Objectbay
Software • Engineering • Consulting

Transforming Ideas into Software

Certified Scrum Master Training

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Agenda for the next two days

1. **Inspection & Adaption**
2. **Agile Principles**
3. **Scrum Roles**
4. **Scrum Framework**
5. **During the Sprint**
6. **Product Backlog**
7. **Agile Estimation & Planning**
8. **Scrum Master Role**
9. **Optional: Scaling Scrum**

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1

Inspection & Adaption

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Process Categories

- Table discussion:
  - What do you think the task should belong to?
  - Discuss why?
  - Think of planning, outcomes, who does the job, etc.

simple	complicated
complex	chaotic

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simple	complicated
complex	chaotic

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simple	complicated
complex	chaotic

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simple	complicated
complex	chaotic

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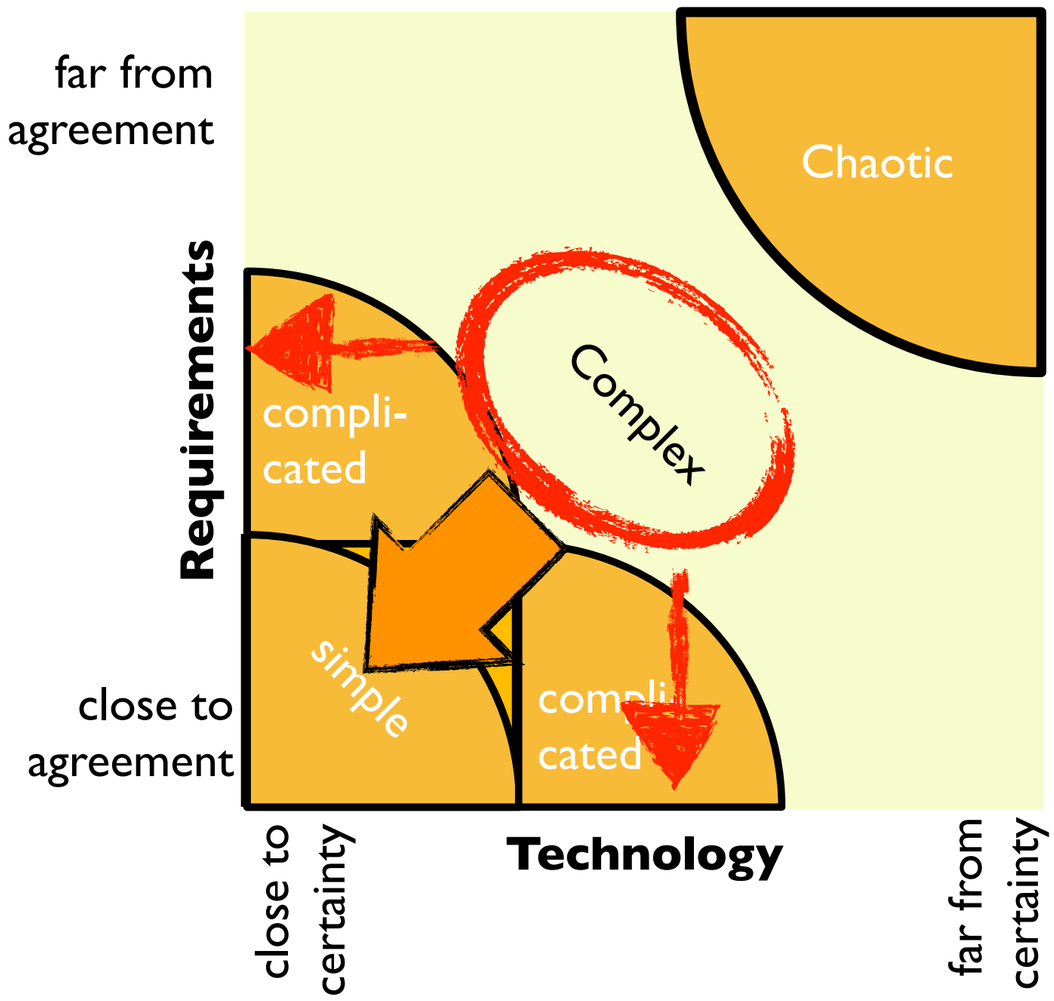
What about Software Development?



Source: „Strategic Management and Organizational Dynamics“ (1997) by Ralph Stacey, adapted in Agile Software Development with Scrum by Ken Schwaber and Mike Beedle (2002)

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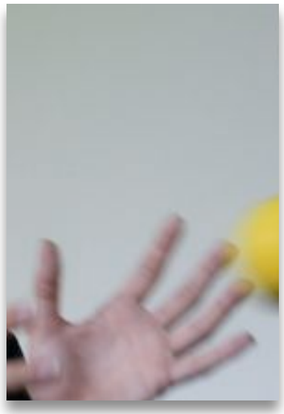
Ballpoint Game

- You are one large team, your goal is to collect as much „ball points“ as you can within a two-minute play
- A ball point is earned by the team when a particular ball has been touched by every team member
- But:
  - Balls must fly (have „air time“)
  - No passing to the „direct neighbor“ (left, right)
  - If a ball falls on the floor, it must remain there
  - No physical changes to the balls
- Gameplay is 2 minutes
- You need to estimate and count



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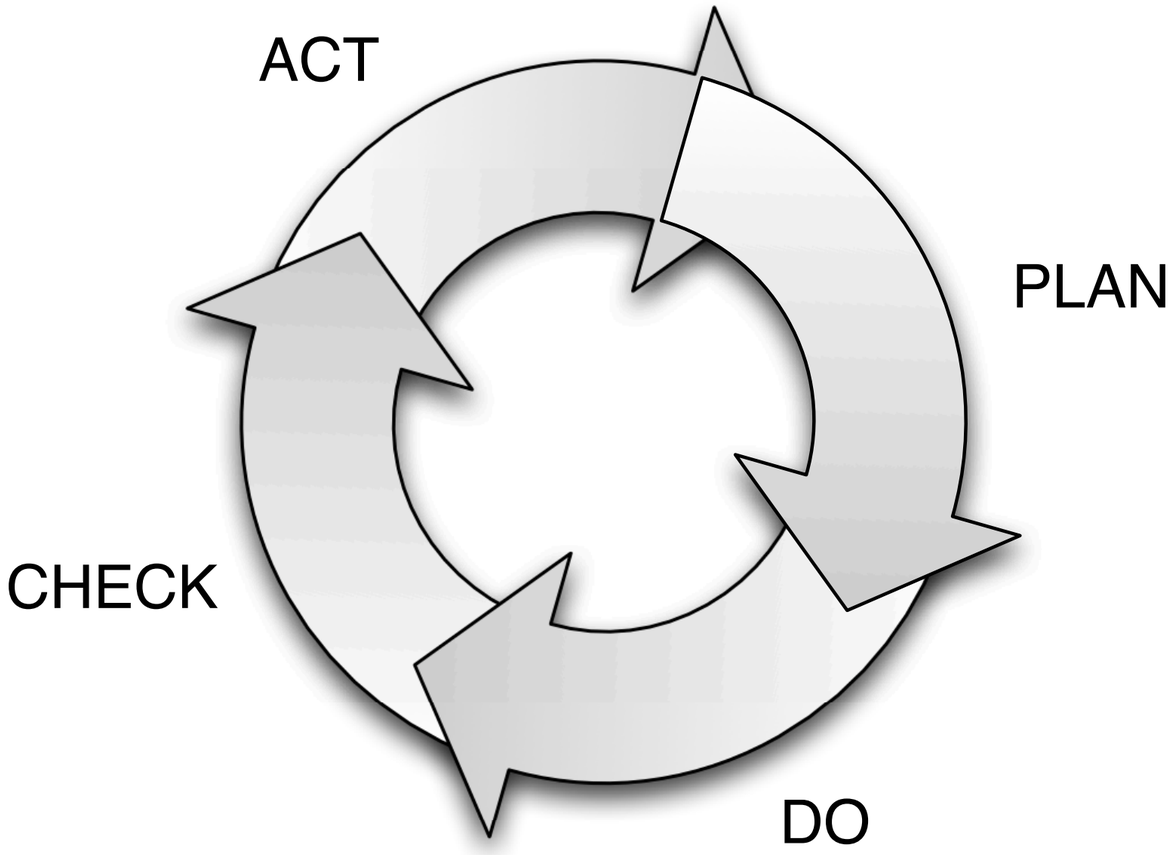
Deming Cycle



... is the core of Scrum.

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Agile Values & Principles

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Software Development Process

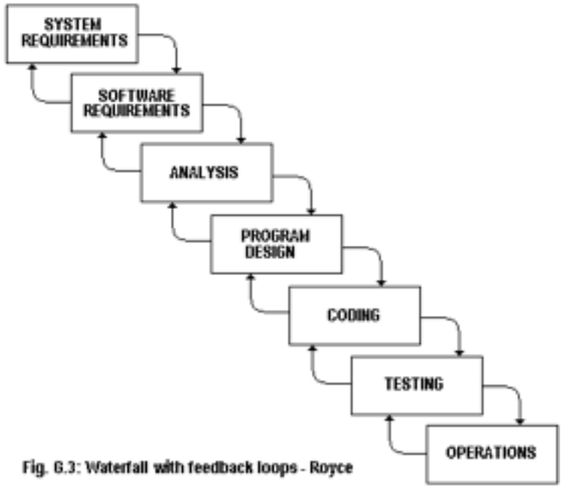
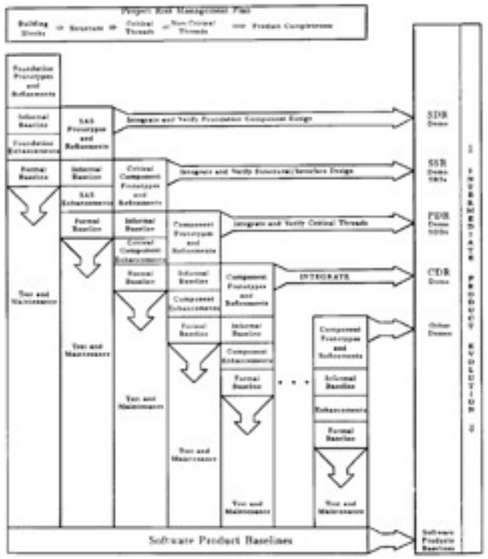
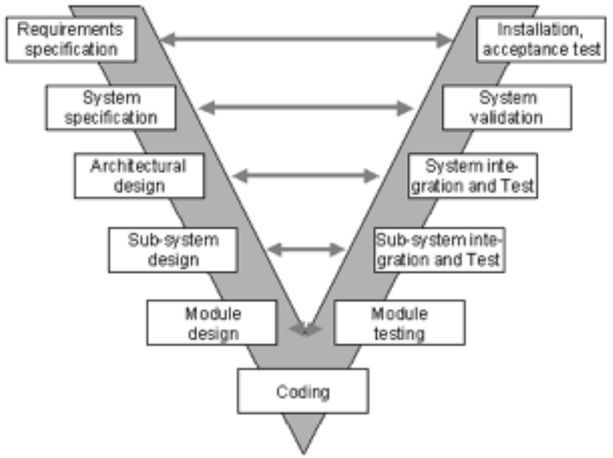
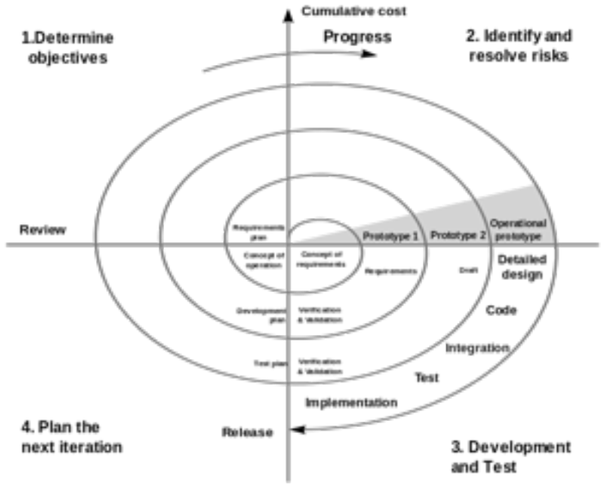
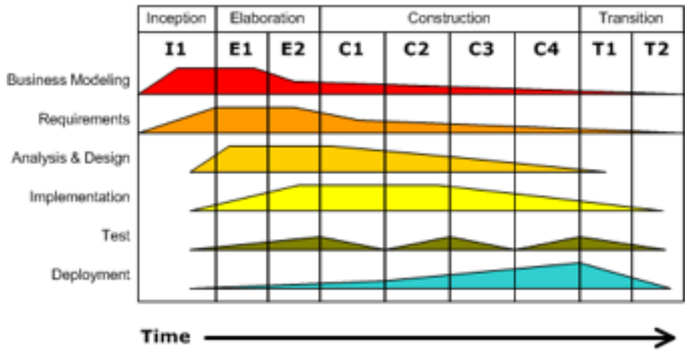


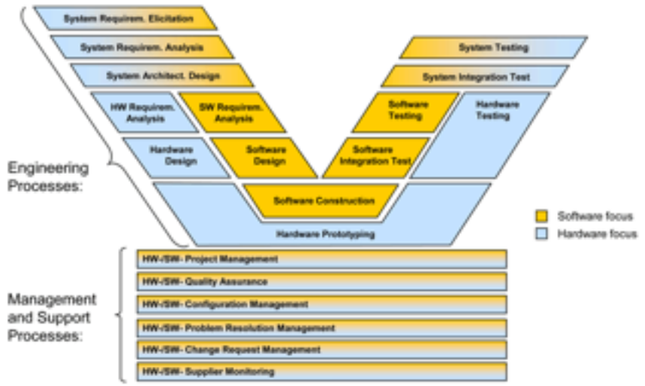
Fig. 6.3: Waterfall with feedback loops - Royce

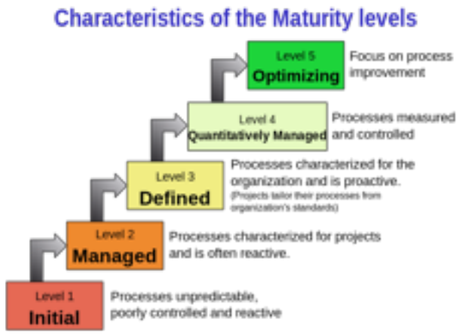


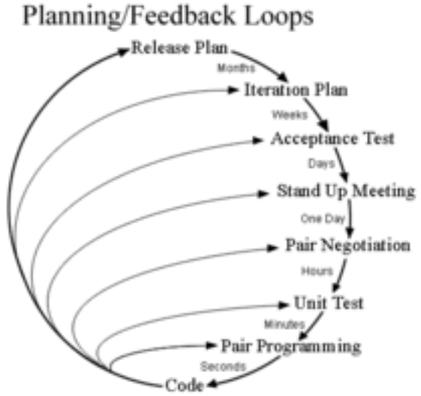












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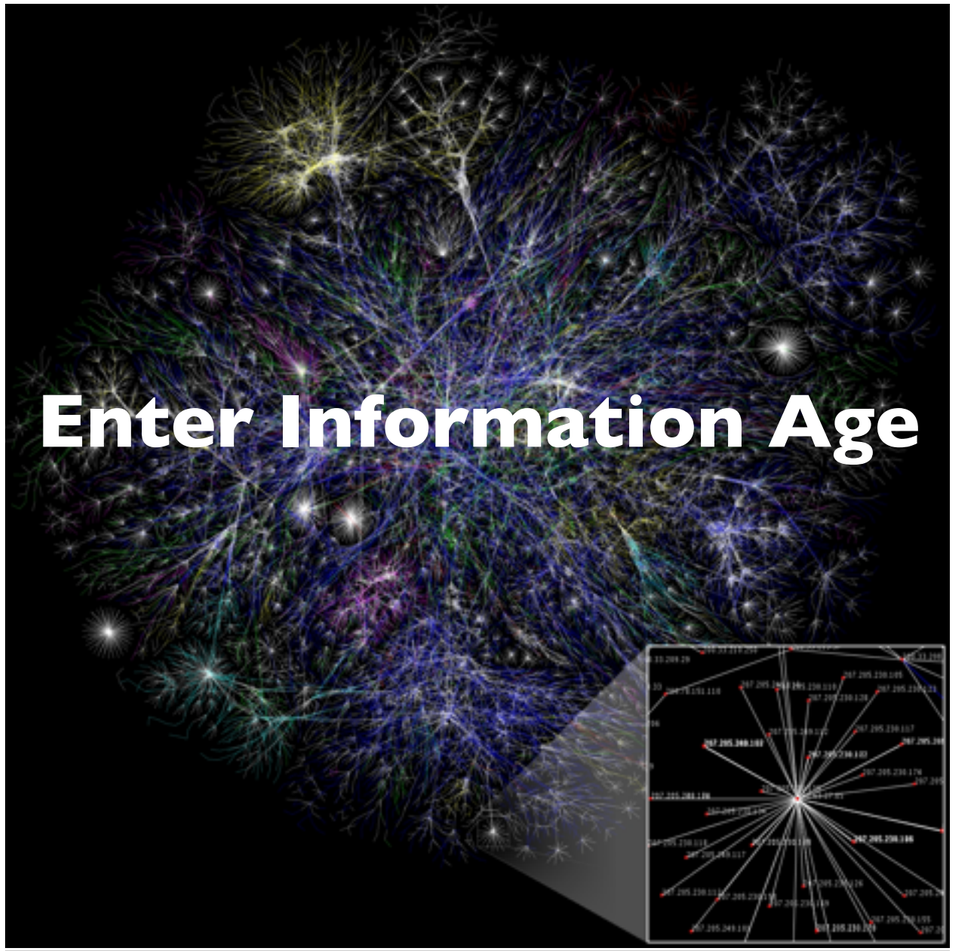
Leaving the Age of Industry...

Picture Source: Wikipedia, Public Domain, http://en.wikipedia.org/wiki/File:William_Bell_Scott_-_Iron_and_Coal.jpg



Picture Source: Wikipedia, CCA.2.5, http://en.wikipedia.org/wiki/File:Internet_map_1024.jpg

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The Agile Manifesto 2001

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

2

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

3

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

4

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

5

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

6

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

7

Working software is the primary measure of progress.

8

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

9

Continuous attention to technical excellence
and good design enhances agility.

10

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

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

12

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

The Agile Manifesto 2001

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

That is, while there is value in the items on the right, we value the items on the left more.

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3

The Scrum Roles

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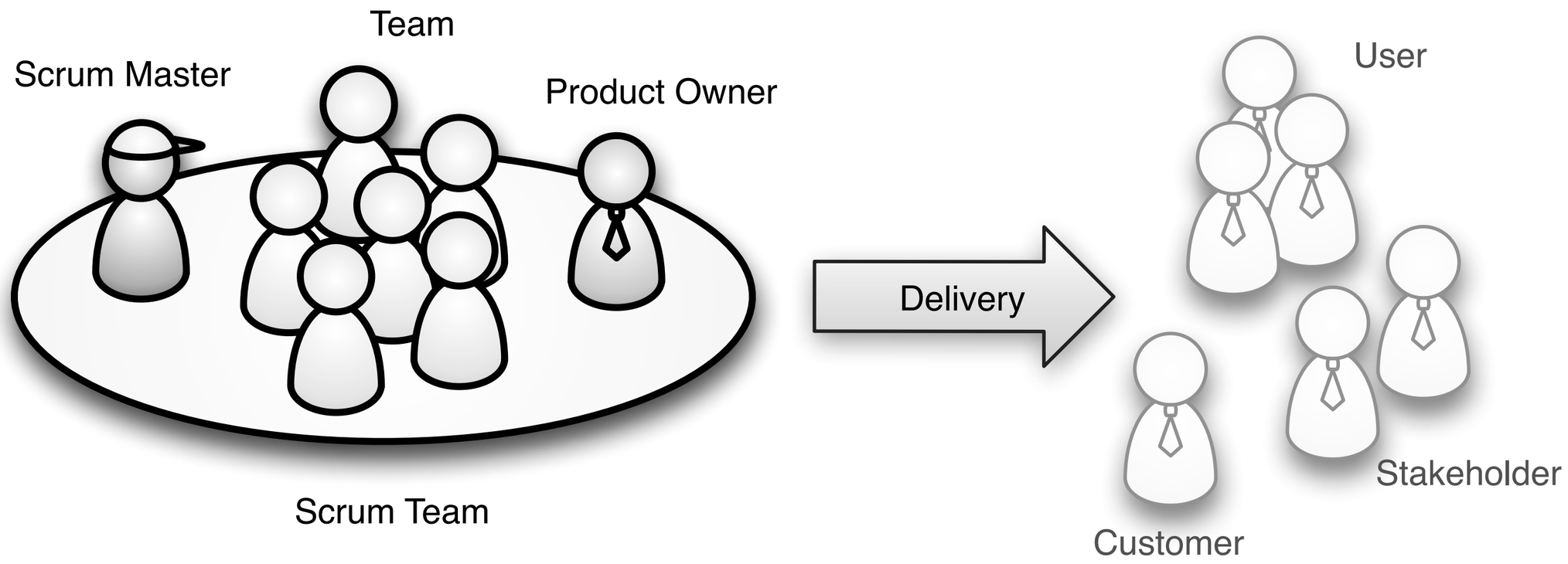
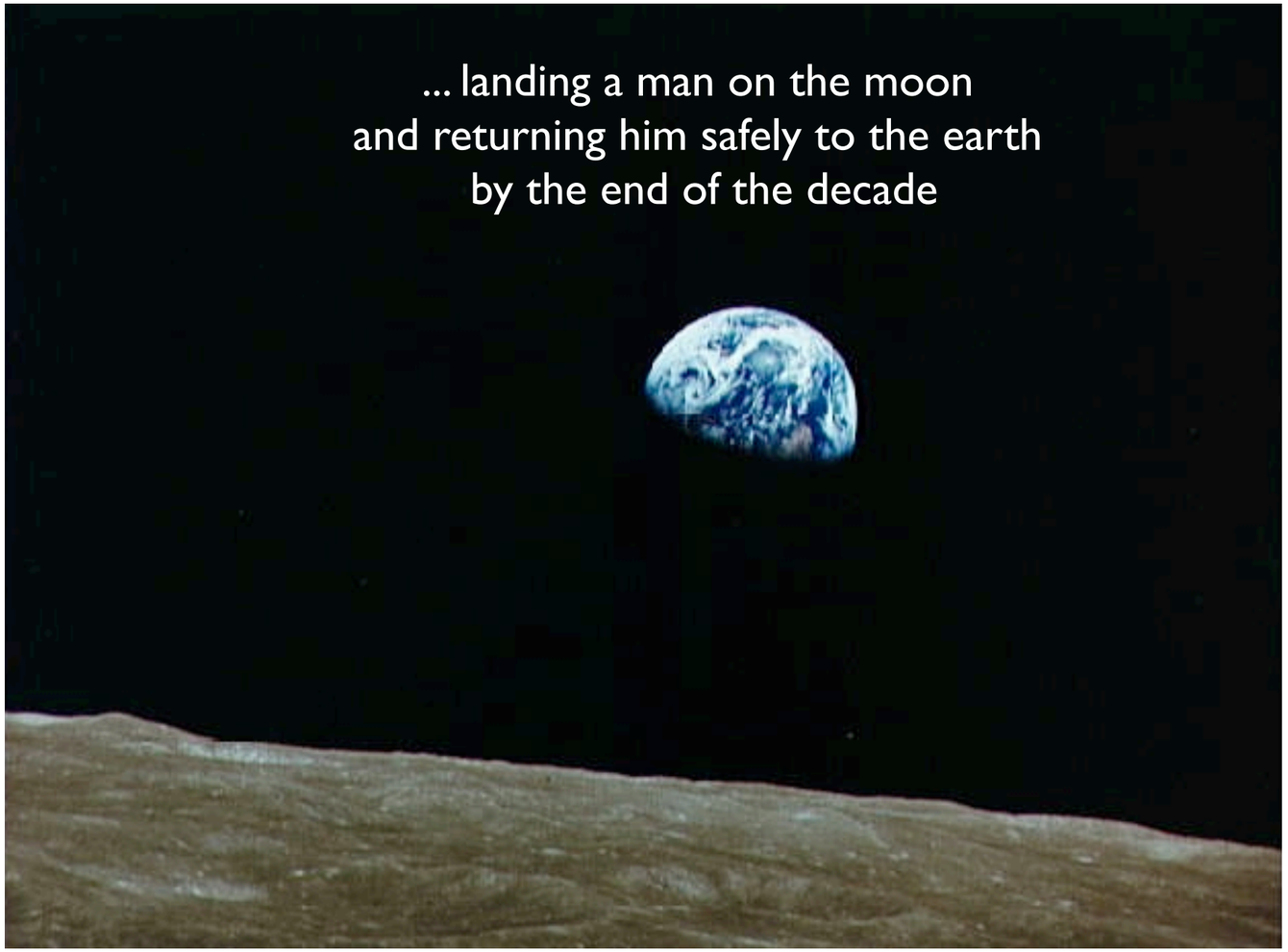
Scrum!


Team
Scrum Master
Product Owner
Scrum Team
Delivery
User
Stakeholder
Customer

Product Owner

Having a Vision



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Stakeholders' Concerns

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Knowing what to deliver

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Priority

- Business Value
- Technical Risk
- Customer Satisfaction
- Cost
- Cost of Delay
- Politics?

