

SE 234 Basic Development and Operations

#5 Modern Issue Tracking



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Issue Tracking

- In our previous lab



Traditional processes of issue management

1. A defect is shown up.
2. It is logged in a tracking tool, e.g., Gitlab
3. A project manager prioritizes the defects and feed the list to the dev.
4. These steps are repeated throughout the software life cycle.

The key questions for issue management

- How to schedule the fix?
- Who should fix it?
- When is the issue likely to be fixed?
- Can we improve the process in the future?

What's wrong with the traditional issue management

- Low throughput
- Numerous waste
- Burnout — constantly overwhelmed with the **stuffs** that keeps showing up.
- Etc.

Kanban - A (More) modern approach

- Kanban is a system for managing workload.
- In manufacturing, it is a visual signal communicating that an order needs to be placed or filled.
- It was first introduced in late 40s by Taiichi Ohno, the father of the Toyota Production System.

KAN + BAN = Visual Board

署名する + ボード = 看板

Kanban

- Toyota studied the idea of applying shelf-stocking techniques in supermarkets to the factory floor.
- Supermarkets stock **just enough** products to meet consumer demand.
- Shelves **never overflowed** with excess stock or **ran empty**.
- Supermarkets would only refill what were taken by the customers from the shelves. — Products are **never pushed** to the shelves **unless** they are **pulled** out of the shelves by a customer.

Kanban

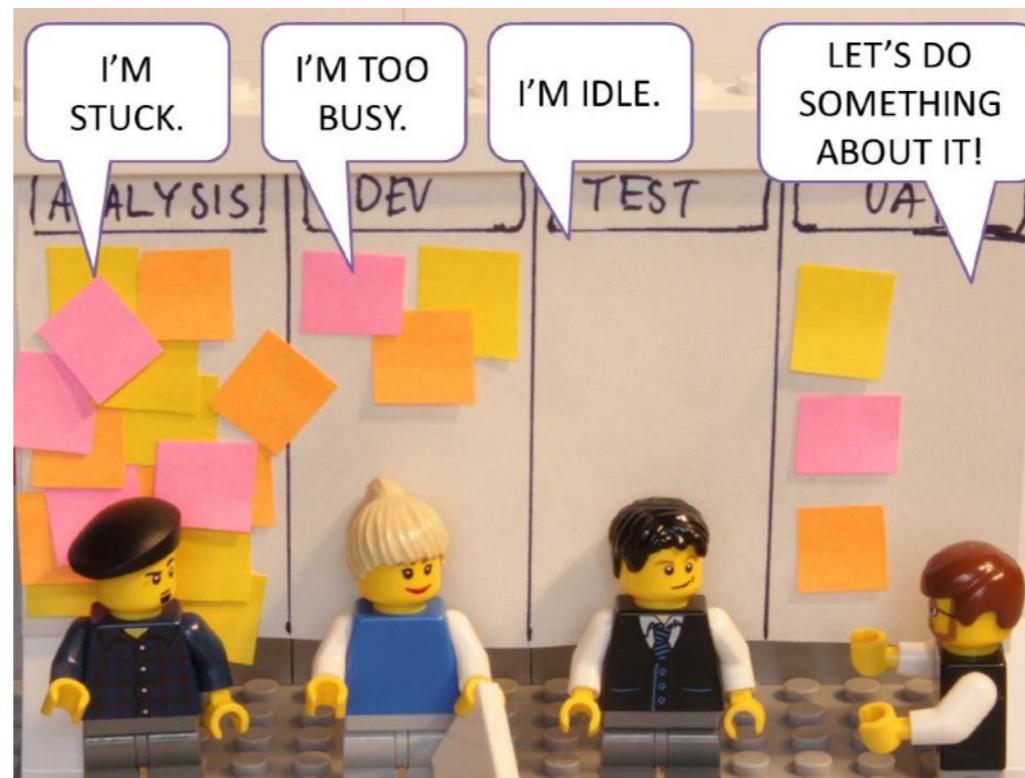
- Applied to Toyota, the goal was to better match their massive inventory levels with the actual consumption of materials.
- A good communication mechanism is required to ensure the optimal alignment.



