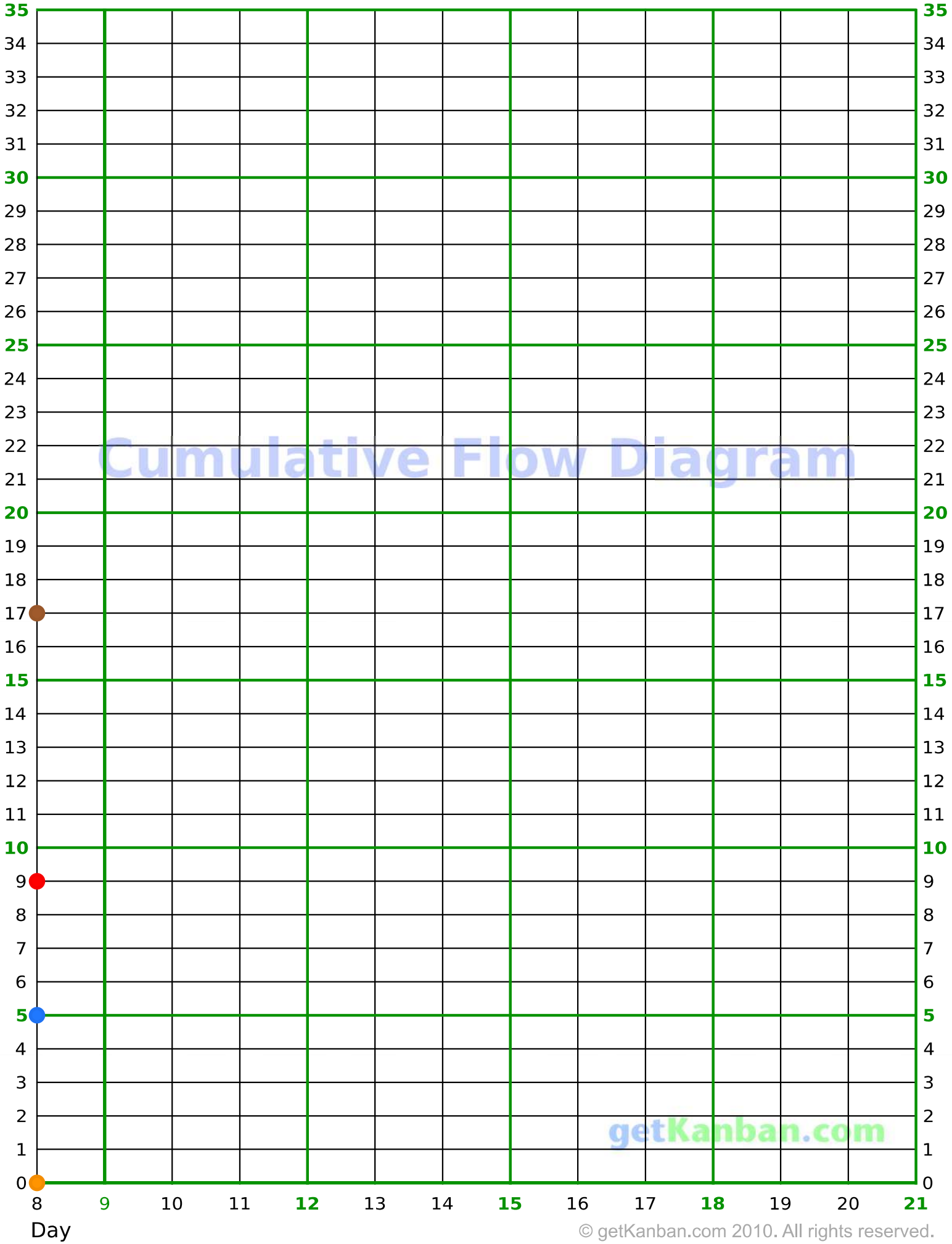


CFD Instructions

Purpose

The Cumulative Flow Diagram (CFD) will show over time how much work has passed through each stage of our system. The top (brown) line will show arrivals into the system (into Ready). The bottom (orange) line will show departures from our system (from Test into Deployed). The middle two lines will show the amount of work that has completed design (red) and development (blue) respectively.

Before Tracking the CFD

At the end of each day, before tracking the CFD, make sure that all stories are in the right places, i.e. that stories have been pulled as far right as they can be while still honoring WIP limits, and that the Ready queue is filled to its WIP limit.