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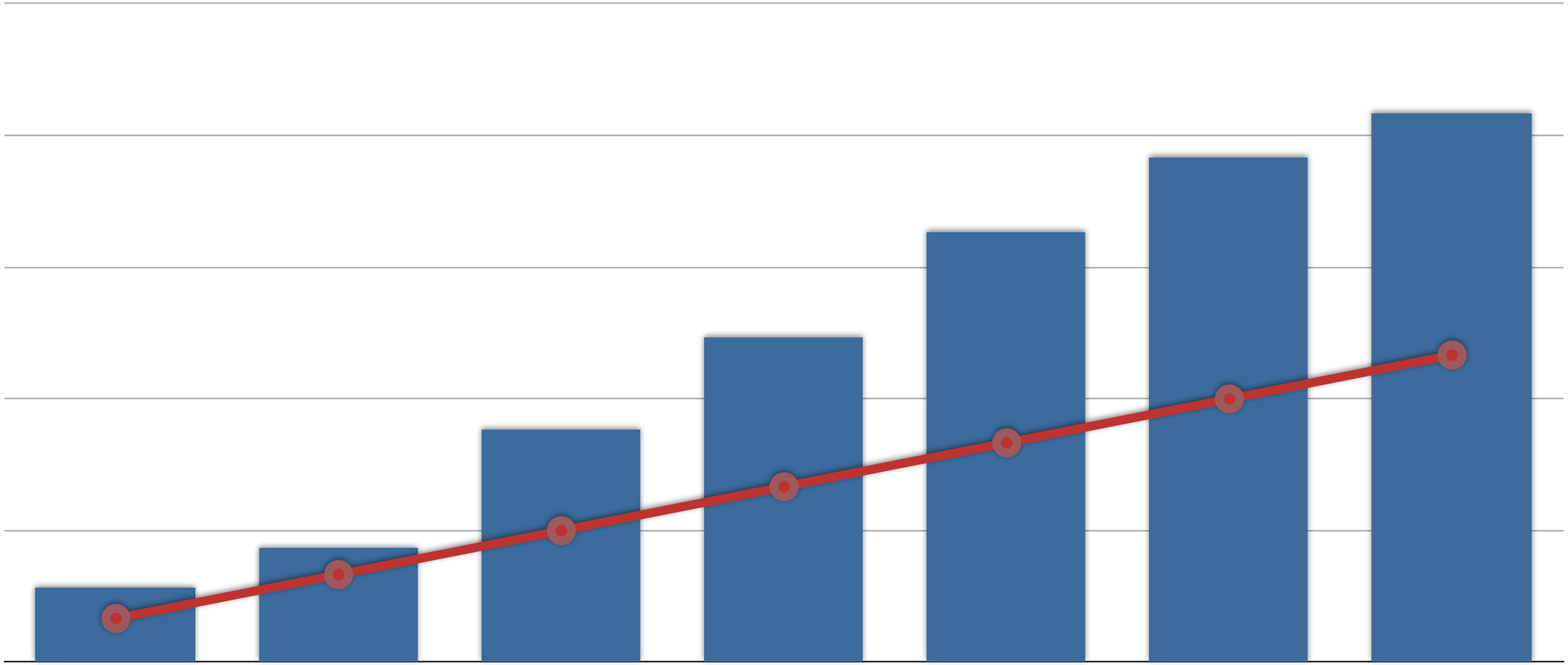
Return on Investment



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Maintain Product Backlog

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Enjoyable Pieces

Accept working results

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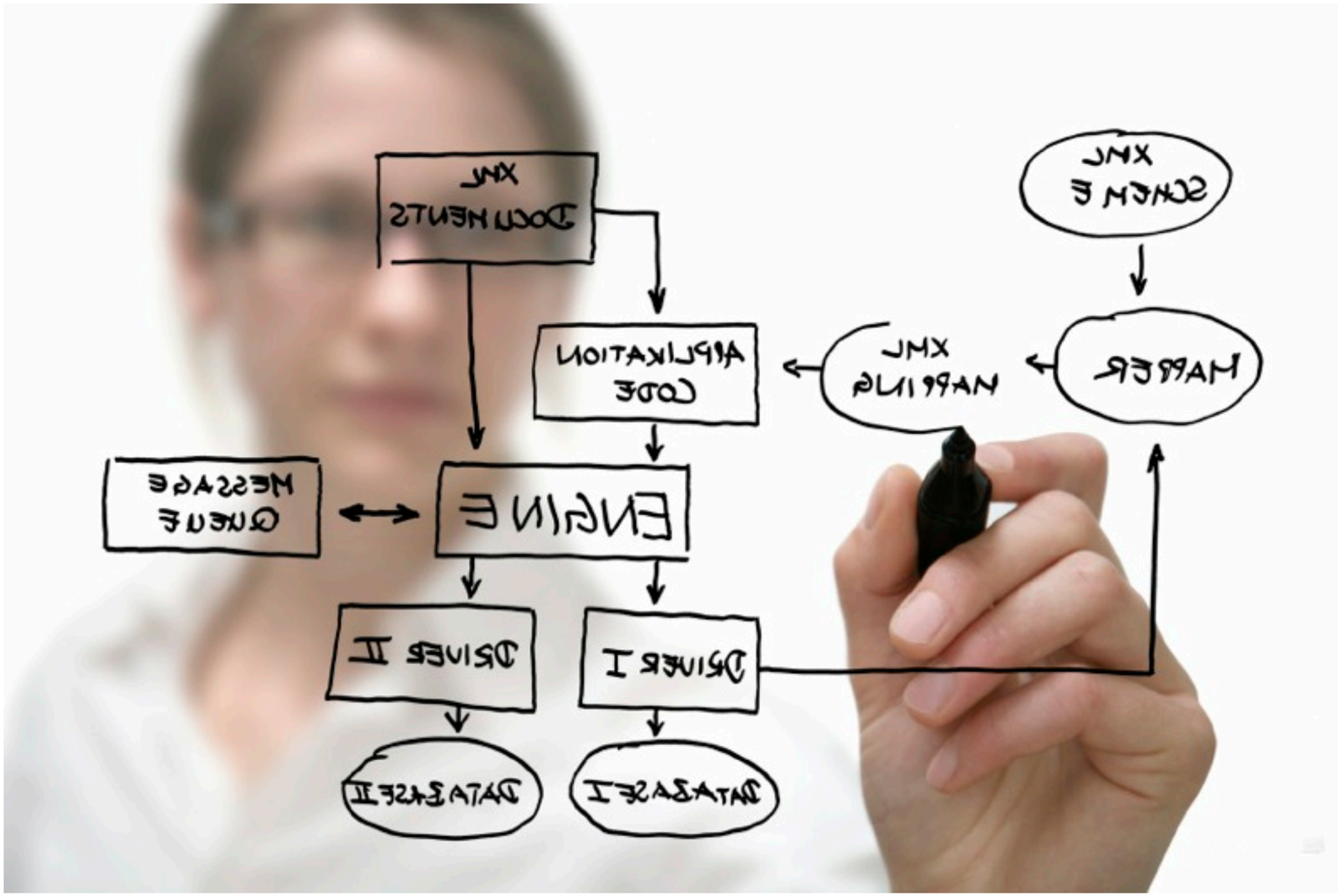
Planning releases

Development Team

Knowing how to deliver



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The Development Team

- Small: 7±2
- Full time
- Cross functional
- Self organizing
- Empowered, autonomous
- Co-located
- Accountable for delivery

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Delivers at the end of each sprint

- Sprint is a Time-Box
- Team Pulls Backlog Items
- Commits to sprint goal
- Plans work for the sprint
- Deliver, deliver, deliver!

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Establish a sustainable pace

- Scrum maximizes team productivity
- Ongoing overcommitments are a problem
- Quality will not be negotiated
- If you do death marches and Scrum, you will end up doing 30-day death marches

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No changes during a sprint!

- Team **commits** to sprint goal, so we do not
  - change the team
  - disturb the team
  - allocate team members with other work

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Scrum Master

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Team Coach

- Ensures the team is completely functional and productive
- helps the team to organize its work
- Leads through conflicts
- Fosters the team on continuous improvement
- Creates Transparency
- Moderator, Trainer, Mentor, Mediator

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Protects the team

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Removes Impediments

- „Scrum *reduces* the transformation of requirements into working software from many months to 2 to 4 weeks...“
- Underlying problems and organizational boundaries will become *highly visible*!

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Picture Source: Todd Huffman, Flickr

Helps the team become self-organizing

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Not the team's manager

- but a leader
- and a facilitator
- Takes care of the team
- Takes care of the process
- Makes sure agile ideas are understood and respected by all stakeholders, PO and organization
- Agent for change

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Concept Centers

- Create three tables, one for each Scrum role
  - Each table group distributes role cards accordingly
  - Walk around and discuss with your peers
- Discuss in table groups and then report back:
  - What happens to the classical project management responsibilities in Scrum?
  - Do we need a project manager as well?
- Open Discussion
  - Questions?
  - Roles with multiple Hats?

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Why Multitasking is bad

- Prepare a pen and a pad, we need one person volunteering for time taking
- We are doing three projects A, B, C
  - Version (1) with multitasking
  - Version (2) in sequential order
- Please write down the following text of the three projects (1) alternating and (2) in sequence.
- When done raise your hand.

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A 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

B a, b, c, d, e, f, g, h, i, j, k

C I, II, III, IV,V,VI,VII,VIII, IX, X, XI

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Where is the Project Manager?

- Discuss in small groups and then report back:
  - What happens to the classical project management responsibilities in Scrum?
  - Do we need a project manager as well?

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4

The Scrum Framework

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Transparency

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Feedback - early & frequent

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Picture Source: Beep., Flickr

Rules & Values

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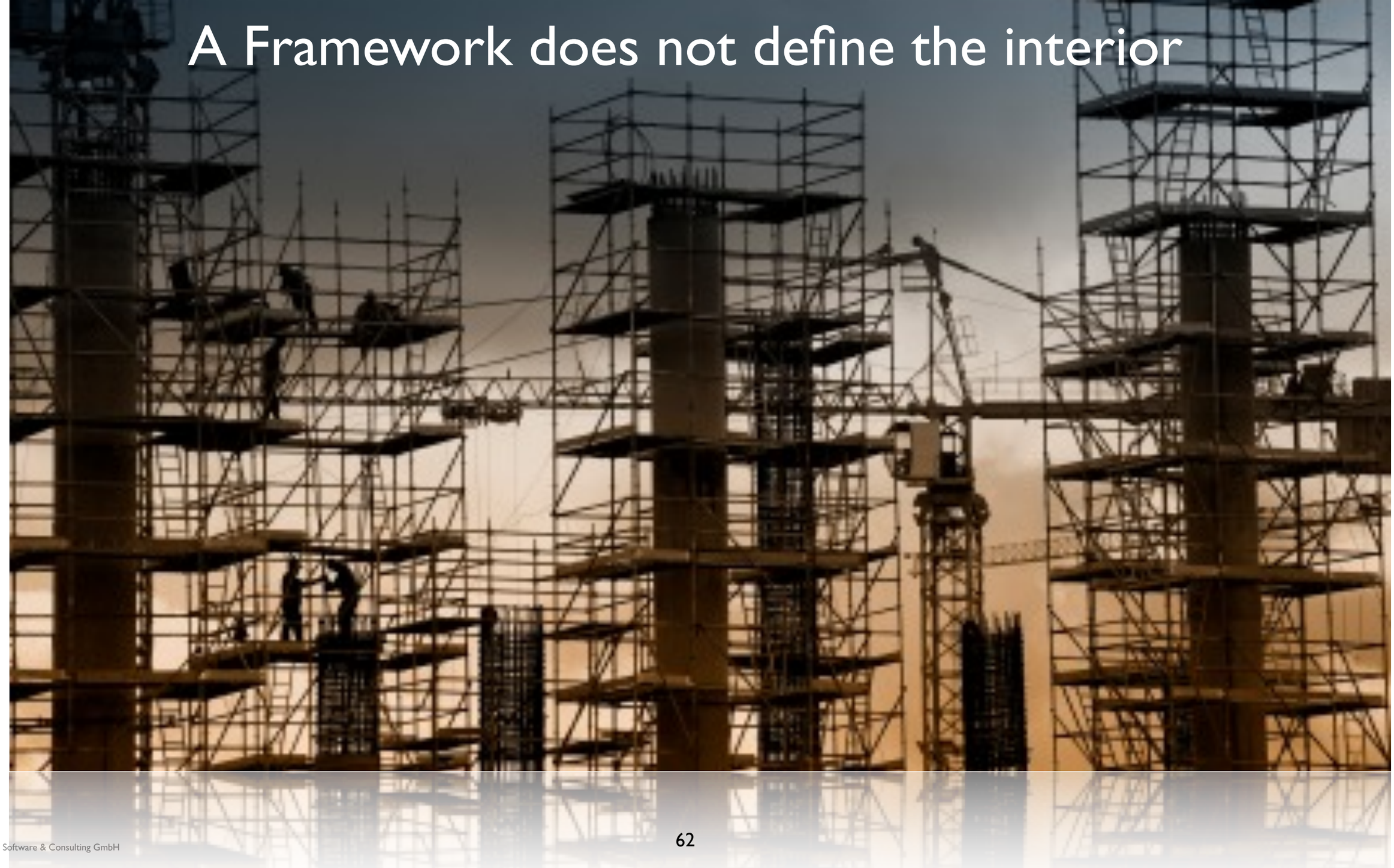
A Framework does not define the interior



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Scrum is a mirror

The purpose of Scrum is to highlight bottlenecks so the organization can fix it. That problems become visible through the compression of the actual development process from concept to working software into a short timebox called “Sprint”.

Scrum does not fix the problems!

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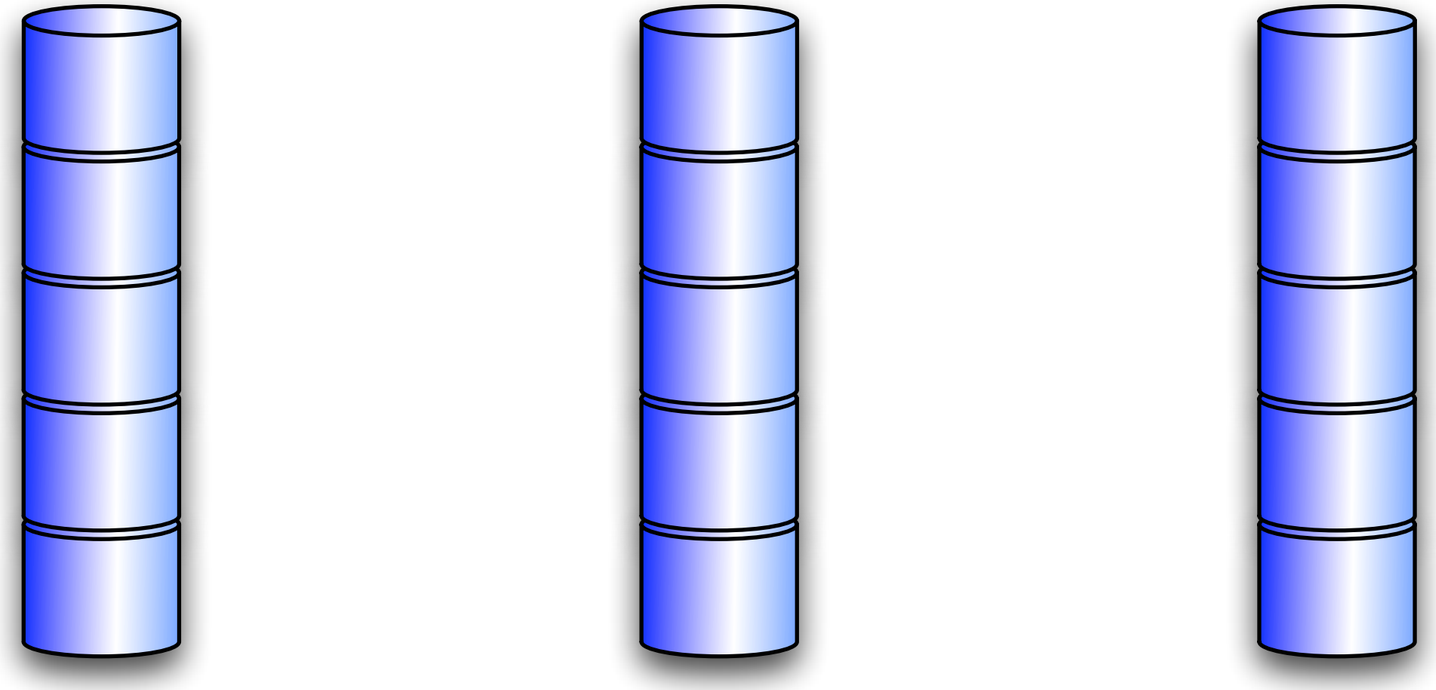
Three Pillars build the basement



Transparency Inspection Adaption

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Scrum Framework

- 3 Roles (Product Owner, Scrum Master, Development Team)
- 5 Ceremonies (Sprint Planning, Daily Scrum, Sprint Review, Sprint Retrospective, the Sprint itself)
- 3 Artifacts (Product Backlog, Sprint Backlog, Shippable Product Increment)

...based on the mechanisms of transparency, inspection and adaption.

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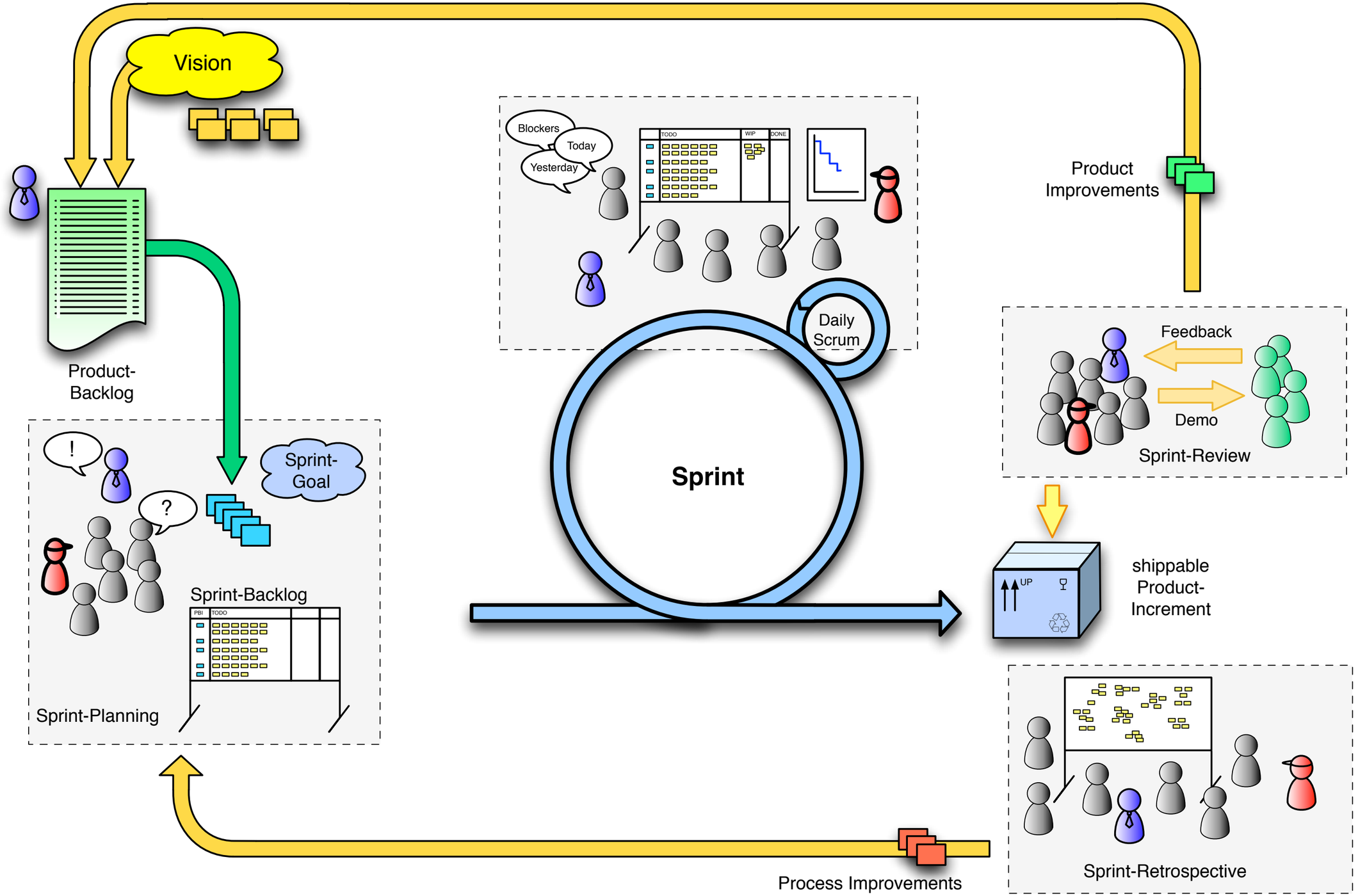
Vision
Product-
Backlog
Blockers
Today
Yesterday
TODO
WIP
DONE
Daily
Scrum
Sprint
Product
Improvements
Feedback
Demo
Sprint-Review
!
?
Sprint-
Goal
Sprint-Backlog
PBI
TODO
Sprint-Planning
UP
shippable
Product-
Increment
Sprint-Retrospective
Process Improvements

Here's how ...

- Scrum will change your organization and the way you do work.

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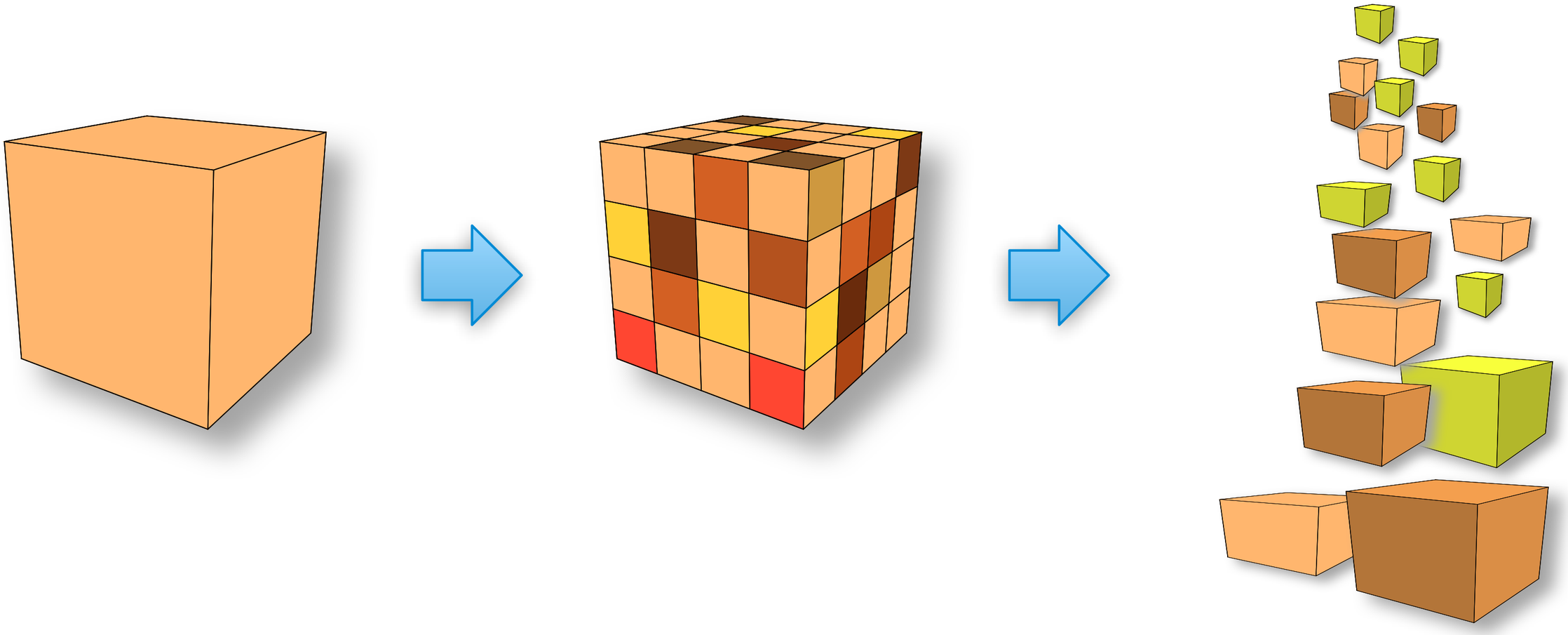
Split work into small deliverables



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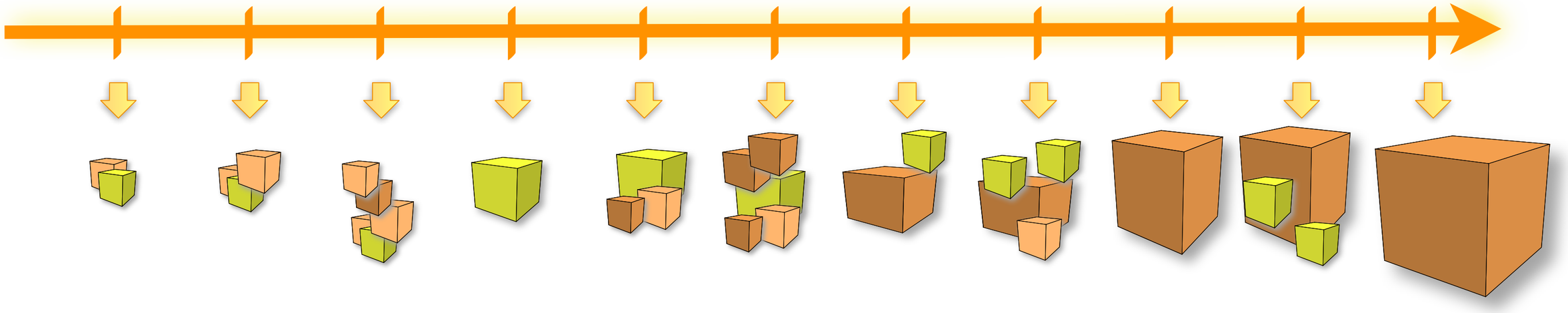
Split your Time
into short iterations of fixed length



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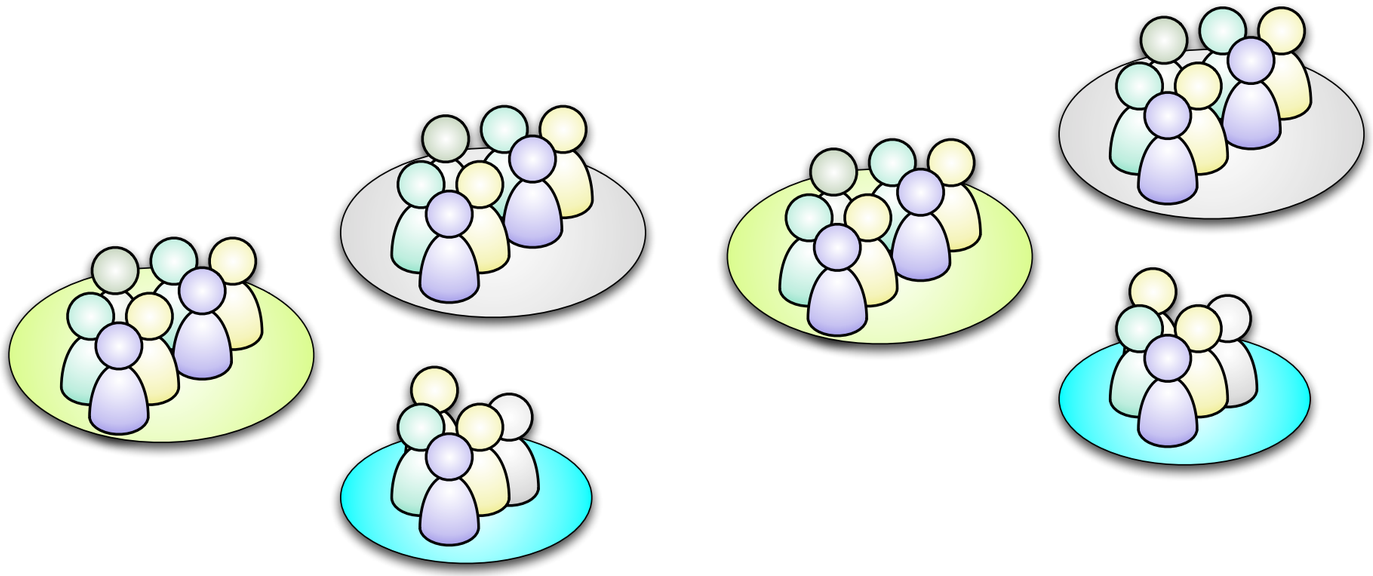
Split your Organisation into small, self-organising Teams



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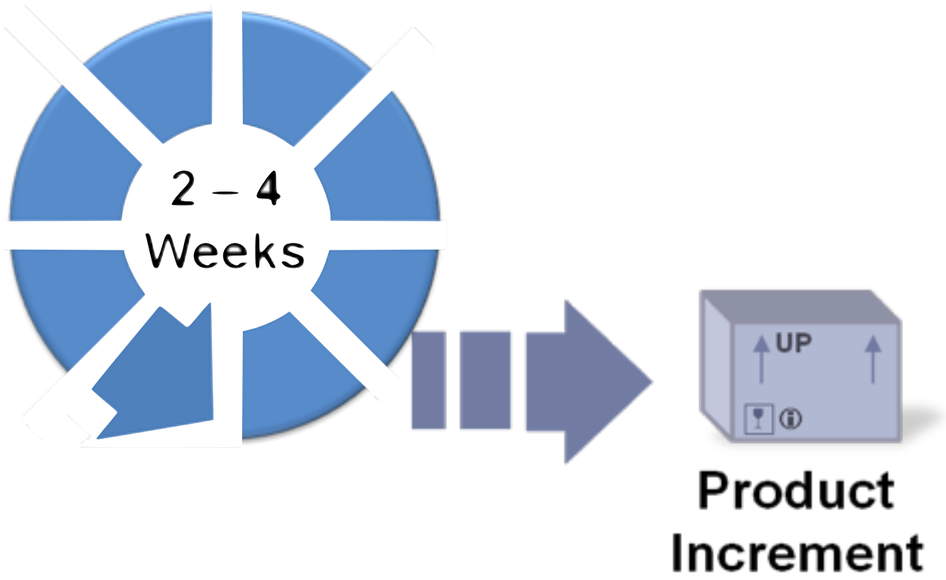
Sprints

