

# Agile Software Project Management with Scrum

## Unleash team Self-Organization

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Jan 2008

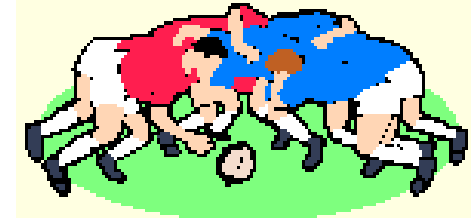
Blog: [ScrumXp.blogspot.com](http://ScrumXp.blogspot.com)



# Agenda

- **What's Scrum?**
- Scrum Characteristics
- Scrum Flow
- Scrum Role
- Scrum Development Process
- Challenge triggered by Scrum

# Scrum



- It is not an acronym.
- It is an agile lightweight process that can manage and control software and product development.
- “The New Product Development Game” in *Harvard Business Review*, 1986.
  - “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* by DeGrace and Stahl, 1990.
  - This is where Scrum was first mentioned in a software context.

# Scrum Origins

## ➤ Jeff Sutherland

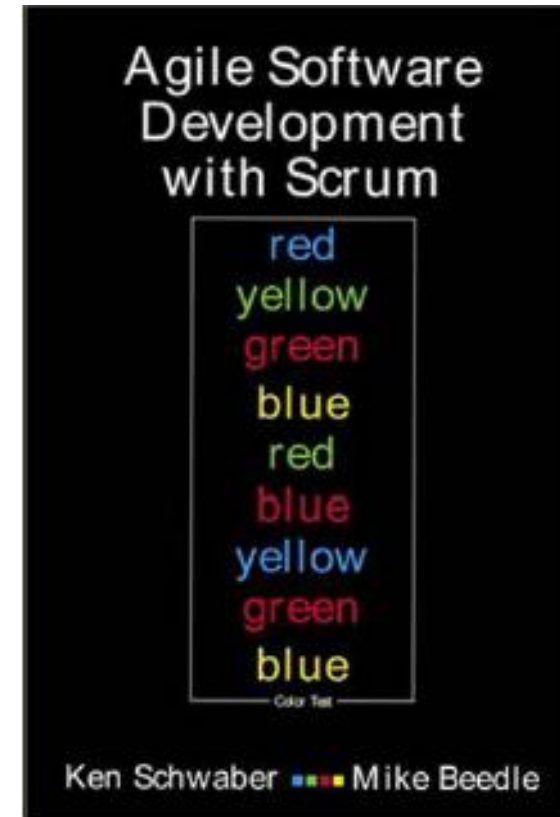
- Initial Scrums at Easel Corp in 1993
- IDX and nearly 600 people doing
- Not just for trivial projects
  - FDA-approved, life-critical software for x-rays and MRIs

## ➤ Ken Schwaber

- Initial definitions of Scrum at OOPSLA 96 with Sutherland

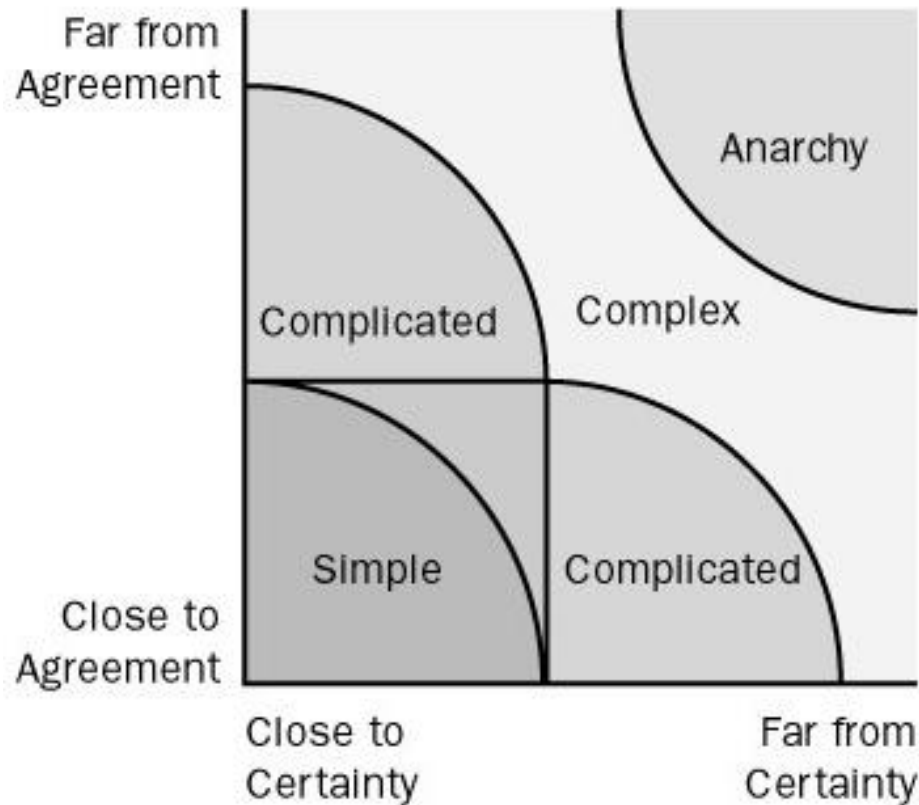
## ➤ Mike Beedle

- Scrum patterns in PLOPD4 Scrum



# Complex Software Development

➤ Most three significant complexity dimensions in software development: requirements, technology, and people.



# Values of Agile Alliance

individuals and interactions	over	processes and tools
working software	over	comprehensive documentation
customer collaboration	over	contract negotiation
responding to change	over	following a plan

