

ITSE 2F12

Software Engineering

Lecture 12

Scrum and Agile Software Development

Reading:

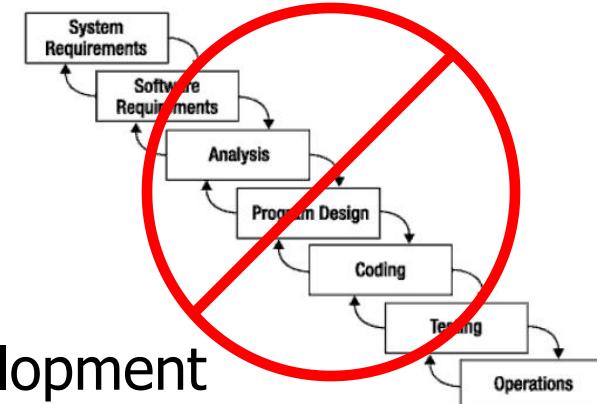
Scrum Primer,
by Deemer/Benefield/Larman/Vodde

slides created by Marty Stepp
<http://www.cs.washington.edu/403/>

What is Scrum?

- **Scrum:** It's about common sense

- Is an agile, **lightweight** process
- Can **manage** and **control** software and product development
- Uses iterative, incremental practices
- Has a **simple** implementation
- Increases productivity
- Reduces **time to benefits**
- Embraces adaptive, empirical systems development
- Is not restricted to software development projects
- Embraces the opposite of the **waterfall** approach...