- Timeboxed
- No disturbances allowed
- Shippable product increment
  - fully implemented
  - tested and free of known issues
  - integrated and deployed on production near environment



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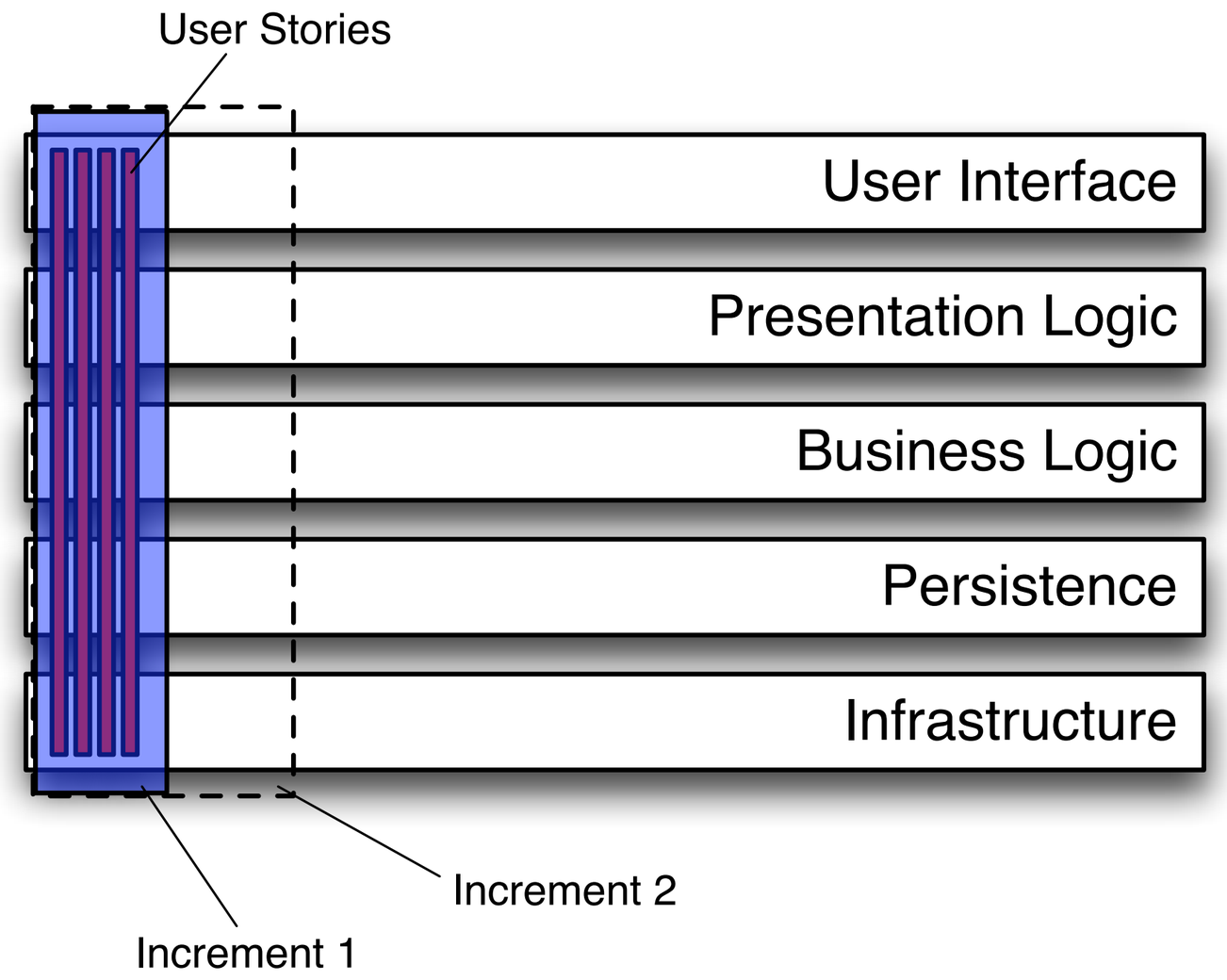
Increments are vertical



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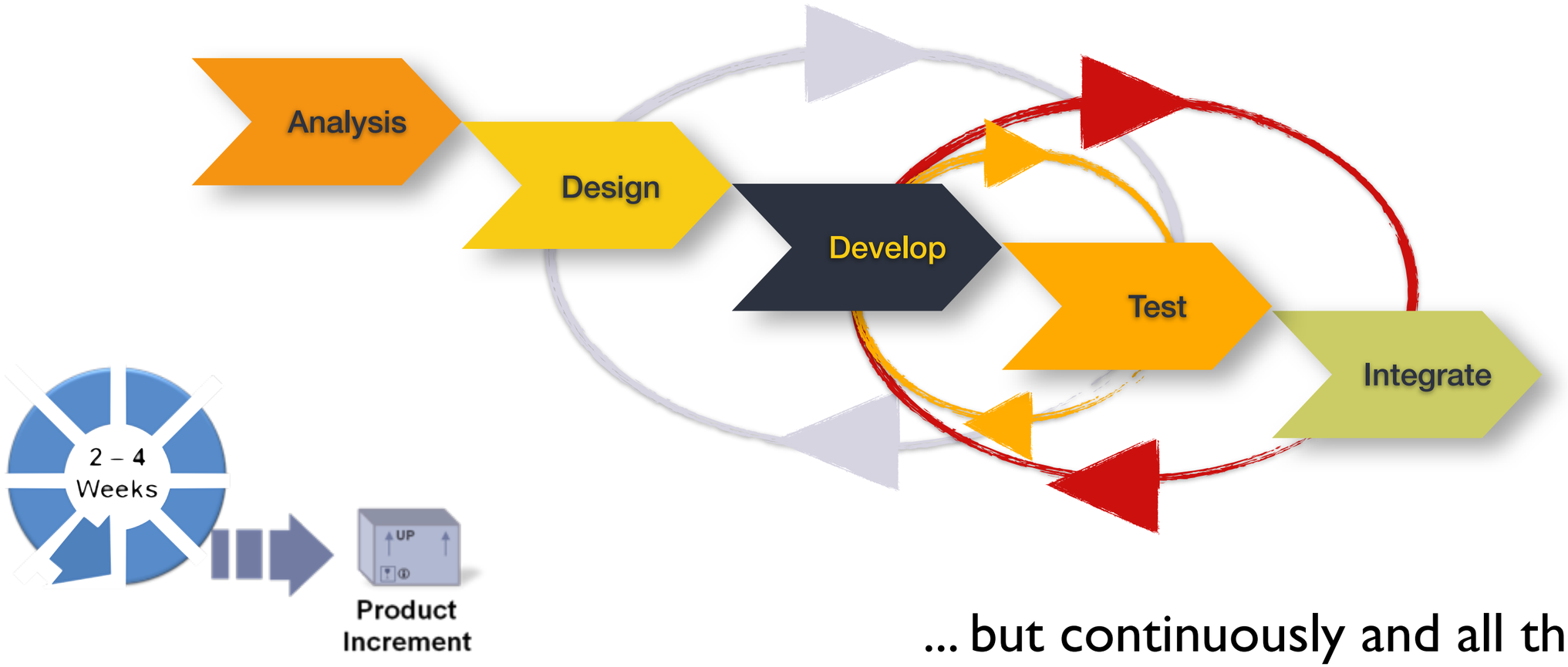
All classic activities are done during a sprint ...



... but continuously and all the time
(not as mini-waterfall)

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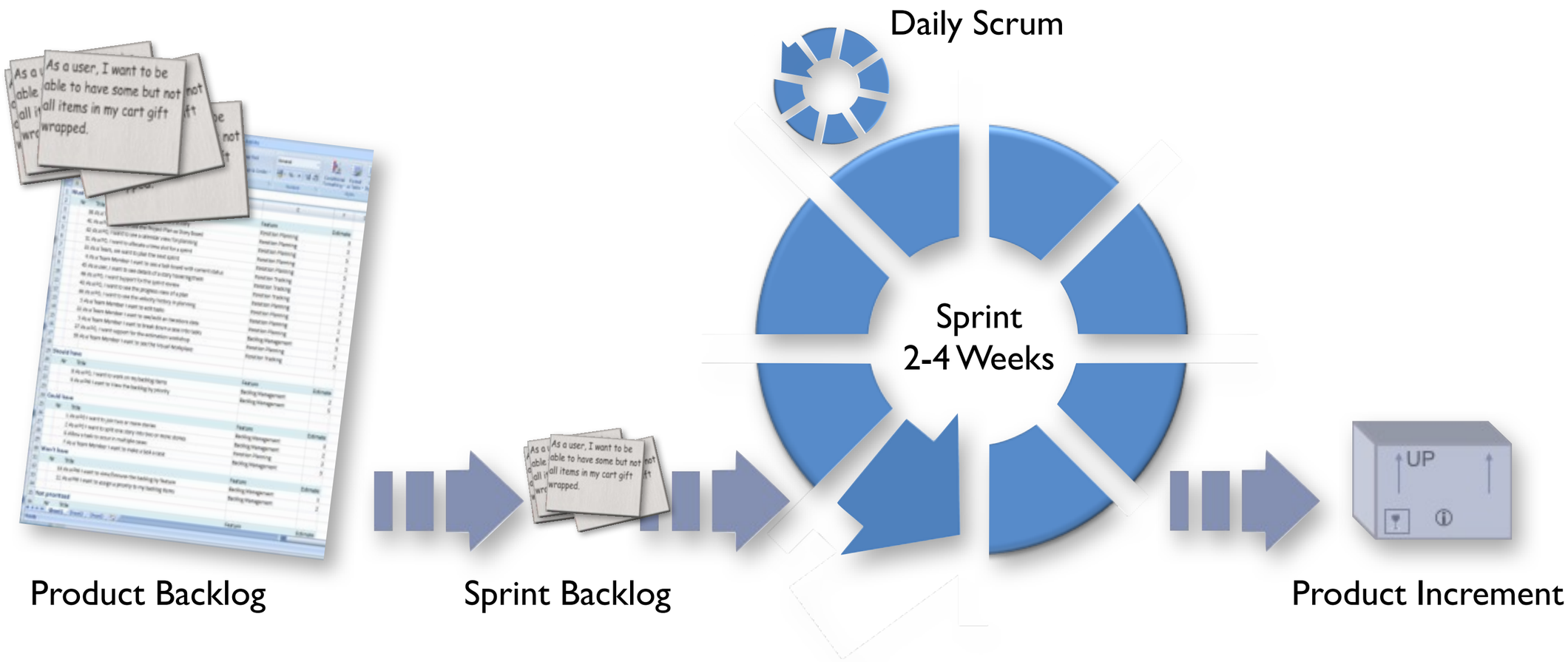
Scrum Process



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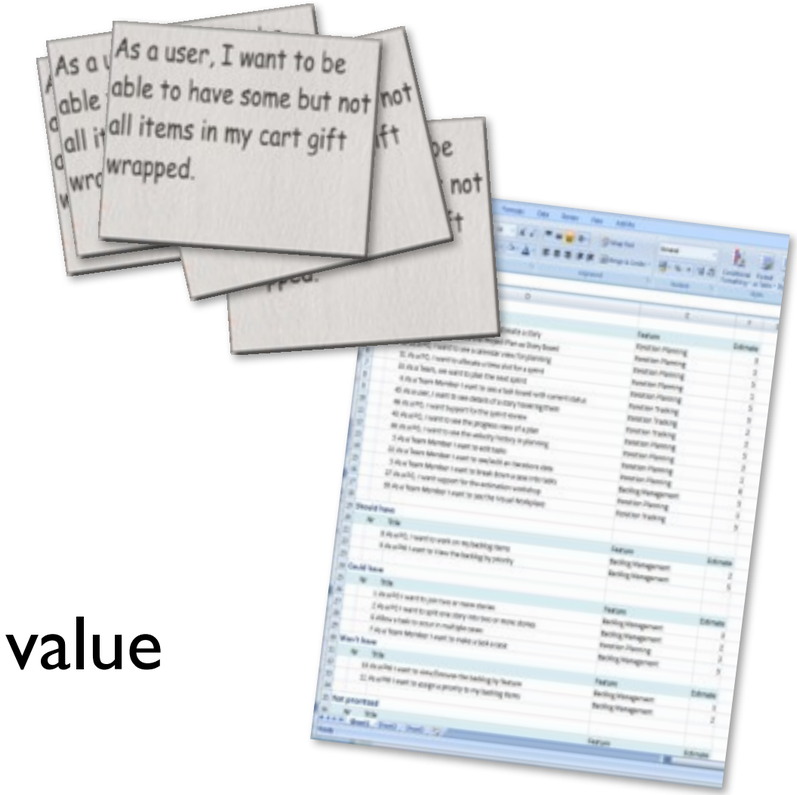
Product Backlog

- Sorted list of requiremens, items to be delivered
- ... of features, or better: deliverables
- Commonly used „User Stories“
- Sorted (prioritized) manly by business value



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Sprint Backlog

- Pull principle: Highest priorities goes first
- The development team
  - plans, selects, clarifies, commits
- *They determine how much they do!*
- Requirements will not change, though shades of grey will change - we need an understood level of defined requirements (we'll discuss that later)

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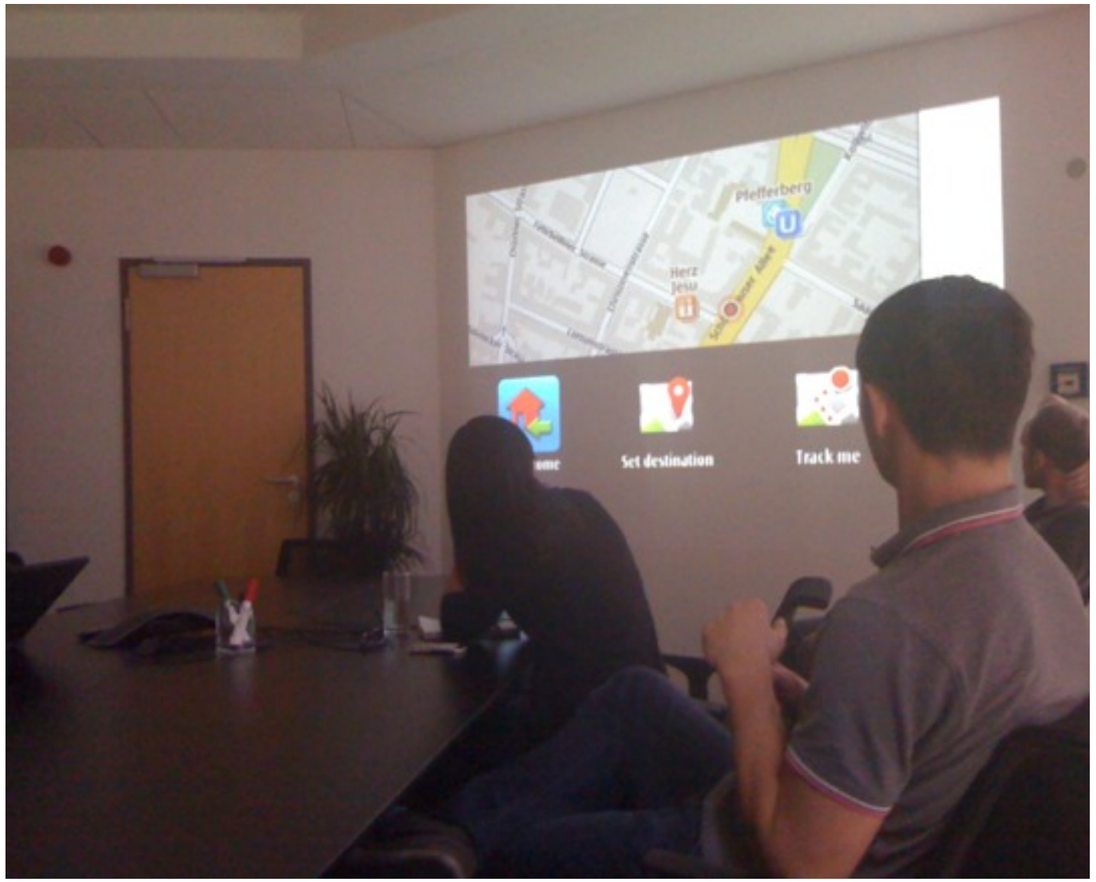
Working Software is demonstrated at the end

- Purpose: We get Feedback at the end of the sprint (early and frequent)
- We show only working features
- Features that are entirely „Done“
- Shippable Product Increment



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Scrum - The New New Product Development Game

"The… 'relay race' approach to product development…may conflict with the goals of maximum speed and flexibility. Instead a holistic or 'rugby' approach—where a team tries to go the distance as a unit, passing the ball back and forth—may better serve today's competitive requirements."

- „Wicked Problems, Righteous Solutions" (DeGrace/Stahl), 1990
- DuPont, Ken Schwaber

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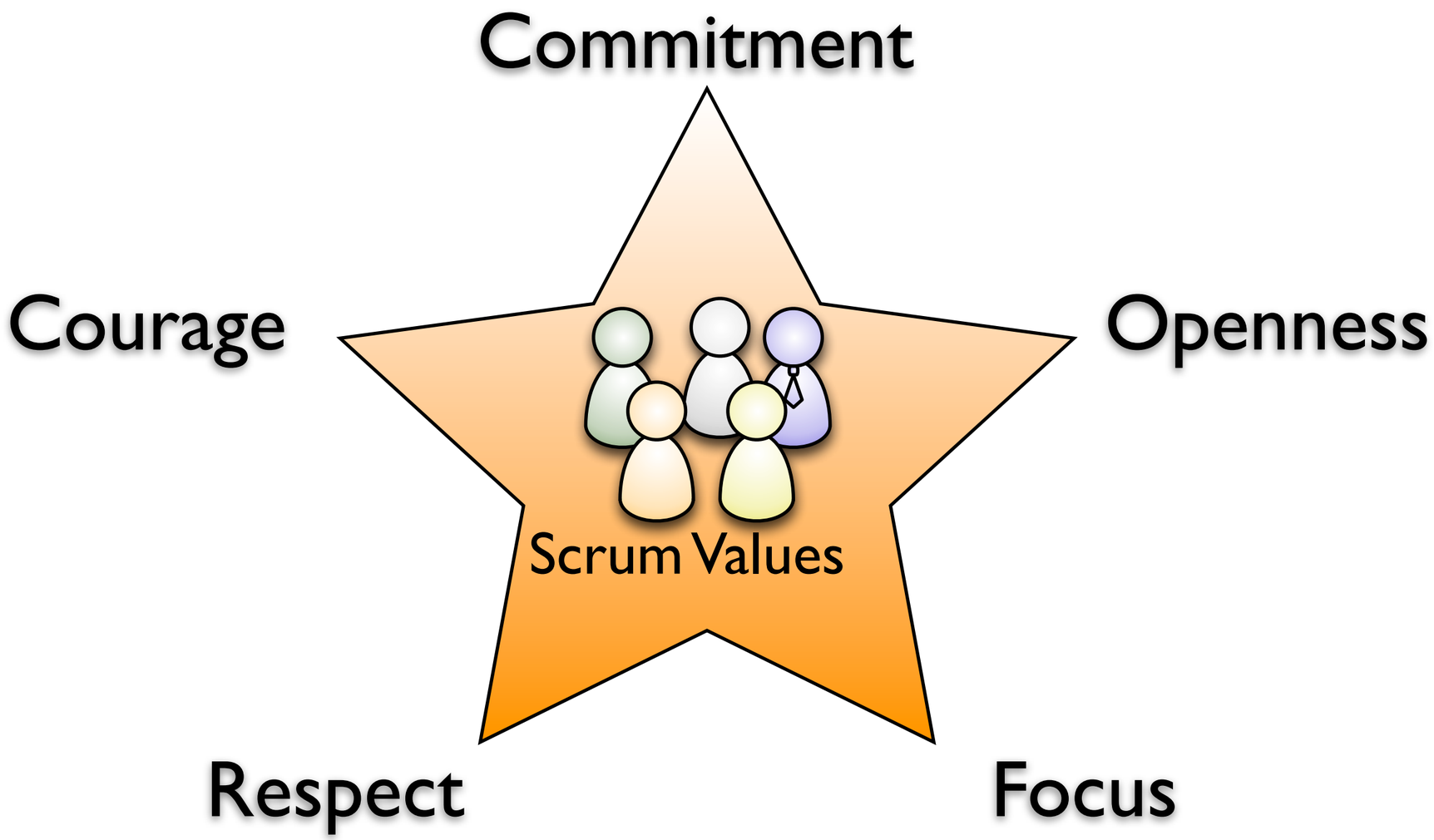

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What do the Scrum Values mean to you?

- For each of the five Scrum Values
  - explain what they mean to you
  - and how you already "live" them

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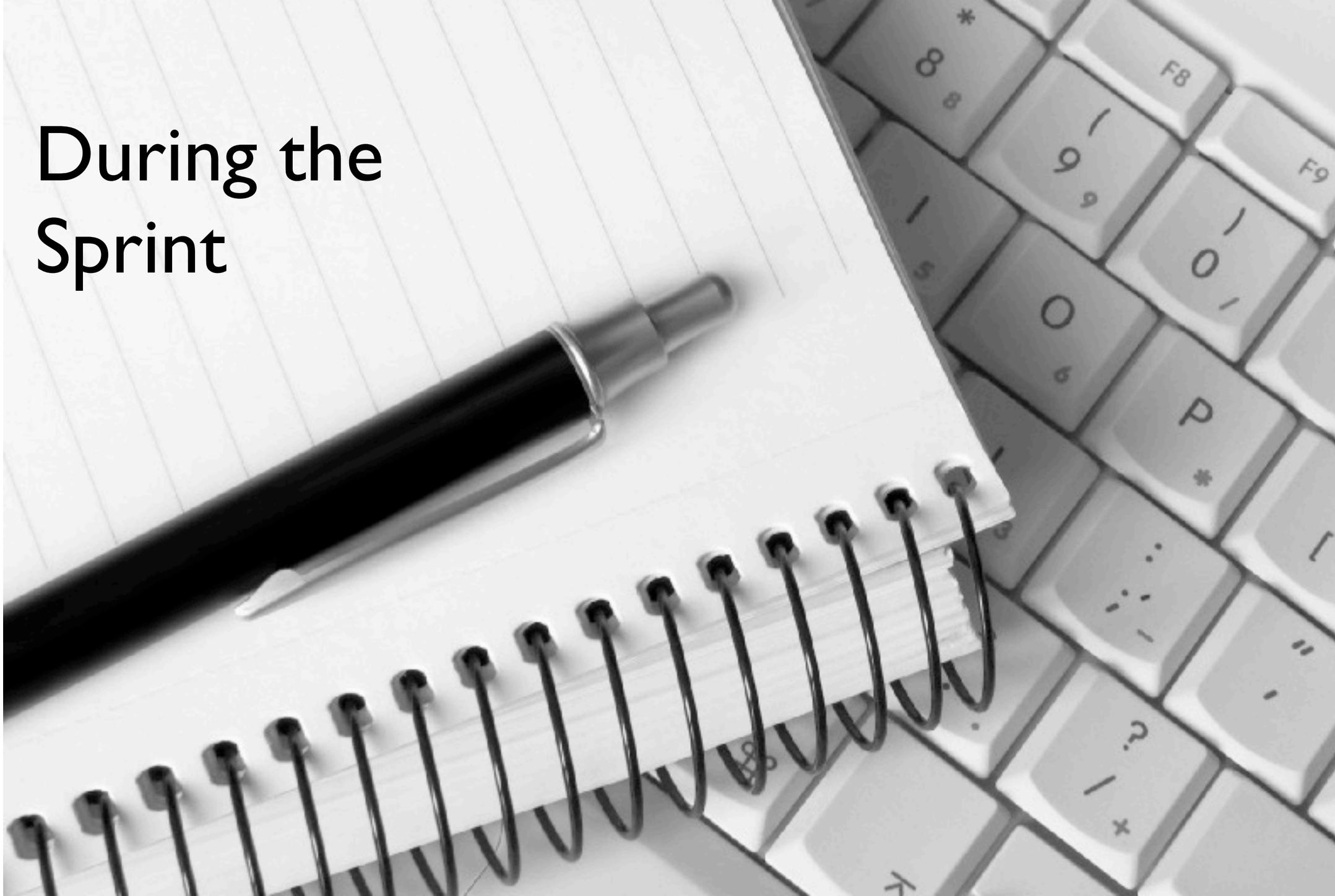
5

During the Sprint



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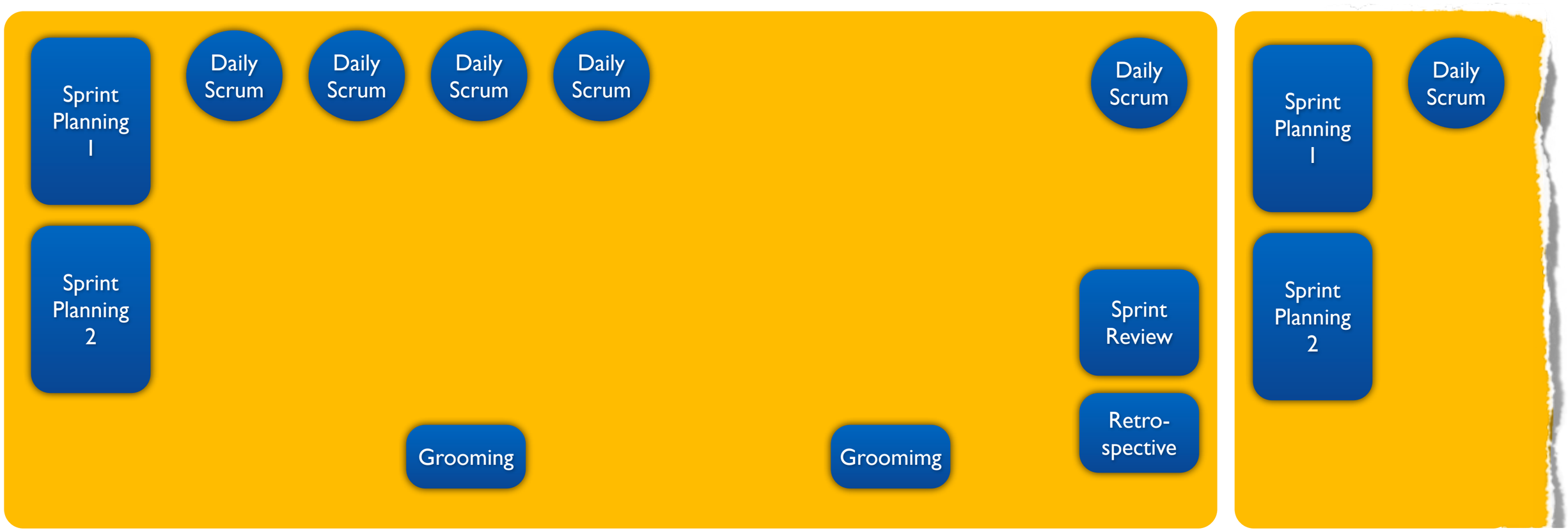
Running a sprint



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Before we start a Sprint

- DEEP Backlog
- Definition of Ready
- Definition of Done
- Team Availability

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Definition of Ready

- When are requirements clear enough so they can be taken into the sprint?