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

# Agenda

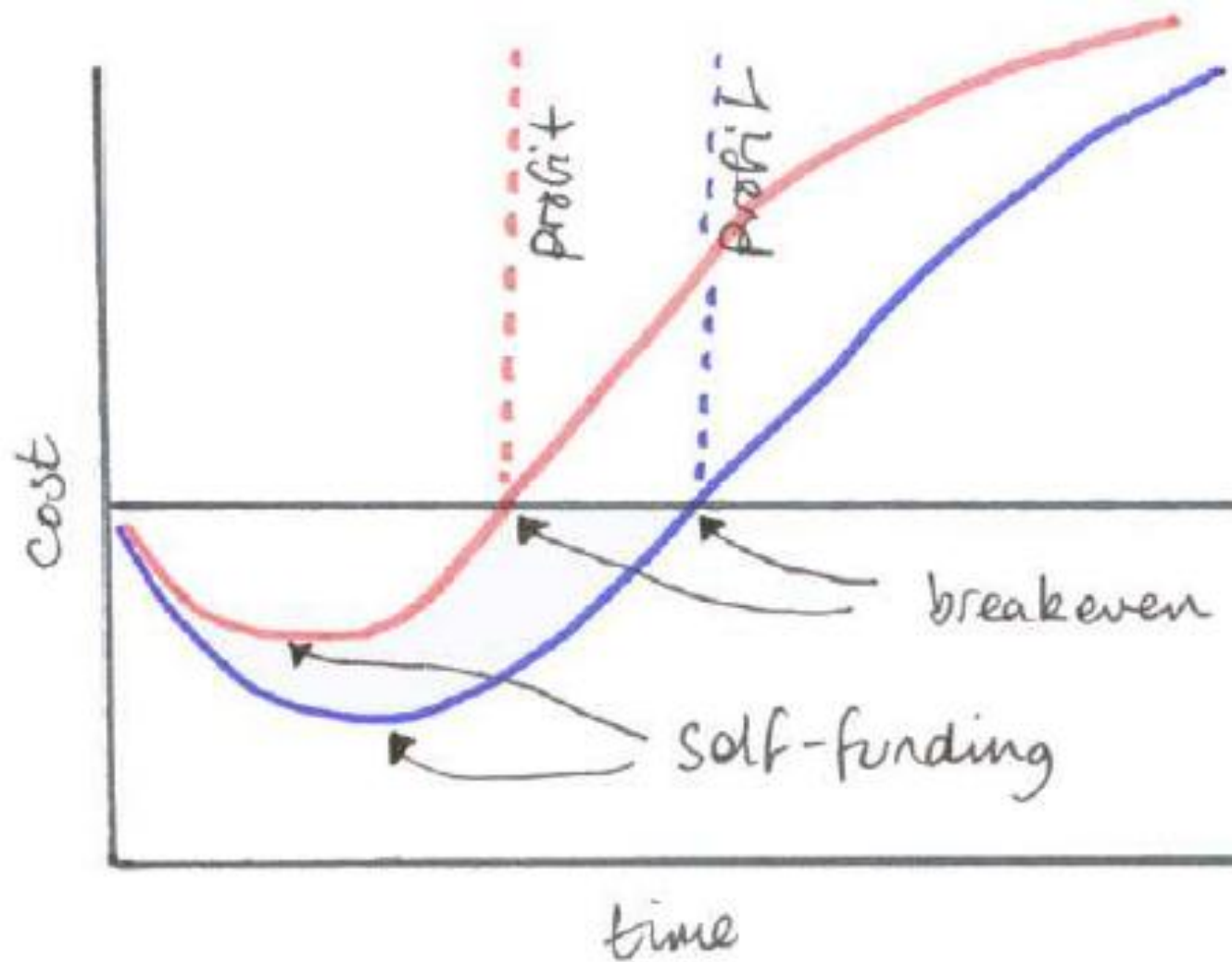
- What's Scrum?
- **Scrum Characteristics**
- Scrum Flow
- Scrum Role
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# Scrum Characteristics

- Self-organizing, Self-managing teams
- Product progresses in a series of month-long “sprints”
- Requirements are captured as items in a list of “product backlog”
- No specific engineering practices prescribed
- Uses iterative & incremental rules to create an agile environment for delivering projects
- Fully Business driven
- Timely inspect, adapt and remove impedance



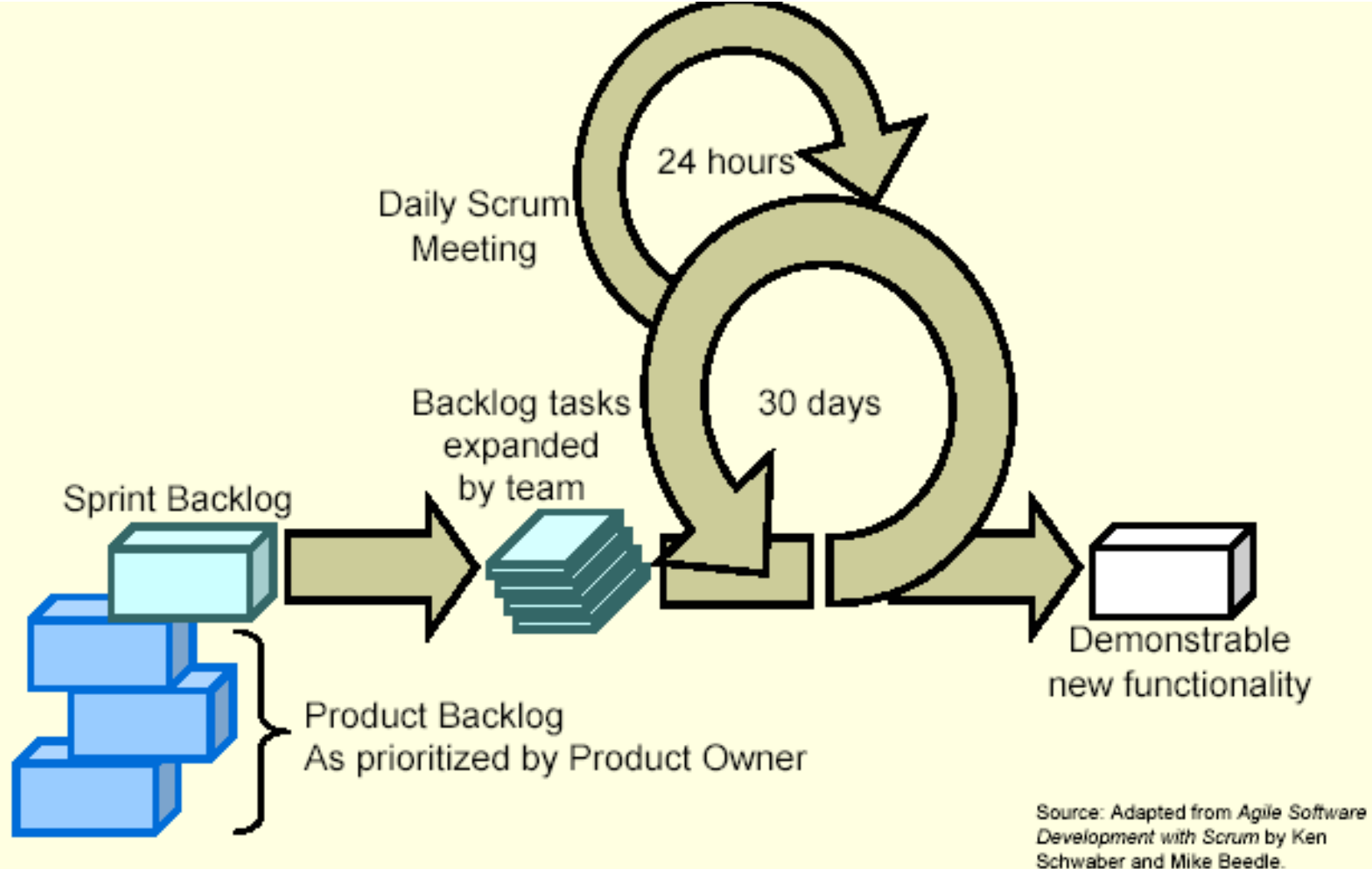
# Why Scrum iterative & incremental development works?



# Agenda

- What's Scrum?
- Scrum Characteristics
- **Scrum Flow**
- Scrum Role
- Scrum Development Process
- Challenge triggered by Scrum

# Scrum Flow



# Agenda

- What's Scrum?
- Scrum Characteristics
- Scrum Flow
- **Scrum Role**
  - **Product Owner, Scrum Master, Scrum Team**
- Scrum Development Process
- Challenge triggered by Scrum

# Product Owner

- Possibly a Product Manager or Project Sponsor, a member of Marketing or an Internal Customer.
- Responsible for representing the interests of everyone with a stake in the project and its resulting system.
- Create the project's initial overall requirements, return on investment (ROI) objectives, and release plans. The list of requirements is called the Product Backlog.
- Responsible for frequently prioritizing the Product Backlog to queue up the most valuable requirements for the next iteration.

