

Points vs. Hours

Better, Faster, Cooler, Cheaper – the perennial debate

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Presenter: Jeff Sutherland

scruminc.: Who We Are

Scrum Inc. is the Agile leadership company of Dr. Jeff Sutherland, co-creator of Scrum. We are based in Cambridge, MA.

We maintain the Scrum methodology by:

- Capturing and codifying evolving best practices,
- Conducting original research on organizational behavior
- Adapting the methodology to an ever-expanding set of industries, processes and business challenges



We also help companies achieve the full benefits of Scrum through our full suite of support services:

- Training (Scrum Master, Product Owner, Agile Leadership, webinars, etc.)
- Consulting (linking Scrum and business strategy, customizing Scrum)
- Coaching (hands-on support to Scrum teams)
- Publishing and new content development

We run our services company using Scrum as the primary management framework, making us a living laboratory on the cutting edge of “Enterprise Scrum”

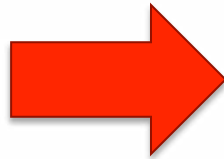
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Agenda

- Context: the purpose of estimation and velocity in Scrum
- What are points?
- Why do teams use hours?
- Why points are better than hours
 - Faster
 - Better
 - Cooler

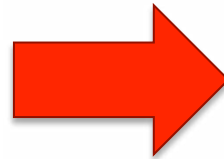
Context: The Reason we Estimate in Scrum

Why do we estimate user stories?



In order to determine our team's Velocity

Why do we need Velocity?



Need a consistent measure of team output each sprint; 2 reasons:

1

Release Planning

Knowing how much we can produce each Sprint allows us to accurately forecast when we will complete future features

2

Continuous Improvement

Measuring if output increases, decreases or stays the same confirms whether we are removing impediments successfully

Reasons that are NOT why we Estimate

- Keeping tabs on team members
 - Scrum teams are empowered and collectively focused on team goals
 - So we don't need to keep tabs on individuals
- Measuring inputs to the Scrum system
 - We measure those explicitly, and in different ways
- Measuring the cost of individual features
 - We can determine the cost using the velocity and known team cost
 - But that is different than velocity

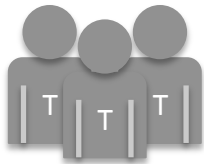
What are Points?



Points are...

1. A measure of team OUTPUT
 - Correlated to but not necessarily the same as effort
2. A relative measure (like T-shirt sizes)
 - Measured relative to a known “reference” story
 - Consistent over time for the same team
 - Not necessarily comparable across teams
3. Deliberately abstracted from common units of measurement (hours, meters, kilograms, etc.)
 - Physical measures come with emotional baggage
4. Quick to use, once you have established a reference story

Estimating the Product Backlog



Development Team

- Estimate backlog
- Estimates are forecasts, not commitments



Scrum Master

- Facilitates process



Product Owner

- Available to clarify intent of PBIs to help estimate
- But does NOT estimate

Two options for estimating process:

Estimate Stories Individually

- Lay out all stories
- Agree which one is least effort; call this “3-points”
- Estimate other stories relative to the reference story

Estimate Groups of Stories

- First group stories into similarly sized piles of related activity
- Then estimate number of points for each pile
- Fast way to estimate a large number of stories

Estimate User Stories with "Planning Poker"

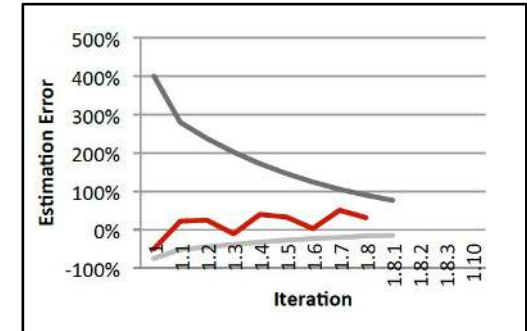


Why do teams still use hours?

- In the modern office, our days are ruled by time and we are surrounded by hours
 - “Why wouldn’t we estimate in hours, we do everything else that way”
- Teams think they know what an hour is, and that it is consistent and concrete
 - “If teams determine their own points, ‘point inflation’ will be rampant”
- Companies often bill their work in hours, and think it is simpler to use the same convention for estimation
- Organizational inertia
 - “We have always estimated in hours, why change?”

