Agile Methods

Introduction to Agile Methods

by Pietari Kettunen

Me

- Pietari Kettunen
- Software person since 2003
- TietoEnator, Solita, Swisscom and Sqooba
- Agilist since ~ 2005
- “Certified” Scrum Master, Product Owner, Scrum Practitioner, Kanban
- @Pietrotull

Sqooba

- Data Analytics -company
- Founded 2016
- Employees > 30
- Based in Bern
- Acquired by OpenSystems in 2020

Sqooba Customers

Agenda

- Traditional software engineering
  - Problems
- Transition to agile
- Values and principles of agile
- Agile process
  - Scrum
  - Kanban
- Technical Practises
  - TDD
  - CI/CD

Traditional S.E.

- Modelled after construction engineering
  - Architect
  - Software Architecture
  - Build tools

Not without issues...

The Problem

“Only thing that is constant is change”

- Heraclitus

Construction vs Software

low design cost & high build cost

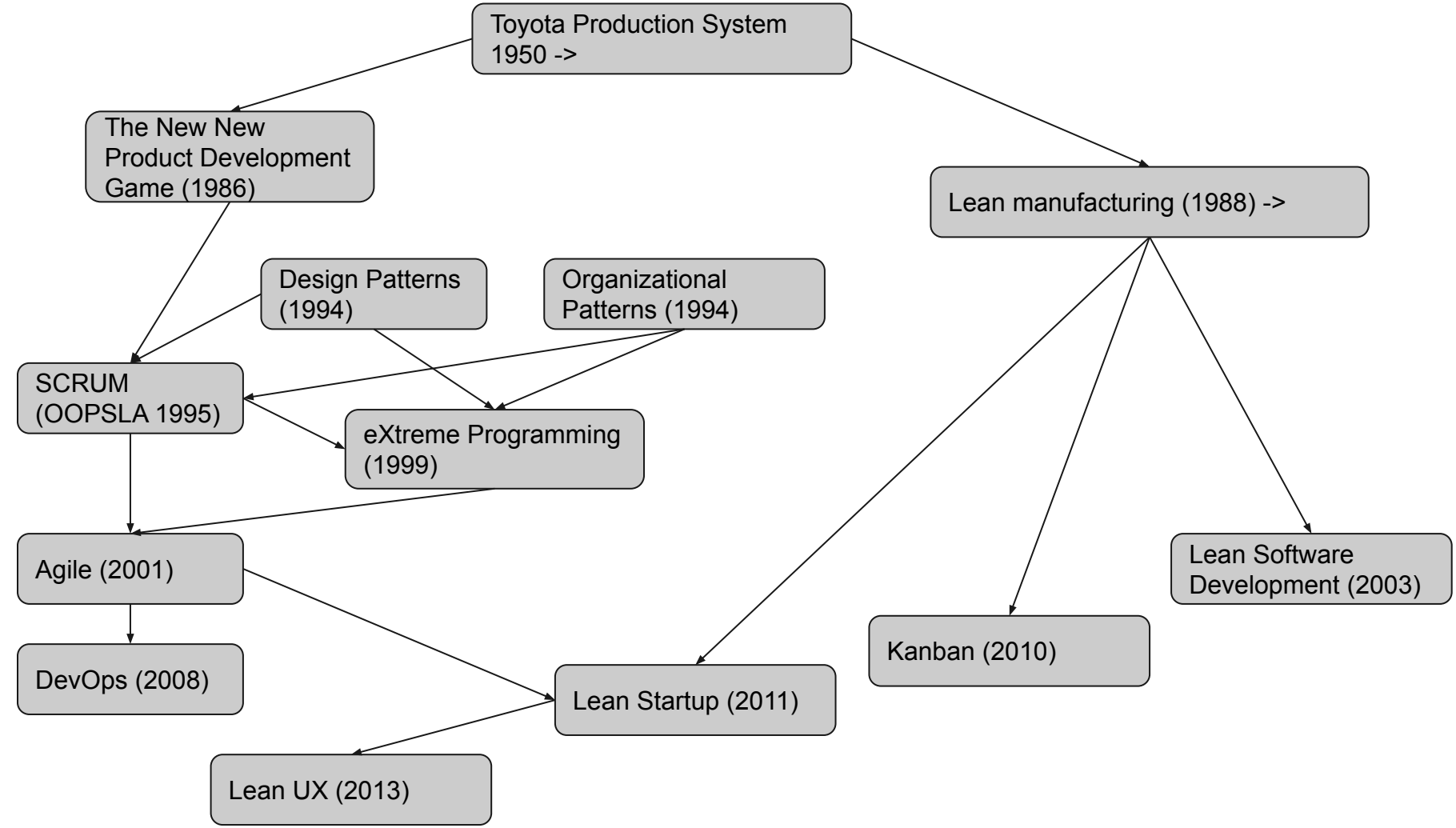
vs

high design cost & minimal “build” cost

The Solution: agile

- Adaptation
- Feedback loops
- Defer decisions

Agile Family Tree



Agile Manifesto

- February 2001
  - Kent Beck
  - Mike Beedle
  - Arie van Bennekum
  - Alistair Cockburn
  - Ward Cunningham
  - Martin Fowler
  - James Grenning
  - Jim Highsmith
  - Andrew Hunt
  - Ron Jeffries
  - Jon Kern
  - Brian Marick
  - Robert C. Martin
  - Steve Mellor
  - Ken Schwaber
  - Jeff Sutherland
  - Dave Thomas

Agile Manifesto

Individuals and interactions over

processes and tools

Working software over

comprehensive documentation

Customer collaboration over

contract negotiation

Responding to change over

following a plan

12 Principles of Agile

- customer satisfaction
- embrace change
- frequent delivery
- collaboration
- motivated individuals
- face to face
- working software
- sustainable development
- technical excellence
- simplicity
- self-organizing team
- retrospection

Agile

- Technical Practises
- Process Management

Technical practices

- Pair programming
- Test driven development
- CI / CD
  - Continuous Integration
  - Continuous Deployment
- Behaviour driven development / specification by example

Process Methodologies

- Scrum
- Kanban
- XP

Characteristics

- Just In Time decisions
- Pull -mechanism / slack
- Visualization
- Transparency
- Splitting work into smaller pieces
- Limiting work in process
- Kaizen - continuous improvement

Scrum

Scrum

Pioneering Scrum

Scrum (early 90's)

- Jeff Sutherland (Easel Corp)
- Ken Schwaber (Advanced Development Methods)

