Agile Estimating and Planning
Agile Development Practices East 2010
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Orlando, Florida
by Kenny Rubin

Includes slides from: Mountain Goat Software

www.innolution.com

Background of Kenny Rubin

Author

Trainer/Coach

Trained more than 15,000 people in Agile/Scrum, SW dev and PM

Provide Agile/Scrum coaching to developers and executives

Experience

Former Managing Director

My first Scrum project was in 2000 for bioinformatics

GENOMICA

Executive

ParcPlace

Agenda

- Multi-level Planning
- Release Planning
- Iteration Planning
- Estimating Product Backlog Items

The Myth of Agile Planning

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Agile Planning Principles

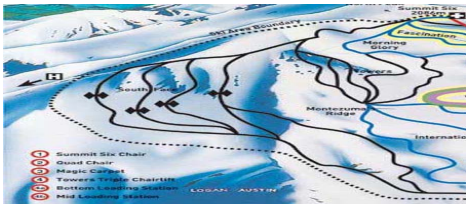
Upfront planning should be helpful without being excessive

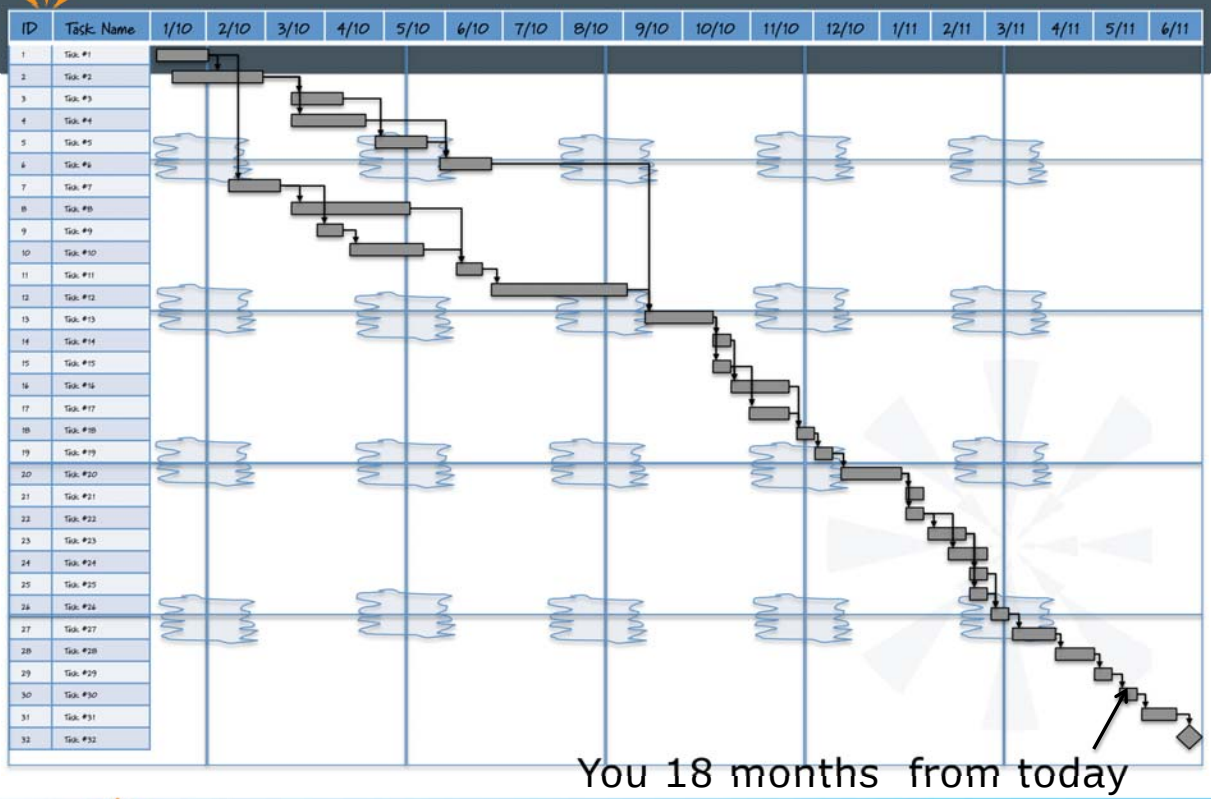
Focus more on the planning than the plan

Balance planning effort against the probability of being wrong

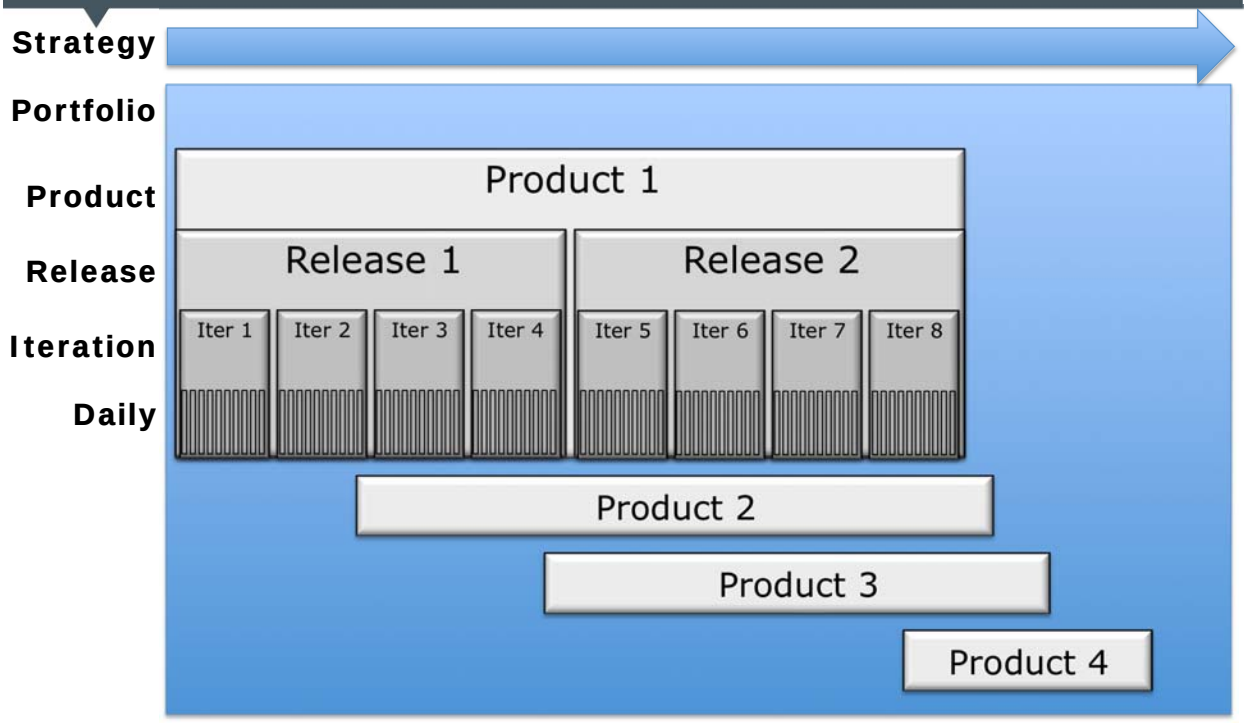
“Extreme Skiing” Survival Project

- Project goal is to get from the top of the mountain to the bottom using the equipment, time and resources that you have been allocated
- Create the complete plan before you start!

