

This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/).

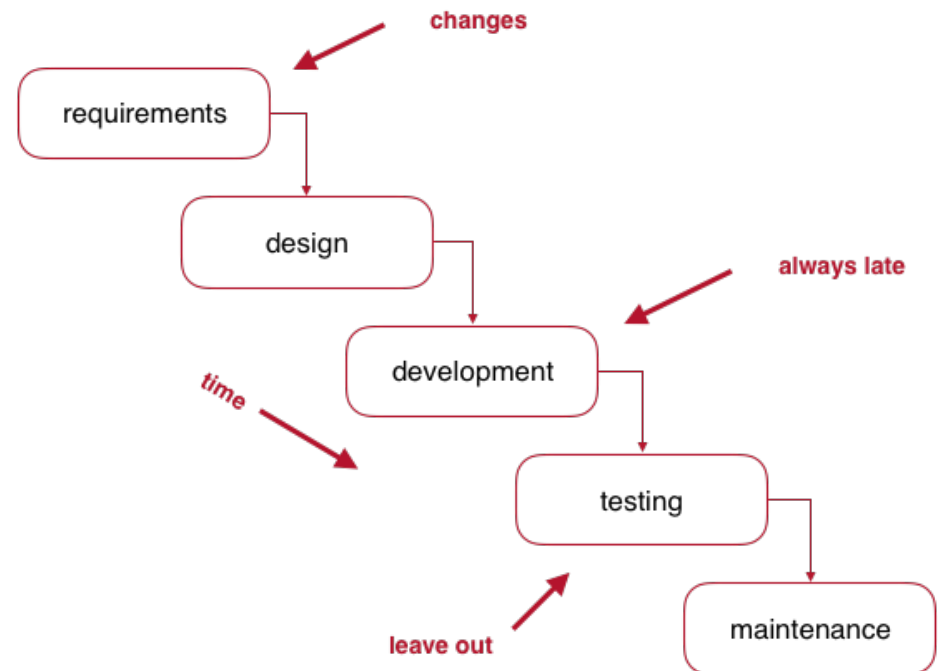
- Classic project management
- Agile methodologies
 - Scrum
 - eXtreme Programming (XP)
 - Lean
 - Kanban



- Characteristics
 - Sequential execution of steps
 - Rarely returning to previous steps
 - Emphasis on being right/complete in first step



- Characteristics
 - Sequential execution of steps
 - Rarely returning to previous steps
 - Emphasis on being right/complete in first step
- Problems
 - Product delivered at the end
 - Testing late in the process
 - Late validation (usually too late)



Software development using
waterfall model has

many shortcomings, it is usually more **expensive** and
less efficient then development using
agile methodology

SPEED **flexibility**
AGILE methodologies
cooperation **QUALITY** **iterative**

It is not a process, It is more like a philosophy
and a set of values

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

Twelve Principles of Agile Software

Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

Business people and developers must work together daily throughout the project.

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Working software is the primary measure of progress.

