Estimation and Velocity(II)

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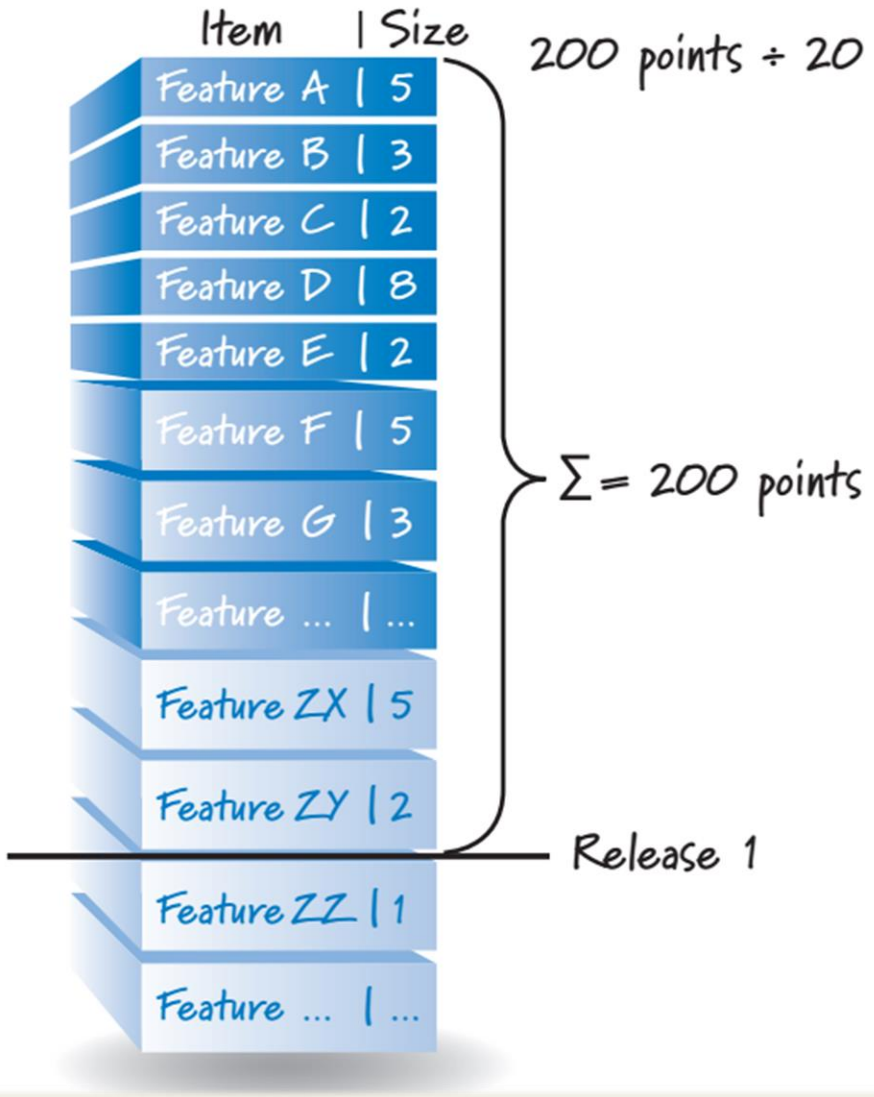
Introduction

- When planning and managing the development of a product, we need to answer important questions.
  - *"How many features will be completed?"*
  - *"When will we be done?"*
  - *"How much will this cost?"*
- We need to estimate the size of what we are building and measure the velocity or rate at which we can get work done.
- With that information, we can derive the likely product development duration (and the corresponding cost).