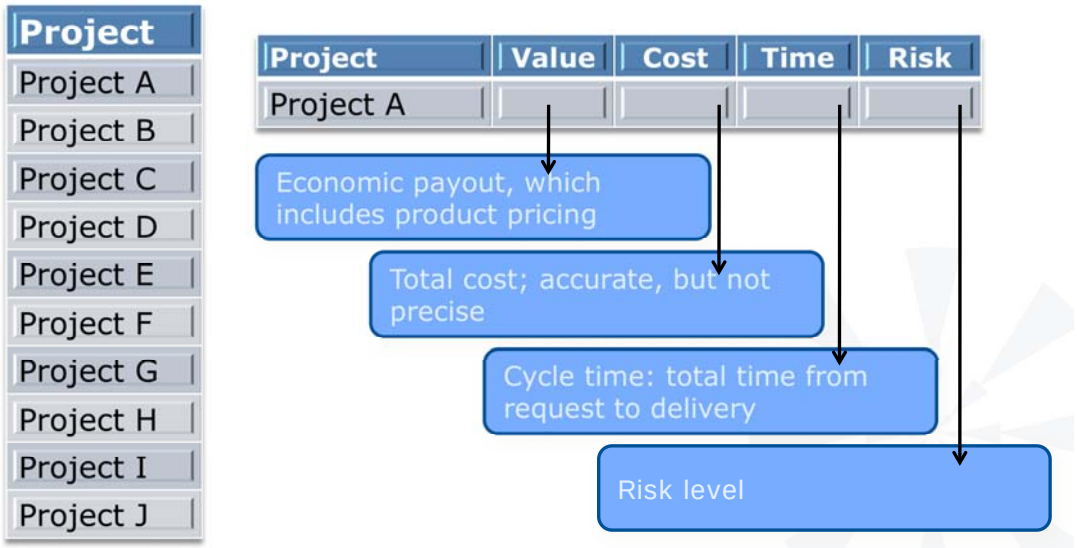




Different Levels of Planning

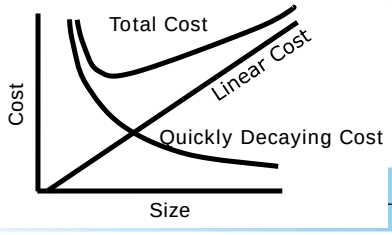


Portfolio Backlog



Portfolio Planning Strategies

- Take an economic view – default prioritization goal is to maximize life-cycle profits
- Watch the baton not the runners – focus on idle work sitting in queues, not inactive people
- Reduce project sizes – consider smaller, more frequent releases
- Estimate for accuracy, not precision (use t-shirt sizes) – important trade-offs have u-curve optimizations
- Determine Cost of Delay for each project and how it affects other economic variables
- Deal quickly with emergent opportunities – they arrive continuous and randomly and are perishable
- Establish work-in-process (WIP) constraints to match available capacity –max # concurrent projects
- Manage project arrival rate – try to avoid a lot projects arriving at portfolio planning at the same time



Planning Level Comparison

Level	Horizon	Who	Focus	Deliverables
Product	Up to many months	Product Owner & Stakeholders	Vision & product evolution over time	Product vision, roadmap, & high-level features
Release	Three (or less) to nine months	Entire agile team & stakeholders	Continuously balance customer value and overall quality against constraints of scope, schedule, and budget	Release plan
Iteration	Every iteration (1 to 4 weeks)	Entire agile team	What features to deliver in next Iteration	Iteration goal & iteration backlog
Daily	Every day	Agile Coach & Team	How to complete committed features	Daily status & updated iteration backlog

Product Planning (Envisionment)

Product vision

Product roadmap

	Q1-2007	Q2-2007	Q3-2007
Market Map	Launch & retire		
Feature/ Benefit Map	Class listing CST support	Membership Bulk loading	Searching filtering
Architecture Map	Ruby on Rails		RegOnline Integration
Market Events		Scrum Gathering	Agile 2007
Release Schedule	0.5	1.0	

Product backlog

Example Product Vision

For people worldwide who are interested in Scrum, the new Scrum Alliance Website will be their trusted source of Scrum knowledge. It will be feature and content rich and will be their first stop on the Internet for learning more about Scrum or to collaborate on Scrum topics of interest.

Example Product Roadmap

	Q1-2007	Q2-2007	Q3-2007
Market Map	Launch & retire		
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Architecture Map	Ruby on Rails		RegOnline Integration
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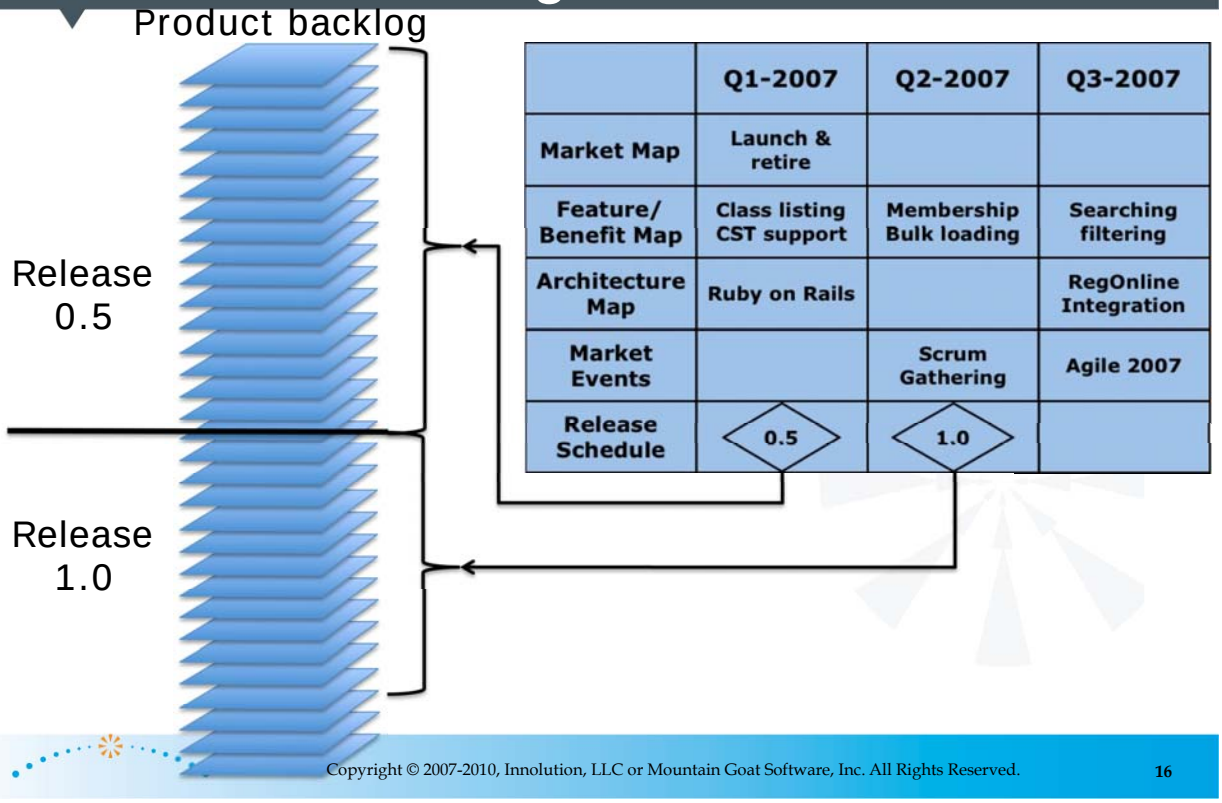
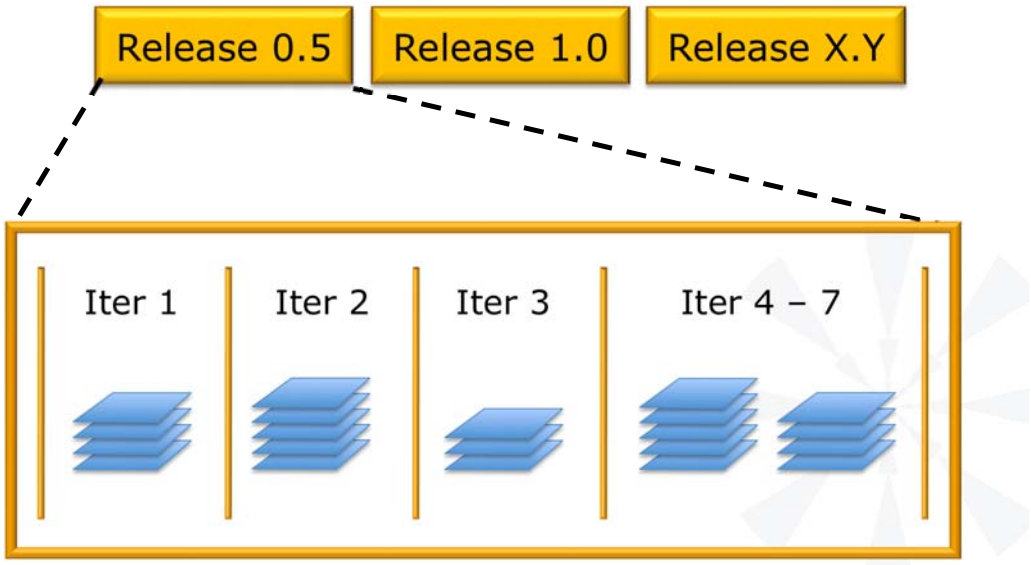
Product Roadmap Releases Tied to Product Backlog