Agile Manifesto

Individuals and interactions

over

Process and tools

Working software

over

Comprehensive documentation

Customer collaboration

over

Contract negotiation

Responding to change

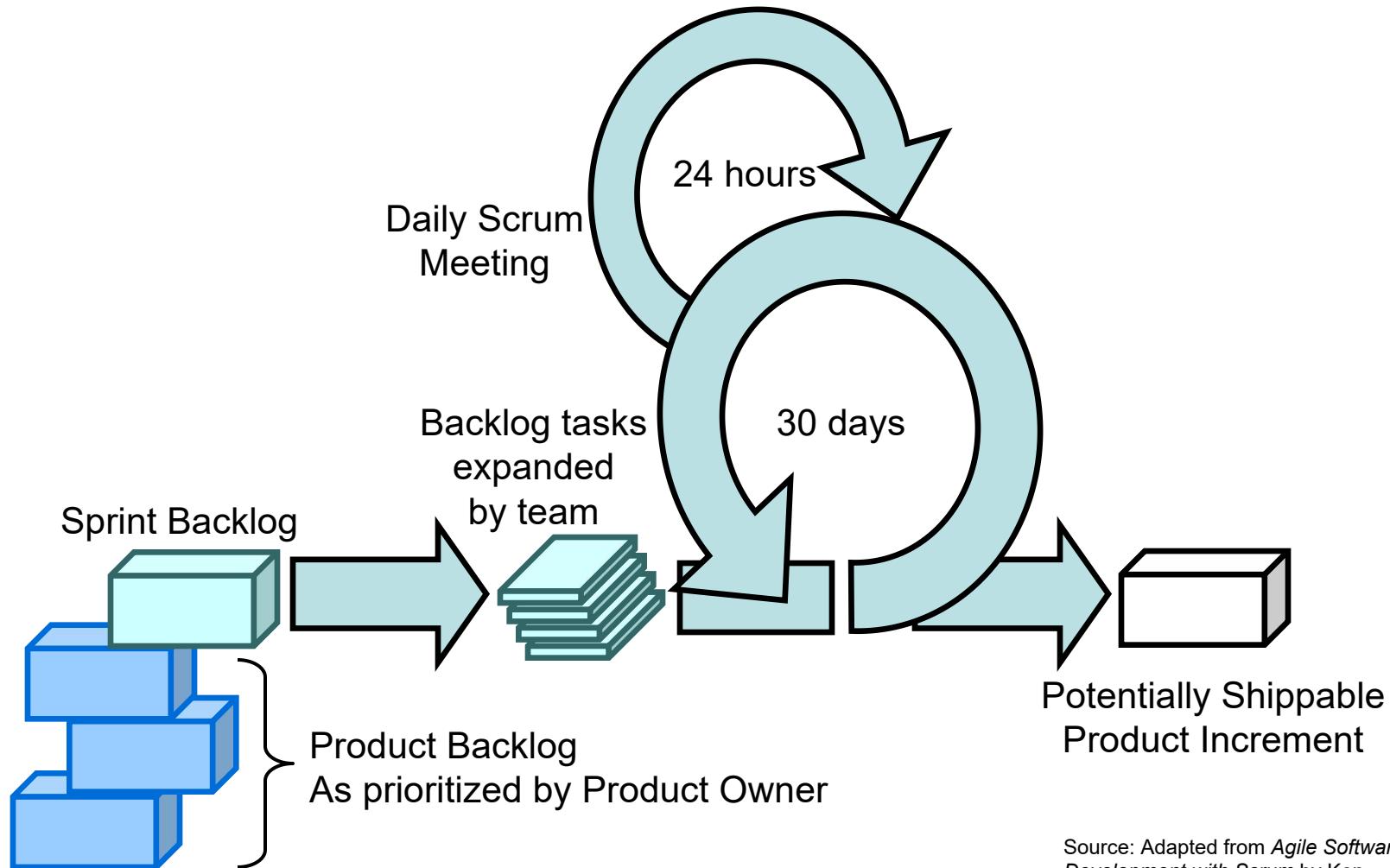
over

Following a plan

Source: www.agilemanifesto.org

See: <https://www.scrumalliance.org/community/articles/2013/2013-april/what-does-the-agile-manifesto-mean>

Scrum at a Glance



Source: Adapted from *Agile Software Development with Scrum* by Ken Schwaber and Mike Beedle.

Sequential vs. Overlap

Requirements

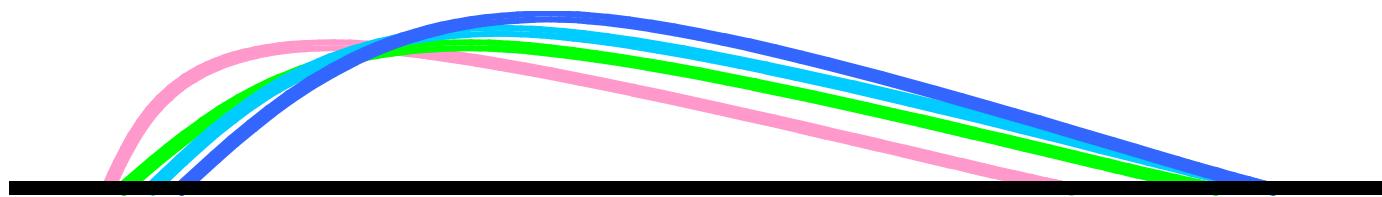
Design

Code

Test

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

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



Scrum Framework

Roles

- Product owner
- Scrum Master
- Team

Ceremonies

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

Artifacts

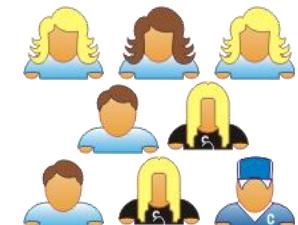
- Product backlog
- Sprint backlog
- Burndown charts

Scrum Roles

- Product Owner
 - Possibly a Product Manager or Project Sponsor
 - Decides features, release date, prioritization, \$\$\$

- Scrum Master
 - Typically a Project Manager or Team Leader
 - Responsible for enacting Scrum values and practices
 - Remove impediments / politics, keeps everyone productive

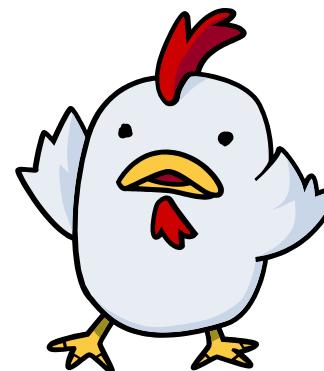
- Project Team
 - 5-10 members; Teams are self-organizing
 - Cross-functional: QA, Programmers, UI Designers, etc.
 - Membership should change only between sprints