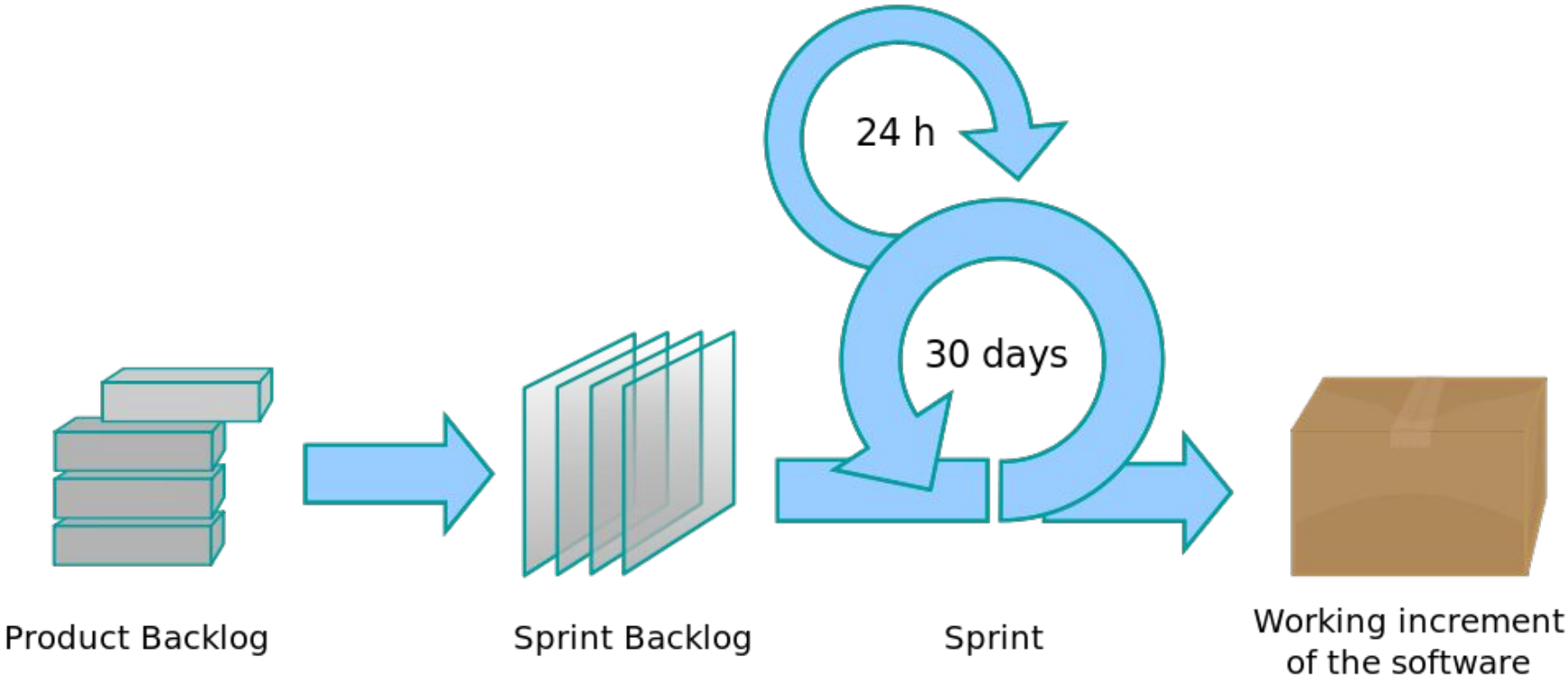
Jeff & Ken collaborated to present

- Scrum methodology at OOPSLA '95

Scrum

- Agile process for producing business value
- Iterative (sprints)
- does NOT prescribe technical practises

Scrum in action



Scrum Roles

- Product owner
- Scrum master
- Team

Product Owner

- Decides priorities / order
- Vision of the product

ScrumMaster

- Takes care of the process
- Enables the team to do their work
- Owns the impediment list

Team

- Makes the magic happen
- Cross Functional
  - includes all the skills to finish the product
- Self-organizing

Scrum Ceremonies

1. Sprint planning
2. Daily scrum meeting
3. Sprint review
4. Sprint retrospective

1. Sprint planning

Who

- Team, ScrumMaster & Product Owner

Agenda

- Discuss top priority backlog items
- Team selects which to do

Why

- Know what will be worked on
- Understand it enough to do it

2. The daily scrum

Parameters:

- Daily
- max 15 minutes
- standing

Not a problem solving meeting

- Whole world is invited
- only team, ScrumMaster, Product Owner can talk

2. The daily scrum

Questions

1. What did you do?
2. What will you do?
3. Is there anything stopping you? (impediment)

3. Sprint review

- Inspect and adapt the product
- Team presents what was accomplished
- Typically involves a demo
- Informal

4. Retrospective

- Inspect and adapt the process
- Everyone can participate

Scrum Artifacts

- Product backlog
- Sprint goal
- Sprint backlog
- Burndown chart
- Impediment List

Product backlog

- List of desired work
- Ordered / prioritized by the product owner
- Reorganized at the start of each sprint

