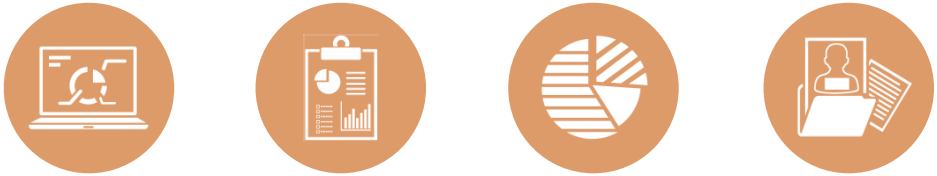
PMI®—Agile Certified Practitioner (PMI-ACP)®

Agile Planning, Monitoring, and Adopting: Part 2



Objectives

After completing this lesson, you will be able to:

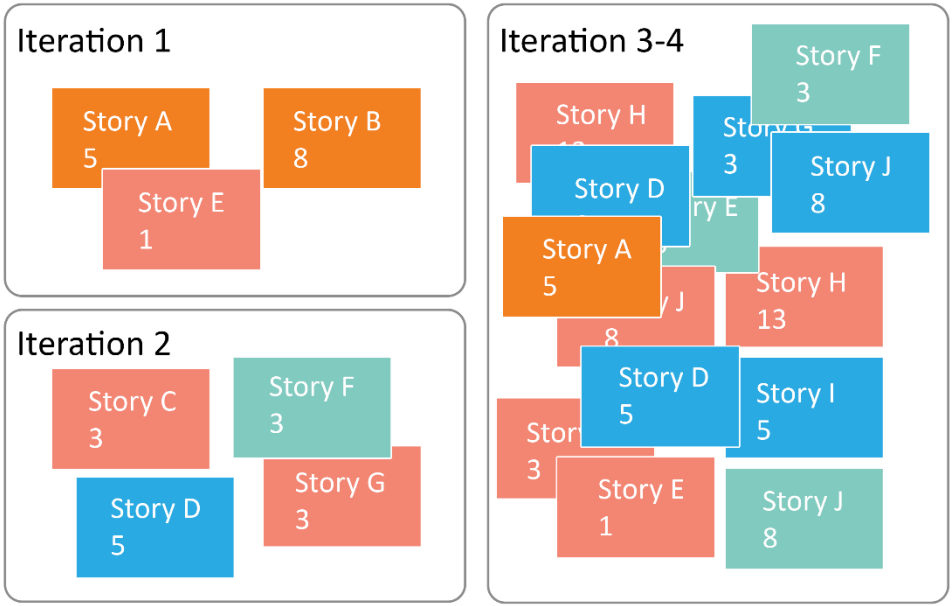
- Explain the concepts of velocity and iteration planning
- Identify the processes involved in iteration planning
- Use burnup charts, burndown charts, and cumulative flow diagrams to monitor the release plan

Velocity is a measure of a team's rate of progress per iteration. It is calculated by adding the number of story points assigned to each user story that the team has completed during the iteration.

Q The project team completes four stories in one iteration. The story points are as Story A—5, Story B—3, Story C—7, Story D—5. Calculate the velocity.

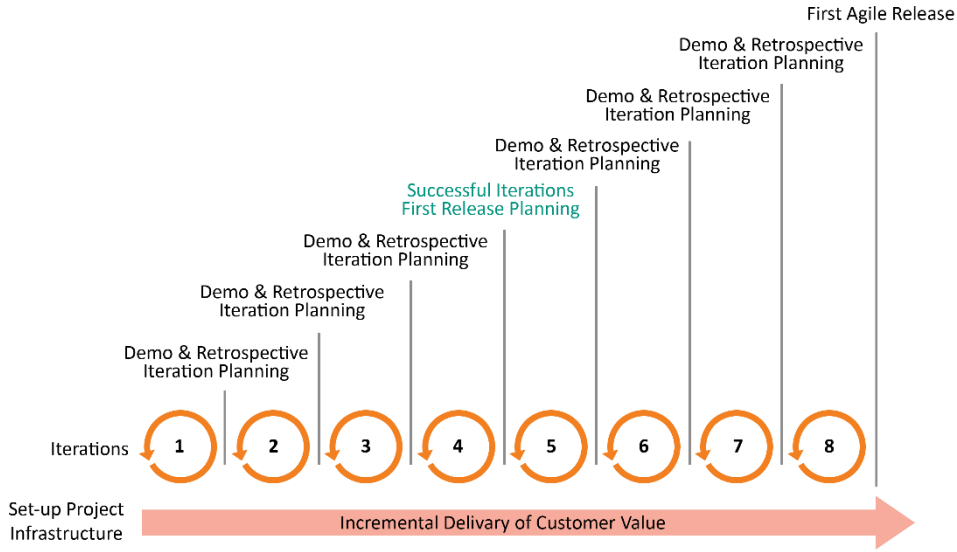
A Adding the story points assigned to each user story gives the velocity.
Hence, velocity = 5+3+7+5 = 20

Based on an expected velocity of 14, allocate user stories to iterations.