# Scrum Master

- Represents management to the project
- Typically filled by a Project Manager or Team Leader
- Responsible for enacting Scrum values, process and practices
- Main job is to remove impediments and protect “**Scrum team**” from external threat during each “**Sprint**”
- Responsible for presiding over “**Daily Scrum Meeting**”

# Scrum Team

- Typically 5-10 people
- Cross-functional
  - QA, Programmers, UI Designers, etc.
- Members should be full-time
  - May be exceptions (e.g., System Admin, etc.)
- Teams are self-managing, self-organizing.
- Membership can change only between sprints
- Responsible for figuring out how to turn Product Backlog into an increment of functionality within an iteration and managing their own work to do so
- Collectively responsible for the success of each iteration and of the project as a whole.
- Two administrative responsibilities during the Sprint: attend the Daily Scrum meeting, and keep the Sprint Backlog up-to-date and visible to all.

## *Pigs VS Chickens*

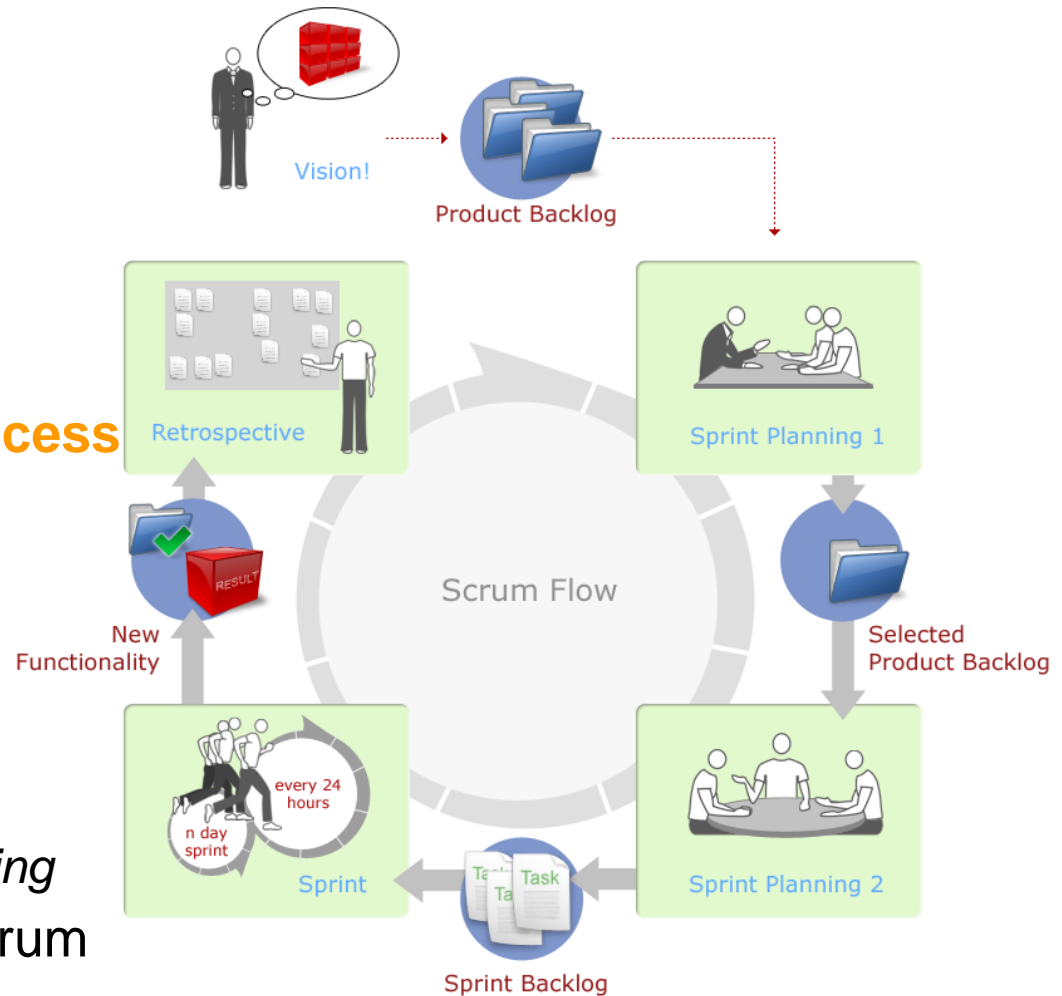
# Roles Summary

Activity	Owner	Responsibilities
<b>Manage the vision</b>	<b>Product Owner</b>	The Product Owner establishes, nurtures and communicates the product vision. He achieves initial and on-going funding for the project by creating initial release plans and the initial Product Backlog.
<b>Manage the ROI</b>	<b>Product Owner</b>	The Product Owner monitors the project against its ROI goals and an investment vision. He updates and prioritizes the Product Backlog to ensure that the most valuable functionality is produced first and built upon. He prioritizes and refines the Product Backlog and measures success against expenses.
<b>Manage the development iteration</b>	<b>Team</b>	During an iteration the team selects and develops the highest-priority features on the Product Backlog. Collectively, the team expands Product Backlog items into more explicit tasks on a Sprint Backlog and then manages its own work and self-organizes around how it desires to complete the iteration. The team manages itself to its commitments.
<b>Manage the process</b>	<b>Scrum Master</b>	The Scrum Master is responsible for setting the team up for success by ensuring the project and organizational culture are optimized for meeting the ROI goals of the project. This involves organizing a Sprint Planning Meeting (during which the team expands Product Backlog into Sprint Backlog), a Sprint Review Meeting (during which the newly developed functionality is demonstrated), shielding the team from outside disturbances, holding brief Daily Scrum meetings, and removing obstacles to progress.
<b>Manage the release</b>	<b>Product Owner</b>	The Product Owner makes decisions about when to create an official release. For a variety of reasons it may not be desirable to release at the conclusion of every increment. Similarly, if an official release is planned for after the fifth increment it may be released (with fewer features) after the fourth increment in order to respond to competitive moves or capture early market share. The Product Owner makes these decisions in a manner consistent with the investment vision that has been established for the project.



# Agenda

- What's Scrum?
- Scrum Characteristics
- Scrum Flow
- Scrum Role
- **Scrum Development Process**
  - ✓ *Product Backlog*
  - ✓ *Sprint Planning Meeting*
  - ✓ *Sprint Backlog*
  - ✓ *Daily Scrum*
  - ✓ *Sprint Review Meeting*
  - ✓ *Sprint Retrospective Meeting*
- Challenge triggered by Scrum



# Product Backlog

- A list of all desired work on the project
  - story-based work (“let user search and replace”)
  - task-based work (“improve exception handling”)
  
- List is prioritized by the Product Owner
  - Typically a Product Manager, Marketing, Internal Customer, etc.