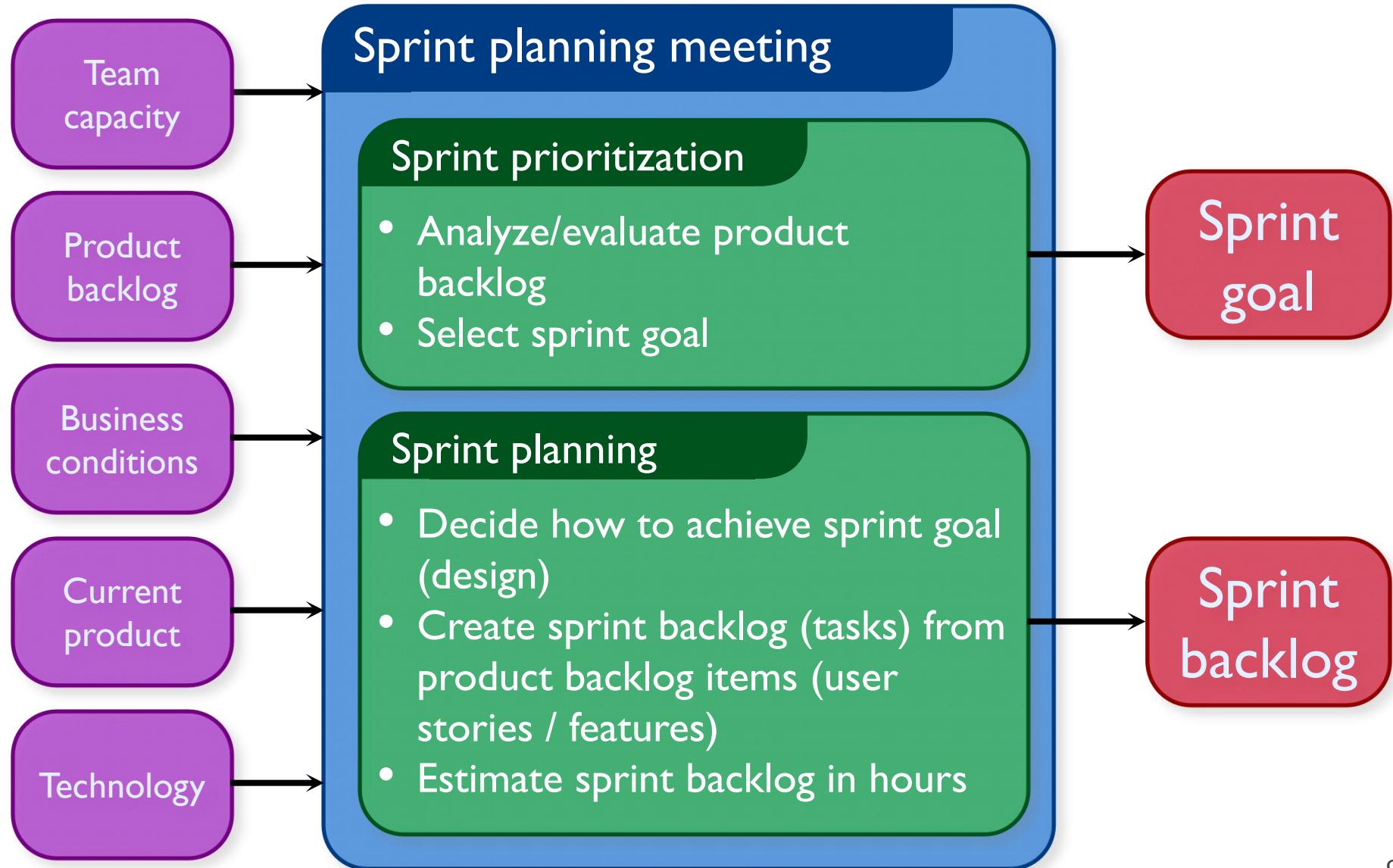
"Pigs" and "Chickens"

- **Pig:** Team member committed to success of project
- **Chicken:** Not a pig; interested but not committed

A pig and a chicken are walking down a road. The chicken looks at the pig and says, "Hey, why don't we open a restaurant?" The pig looks back at the chicken and says, "Good idea, what do you want to call it?" The chicken thinks about it and says, "Why don't we call it 'Ham and Eggs'?" "I don't think so," says the pig, "I'd be committed but you'd only be involved."



Sprint Planning Mtg.



Daily Scrum Meeting

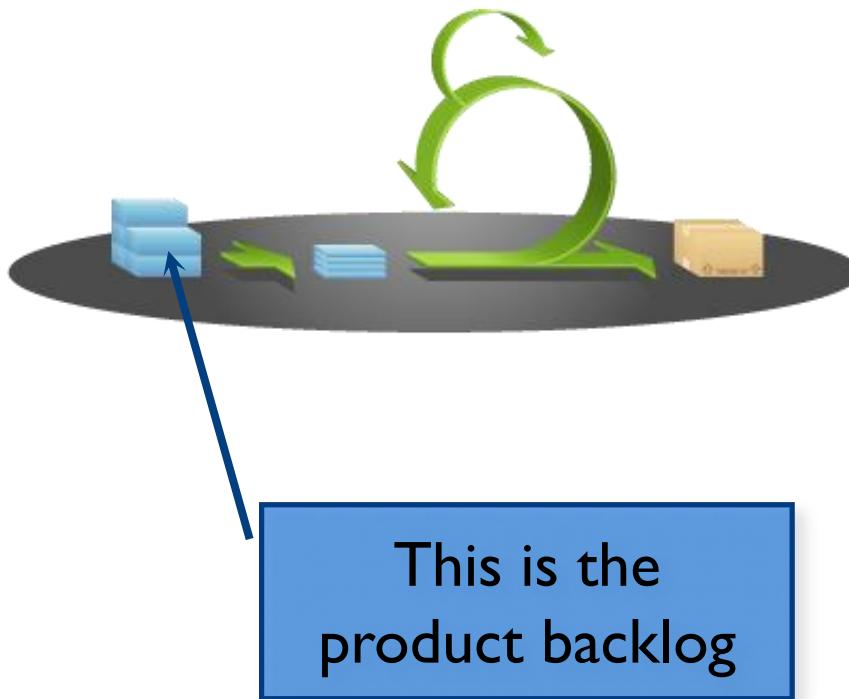
- Parameters
 - Daily, ~15 minutes, Stand-up
 - Anyone late pays some money
- Not for problem solving
 - Whole world is invited
 - Only team members, Scrum Master, product owner, can talk
 - Helps avoid other unnecessary meetings
- Three questions answered by each team member:
 1. What did you do yesterday?
 2. What will you do today?
 3. What obstacles are in your way?