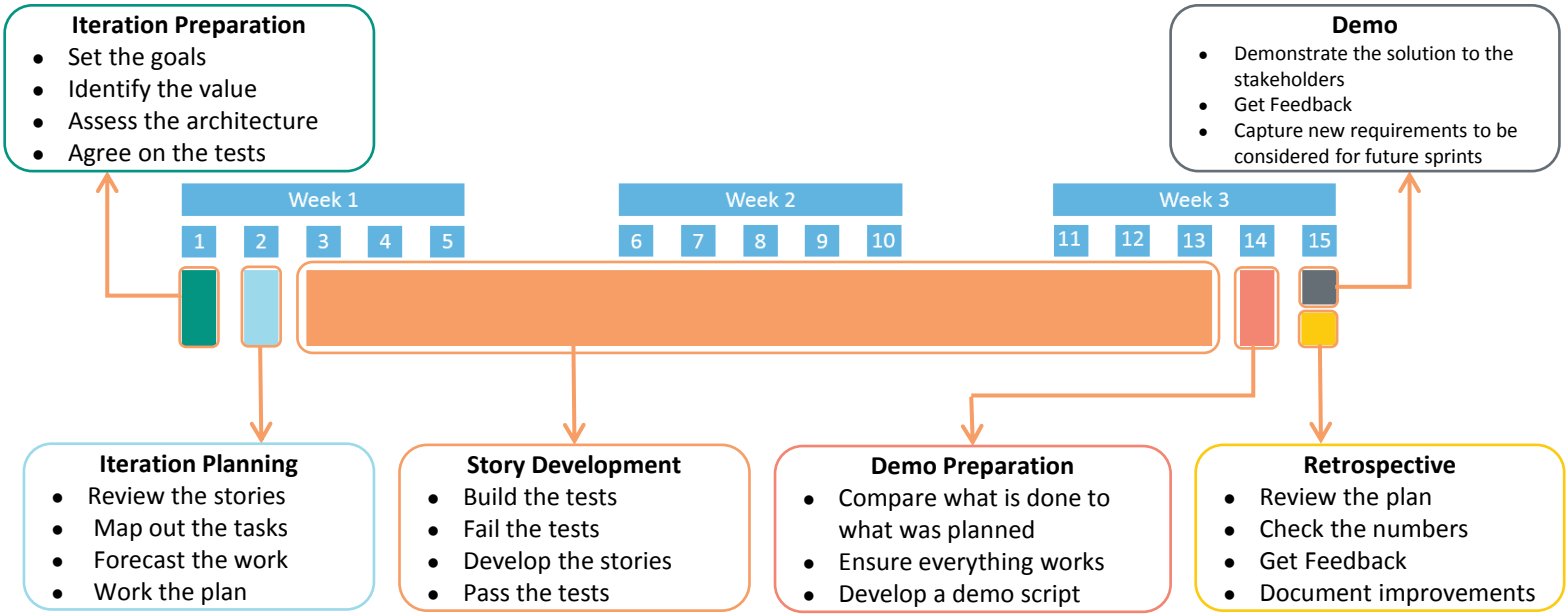
Iteration Plan

An iteration plan is a low level view of the product where the team takes a more focused, and detailed look at what will be necessary to implement, i.e., only those user stories, that have been selected for the iteration. Each iteration follows the same consistent pattern.



Iteration—Example

In this example, the major activities of a three week iteration are shown.



An iteration plan is created during the iteration planning session. It can be as simple as a spreadsheet or a set of note cards with one task handwritten on each card.

Iteration Plan Meeting

The participants of this meeting are:

- Product Owner
- Analysts
- Programmers
- Testers
- Database Engineers
- UI Designers

Iteration Plan

Iteration plan could be a spreadsheet or a post-it note.

Identifies themes or goals that should be achieved.

Positions the team to start working on the iteration.