Less than 13 SP
Clear AC
No open questions
INVEST
...

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Definition of Done

- What are common attributes of a User Story to be considered done?
- Are there additionally items for Increments?

Fully implemented
All AC fulfilled
Unit tested
No known issues
...

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Team Availability

	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri
Alice		X								
Eve					X					X
Carol		X	X							
Dave						X	X	X	X	X
Eve										

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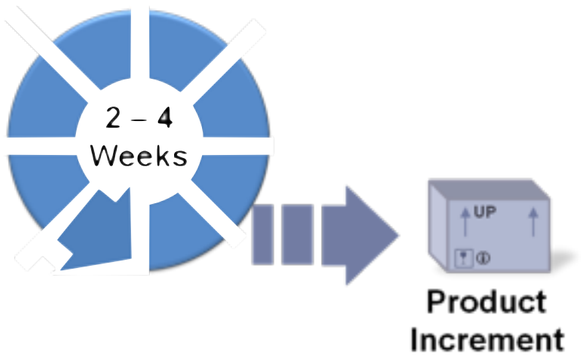
Sprint Planning I

1. Define Sprint Goal
2. Discuss and pull User Stories into Sprint Backlog
3. Continue with 2 until Sprint Backlog is full
4. Commit to Sprint Goal

WHAT

Sprint Goal

- Describes the shippable product increment
- More than just the sum of all User Stories
- Usually a functional goal



The end-to-end workflow for creating a new customer is finished.

... the average response time of the important sites is significantly reduced.

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Discussing the details

- Team pulls top priority User Story from Product Backlog into Sprint Backlog and discusses with PO
  - Acceptance Criteria
  - User Interface (e.g. Mock-Ups)
  - data needed
  - workflow, business rules
  - demonstration
  - non-functional aspects
  - ...

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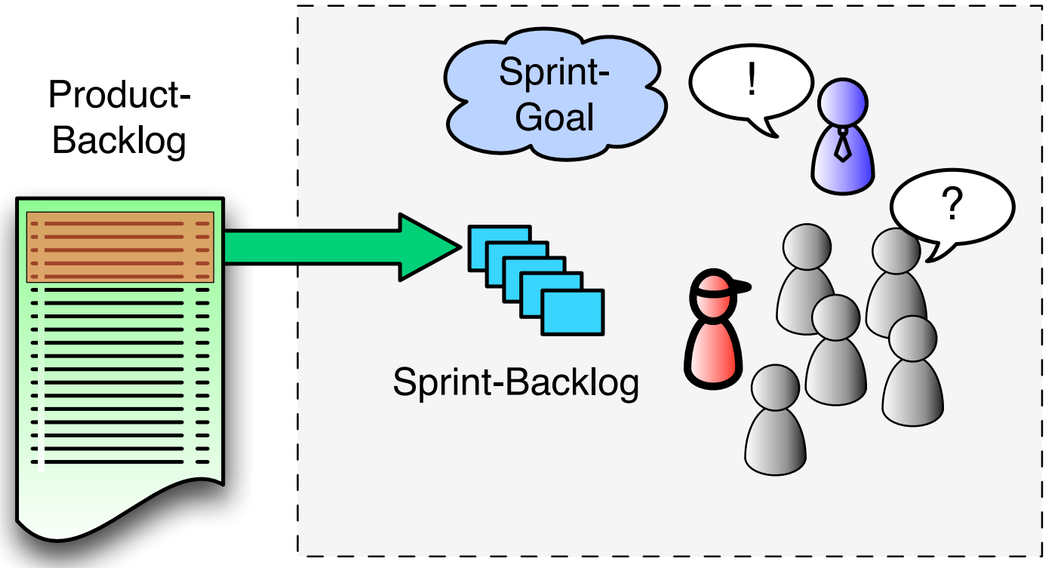
Sprint Backlog

- Team pulls until sprint is full
  - Gut feeling
  - velocity / availability
- Discuss Sprint Goal
- Commitment/Forecast



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Defects / unfinished work

- Defects: Showstopper vs. nice-to-have
  - Plan known issues - less time for new Stories
  - Similar with maintenance, support, ...
- Reserve fixed capacities
- Goal: 0 known defects

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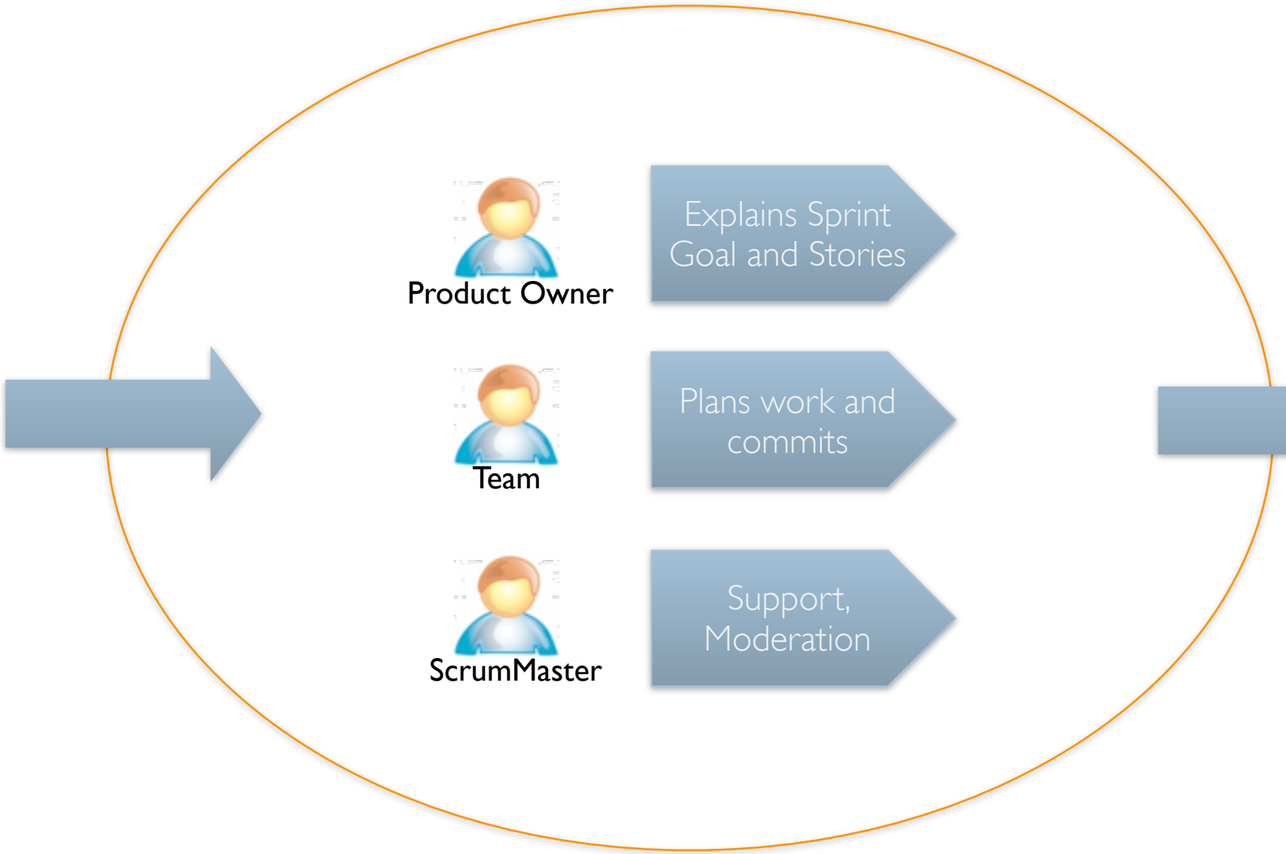
Sprint Planning overview

Sprint Goal

Backlog
Top-Elements

Techn. Documents



Committed Sprint Goal

Committed Sprint Backlog

1h / sprint week

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Sprint Planning II

- Create a plan: how to deliver product increment
  - Rough Architecture
  - Design decisions
  - Identify tasks the team needs to do

HOW

Create a rough design

- Identify components and interfaces
- Identify dependencies
- Which external systems have to be integrated / used?
- What data do we need? Where do they come from?
- What architectural patterns can be applied?
- How do we test things?

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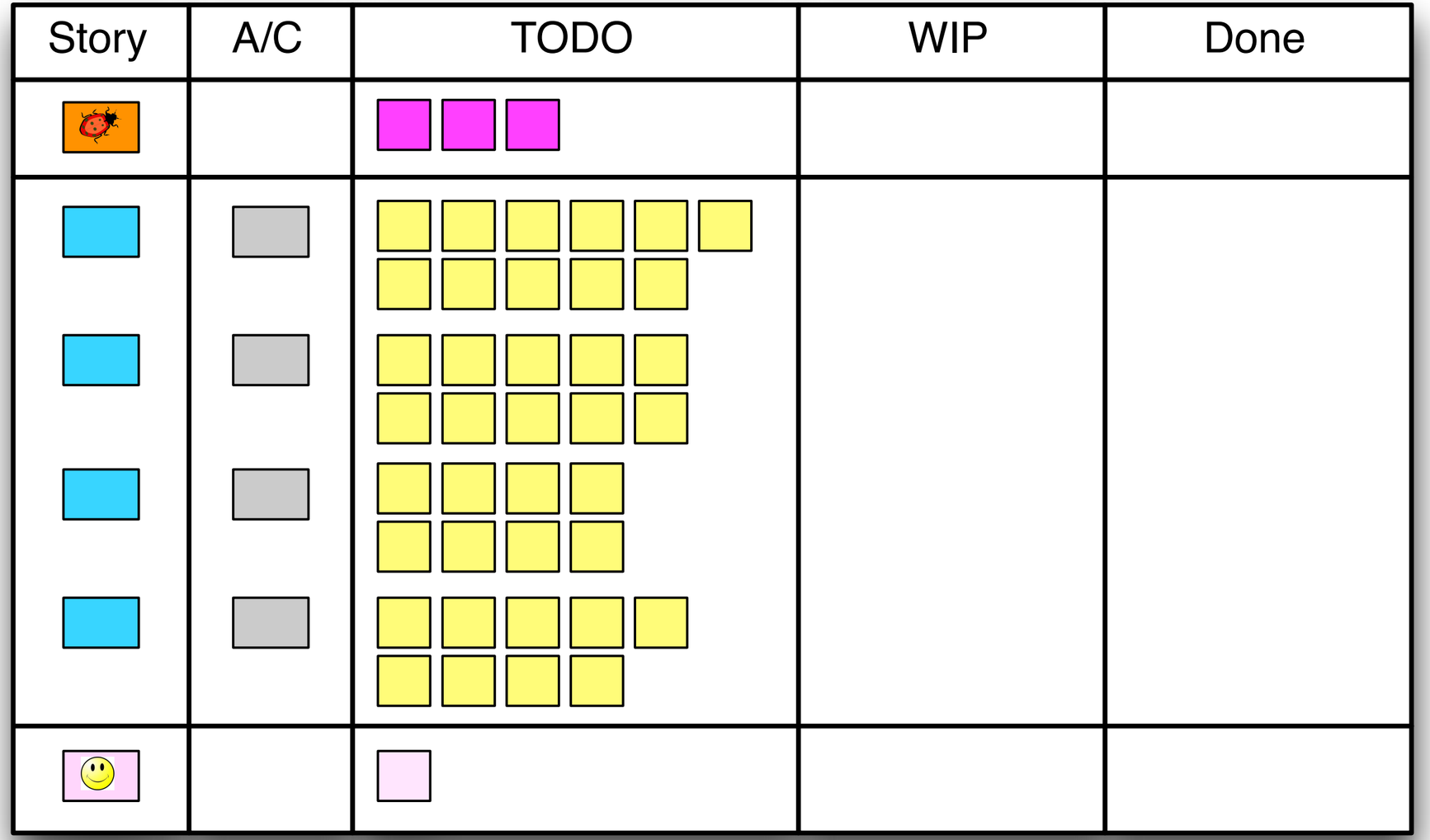
Sprint Planning - Result



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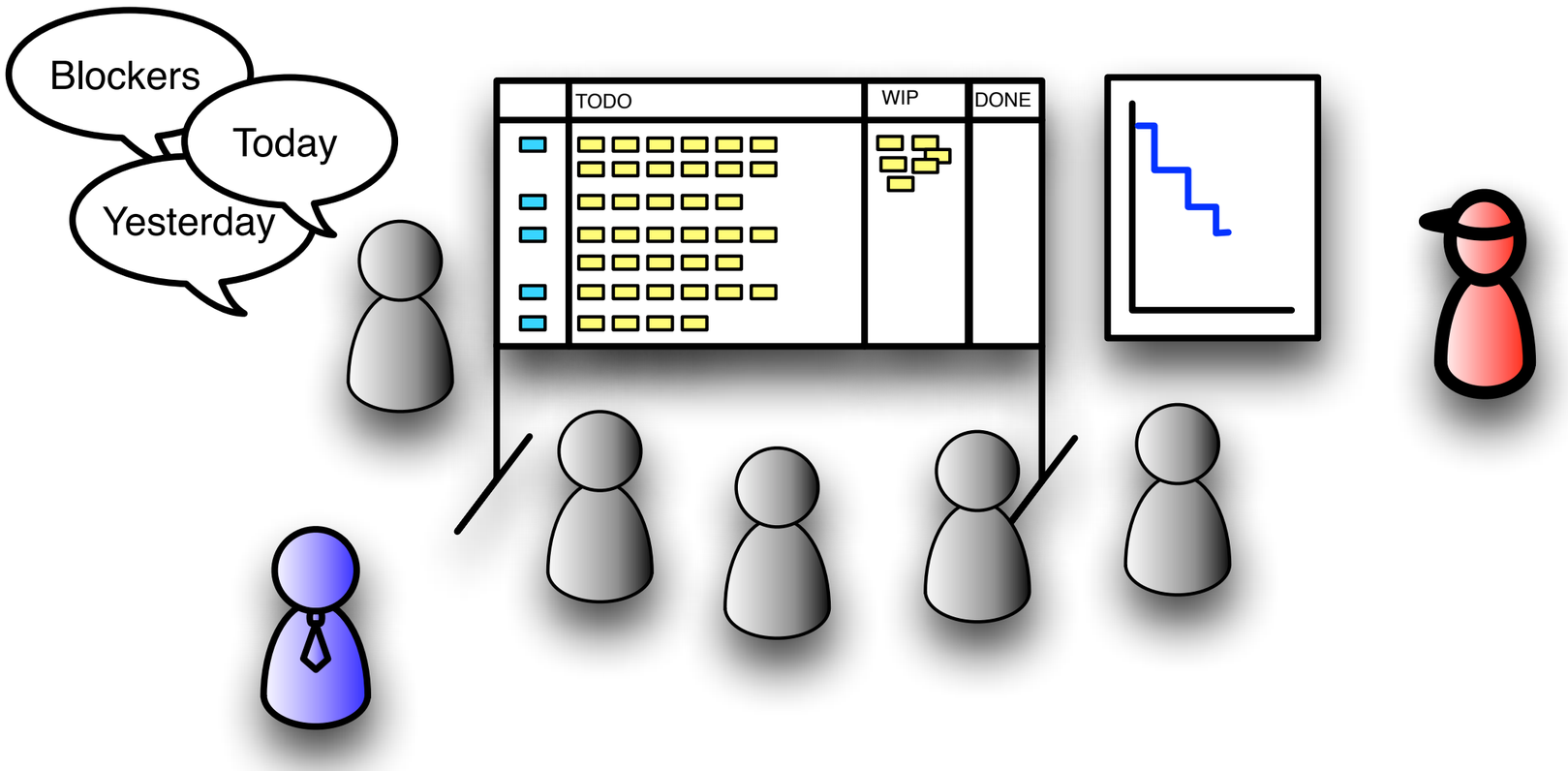
Daily Scrum



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Daily Scrum mechanics

- Update Sprint Backlog to reflect reality
- Update Sprint Burndown Chart
  - Inspect: understand the situation
  - Adapt: self organizing for achieving sprint goal
- max. 15 minutes
- Only team members talk - 3 questions

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Daily Scrum

- Inspect situation
- Identify impediments
- Adapt plans for achieving sprint goal
- Sync between team members
- do NOT report to your ScrumMaster

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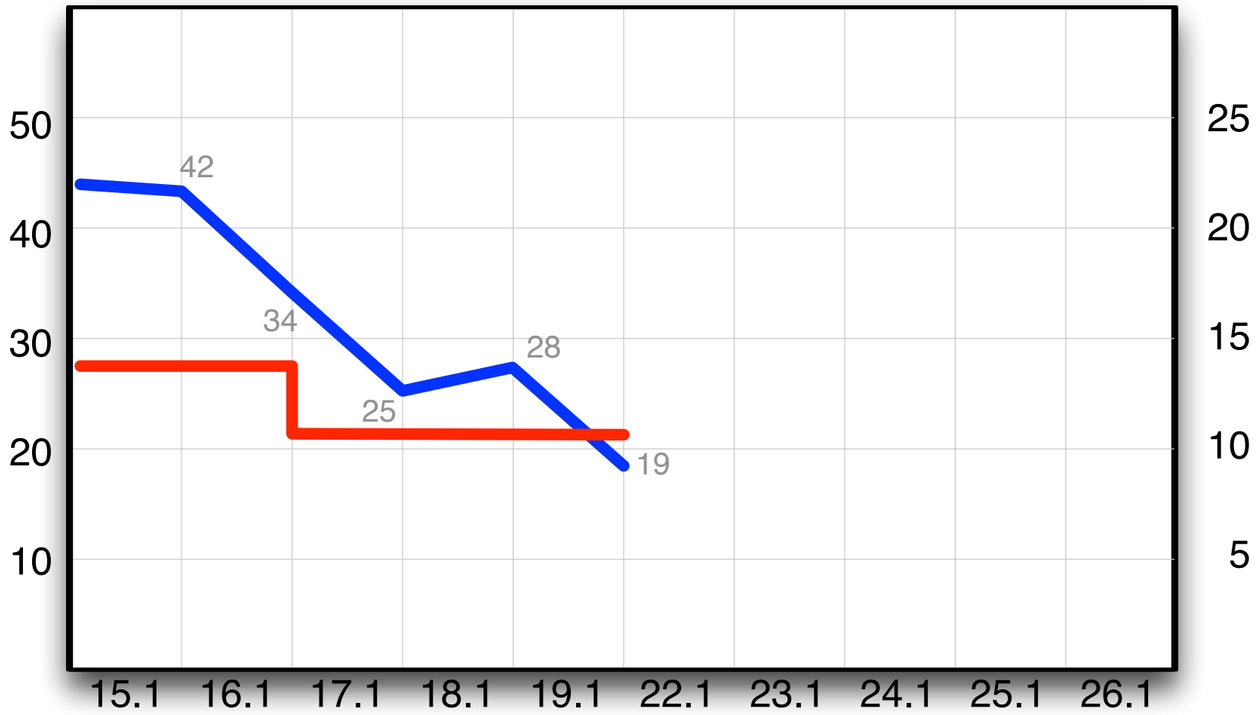
Burndown Chart

- Shows remaining work over time (Sprint: days in Sprint)
- Early feedback if goal is reachable



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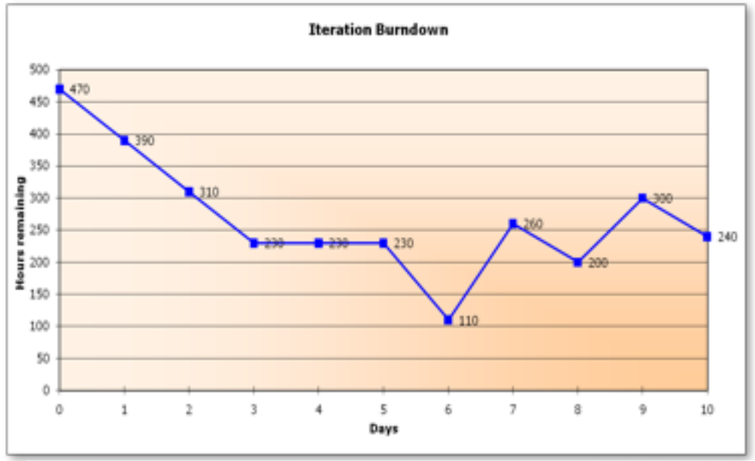

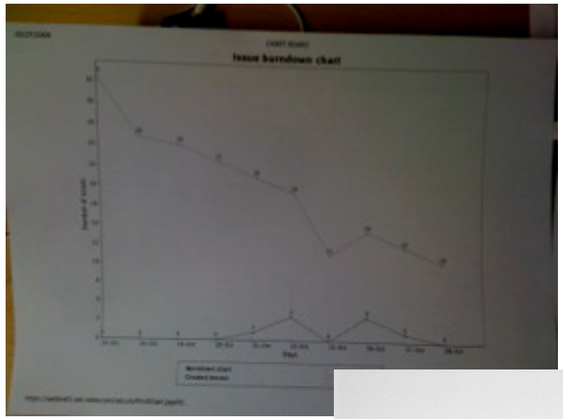

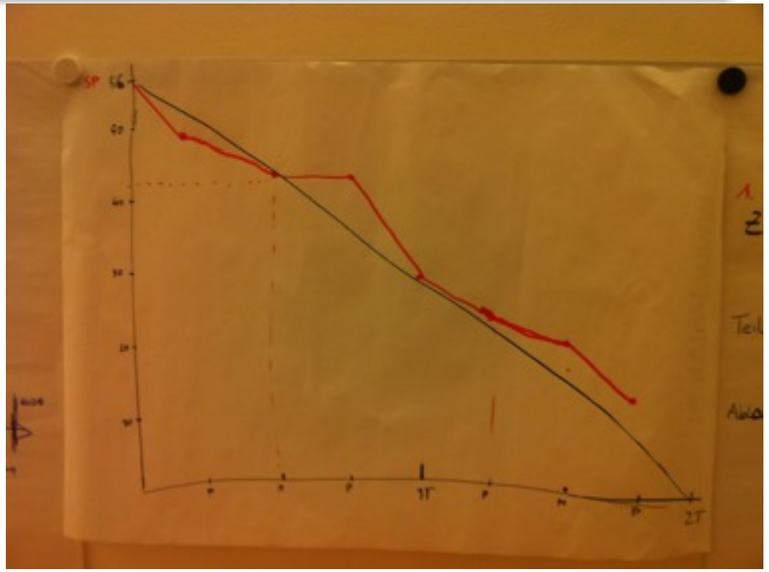

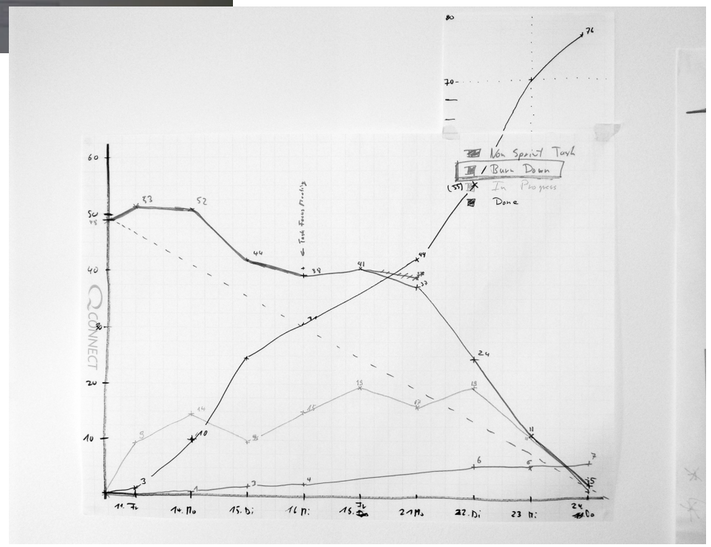

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Exercise - Burndown signals

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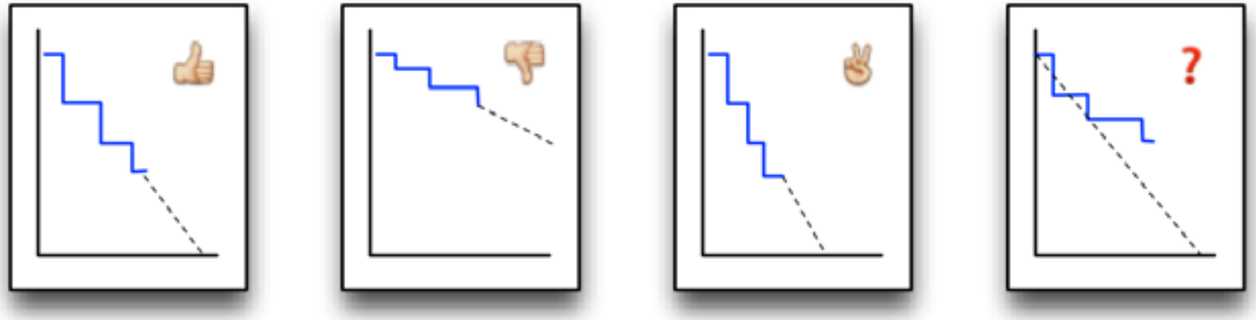

(a) (b) (c) (d)

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Having a visual workplace

- agile methods require easy visualization and open communication
- all important information is available, all the time
  - release plan, sprint goal, sprint backlog, impediments, ...
- Allows self-organization and inspect & adapt
- Transparency!