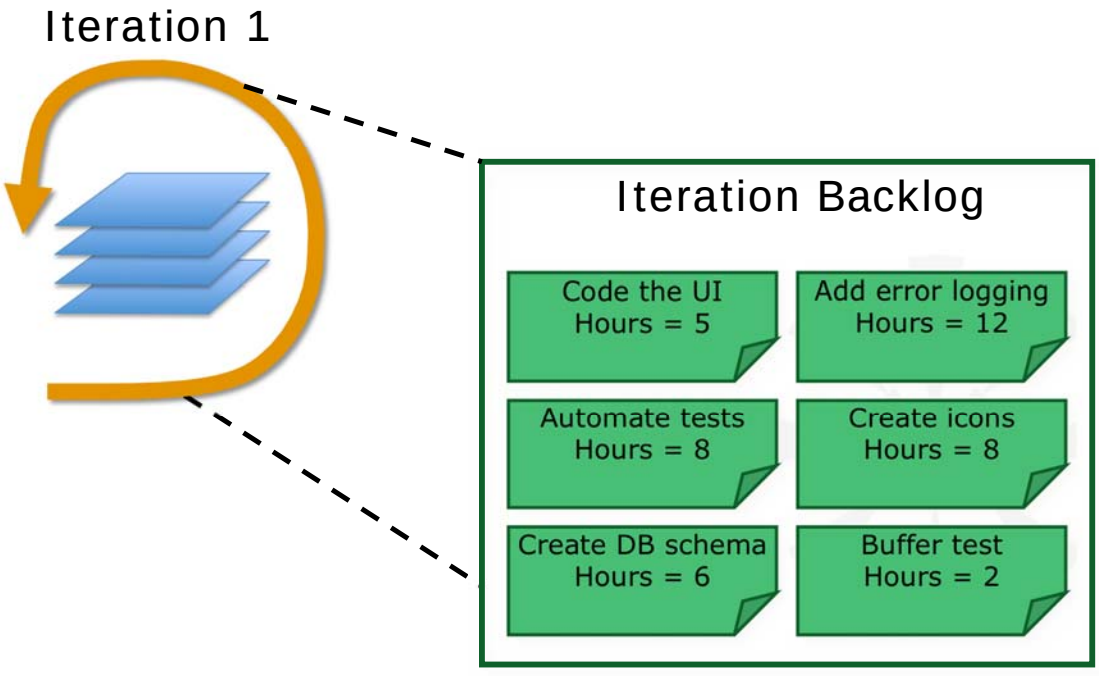


A Release Has One or More Iterations

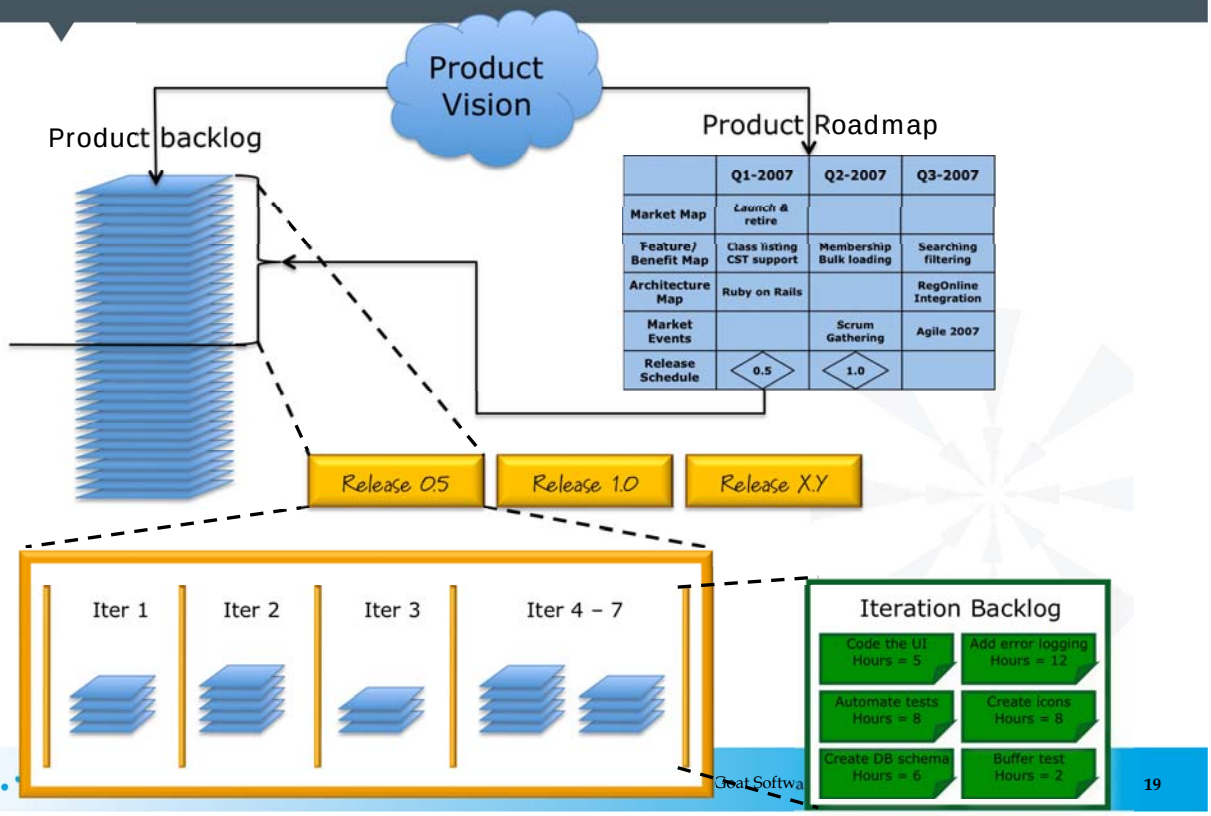


Release Plan

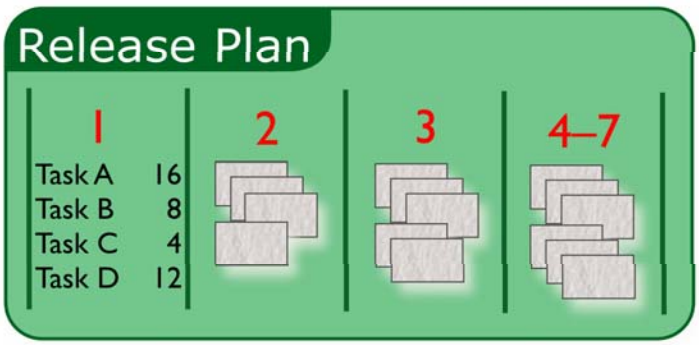
Iteration Planning



Putting It All Together

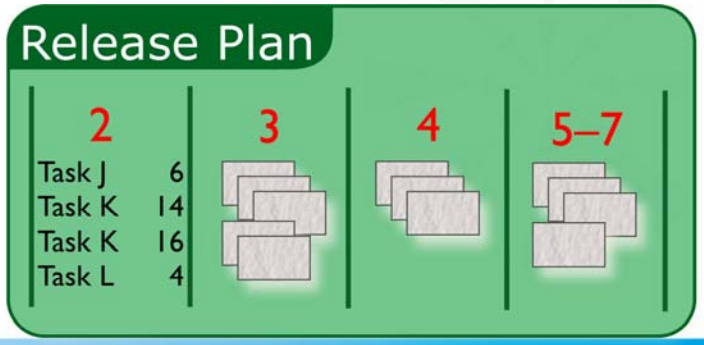


Rolling Lookahead Planning

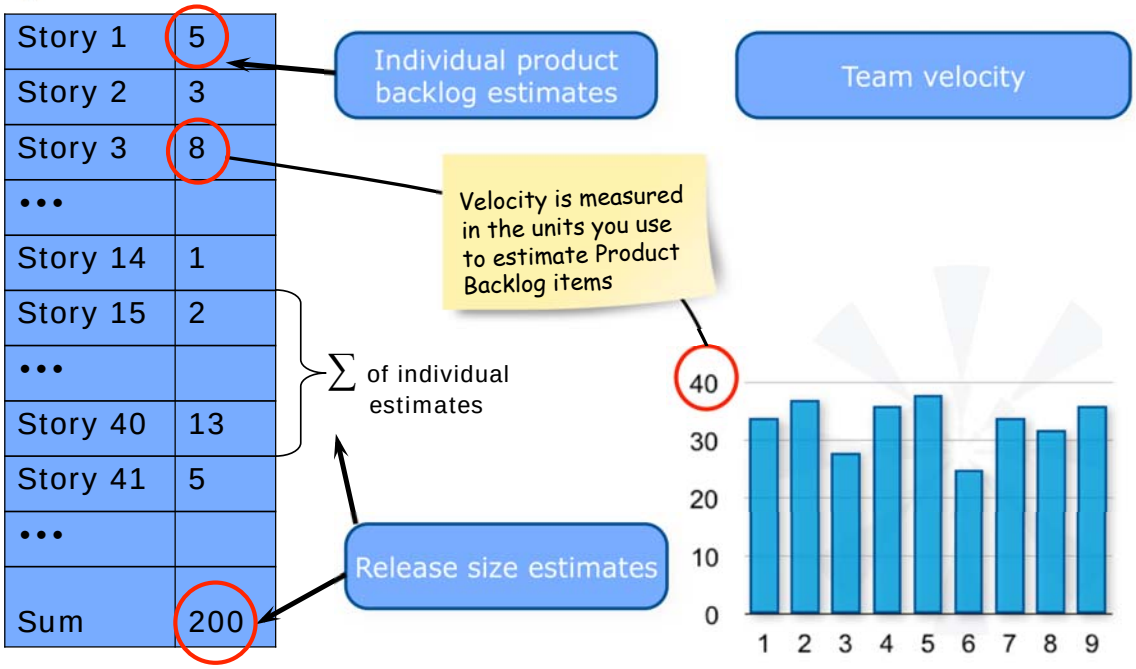


Immediately after planning iteration 1

Immediately after planning iteration 2



Core Agile Planning Elements



Exercise – Why Does Agile Planning Work

Purpose: Discuss why Agile planning works.

Background:
- We just covered the core principles of Agile planning.

Instructions:
- Organize into teams to discuss.

Question:
- Why do you think Agile planning works?
- Try to frame your answer in terms of Agile principles such as:
  - Eliminate waste
  - Amplified learning
  - Leaving options open
  - Delivering fast
  - Empowering the team
  - Seeing the whole

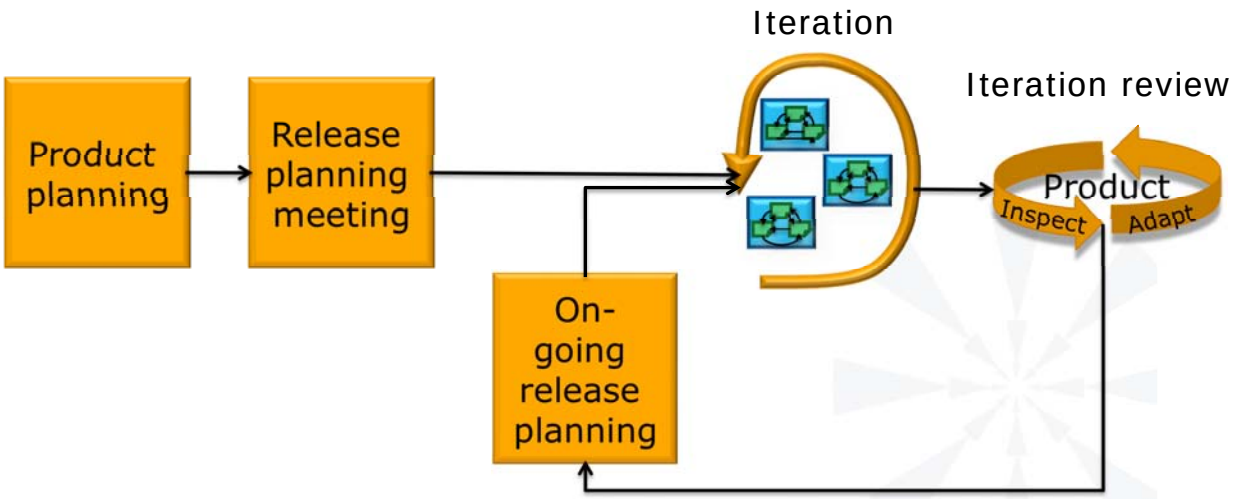
Release Planning Questions

How much will be done by June 30?

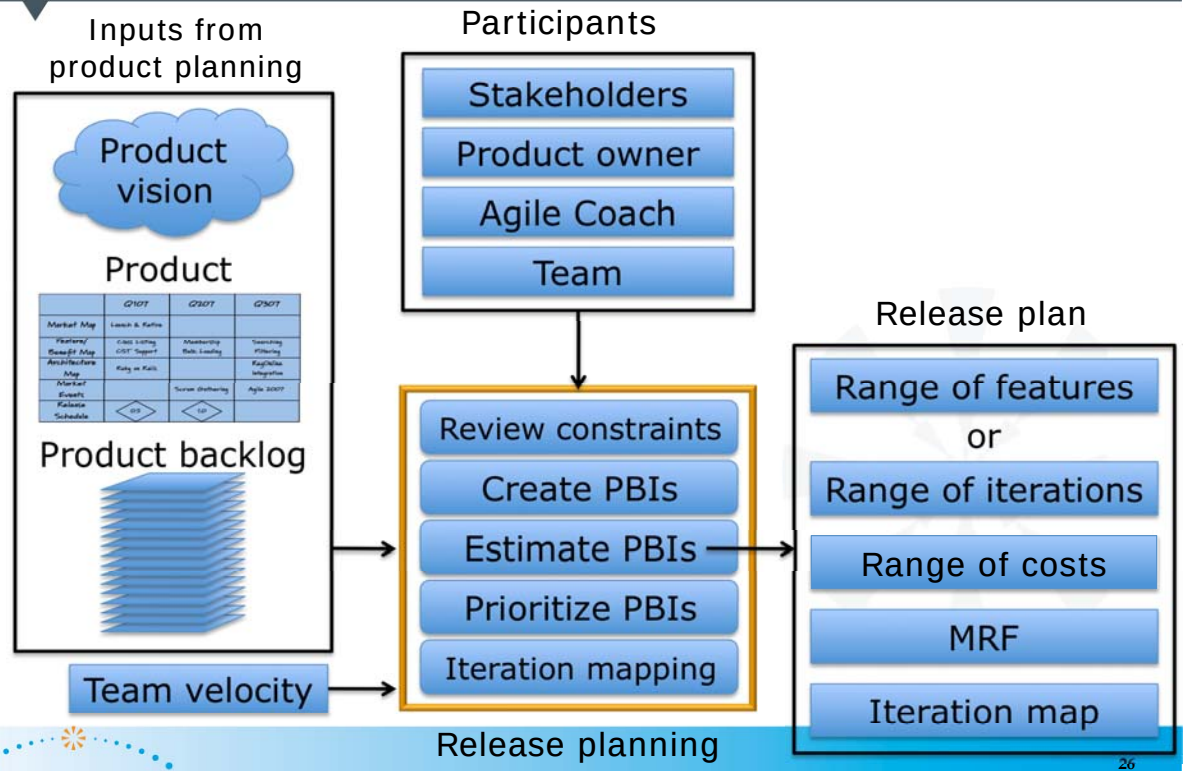
When can we ship with this set of features?

How much will it cost to get this set of features?

