An Introduction to Scrum

Presented by

Massimo Mecella
MSE-CS - Advanced Programming

cc BY

We're losing the relay race

why scrum:

previous models were:

"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."

Hirotaka Takeuchi and Ikujiro Nonaka, "The New New Product Development Game", *Harvard Business Review*, January 1986.

CC BY

Scrum in 100 words

- Scrum is an agile process that allows us to focus on delivering the highest business value in the shortest time.

=> fast but in rapid release stages

- It allows us to rapidly and repeatedly inspect actual working software (every two weeks to one month).

no paper

- The business sets the priorities. Teams self-organize to determine the best way to deliver the highest priority features.

with continuous customer upfronts:

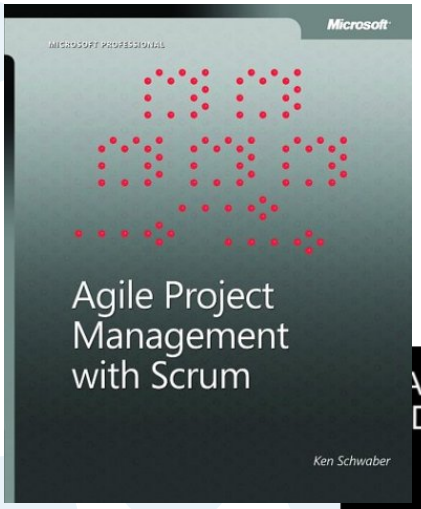
- Every two weeks to a month anyone can see real working software and decide to release it as is or continue to enhance it for another sprint.

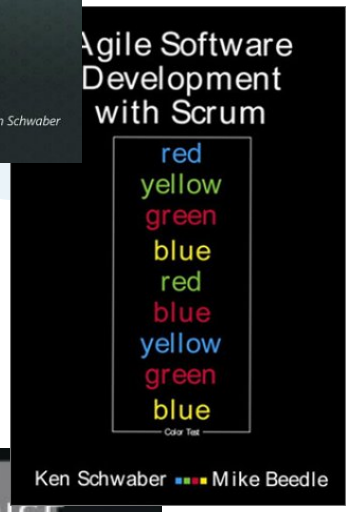
(modern microfunctionality in most our phones app are probably done this way released rapidly)

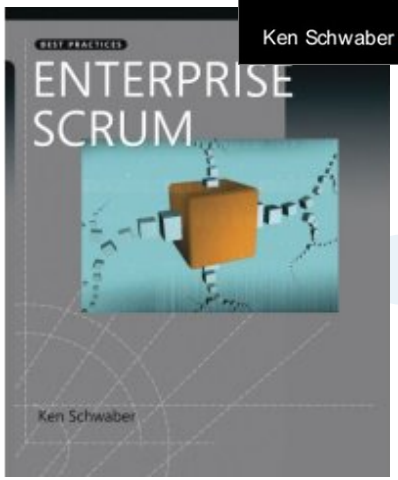
CC BY

Scrum origins

- Jeff Sutherland
  - Initial scrums at Easel Corp in 1993
  - IDX and 500+ people doing Scrum
- Ken Schwaber
  - ADM
  - Scrum presented at OOPSLA 96 with Sutherland
  - Author of three books on Scrum
- Mike Beedle
  - Scrum patterns in PLOPD4
- Ken Schwaber and Mike Cohn
  - Co-founded Scrum Alliance in 2002, initially within the Agile Alliance







cc BY

Scrum has been used by:

- Microsoft
- Yahoo
- Google
- Electronic Arts
- IBM
- Lockheed Martin
- Philips
- Siemens
- Nokia
- Capital One
- BBC
- Intuit
- Nielsen Media
- First American Real Estate
- BMC Software
- Ipswitch
- John Deere
- Lexis Nexis
- Sabre
- Salesforce.com
- Time Warner
- Turner Broadcasting
- Oce

cc BY

Scrum has been used for:

- Commercial software
- In-house development
- Contract development
- Fixed-price projects
- Financial applications
- ISO 9001-certified applications
- Embedded systems
- 24x7 systems with 99.999% uptime requirements
- the Joint Strike Fighter
- Video game development
- FDA-approved, life-critical systems
- Satellite-control software
- Websites
- Handheld software
- Mobile phones
- Network switching applications
- ISV applications
- Some of the largest applications in use

CC BY

Characteristics

- Self-organizing teams but the deadlines are decided previous:
- Product progresses in a series of 2-4 week "sprints"
- Requirements are captured as items in a list of "product backlog"
- No specific engineering practices prescribed apply to all the projects , all the languages
- Uses generative rules to create an agile environment for delivering projects
- One of the "agile processes"

CC BY

The Agile Manifesto–a statement of values

Individuals and interactions

over

Process and tools

Source: www.agilemanifesto.org

CC BY

The Agile Manifesto–a statement of values

Individuals and interactions	over	Process and tools
Working software	over	Comprehensive documentation

Source: www.agilemanifesto.org

cc BY

The Agile Manifesto–a statement of values

Individuals and interactions	over	Process and tools
Working software	over	Comprehensive documentation
Customer collaboration	over	Contract negotiation

Source: www.agilemanifesto.org

CC BY

The Agile Manifesto–a statement of values

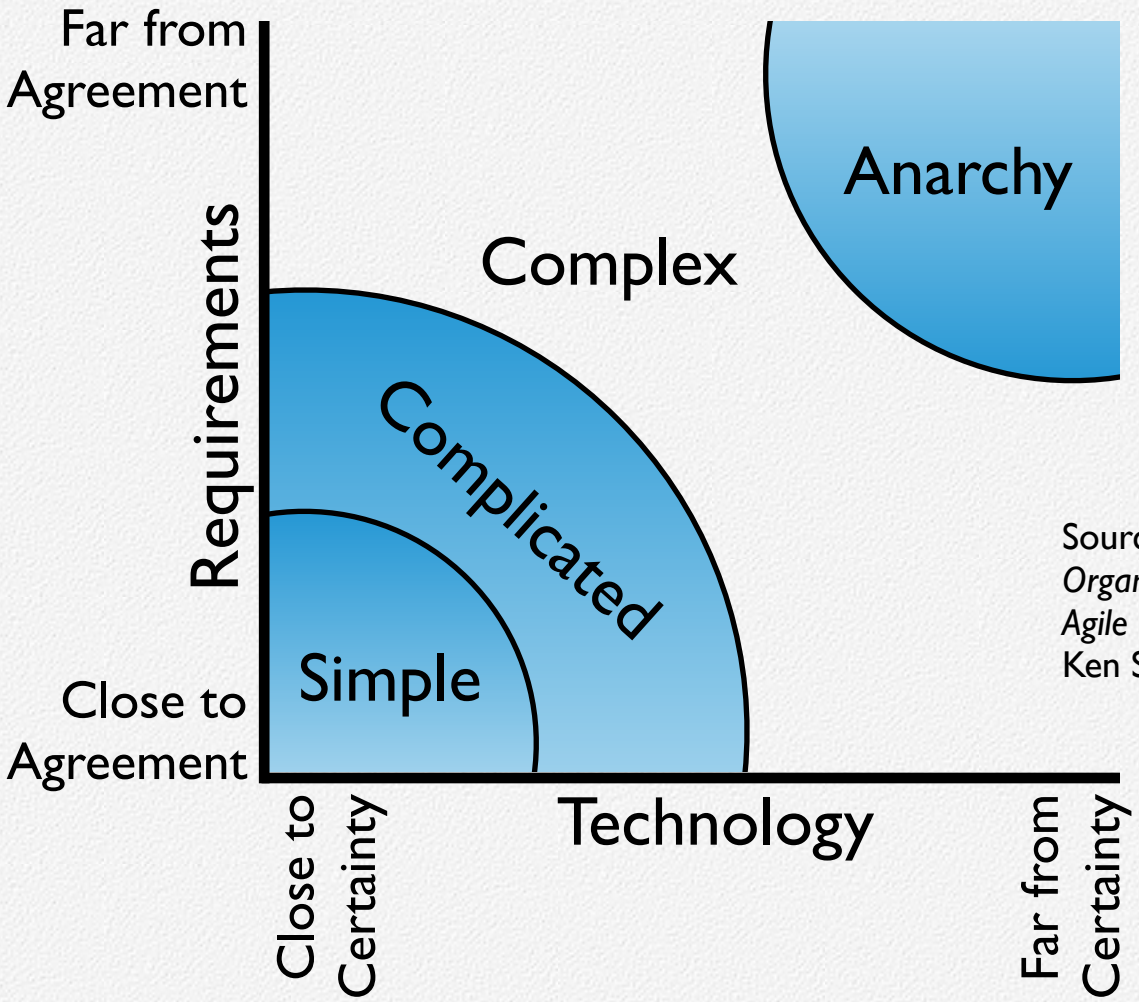
today is a compromise of blue and green feautres:

Individuals and interactions	over	Process and tools
Working software	over	Comprehensive documentation
Customer collaboration	over	Contract negotiation
Responding to change	over	Following a plan

Source: www.agilemanifesto.org

cc BY

Project noise level



Source: *Strategic Management and Organizational Dynamics* by Ralph Stacey in *Agile Software Development with Scrum* by Ken Schwaber and Mike Beedle.

Scrum

basic idea of scrup:

i have a list of funcninlity

Product backlog

cc BY

Scrum

Product backlog

cc BY

Scrum

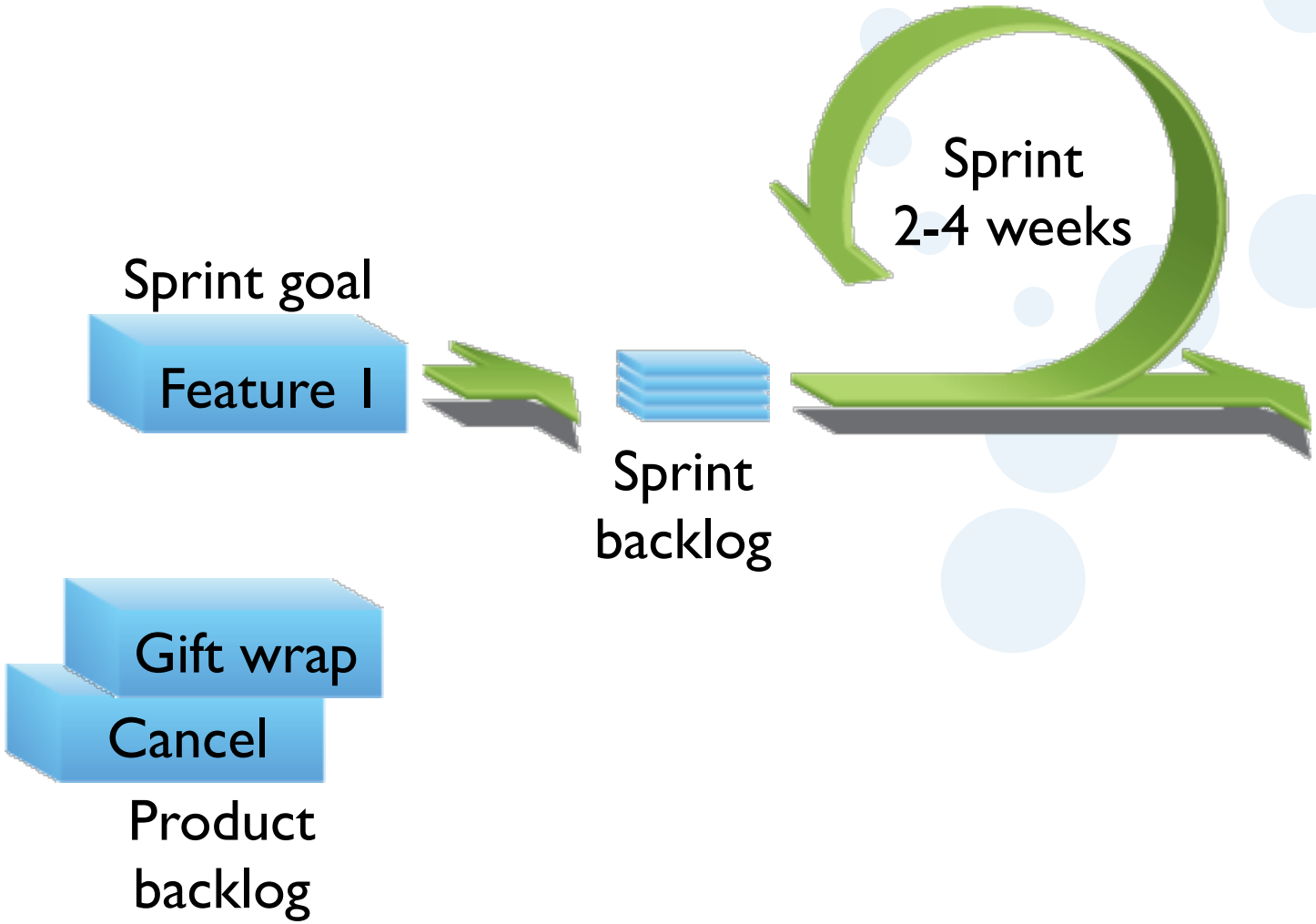
if the feature is not good it comes back

Sprint goal

Product backlog

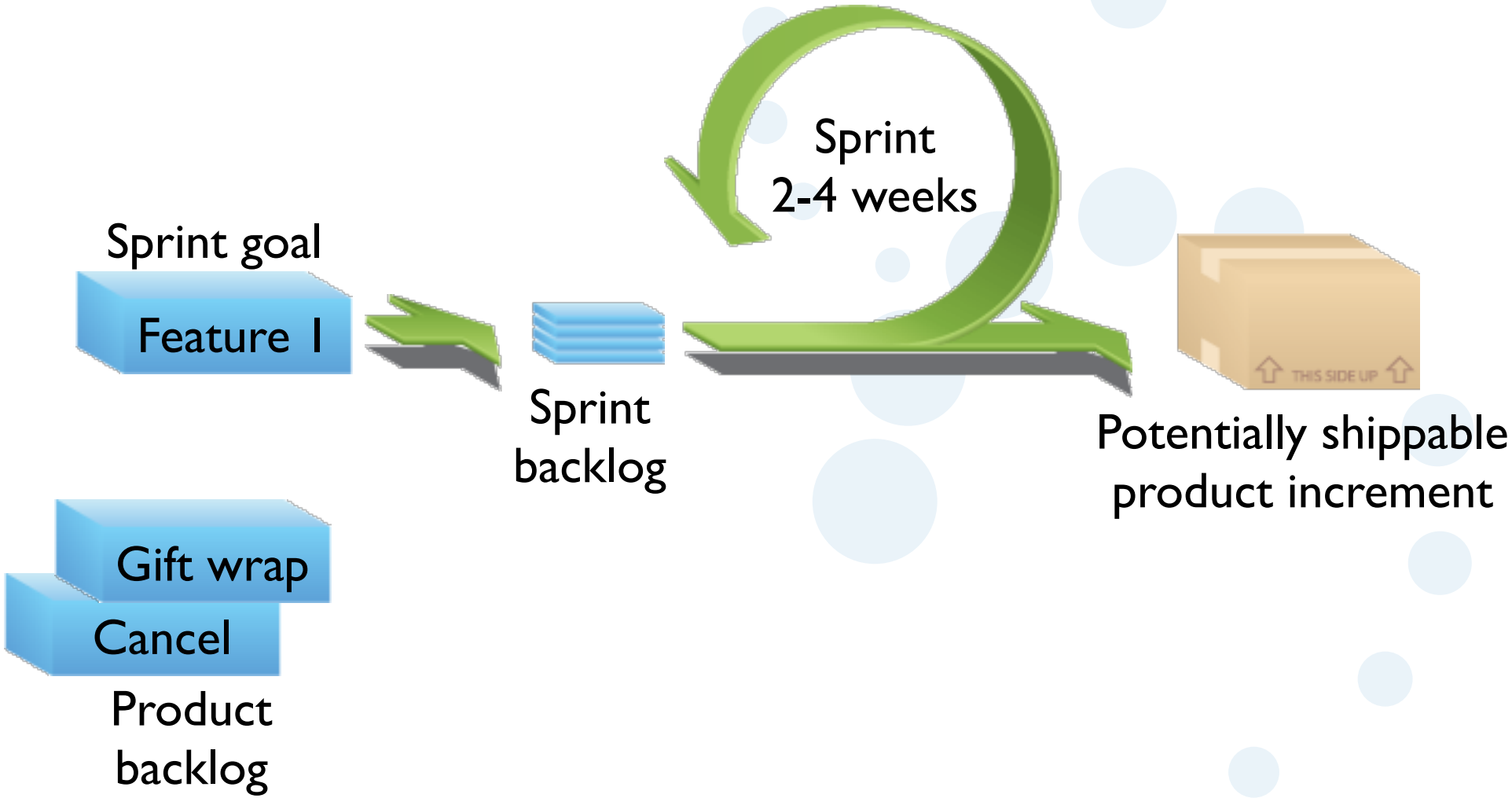
cc BY

Scrum


Sprint
2-4 weeks
Sprint goal
Feature 1
Sprint
backlog
Gift wrap
Cancel
Product
backlog