Visual Board

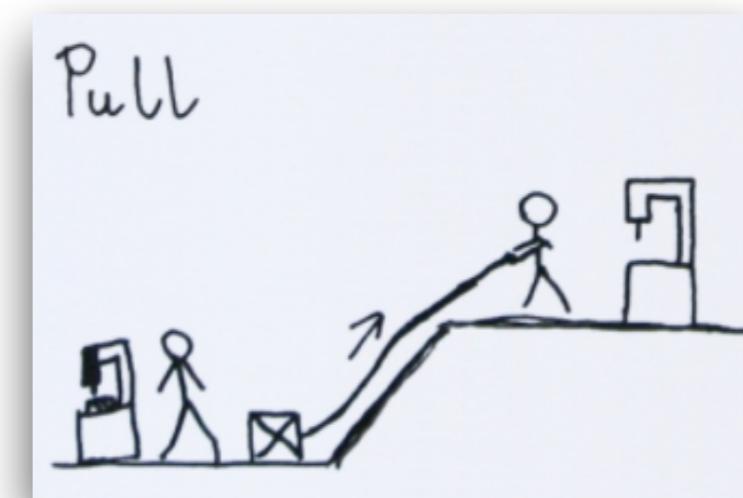
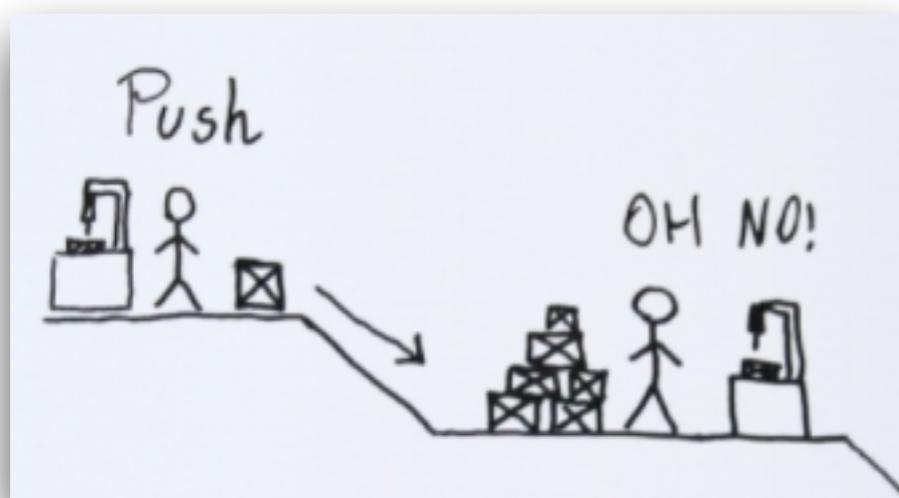
Kanban

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Kanban

- The simplest form — a big board and with story cards
 - Board represents the state of the project at any point.
 - Story cards represent the tasks.
- Work in progress (WIP) is limited. This is done by setting the maximum number of cards to be placed in one particular stage.
- It enables an ability to identify bottlenecks in the system through the board.
- The main aim is to minimizing waste.

