Planning and Tracking on Agile Projects

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Mike Cohn - background

USER STORIES APPLIED
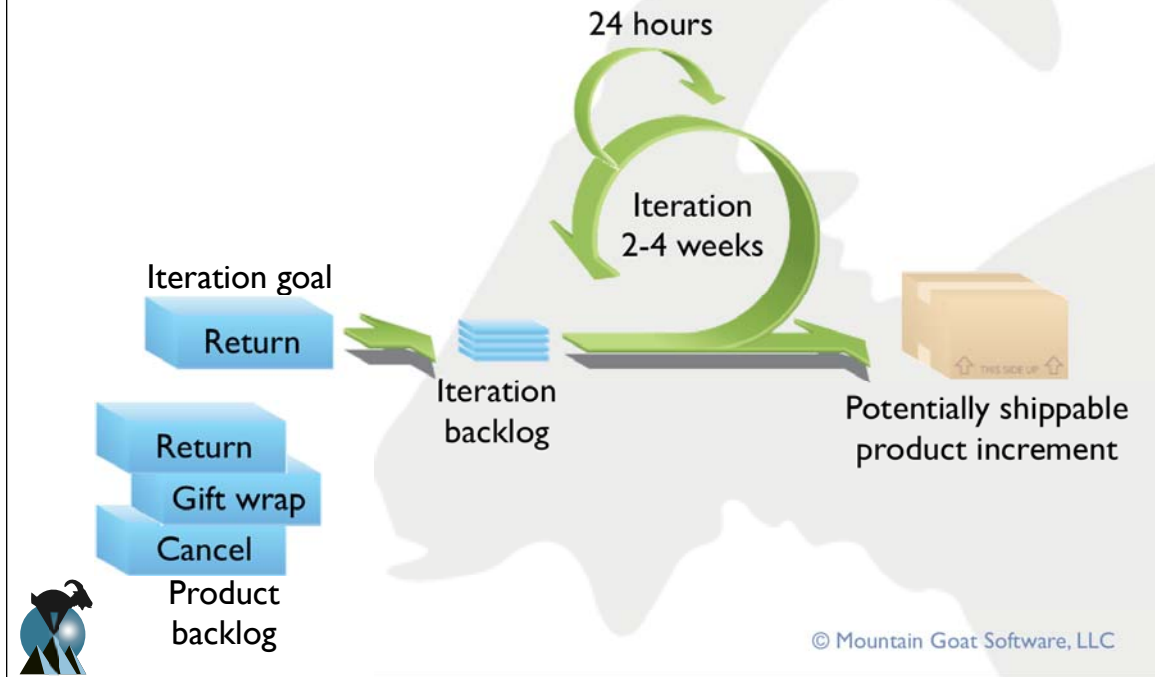FOR AGILE SOFTWARE DEVELOPMENT
MIKE COHN
Foreword by Kent Beck

Robert C. Martin Series
Agile Estimating and Planning
Mike Cohn
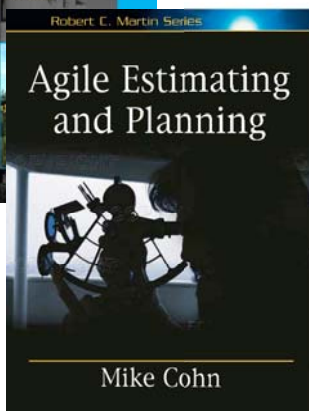
Consultant, author, and speaker

O Founding member and director of Agile Alliance, Scrum Alliance, and Agile Project Leadership Network