Estimated size ÷ measured velocity = (number of sprints)

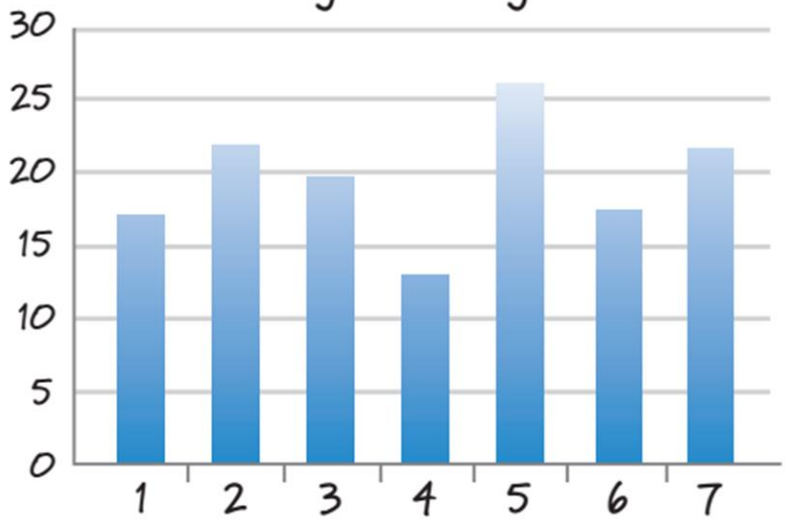


200 points ÷ 20 points/sprint = 10 sprints

Σ = 200 points

Release 1

Average velocity = 20



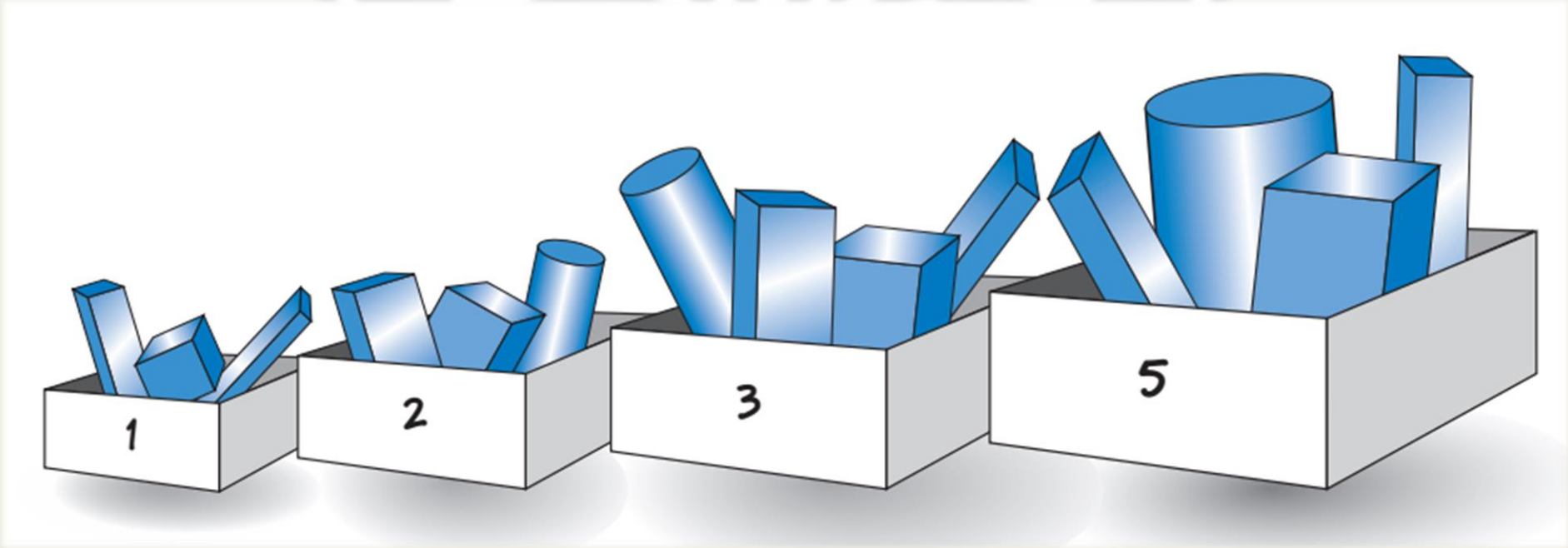
Technique for sizing PBIs

- Consensus-based.
- Knowledgeable people (the experts) slate to work on a PBI engage in an intense discussion to expose assumptions, acquire a shared understanding, and size the PBI.
- Relative size estimates by accurately grouping or binning together items of similar size.
- The team leverages its established PBI estimation history to more easily estimate the next set of PBIs.