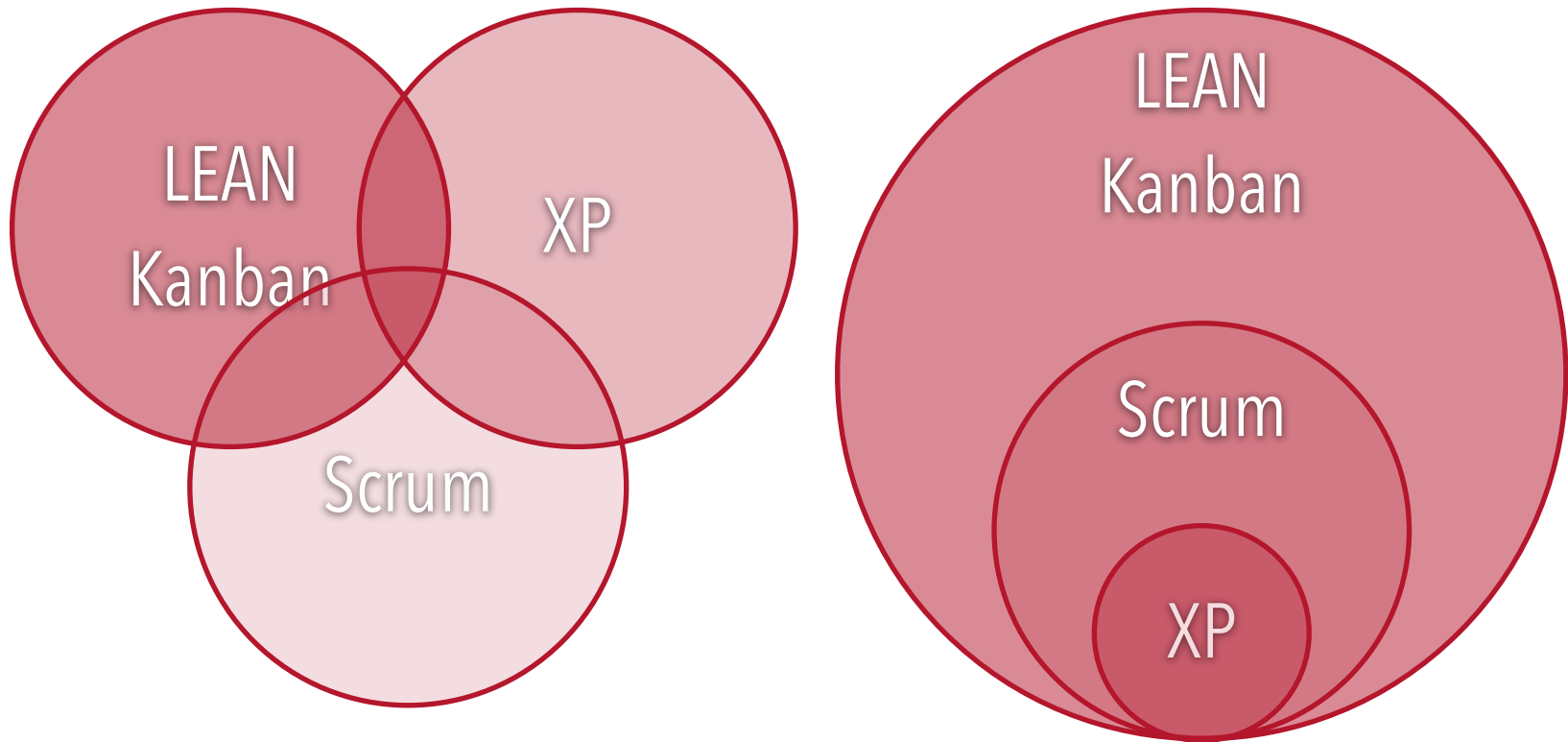
Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

Continuous attention to technical excellence and good design enhances agility.

Simplicity--the art of maximizing the amount of work not done--is essential.

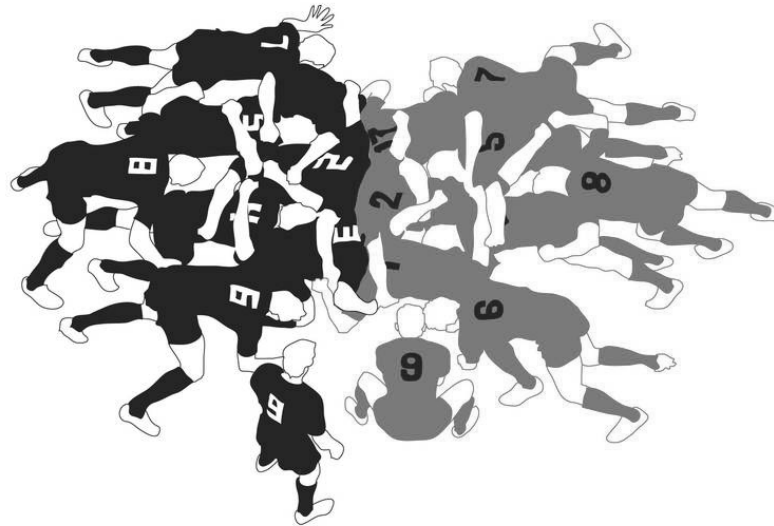
The best architectures, requirements, and designs emerge from self-organizing teams.

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.





Values from Agile manifesto are shared between different agile methodologies.

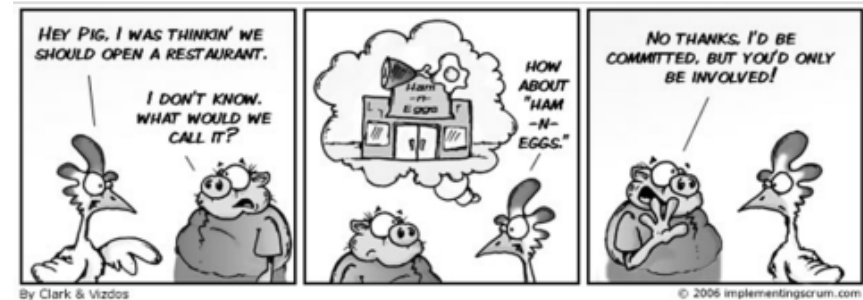
Scrum is a framework within which people can **address complex adaptive problems**, while **productively** and **creatively** delivering products of the **highest possible value**.