What are the possible wastes

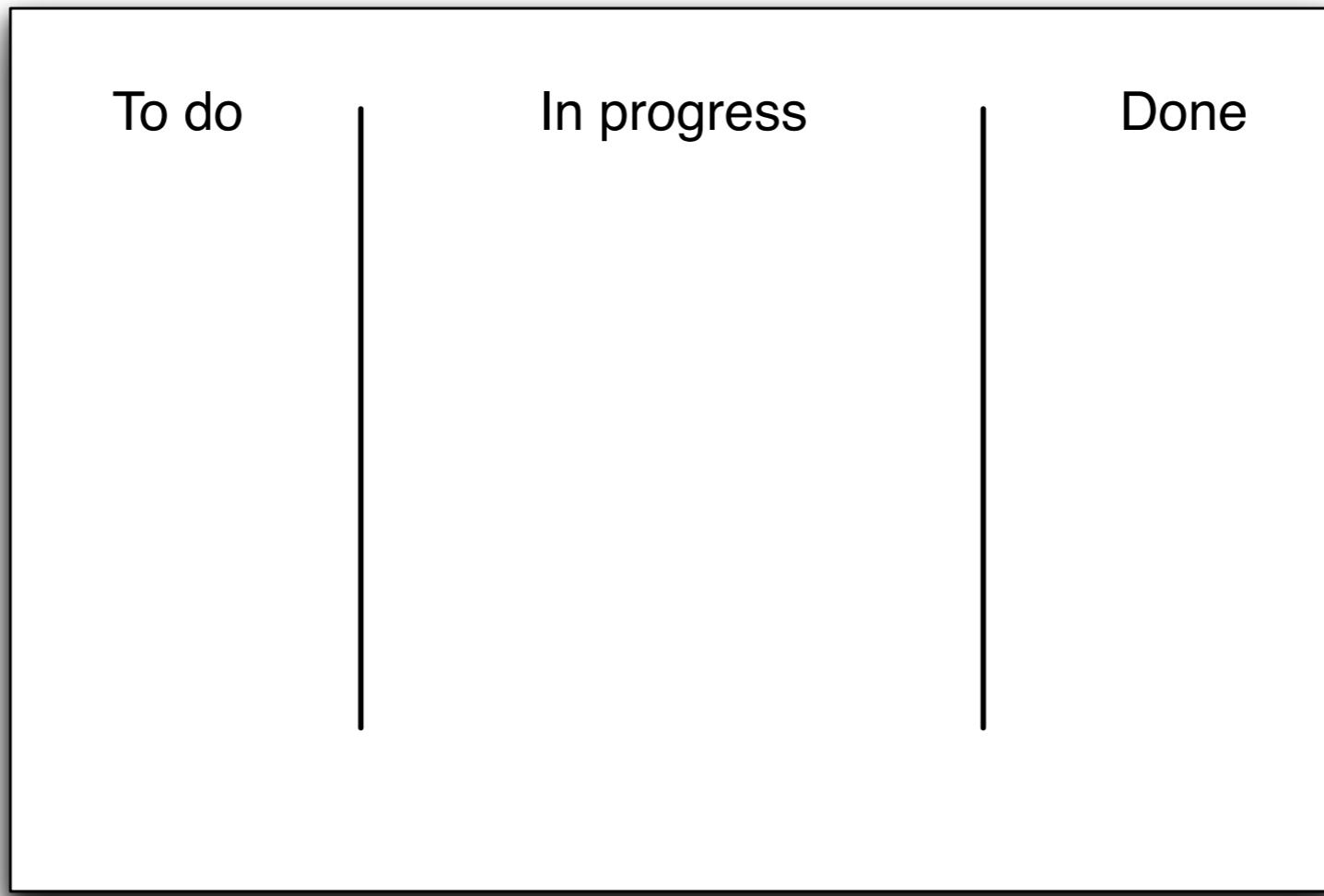
- Overproduction
- Waiting time
- Communication overhead
- The process itself
- Underutilized workers

Kanban — general practices

- Visualize the workflow
- Limit the work in progress (WIP)
- Manage flow
- Continuous measure and implement a feedback loop to improve the life cycle