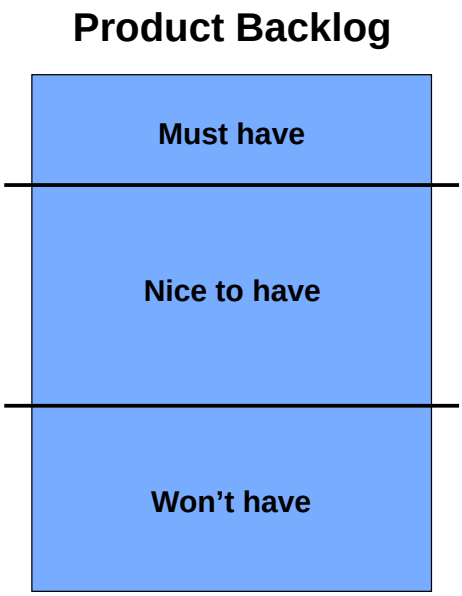
When Release Planning Takes Place



Release Planning Process



What Features to Include



Have to have these features; can't ship without them

Would like to get these features into the release; but will ship without them

Moved to the next release (out of scope)

Initial Velocity

Three ways to determine Initial Velocity

1. Use historical averages
2. Wait until you run at least one iteration
3. Forecast it

Express velocity as a range that matches your uncertainty in it

Iteration Map

Item	Size
Feature A	5
Feature B	3
Feature C	2
Feature D	8
Feature E	2
Feature F	5
Feature G	3
Feature H	5
Feature I	5
Feature J	2
Feature K	1
Feature L	5
Feature M	8
Feature O	5
Feature P	13
Feature Q	5
Feature ...	...
Feature ZZ	X

Team average velocity = 20

Iteration 1

Iteration 2

Iteration 3

Etc.

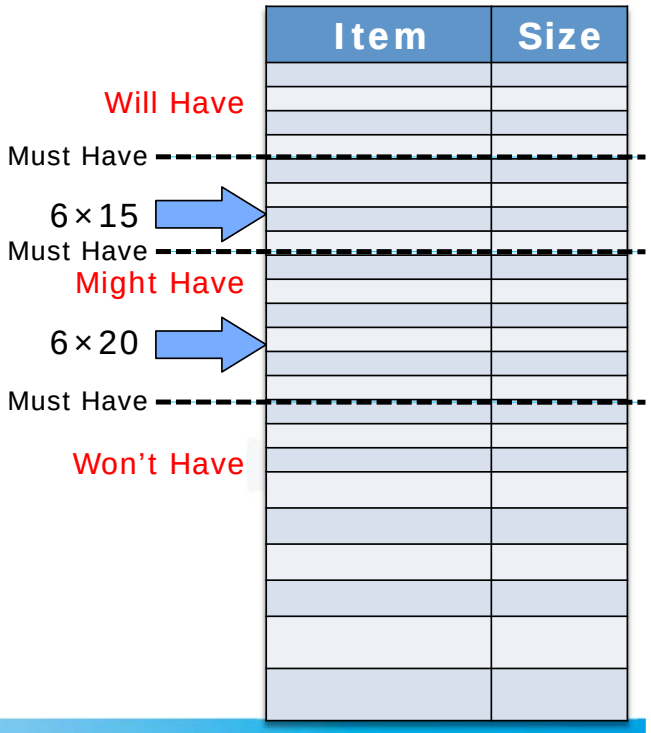
Fixed-date Planning

How much can I get by <date>?

1. Determine how many Iterations you have
2. Measure or estimate velocity as a range
3. Multiply average low velocity × number of Iterations
   - Count off that many points
     - These are “Will Have” items
4. Multiply average long-term velocity × number of Iterations
   - Count off that many more points
     - These are “Might Have items”

Fixed-date Planning: An Example

Desired release date	30 June
Today's Date	1 January
Number of Iterations	6 (monthly)
Average low velocity	15
Average long-term velocity	20



Fixed-scope Planning

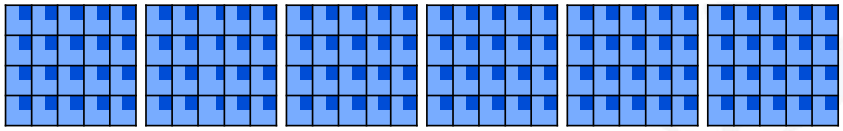
When will all of this be done?

1. Sum all the backlog items the customer *needs*
2. Measure or estimate velocity as a range
3. Divide total story points by average long-term velocity
   - This is likely the shortest number of Iterations it could take
4. Divide total story points by average low velocity
   - This is the "expected" number of Iterations it should take

Fixed-scope Planning: An Example

Total story points desired	120
Average low velocity	15
Average long-term velocity	20

120 ÷ 20 =



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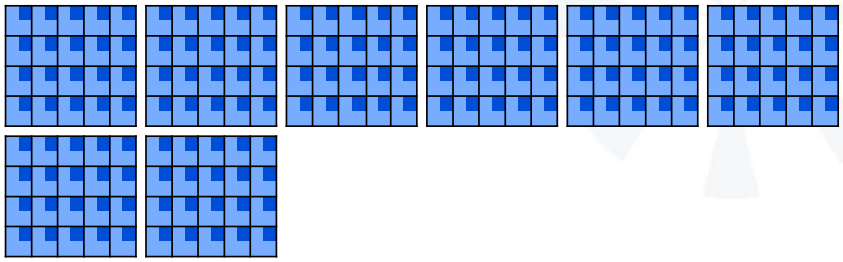
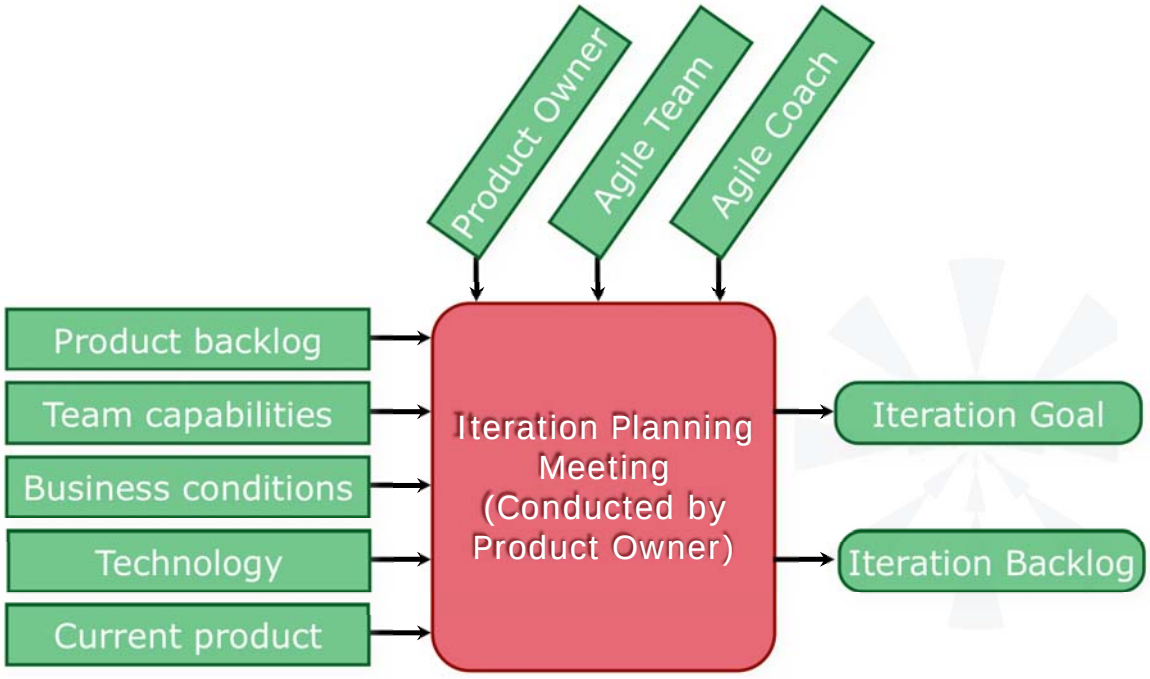