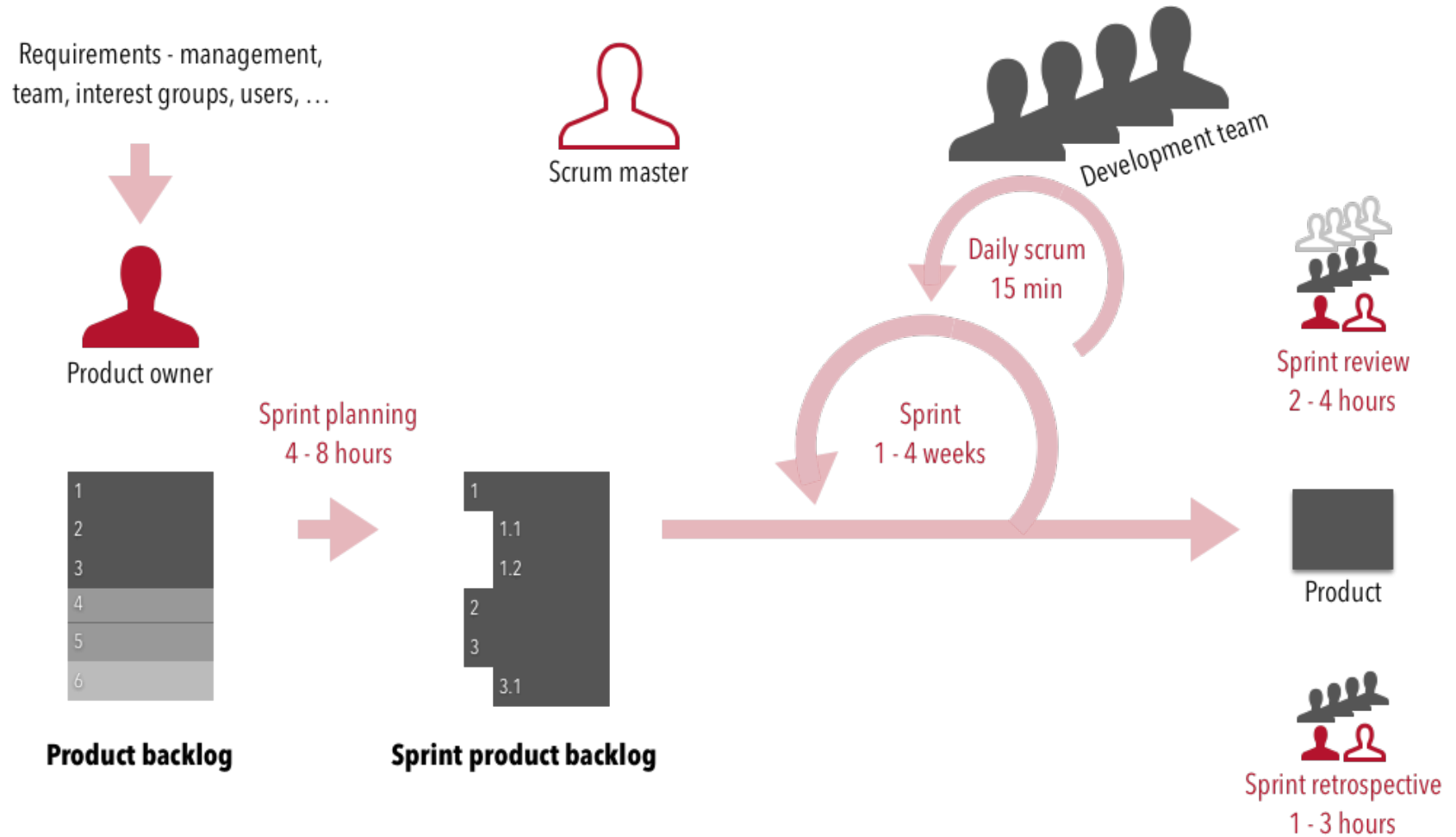


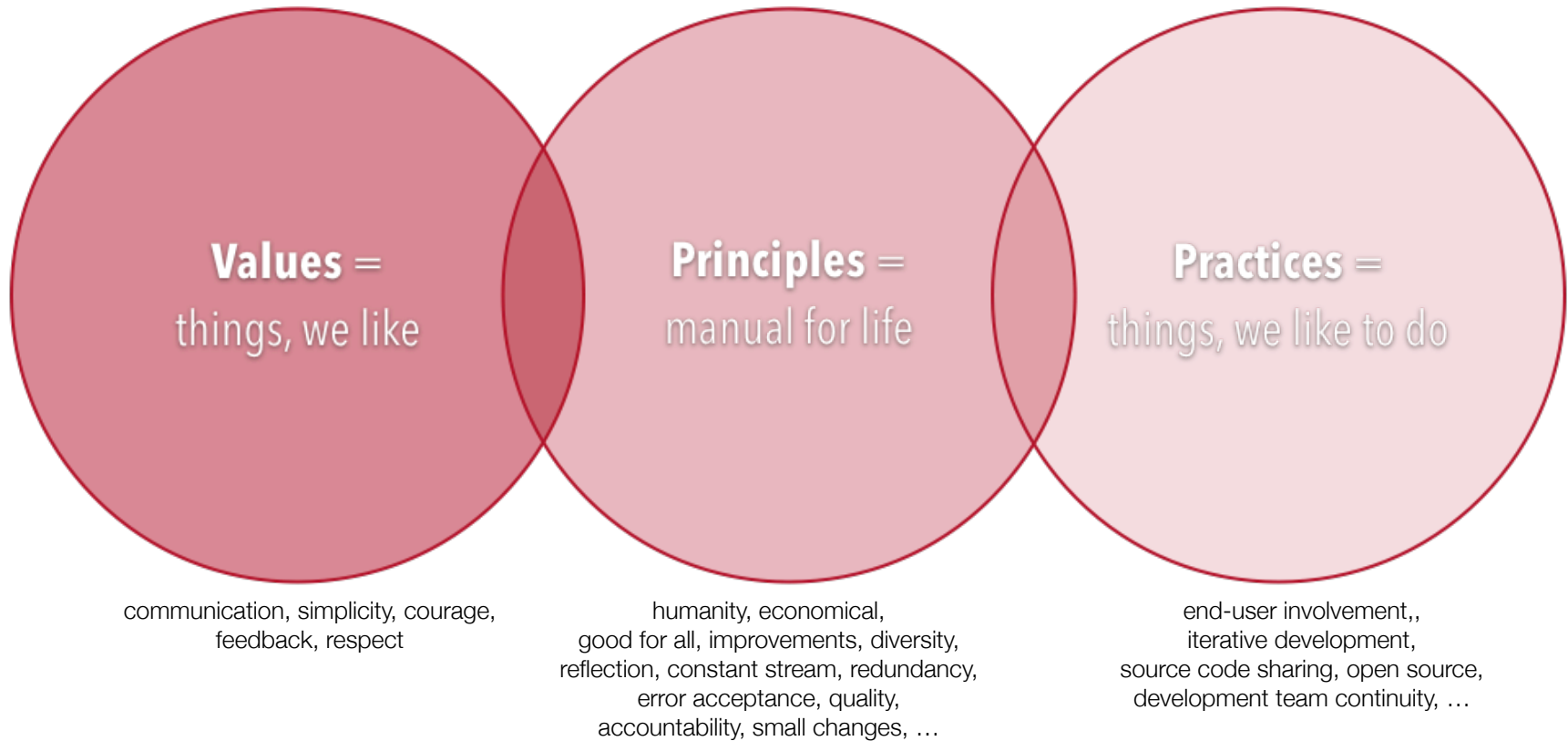
- Empirical process control theory
 - Empiricism asserts that knowledge comes from experience and making decisions based on what is known.
 - Scrum employs an iterative, incremental approach to optimise predictability and control risk.
- Three pillars of Scrum
 - transparency
 - inspection
 - adaptation
- Scrum team characteristics
 - Self-organizing
 - Cross-functional
 - Flexibility, creativity, productivity
 - Agility / completeness / 3 - 9 members
- Scrum team roles
 - Product owner
 - Development team
 - Scrum master