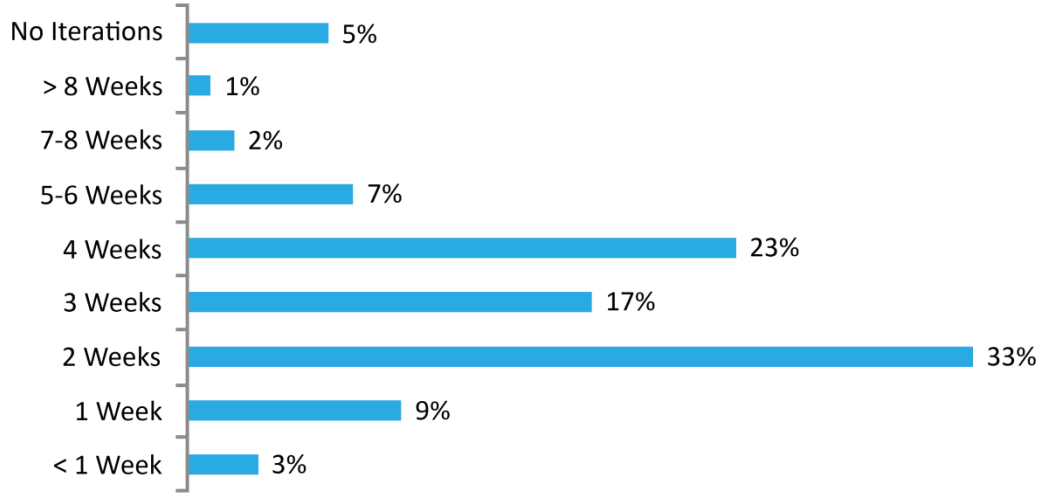
Iteration Length Selection

Following factors are considered while selecting an iteration length:

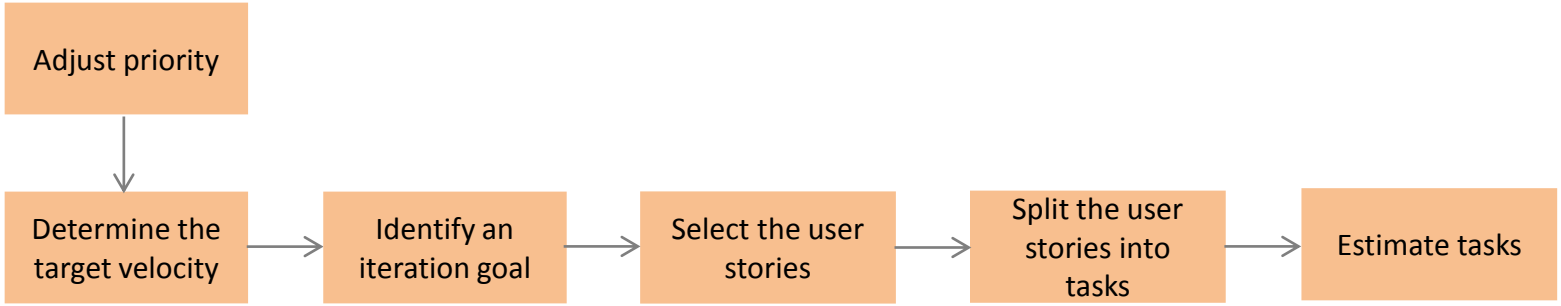
- The length of the release being worked on
- The amount of uncertainty
- The ease of getting feedback
- The duration in which priorities can remain unchanged
- Willingness to go without feedback
- The overhead of iteration
- A feeling of urgency is maintained, the shorter the iteration duration the greater the sense of project urgency

Length of Iterations

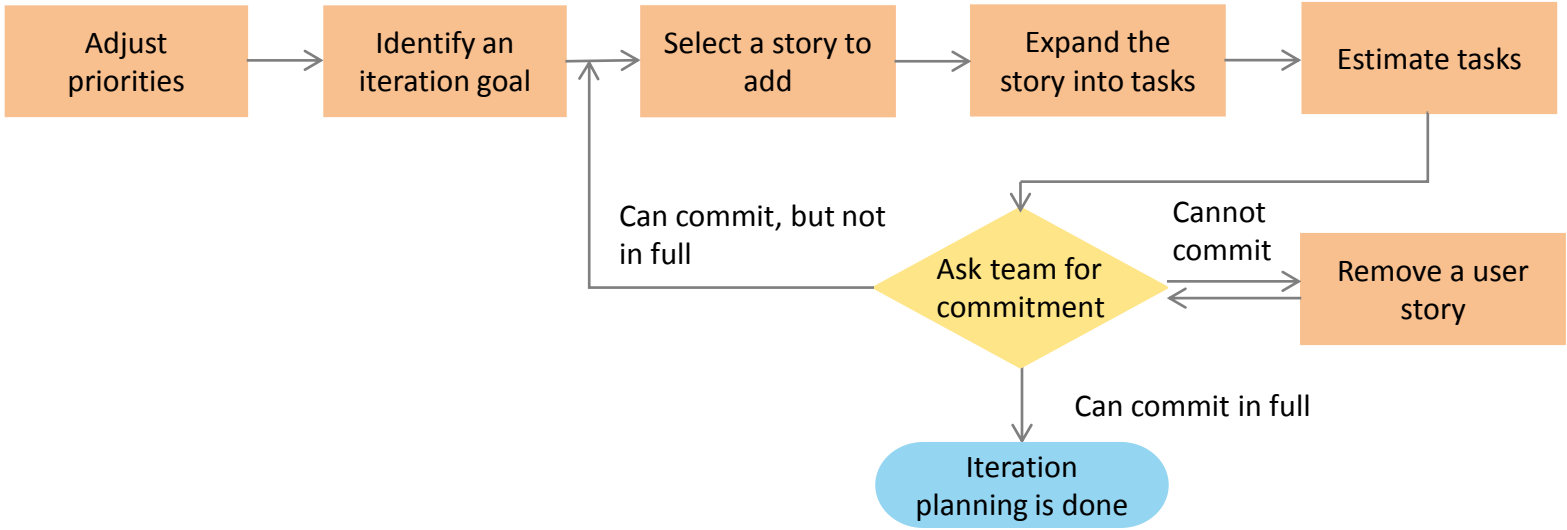
The following graph represents the average length of the iteration in Agile projects. 82% have iterations between 1 and 4 weeks in length.