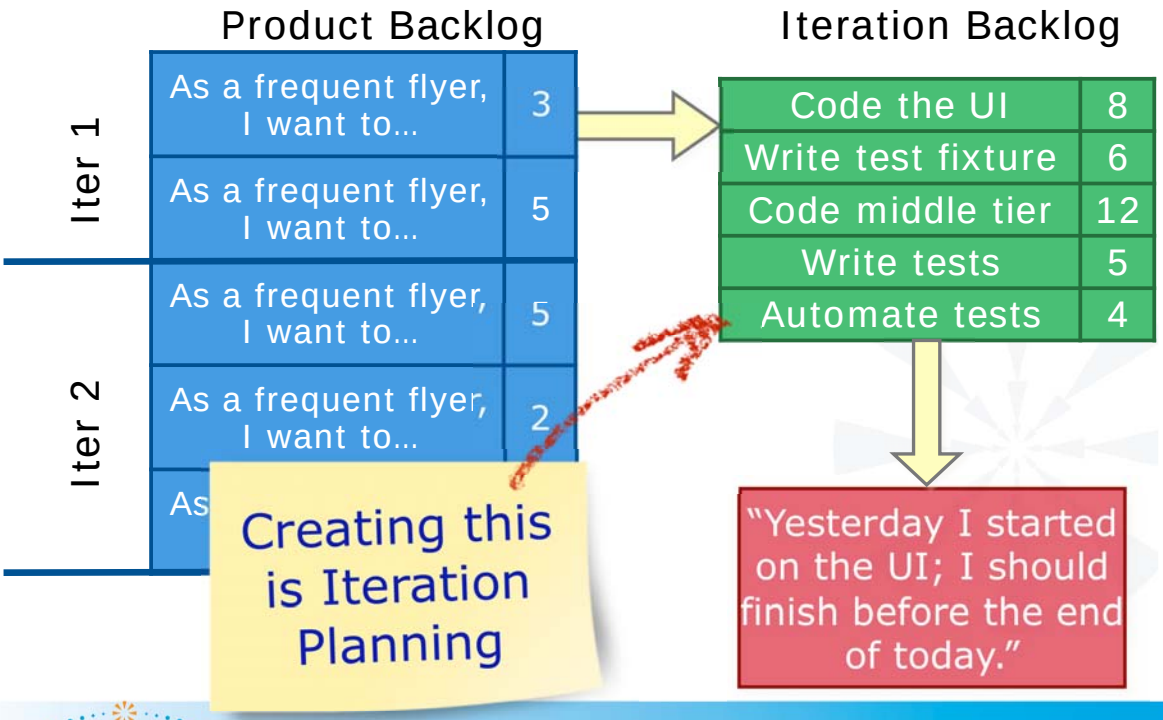
Purpose of Iteration Planning

- The purpose of the iteration planning meeting is to arrive at a commitment to an iteration goal or set of product backlog items.
- The purpose of the meeting is not to come up with a list of tasks and hours.
- The tasks and estimates are a tool for determining what we can commit to.

Iteration Planning Meeting



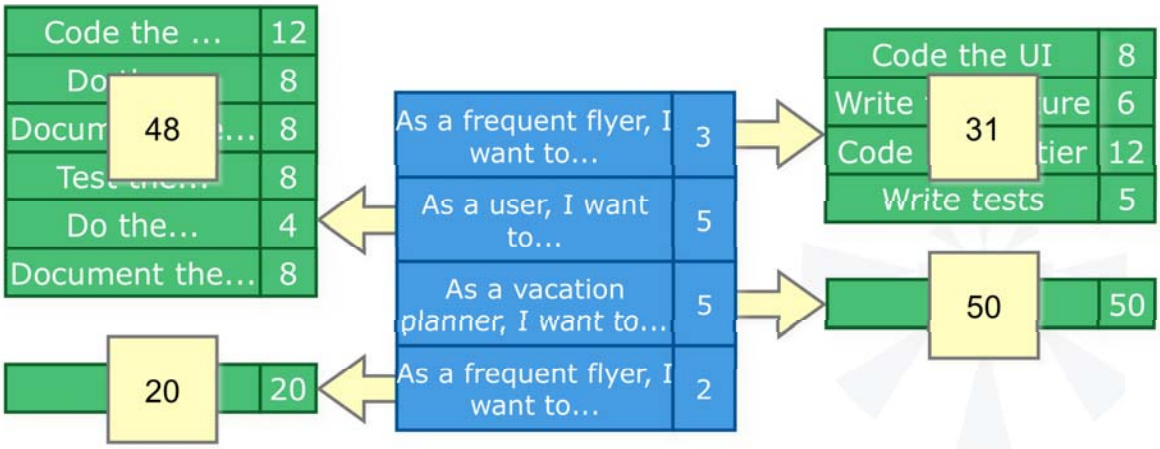
Which Are We Talking About?



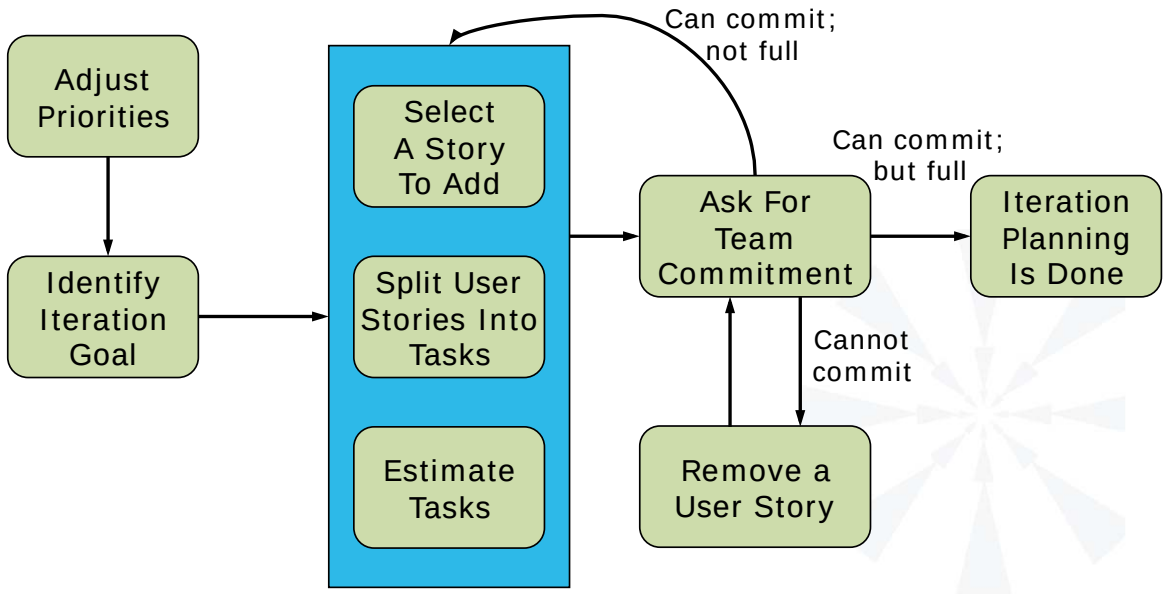
Estimate Availability

Person	Hours per Day	Hours per Iteration
Sergey	4-6	40-60
Yuri	5-7	50-70
Carina	2-3	20-30
Total		110-160

Sergey, Yuri, and Carina have 110-160 available hours. What is their likely velocity?