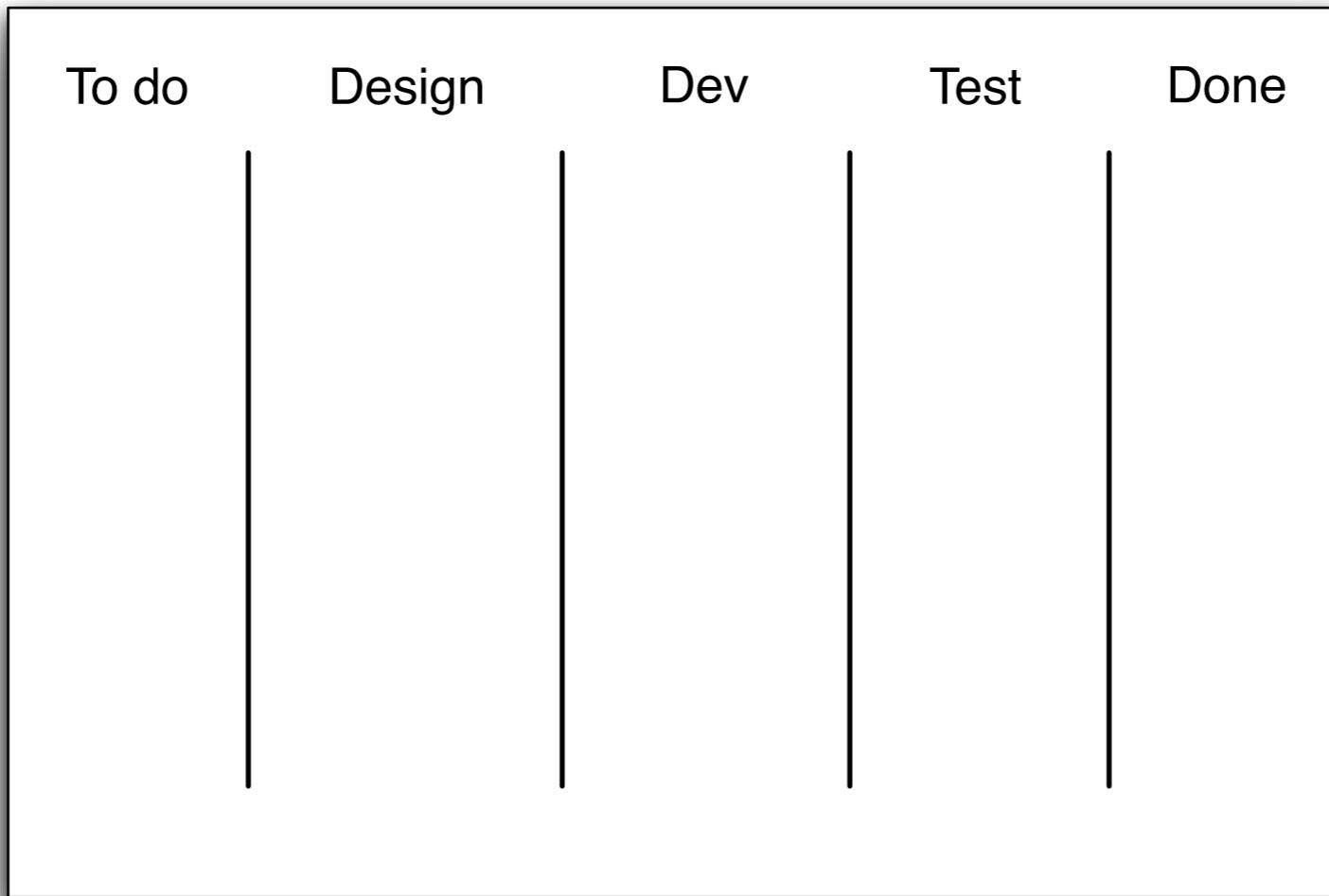
Setup

1. Create a board and divide it into 3 sections —
To do, In progress, and Done



Setup

2. Divide the development process — e.g., design, development, testing, and deployment.
Then replace the in-progress section with these processes.



Setup

3. Make sub queues

To do	Design	Dev	Test	Done
	Doing : Done	Doing : Done	Doing : Done	

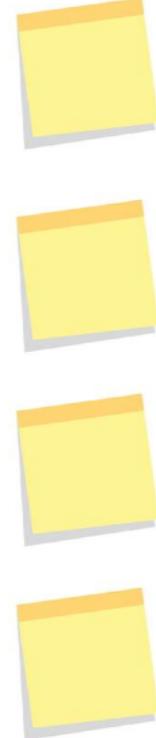
Setup

4. Declare the work-in-progress limit. Rule of thumb is to start with the number of people * 1.5, then fine-tune it later.