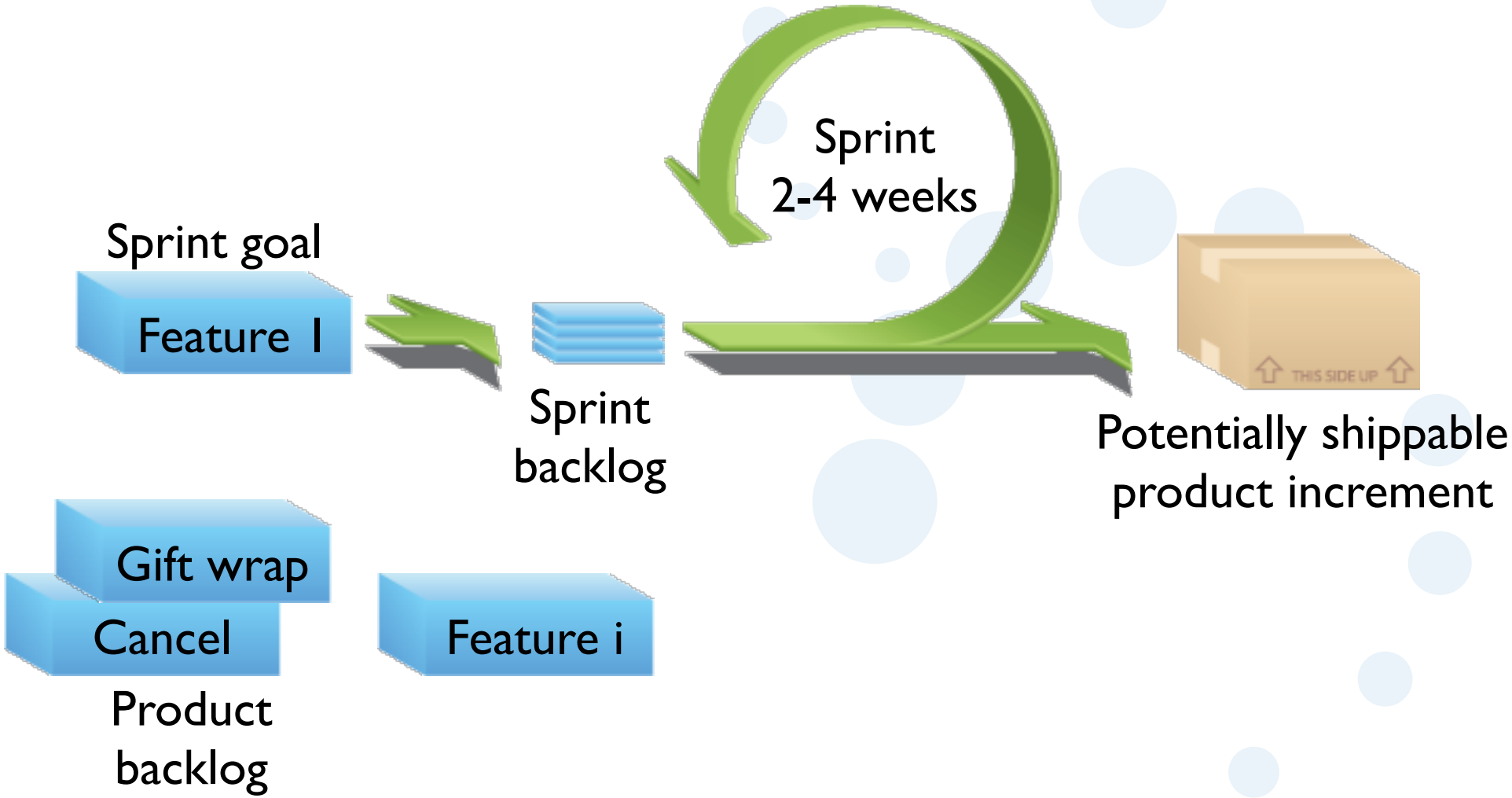
cc BY

Scrum


Sprint
2-4 weeks
Sprint goal
Feature 1
Sprint
backlog
THIS SIDE UP
Potentially shippable
product increment
Gift wrap
Cancel
Product
backlog

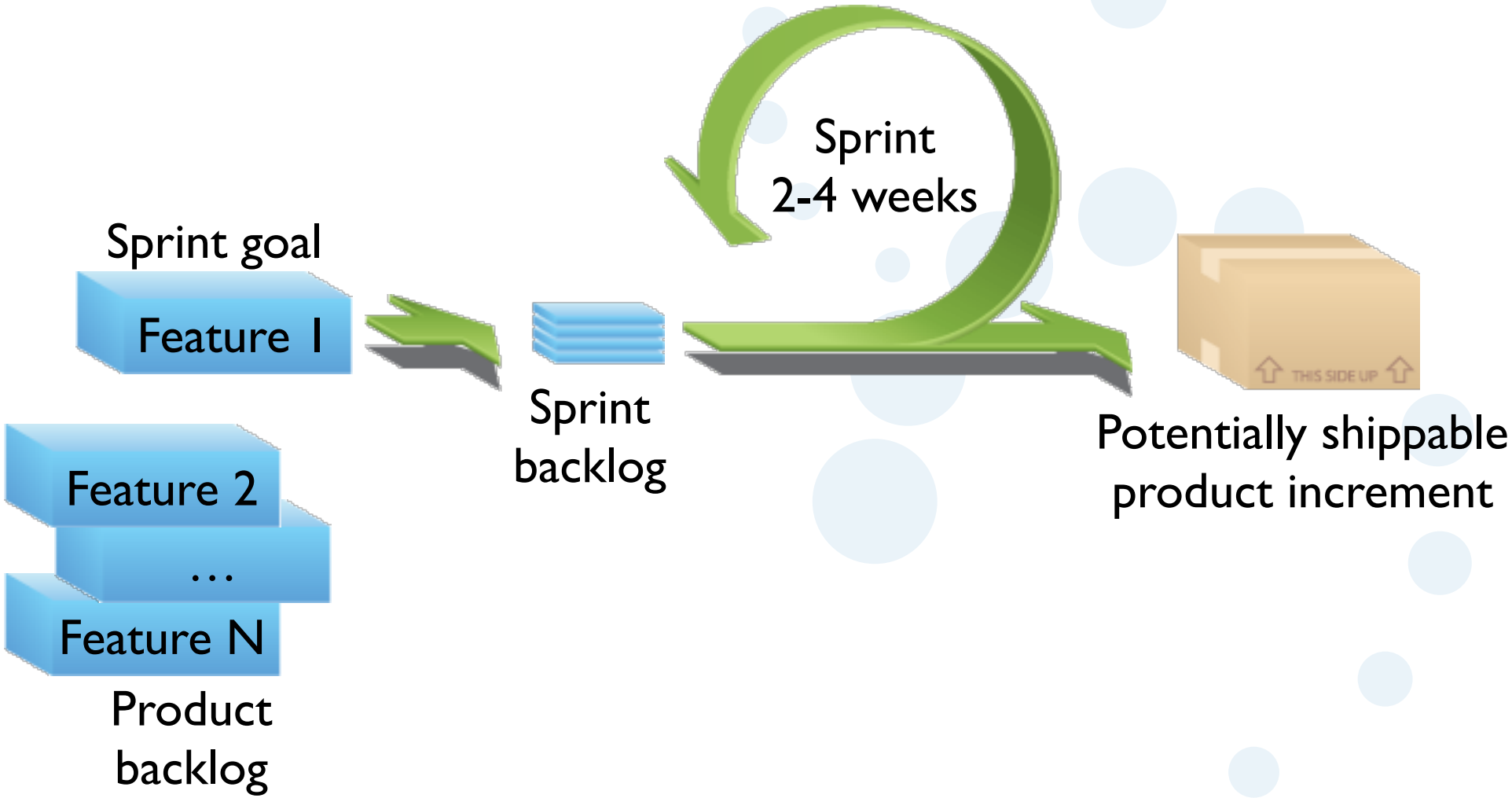
cc BY

Scrum


Sprint
2-4 weeks
Sprint goal
Feature 1
Sprint
backlog
THIS SIDE UP
Potentially shippable
product increment
Gift wrap
Cancel
Feature i
Product
backlog

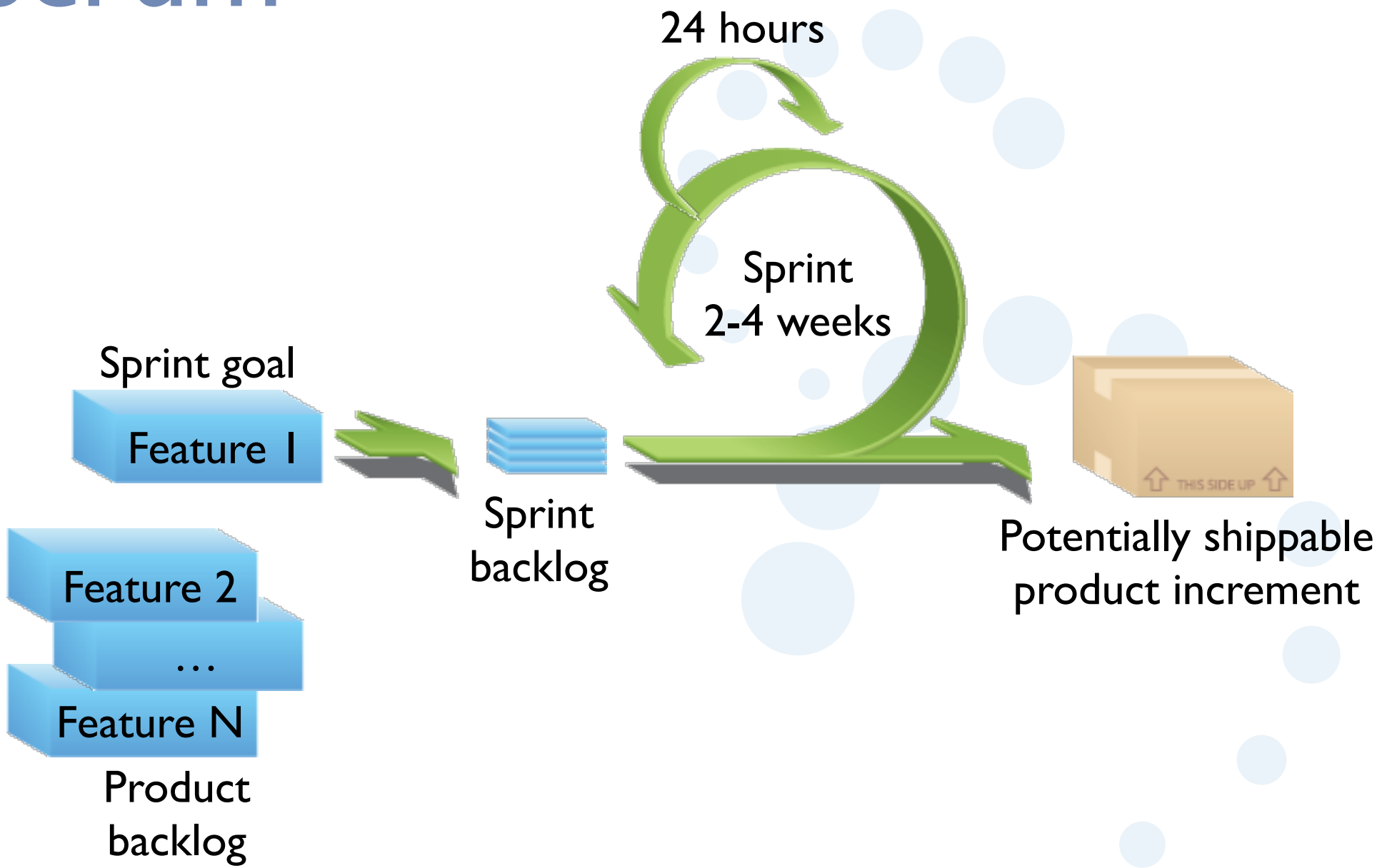
cc BY

Scrum


Sprint goal
Feature 1
Feature 2
…
Feature N
Product backlog
Sprint backlog
Sprint
2-4 weeks
THIS SIDE UP
Potentially shippable product increment

CC BY

Scrum


24 hours
Sprint
2-4 weeks
Sprint goal
Feature 1
Feature 2
…
Feature N
Product
backlog
Sprint
backlog
THIS SIDE UP
Potentially shippable
product increment