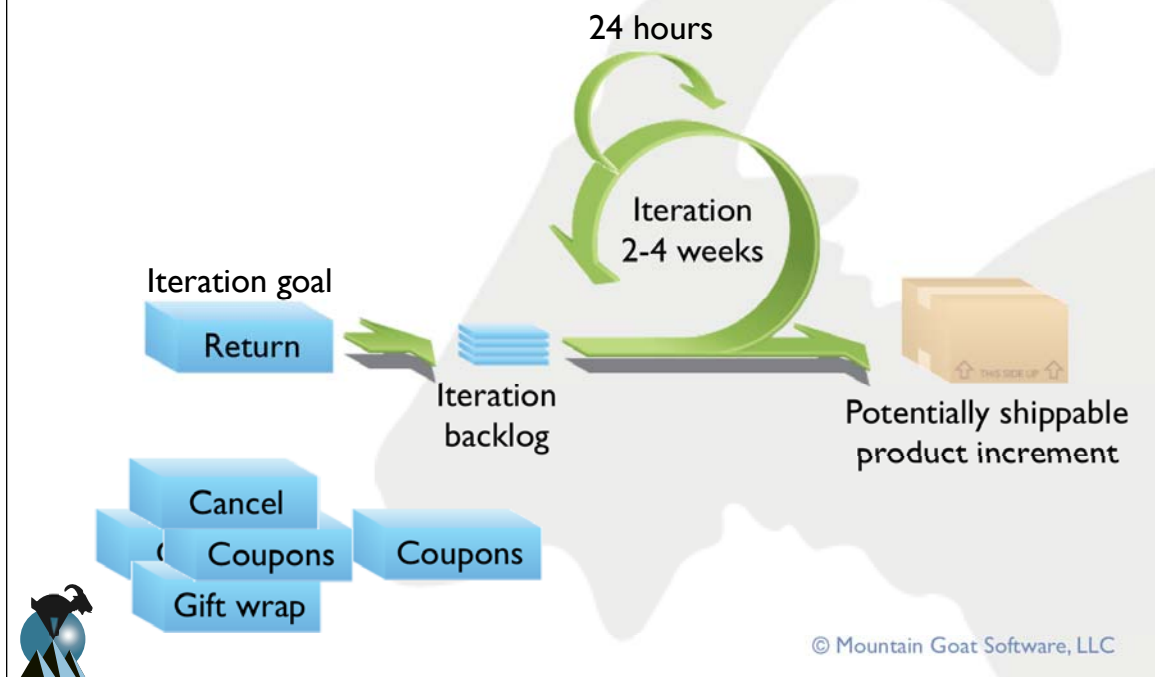O Founder of Mountain Goat Software

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Scrum: a typical agile process

24 hours

Iteration
2-4 weeks

Iteration goal

Return

Return

Gift wrap

Cancel

Product
backlog

Iteration
backlog

Potentially shippable
product increment

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Review and planning

24 hours

Iteration
2-4 weeks

Iteration goal

Return

Cancel

Coupons

Coupons

Gift wrap

Iteration
backlog

Potentially shippable
product increment

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Imagine...

- That you're fed up with software development as a career

- And you decide to go into the landscaping business

- Your first job is moving this pile of rock from the front of my house to the back

How might you estimate this?

- One way:
  - Look at the pile of rock and estimate how many wheelbarrow loads it represents

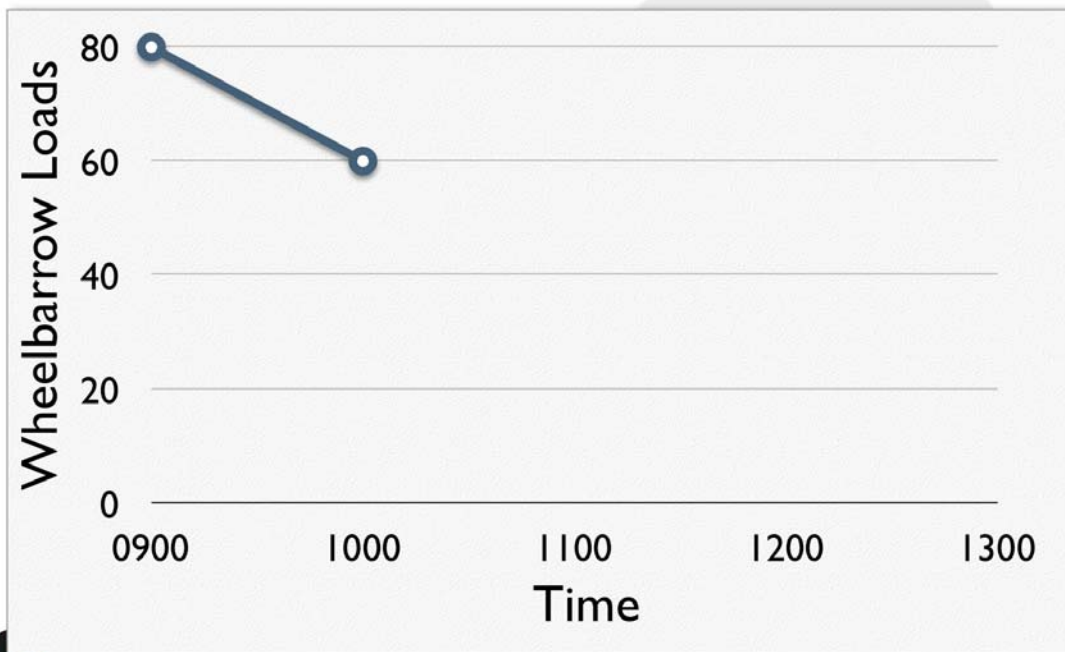- After an hour, see how many wheelbarrow loads you've moved then extrapolate the total duration