ScrumWorks - Product: ScrumWorks - Danube Technologies

File Edit User Reports Help

### Committed Backlog

Bellevue

**View Impediments (2)**

R	Committed Backlog Items/Tasks	Task Hours	Backlog Effort
<input type="checkbox"/>	<b>Sprint -- 2/1/2006 - 2/15/2...</b>	Total: 56	Total: 55
<input type="checkbox"/>	Create a version of ScrumWo...		4
	Update init script	0	
	Create MySQL schema	0	
	migrate ice to mysql	4	
<input type="checkbox"/>	Upgrade to Java 5		4
	Update Cruise machine	1	
	Update build.xml	1	
	Update the installer	4	
	JBoss 4.0.2 on java 5?	0	
	Update XDoclet	0	
<input type="checkbox"/>	Define API with our users		8
	Set up mailing list	1	
	Discuss API with users to...	12	
<input type="checkbox"/>	import backlog items from Exc...		16
	Create UI	6	
	Import from Excel	8	
<input type="checkbox"/>	API technology		4
	Investigate choices	2	
	Add libraries, framework	1	
	prototype	2	
<input type="checkbox"/>	Create API prototype		3
	Implement something the...	4	
<input type="checkbox"/>	Release alpha version for api ...		6
	Deploy to a server in CA	3	

Search:  Next

### Uncommitted Backlog

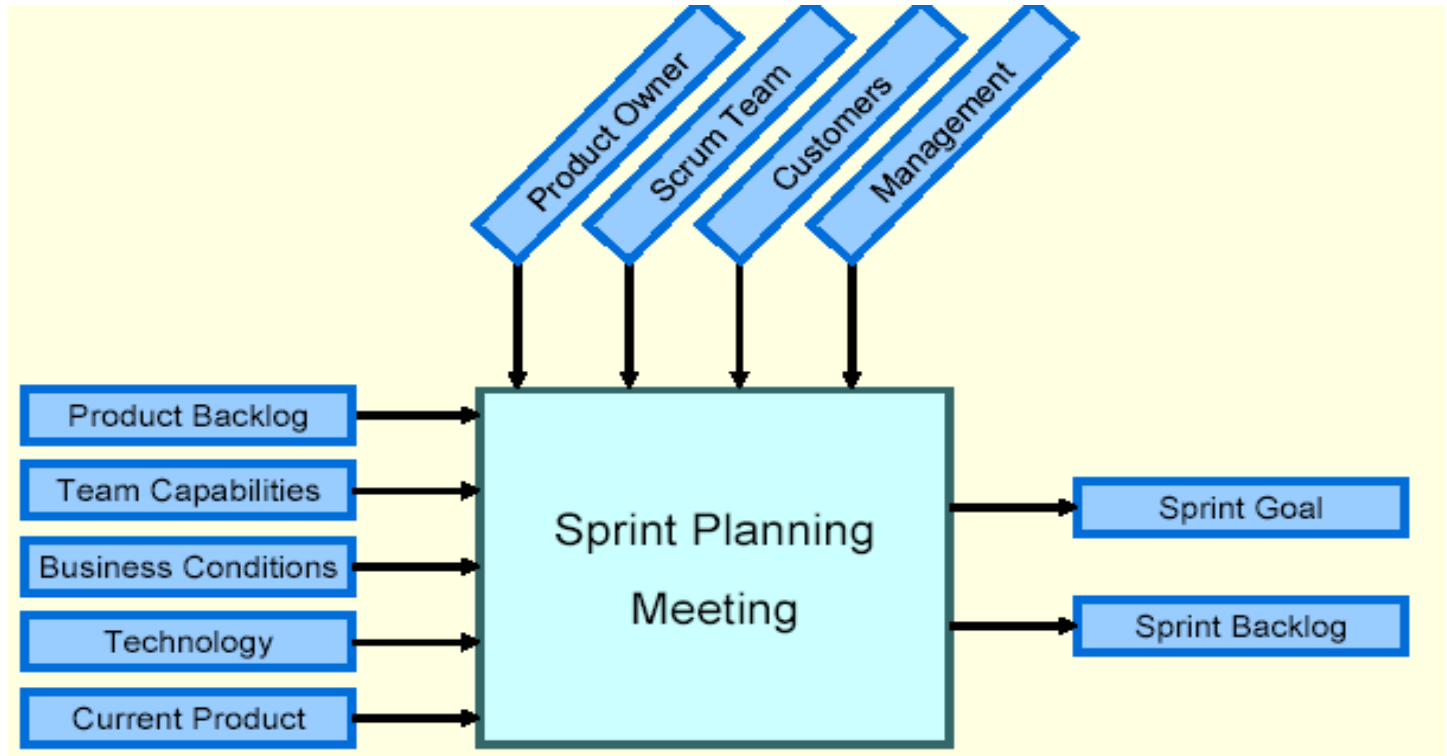
R	Uncommitted Backlog Items/Tasks	Task Hours	Backlog Effort
<input type="checkbox"/>	BUG: space-infected URLs not en...		4
<input type="checkbox"/>	BUG: Forecast completion bugs	2	2
<input type="checkbox"/>	BUG: file references only work wit...		8
<input type="checkbox"/>	BUG: UnDone tasks in Done backl...		6
<input type="checkbox"/>	Bug: Added goals not reflected in...		2
<input type="checkbox"/>	Disable OK button when it would ...		8
<input type="checkbox"/>	BUG: Selected Done PBI Should R...		1
<input type="checkbox"/>	<b>1.9.0</b>	Total: 36	Total: 110
<input type="checkbox"/>	Multi-Select Tasks	13	16
<input type="checkbox"/>	Multi-Select Backlog Items Robust...	6	6
<input type="checkbox"/>	Option to word-wrap titles		0
<input type="checkbox"/>	include task description in Sprint ...		4
<input type="checkbox"/>	More graceful recovery from serv...		8
<input type="checkbox"/>	Read PBIs into a release from RSS		16
<input type="checkbox"/>	keep an old build running to demo...		3
<input type="checkbox"/>	Differentiate/Combine Wiki FAQ a...		5
<input type="checkbox"/>	BUG: App is not very responsive ...		4
<input type="checkbox"/>	BUG: cannot delete a team even ...		16
<input type="checkbox"/>	Prioritize Impediments		0
<input type="checkbox"/>	131. Product Burndown PDF	17	16
<input type="checkbox"/>	Source field for PBIs		0
<input type="checkbox"/>	deconstruct VersionOne		4
<input type="checkbox"/>	15 minute timer in Sprint Detail Wi...		8
<input type="checkbox"/>	BUG: sprint list on the product ch...		2
<input type="checkbox"/>	Increase timeout on the web client		2
<input type="checkbox"/>	<b>wish list</b>	Total: 87	Total: 923
<input type="checkbox"/>	<b>Probably Not doing it</b>	Total: 36	Total: 160
<input type="checkbox"/>	<b>1.0.0</b>	Total: 0	Total: 0

Backlog Planner -- helps the team and product owner prioritize, negotiate, and schedule work.

# Sprints

- Scrum projects make progress in a series of “sprints”
  - Analogous to XP/RUP iterations
- Target duration is one month
  - +/- a week or two
- Product is designed, coded, and tested during the sprint
  - Ready to release.

# Sprint Planning Meeting



## Meeting Rules

- 1 day
- 1st - 4 hours max. for team to select Product Backlog and sets goal with Product Owner
- 2nd - 4 hours max. for team to define Sprint Backlog to build functionality
- Anyone can attend, but primary conversation and work is between team and Product

Owner

# Sprint Planning Meeting – Part 1

- Four hour max. meeting
- Defines what to build in the next Sprint
- Attended by Product Owner, Scrum team, customers, management

## **TEAM DEFINES a SPRINT GOAL!!**

- Team selects as much Product Backlog as it believes it can develop during the next Sprint
- Estimates may be revised upon review
- Lower priority backlog may be included if appropriate and Product Owner agrees
- Estimated effort/cost for selected product backlog items is a budget that team manages to; negotiate with Product Owner before exceeding.

# Sprint Goal

A short “theme” for 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.”