Sprint goal

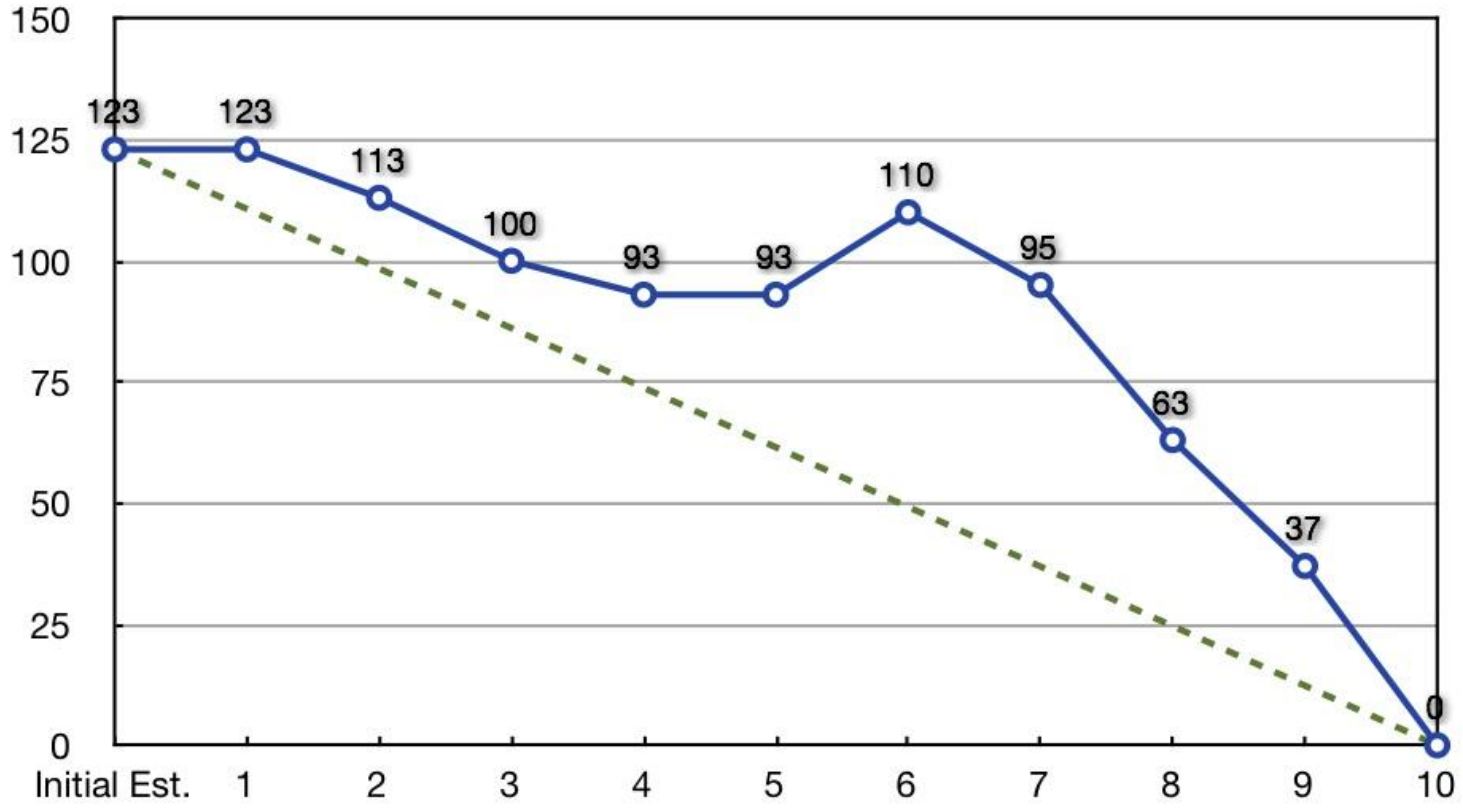
High level summary of where the focus is for given sprint

For the “high level” boss

Sprint backlog

- Evolves
- Team maintains
  - can add tasks
  - can remove tasks
  - re-estimate
- The team owns the sprint backlog
- “Best guess” what the team needs to do
- Progress visible in the task board

Burndown chart



Scaling Scrum

- Several Scrum teams
- Scrum of scrums
  - coordination over several Scrum teams
- LeSS
- SAFe

Kanban

Kanban

- Kan ban = “signal card”
- Originally by Taichi Ono (Toyota)
- Software Kanban by David Anderson
- Evolutionary approach

Kanban method

1. Start with what you have
2. Agree to pursue incremental, evolutionary change
3. Respect current process, roles & titles
4. Leadership at all levels

Kanban 6 practises

1. Visualize workflow
2. Limit work in progress
3. Manage flow
4. Explicit policies
5. Implement feedback loops
6. Improve collaboratively, evolve with experiments

1. Visualize workflow

- Analyze work states
- Define work item types
- Make problems visible

2. Limit work in progress

MULTITASKING

- Prevent multitasking / context switching
- Less work in progress = less waste

3. Manage flow

- Sustainable pace

4. Explicit policies

- No secrets
- Few clear rules

5. Improve collaboratively

" To be termed scientific, a method of inquiry must be based on gathering empirical and measurable evidence subject to specific principles of reasoning”