- I think that's 80 wheelbarrow loads
- After an hour I've moved 20 loads
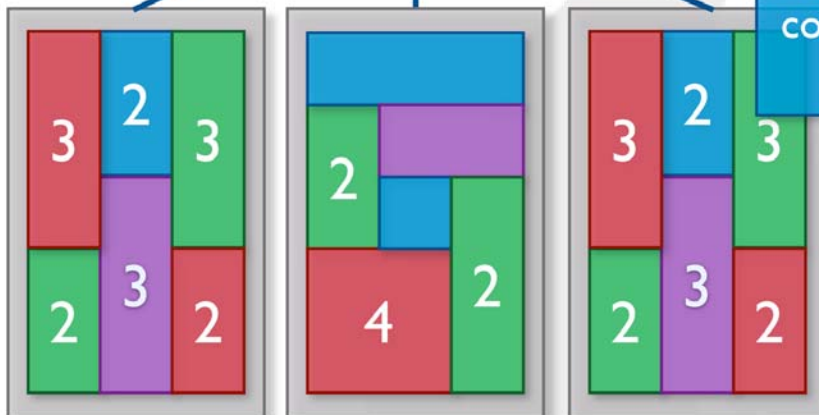- So, I'll be done in a total of 4 hours

My landscaping

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•An iteration is a short, constrained period of time
•Typically 1-4 weeks

Velocity is the amount of work planned or completed in an iteration.
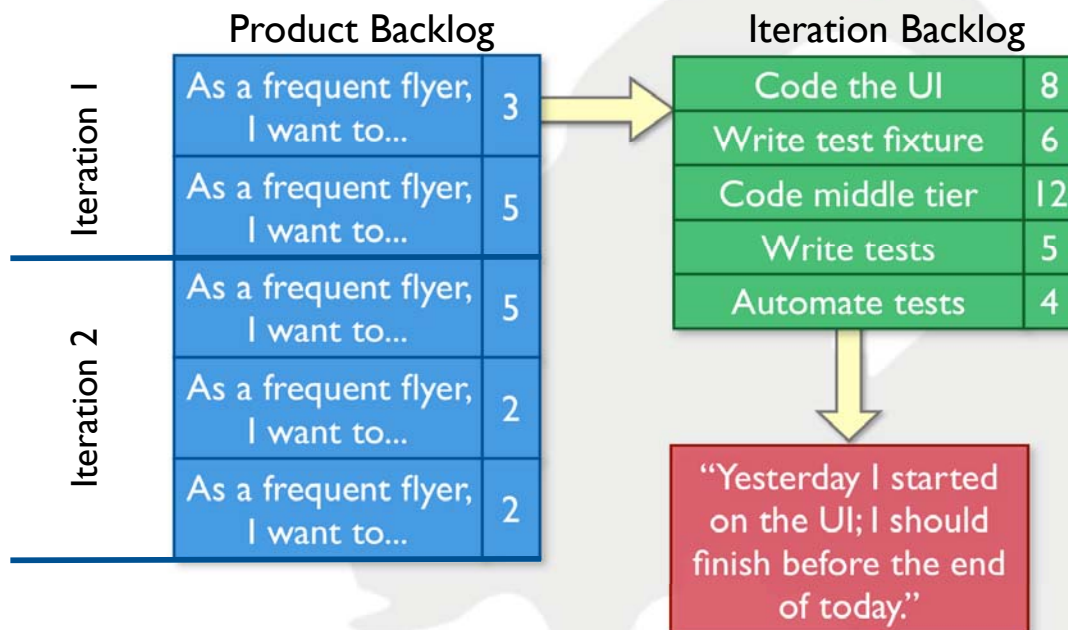
A release typically comprises more than one iteration

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The planning onion
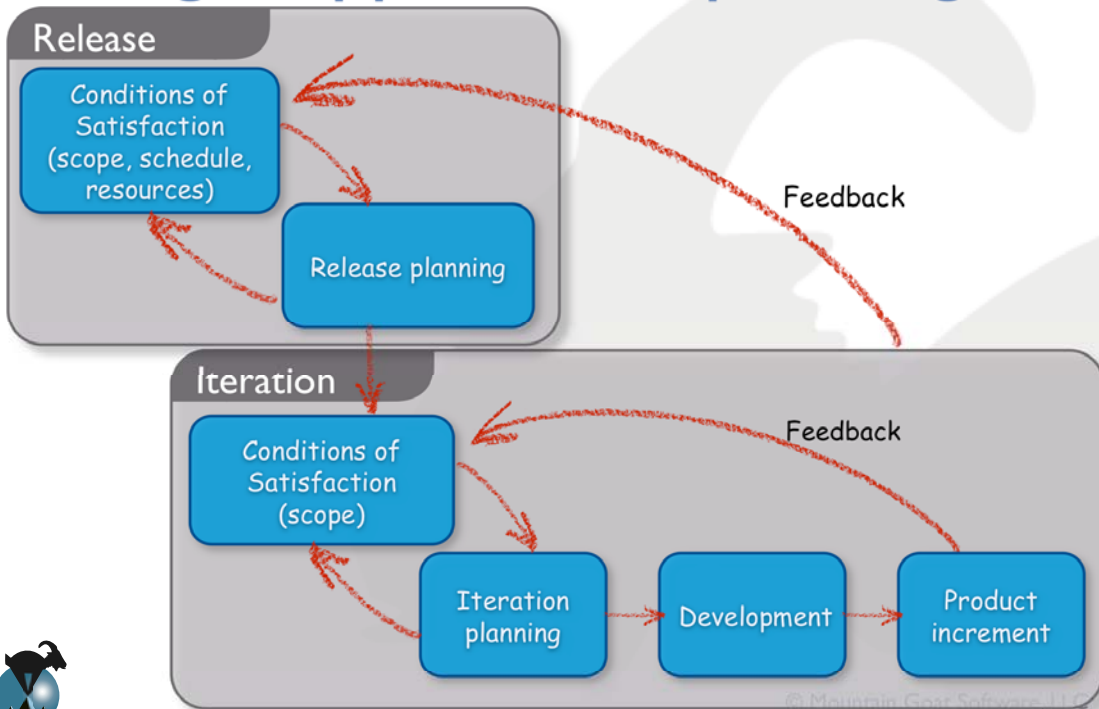
Strategy
Portfolio
Product
Release
Iteration
Daily