Estimation Scale

- The team must decide which scale or sequence of numbers it will use for assigning estimates. Because our goal is to be accurate and not overly precise, we prefer to not use all of the numbers.
- When we receive a package, we need to decide which bin to place the package in. Now, not all packages in the same bin are or will be identically the same physical shape, size, or weight, so we need to examine the packages that are currently in the bins so that we can find the best-fit bin for the package we are estimating. Once we find the closest matching bin, we put the package in the bin and move on to the next package.
- Obviously, the more packages we put into the bins, the easier it should be to size and bin future packages because we'll have more points of comparison.

Binning



How

- The full Scrum team participates.
- During the session, the product owner presents, describes, and clarifies PBIs.
- The ScrumMaster coaches the team to help it better applying. The ScrumMaster is also constantly looking for people who, by their body language or by their silence, seem to disagree and helping them engage.
- And the development team is collaboratively generating the estimates.

The rules

1. The product owner selects a PBI to be estimated and reads the item to the team.
2. Development team members discuss the item and ask clarifying questions to the product owner, who answers the questions.
3. Each estimator privately provides her estimation.
4. Once each estimator has made a private selection, all private estimates are simultaneously exposed to all estimators.
5. If everyone selects the same size, we have consensus, and that consensus number becomes the PBI estimate.
6. If the estimates are not the same, the team members engage in a focused discussion to expose assumptions and misunderstandings. Typically we start by asking the high and low estimators to explain or justify their estimates.
7. After the discussion, we return to step 3 and repeat until consensus is reached.

The estimation

- The goal is not to compromise, but instead for the development team to reach a consensus about the estimate of the story's overall size (effort) from the team perspective.
- Usually this consensus can be achieved within two or three rounds of voting, during which the team members' focused discussion helps obtain a shared understanding of the story.

Benefits

- Brings together the diverse team of people who will do the work and allows them to reach consensus on an accurate estimate that is frequently much better than any one individual could produce.
- Discussion and better understanding that team members will share about the PBIs.

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What is Velocity?

- Is the amount of work completed each sprint.
- It is measured by adding the sizes of the PBIs that are completed by the end of the sprint.
- A PBI is either done or it's not done.
- The product owner doesn't get any value from undone items, so velocity does not include the size numbers of partially completed PBIs.
- Velocity measures output (the size of what was delivered), not outcome (the value of what was delivered).
- We assume that if the product owner has agreed that the team should work on a PBI, it must have some value to him.