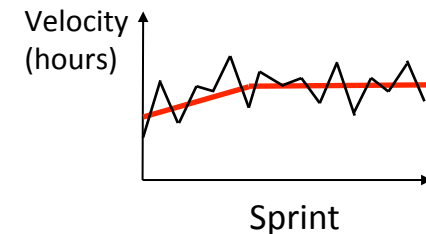
Why Points are Better Than Hours

1. Repeated studies have shown estimates in points are more accurate than estimates in hours



2. Estimating in hours undermines the fundamental purpose of velocity...
Measuring Output!

3. Time is finite. There are a fixed number of hours in a day, so a velocity based on hours can't increase!



Points are More Accurate

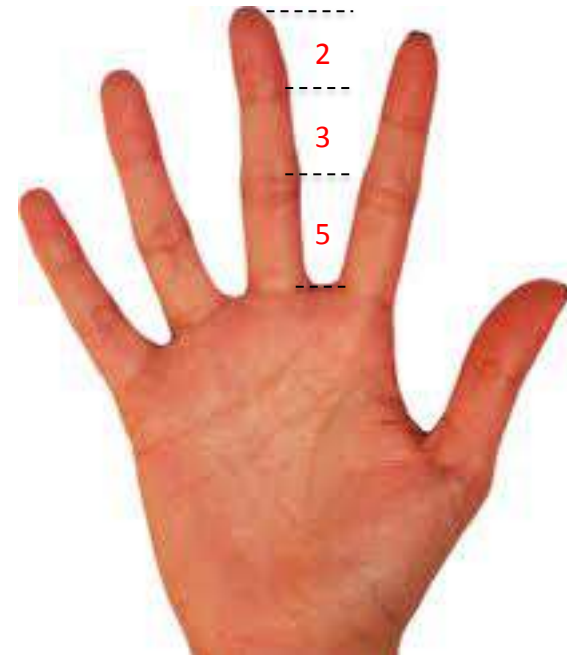
Part I: How to win the Cold War

- Rand Corporation received a grant from U.S. DOD in the 1940's to determine best way to estimate tough projects
 - Discovered estimation in hours has high error rate and wide variance
 - Found people could put things in relative size piles best
- Fibonacci growth pattern easiest for humans
 - Next number is sum of the previous two
 - Seen everywhere in nature
- RAND called the method they developed the "Delphi technique"



Fibonacci Sequence: All around us

- Fibonacci Sequence is a pattern where the next number in the sequence is the sum of the previous two
 - E.g. 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55...
- Ubiquitous in natural systems, so humans have millennia of experience with it