Updating the CFD

At the end of each day, hereafter referred to as 'today,' count up the total number of stories that have been deployed since the previous day. Add this number to the orange point on the CFD from the previous day, and track an orange point for today.

Join the orange points with an orange line.

Count up the number of stories in Development Done and Test today (the columns with blue borders on the game board). Add this number to the orange data point for today, and track a blue point for today. Join the blue points with a blue line.

Count up the number of stories in Design Done and Development Doing (the columns with red borders on the game board). Add this number to the blue data point for today, and track a red point for today. Join the red points with a red line.

Count up the number of stories in Ready and Design Doing (the columns with brown borders on the game board). Add this number to the red data point for today, and track a brown point for today. Join the brown points with a brown line.

Notice the instructions provided as an aid at the bottom of the columns on the game board.

Make note of any significant events that occurred on the day as described in the Event Card.

If Things Go Wrong

If you think you might have made a mistake, you can recreate the bottom (orange) line from the information on the stack of deployed story cards. Each deployed story card has a Day Deployed field from which you can determine how many stories were deployed on each day.

Similarly, you can recreate the top (brown) line from the information on all the story cards that have passed through the Ready queue so far (which includes all stories on the board, and all stories deployed so far). Each such story has a Day Ready field from which you can determine how many stories entered the system on each day.

We did not collect data on the other transitions, so they cannot be recreated. If things go very wrong, just make sure your chart is correct as at today (by counting up stories with Day Ready and Day Deployed fields completed, and counting the stories in the red and blue columns on the board), and continue the game.

The Starting State

To save startup time, we are beginning the game at the start of day 9 of the project, so the board reflects the state of the work as at the end of day 8:

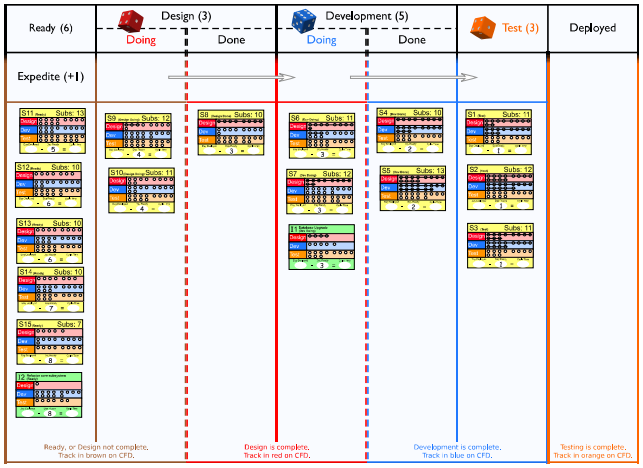


Figure 1.

The starting state of the game board is reflected in the starting state of the CFD, as shown in Figure 2.

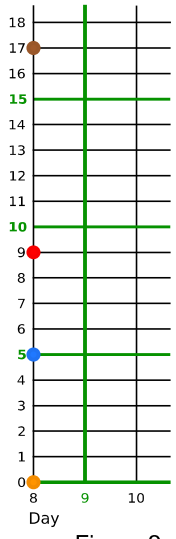


Figure 2.

At the end of day 8 there are no stories in the orange column on the board. Zero stories have completed testing, and therefore zero stories have been deployed. Stories that have finished testing and have been deployed are tracked in orange, so there is an orange point at 0 on day 8.

There are 5 stories in the blue columns on the board. These stories have either finished development and are waiting for testing, or they are currently in test. On our CFD, we do not distinguish between these states. We only account for what is actually complete. These 5 stories have finished development, so there is a blue point at 5.

There are 4 stories in the red columns on the board. These stories have either finished design and are waiting for development, or they are currently in development. The 5 stories that were tracked in blue have already finished design and development. Altogether 4 + 5 = 9 stories have finished design, so there is a red point at 9.

There are 8 stories in the brown columns on the board. These stories are either waiting in the Ready queue, or are currently being designed. They have not yet finished design. The 9 stories in the columns to the right have all passed through the Ready queue and have been through design. Altogether 8 + 9 = 17 stories have been pulled into the Ready queue at some stage in their existence by day 8, so there is a brown point at 17.