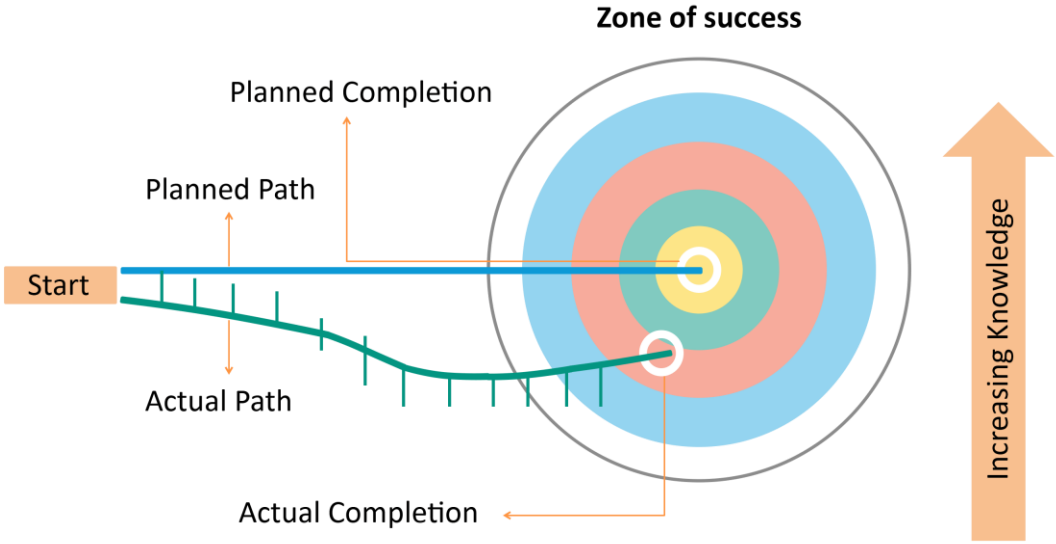
When the team is aware of the velocity, the following processes are undertaken to plan an iteration:



In commitment-driven iteration planning, the team is asked to add stories to the iteration one-by-one until they cannot commit anymore.



While working on a release, iterations allow mid-course corrections.

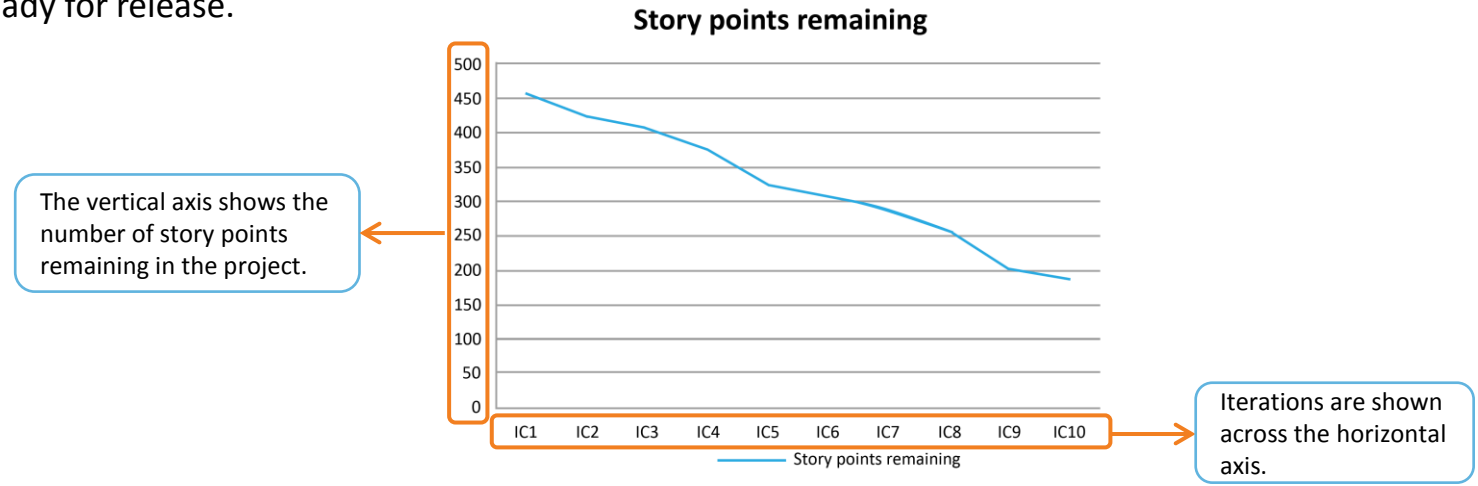


As knowledge increases, leaders use iterations to guide the project towards enhanced goal.