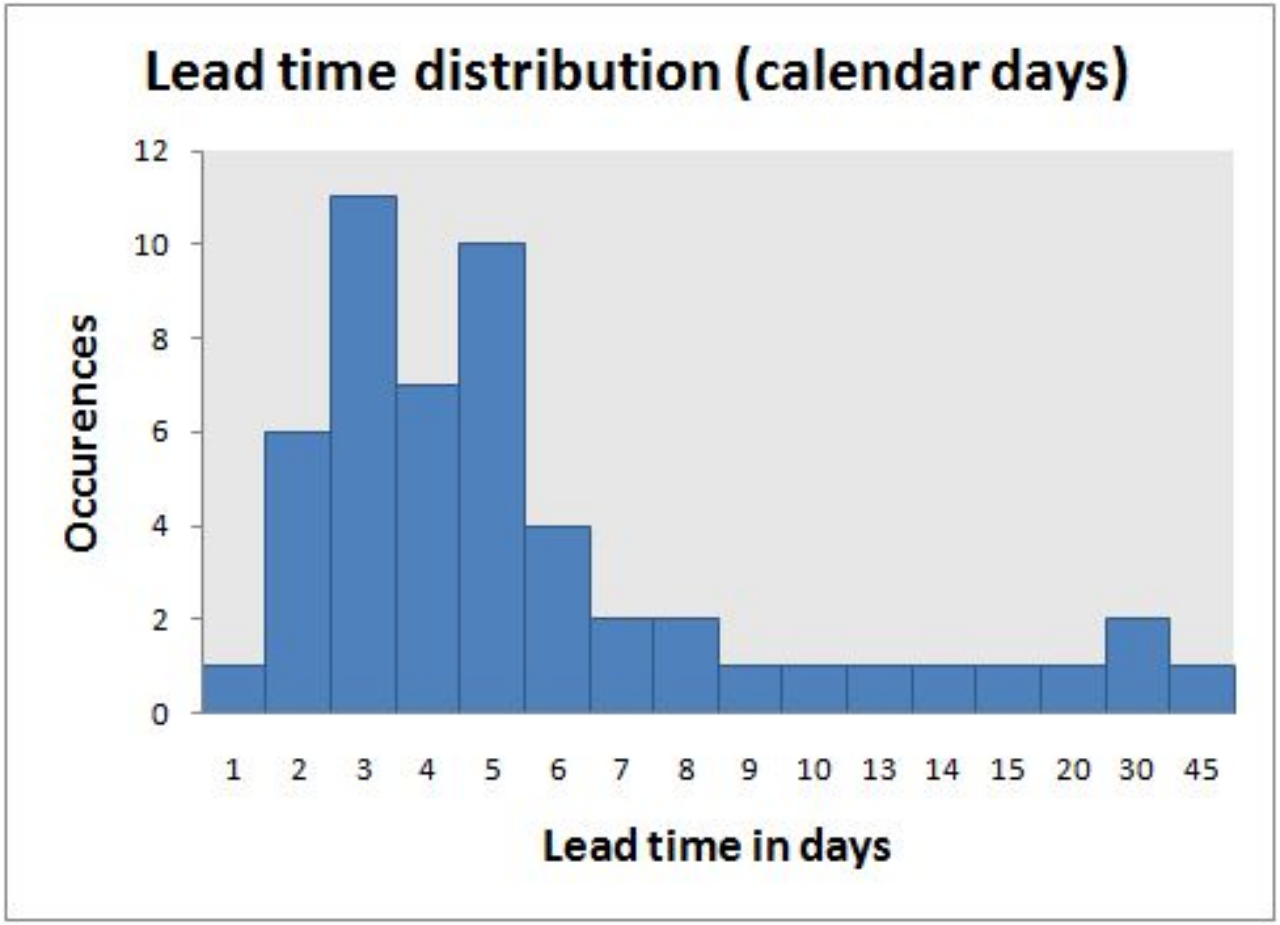
-Isaac Newton

- Collaboration with all stakeholders
- avoid local optimizations

Cadence

- Everything has its own rhythm

Estimation


Lead time distribution (calendar days)
Occurences
0
2
4
6
8
10
12
1
2
3
4
5
6
7
8
9
10
13
14
15
20
30
45
Lead time in days

Scrum vs Kanban

Scrum

- WIP per sprint
- Sprint content set
- Task size
- Cross Functional teams
- Timeboxed
- Velocity
- Fair amount of rules

Kanban

- WIP per stage
- No untouchable tasklist
- Task size unlimited
- Allows specialist teams
- No time limits
- Lead time
- Very few rules

Tool for the job?