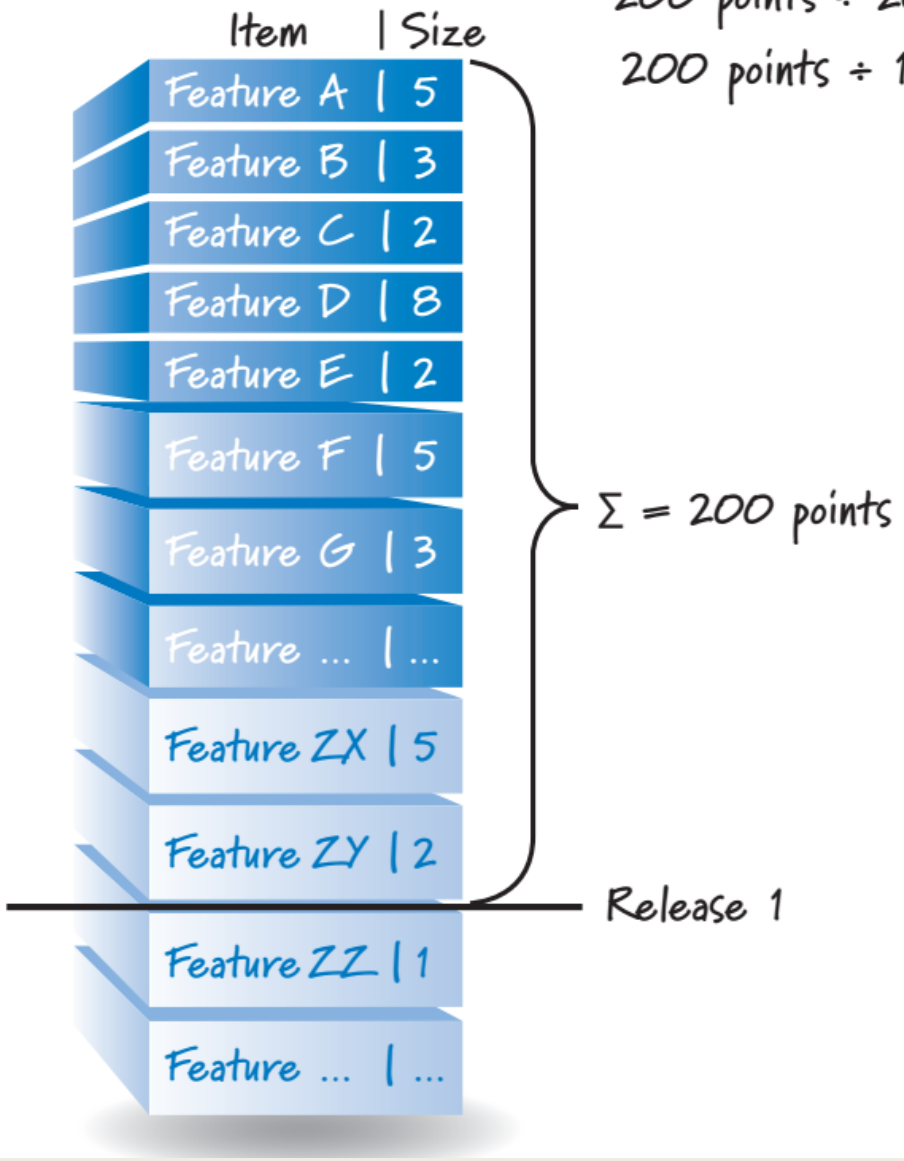
Calculate a Velocity Range

- For planning purposes, velocity is most useful when expressed as a range, such as "The team is typically able to complete between 25 and 30 points each sprint."
- Using a range allows us to be accurate without being overly precise.
- With a velocity range we can more accurately provide answers to questions like "When will we be done?" "How many items can we complete?" or "How much will all this cost?"
- By using a range, we can communicate our uncertainty.

Release 1 will need 10 to 12 sprints to complete

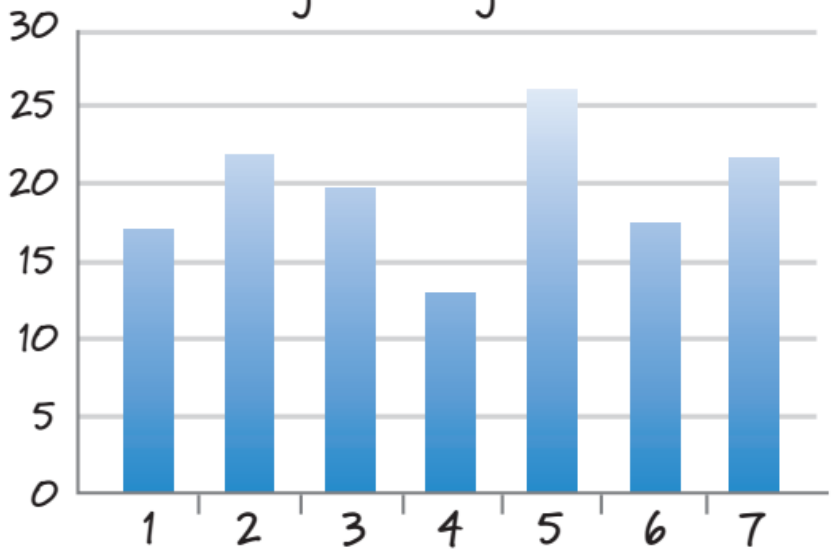
200 points ÷ 20 points/sprint = 10 sprints