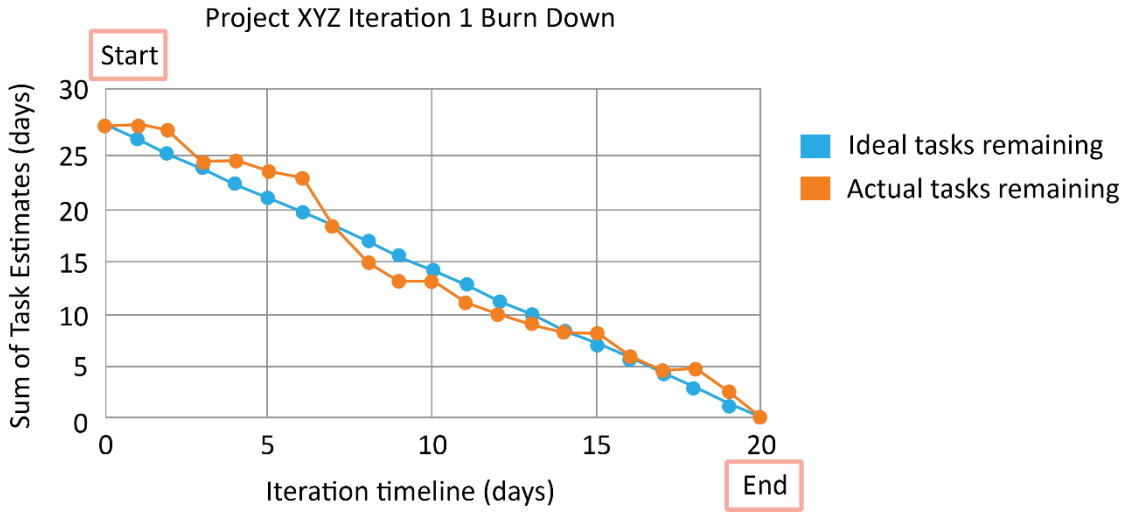
The release plan looks forward through the release of the product while the iteration plan looks ahead only the length of one iteration. The differences between a release plan and an iteration plan are as follows:

Release Plan	Iteration Plan
Planning horizon is three to nine (3 – 9) months.	Planning horizon is one to four (1 – 4) weeks.
Release plan is based on user stories.	Iteration plan is based on tasks.
Estimations are done in story points or ideal days.	Estimations are done in ideal hours.

The project team tracks its progress against a release plan by updating a release burndown chart at the end of each iteration. The graph shows a hypothetical burn down chart for a project across several iterations. When the graph reaches zero there are no more story points in the project and it is ready for release.

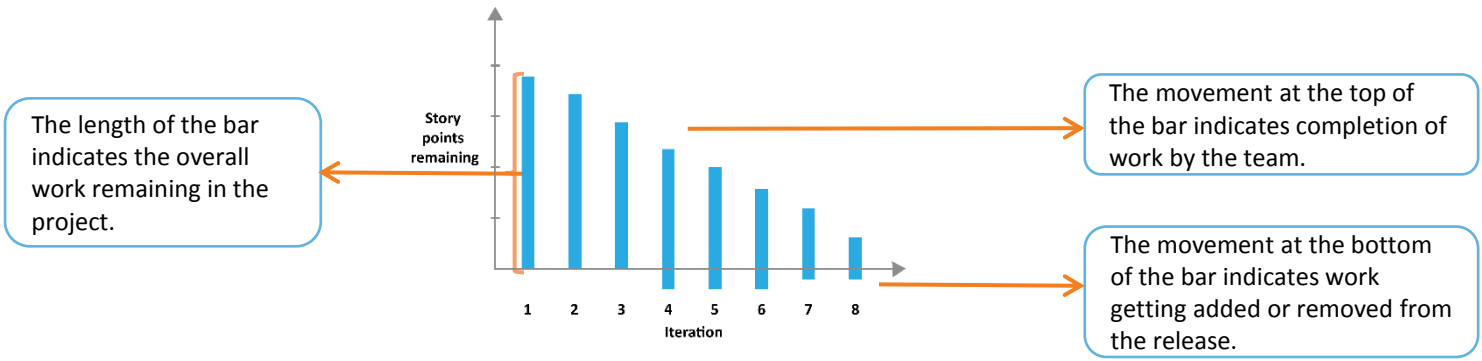


Burndown charts can also be tracked against the expected velocity based on a velocity driven iteration plan. This provides visibility on how the team will complete the stories and tasks within an iteration.