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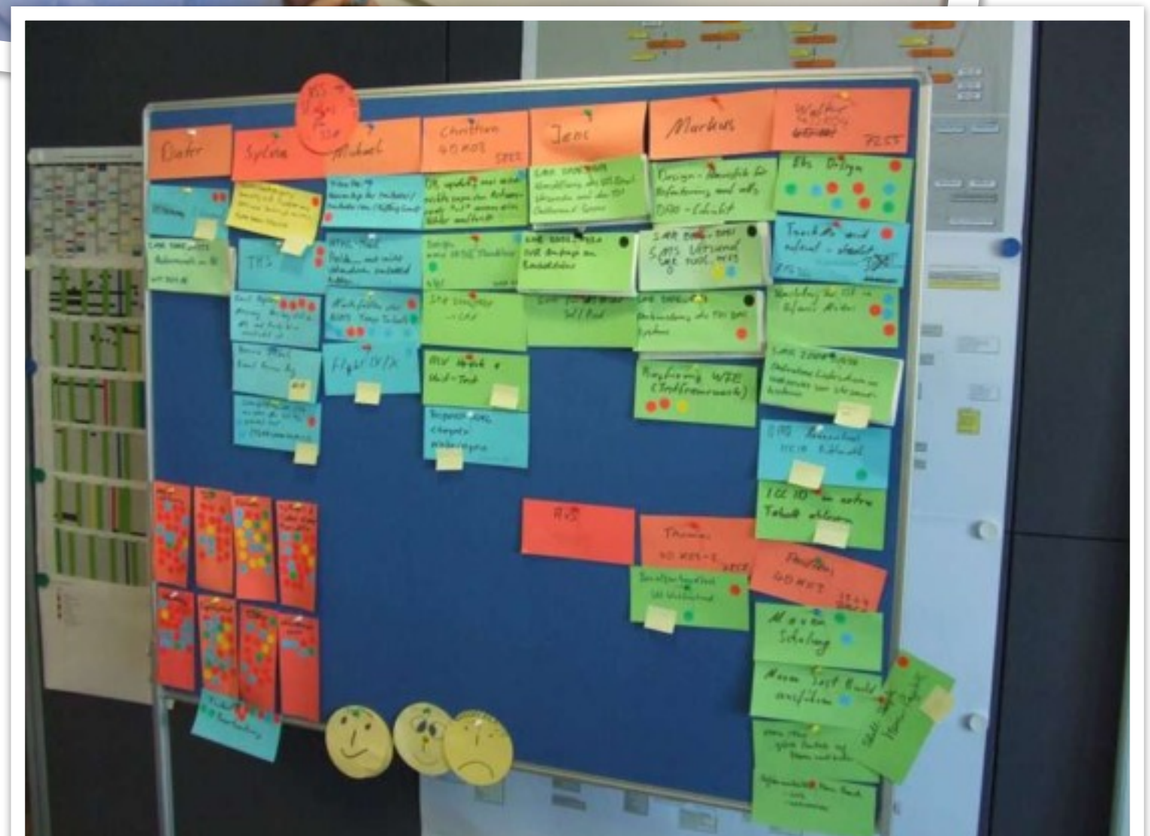
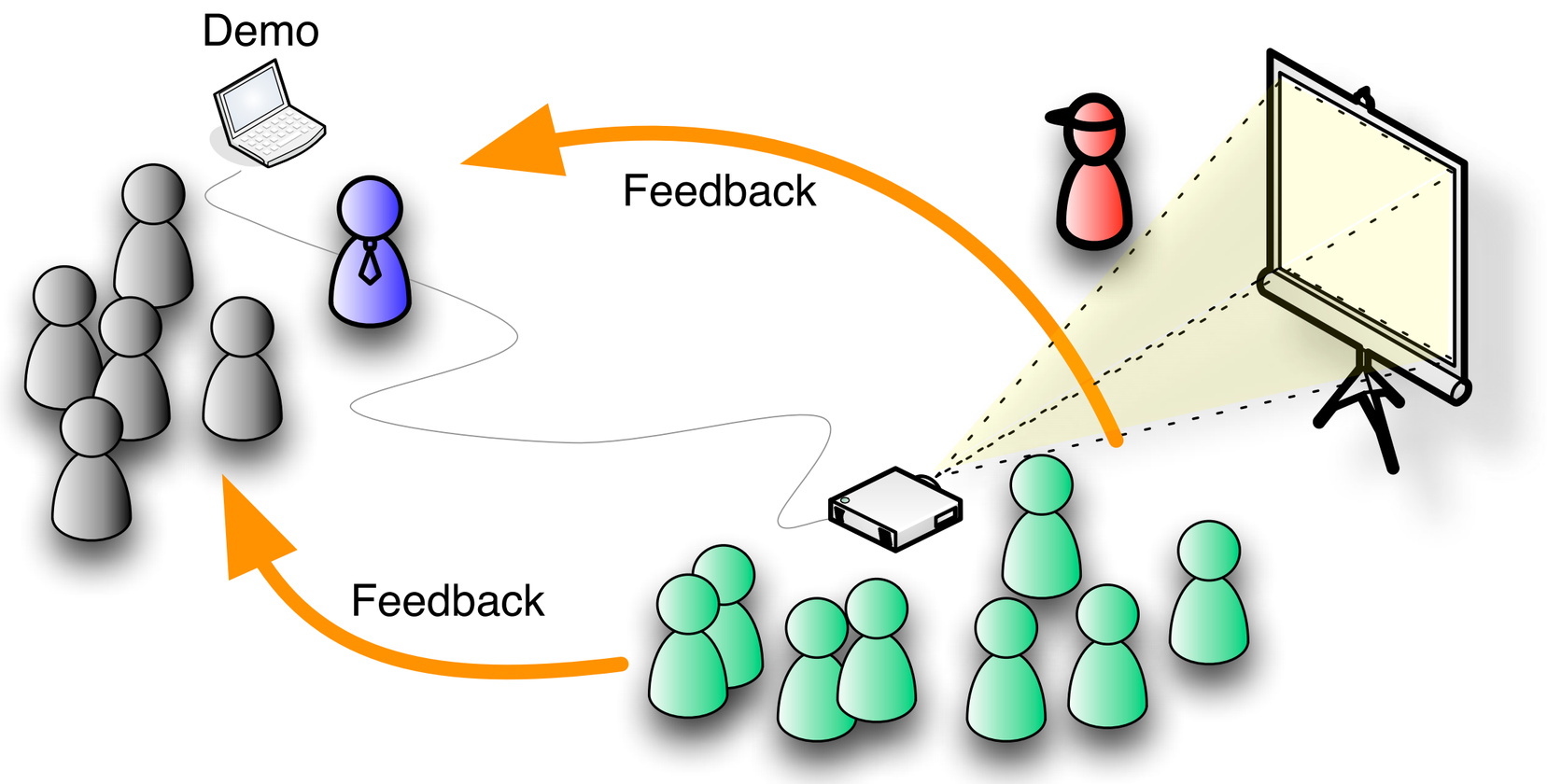
User Stories
A/C
To Do
In Progress
Done
Bugs
Impediments


Markus

Sprint Review



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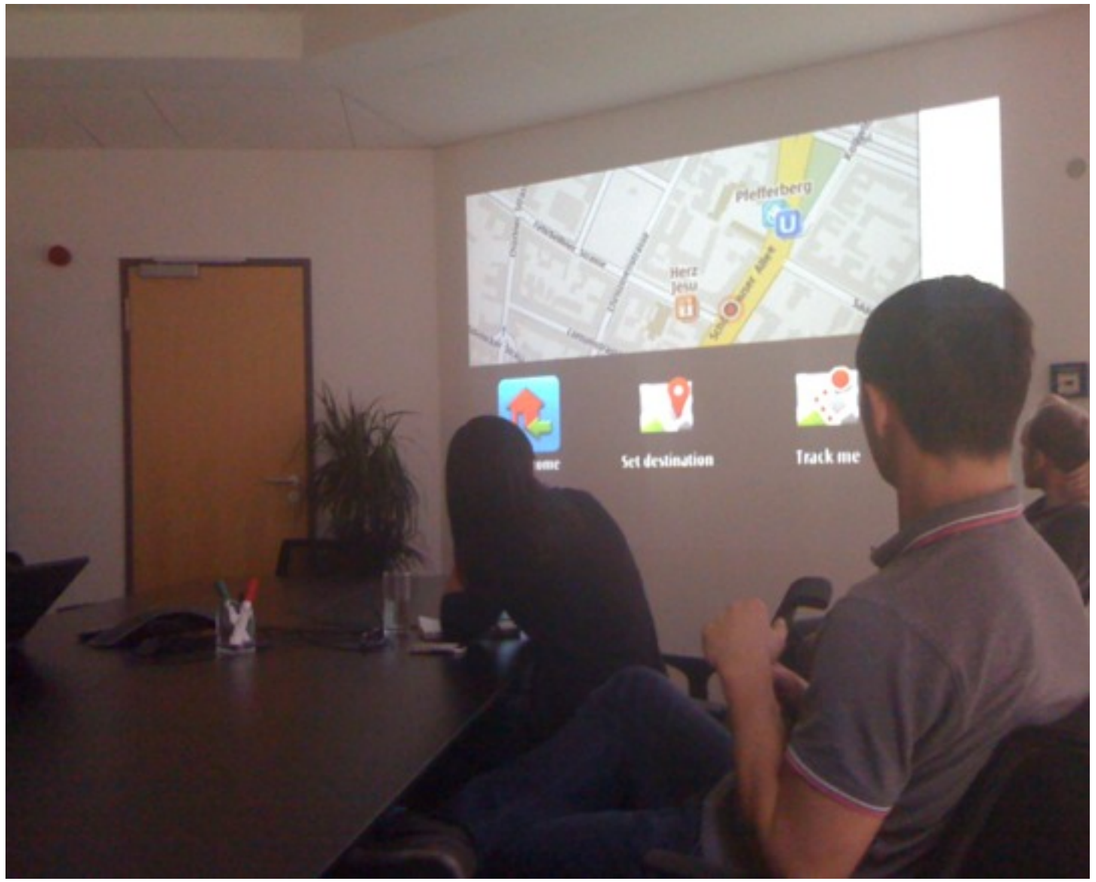
Sprint Review

- Working Software
  - Completely “Done”
- Real environment
- Feedback
  - Product improvements
  - Hands-on



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Sprint Retrospective

- Inspect & Adapt
- Improve
- Learn
- *Process Improvements!*

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Retrospective involves the whole Scrum Team

- ScrumMaster + Dev Team + PO
- Others on invitation
- No Blaming!
- At end of each sprint

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Prime Directive

"Regardless of what we discover, we understand and truly believe: that everyone did the best job they could, given what they knew at the time, their skills and abilities, the resources available, and the situation at hand."

Norman Kerth, Project Retrospectives

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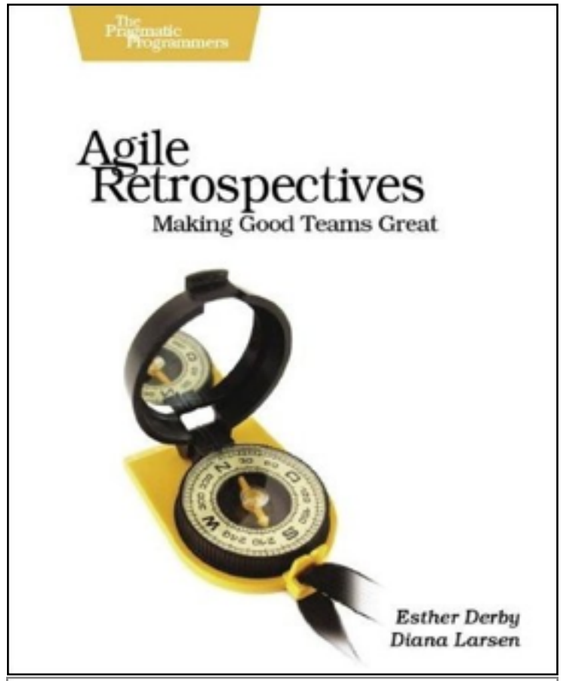
1. Set the Stage

- *Agenda*
- *Purpose*
- *Focus*
- *Rules*



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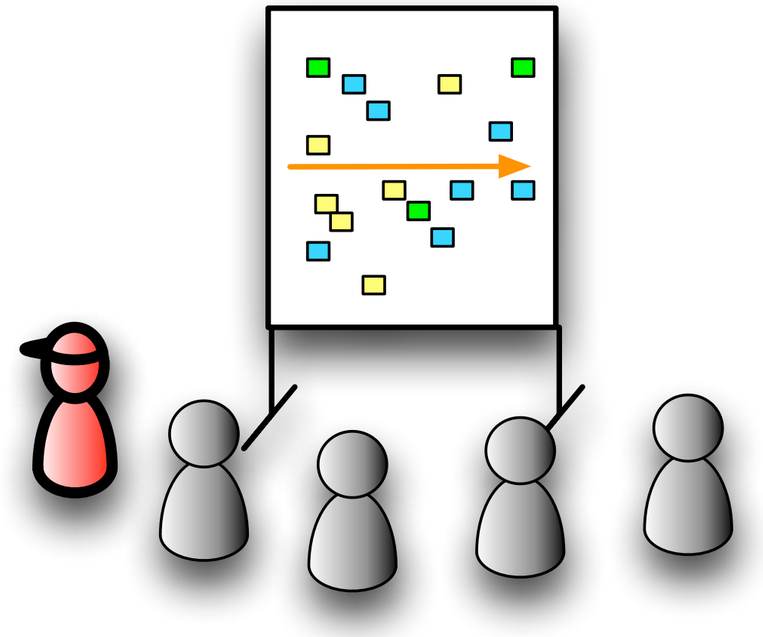
2. Gather Data

- What happened last Sprint?
- Create common view
  - Eg. Timeline



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3. Generate Insights

- E.g. Good/Bad
- 5 Whys
- Fishbone Diagram ...

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4. Decide what to do

- Discuss solutions
  - Moderation!
- less than 3 improvements / Sprint
  - E.g. Dot Voting

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5. Close

- Summarize results
- Agreement/Buy-In on TODOs
- Some do: Retrospective of Retrospective
- Rapid Feedback: Return On Time Invested

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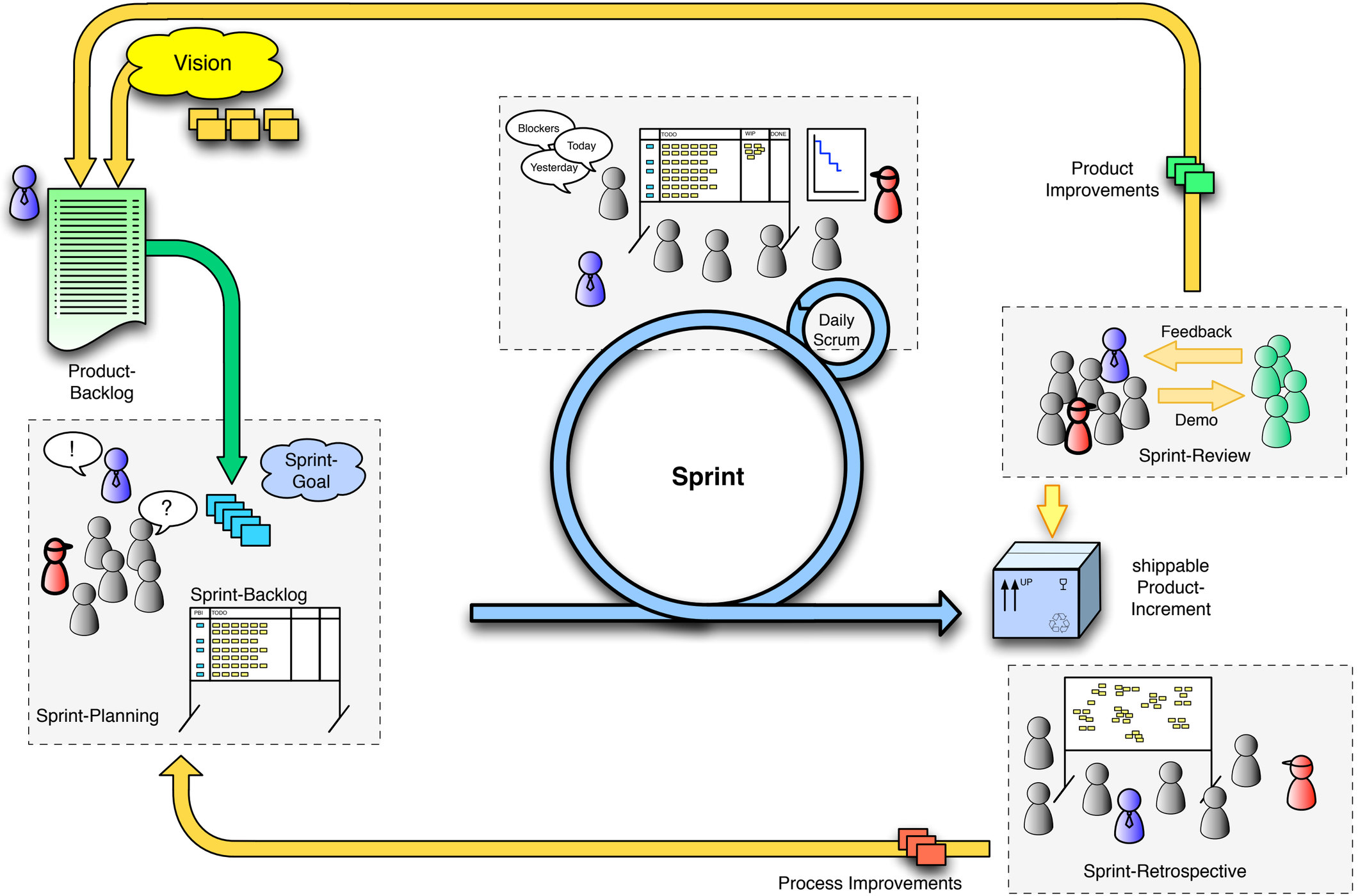
Vision
Product-
Backlog
Blockers
Today
Yesterday
TODO
WIP
DONE
Daily
Scrum
Sprint
Product
Improvements
Feedback
Demo
Sprint-Review
!
?
Sprint-
Goal
Sprint-Backlog
PBI
TODO
Sprint-Planning
UP
shippable
Product-
Increment
Sprint-Retrospective
Process Improvements

Running a Sprint

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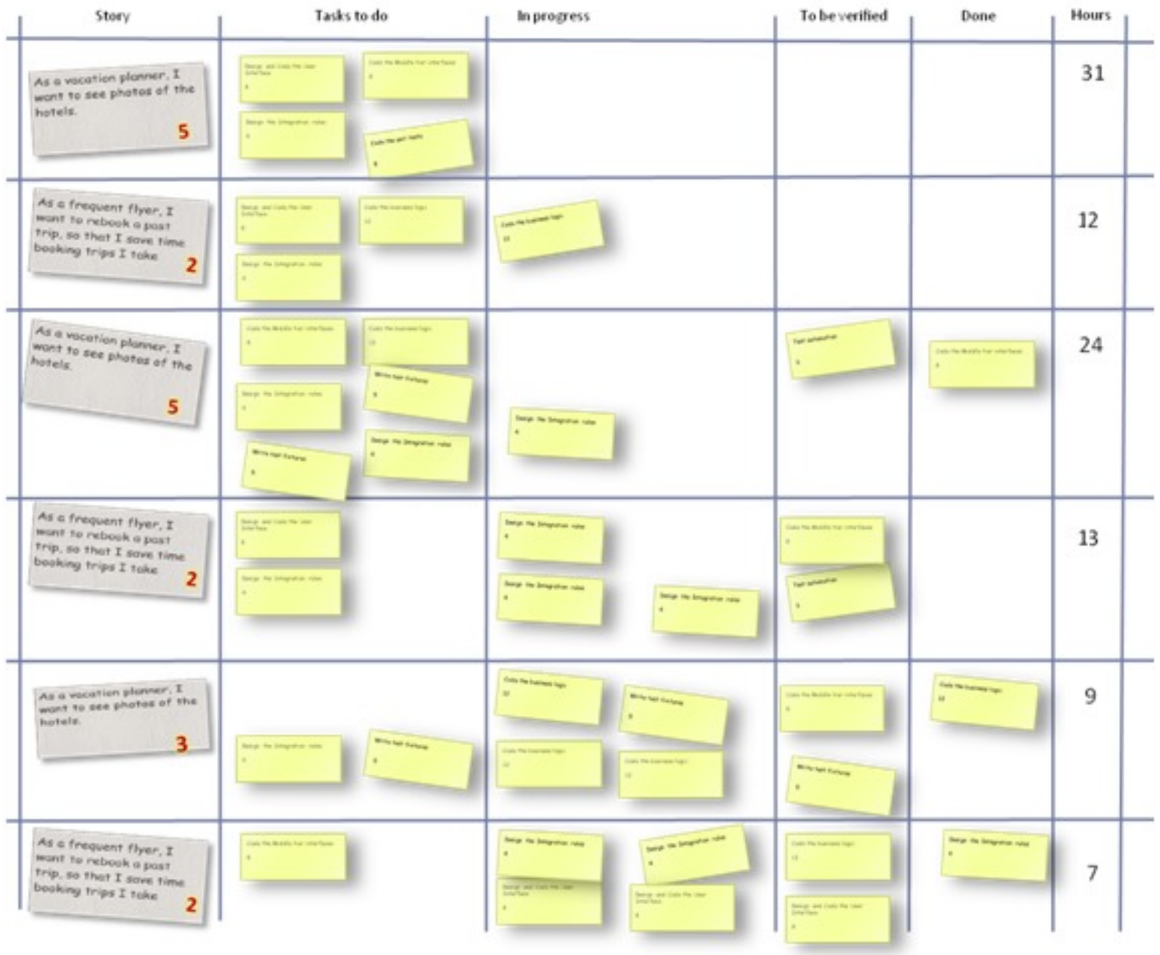
Task Board – whats wrong here?



Source: Roman Pichler

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Collective Responsibility

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Deliver high quality software

- Focus
- KISS
- YAGNI
- Defined vs. achieved goal

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Avoid Premature Optimization

- “premature optimization is the root of all evil”
  (D.E. Knuth in recognition of C.A.R. Hoare)
- “First make it run, then make it run fast.”
  (Brian Kernighan in “The C Programming Language”)
- Long known, ... so many times unrespected!

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Emergent Design

- Agile teams can implement changed requirements at any time (in the next sprint)
- Changeable Software

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Picture Source: Todd Huffman, Flickr

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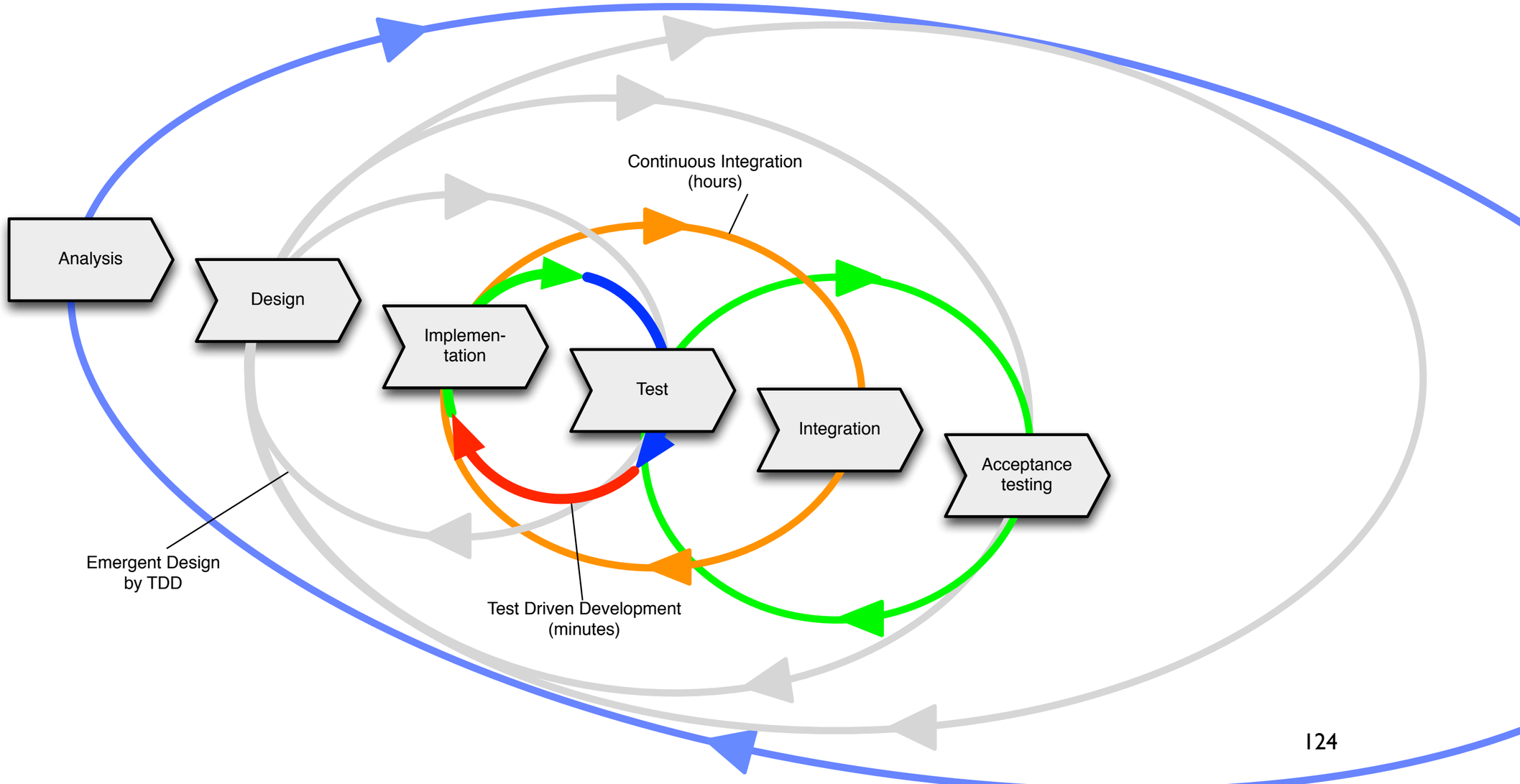
Cycles - Not Waterfall



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Feature-based working

- Deliver vertical increments = User Stories
  - Priority-based
  - Sequential
  - Less stress

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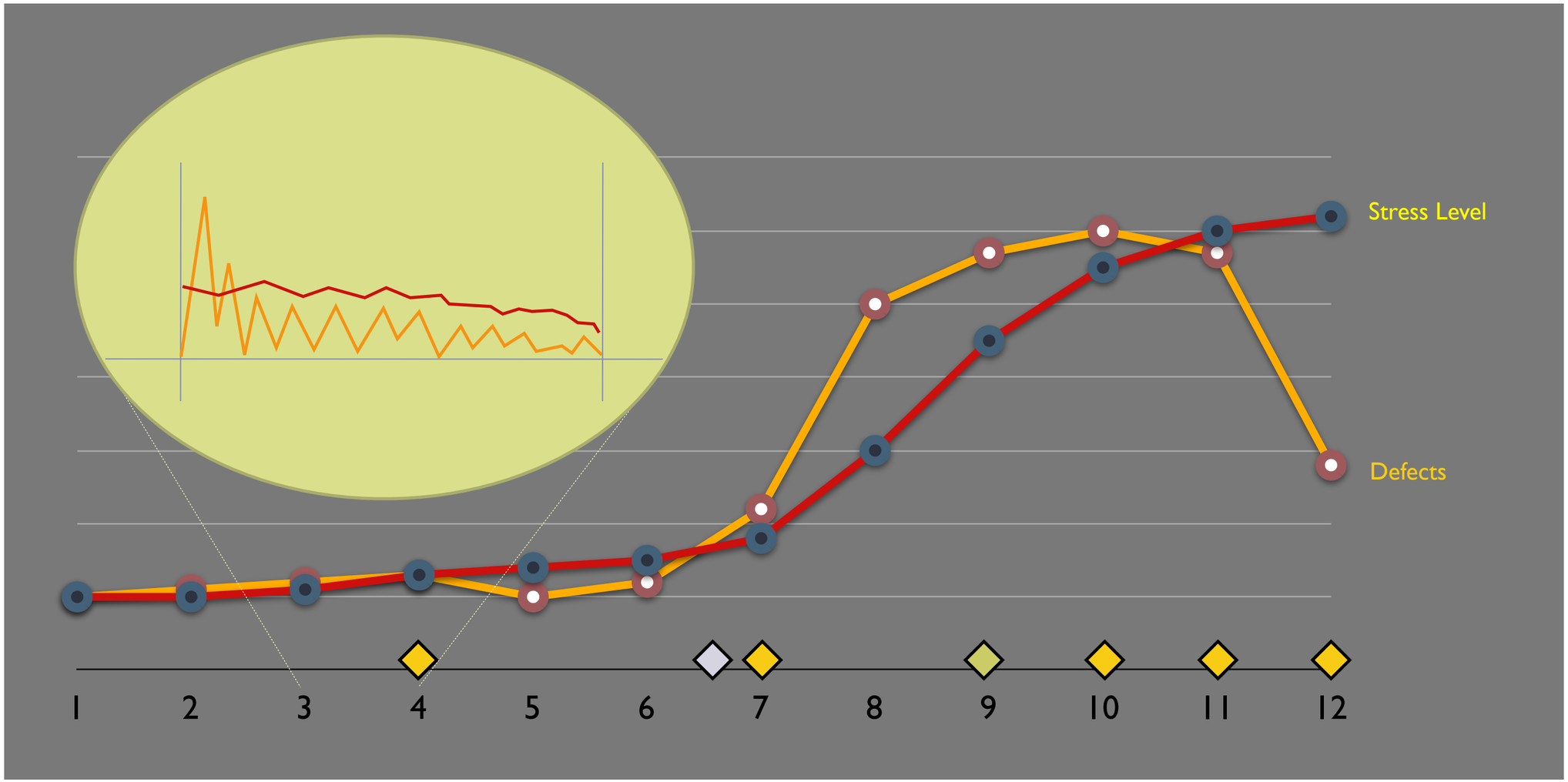
Development cycles compared



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Sprint goal cannot be reached

- Remove A/C
- Split User Story
- Remove User Story
- Do investigation

NEVER compromise quality!