# From Sprint Goal to Sprint Backlog

- Scrum team takes the Sprint Goal and decides what tasks are necessary
- Team self-organizes around how they'll meet
  - Manager will never assign tasks to individuals
  - Team member make their own commitment, including cooperation
- Managers will never make decisions for the team
- Sprint Backlog is created

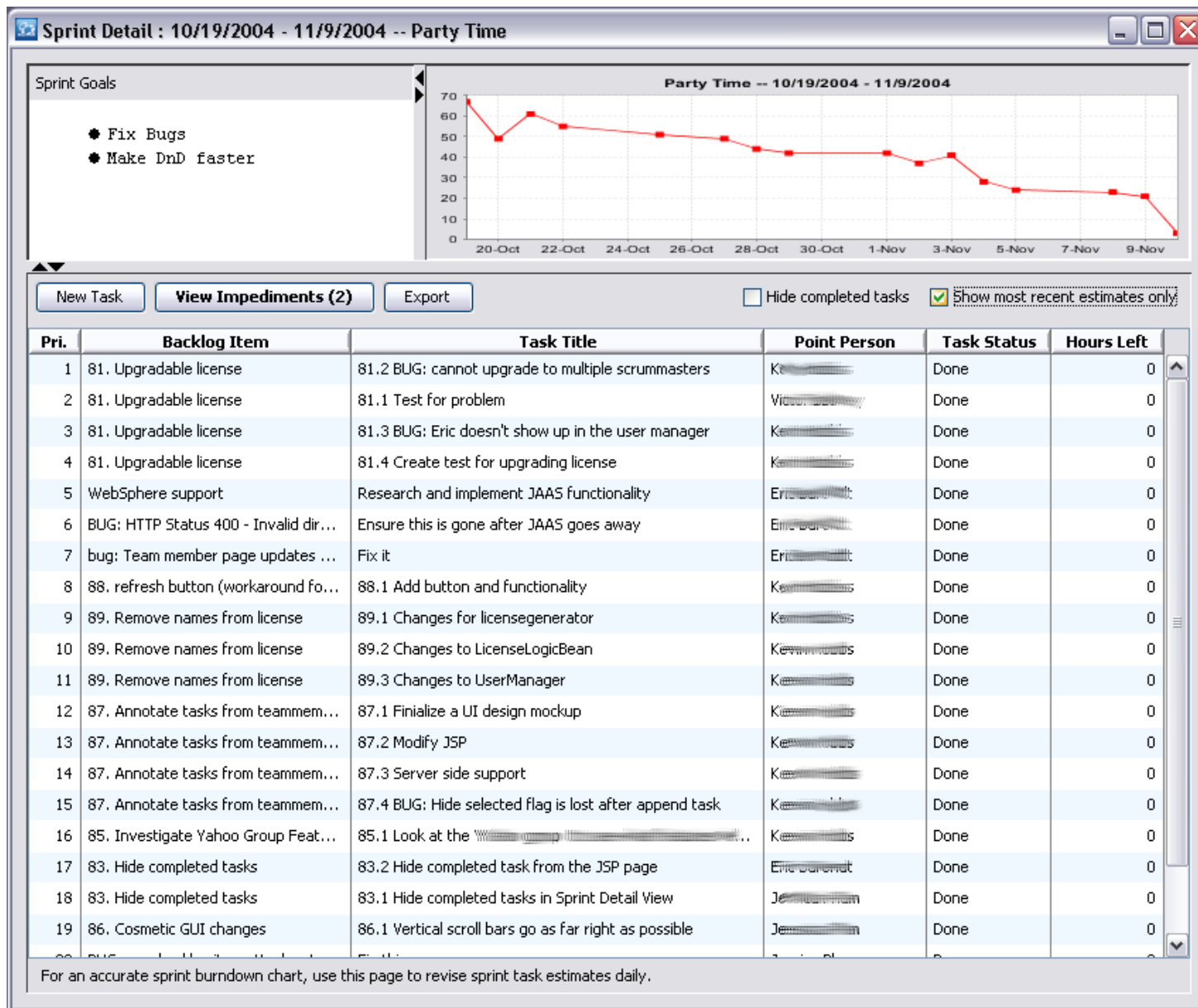


# Sprint Planning Meeting – Part 2



Sprint Planning 2

- Four hour max. meeting.
- Defines how to build the product functionality into a product increment in the next Sprint. This list is called the Sprint Backlog.
- Attended by Product Owner, Scrum team, development management
- Design is extended in this session.
- Team defines Sprint Backlog, consisting of all tasks that need to be completed during Sprint.
- Team members sign up for work and estimate their tasks.
- Tasks are 1-16 hours long; if longer, breakdown into more granularity.



Sprint Detail View -- focus the team discussion during daily scrum meetings.

# Sprint Backlog during the Sprint

## ➤ Changes

- Basic Rule : Try to keeping change out of one sprint
- Team adds new tasks whenever they need to in order to meet the Sprint Goal
- Team can remove unnecessary tasks
- But: Sprint Backlog can only be updated by the team

## ➤ Estimates are updated whenever there's new information

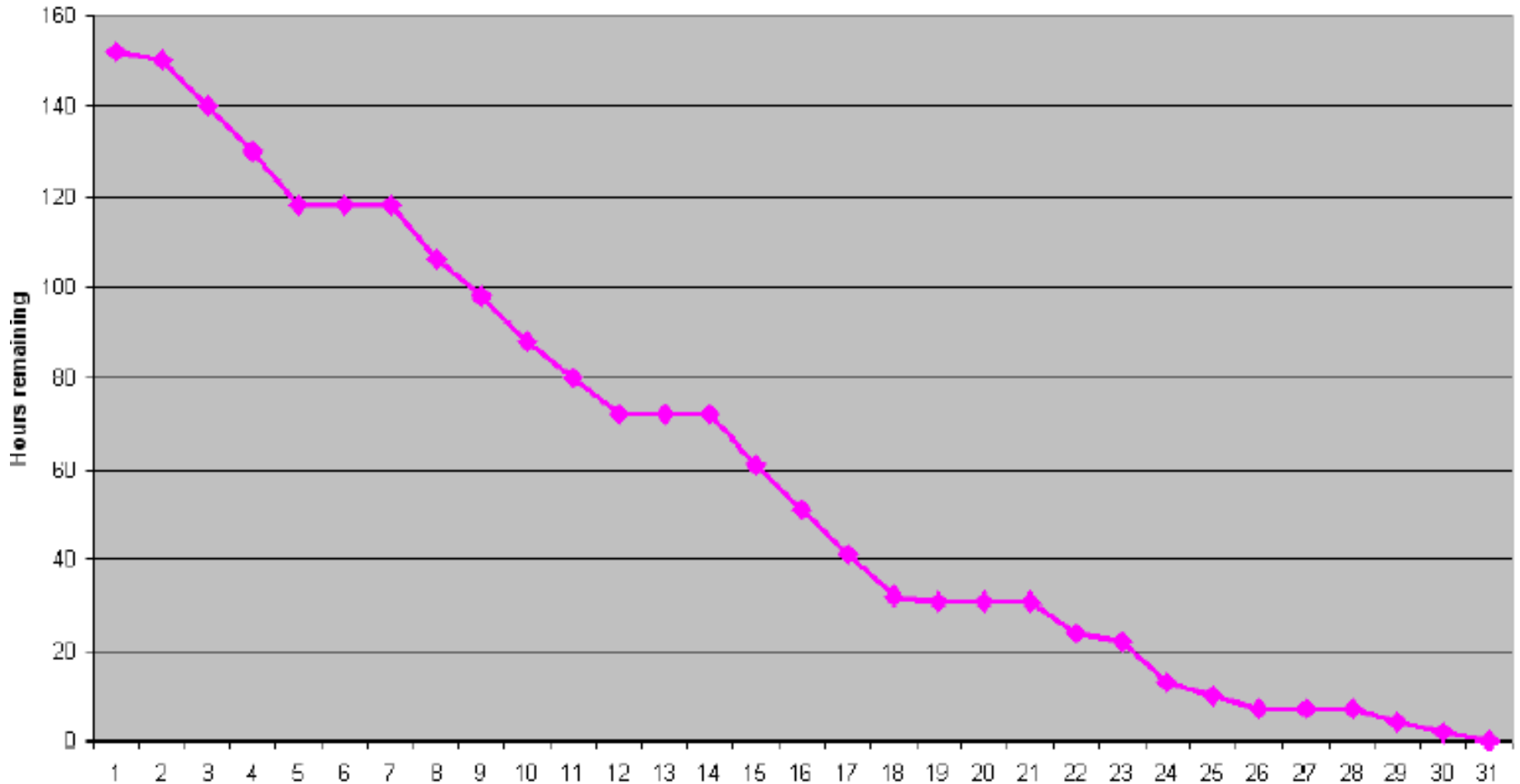
# When a Team member says “done,” what does that mean?