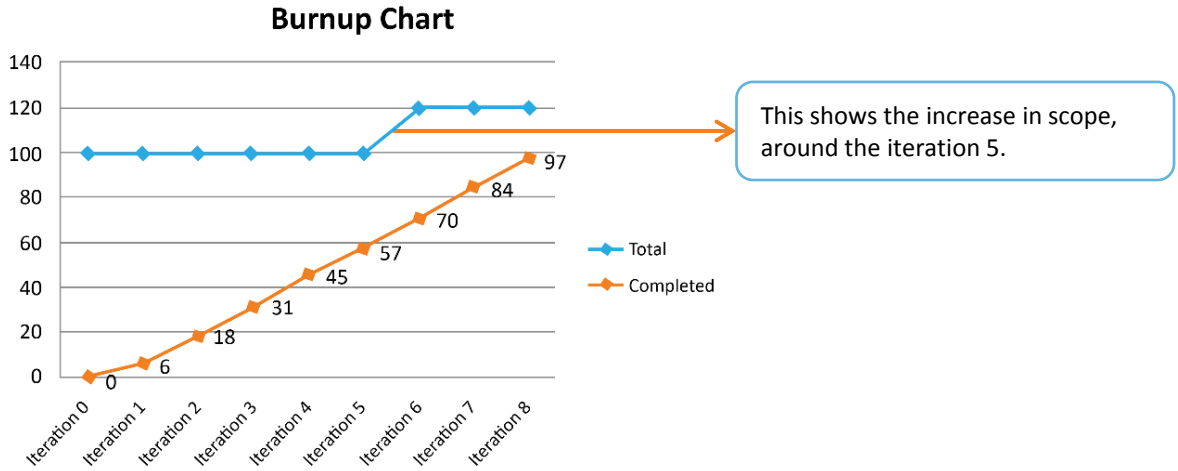


Burndown Bar Charts

In addition to the rate at which work is completed, the burndown bar chart helps to visualize the work that gets added or removed from the scope for a particular release or iteration.



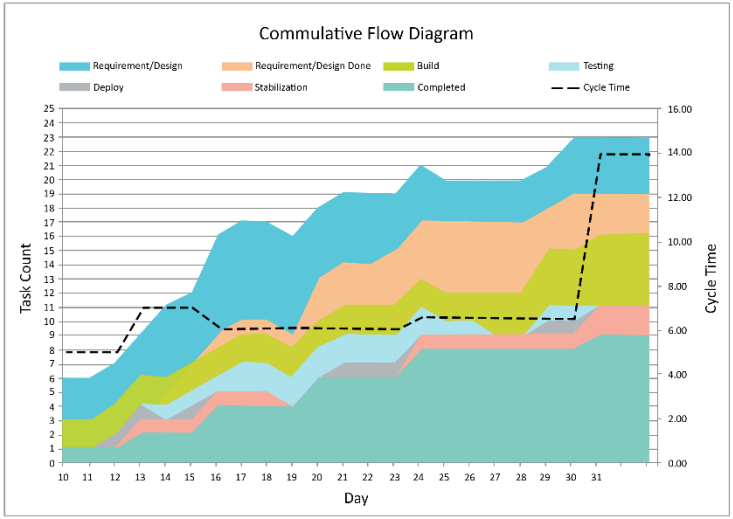
In addition to showing how much work is completed, the burnup chart also shows the work in the project scope. This chart is also known as 'Feature Complete Graph' in Feature Driven Development (FDD).