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Sprint goal is reached too early

- Pull work from product backlog
  - Suitable for Sprint Goal
  - Work with PO
- Have you got optinal work
  - Technical stuff?

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Changes during a Sprint

- Small changes with no impacts on started work - OK
- Impacts on started work
  - other work might drop out of sprint
  - usually delivery will shrink

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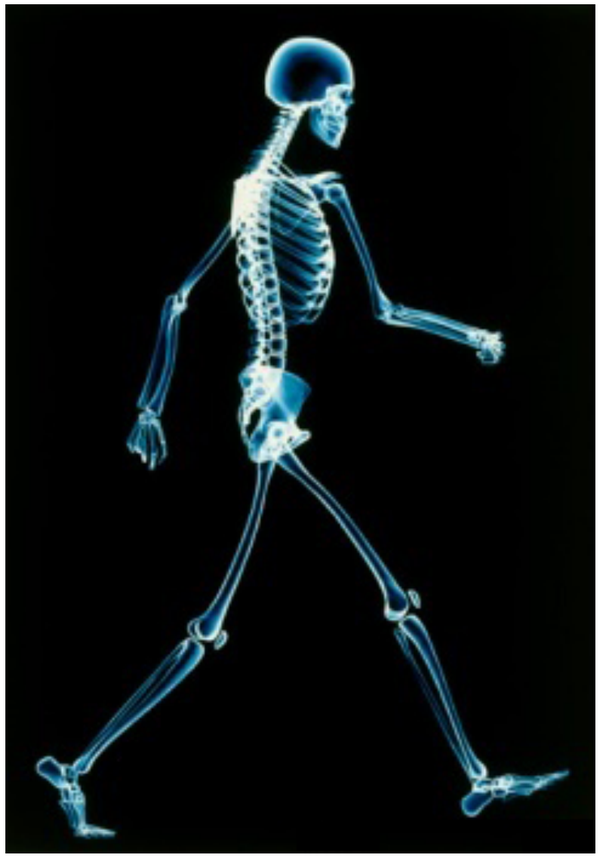
Starting from scratch

- "Walking Skeleton"
  - Thinnest possible slice of functionality that we can possibly build and test
  - Just enough of
    - Major components
    - Automation
    - Infrastructure
    - Architecture



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6

The Product Backlog

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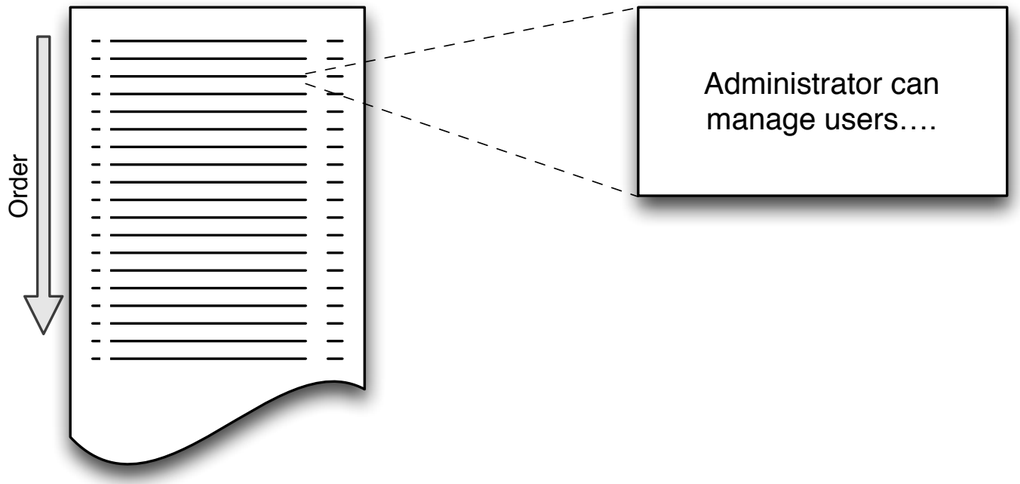
Product Backlog

- An ordered list of things to be delivered in future
- Short items describe “what it is” and not “how it’s done”



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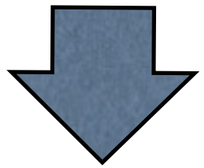
Agile Product Backlogs

- Not all requirements are known from beginning
- New requirements can arise, some may fall out



- Agile: more conversation, less writing, just write what is necessary
- Accept the fact that the PB is emergent
- Get early and frequent feedback

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The Product Backlog is sorted

- Business Value, Risk, Customer Satisfaction, Cost, Cost of Delay
- Product Backlog is emergent
  - Priorities change
  - Independent items wanted

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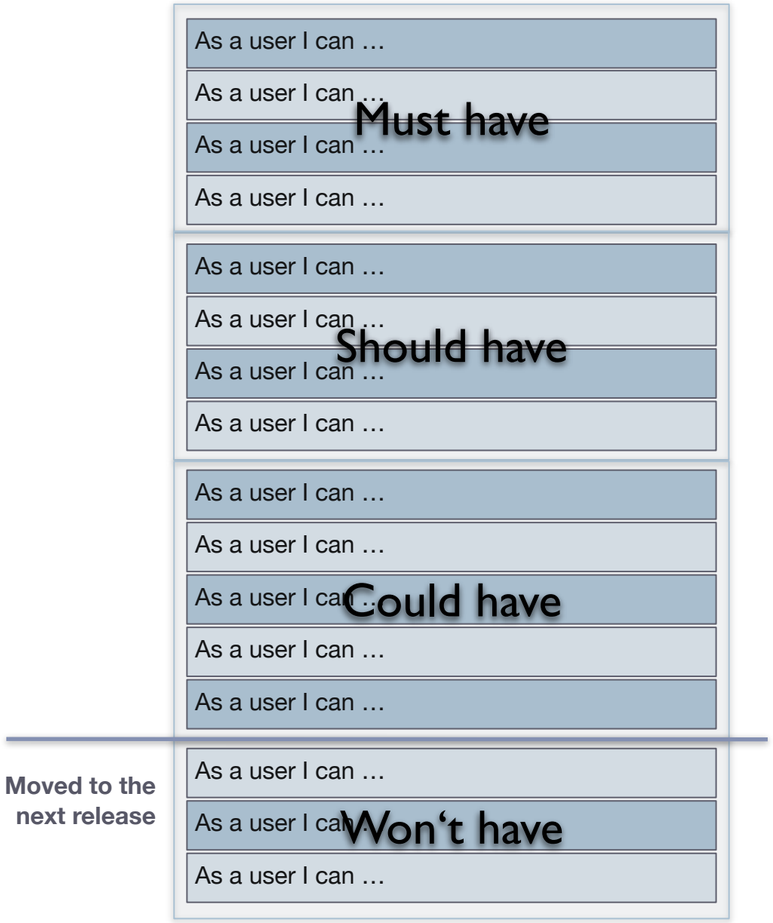
Priority

- MuScoW Scheme very popular
- See those as a „bucket“
- Absolute Priority only for Must Haves
  - 1...n
  - Order of Delivery



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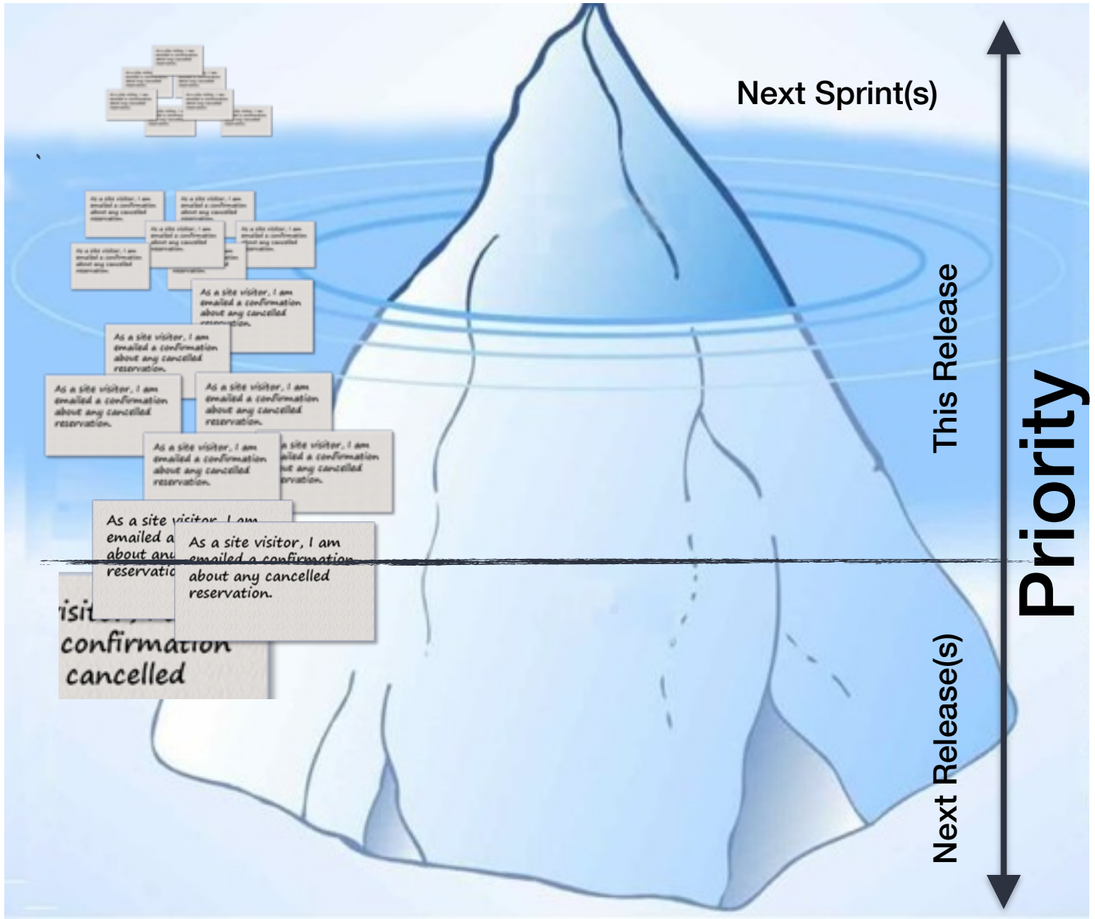
The Product Backlog Iceberg

- The ideal shape of the Product Backlog
- User Stories in the high priorities should be small to work on the upcoming sprint(s)
- There are medium sized stories in the middle priority ranges, some details are known but not all
- We do not focus on details of low priority user stories



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The product backlog is not a ...

- complete list
- collection of technical solutions
- contract between team an PO

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Detailed enough

Estimated

Emergent

Prioritized

It all starts with a Product Vision

... landing a man on the moon
and returning him safely to the earth
by the end of the decade

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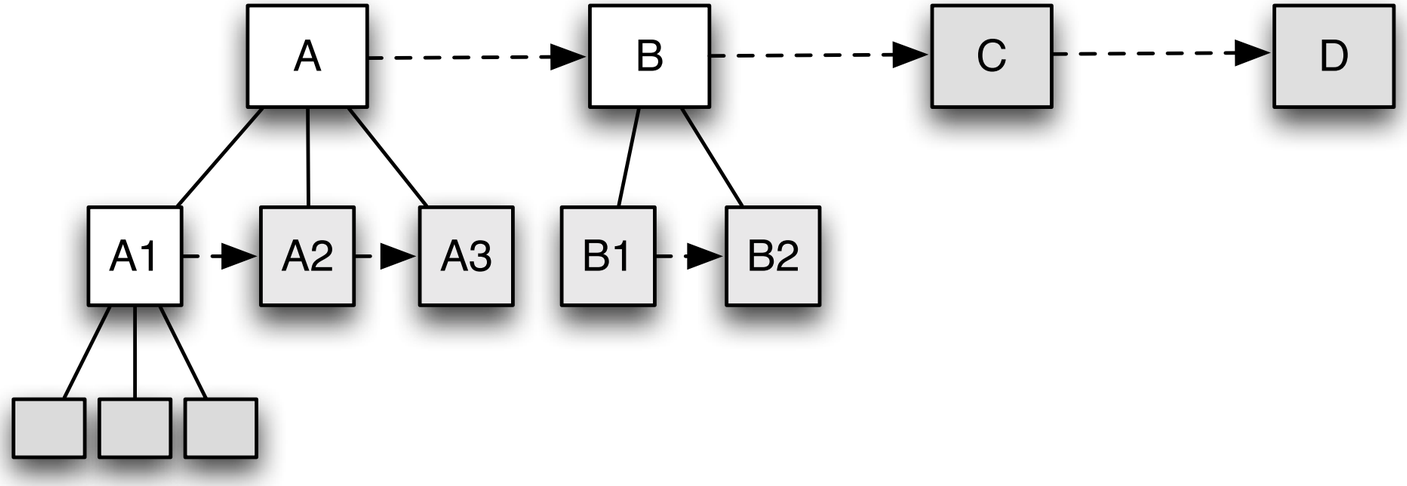
Creating a Backlog

- PO responsibility, but often whole Scrum Team
- First list high-level features, then refine them to smaller deliveries



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User Stories

- WHO - WHAT - WHY
- A short description of a requirement from a user's view
  - Clarifies what the user will get
  - Not a specification
  - Promise for conversation

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User Story template

As a <role> I want <a feature> so that <reason, value>.

As a frequent traveller I want to be able to quickly rebook frequently booked flights so that I can save time during the booking process.

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Details of a User Story

- Acceptance criteria
  - Clarify non-obvious requirements
  - Leave some room
  - Make clear what is wanted
- This is not a Spec

As a user, I want to cancel a reservation.

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Details of a User Story

- Acceptance criteria
  - Clarify non-obvious requirements
  - Leave some room
  - Make clear what is wanted
- This is not a Spec

- Verify that a premium member can cancel the same day without a fee.
- Verify that a non-premium member is charged 10% for a same-day cancellation.
- Verify that an email confirmation is sent.
- Verify that the hotel is notified of any cancellation.

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User Stories are vertical, too!

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Splitting User Stories into smaller ones

As a user, I want to cancel a reservation.

As a premium site member, I can cancel a reservation up to the last minute

As a non-premium member, I can cancel a reservation up to 24 hours in advance.

As a site visitor, I am emailed a confirmation about any cancelled reservation.

Source: Mike Cohn

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I ndependent

N egotiable

V aluable

E stimable

S ized properly

T estable

Independent

- Avoid dependencies between stories
  - Problems with estimation, prioritizing, implementation
  - ideally isolated
- Possible solutions
  - combine small stories
  - split stories

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Negotiable

- Stories are no contracts / specifications
- Not all details are included
  - too many details create false assumptions about completeness
- Flexibility: Details are communicated directly with PO
- Story is just a “promise for conversation”

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Valuable

- Value of a User Story is expressed by its functionality and use / benefit for
  - customer
  - user
  - buyer
  - sponsor, ...

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Estimatable

- Estimations are required for planning
- Team will fail to estimate properly if
  - User Story is too big
  - technical knowledge is missing / requirement is not clear
  - domain knowledge is missing

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Sized properly

- Size correlates with uncertainty
  - big User Stories are difficult to estimate
  - and useless for planning
  - completely useless for a sprint

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Testable

- to know when we're done
- Story must have clear acceptance criteria
  - each AC results in at least one acceptance test
  - tests should be automated

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Nonfunctional requirements go into Product Backlog as well

1. Write an automated Test
2. Create Baseline
3. Implement

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Technical Stories

- Product Backlog is list of deliveries
  - with value for the customer
- Technical work reduces valuable delivery
  - make it transparent

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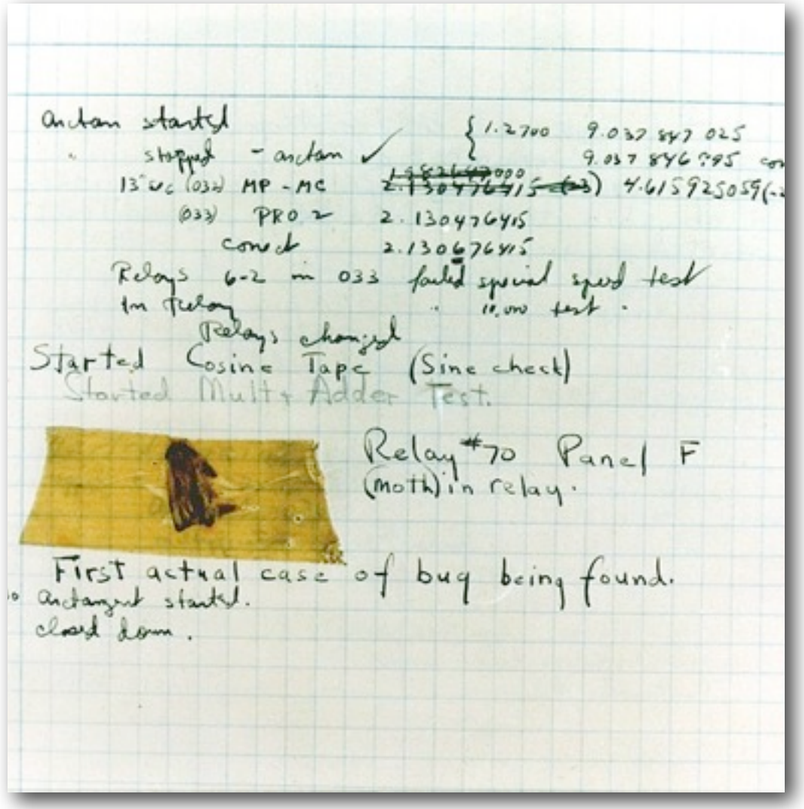
Dealing with Bugs

- Bugs are technical debt and therefore not part of a team's velocity
  - Team gets slower - transparency
- Keep Bugs rather in Bugtracker
  - than in Product Backlog



Source: Courtesy of the Naval Surface Warfare Center, Dahlgren, VA., 1988
http://www.history.navy.mil/photos/images/h96000/h96566kc.htm

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Exercise: User Stories

- Teams of 3 - 6
- Refine your Vision
  - What are the 5 top-level features?
  - Priorities?
  - For Feature #1
    - What are the top 5 User Stories?

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Real life examples

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Backlog Grooming

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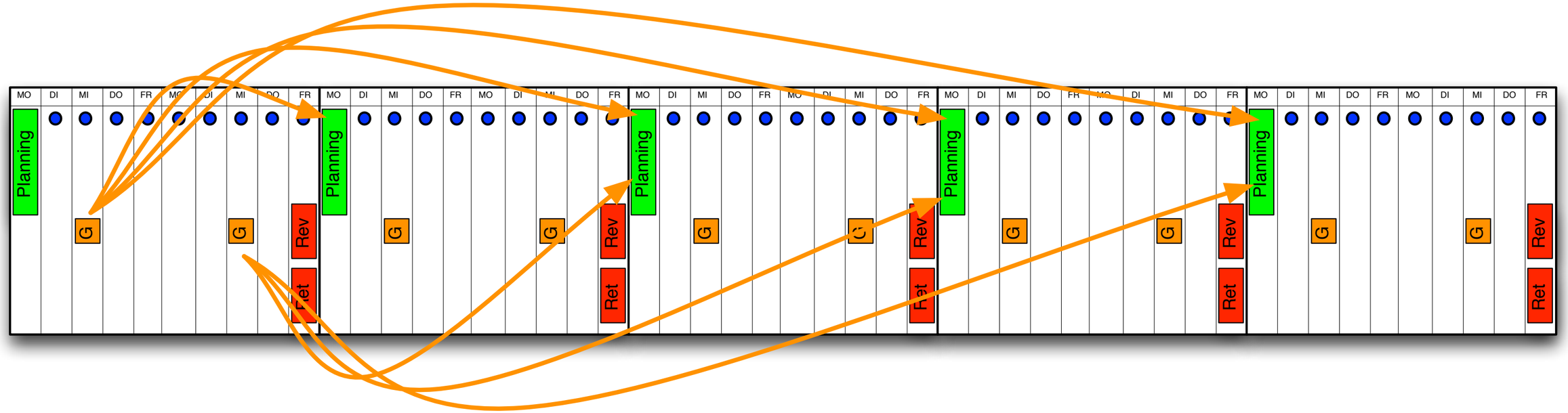
Prepare the Backlog



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Activities

- Estimate User Stories
- Enrich User Stories with new details
- Split User Stories into smaller ones
- discuss technical risk
- Enhance new User Stories (text)
- Re-Prioritize and Re-Estimate

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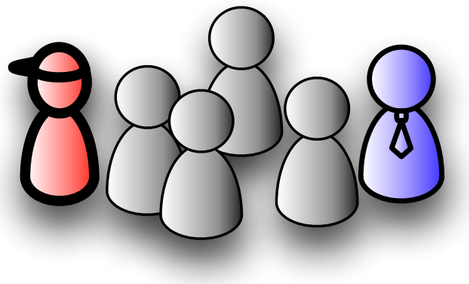
Backlog Grooming Meeting

- Common practice in Scrum Community
- e.g. weekly for about 1hr to 90 min
- ensure the backlog is DEEP and
- First n User Stories are READY



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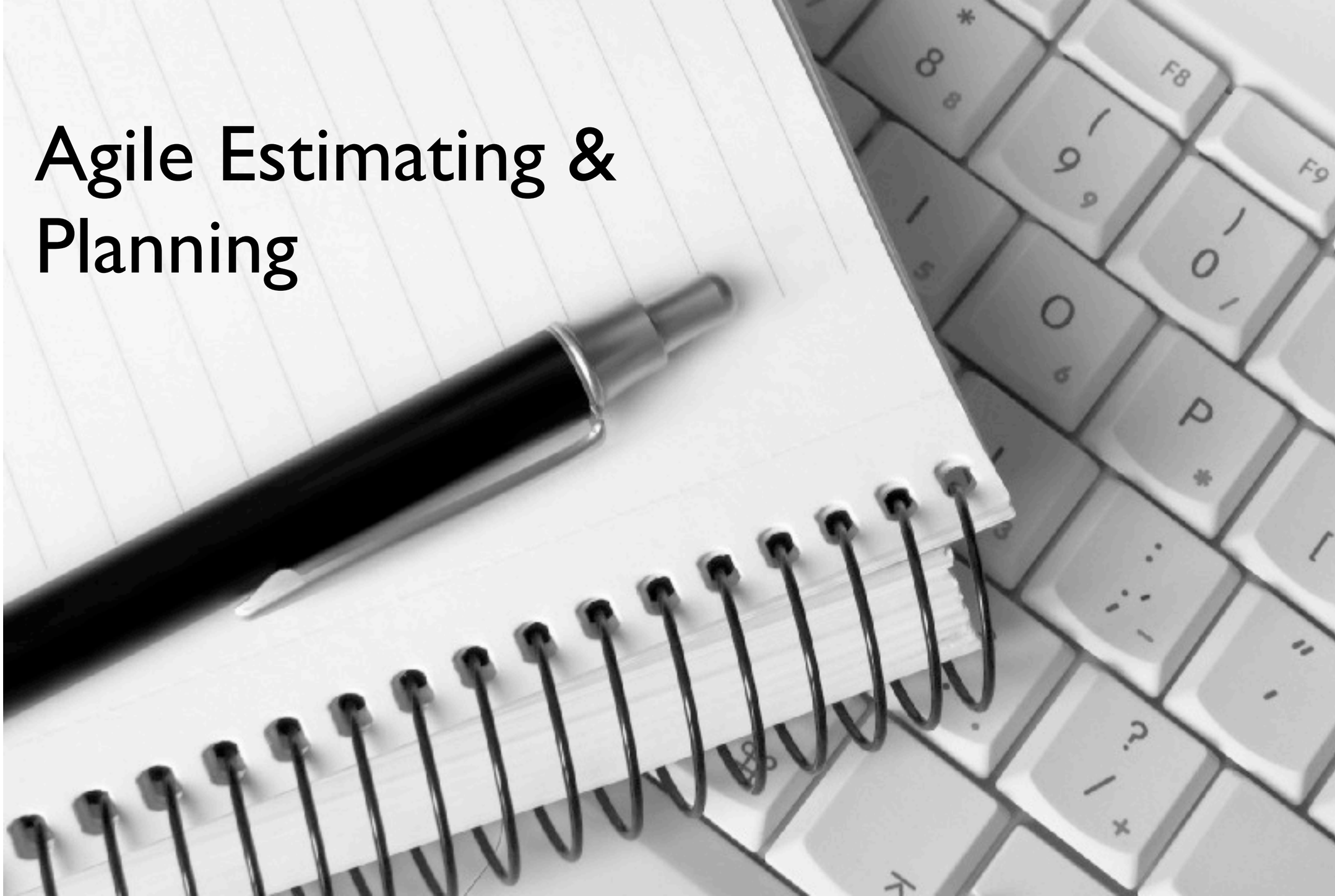
7

Agile Estimating & Planning



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Exercise - estimating countries

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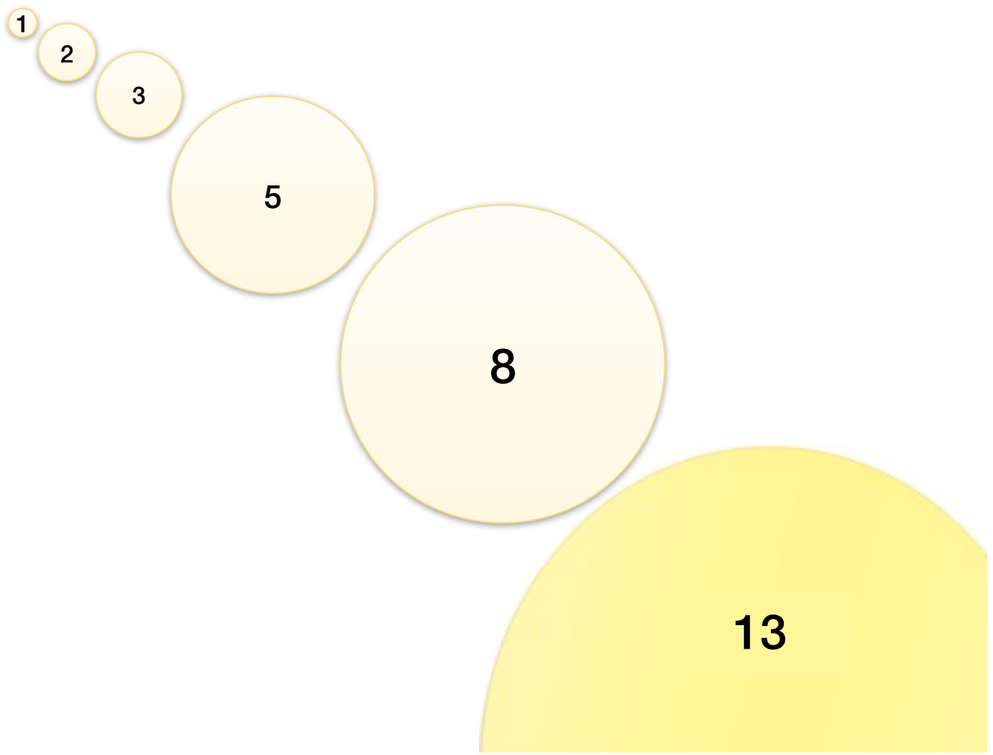
Relative Estimation