- Code adheres to standards, is clean, has been refactored, has been unit tested, has been checked in, has been built, and has had a suite of unit tests applied to it
- Development environment for this to happen requires source code library, coding standards, automated build facility, and unit test harness



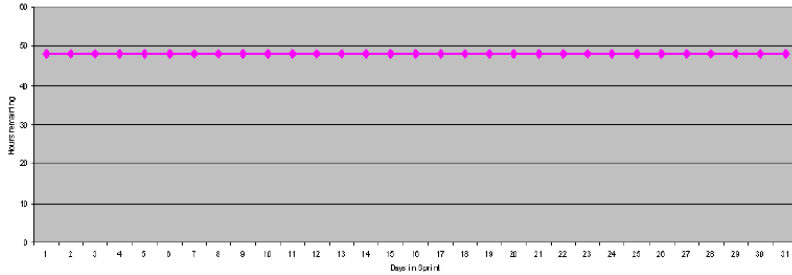
New  
Functionality

# Sprint Burndown Chart

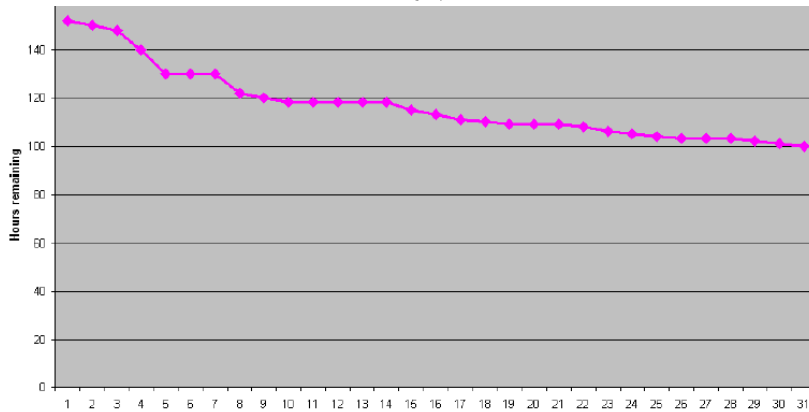


**It discloses Sprint progress and productivity.**

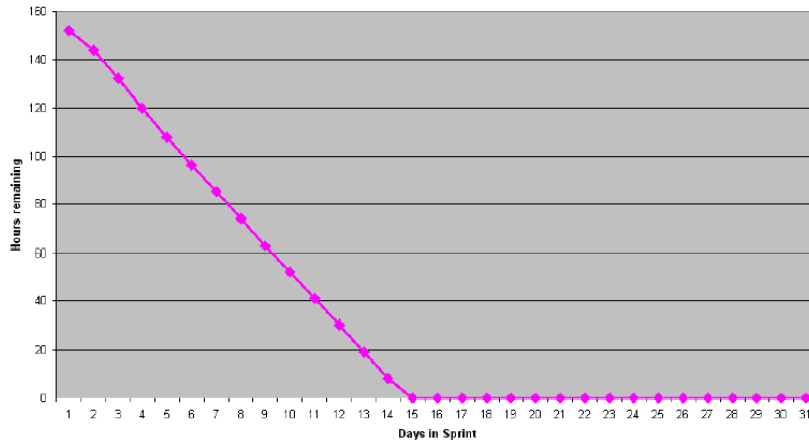
# More about Sprint Burndown Chart



1. No work has been performed in the sprint.
2. The Sprint Backlog is not being updated

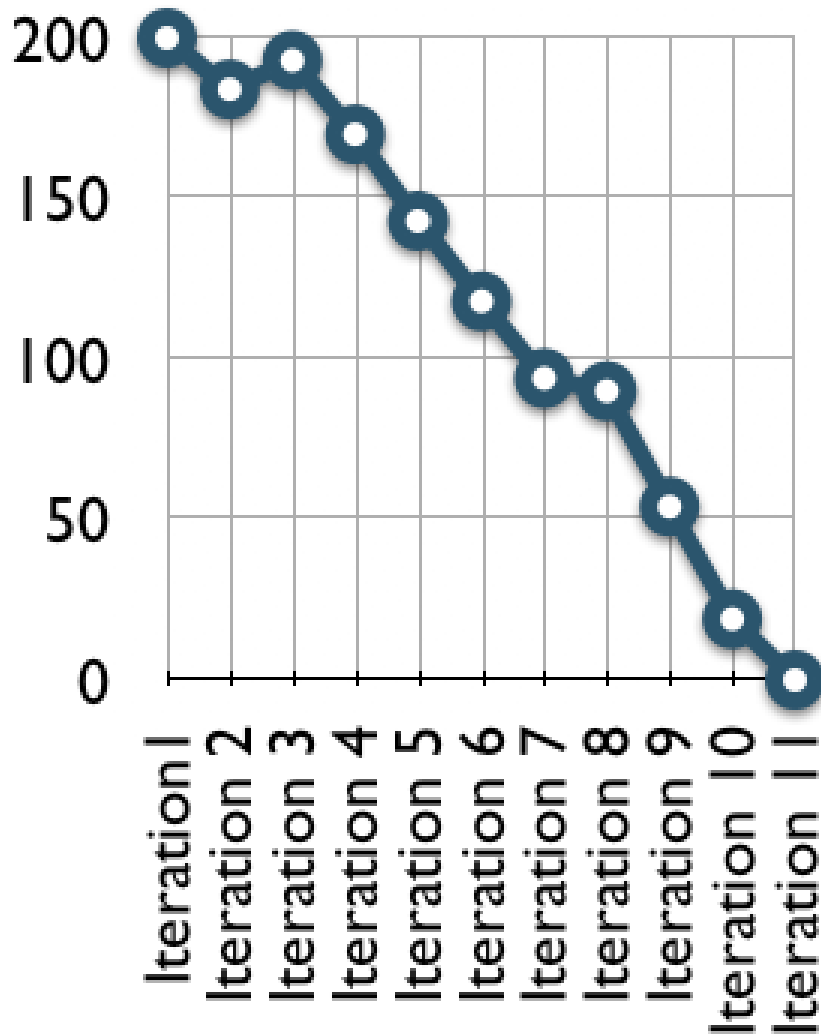


1. The Scrum Team, or individuals are being distracted from their work
2. The Sprint Backlog is not being updated by someone.
3. The Sprint Backlog items are too difficult