- Agile teams plan at the innermost three levels.
- Others (on the team in the company) plan at the outer levels.

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Relating the different planning levels

Product Backlog

Iteration Backlog

Iteration 1

Iteration 2

As a frequent flyer, I want to...	3
As a frequent flyer, I want to...	5
As a frequent flyer, I want to...	5
As a frequent flyer, I want to...	2
As a frequent flyer, I want to...	2

Code the UI	8
Write test fixture	6
Code middle tier	12
Write tests	5
Automate tests	4

"Yesterday I started on the UI; I should finish before the end of today."

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An agile approach to planning

Agenda

☐ Estimating

☐ Release planning

☐ Burndown charts

Story points

- The most common way for agile teams to estimate these days is in "Story Points"
  - Name is derived from agile teams commonly expressing requirements as "user stories"
  - Based on a combination of the size and complexity of the work
  - Unitless but numerically relevant estimates
  - A 10-point user story is expected to take twice as long as a 5-point user story

---

Consider these two piles of work

What story point values might we put on these?

Zoo points

Assign "zoo points" to the following breeds

Lion
Kangaroo
Rhinocerus
Bear
Giraffe
Gorilla
Hippopotamus
Tiger

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Three key advantages

- Estimating in story points

1. Forces the use of relative estimating

   - Studies have shown we're better at this[†]

2. Focuses us on estimating the size, not the duration

   - We derive duration empirically by seeing how much we complete per iteration

3. Puts estimates in units that we can add together

   - Time based estimates are not additive

[†]Lederer and Prasad, 1998. *A Causal Model for Software Cost Estimating Error* and Vicinanza et al., 1991. *Software Effort Estimation: An Exploratory Study of Expert Performance.*

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Planning poker for estimating

- An iterative approach to estimating, loosely based on wideband Delphi
- Steps
  1. Each estimator is given a deck of cards, each card has a valid estimate written on it
  2. Customer/Product owner reads a story and it's discussed briefly
  3. Each estimator selects a card that's his or her estimate
  4. Cards are turned over so all can see them
  5. Discuss differences (especially outliers)
  6. Re-estimate until estimates converge

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Planning poker - an example

Estimator	Round 1	Round 2
Susan	3	5
Vadim	8	5
Ann	2	5
Chris	5	8

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Why planning poker works

- Those who will do the work, estimate the work[1]
- Estimators are required to justify estimates[2,3]
- Focuses most estimates within an approximate one order of magnitude[4,5]

[1]Jørgensen, Magne. 2004. *A Review of Studies on Expert Estimation of Software Development Effort.*
[2]Hagafors, R., and B. Brehmer. 1983. *Does Having to Justify One's Decisions Change the Nature of the Decision Process?*
[3]Brenner, et al. 1996. *On the Evaluation of One-sided Evidence.*
[4]Miranda, Eduardo. 2001. Improving Subjective Estimates Using Paired Comparisons.
[5]Saaty, Thomas. 1996. *Multicriteria Decision Making: The Analytic Hierarchy Process.*