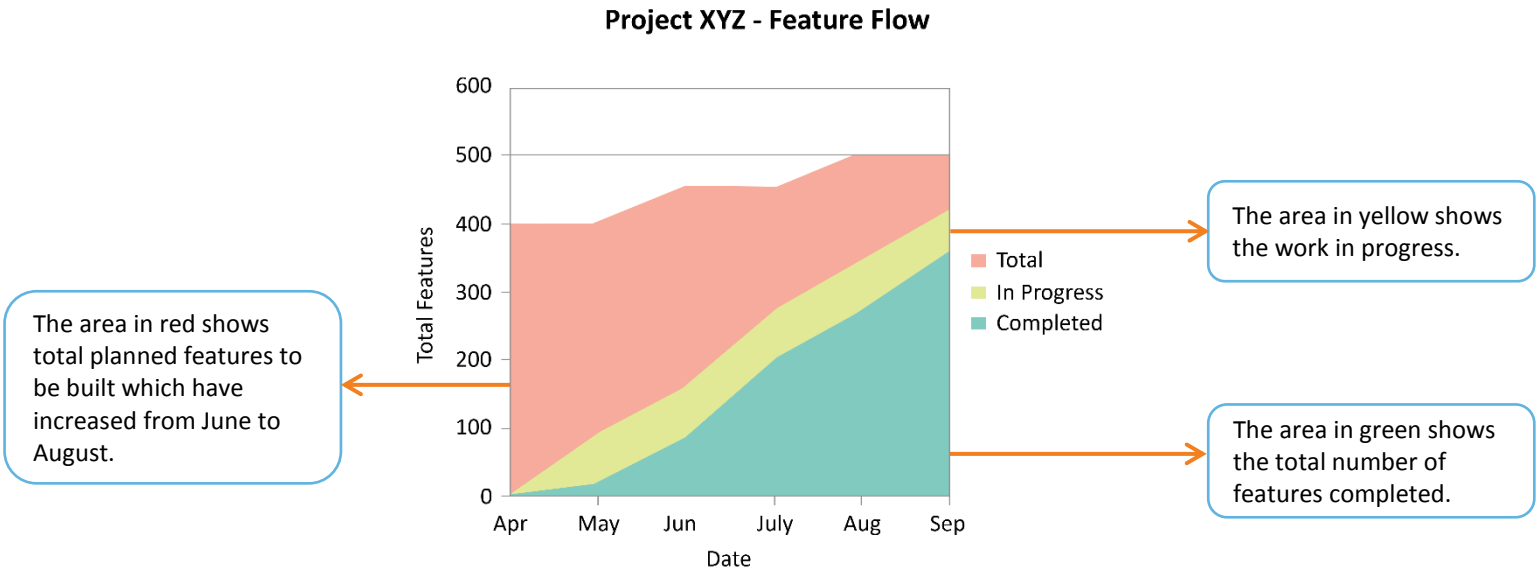
Cumulative Flow Diagrams

Cumulative Flow Diagram (CFD) was introduced by Lean thought leaders, Don Reinertsen and David Anderson.

- CFD is an important tool for tracking and forecasting Agile projects.
- It shows work in different states, that is ‘Completed’ and ‘In Progress’.
- One report can provide insight to Burn-up, Cycle Time, WIP, and Bottlenecks all at once.

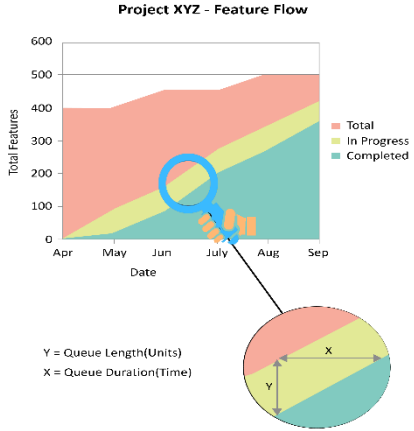


An example of a cumulative flow diagram is given below:



Cumulative Flow Diagram helps us to determine the amount of inventory in the system. Little's law states that at a given WIP level, the ratio of WIP to cycle time (CT) equals throughput (T).

Number of items in the queue can be determined by looking at the vertical (Y) distance.

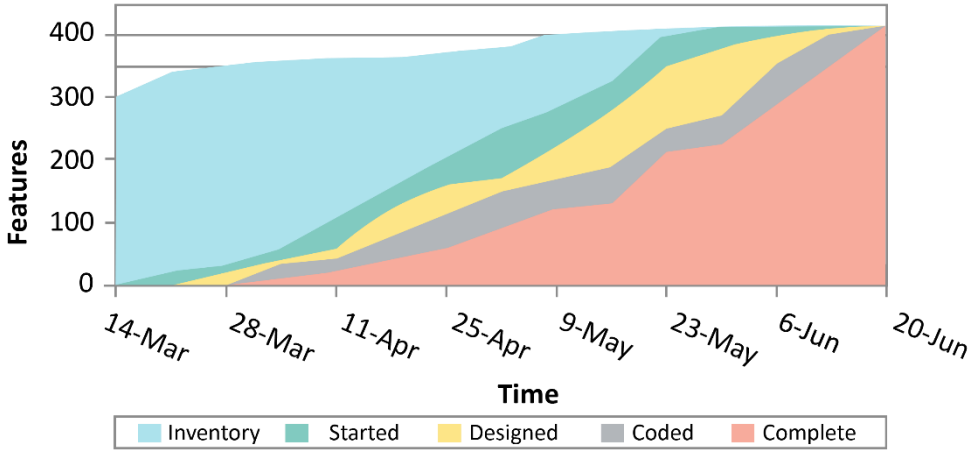


The time taken by the items to complete can be determined by examining the horizontal (X) distance; known as cycle time.