Scrum's Artifacts

- Scrum has remarkably few artifacts
 - Product Backlog
 - Sprint Backlog
 - Burndown Charts
- Can be managed using just an Excel spreadsheet
 - More advanced / complicated tools exist:
 - Expensive
 - Still under development

Product Backlog



- The requirements
- A list of all desired work on project
- Ideally expressed as a list of user stories along with "story points", such that each item has value to users or customers of the product
- Prioritized by the product owner
- Reprioritized at start of each sprint

User Stories

- 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.

Sample Product Backlog

Backlog item	Estimate
Allow a guest to make a reservation	3 (story points)
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

Sample Product Backlog 2

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 lbcCaption 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	

Sprint Backlog

- 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 change 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

Sample Sprint backlog

Tasks	Mon	Tue	Wed	Thu	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	

Sample Sprint Backlog

Sprint 1

01/11/2004

Sprint Day		1 Mo	2 Tu	3 We	4 Th	5 Fr	6 Sa	7 Su
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19 days work in this sprint

Hours remaining		152	152	152	152	152	152	152
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Backlog Item	Backlog Item	Owner	Estimate	8	8	8	8	8	8	8	8
1 Minor	Remove user kludge in .dpr file	BC	8	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	8
3 Minor	Create "Legacy" discipline node with old civils and E&I content	BC	8	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	80
5 Major	Extend Engineering Design estimate items to include summaries	BC	16	16	16	16	16	16	16	16	16
6 Super	Supervision/Guidance	CAM	32	32	32	32	32	32	32	32	32

Sprint 1

01/11/2004

Sprint Day		1 Mo	2 Tu	3 We	4 Th	5 Fr	6 Sa	7 Su
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19 days work in this sprint

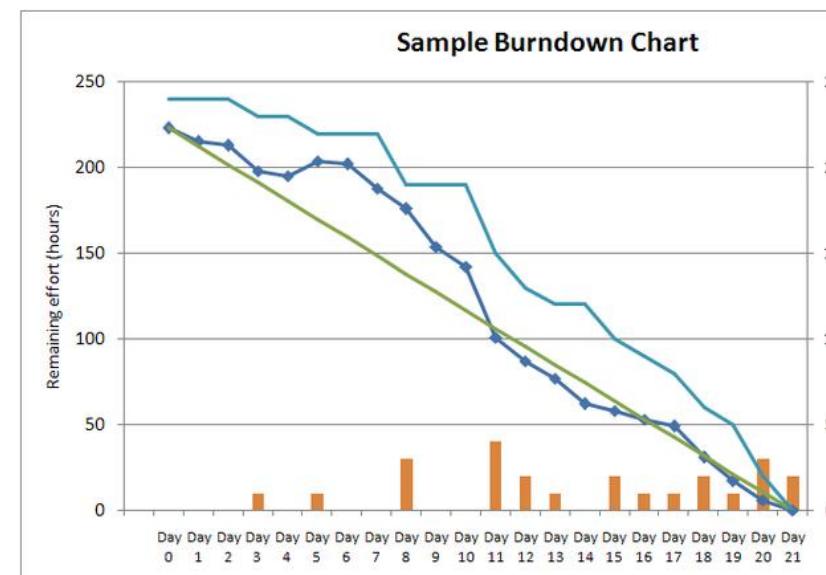
Hours remaining		152	150	140	130	118	118	118
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Backlog Item	Backlog Item	Owner	Estimate	8	8	4	2	0	0	0	0
1 Minor	Remove user kludge in .dpr file	BC	8	8	8	4	2	0	0	0	0
2 Minor	Remove cMap/cMenu/cMenuSize from disciplines.pas	BC	8	8	8	4	0	0	0	0	0
3 Minor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