Why planning poker works

- Combining of individual estimates[6] through group discussion[7] leads to better estimates
- Emphasizes relative rather than absolute estimating
- Estimates are constrained to a set of values so we don't waste time in meaningless arguments
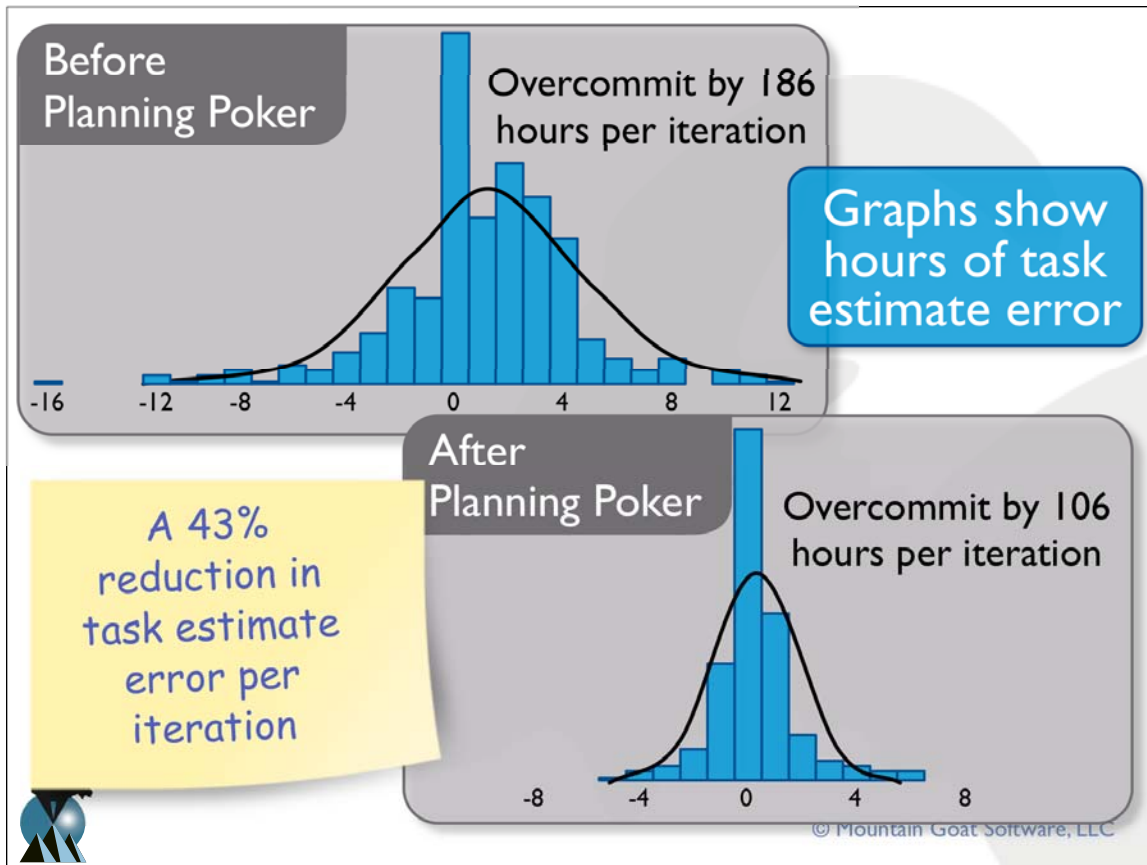- Everyone's opinion is heard
- It's quick and fun

[6]Hoest, Martin, and Claes Wohlin. 1998. *An Experimental Study of Individual Subjective Effort Estimations and Combinations of the Estimates.*
[7]Jørgensen, Magne, and Kjetil Moløkken. 2002. *Combination of Software Development Effort Prediction Intervals: Why, When and How?*

Agenda

☑ Estimating

☐ Release planning

☐ Burndown charts

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Release planning

Purpose
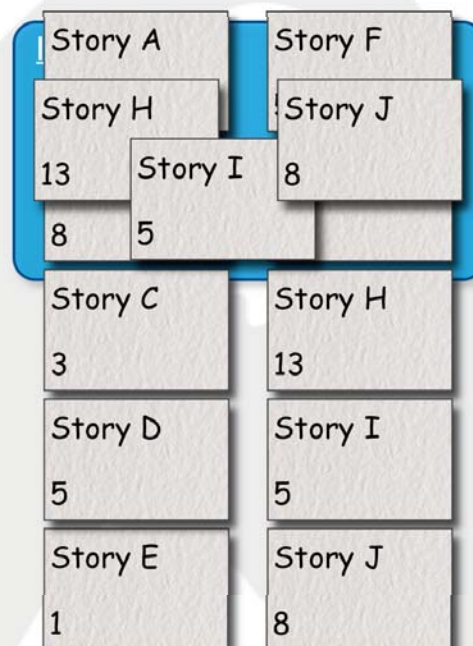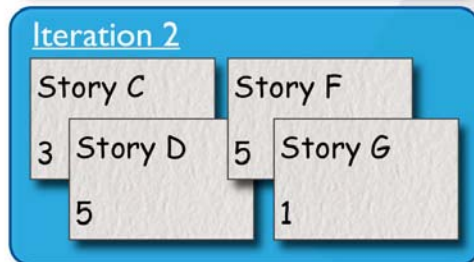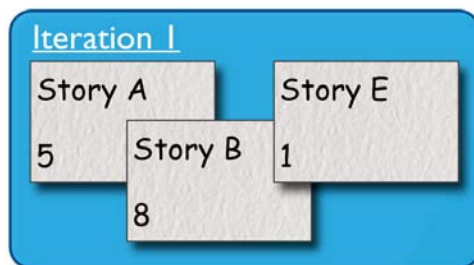
To answer questions such as:
- How much will be done by 30 June?
- When can we ship with this set of features?
- How many people or teams should be on this project?