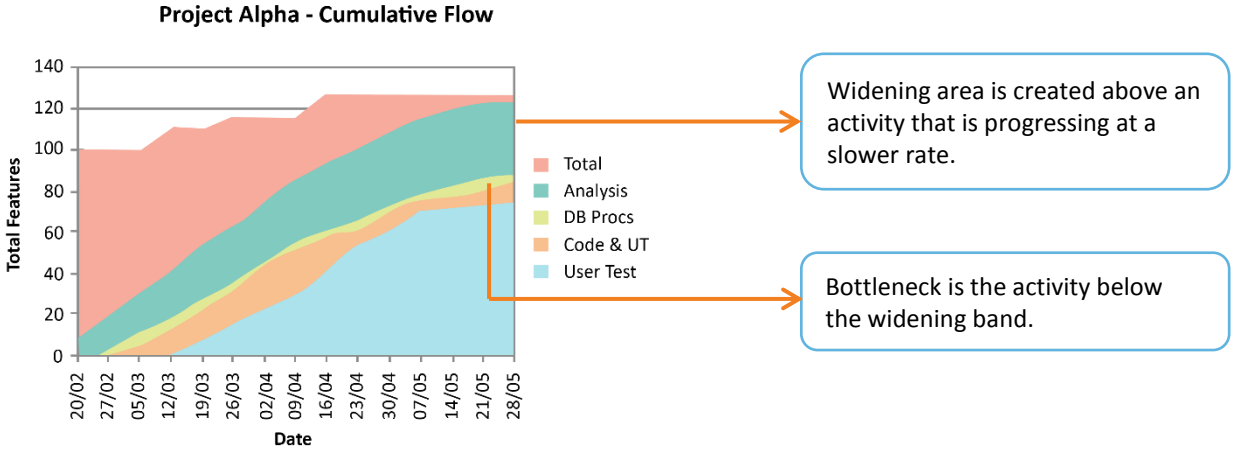
T = WIP/CT

If there are ten user stories in progress and it takes 6 hours to complete a user story, the throughput will be 10/6 or 1.6 stories per hour. Given that it takes 1.6 hours to complete a story, if a story enters the In Progress queue and it is the tenth story in the queue, it will take 10*1.6hrs or 16 hours.

The CFD can be modified to get more detailed Work-In-Progress (WIP) information. The WIP area (yellow) has been broken out by activity, like ‘Started’, ‘Designed’, and ‘Coded’.



Detailed CFD chart can help in identifying the bottlenecks in a process.



In the image, 'Analysis' is going OK, but 'DB Process' is below the widening band, indicating a slower rate of progress and a warning that it is a bottleneck in the system.

Quiz

QUIZ 1	In your project, the sum of all the stories is 85 story points. Based on past experience, it is known that the team's velocity is 10 story points per one-week iteration. How many iterations does the project need to complete the user stories?

a. 8

b. 10

c. 8.5

d. 85

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c. 8.5

d. 85

Answer: c.

Explanation: Iterations = 85/10 = 8.5

QUIZ 2	Which of the following is not a criteria for evaluating the iteration length?

a. Building and testing the stories

b. Exploration factor

c. Release timeframe

d. Management’s acceptance of the stories

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Answer: d.

Explanation: Three criteria should be looked at when setting iteration length; delivering chunks (stories) of user valued functionality, building and testing the stories (working software), and product team acceptance of the stories. Additional factors are release timeframe, exploration factor, overhead, and learning needs.

QUIZ 3

Which of the following chart shows the total work in a project?

a. Burnup chart

b. Burndown chart

c. Iteration graph

d. Task board

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Answer: a.

Explanation: In addition to showing how much work is completed, the burnup chart also shows the work in the project.

QUIZ 4	What does Little's Law state?

a. The amount of work expands to fit the available time.

b. Projects deliver little in the last two days of an iteration.

c. Inventory in a process is the multiplication of throughput and the flow-time.

d. Project throughput diminishes with larger user stories.

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Answer: c.

Explanation: Little's law states that at a given WIP level, the ratio of WIP to cycle time (CT) equals throughput (T). T = WIP/CT, we can then determine that WIP = T * CT

QUIZ 5	In a CFD diagram, how can a bottleneck be determined?

a. A large colored area appears in one of the process areas.

b. The value points for the release start to increase.

c. Project velocity starts to decrease.

d. The team starts experiencing negative velocity.

QUIZ 5	In a CFD diagram, how can a bottleneck be determined?

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d. The team starts experiencing negative velocity.

Answer: a.

Explanation: The CFD will start showing a growing colored area in a process that is experiencing a bottleneck.

Here is a quick recap of what was covered in this lesson:

- Velocity is a measure of team's rate of progress per iteration. It is calculated by adding the number of story points assigned to each user story that the team has completed during the iteration.
- Iteration plan is a low level plan used by the teams to identify and allocate the work for a given iteration. Iterations also support mid-course corrections in a release.
- Burndown chart tracks the rate at which the team is 'burning down' (completing) the work. The burnup chart indicates the amount of work completed during a release or iteration.
- In addition to the rate at which the work is burnt down, the burndown bar chart also helps visualize the work that gets added or removed from the scope for a particular release or iteration.
- Cumulative Flow Diagram (CFD) helps to track work at different stages, the amount of work that is completed and the amount of work in the in-progress state.

THANK YOU