Example: Day 9

Our facilitator will guide us through day 9. At the end of day 9, our board should look like this:

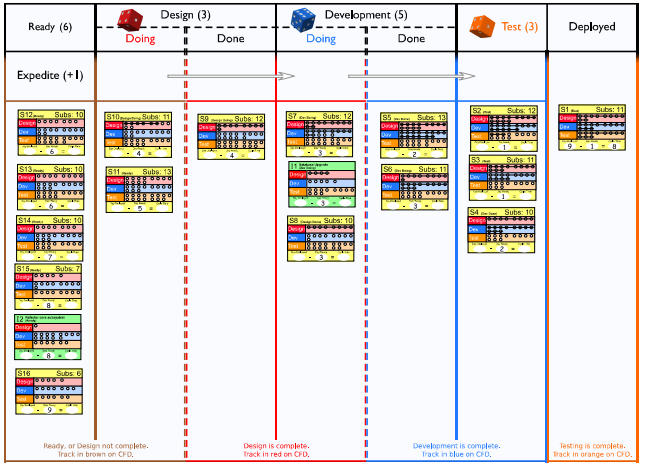


Figure 3.

There were 0 (zero) stories deployed at the end of the previous day (day 8), and 1 story was deployed on day 9. 0 + 1 = 1, so on day 9 we track an orange point at 1, and join the orange points.

Now on day 9 there is an orange point at 1, and there are 5 stories in the blue columns. 1 + 5 = 6, so we track a blue point at 6, and join the blue points.

There is a blue point at 6 and there are 4 stories in the red columns. 6 + 4 = 10, so we track a red point at 10, and join the two red points.

There are 8 stories in the brown columns. 10 + 8 = 18, so we track a brown point at 18 and join the brown points. At the end of day 9 our CFD should look like Figure 4.

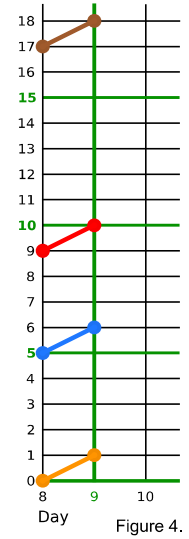
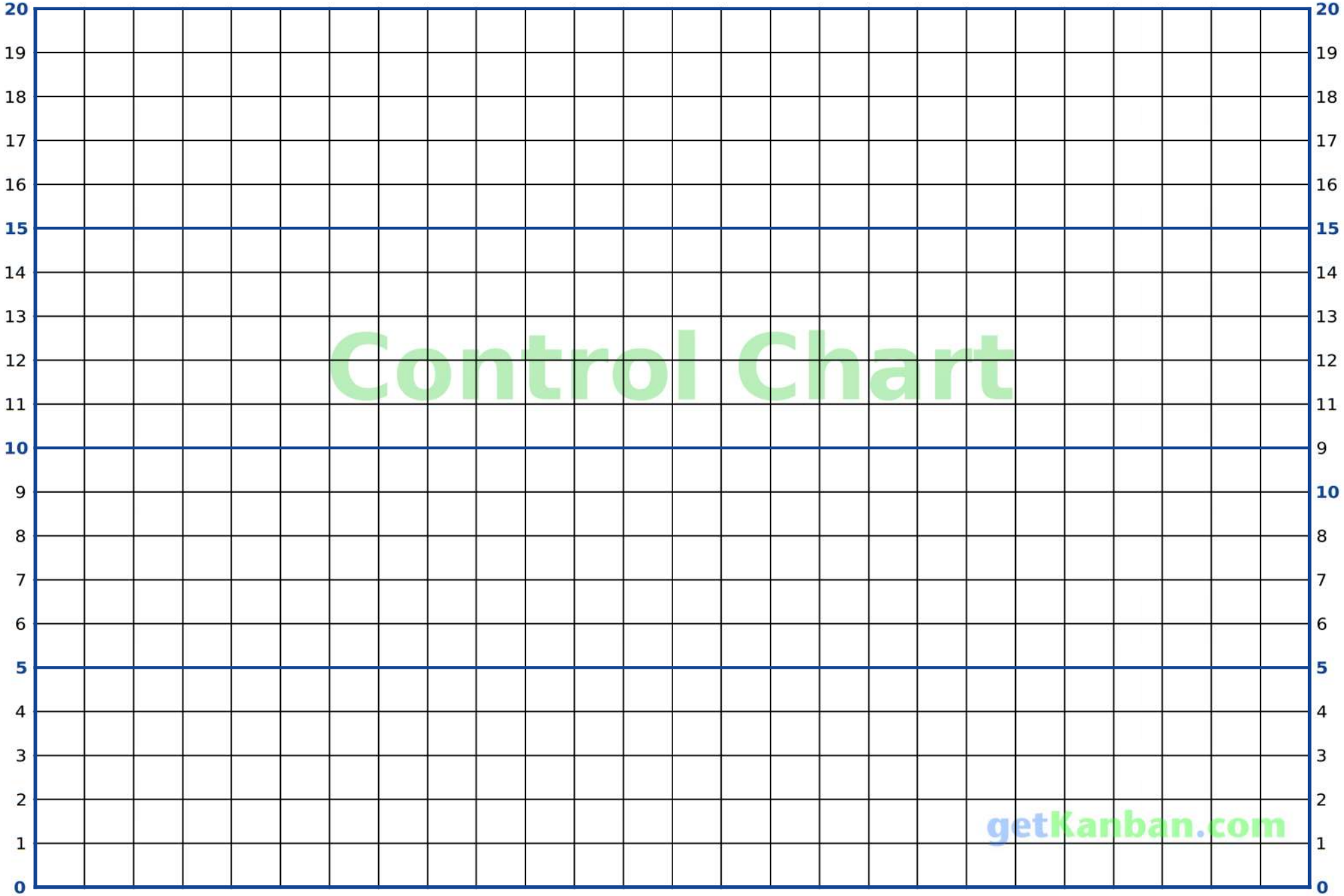