Agile Documentation

- Documentation is a poor substitute for conversation
- UI mockups
- Only code is up to date
- Comprehensive test suite - living documentation

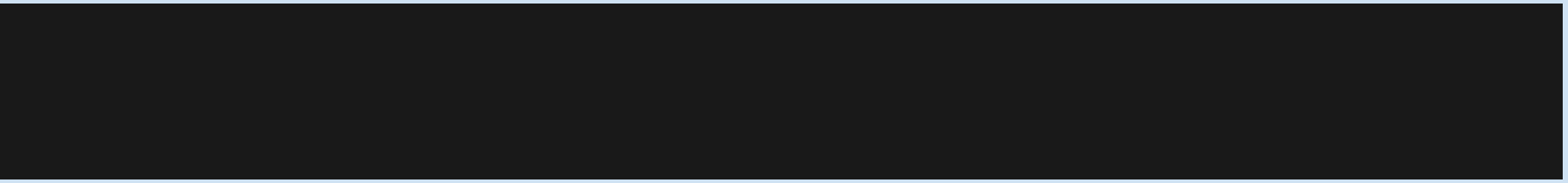
Code example 1

```
public List<int[]> getThem() {
    List<int[]> list1 = new ArrayList<int[]>();
    for(int[] x : theList) {
        if (x[0] == 4) {
            list1.add(x);
        }
    }
    return list1;
}
```

Code example 2

```
public List<int[]> getFlaggedCells() {
    List<int[]> flaggedCells = new ArrayList<int[]>();
    for(int[] cell : gameBoard) {
        if(cell[STATUS_VALUE] == FLAGGED) {
            flaggedCells.add(cell)
        }
    }
    return flaggedCells;
}
```