To do	Design (2)	Dev (3)	Test (2)	Done
	Doing Done	Doing Done	Doing Done	

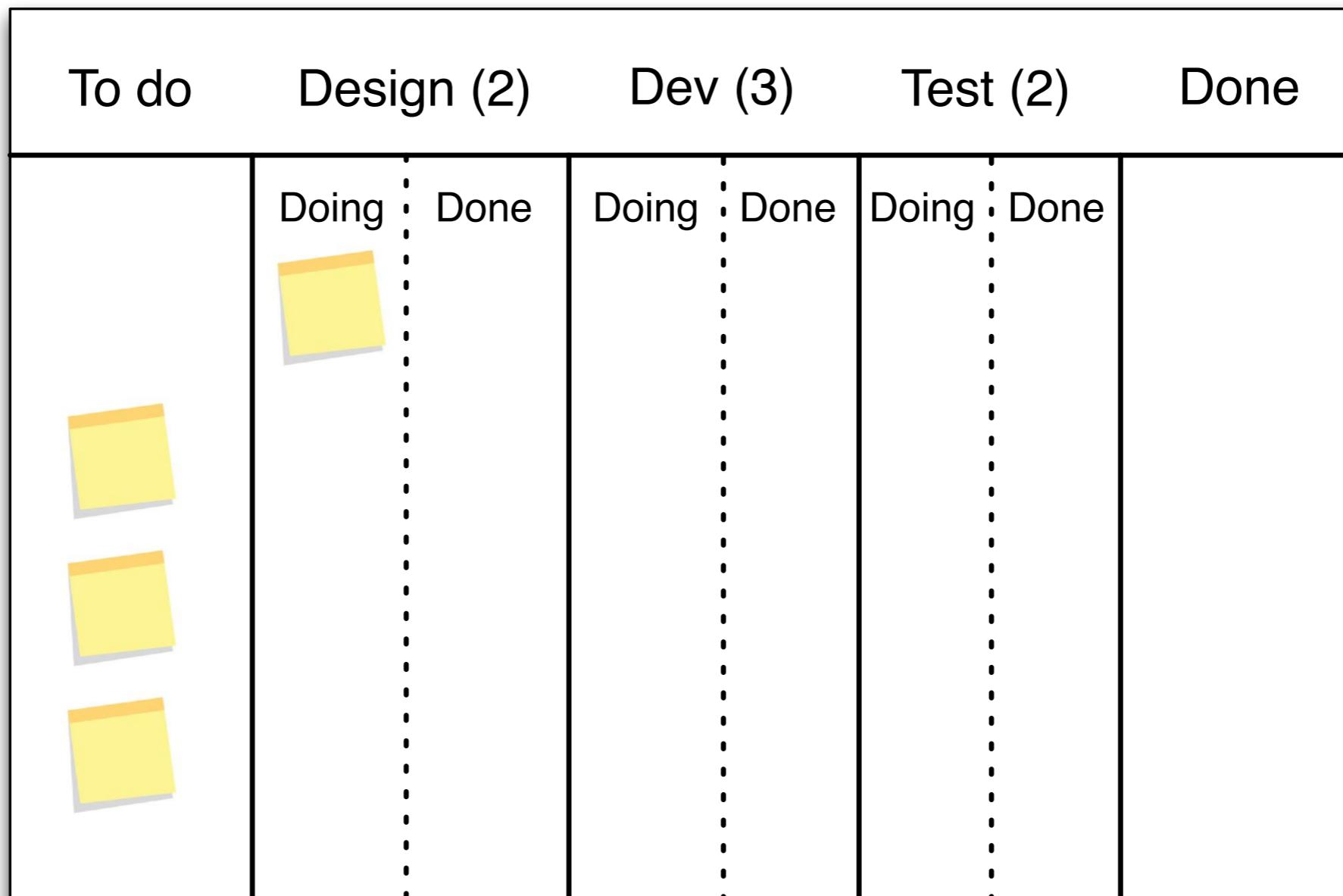
Process

1. Identify tasks and list them in the To do section.