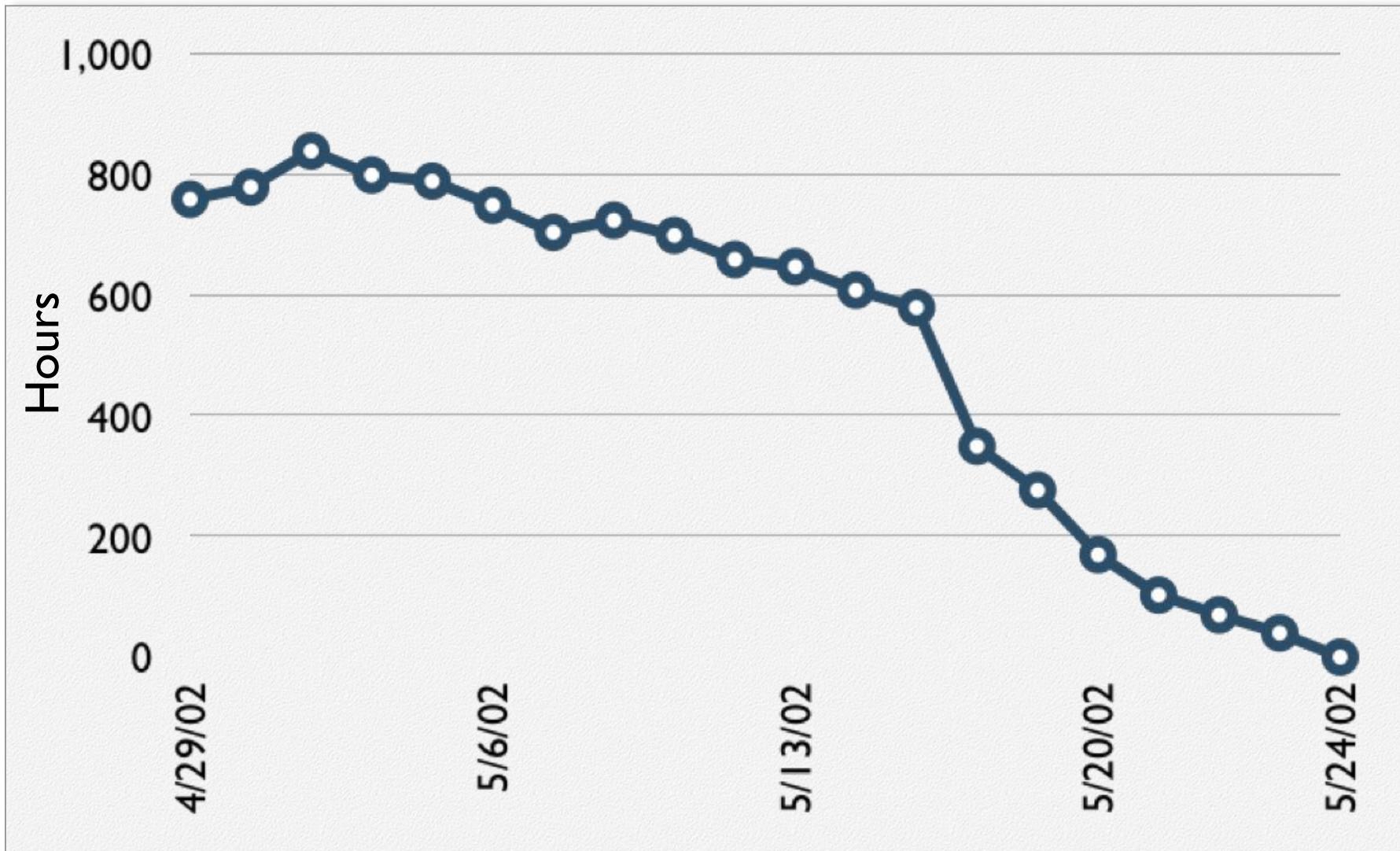
Sprint Burndown Chart

- 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)