Putting it all together

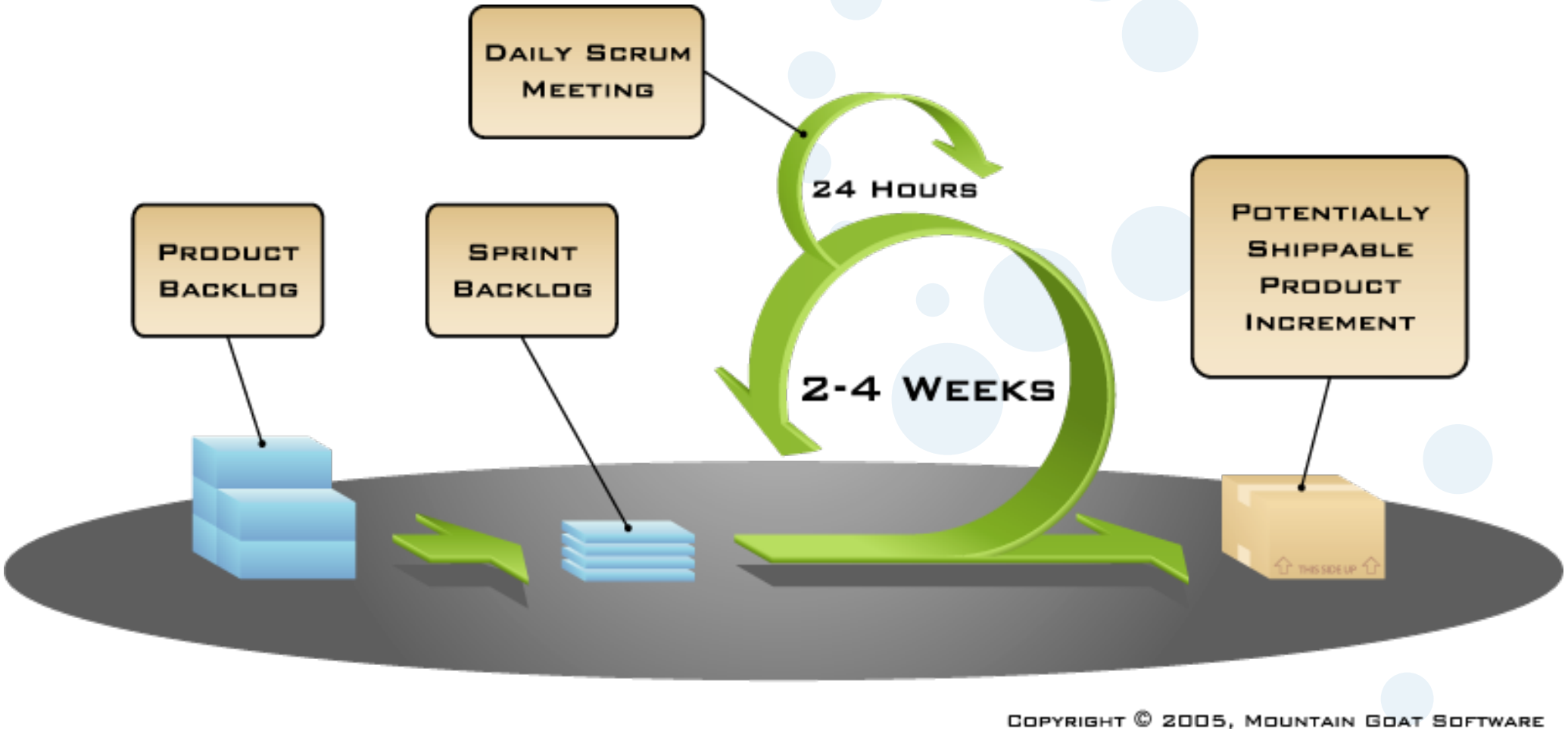


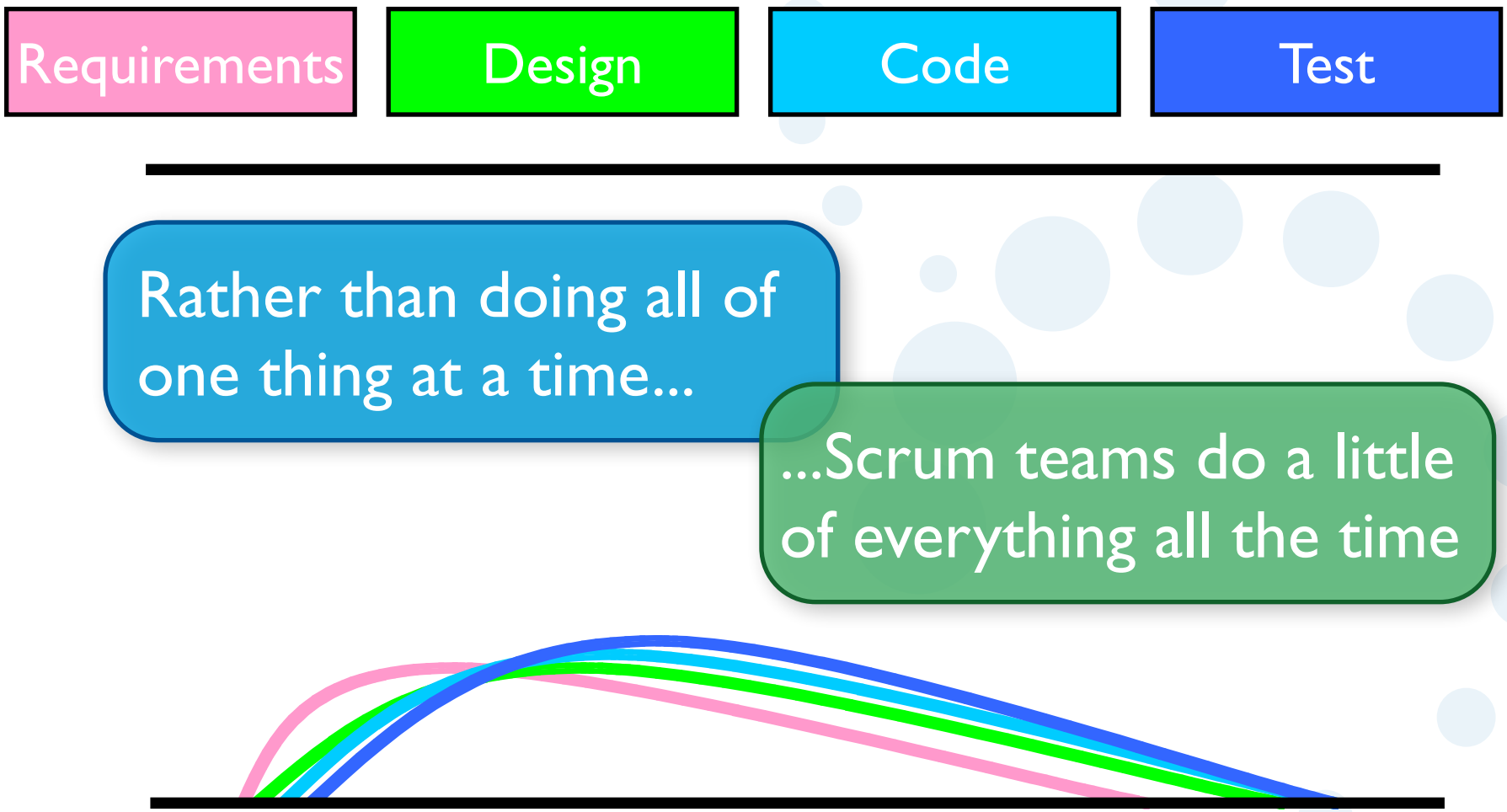
Image available at
www.mountaingoatsoftware.com/scrum

CC BY

Sprints

- Scrum projects make progress in a series of "sprints"
  - Analogous to Extreme Programming iterations
- Typical duration is 2–4 weeks or a calendar month at most
- A constant duration leads to a better rhythm
- Product is designed, coded, and tested during the sprint

Sequential vs. overlapping development



Rather than doing all of one thing at a time...

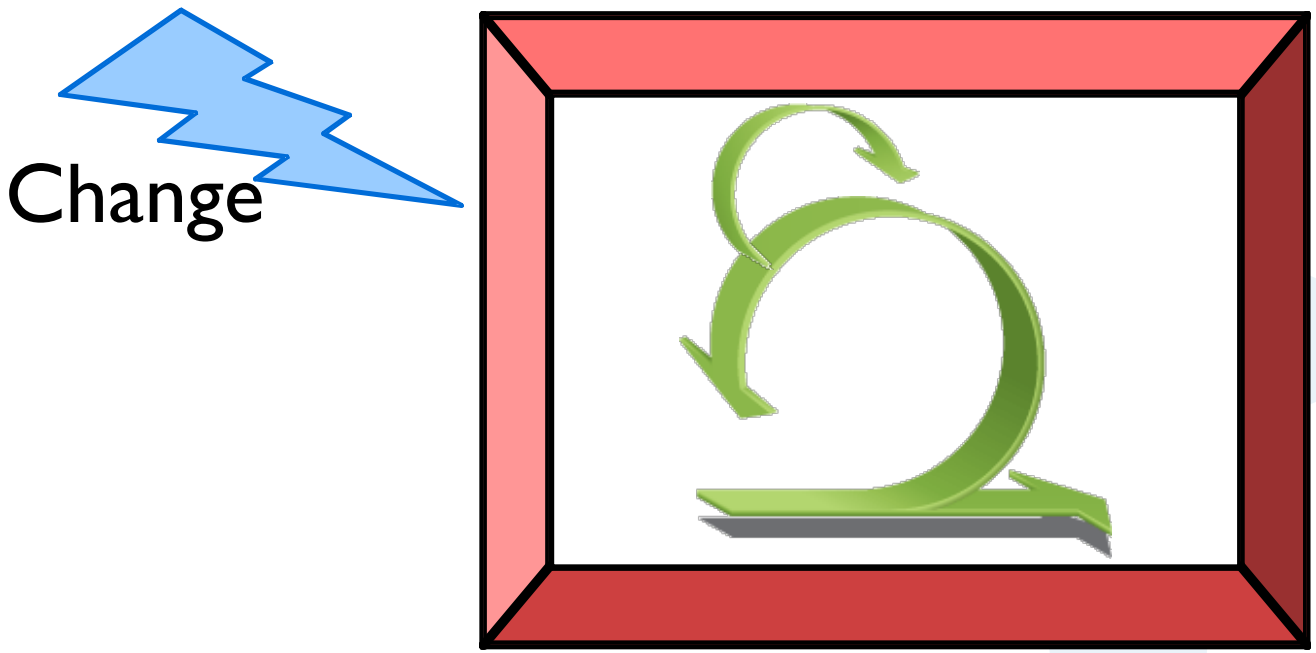
...Scrum teams do a little of everything all the time

Source: "The New New Product Development Game" by Takeuchi and Nonaka. *Harvard Business Review,* January 1986.

cc BY

No changes during a sprint

during the sprint duration i don't accept customer modify requests



- Plan sprint durations around how long you can commit to keeping change out of the sprint

cc BY

Scrum framework

Roles

- Product owner
- ScrumMaster
- Team

Ceremonies

- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

BY

Scrum framework

Roles

- Product owner
- ScrumMaster
- Team

Ceremonies

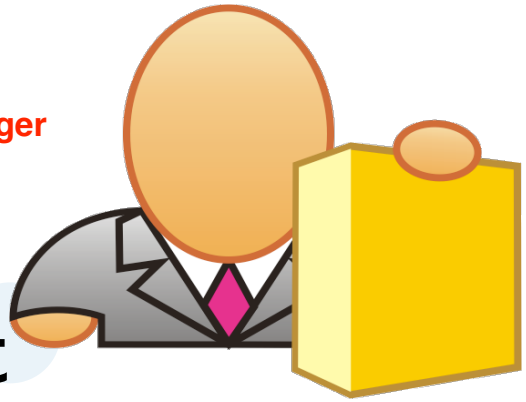
- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

Product owner

also called product manager



is the one who:

- Define the features of the product
- Decide on release date and content
- Be responsible for the profitability of the product (ROI)
- Prioritize features according to market value
- Adjust features and priority every iteration, as needed
- Accept or reject work results

cc BY

The ScrumMaster

=> not a traditional project manager (in sw entp.'s) that push you to produce as much as you can, instead is a person that has to guarantee that all the other peoples works

- Represents management to the project
- Responsible for enacting Scrum values and practices
- Removes impediments
- Ensure that the team is fully functional and productive
- Enable close cooperation across all roles and functions
- Shield the team from external interferences

cc BY

The team

- Typically 5-9 people
- Cross-functional:

  many people with different skills

  - Programmers, testers, user experience designers, etc.
- Members should be full-time

  work togheter as a group always

  - May be exceptions (e.g., database administrator)
- Teams are self-organizing
  - Ideally, no titles but rarely a possibility
- Membership should change only between sprints

CC BY

Scrum framework

Roles

- Product owner
- ScrumMaster
- Team

Ceremonies

- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

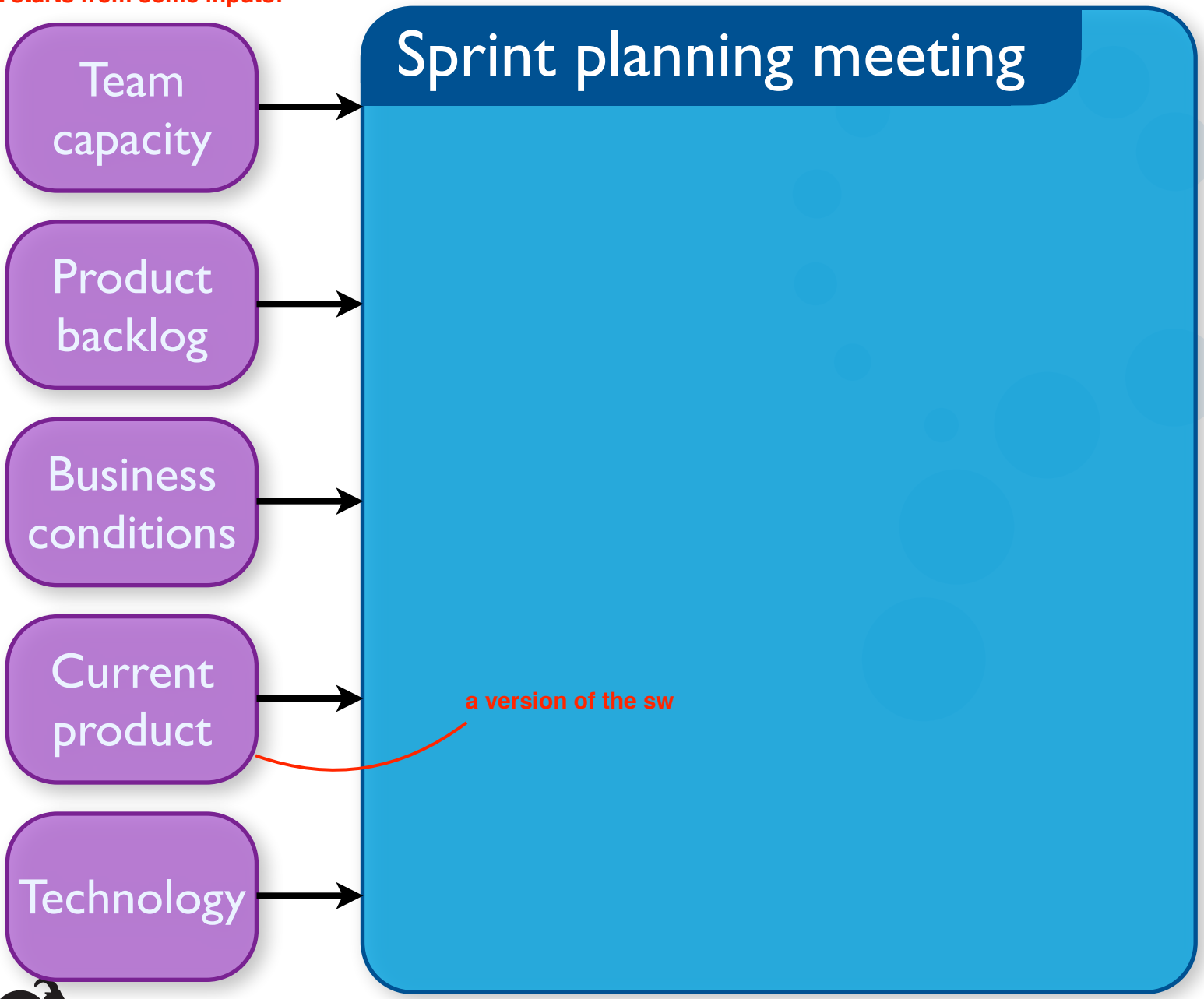
Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