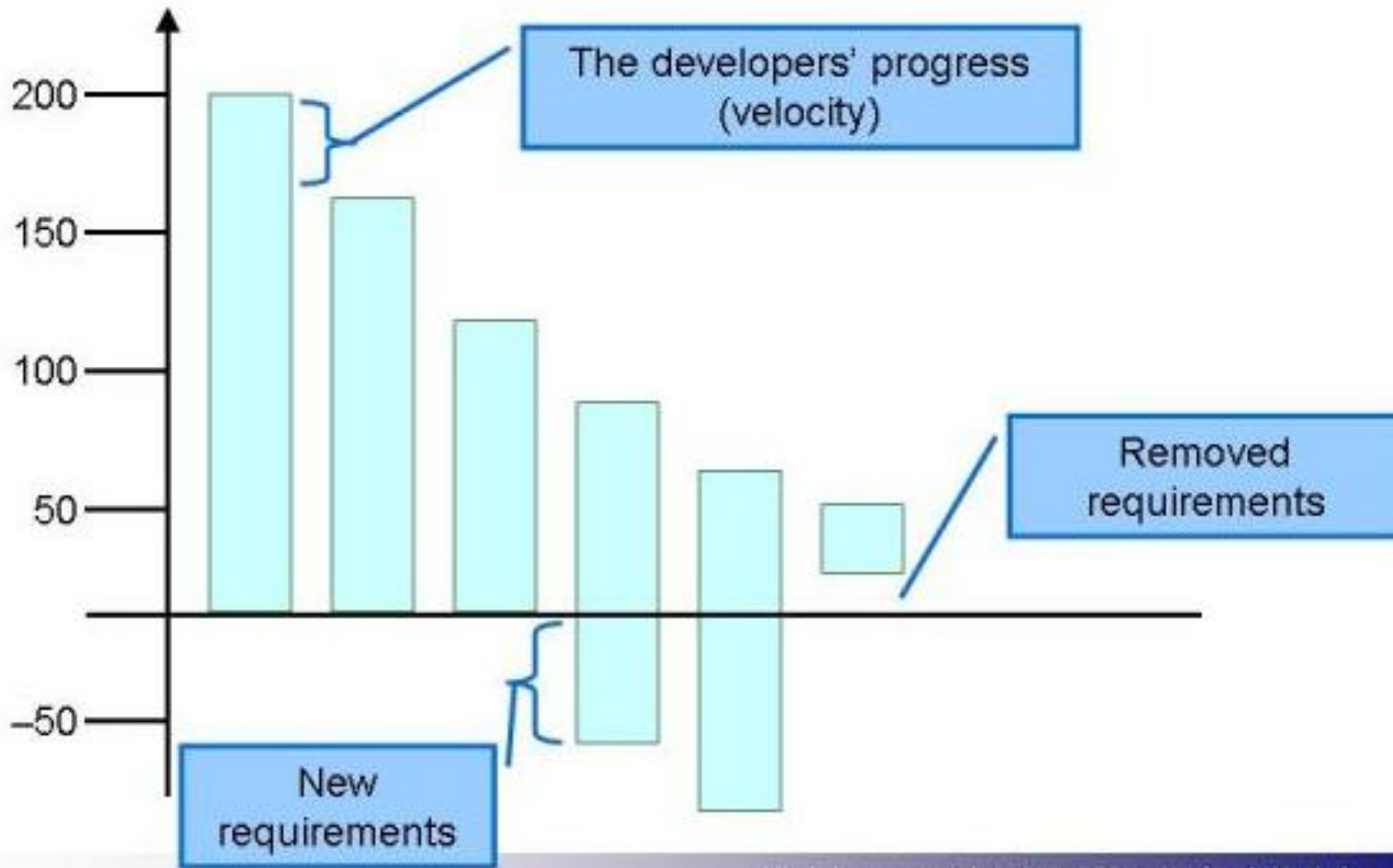
1. Excessive working
2. Sprint Backlog item estimates may be incorrect

# Product/Release Burndown Chart



- A big picture view of where your product stands.
- It discloses the trend of when will a product/release could be finished.
- It doesn't work well with lots of changing requirements.