Scrum Roles

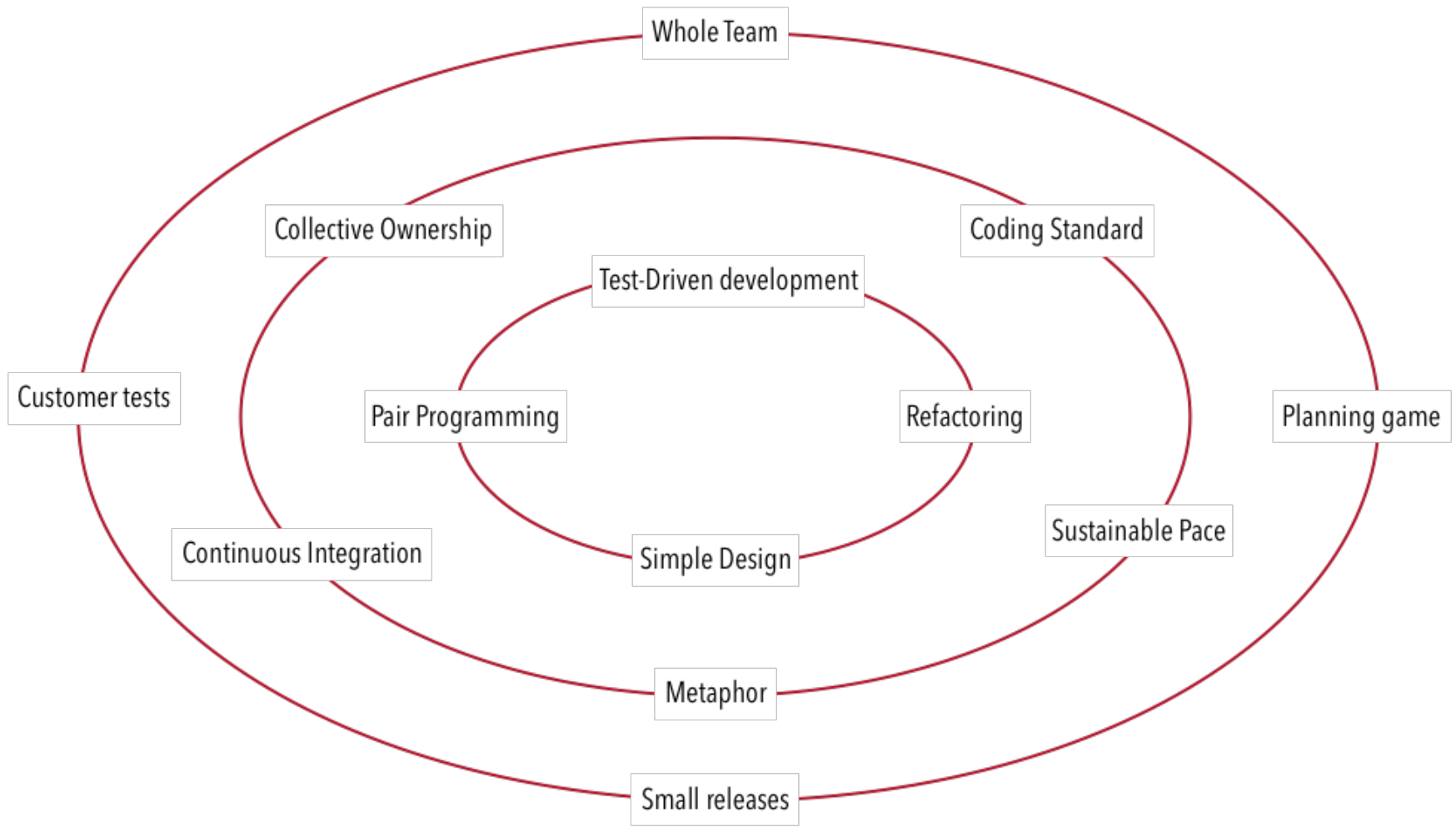
 Pigs	 Chickens
<p>Roles and RACI –VS governance matrix:</p> <ul style="list-style-type: none">• Product Owner (accountable, verifier)• Scrum Master (responsible)• Scrum Team (responsible) <p>Committed to:</p> <ul style="list-style-type: none">• Adhering to the Scrum process• Collaboration to get work done• "having their bacon on the line"	<p>Roles:</p> <ul style="list-style-type: none">• Business owner (accountable)• Project committee (signatory)• Stakeholders• End-users• Consulting experts <p>Everyone else who is involved, engaged, consulted and interested in the project.</p> <p>RACI- VS governance matrix:</p> <ul style="list-style-type: none">• Consulted, informed



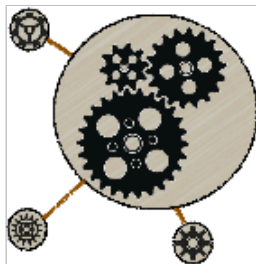




The goals is a development of extensible in flexible solutions.