Test Driven Development

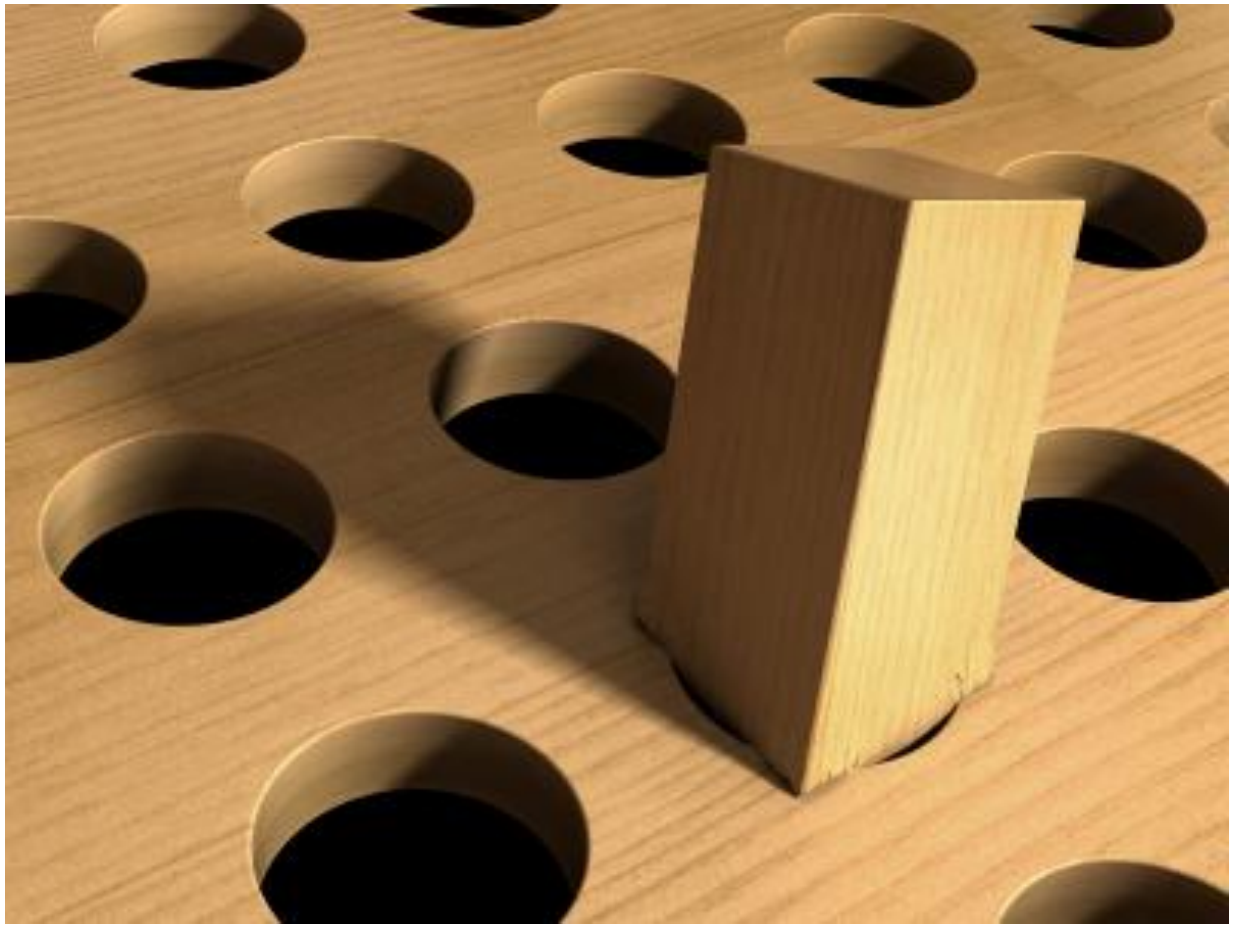


Created by Kent Beck

- Write failing test first
- Write code to make the test pass
- Refactor
- Rinse and repeat

Do the right thing

Do the right thing



Minimum Viable Product

- pareto principle (80/20)
- Just In Time
- Has to be viable

Full of features (2007)

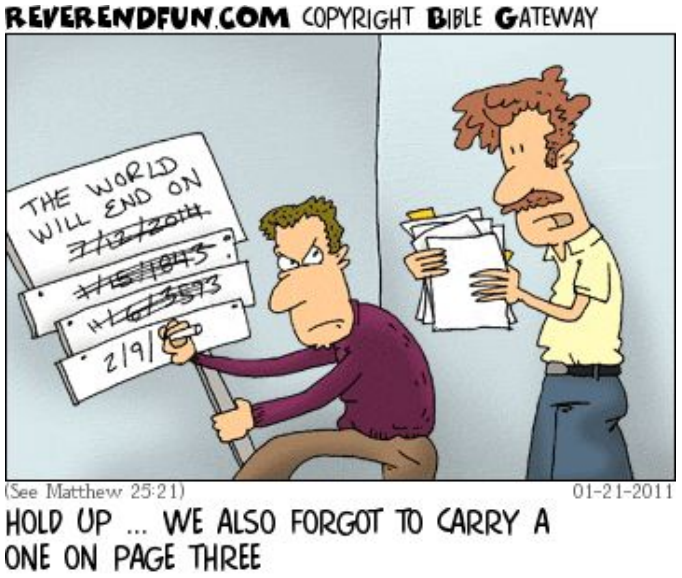
	Nokia N95	competitor
3G	yes	no
Camera	5mp	2mp
Memory card	microSD up to 32GB	no
MMS	yes	no
3rd party apps	yes	no
Video out	yes	no
VoIP	yes	no
Video calls	yes	no
Instant Messaging	yes	no
Bluetooth	yes	no

N95 vs iPhone

Pitfalls & Tips

Common Pitfalls

- Estimates as deadlines
- Illusion of Importance
- Scrum Master Manager
- Find and Replace
- Detailed plans
- Agile sells



"predicting is very difficult, especially if it involves the future"

- Niels Bohr

Tips

- Split to tasks
- Validation, feedback loops
- Definition of done
- Minimum viable product
- Measure progress
- Discipline
- Plan just enough
- Start implementation early (not without planning)

Sources

- https://www.scrumguides.org
- https://edu.leankanban.com/
- https://www.crisp.se/bocker-och-produkter/scrum-and-xp-from-the-trenches

The End...

Thank you for your attention...