Inputs

- Velocity
  - The amount of work completed in an iteration
- The length of the project
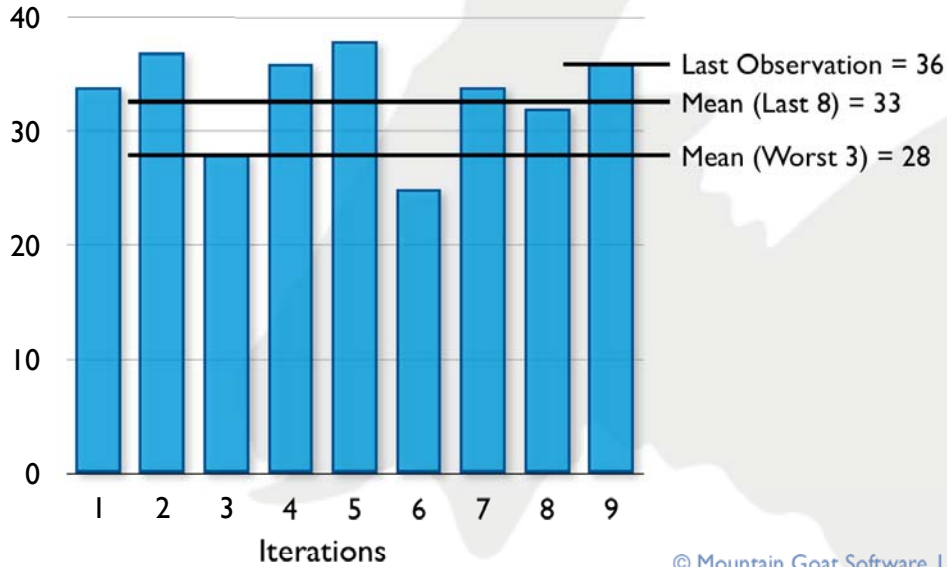- Prioritized product backlog

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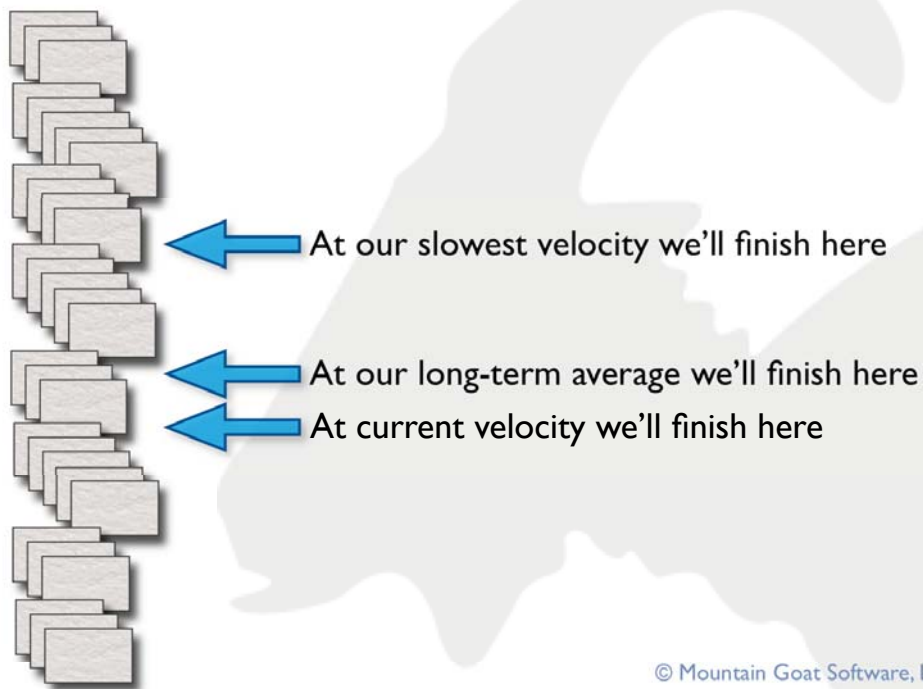
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An example with velocity=14

Iteration 1

Story A — 5
Story B — 8
Story E — 1

Iteration 2

Story C — 3
Story D — 5
Story F — 5
Story G — 1

Story A — 13
Story H
Story I — 5
Story F
Story J — 8

Story C — 3
Story D — 5
Story E — 1

Story H — 13
Story I — 5
Story J — 8

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Updating the release plan

- Use multiple views of observed velocity

Last Observation = 36
Mean (Last 8) = 33
Mean (Worst 3) = 28

Iterations

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Extrapolate from velocity

At our slowest velocity we'll finish here

At our long-term average we'll finish here

At current velocity we'll finish here

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Agenda

- ☑ Estimating
- ☑ Release planning
- ☐ Burndown charts

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How's my landscaping coming?