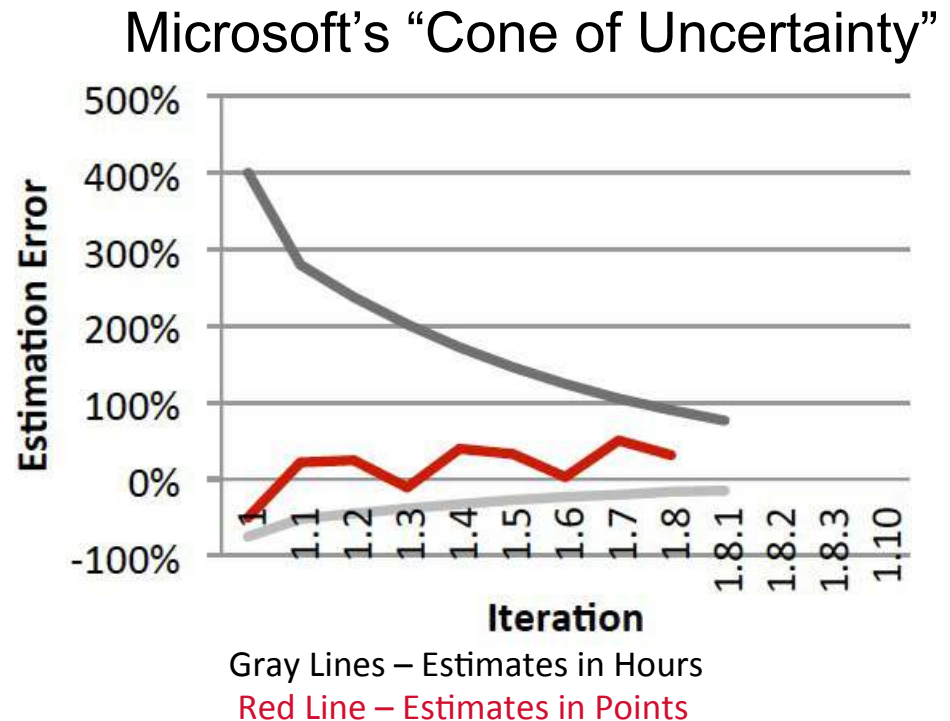


Points are More Accurate

Part II: Repeatable Results

In 2011, researchers at Microsoft completed head-to-head trial of estimating using Points vs. Hours, using teams completing the same work

Found estimates in hours had errors as large as $\pm 400\%$ of the estimate, while estimates in points were always within $\pm 50\%$ of actual



Laurie Williams, Gabe Brown, Adam Meltzer, Nachiappan Nagappan (2012) Scrum + Engineering Practices: Experiences of Three Microsoft Teams. IEEE Best Industry Paper Award, 2011 International Symposium on Empirical Software Engineering and Measurement.

Hours Undermine Velocity

Part I: Measuring Input Rather than Output