BY

is the meeting the team do at the beginning of every sprint

it starts from some inputs:



cc BY

Team capacity

Product backlog

Business conditions

Current product

Technology

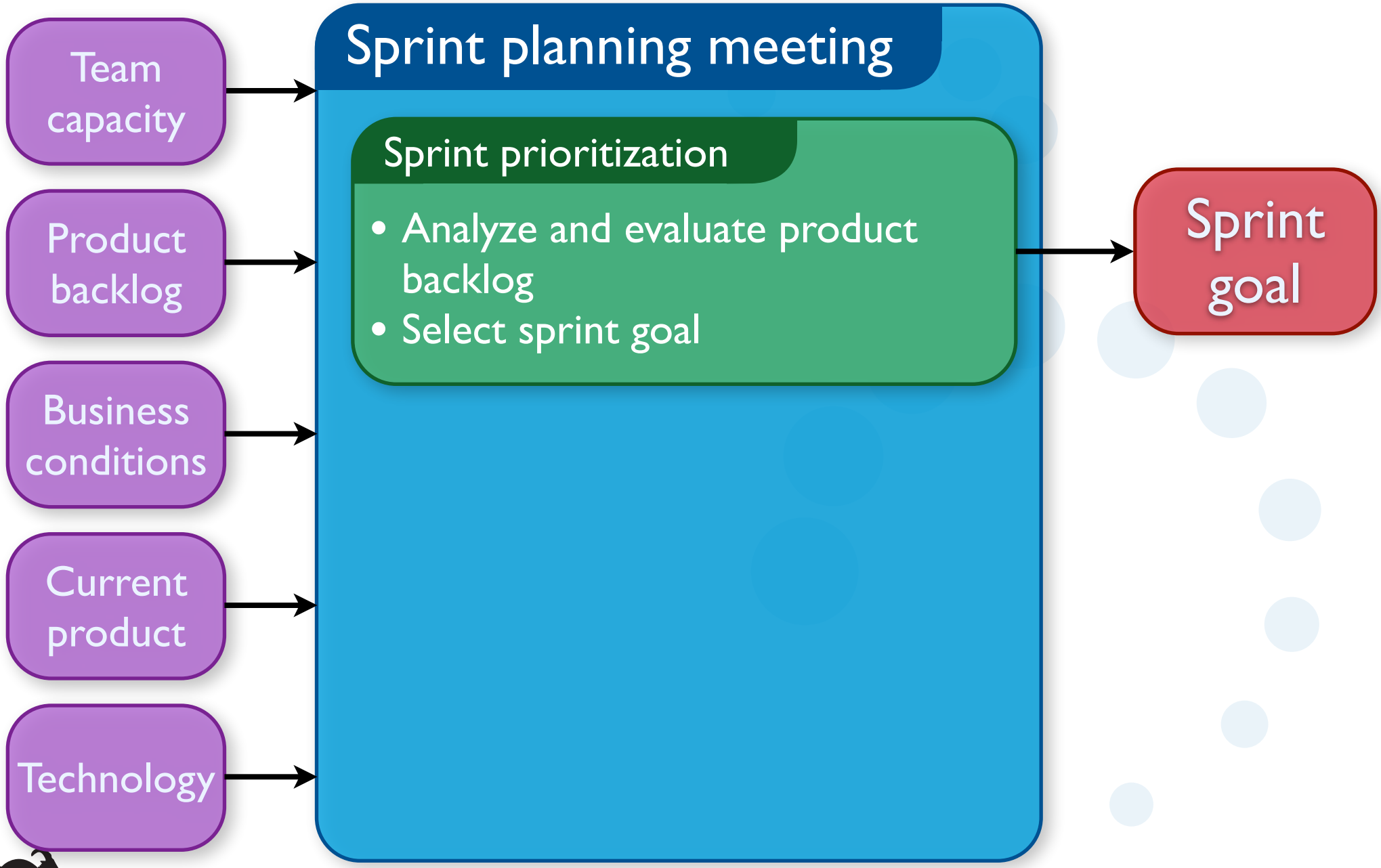
Sprint planning meeting

Sprint prioritization

the product owner:

- Analyze and evaluate product backlog
- Select sprint goal

CC BY


Team capacity
Product backlog
Business conditions
Current product
Technology
Sprint planning meeting
Sprint prioritization
• Analyze and evaluate product backlog
• Select sprint goal
Sprint goal

CC BY

all the functionalities i have to do

Team capacity

Product backlog

Business conditions

Current product

Technology

Sprint planning meeting

Sprint prioritization

- Analyze and evaluate product backlog
- Select sprint goal

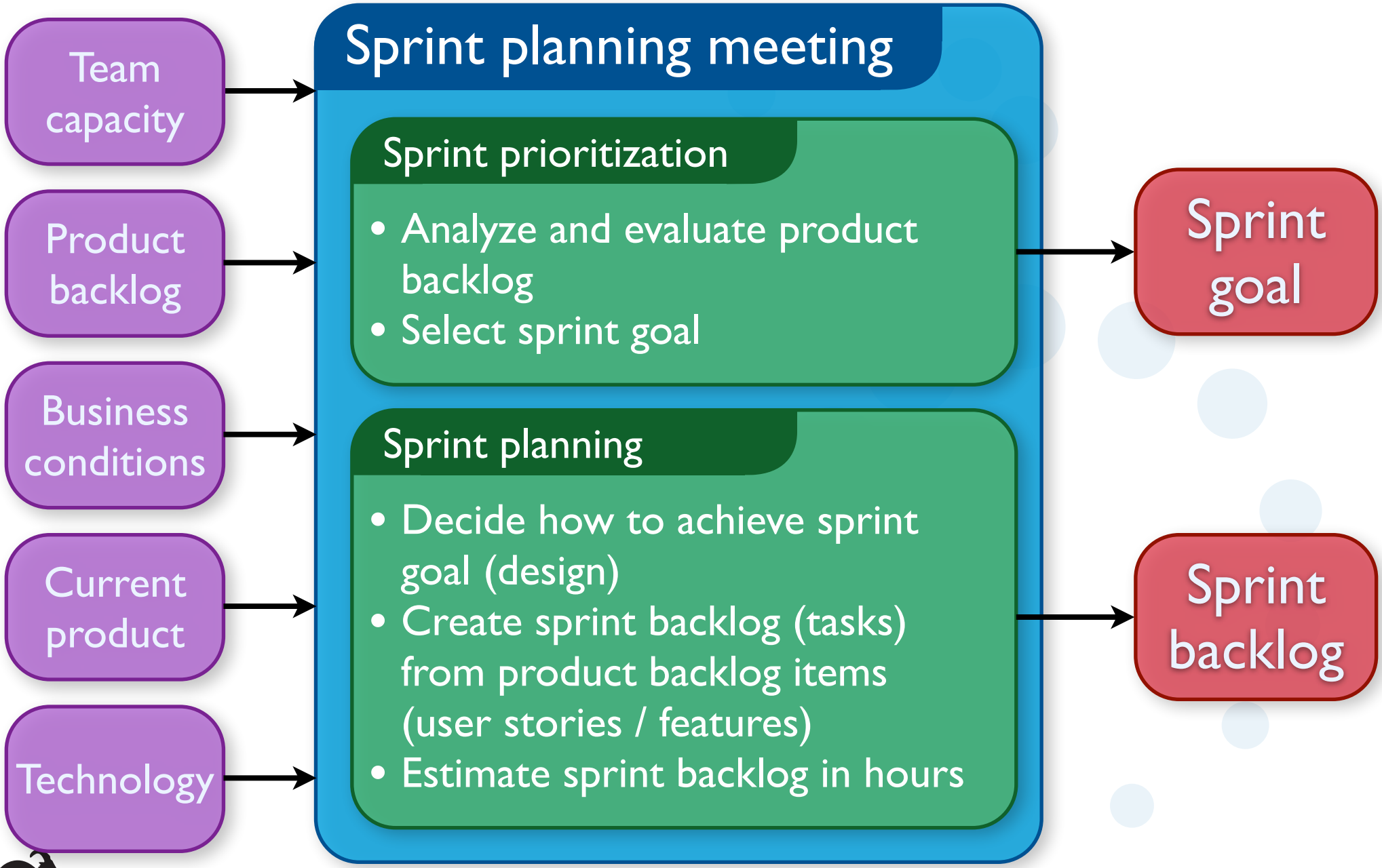
Sprint planning

- Decide how to achieve sprint goal (design)
- Create sprint backlog (tasks) from product backlog items (user stories / features)
- Estimate sprint backlog in hours

Sprint goal

that is defininig which are defining the set of funcionalities we want to do in this sprint

cc BY


Team capacity
Product backlog
Business conditions
Current product
Technology
Sprint planning meeting
Sprint prioritization
• Analyze and evaluate product backlog
• Select sprint goal
Sprint planning
• Decide how to achieve sprint goal (design)
• Create sprint backlog (tasks) from product backlog items (user stories / features)
• Estimate sprint backlog in hours
Sprint goal
Sprint backlog

cc BY

Sprint planning

- Team selects items from the product backlog they can commit to completing
- Sprint backlog is created
  - Tasks are identified and each is estimated (1-16 hours)
  - Collaboratively, not done alone by the ScrumMaster
- High-level design is considered

As a vacation planner, I want to see photos of the hotels.

Code the middle tier (8 hours)
Code the user interface (4)
Write test fixtures (4)
Code the foo class (6)
Update performance tests (4)

cc BY

oss: SCRUM allows you to develop your product in a higher n. of different sprints => also less errors on hour needed planning

The daily scrum

(eg every morning)

if all people are in the same place at the same time you avoid all the communication overhead

- Parameters
  - Daily
  - 15-minutes
  - Stand-up
- Not for problem solving
  - Whole world is invited
  - Only team members, ScrumMaster, product owner, can talk
- Helps avoid other unnecessary meetings

CC BY

Everyone answers 3 questions

important questions:

1. What did you do yesterday?
2. What will you do today?

es: yesterday I finish this sw module you can use it
tomorrow i won't finish it (unuseful to lie to each other!)

3. Is anything in your way?

are there any problems?

- These are *not* status for the ScrumMaster
  - They are commitments in front of peers

CC BY

The sprint review

- Team presents what it accomplished during the sprint and the product owner decides if you have finished or you have to go on so and so
- Typically takes the form of a demo of new features or underlying architecture
- Informal
  - 2-hour prep time rule
  - No slides
- Whole team participates
- Invite the world

Mountain Goat Software, LLC

Sprint retrospective

take a look of the team what we have done who is working well who is not…

- Periodically take a look at what is and is not working
- Typically 15–30 minutes
- Done after every sprint
- Whole team participates
  - ScrumMaster
  - Product owner
  - Team
  - Possibly customers and others

CC BY

Start / Stop / Continue

- Whole team gathers and discusses what they'd like to:

Start doing

what would we add?

Stop doing

what is not going well

Continue doing

This is just one of many ways to do a sprint retrospective.

CC BY

Scrum framework

Roles

- Product owner
- ScrumMaster
- Team

Ceremonies

- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

ie: documents produced

BY

Product backlog

This is the product backlog

- The requirements
- A list of all desired work on the project
- Ideally expressed such that each item has value to the users or customers of the product
- Prioritized by the product owner
- Reprioritized at the start of each sprint

at the beginning the p.ow. decide which are the most valuable

cc BY

User stories

rigorous language where sentences have to be expressed as:

Instead of Use Cases, Agile project owners do "user stories"

- **Who** (user role) – Is this a customer, employee, admin, etc.?
- **What** (goal) – What functionality must be achieved/developed?
- **Why** (reason) – Why does user want to accomplish this goal?

As a [user role], I want to [goal], so I can [reason].

Example:

"As a user, I want to log in, so I can access subscriber content."

story points: Rating of effort needed to implement this story

common scales: 1-10, shirt sizes (XS, S, M, L, XL), etc.

S: a simple user story
XL: a very complex user story

or 1 to 10:

CC BY

A sample product backlog

Backlog item	Estimate
Allow a guest to make a reservation	3
As a guest, I want to cancel a reservation.	5
As a guest, I want to change the dates of a reservation.	3
As a hotel employee, I can run RevPAR reports (revenue-per-available-room)	8
Improve exception handling	8
...	30
...	50

Real example

Product Backlog
Estimating System Upgrade

Sprint	ID		Backlog Item	Owner	Estimate (days)	Remaining (days)
1	1	Minor	Remove user kludge in .dpr file	BC	1	1
1	2	Minor	Remove cMap/cMenu/cMenuSize from disciplines.pas	BC	1	1
1	3	Minor	Create "Legacy" discipline node with old civils and E&I content	BC	1	1
1	4	Major	Augment each tbl operation to support network operation	BC	10	10
1	5	Major	Extend Engineering Design estimate items to include summaries	BC	2	2
1	6	Super	Supervision/Guidance	CAM	4	4
	7	Minor	Remove Custodian property from AppConfig class in globals.pas	BC	1	
	8	Minor	Remove LOC_ constants in globals.pas and main.pas	BC	1	
	9	Minor	New E&I section doesn't have lblCaption set	BC	1	
	10	Minor	Delay in main.releaseform doesn't appear to be required	BC	1	
	11	Minor	Undo modifications to Other Major Equipment in formExcel.pas	BC	1	
	12	Minor	AJACS form to be centred on the screen	BC	1	
	13	Major	Extend DUnit tests to all 40 disciplines	BC	6	

cc BY

The sprint goal

- A short statement of a summary of what the work will be focused on during the sprint

Life Sciences

Support features necessary for population genetics studies.

Database Application

Make the application run on SQL Server in addition to Oracle.