Commitment-Driven Iteration Planning



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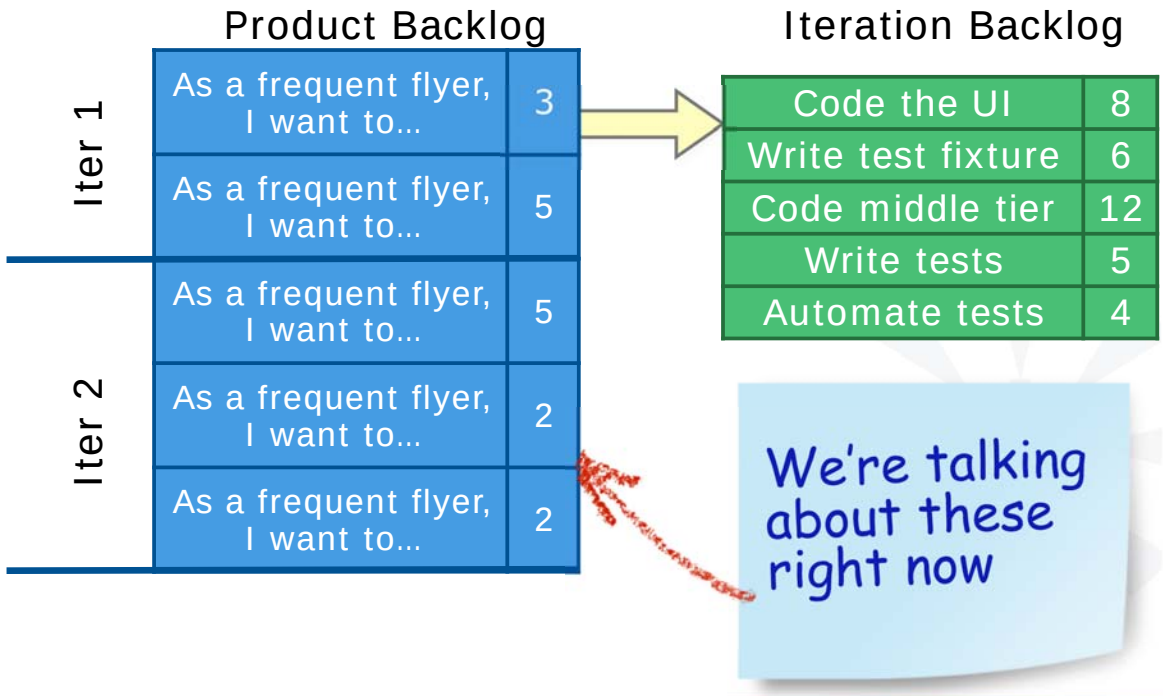


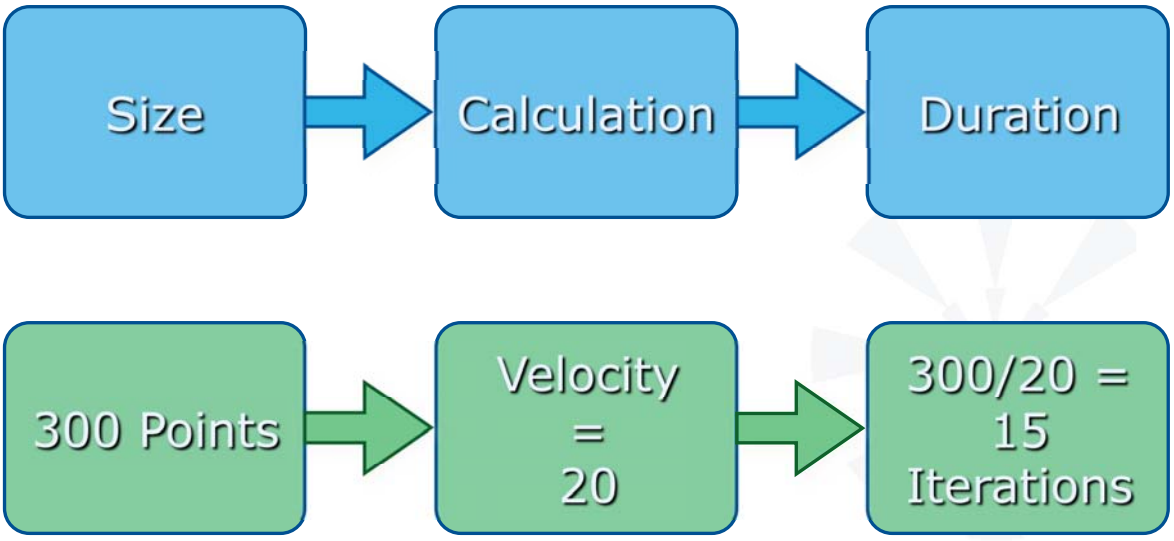
Estimates – What You Need to Know

- Estimates should be created by the team
- You need estimates before you can prioritize
- Estimates are not targets or commitments
- Estimates should be of relative size, rather than absolute size

How Long Will It Take...

- ...to read the latest Harry Potter book?
- ...to drive to Dallas?

Estimate Size; Derive Duration

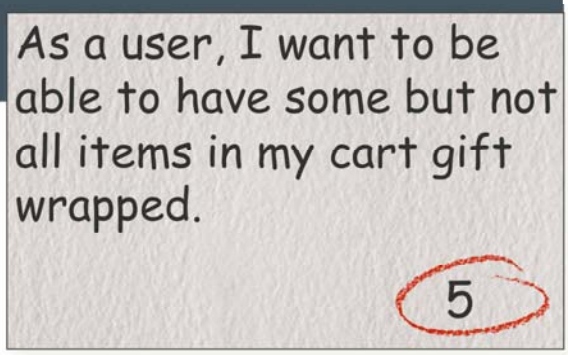


Measures of Size

Traditional and agile measure size differently

Story Points

- The "bigness" of a task
- Influenced by
  - How hard it is
  - How much of it there is
- Relative values are what is important:
  - A login screen is a 2
  - A search feature is an 8
- Points are unit-less



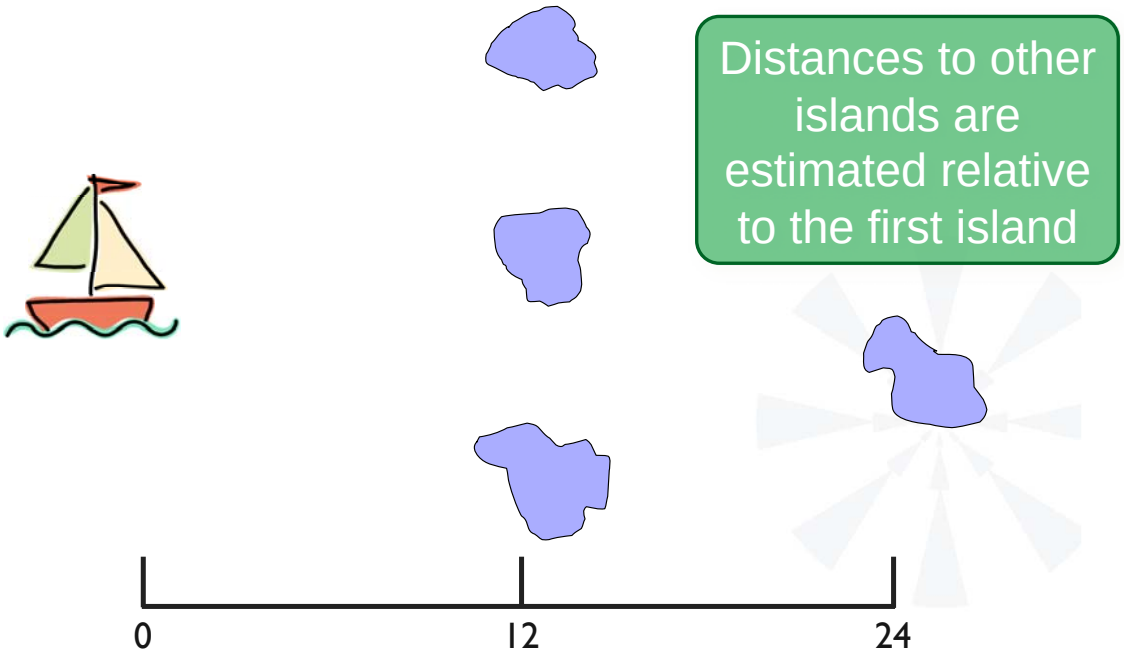
Where do we get the points?

- Mostly we make them up!
- Suppose we're sailing…
  - …we see this island through our telescope
- How far away is it?

How far away is the island?