Velocity is a measure of output per Sprint, whereas hours are a measure of input

Two examples where measuring in hours breaks down:

Example 1

This sprint I completed an activity and it took me two hours...

...Next sprint, I do the same work again and it only takes me one hour, because I learned from the last experience and am more efficient.

Am I producing only half as much output as before?

Example 2

I completed an activity and it took me two hours...

...If my colleague with more experience in this area had done it, she would have taken only one hour to finish the same work.

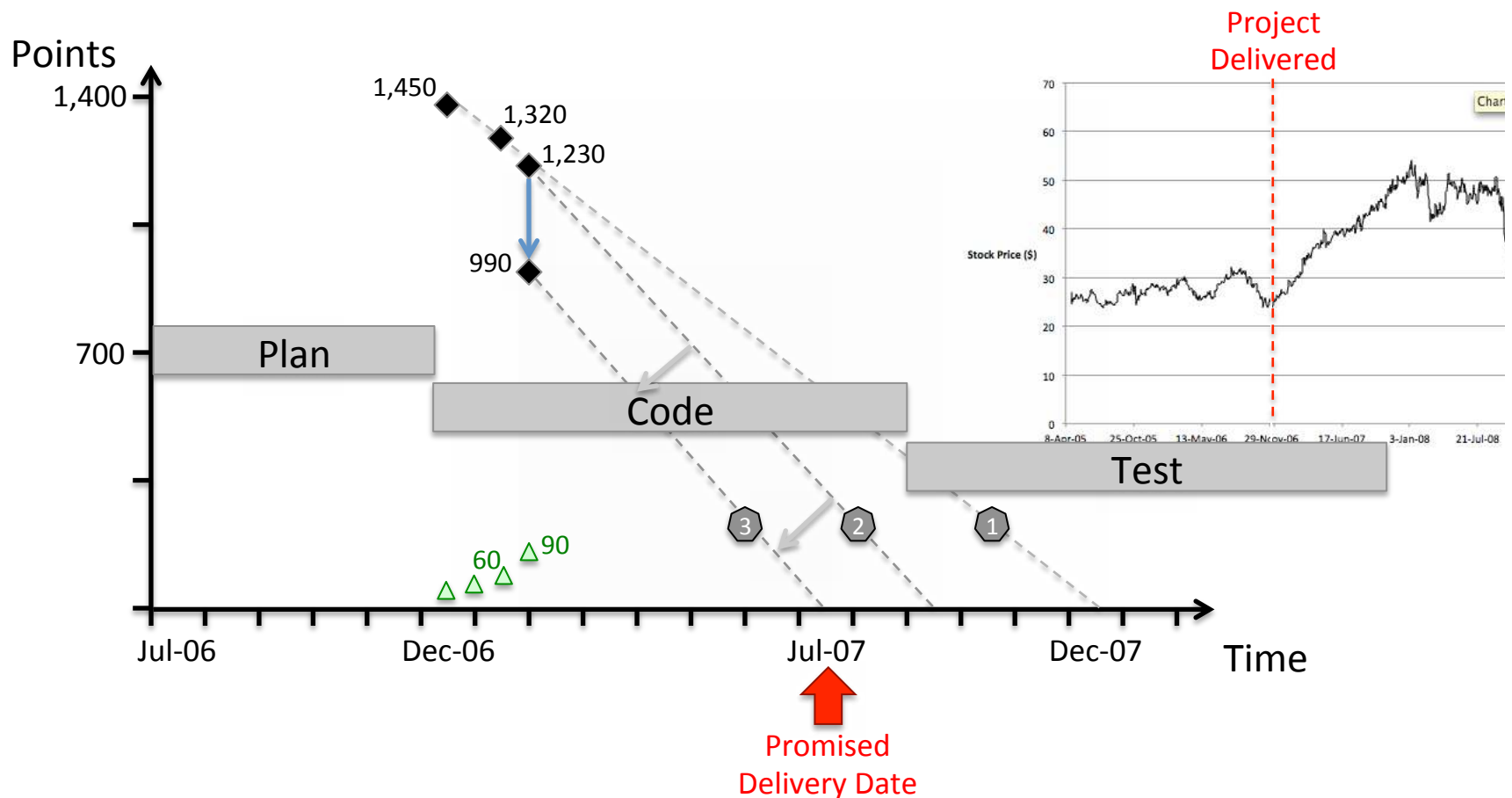
Is she only producing half as much output as I am?