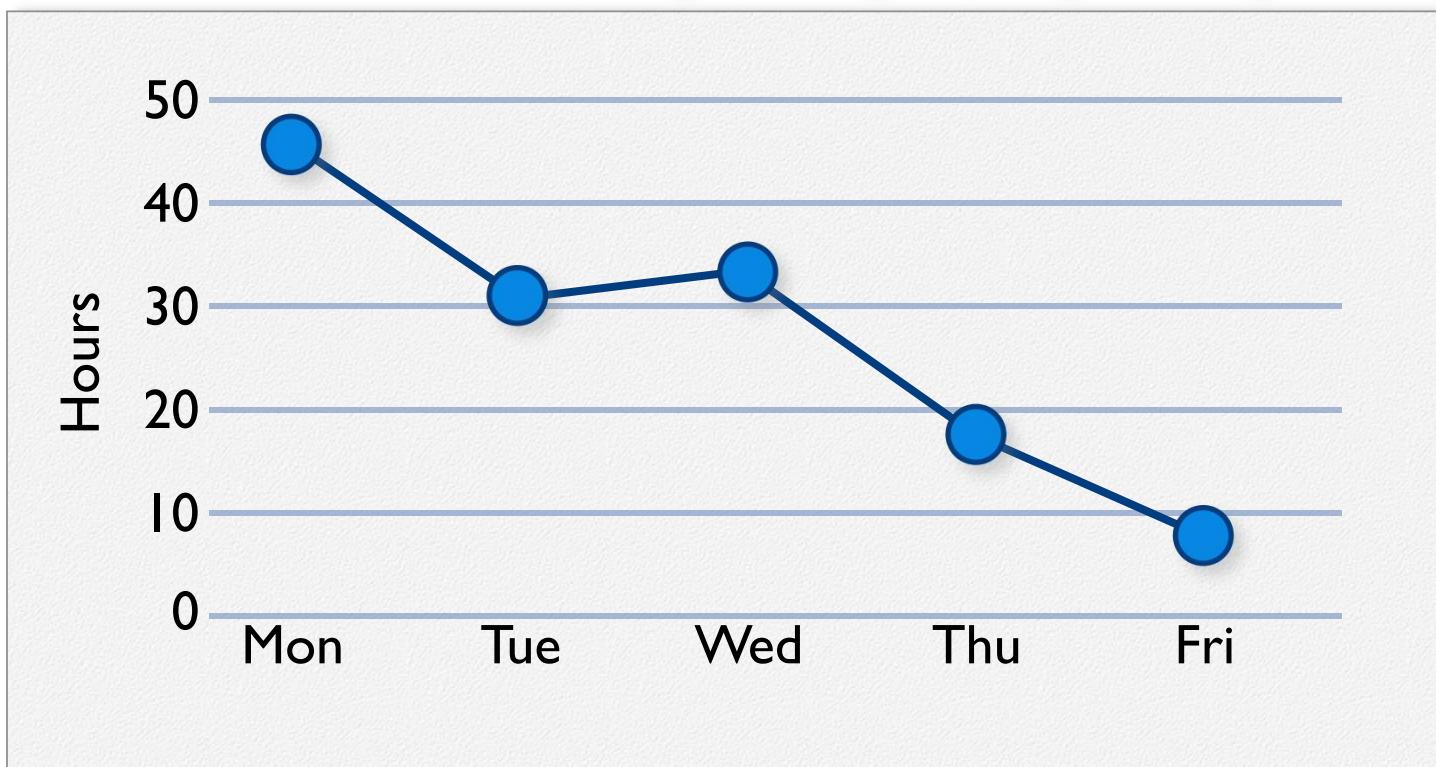
- *variation:* Release burndown chart
 - shows overall progress
 - updated at end of each sprint