- We estimate size in Story Points
- Size compared to other User Story
- The bigger, the imprecise



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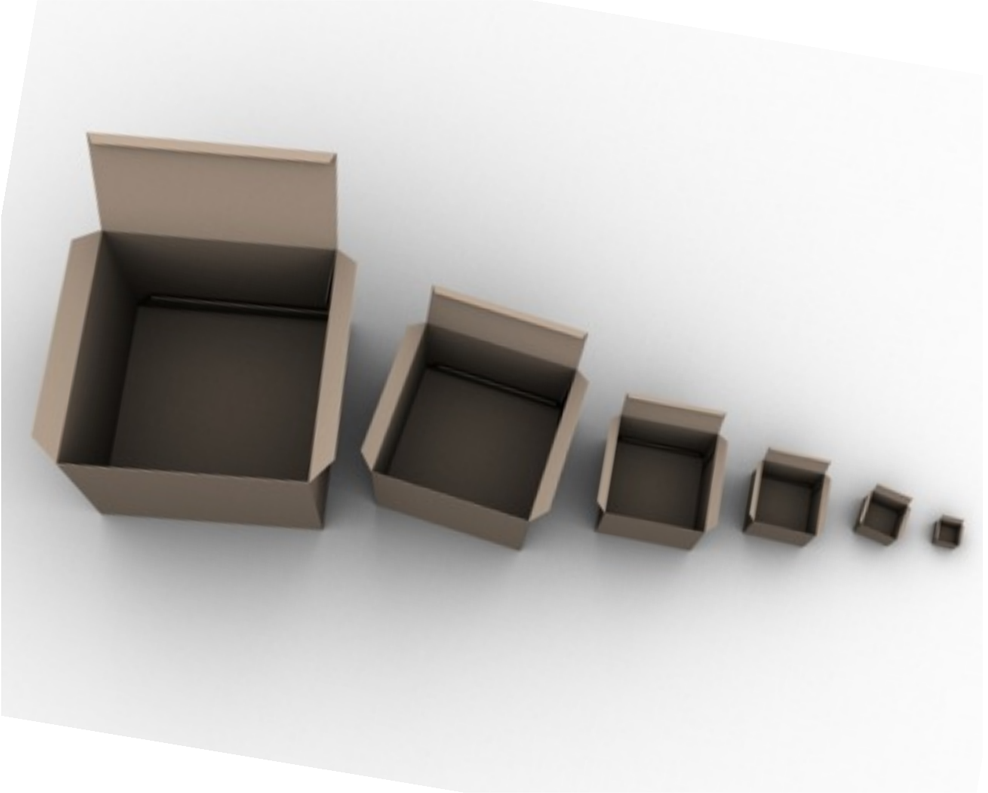
Size

- Size is independent of implementation
  - How much is there
  - Complexity
  - Uncertainty
- If it does not fit into one box, it maybe fits in the next size



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Planning Poker

1. First, create a common understanding of User Story (no technical details)
2. Choose a reference
3. Estimate size in relation to reference - but don't tell anyone yet
4. Show your cards at the same time
5. Discuss differences
6. Repeat estimation until consensus
7. Estimated User Story becomes new reference

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Story Points are a measure of size

- As they are relative, they have no units
- relative values help with estimation
  - Germany is about 4 times as big as Austria
  - If Hungary is 2, then Austria is 2 as well

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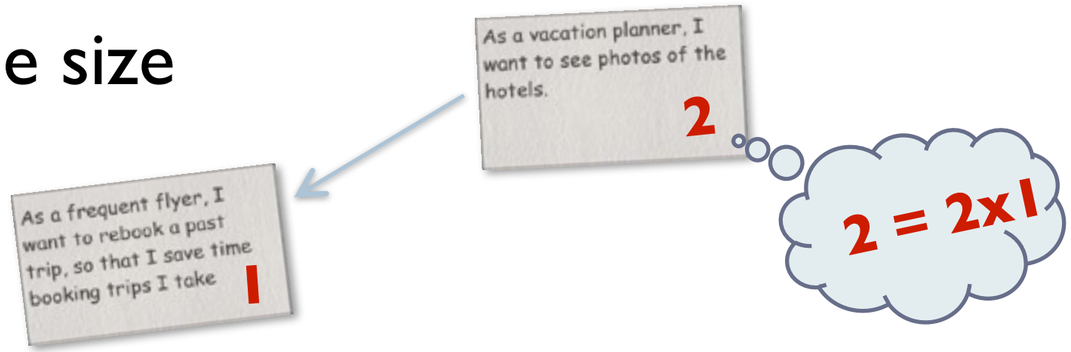
Estimation good practices

- Estimate User Stories by comparing to other ones
- Do not use a “standard story”
- Make groups and triangulate
  - Compare Stories with same size
  - with half the size
  - with twice the size



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Why Planning Poker works

- Those who do the work do the estimation
- Team mates have to give reasons for their estimation
- Combining individual estimates leads to more precise estimates
- Fosters relative estimation
- Each team member will be heard
- It's fast and it's fun!

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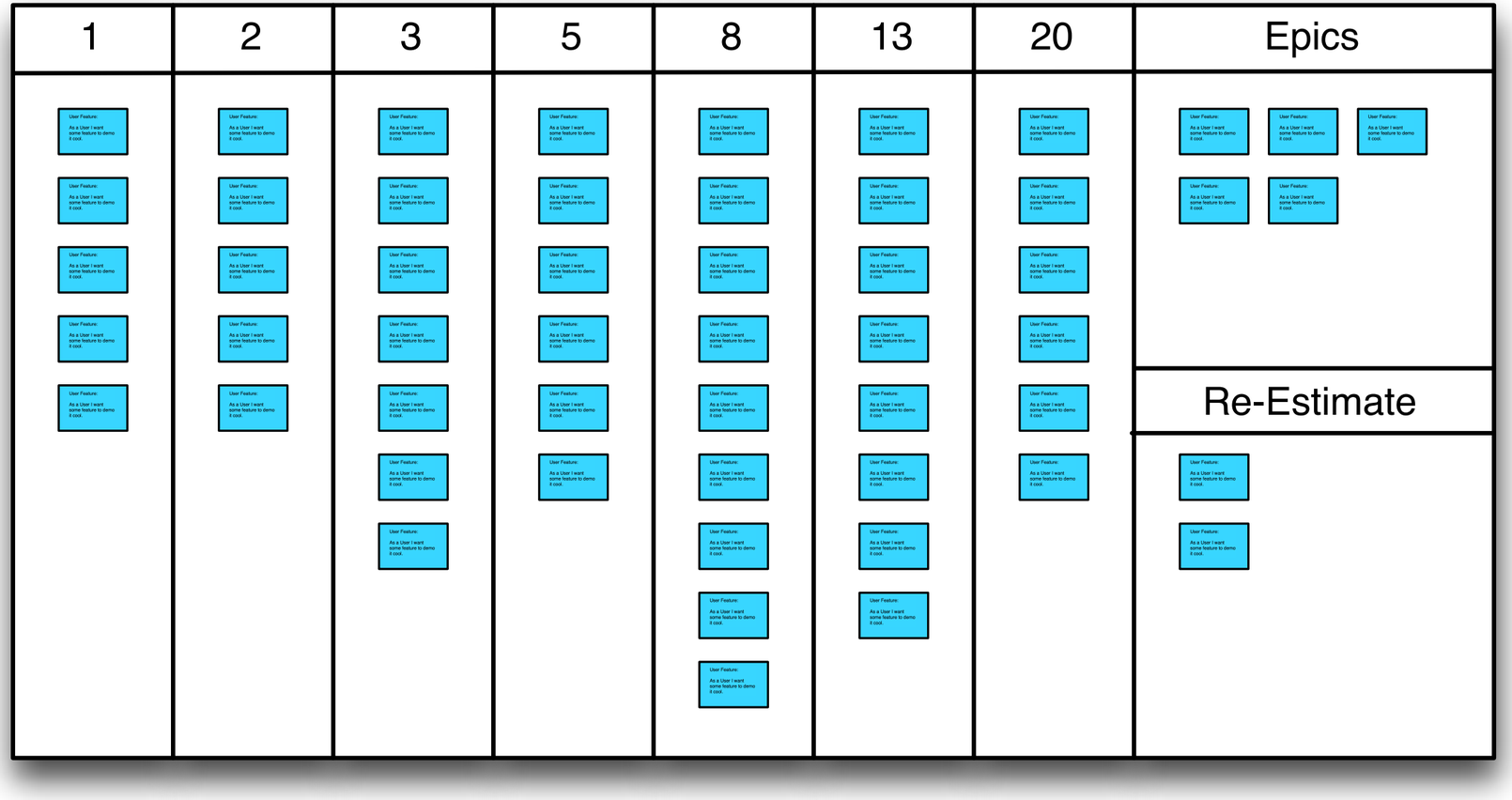
Triangulation

- Find three Stories: smaller, larger, equal sized



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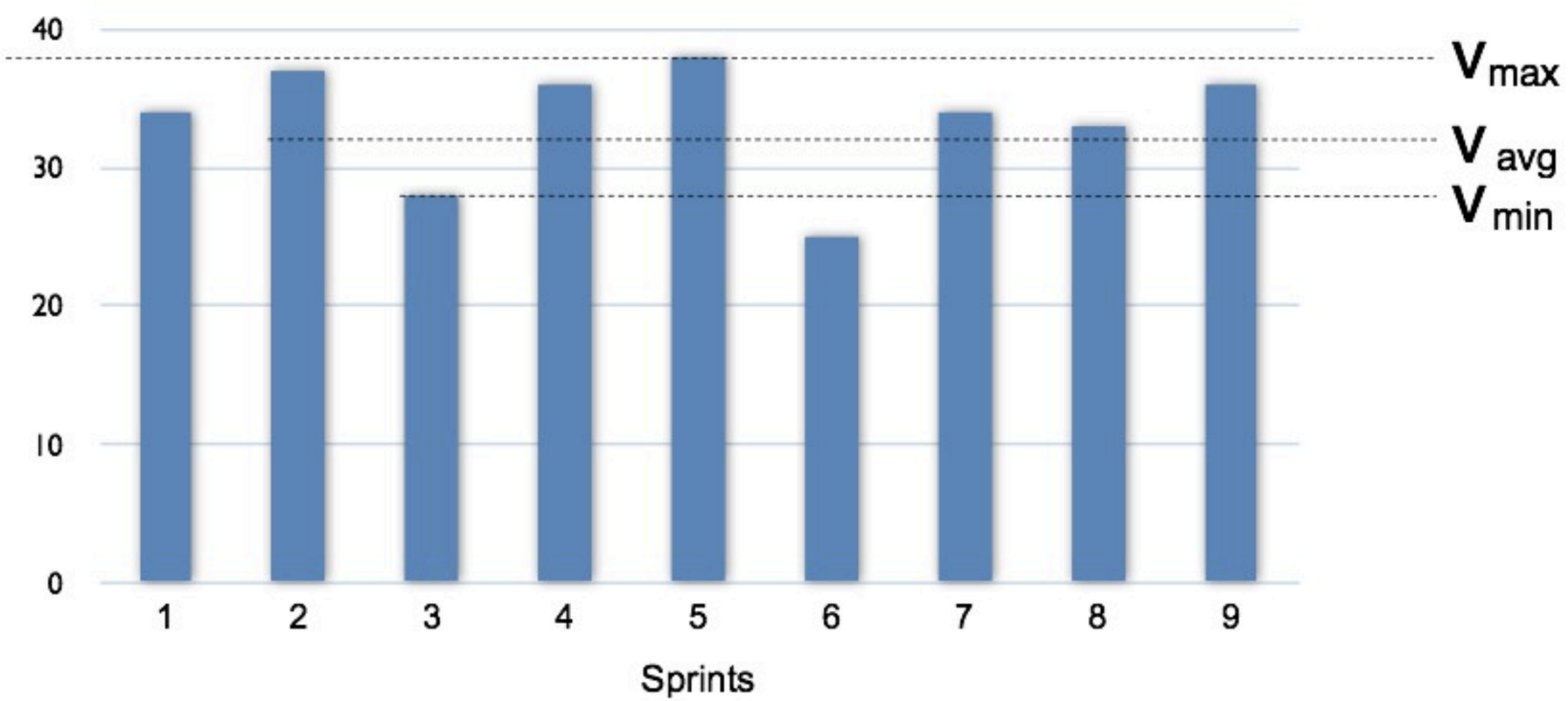
Velocity

- The total of all stories "done" within a Sprint (Story Points)



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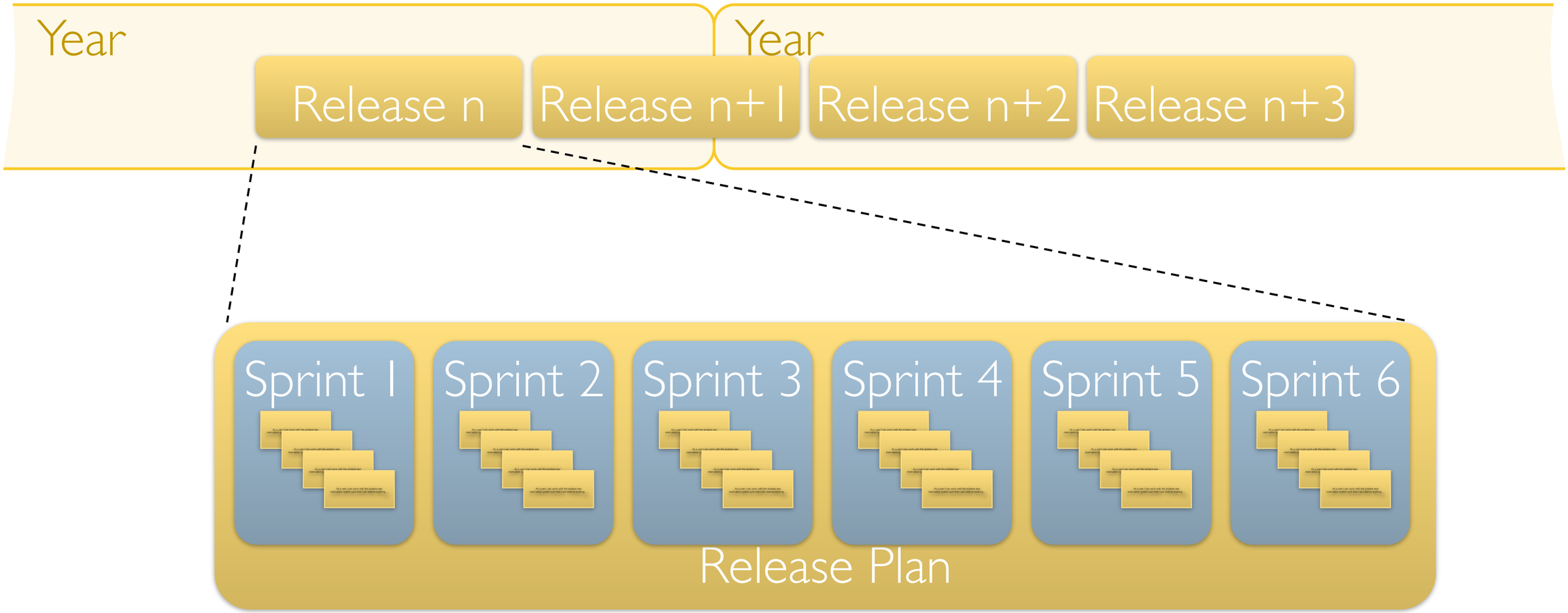
Release Planning



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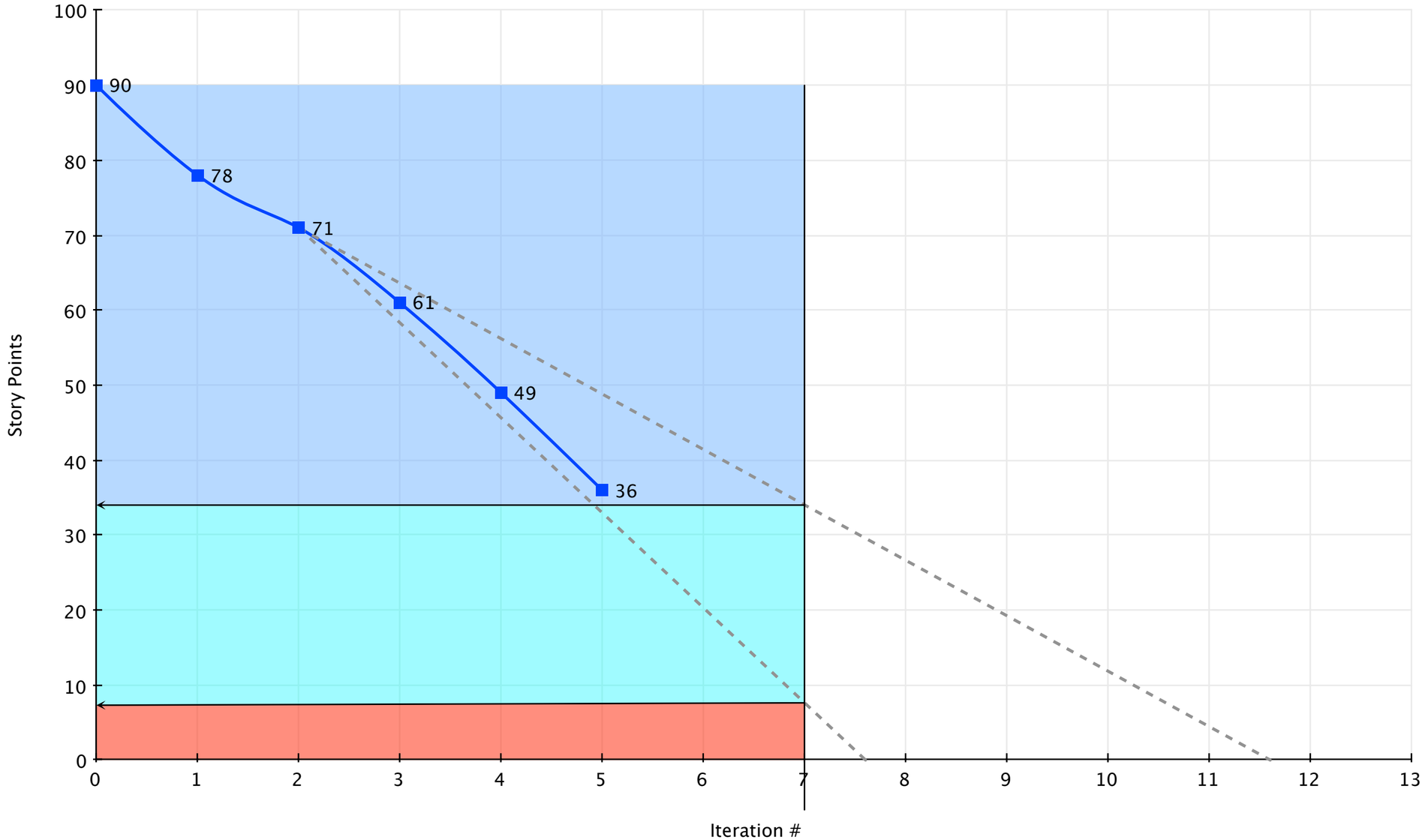
Release Burndown Chart



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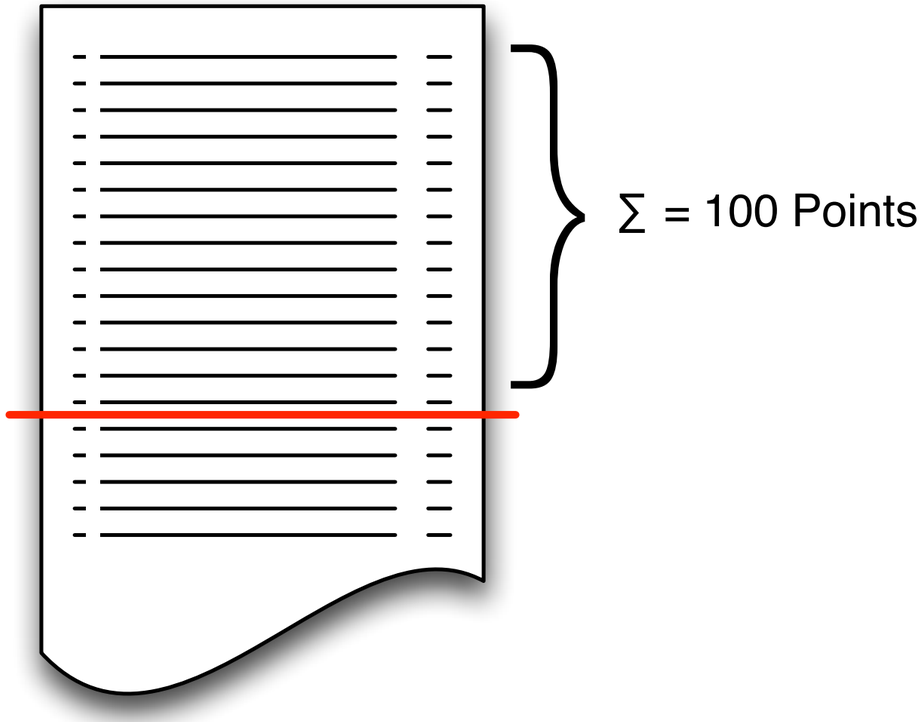
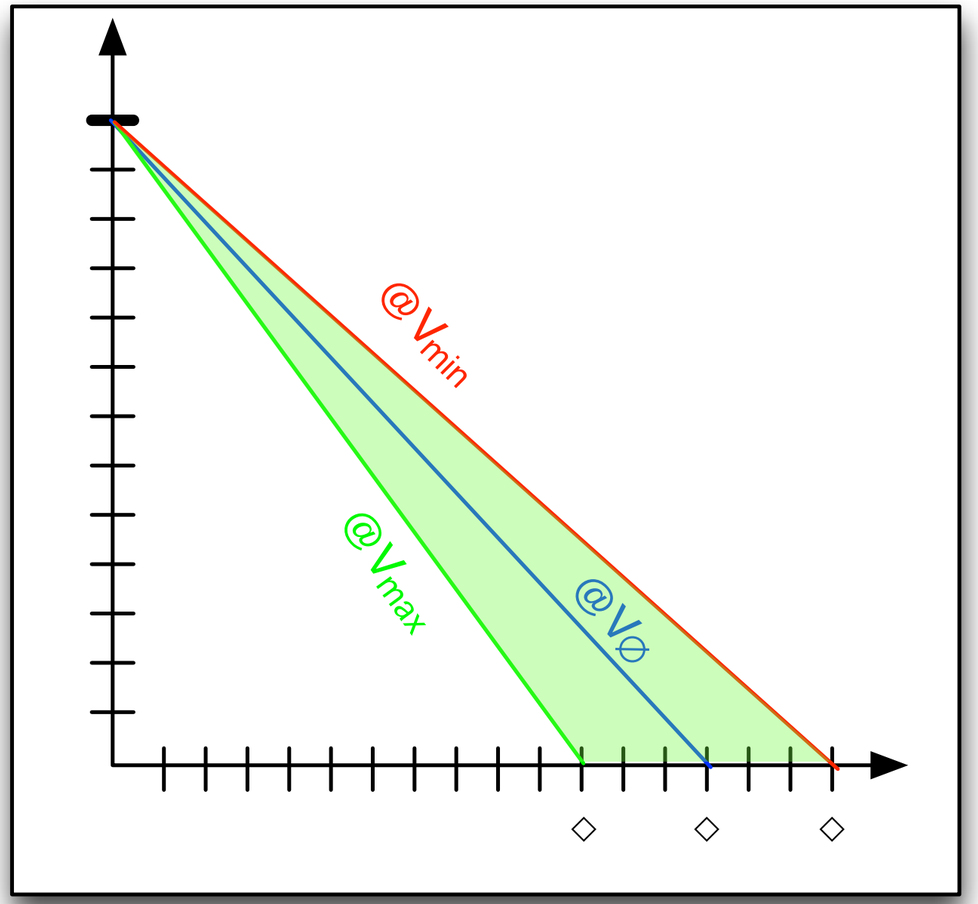
Fixed Scope





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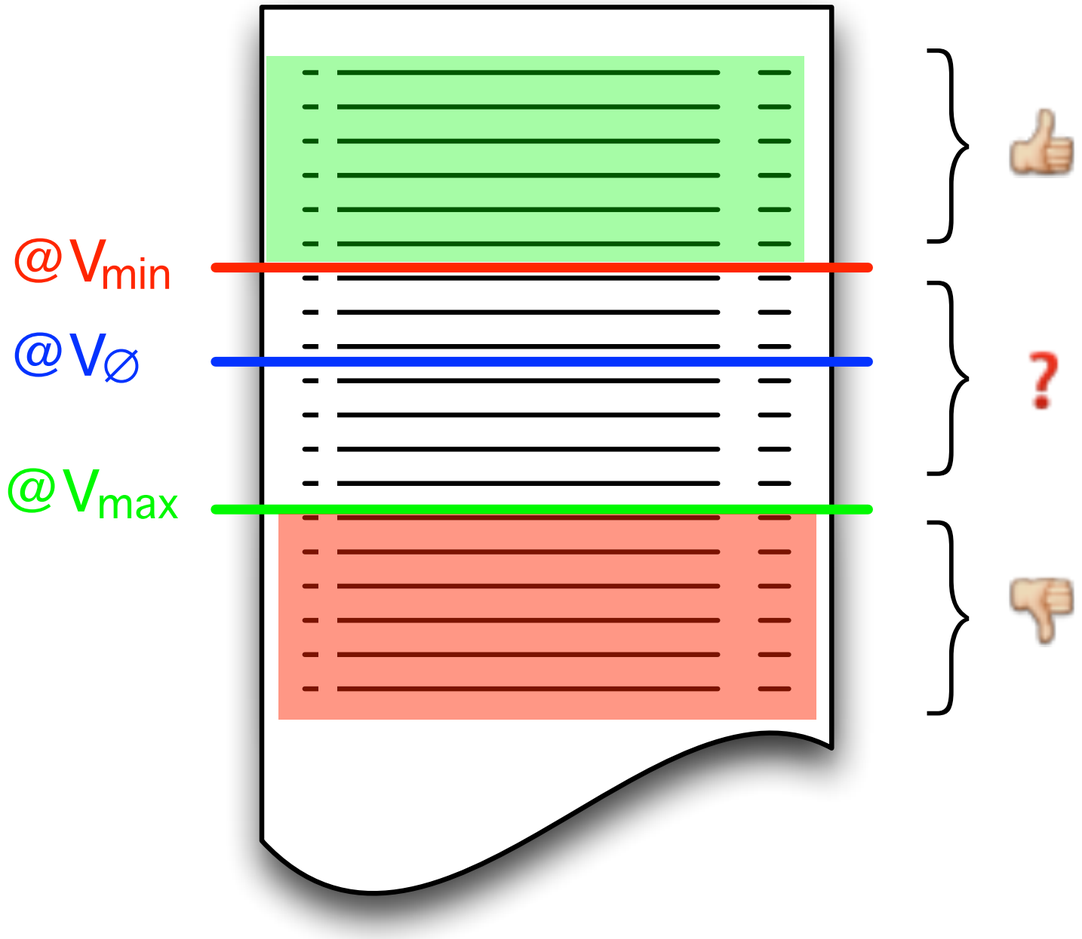
Fixed Release Date