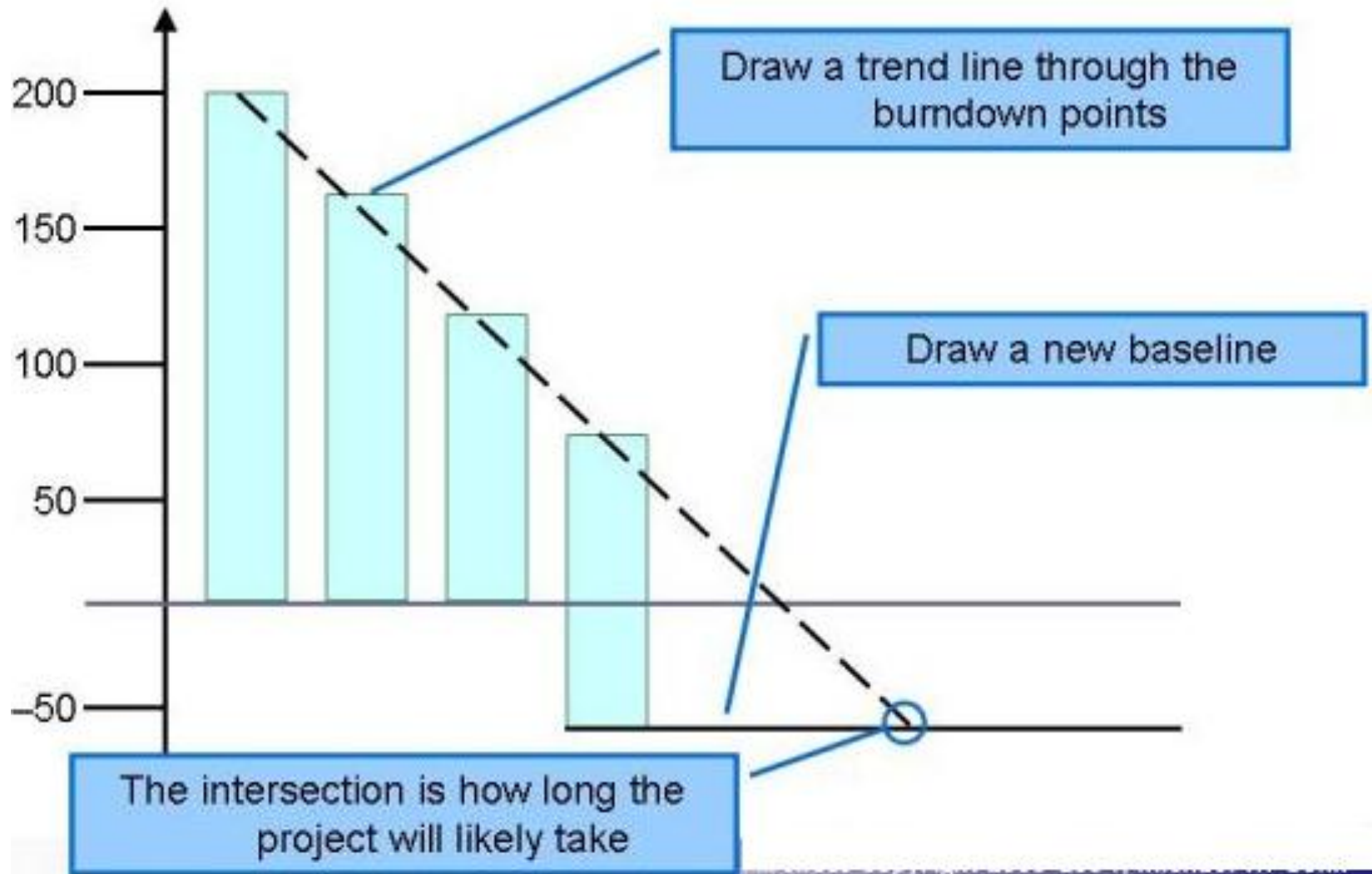
# More powerful release burndown



Help us to better understand “was the team slower than expected or was more work added to the release? “ – Productivity.



# Predicting the end date



# Daily Scrum Meeting

## ➤ Parameters

- Daily
- 15-minutes
- Stand-up
- Not for problem solving

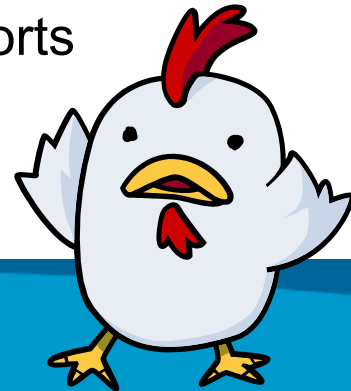
## ➤ Three questions:

- 1. What have you done on this project since the last Daily Scrum meeting?
- 2. What do you plan on doing on this project between now and the next Daily Scrum meeting?
- 3. What impediments stand in the way of you meeting your commitments to this Sprint and this project?

## ➤ Only Scrum Team/Master/Product Owner (*pigs*) can talk, others (*chickens*) must be silent

## ➤ Daily Scrum meetings can't be replaced by emailed status reports

- Entire team sees the whole picture every day
- Create peer pressure to do what you say you'll do



# Sprint Review Meeting

- Team presents what it accomplished during the sprint
- Typically takes the form of a demo of new features or underlying architecture, intended to bring people together and help them collaboratively determined what the Team should do next .
- Informal
  - a four-hour, time-boxed meeting
- Participants
  - Customers
  - Management
  - Product Owner
  - Other engineers



# Sprint Retrospective Meeting

- When : After the Sprint review and Prior to the next Sprint planning meeting
- Encourages the Team to revise, within the Scrum process framework and practices, its development process to make it more effective and enjoyable for the next Sprint.
  - What went well during the last Sprint?
  - What could be improved in the next Sprint?
- Sprint retrospective reflect the empirical inspection and adaptation practices of Scrum.
- Informal
  - a three-hour, time-boxed meeting
- Participants
  - Scrum Master
  - Scrum Team



# More about Scrum

- Scrum doesn't specify any specific engineering practices
- Other engineering practices are up to you
  - Automation, code inspection, pair programming, static analysis tools, RUP, CMM, etc.
- However, each sprint is required to produce ready-to-use code
  - Heavy in-sprint testing is usually applied
    - Some teams have dedicated testers
    - Others have programmers test everything

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- Scrum Development Process
- **Challenge triggered by Scrum**

# The challenge triggered by Scrum(1)

- Overthrow traditional “waterfall” approach, replace with iterative and incremental practices.
  - Waterfall: requirements gathering, analysis, design, code, test, deploy with each stage being completed before moving on.
- Never “artifact-driven”.
  - Scrum requires very few artifacts, never require large requirements documents, analysis specifications, design, test documents, etc,
- Rely on adaptive and empirical, not to be prescriptive.
  - Scrum provides best possible flexibility.
  - Empirical (Ex, code review)
  - *Prescriptive processes—those that say “do this, then do that, and then do this”.*

# The challenge triggered by Scrum(2)

- Overthrow Deterministic approach to project management that uses detailed plans, Gantt charts, and work schedules..
  - Scrum is the exact opposite. Unlike these tools, which practically fight against a project's natural momentum, Scrum shows management how to guide a project along its optimal course, which unfolds as the project proceeds.
  - Similar to “Learning Curve”
- Effectively apply 80/20 principle, to achieve business value much earlier in the cycle.
  - “80% of a product's value comes from 20% of its features”.
- Focus more on ROI than ever

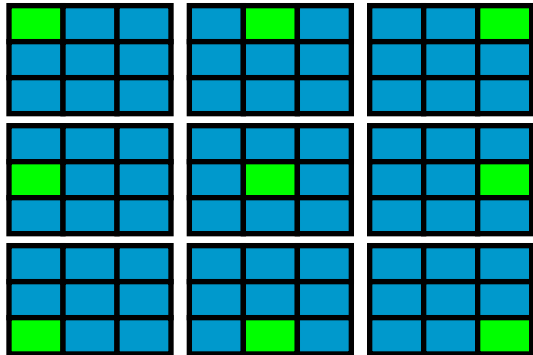
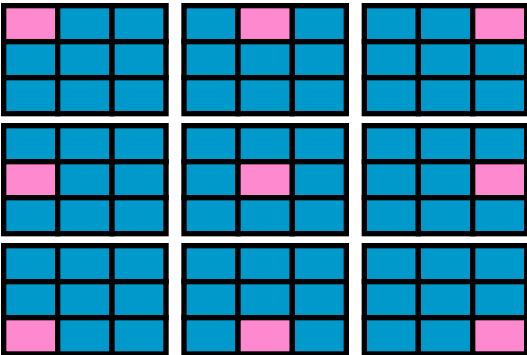
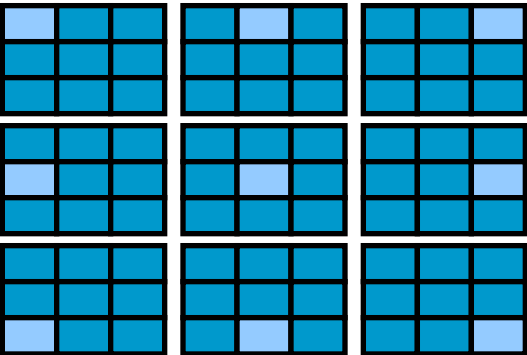
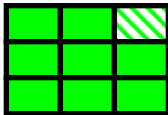
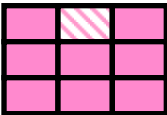
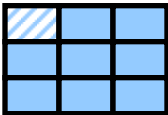


# Scrum of Scrums / Meta-Scrum

Coordinating Scrum



Scrum of Scrums



DailyScrums

# Resource

- Agile Software Development with Scrum by Ken Schwaber and Mike
- Agile Project Management with Scrum by Ken Schwaber
- Ken Schwaber's Web site on Scrum.
  - [www.controlchaos.com/](http://www.controlchaos.com/)
- The home of the AgileAlliance, with a great library of Agile and Scrum articles.
  - [www.agilealliance.org](http://www.agilealliance.org)

**THIS WILL NOT HAVE ANSWERED  
ALL YOUR QUESTIONS!**