This is called a burndown chart.

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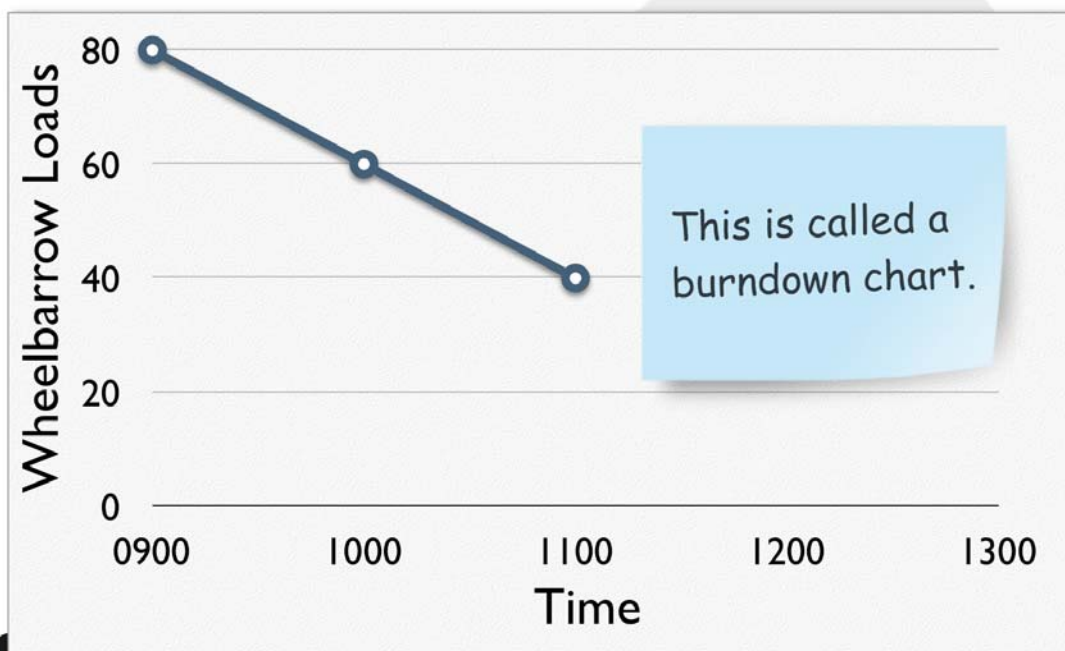
Remember the different levels?
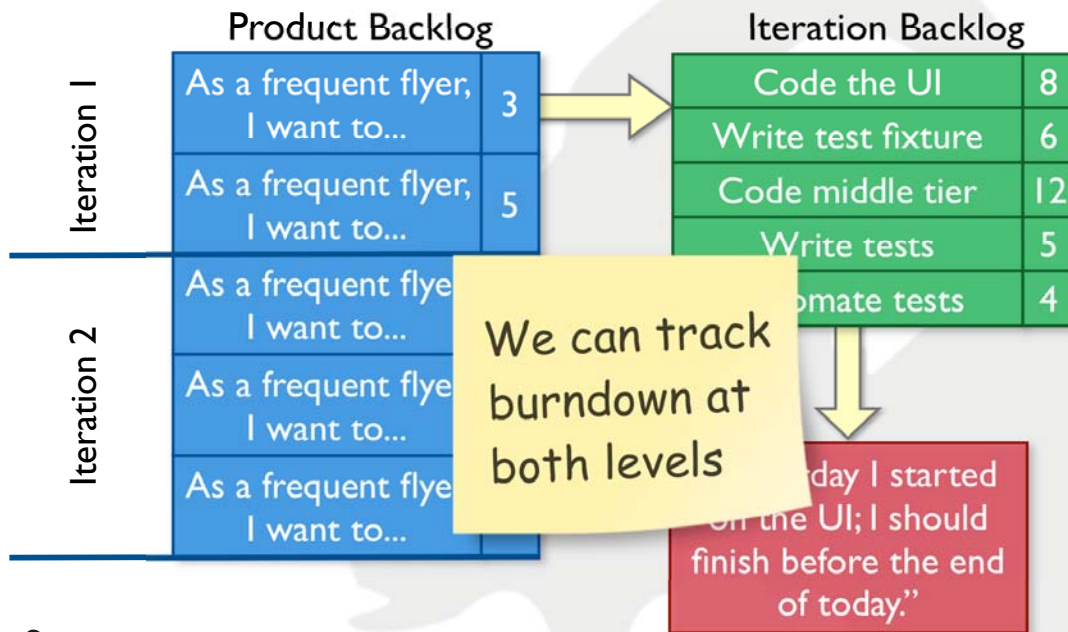
An iteration burndown chart
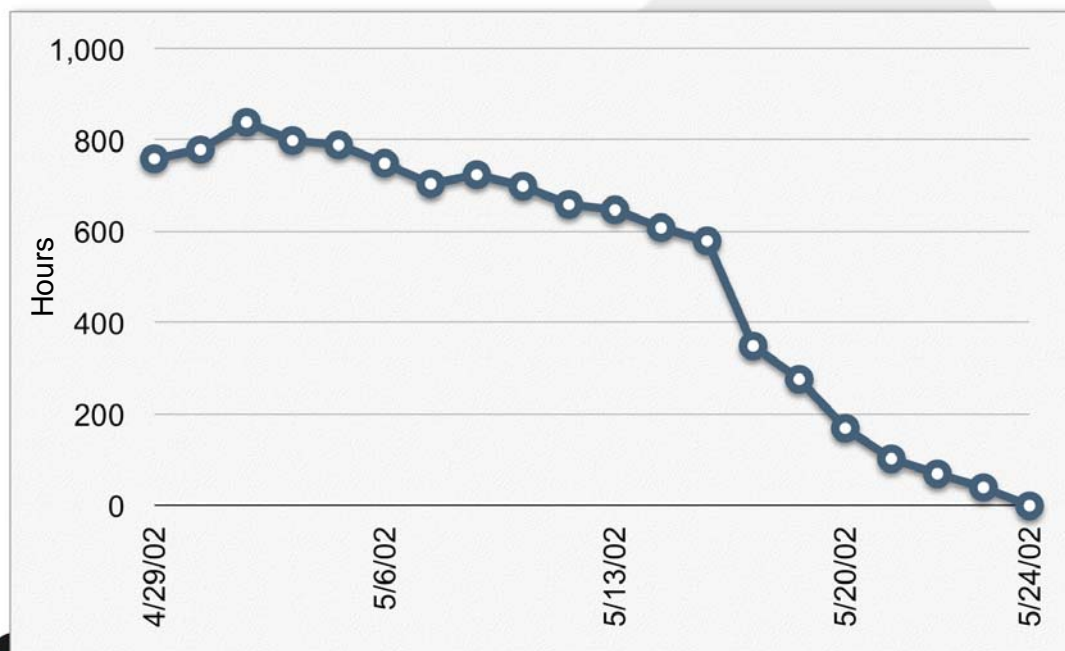
A release burndown chart