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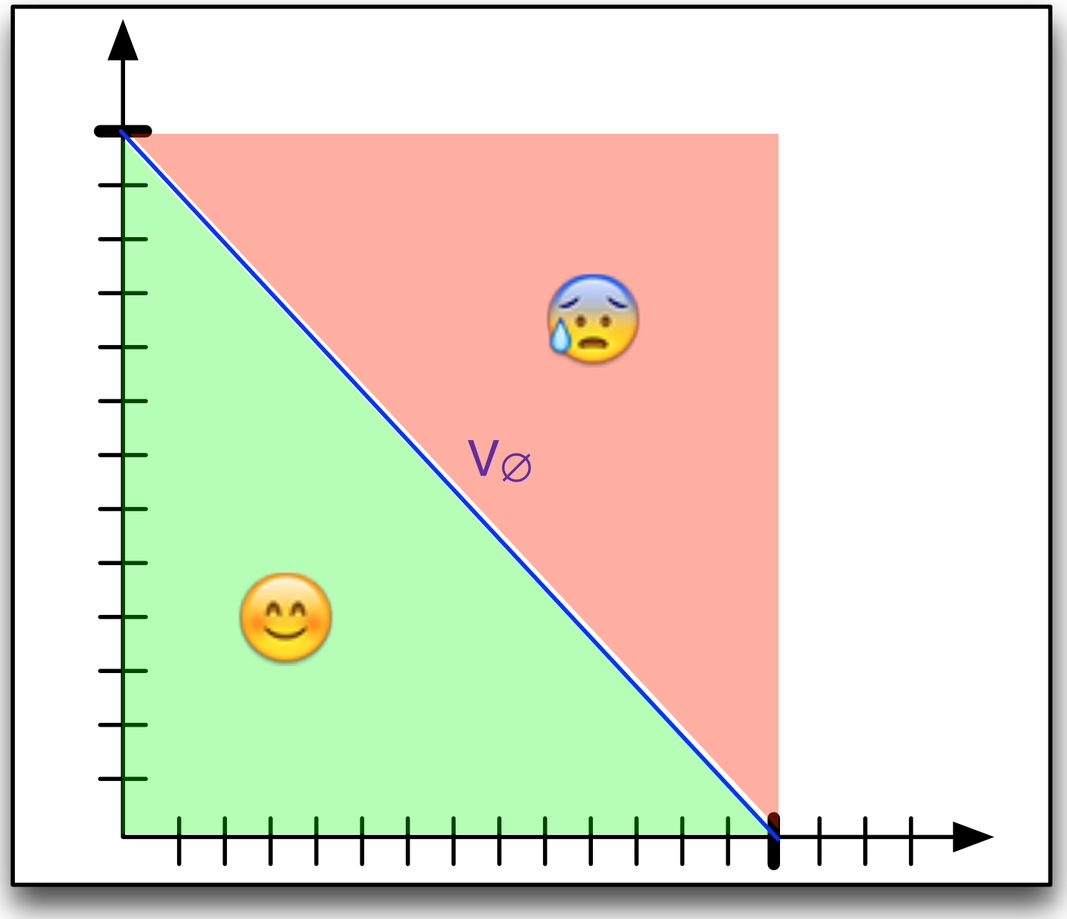
Fixed Scope and Release Date



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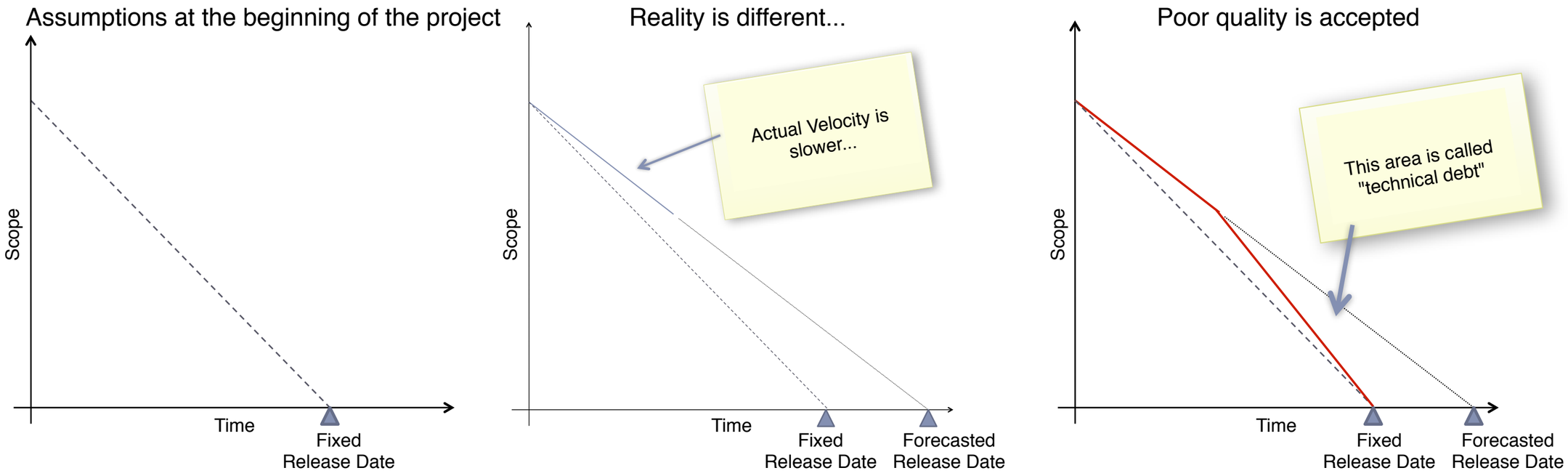
Technical Debt



(a) (b) (c)

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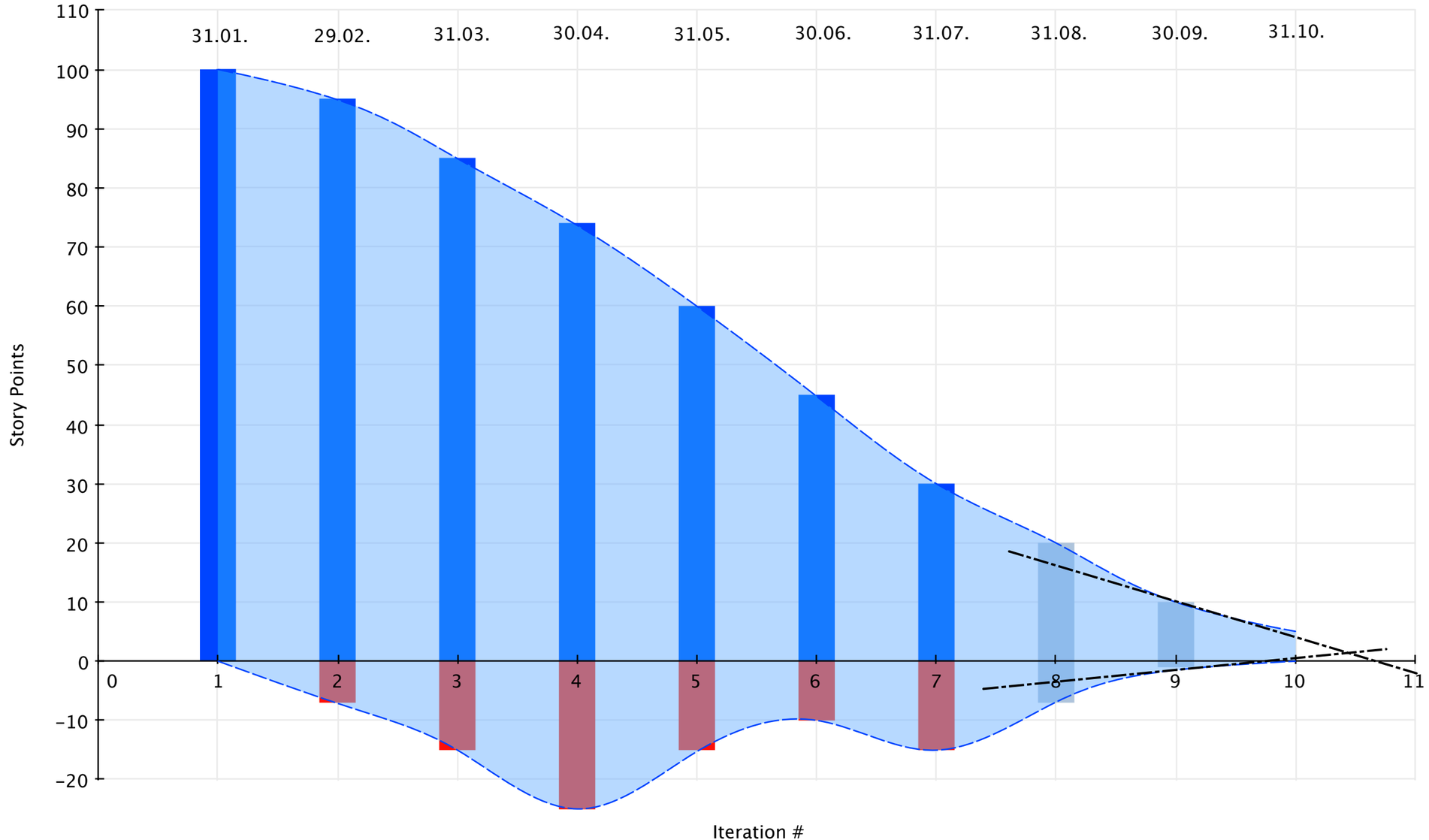
Burndown as Barchart



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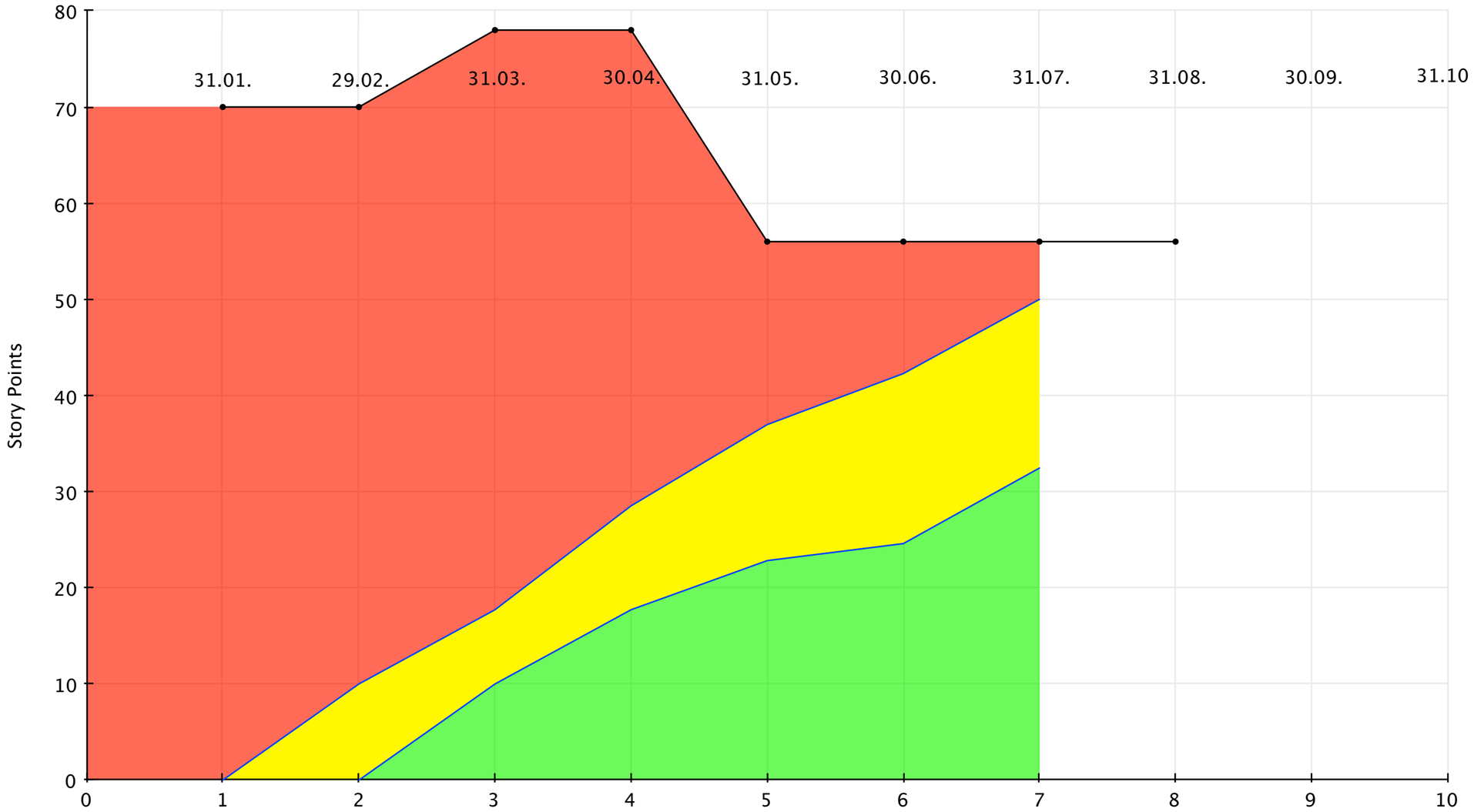
BurnUp Chart



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8

Scrum Master Role Details

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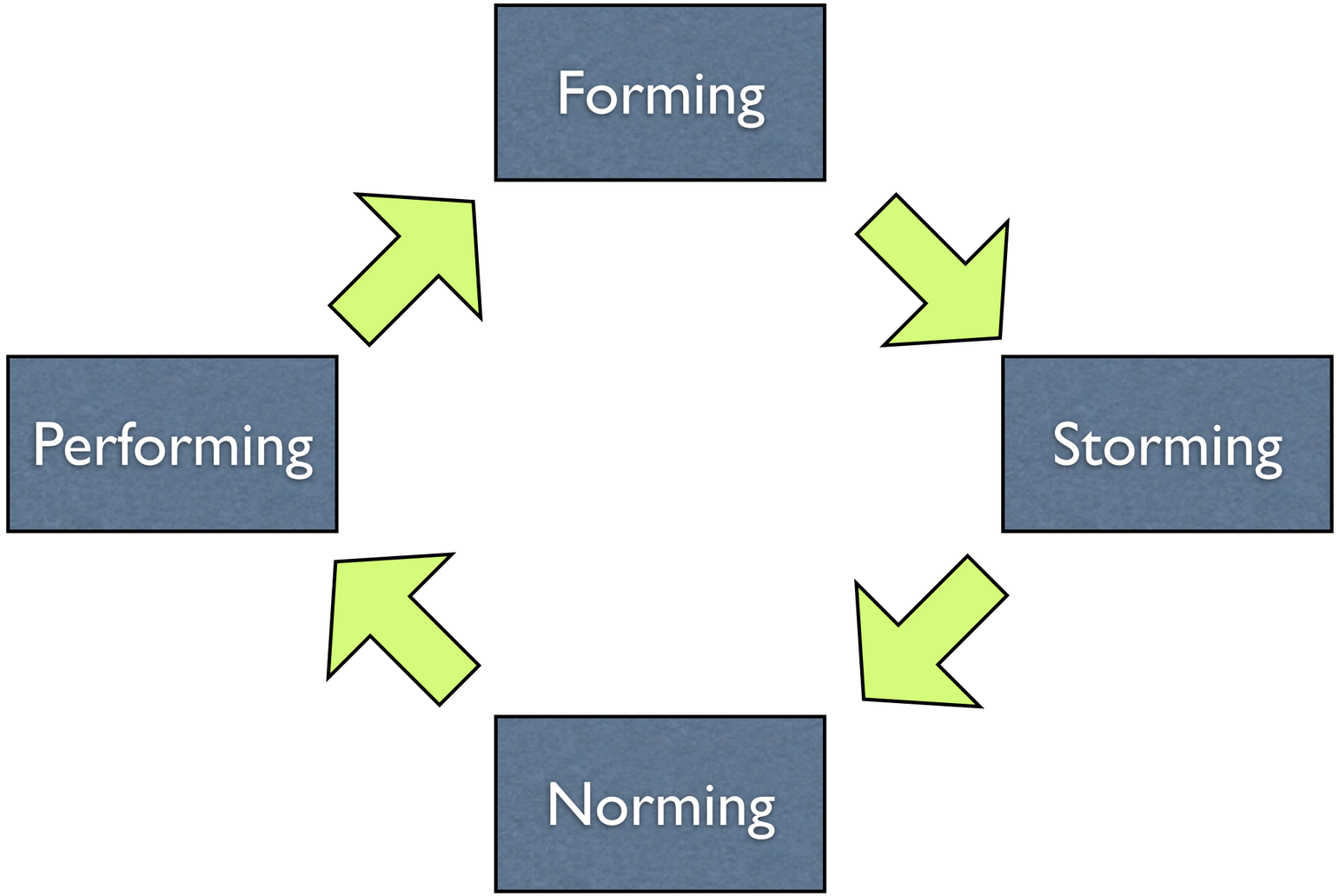
Team Forming



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Team Forming

- In small groups, discuss the following questions:
  - How long does it take to get to “performing” for a new team?
  - How long should a Scrum team stay together?
  - What can be done to help the team to get to performing earlier and who is responsible for this?
  - What happens when the team is changed?

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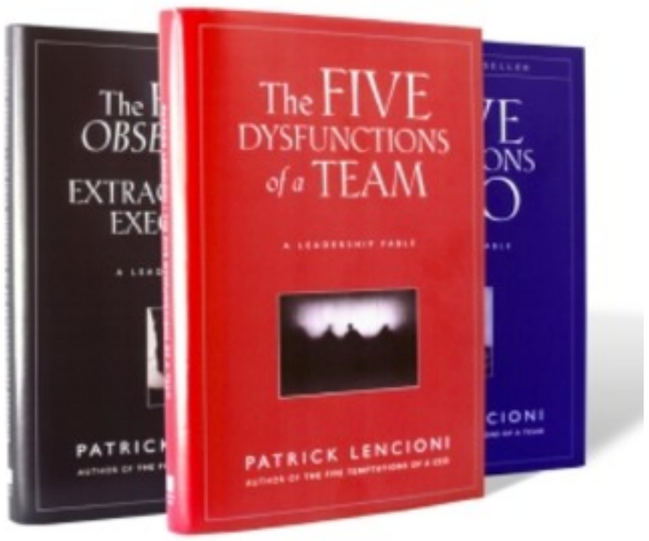
5 Dysfunctions of a Team

- **Inattention to results**
  The desire for individual credit erodes the focus on collective success.
- **Avoidance accountability**
  The need to avoid interpersonal discomfort prevents team members from holding one another accountable for their behaviors.
- **Lack of commitment**
  The lack of clarity and/or the fear of being wrong prevents team members from making decisions in a timely and definitive way.
- **Fear of conflict**
  The desire to preserve artificial harmony stifles the occurrence of productive, ideological conflict.
- **Absence of trust**
  The fear of being vulnerable with team members prevents the building of trust within the team.



Source: Patrick Lenconi, Table Group.
Book: The Five Dysfunctions of a Team

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9

Implementing & Scaling Scrum

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Scrum is very easy to understand...

... and very hard to do.

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Definitive Commitment

Attitude

&

Responsibility

Picture Source: Magnus von Koeller, Flickr

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Focus on...

- Principles over mechanics
- Building excellence in teams
- Engineering practices
- Automation
- Failing fast
- Continuing to learn

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Do not beef up the process

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Lightweight processes do scale

Complex processes do not...

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Scrum changes your organization

Scrum is change management from inside

Scrum Masters are agents for change

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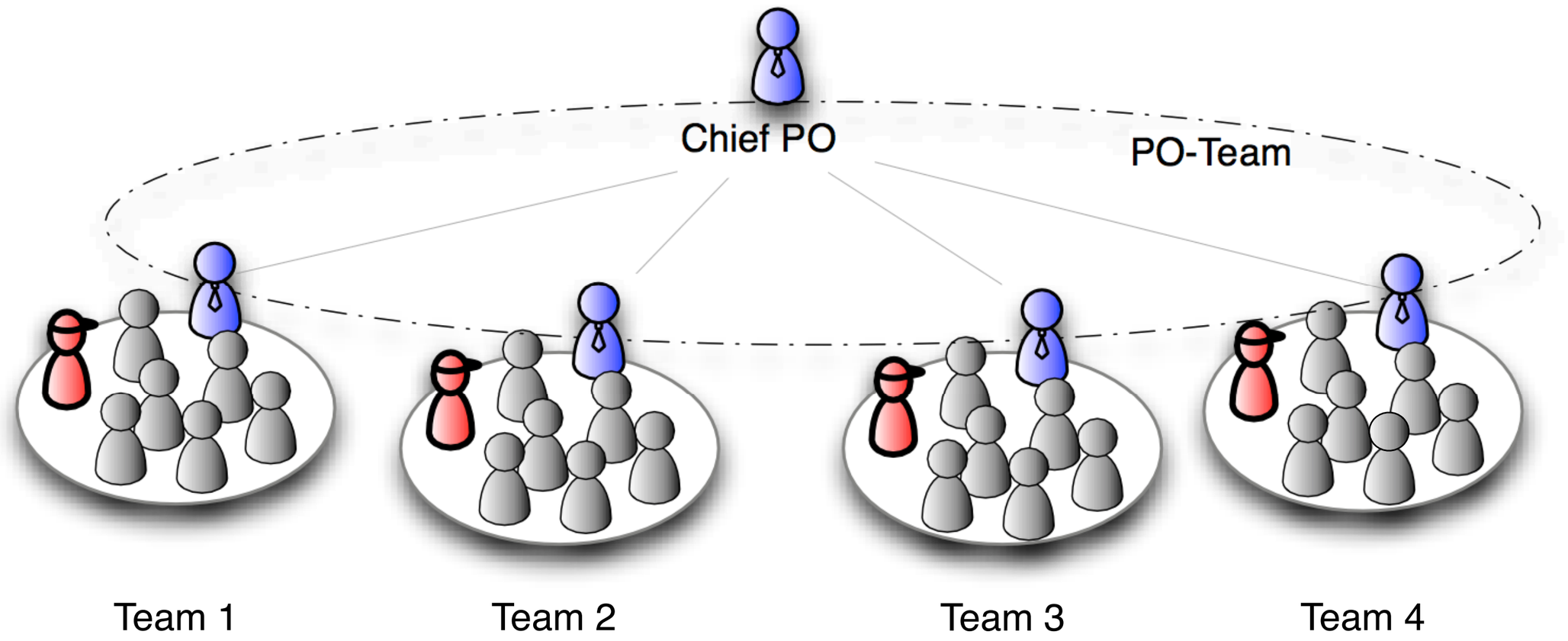
Scaling Scrum



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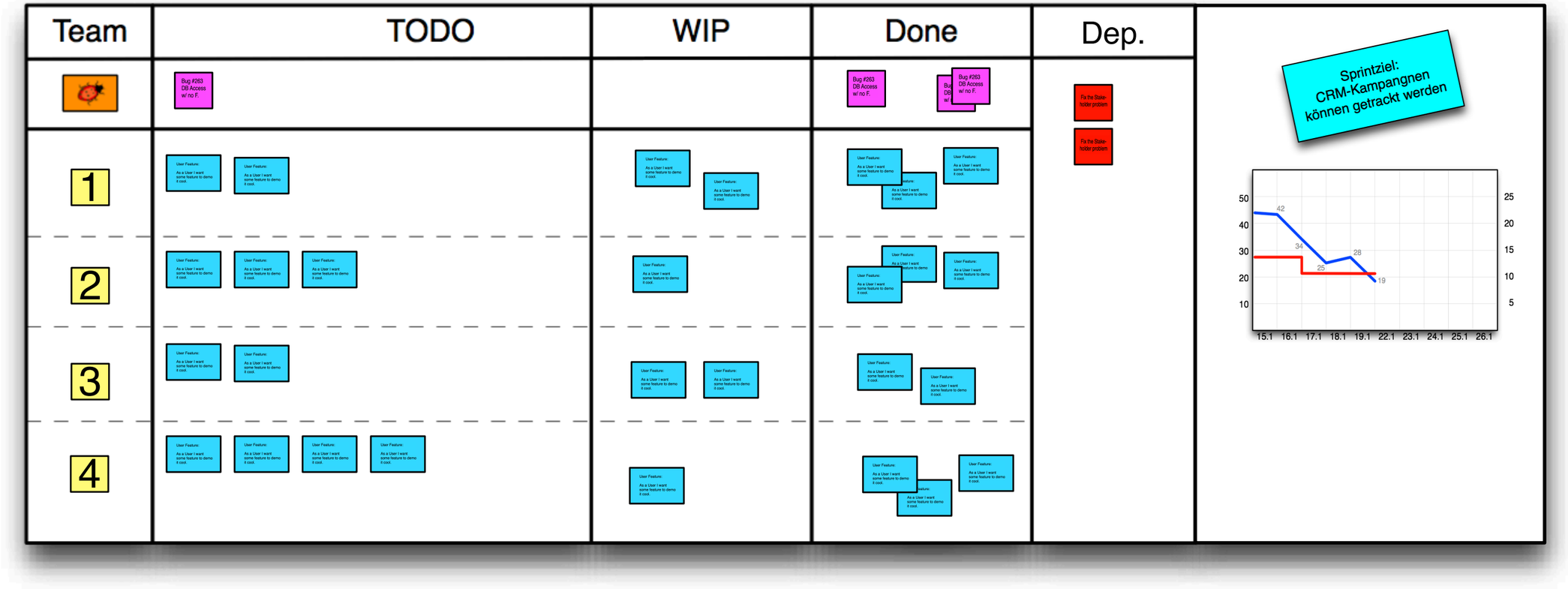
Scrum Of Scrums

A scaled version of the Daily Scrum



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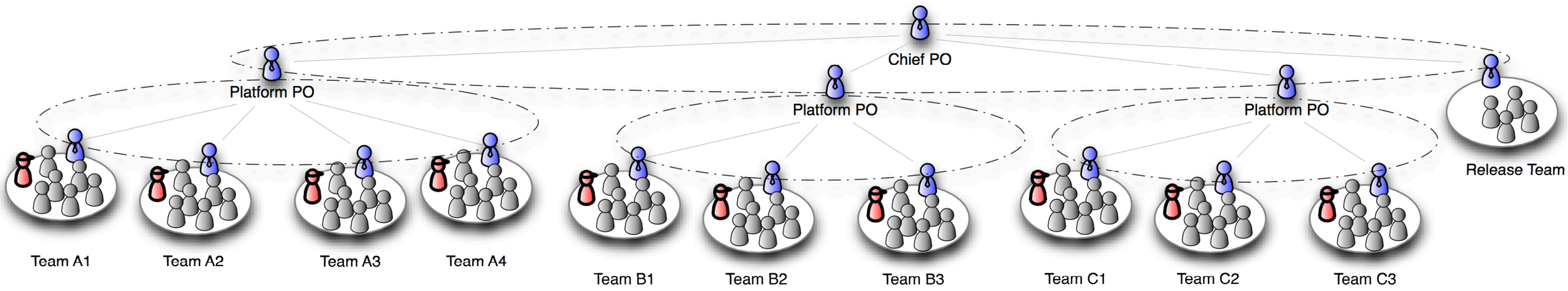
Level-2 of Scaling



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