200 points ÷ 17 points/sprint = 12 sprints



Low velocity = 17

High velocity = 20



Historical velocity

- The team had historical velocity data that we could use to predict future velocity.
- Certainly one of the benefits of having long-lived teams is that they will acquire such useful historical data.

Forecasting Velocity

- But how do we handle the situation where we have a new team whose members haven't worked together and therefore have no historical data? We'll have to forecast it.
- One common way to forecast is to have the team perform sprint planning to determine what PBIs it could commit to delivering during a single sprint. If the commitment seems reasonable, we would simply add the sizes of the committed PBIs.
- Because what we really want is a velocity *range*, we could have the team plan two sprints and use one estimated velocity number as the high and the other as the low.

Forecasting Velocity(Cnt'd)

- Alternatively, we could make some intuitive adjustments to one estimated velocity based on historical data for other teams.
- As soon as the team has performed a sprint and we have an actual velocity measurement, we should discard the forecast and use the actual.

Increasing velocity

- If the team is constantly inspecting and adapting (continuously improving), its velocity should keep getting better and better. It is expected that a team that is aggressively trying to improve itself and is focused on delivering features in accordance with a robust definition of done to see an increase in velocity.
- There are a number of ways that the Scrum team and managers can help get velocity to the next plateau.
  - *Introducing new tools or increasing training can have a positive effect on velocity.*
  - *Managers can strategically change team composition with the hope that the change will eventually lead to a greater overall velocity.*
    - haphazardly moving people on and off teams can and probably will cause velocity to decline.

Increasing velocity(Cnt’d)

- Although introducing new tools, getting training, or changing team composition can have a positive effect on velocity, these actions usually cause a dip in velocity while the team absorbs and processes the change.

- After this decline, there will probably be an increase to the point where the team establishes a new plateau until some other change causes yet another plateau to be achievable.