Four Lessons
Burndown charts:
- Show net progress
- Raise questions; they don't answer them
- Facilitate early discussions
- Make it impossible to lie

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Mike Cohn contact info

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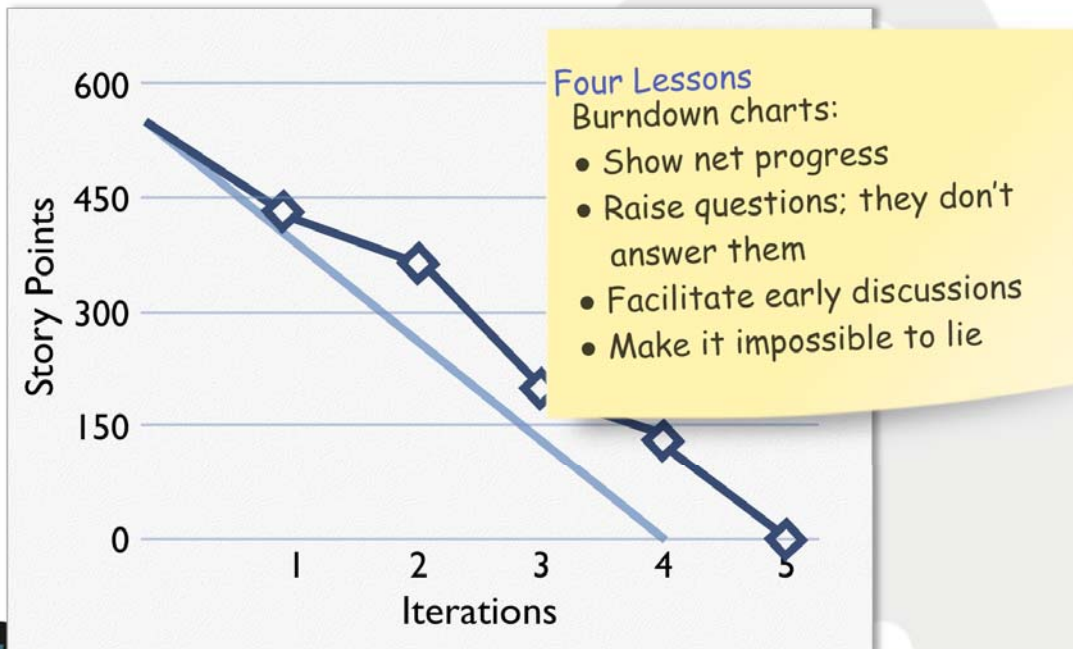
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