Figure 4.



Day:

Notes:

Unit Stories Deployed (one story per vertical line)

Control Chart Instructions

Purpose

The Control Chart tracks the cycle time of every story deployed — one story per vertical line on the chart.

Cycle Time

At the end of each day, any deployed stories must have their Day Deployed and Cycle Time fields updated. Cycle Time is Day Deployed minus Day Ready.

Updating the Control Chart

At the end of each day, for each story deployed on that day, track the cycle time on a new vertical line on the chart. Use the same color marker as the story, except use brown for Standard stories (since yellow is difficult to see) and black for the Expedite story.

Do not join the points. At the end of the game you will add a moving average line.

Below the chart, indicate which day the story was deployed on, and if multiple stories are deployed on one day, indicate with a bracket and day number.

Make note of any significant events that occurred on that day as described in the Event Card for the day.

If Things Go Wrong

If you think you might have made a mistake, all of the information required is recorded on the deployed story cards. You can always look back through the stack of deployed stories and check the Day Deployed and Cycle Time fields against your chart.

At the End of the Game

At the end of the game, track an approximate 3-point moving average line through the brown points on the chart (i.e. the points for Standard stories). This is to hide some of the noise and highlight any trends over time.

Example: Day 9

Our facilitator will guide us through day 9. Story S1 will be deployed during day 9. For this story, Day Ready is 1, Day Deployed will be 9, resulting in a Cycle Time of 8:

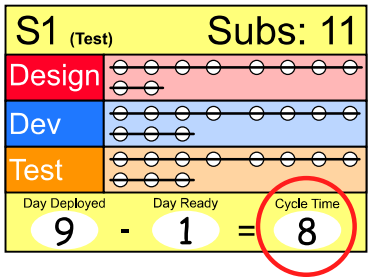


Figure 1.

To track this story on the chart, take a brown dry-erase marker, and put a dot on the first vertical line at 8. Then write 9 at the bottom of the chart to indicate that this story was deployed with cycle time of 8 on day 9. Nothing of any particular interest is expected to happen on day 9, so no need to make any notes on the chart. After day 9 your chart should look like this:

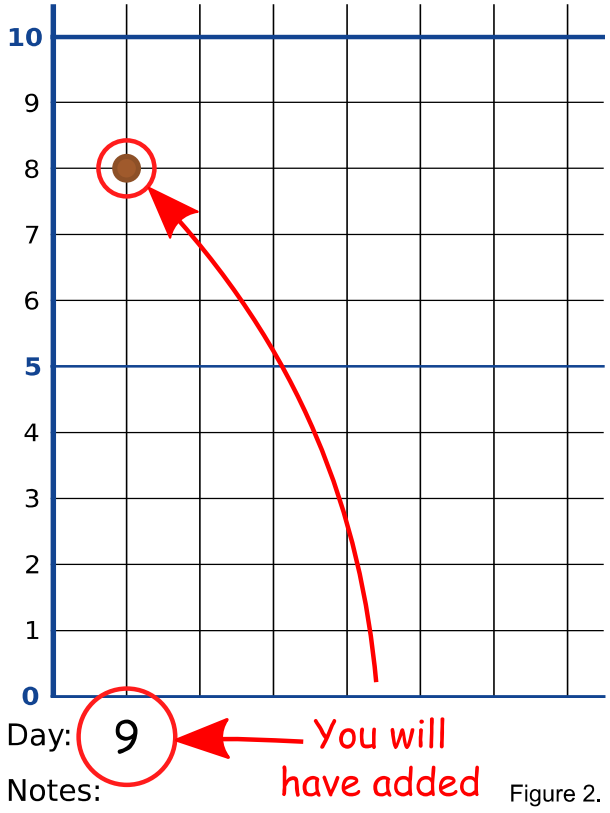


Figure 2.

Hypothetical Example: Day 10

You will be playing the game from day 10, so we can't be sure what will happen, but let's assume that we deploy a further two stories, a Standard (yellow) story with a Cycle Time of 9, and an Intangible (green) story with a Cycle Time of 8. Further, let's assume that the Event Card for day 10 informs us that one of the Designers has gone home with a migraine, and won't be back at work until further notice.

At the end of day 10, our chart would look like this:

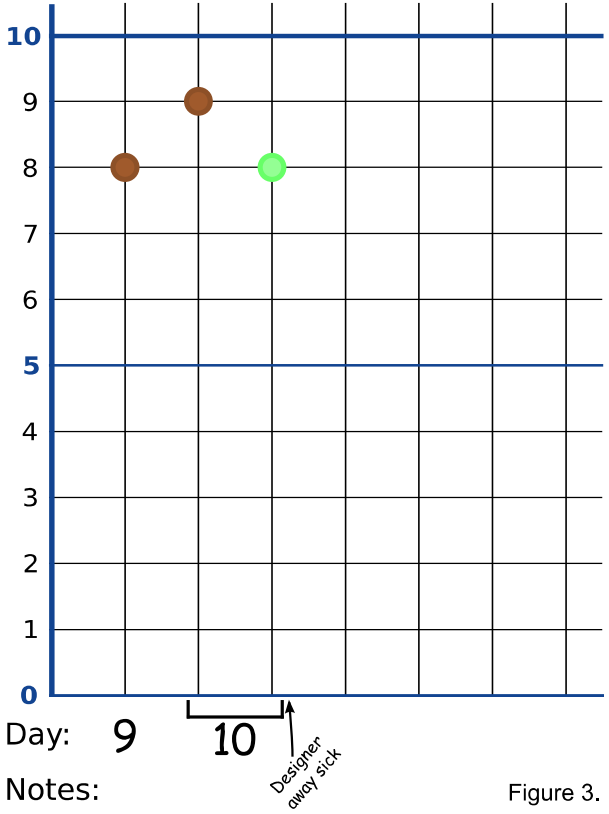


Figure 3.

Financial Summaries: Three Day Billing Cycle

Tick off days as they are completed	8 ✓	9	10	11	12	13	14	15	16	17	18	19	20	21
Billing cycle ended day		9			12			15			18			21
Billing cycle new subscribers (add up Subs from stories deployed in billing cycle)		9A			12A			15A			18A			21A (Did you finish F2 by day 20? If so, make sure you include the 25 additional subscribers.)
Total subscribers to date		9B (Copy 9A)			12B (9B + 12A)			15B (12B + 15A)			18B (15B +18A)			21B (18B + 21A)
Billing cycle subscriber revenue		9C (9B x $100)			12C (12B x $100)			15C (15B x $100)			18C (18B x $100)			21C (21B x $100)
Billing cycle fines or cash payments								15D (Did you finish F1 by day 15? If not, put your $2,200 fine here.) -						21D (Did you finish E1 by day 21? If so, put your $5,000 payment here.)
Billing cycle gross profit		9E (Copy 9C)			12E (Copy 12C)			15E (15C + 15D)			18E (Copy 18C)			21E (21C + 21D)
Total gross profit to date (notify facilitator when calculated)		9F (Copy 9E)			12F (9F + 12E)			15F (12F + 15E)			18F (15F + 18E)			21F (18F + 21E)

Gather up the stories deployed at the end of each billing cycle, and set aside.

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