Sample Burndown Chart

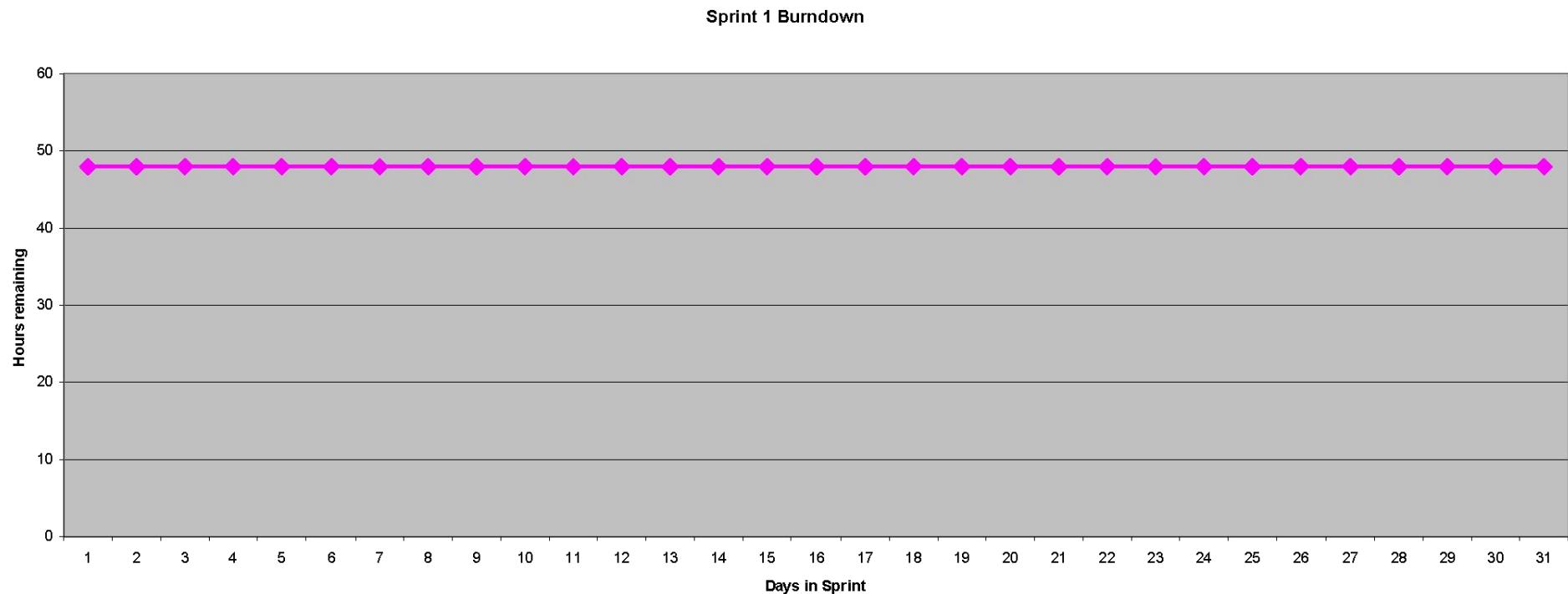


Tasks	Mon	Tue	Wed	Thu	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	7	
Test the middle tier	8	16	16	11	8
Write online help	12				



Burndown Example 1

No work being performed



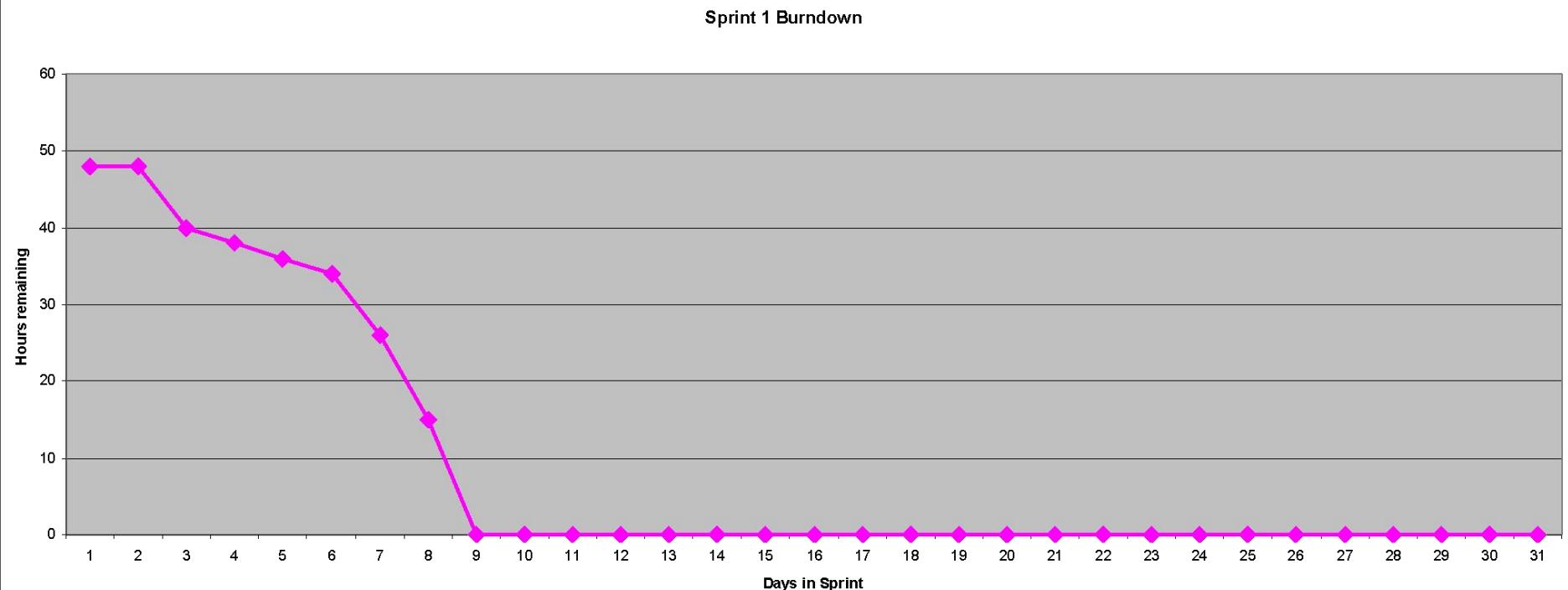
Burndown Example 2

Work being performed, but not fast enough



Burndown Example 3

Work being performed, but too fast!