- There's nothing else in sight so there's nothing to compare it to
- Hard to guess then how many miles away it might be
- So, let's just say the distance is "12"

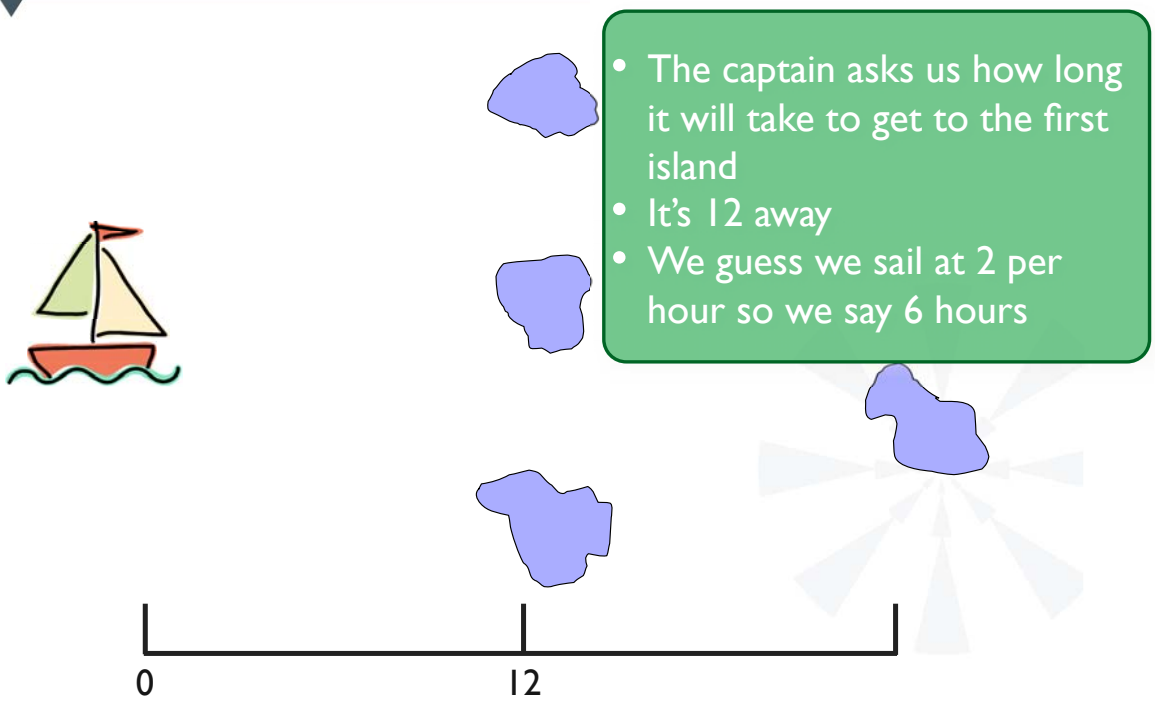
Let's add more islands



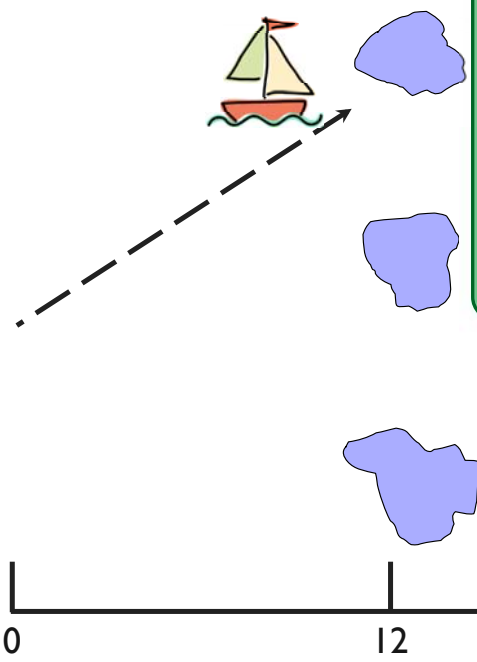
What do we know and not know?

- We know...
  - That three islands are about the same distance (12) away
  - That another island is about twice as far away
- We don't know...
  - how long it will take us to sail a distance of 12
- But we know...
  - That we can sail to all the islands 12 away in about the same time
  - That it will take twice as long to sail to the island that is 24 away

Estimating the first voyage

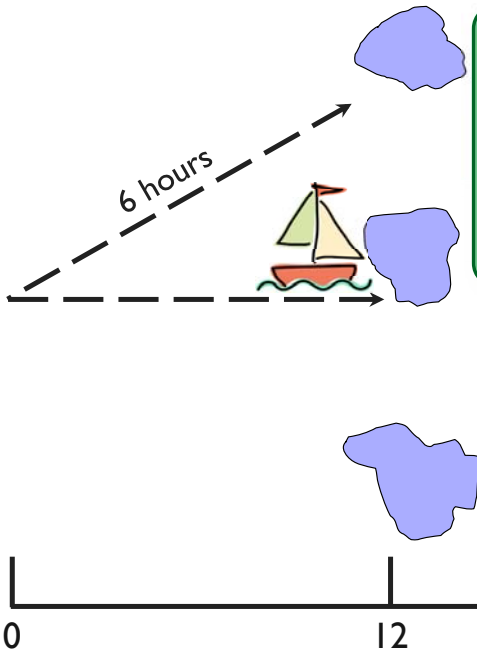


We sail to the first island



- Sailing to the first island takes 6 hours.
- We were right!
- We now know that we sail 2 units per hour, or 12 units in 6 hours.

How long will it take?



- We return to port.
- How long will it take to sail to the second island?
- The third?
- The far island?

No reliance on actual distances

We can now reliably estimate how long it will take to get to each of the four islands

Yet we still don't know how far away each island is

What if we'd been wrong?

- What if we look through the telescope and still said 12.....and estimate we can sail 6 per hour
- We tell the captain we'll be there in 2 hours

- The trip still takes 6 hours (not the 2 we told the captain)
- We now have a data point saying our rate of progress is 2 units per hour
- And we now know how long it will take to make all the other trips

Relating this back to software

- The distances to the islands are our story points

As a vacation planner, I want to see photos of hotel bedrooms. 5	Sail to island A. 12

- Both the boat and a Team have a semi-regular pace per period
  - The boat goes 12 units in 6 hours
  - A software team completes x story points per Iteration

Zoo points

Assign "zoo points" to the following animals

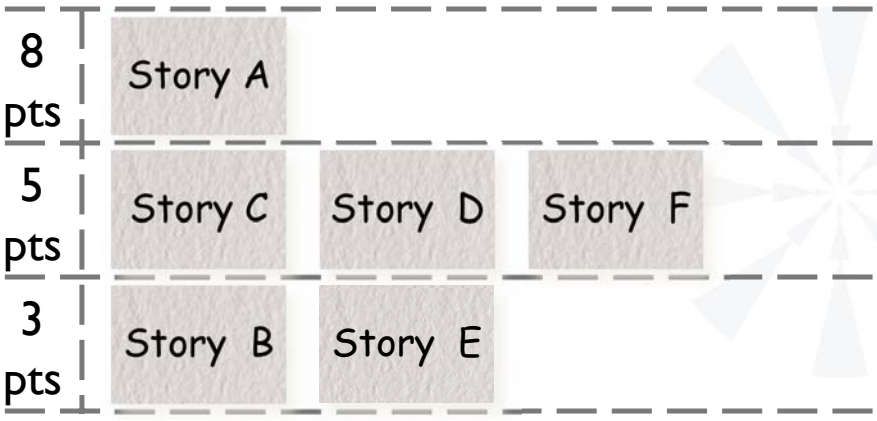
Lion
Kangaroo
Rhinoceros
Bear
Giraffe
Gorilla
Hippopotamus
Tiger

Estimate by Analogy

- Comparing a user story to others
  - "This story is like that story, so its estimate is what that story's estimate was."
- Don't use a single gold standard
- Triangulate instead
  - Compare the story being estimated to multiple other stories

Triangulation

- Confirm estimates by comparing the story to multiple other stories.
- Group like-sized stories on table or whiteboard



Use the Right Units

- Can you distinguish a 1-point story from a 2?
- Can you distinguish a 17 from an 18?
- Use units that make sense, such as
  - 1, 2, 3, 5, 8, 13
  - 1, 2, 4, 8
- Stay mostly in a 1-10 range

Include ½ if you want

Planning Poker – Overview

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

Contact Info for Kenny Rubin

Email:	krubin@innolution.com
Website:	www.innolution.com
Phone:	(303) 827-3333
LinkedIn:	www.linkedin.com/in/kennethrubin
Twitter:	www.twitter.com/krubinagile
Scrum: A Manager's Guide Book Chapters	www.tinyurl.com/yj4m72c
Comparative Agility Website	www.comparativeagility.com