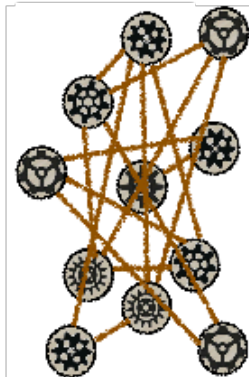
Large classes



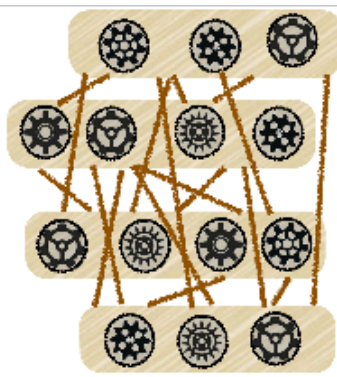
Code duplication



Spaghetti code

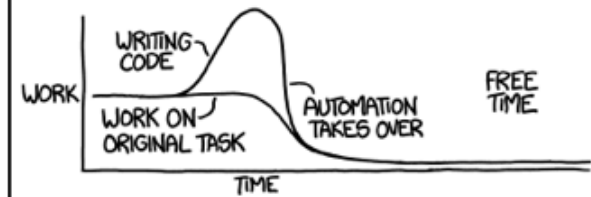


Lasagne code

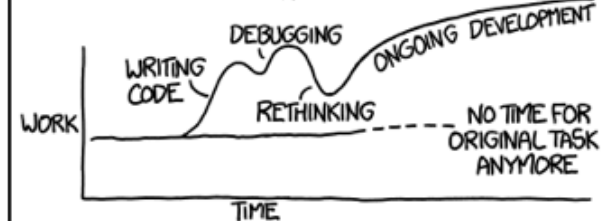


"I SPEND A LOT OF TIME ON THIS TASK.
I SHOULD WRITE A PROGRAM AUTOMATING IT!"

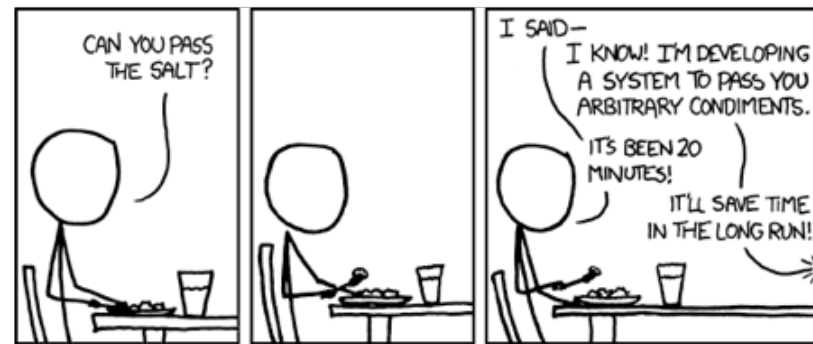
THEORY:



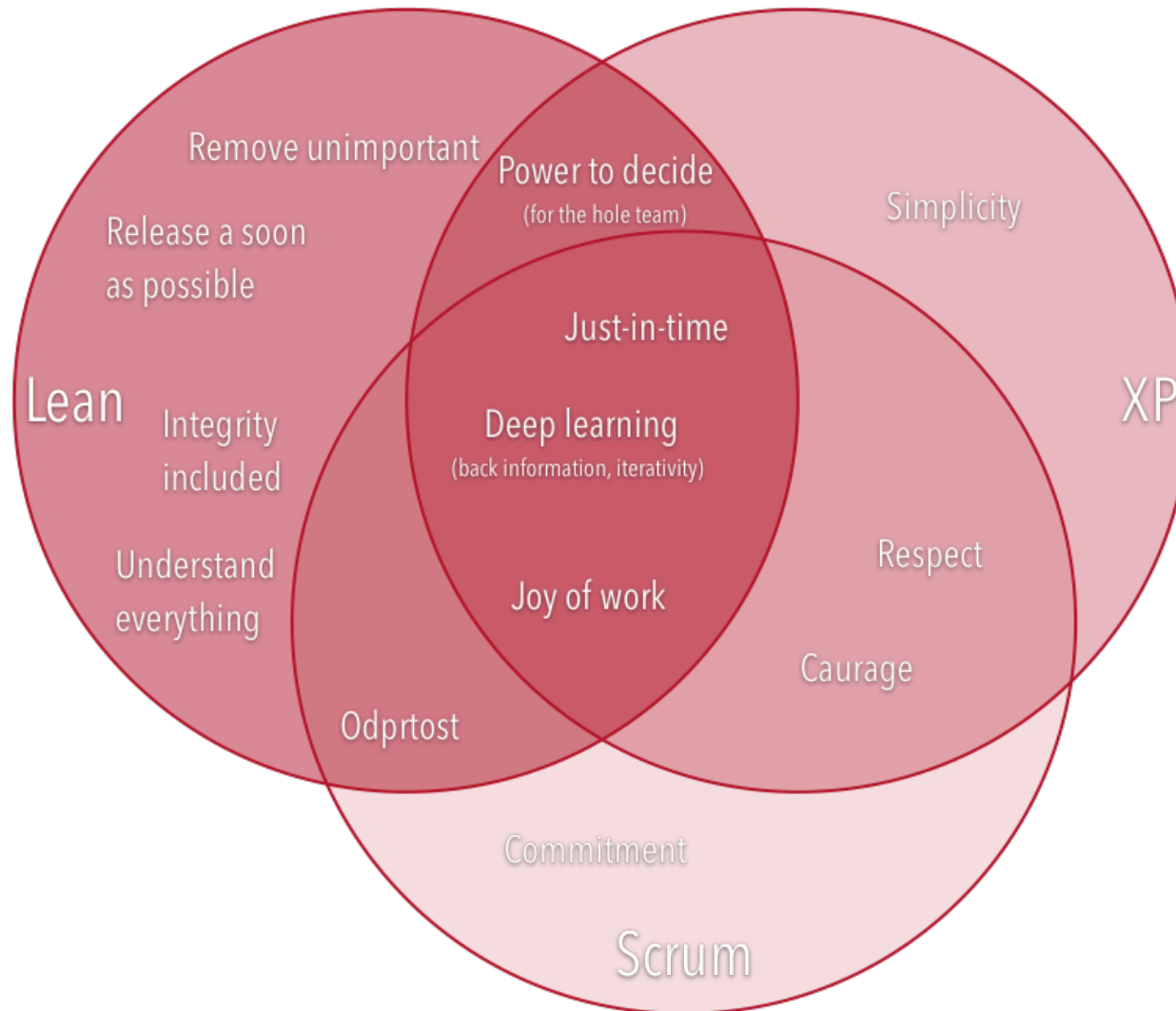
REALITY:

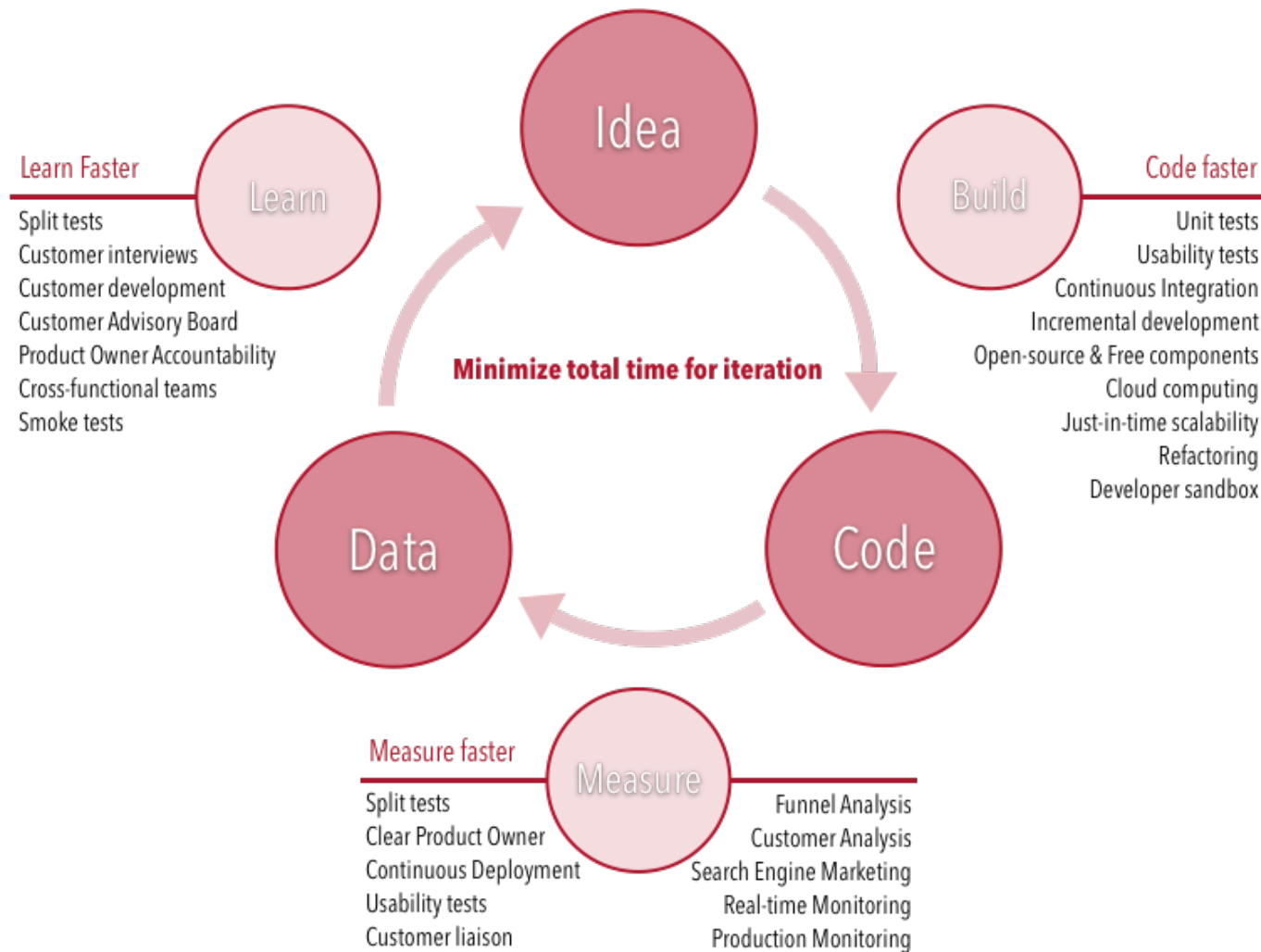


Automation, <http://xkcd.com/1319>



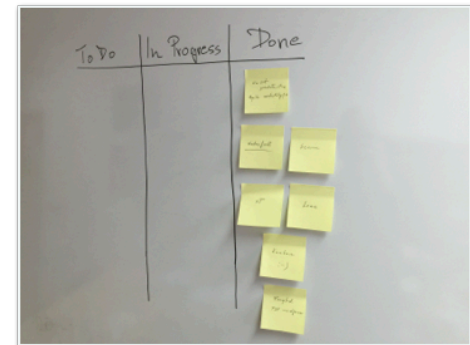
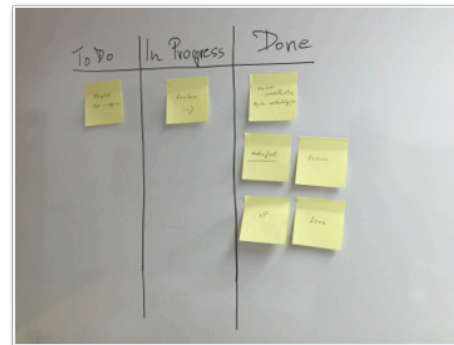
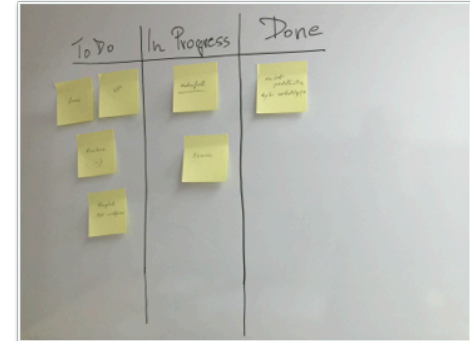
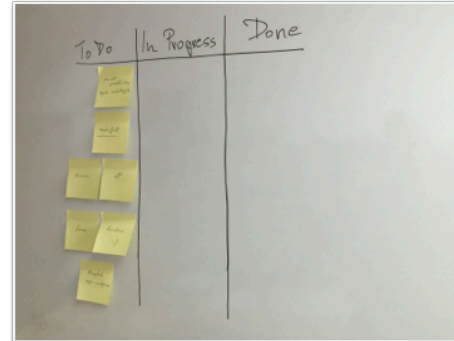
The general problem, <http://xkcd.com/974>





... is a lean method to manage and improve work across human systems. This approach aims to manage work by balancing demands with available capacity, and by improving the handling of system-level bottlenecks.

- Basic principles
 - We start with what we know
 - Incrementally introduce enhancements
 - We start by keeping existing job titles, roles and responsibilities
- Basic practices
 - Visualise the workflow
 - Limit Work In Progress - WIP
 - Manage flow
 - Explicit politics
 - Information feed-back loop
 - Enhance collaboration, experimental development



Game

SPEED **flexibility**
AGILE methodologies
cooperation **QUALITY** **iterative**

It is not a process, It is more like a philosophy
and a set of values