Financial services

Support more technical indicators than company ABC with real-time, streaming data.

cc BY

Managing the sprint backlog

where we define what and who have to do to implement the requirements

- Individuals sign up for work of their own choosing
  - Work is never assigned
- Estimated work remaining is updated daily
- Any team member can add, delete or change the sprint backlog
- Work for the sprint emerges
- If work is unclear, define a sprint backlog item with a larger amount of time and break it down later
- Update work remaining as more becomes known

cc BY

A sprint backlog

practically it's a table in which you decide every day how many hours you want to do that task

Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8				
Code the middle tier	16				
Test the middle tier	8				
Write online help	12				
Write the foo class	8				

=> the sum would be the total hours we have in the sprint

BURNDOWN: quantity of hours i need to work that day to be sure i will complete the work in that sprint

cc BY

A sprint backlog

Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4			
Code the middle tier	16	12			
Test the middle tier	8	16			
Write online help	12				
Write the foo class	8	8			

cc BY

A sprint backlog

Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10		
Test the middle tier	8	16	16		
Write online help	12				
Write the foo class	8	8	8		
Add error logging			8		

CC BY

A sprint backlog

Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	4	
Test the middle tier	8	16	16	11	
Write online help	12				
Write the foo class	8	8	8	8	
Add error logging			8	4	

CC BY

A sprint backlog

Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	4	
Test the middle tier	8	16	16	11	8
Write online help	12				
Write the foo class	8	8	8	8	8
Add error logging			8	4	

typically done in the morning meeting

cc BY

Real sprint backlog

Sprint 1

01/11/2004

19 days work in this sprint

	Backlog Item	Backlog Item	Owner	Estimate	Sprint Day	1 Mo	2 Tu	3 We	4 Th	5 Fr	6 Sa	7 Su
					Hours remaining	152	152	152	152	152	152	152
1	Minor	Remove user kludge in .dpr file	BC	8		8	8	8	8	8	8	8
2	Minor	Remove cMap/cMenu/cMenuSize from disciplines.pas	BC	8		8	8	8	8	8	8	8
3	Minor	Create "Legacy" discipline node with old civils and E&I content	BC	8		8	8	8	8	8	8	8
4	Major	Augment each tbl operation to support network operation	BC	80		80	80	80	80	80	80	80
5	Major	Extend Engineering Design estimate items to include summaries	BC	16		16	16	16	16	16	16	16
6	Super	Supervision/Guidance	CAM	32		32	32	32	32	32	32	32

Sprint 1

01/11/2004

19 days work in this sprint

	Backlog Item	Backlog Item	Owner	Estimate	Sprint Day	1 Mo	2 Tu	3 We	4 Th	5 Fr	6 Sa	7 Su
					Hours remaining	152	150	140	130	118	118	118
1	Minor	Remove user kludge in .dpr file	BC	8		8	8	4	2	0		
2	Minor	Remove cMap/cMenu/cMenuSize from disciplines.pas	BC	8		8	8	4	0			
3	Minor	Create "Legacy" discipline node with old civils and E&I content	BC	8		8	8	8	6	0		
4	Major	Augment each tbl operation to support network operation	BC	80		80	80	80	80	78	78	78
5	Major	Extend Engineering Design estimate items to include summaries	BC	16		16	16	16	16	16	16	16
6	Super	Supervision/Guidance	CAM	32		32	30	28	26	24	24	24

cc BY

Sprint burndown chart

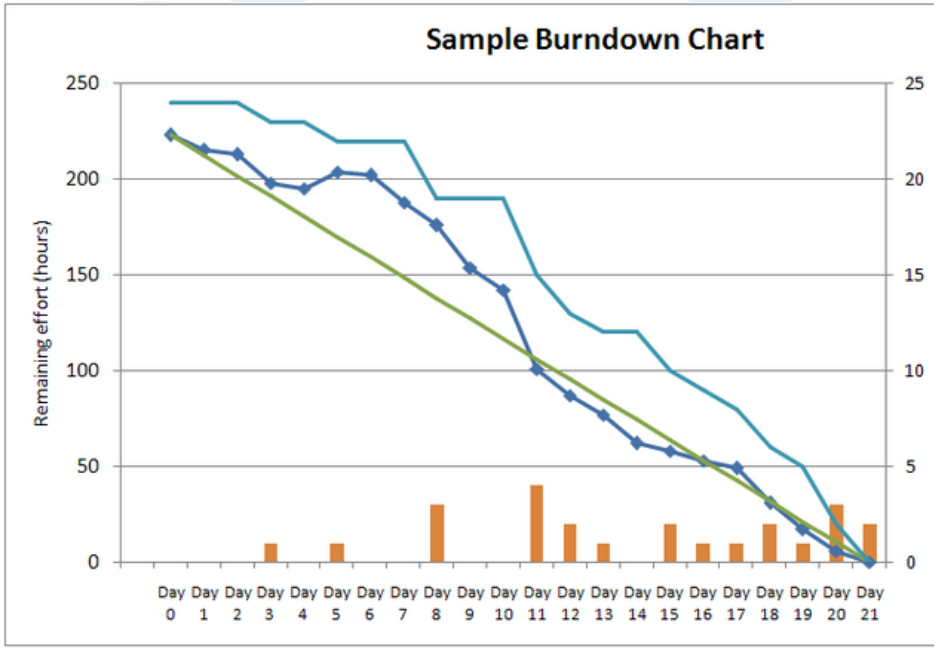
can make a diagram (day, team capability) => the expected graph would be the green line:

A display of what work has been completed and what is left to complete

- one for each developer or work item
- updated every day
- (make best guess about hours/points completed each day)