Affecting Velocity

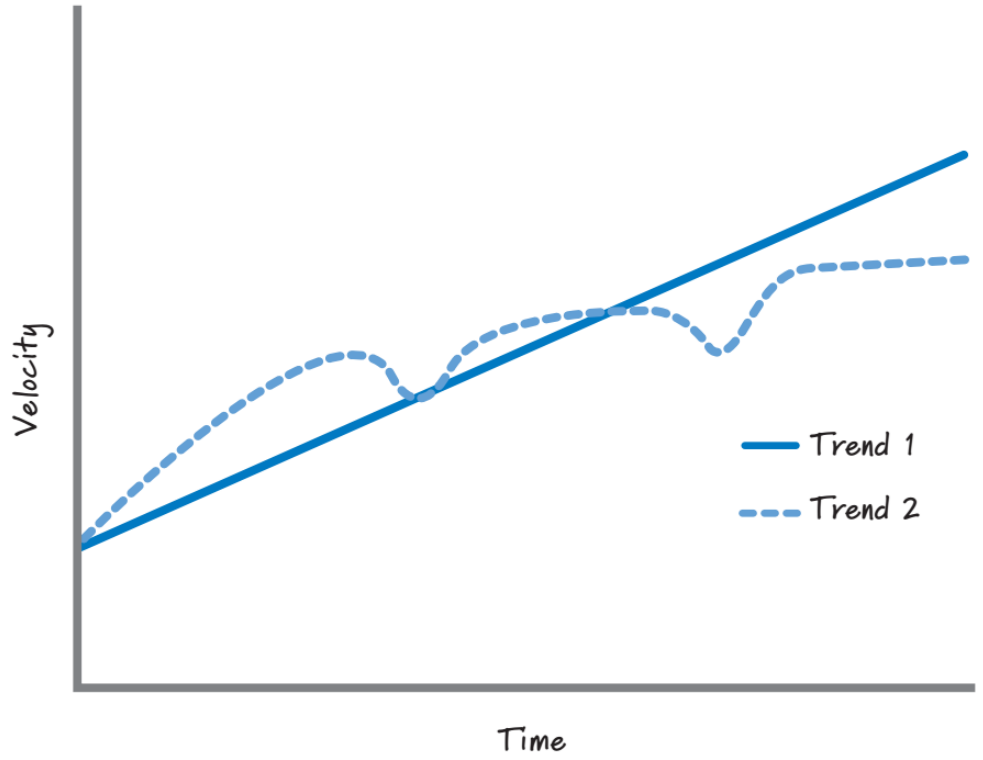


FIGURE 7.13 A team's velocity over time

The effect of overtime on velocity

- there is one obvious thing we could do to try to improve velocity:
  work longer hours. Working a lot of consecutive overtime might initially cause velocity to increase.

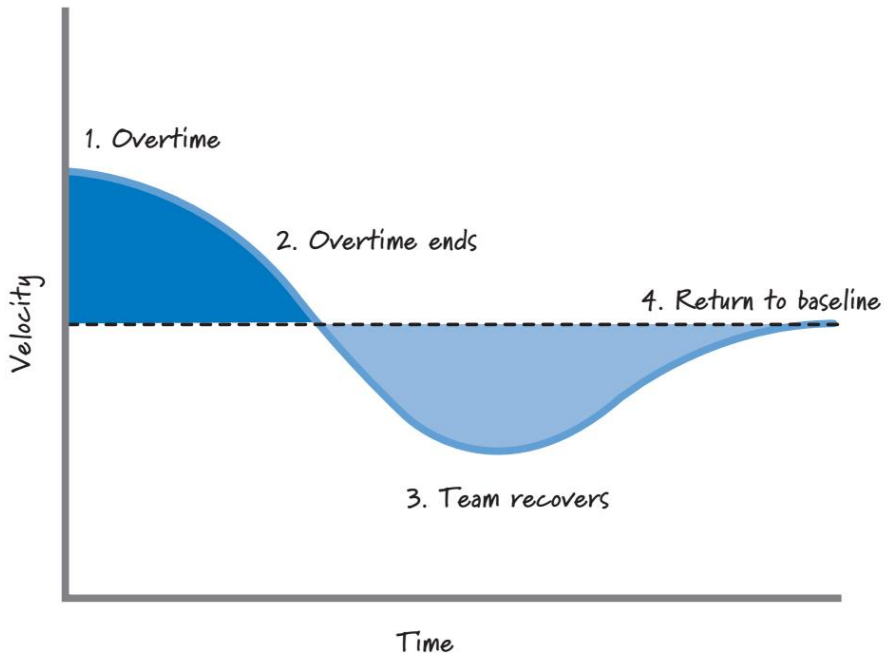


FIGURE 7.14 The effect of overtime on velocity (based on a figure from Cook 2008)

The effect of overtime on velocity(Cnt'd)

- That increase will almost certainly be followed by an aggressive decline in velocity along with a simultaneous decline in quality.
- Even after the overtime period ends, the team will need some amount of time to recover before returning to its reasonable baseline velocity.
- Maybe the trough (decreased velocity area) during the recovery period is larger than the crest (increased velocity area) during the overtime period.
- The end result is that lots of overtime may provide some short-term benefits, but these are frequently far outweighed by the long-term consequences.

Misusing Velocity

- Velocity is used as a planning tool and as a team diagnostic metric. It should not be used as a performance metric in an attempt to judge team productivity.
- When misused, velocity can motivate wasteful and dangerous behavior.
- We should judge velocity on how well it assists us with performing accurate planning and how well it helps a team to internally improve itself.
- Any other uses will likely promote the wrong behavior.

Reference

1- K. S. Rubin, “Essential Scrum, A Practical guide to the most popular agile process,” 2013.