Hours Undermine Velocity

Part II: Managing Projecting Release Dates – Medco Example

On July 7 2006, Medco CEO promised Wall Street analysts a completely new pharmacy fulfillment system to be implemented by July 7, 2007

- Unfortunately, he didn't check with the development team first!?!?



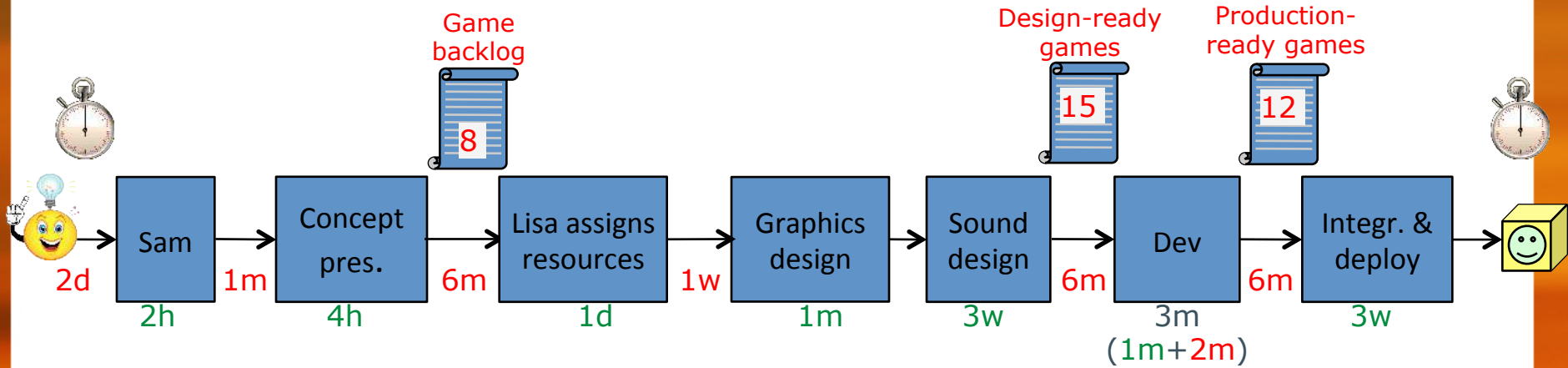
Hours Undermine Velocity

Part III: An Engineer's Approach...Look at the Units

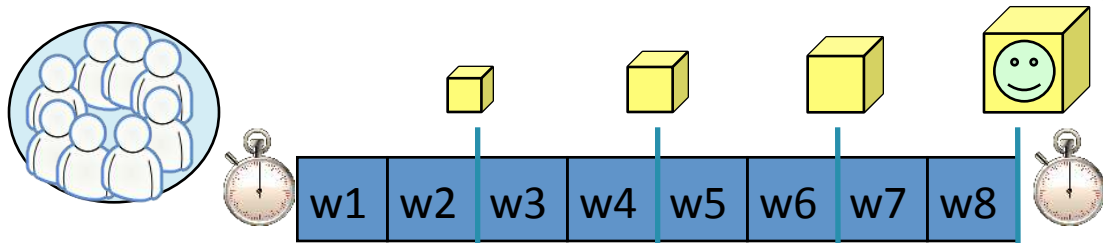
- Velocity measures the rate of change of something over time
 - In a car, the units of velocity are "distance/time"
 - Velocity could also be viewed as "weight/time", or "volume/time"
- Points per Sprint = "output/time" (makes sense)
- Hours per Sprint = "time/time" (which is unit-less or at best, a percentage – doesn't make sense)

Time is Finite, Improvement is Not

Part I: Value Stream Mapping Example



$$\frac{3 \text{ m value added time}}{25 \text{ m cycle time}} = 12\% \text{ Process cycle efficiency}$$



Preliminary result

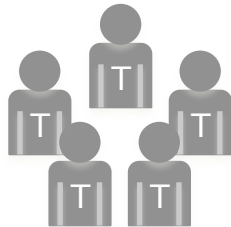
$$3\text{-}4 \text{ m cycle time} = 6\text{-}8\text{x faster}$$

How could you represent this level of improvement measuring Velocity in hours?

Time is Finite, Improvement is Not

Part II: The 200-Hour Work Week

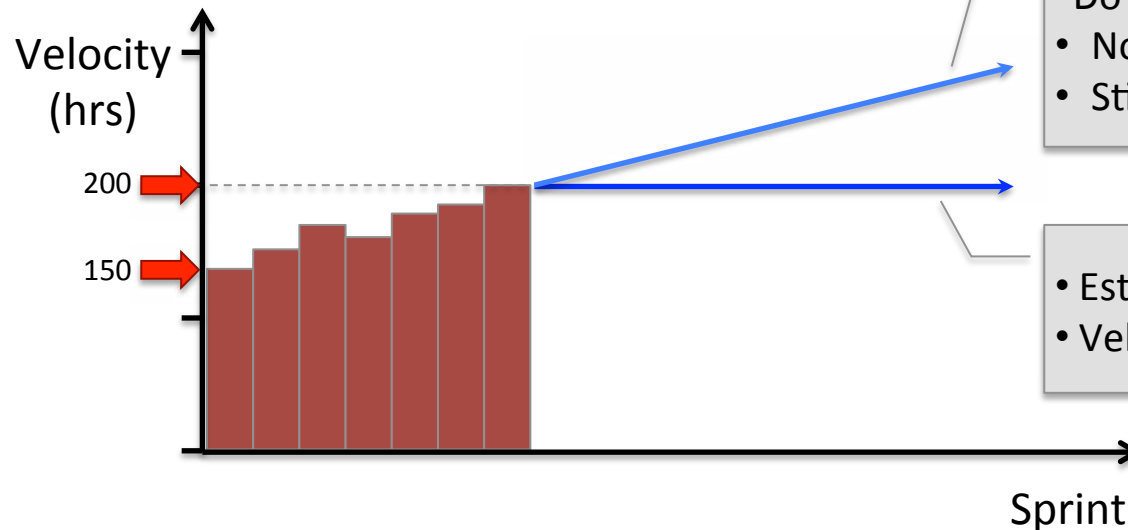
An illustrative example:



A five-person team

1. Measure velocity in hours
2. One week Sprints

Initial Velocity = 200 hrs/sprint
(maybe 150, if team is "honest")



"Do more by working harder"

- Not very Scrum
- Still only 200 hrs/week

- Estimate deflation occurring
- Velocity is meaningless

Conclusions

- Whether to use points or hours to estimate is one of the most passionate debates in Scrum community...but it shouldn't be!
- Most of the reasons that people continue to estimate in hours are grounded in false-perceptions about the precision of hours
- There are three key reasons to use Points rather than Hours:
 - Points result in faster and more accurate estimates
 - Unlike Hours, Points are a measure of output, and enables the PO to work the plan and deliver to a deadline
 - Measuring in Points leaves your team a way to improve Velocity without working more hours
- So USE POINTS!!

Questions?



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