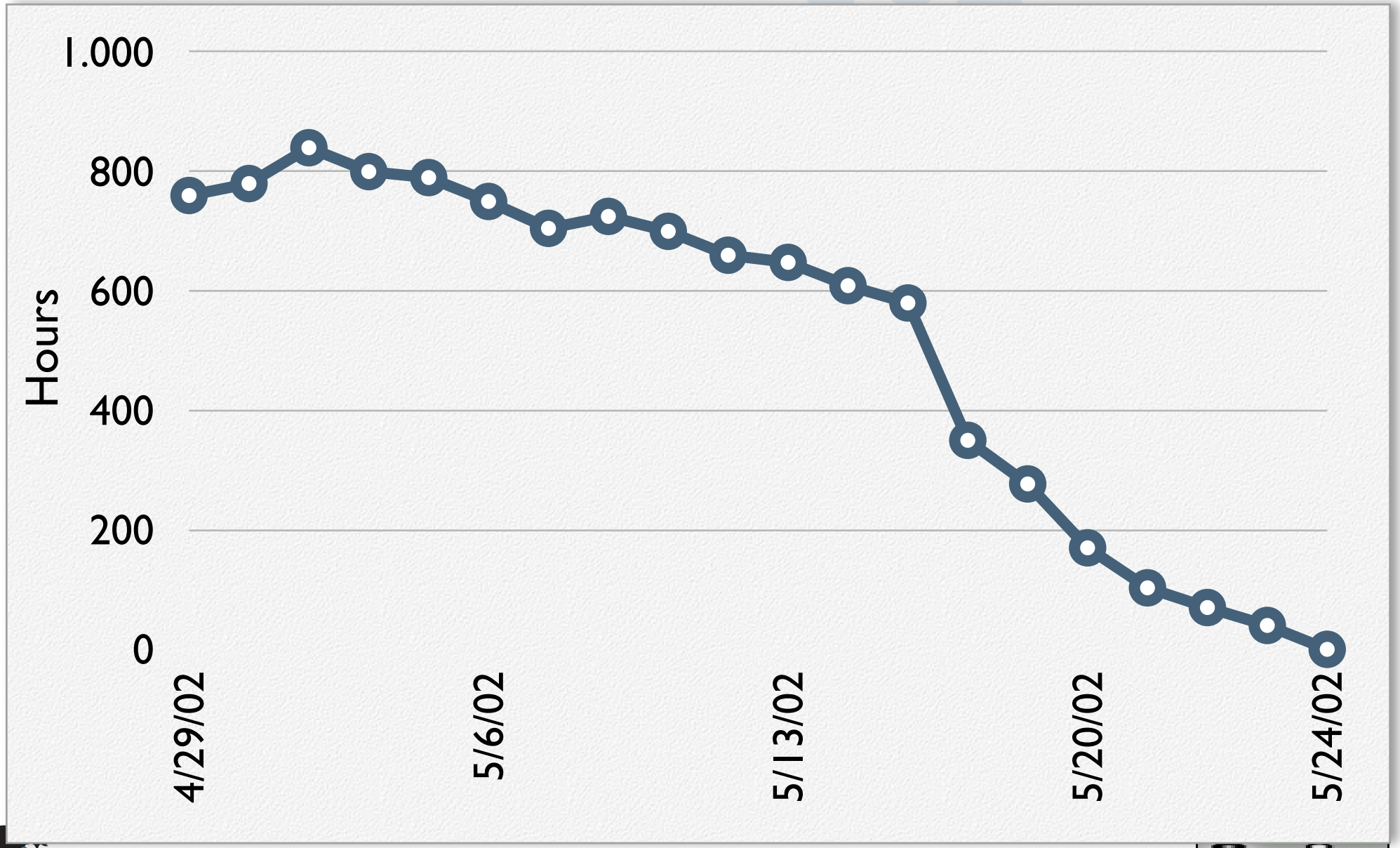
variation: Release burndown chart

- shows overall progress
- updated at end of each sprint



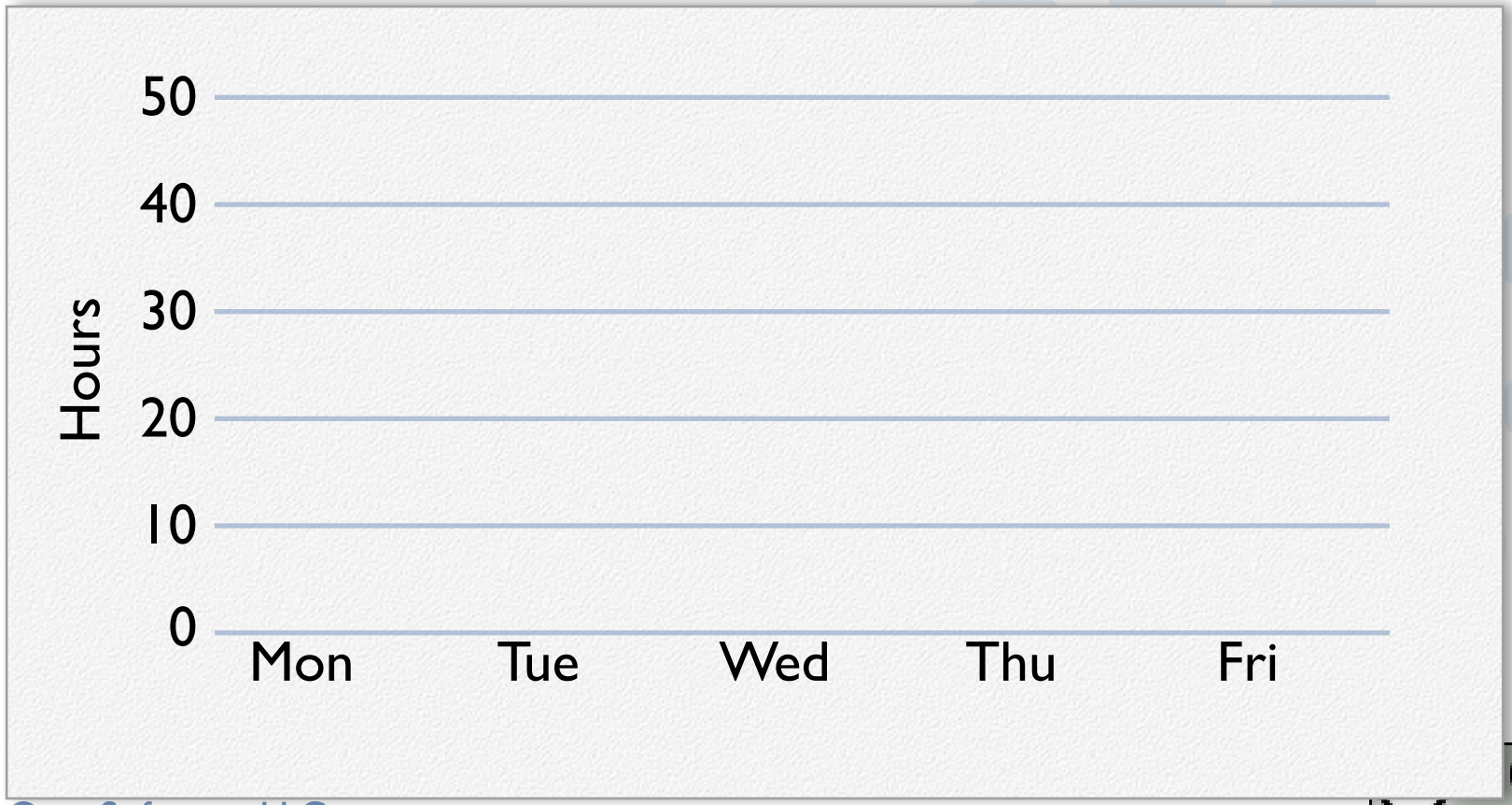
cc BY

A sprint burndown chart

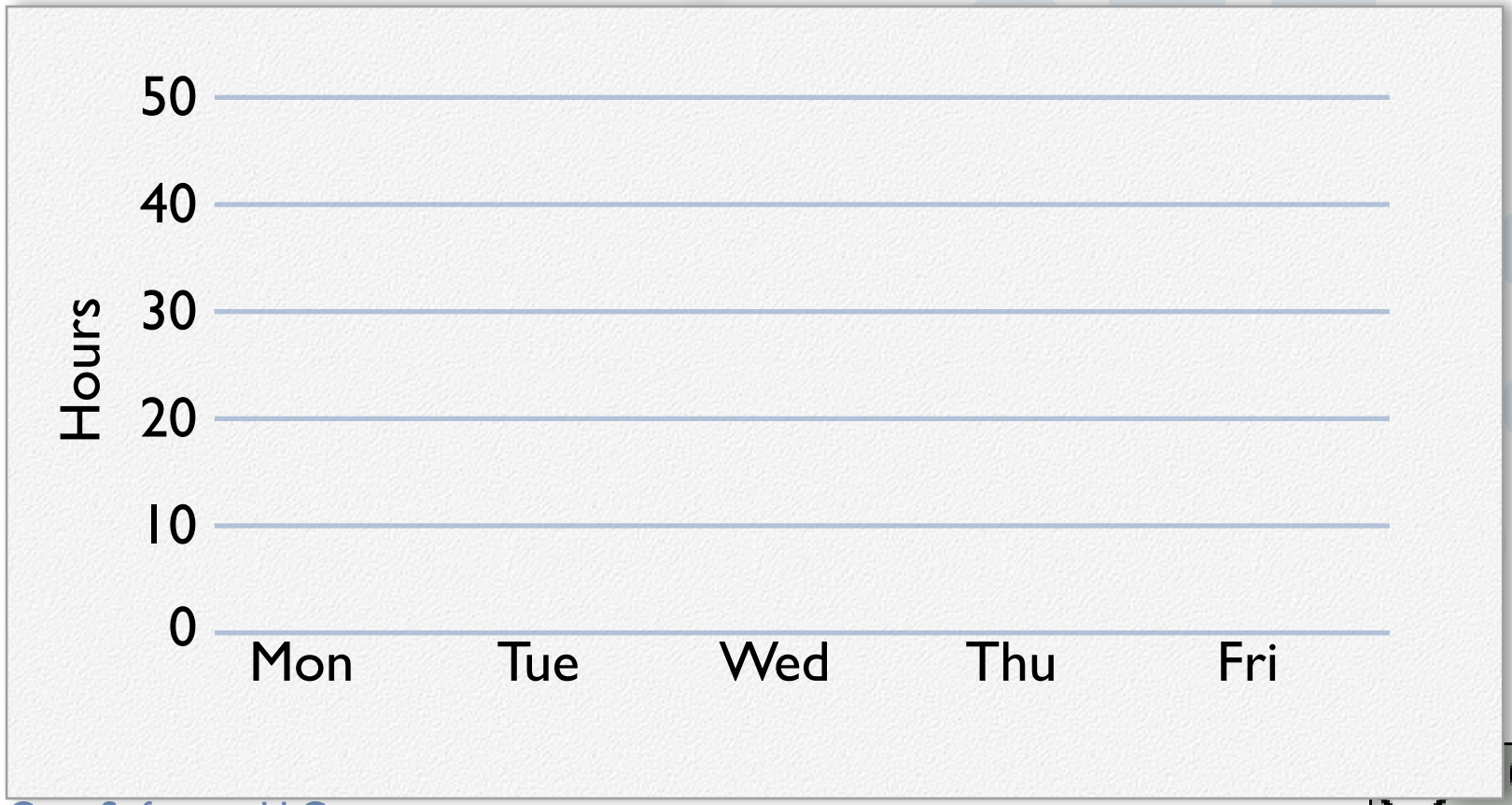


cc BY

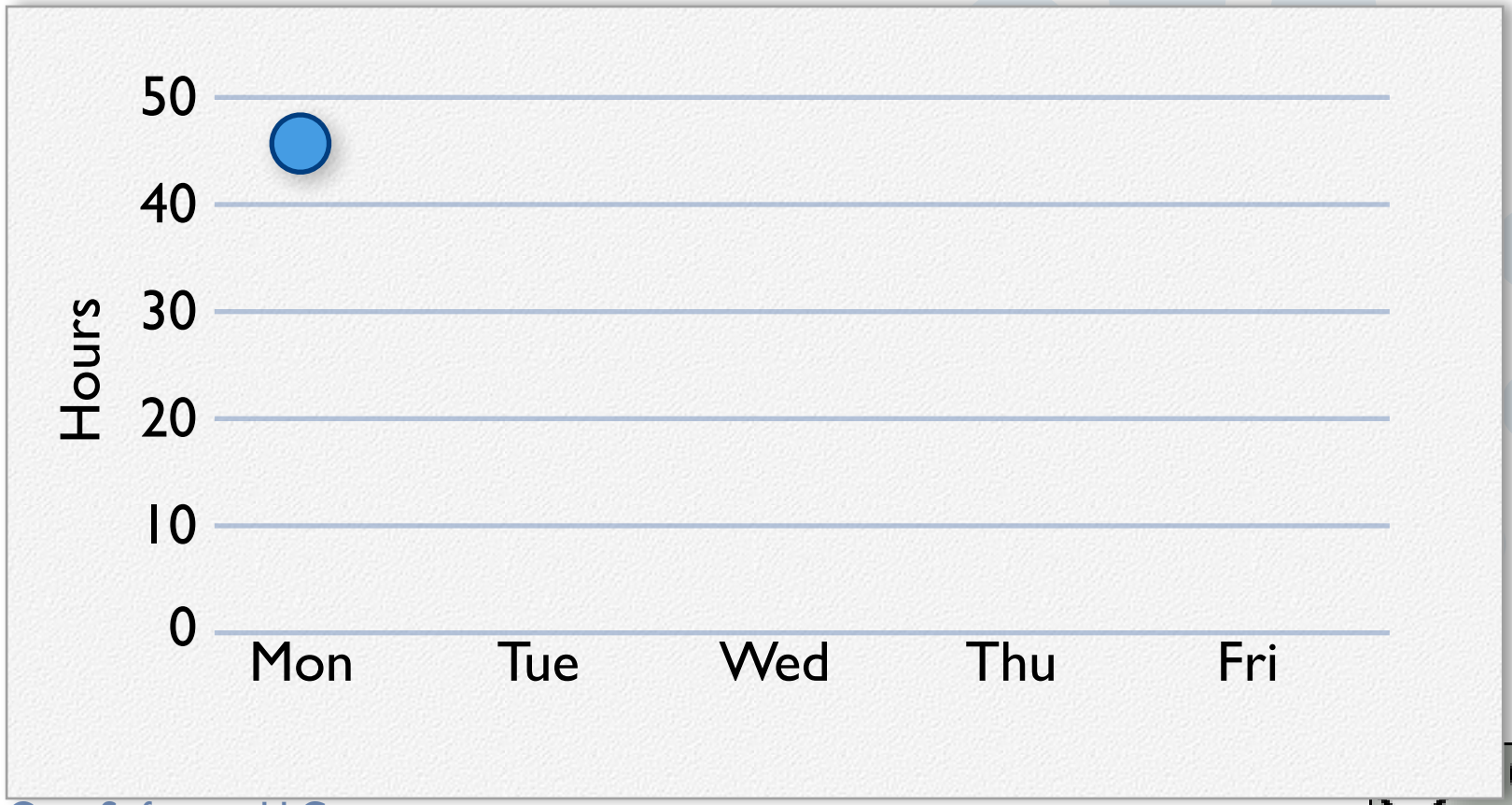
Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8				
Code the middle tier	16				
Test the middle tier	8				
Write online help	12				



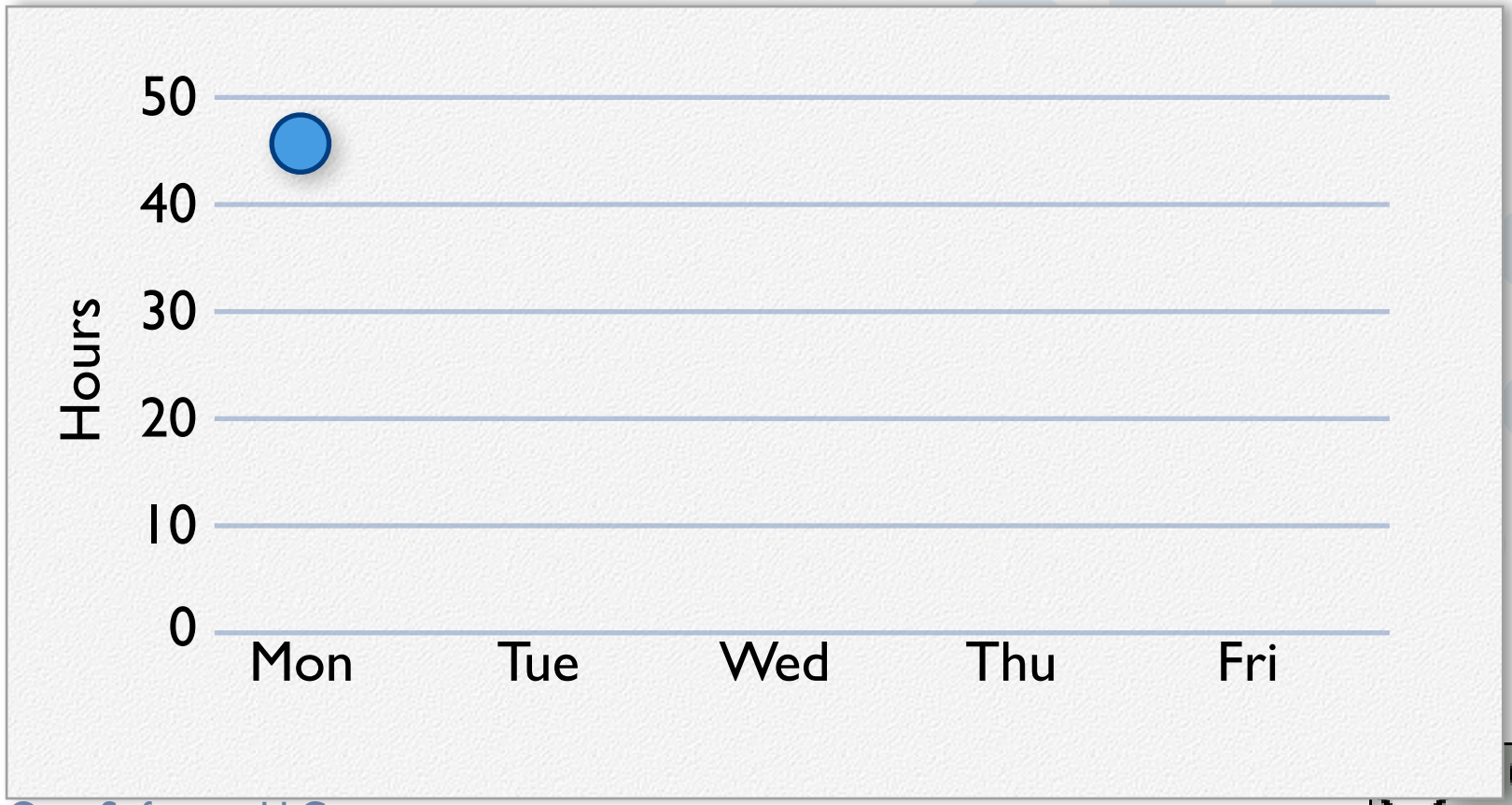
Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8				
Code the middle tier	16				
Test the middle tier	8				
Write online help	12				



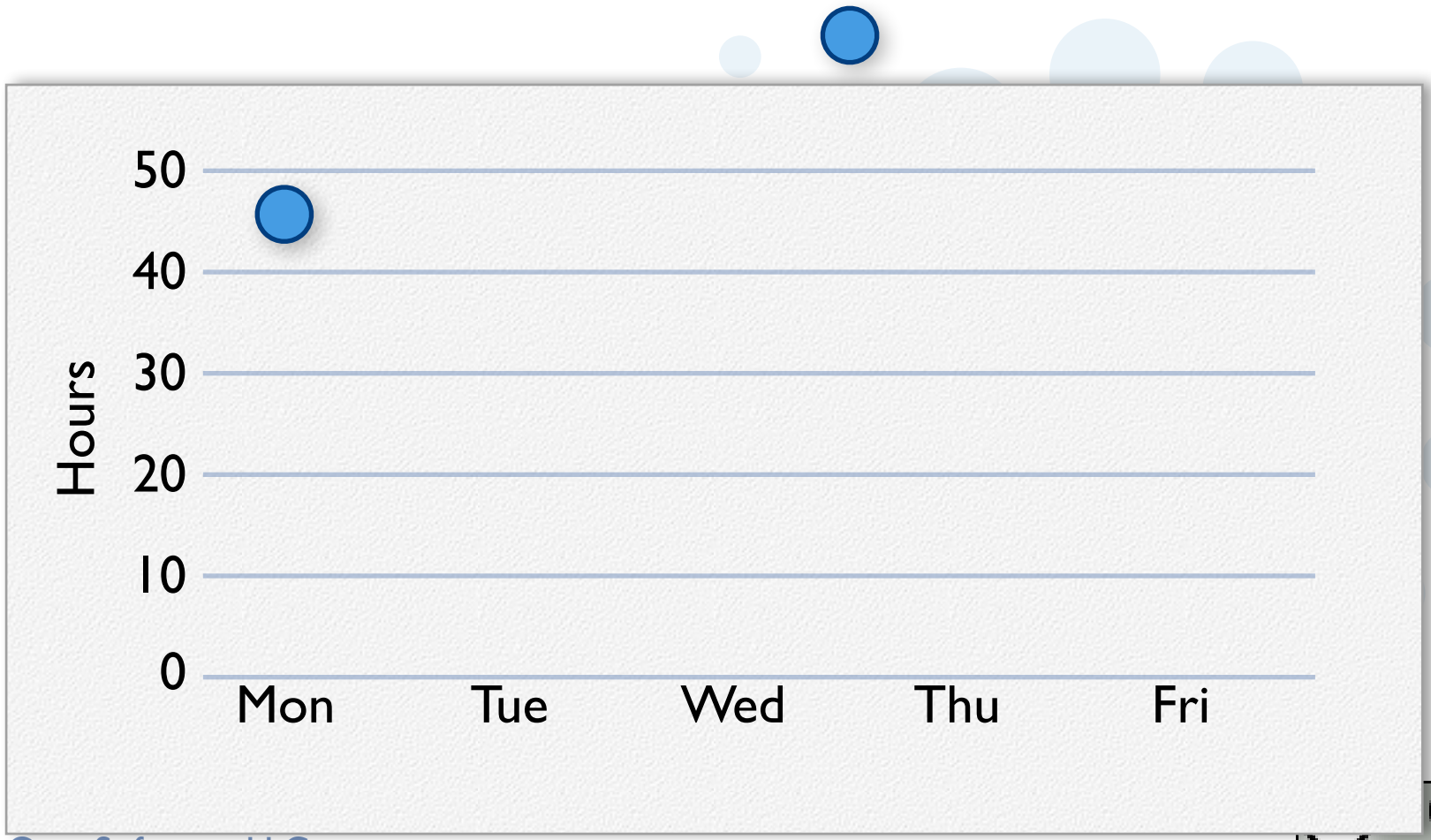
Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8				
Code the middle tier	16				
Test the middle tier	8				
Write online help	12				



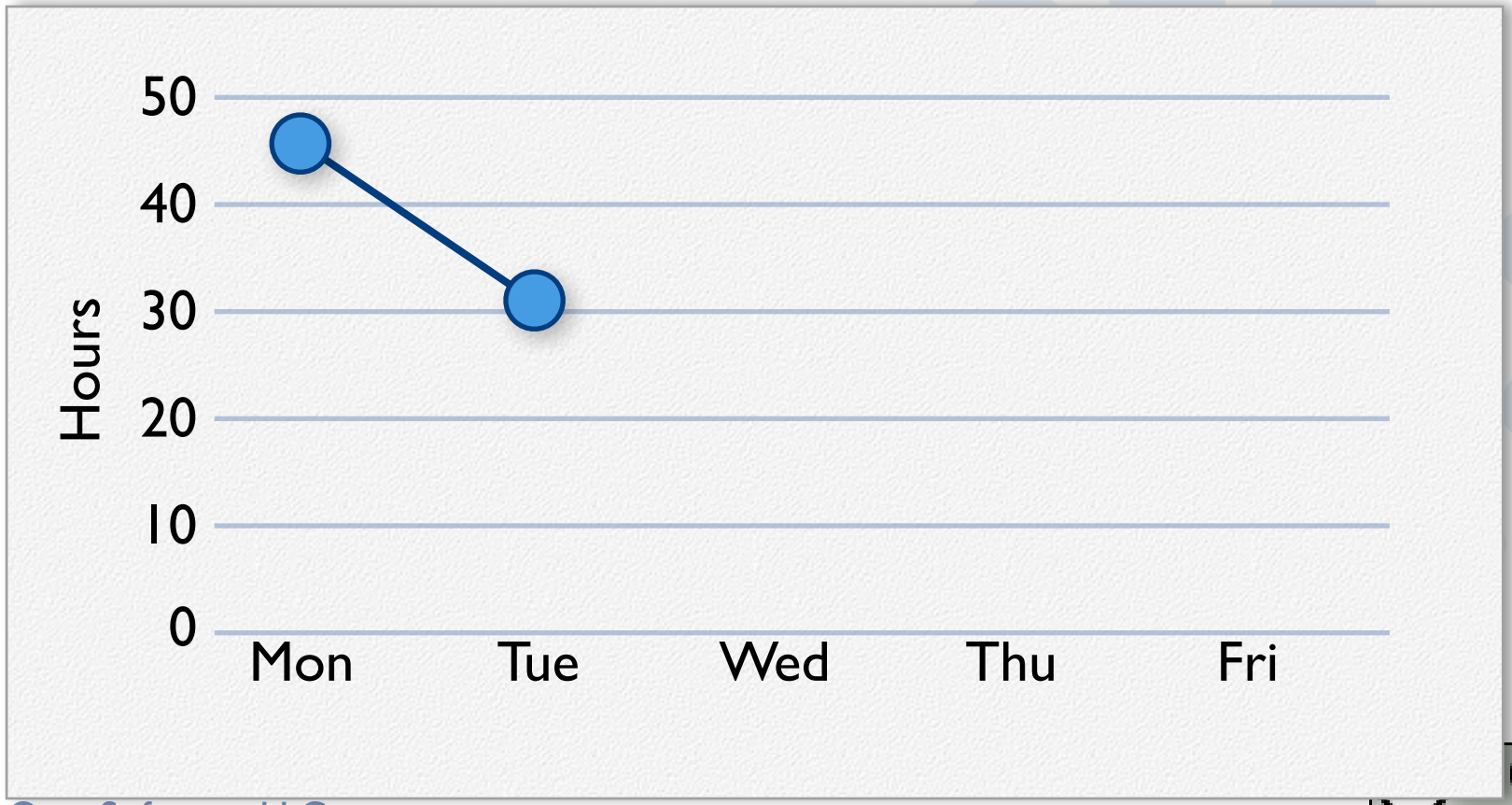
Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4			
Code the middle tier	16	12			
Test the middle tier	8	16			
Write online help	12				