The Sprint Review

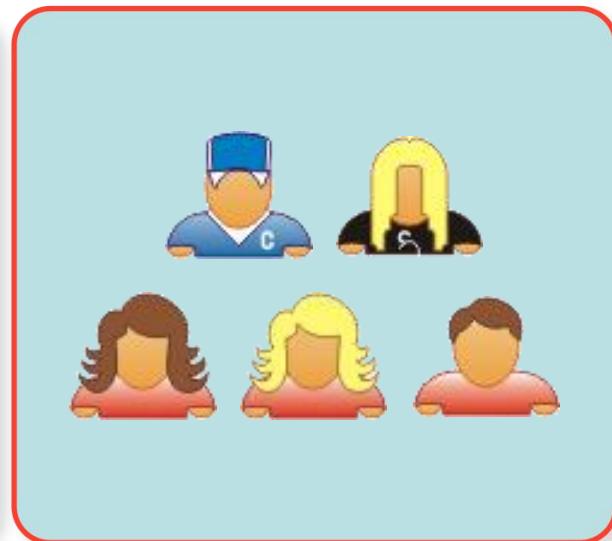
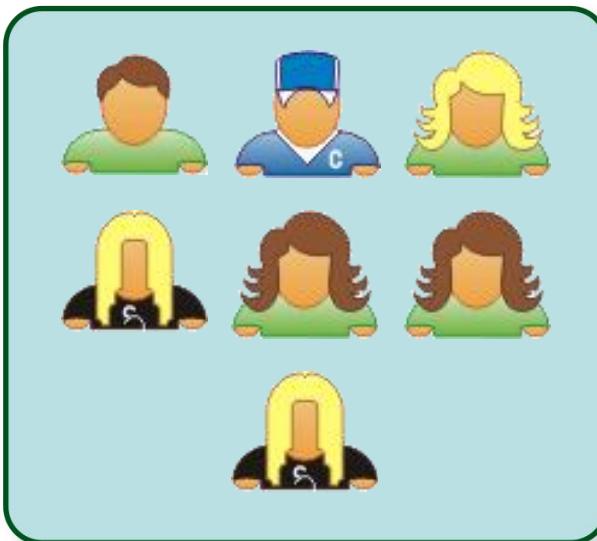
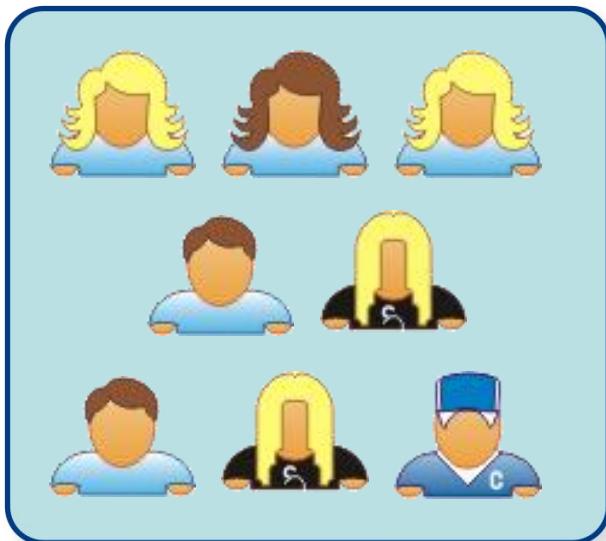
- Team presents what it accomplished during the sprint
- Typically takes the form of a demo of new features or underlying architecture
- Informal
 - 2-hour prep time rule
 - No slides
- Whole team participates
- Invite the world



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

Scaling: Scrum of Scrums



Scrum vs. Other Models

Process Comparison

	Waterfall	Spiral	Iterative	SCRUM
Defined processes	Required	Required	Required	Planning & Closure only
Final product	Determined during planning	Determined during planning	Set during project	Set during project
Project cost	Determined during planning	Partially variable	Set during project	Set during project
Completion date	Determined during planning	Partially variable	Set during project	Set during project
Responsiveness to environment	Planning only	Planning primarily	At end of each iteration	Throughout
Team flexibility, creativity	Limited - cookbook approach	Limited - cookbook approach	Limited - cookbook approach	Unlimited during iterations
Knowledge transfer	Training prior to project	Training prior to project	Training prior to project	Teamwork during project
Probability of success	Low	Medium Low	Medium	High

Credits, References

- Mike Cohn, Mountain Goat Software
www.mountaingoatsoftware.com
- *Scrum and The Enterprise* by Ken Schwaber
- *Succeeding with Agile* by Mike Cohn
- *Agile Software Development Ecosystems* by Jim Highsmith
- *Agile Software Development with Scrum* by K. Schwaber and M. Beedle
- *User Stories Applied for Agile Software Development* by Mike Cohn

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- agilealliance.com/articles/articles/InventingScrum.pdf