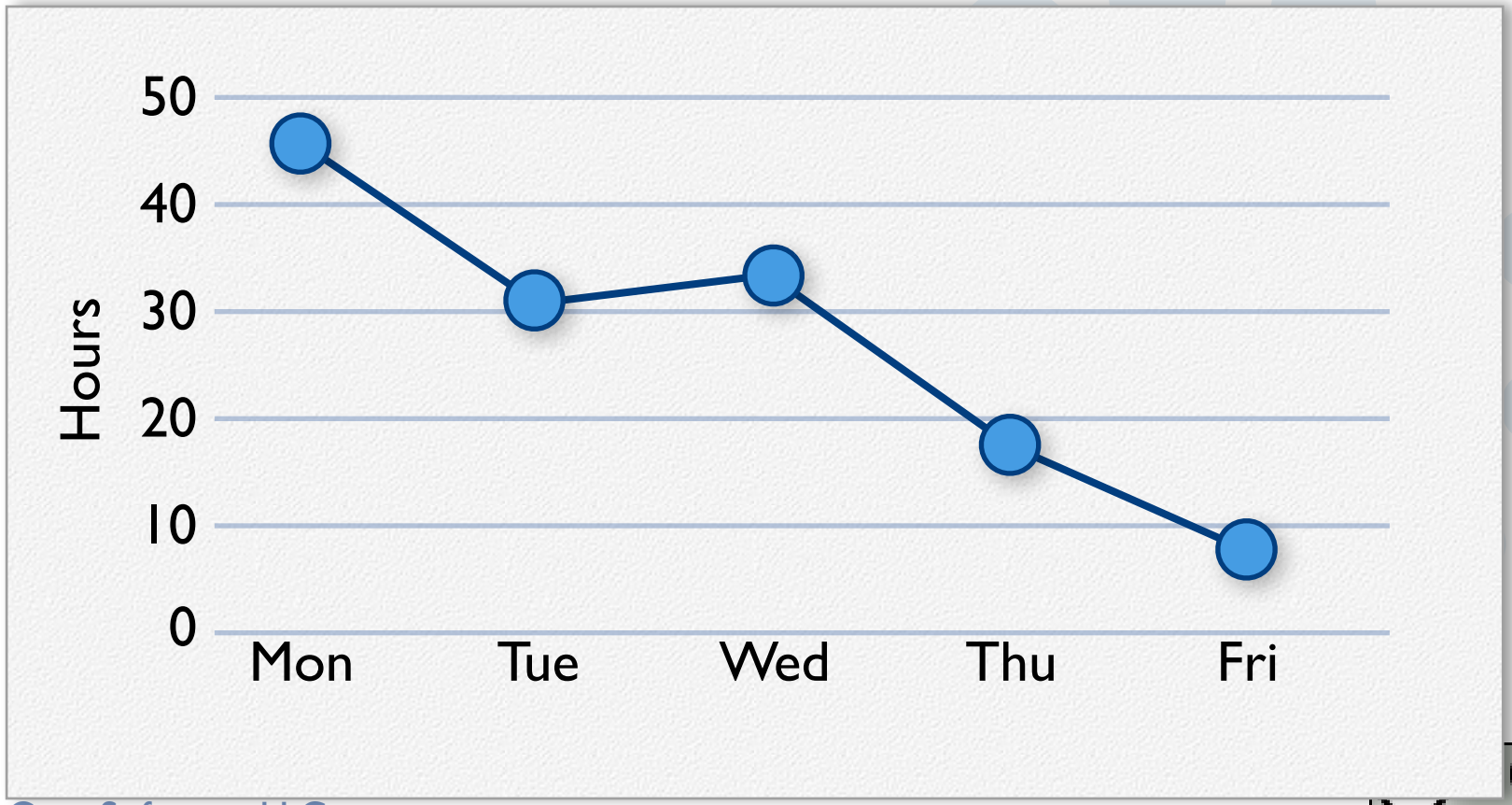
Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4			
Code the middle tier	16	12			
Test the middle tier	8	16			
Write online help	12				



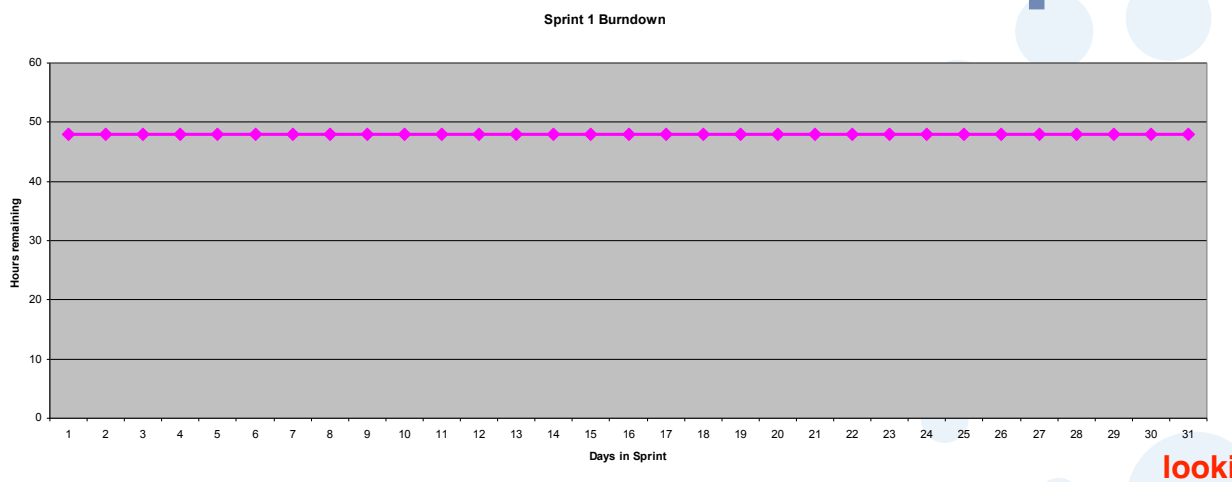
Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4			
Code the middle tier	16	12			
Test the middle tier	8	16			
Write online help	12				



Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	7	
Test the middle tier	8	16	16	11	8
Write online help	12				

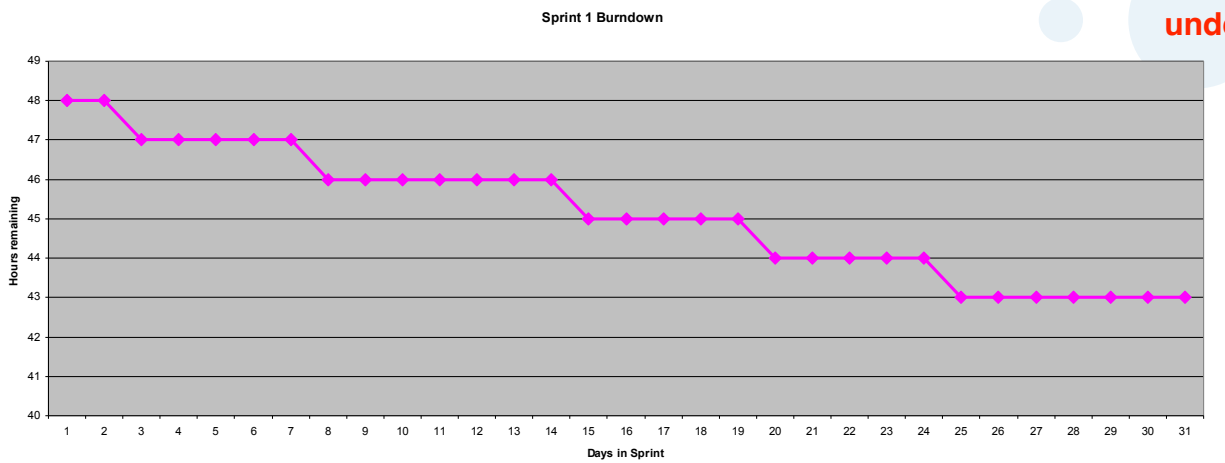


Burndown examples

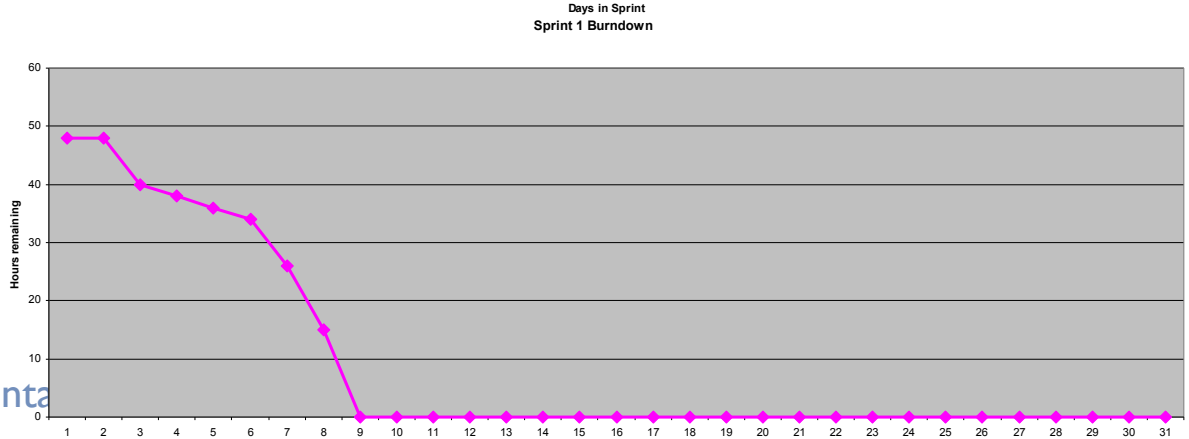


No work

looking at this graph the master could understand how his team is working



Not fast enough



Too fast

Mounta

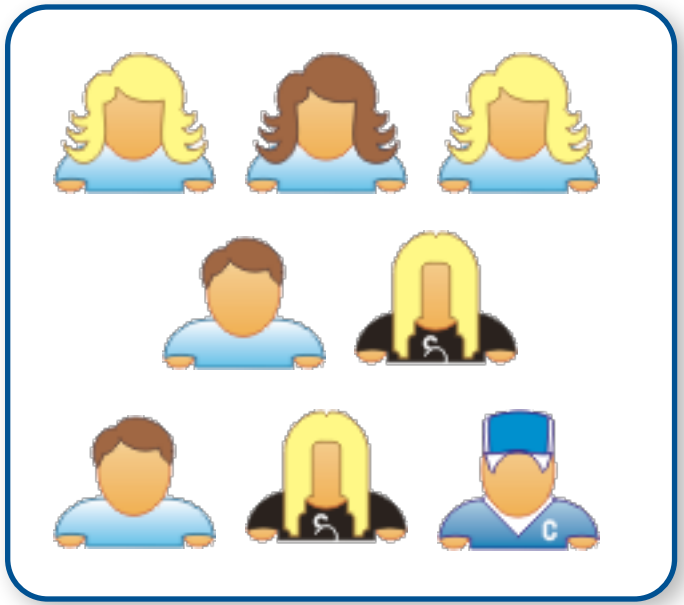
Scalability

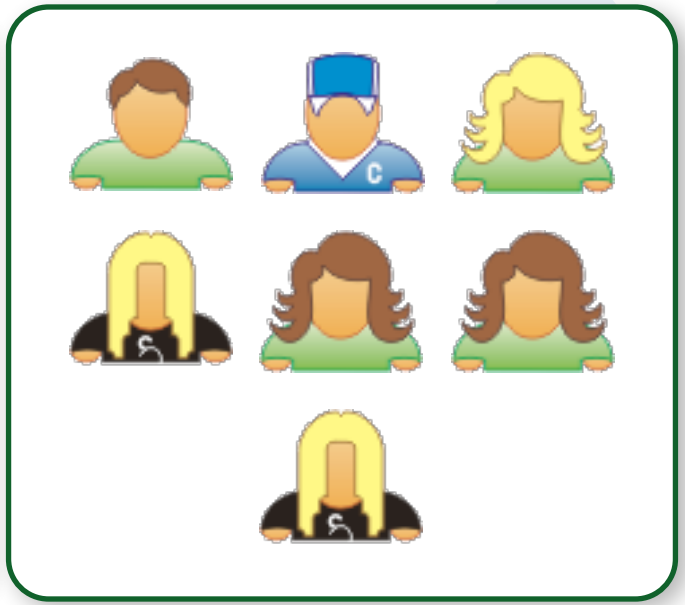
- Typical individual team is 7 ± 2 people
  - Scalability comes from teams of teams
- Factors in scaling
  - Type of application
  - Team size
  - Team dispersion
  - Project duration
- Scrum has been used on multiple 500+ person projects

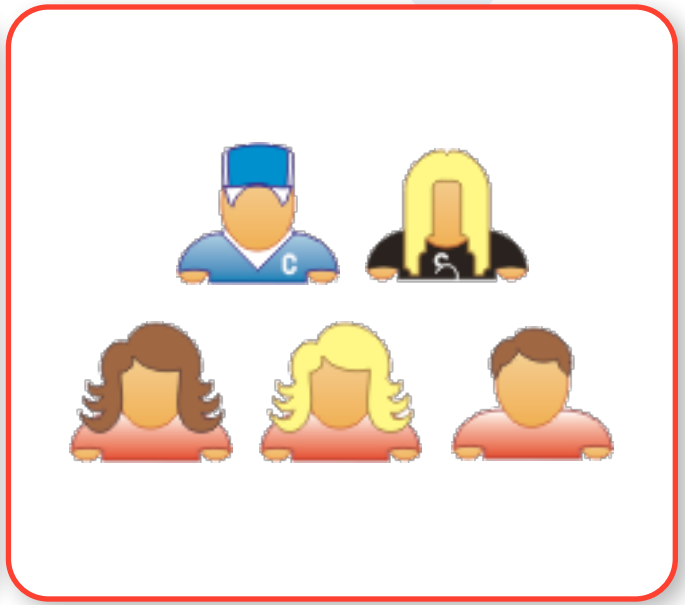
CC BY

Scaling through the Scrum of scrums

how can we scale up the team in big projects:

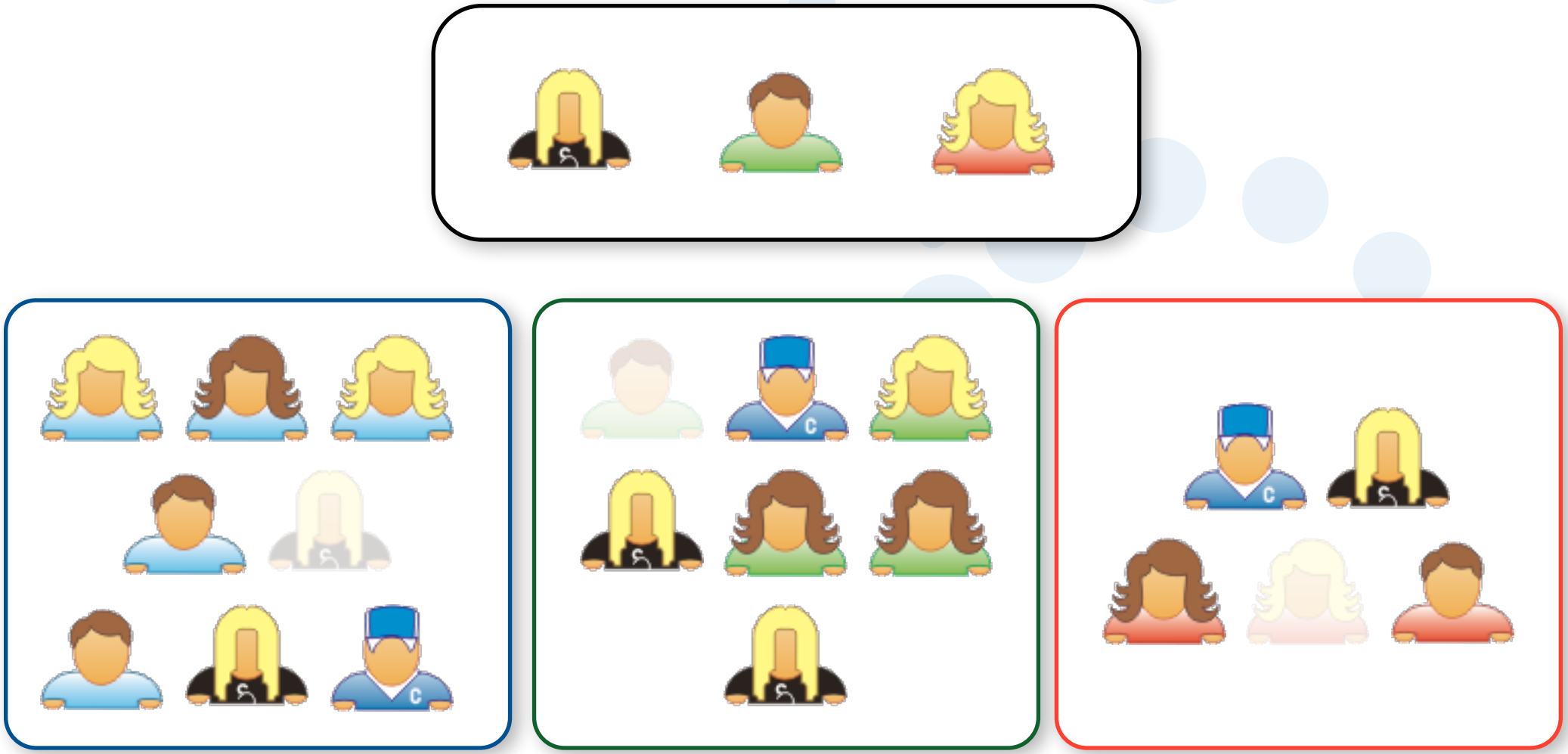






cc BY

Scaling through the Scrum of scrums

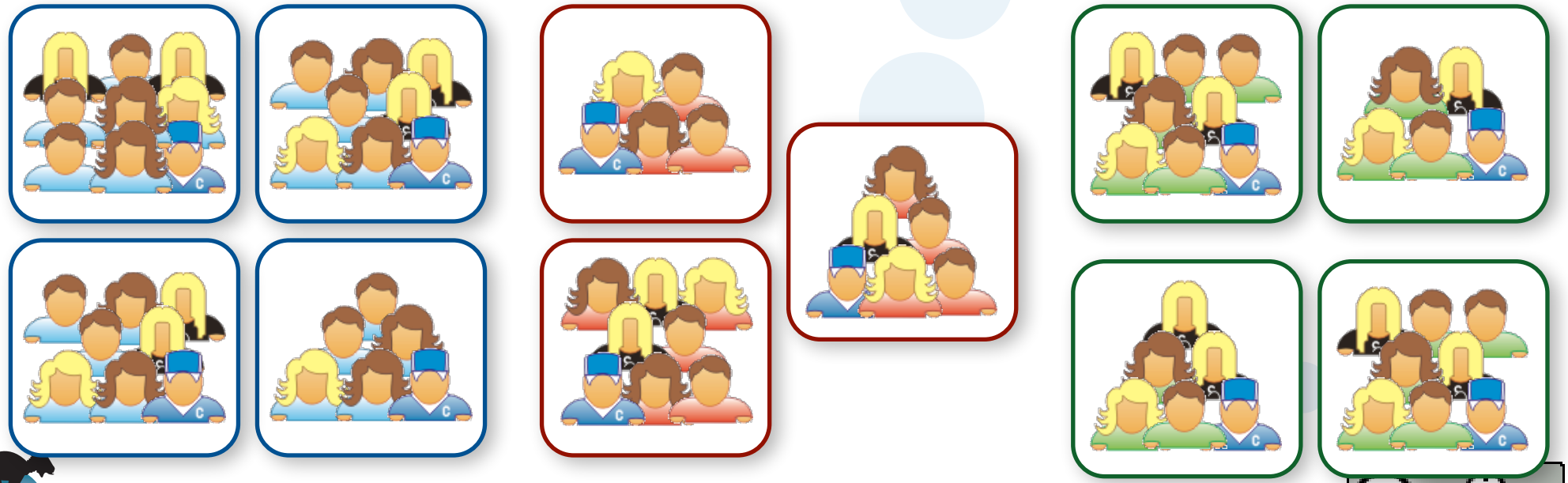


cc BY

Scrum of scrums of scrums

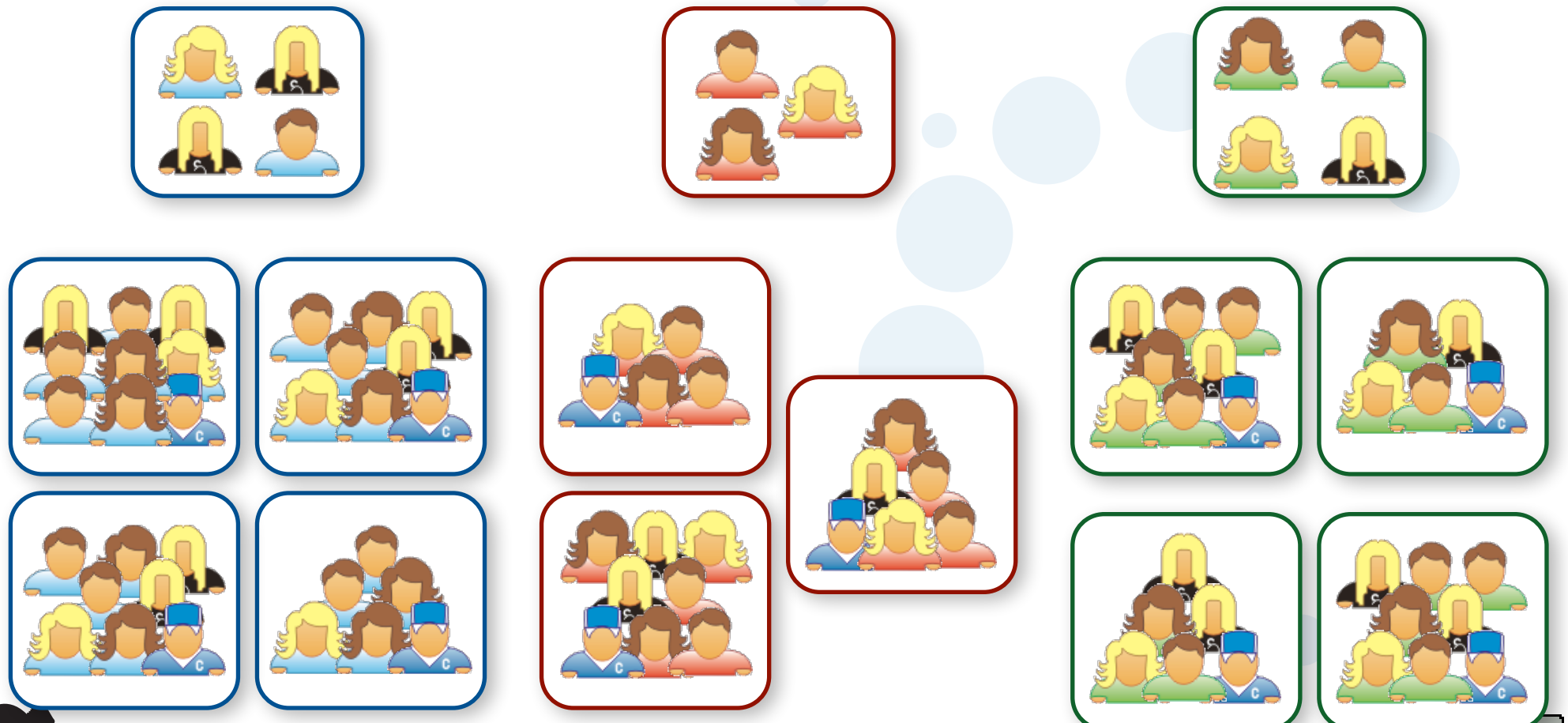
a hierarchy of scrum teams

eg. meeting once a week



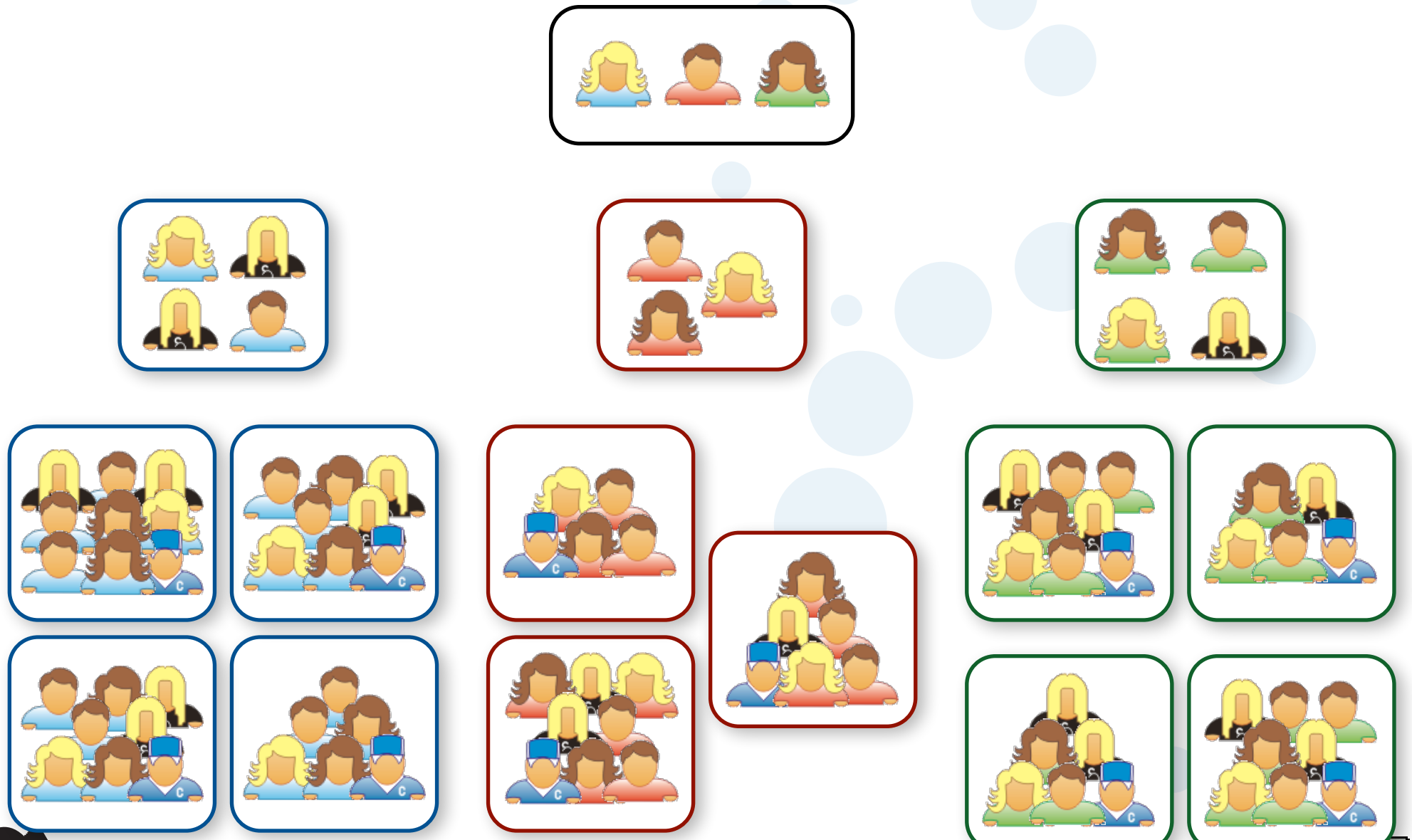
cc BY

Scrum of scrums of scrums



CC BY

Scrum of scrums of scrums



cc BY

Where to go next

- www.mountaingoatsoftware.com/scrum
- www.scrumalliance.org
- www.controlchaos.com
- scrumdevelopment@yahoogroups.com

A Scrum reading list

- *Agile and Iterative Development: A Manager's Guide* by Craig Larman
- *Agile Estimating and Planning* by Mike Cohn
- *Agile Project Management with Scrum* by Ken Schwaber
- *Agile Retrospectives* by Esther Derby and Diana Larsen
- *Agile Software Development Ecosystems* by Jim Highsmith
- *Agile Software Development with Scrum* by Ken Schwaber and Mike Beedle
- *Scrum and The Enterprise* by Ken Schwaber
- *User Stories Applied for Agile Software Development* by Mike Cohn
- Lots of weekly articles at www.scrumalliance.org

cc BY

Copyright notice

creative commons
Attribution 3.0 Unported

You are free:

- to Share—to copy, distribute and and transmit the work
- to Remix—to adapt the work

Under the following conditions

- Attribution. You must attribute the work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work).

Nothing in this license impairs or restricts the author's moral rights.

For more information see http://creativecommons.org/licenses/by/3.0/

Contact information

Presentation by: Mike Cohn
mike@mountaingoatsoftware.com
www.mountaingoatsoftware.com
(720) 890-6110 (office)

You can remove this (or any slides) but please credit the source somewhere in your presentation

Mountain Goat Software, LLC