To do	Design (2)	Dev (3)	Test (2)	Done
	Doing	Done	Doing	Done

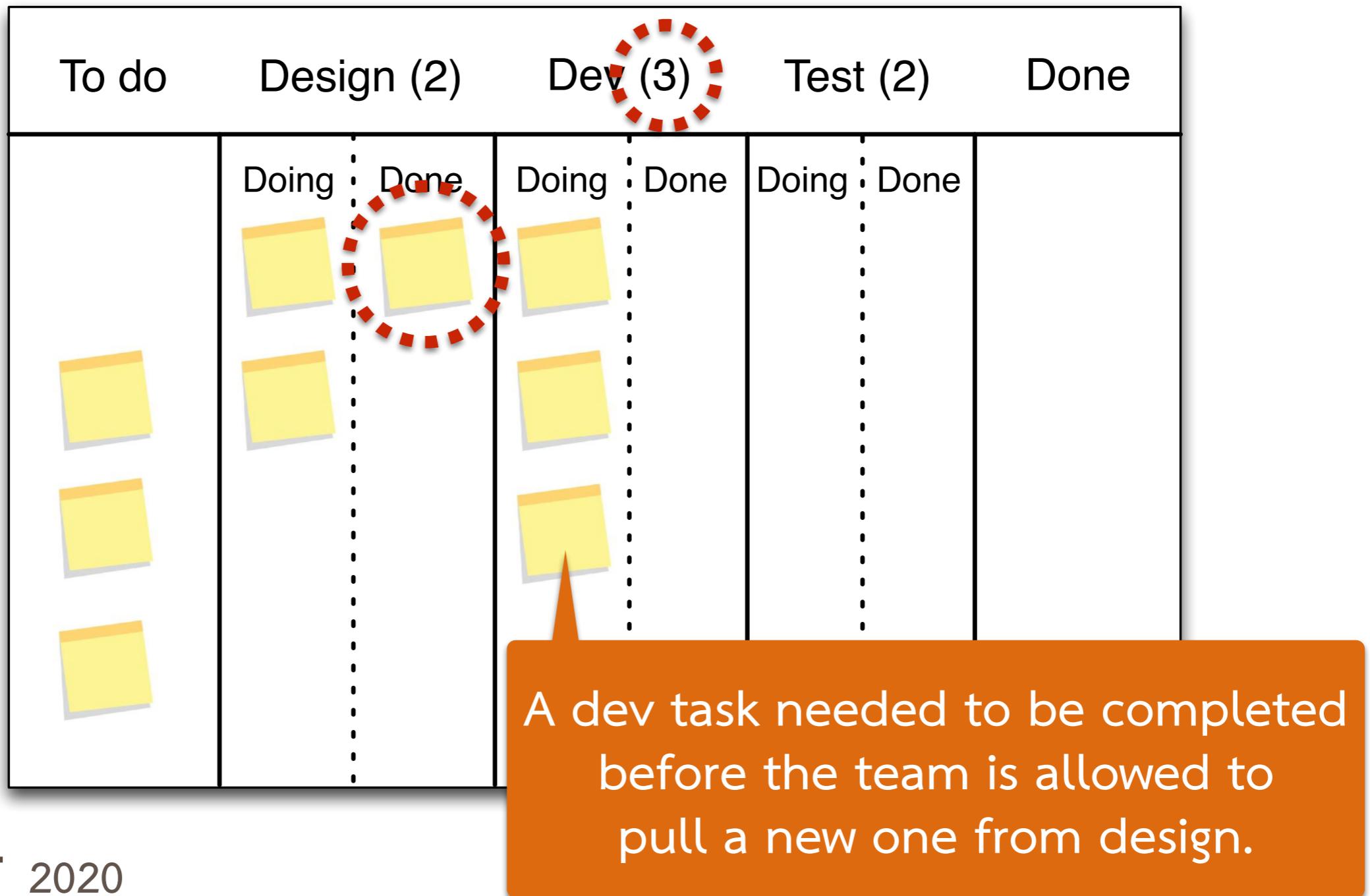
Process

2. Let the person in charge of the process ahead pull the task and work on it.



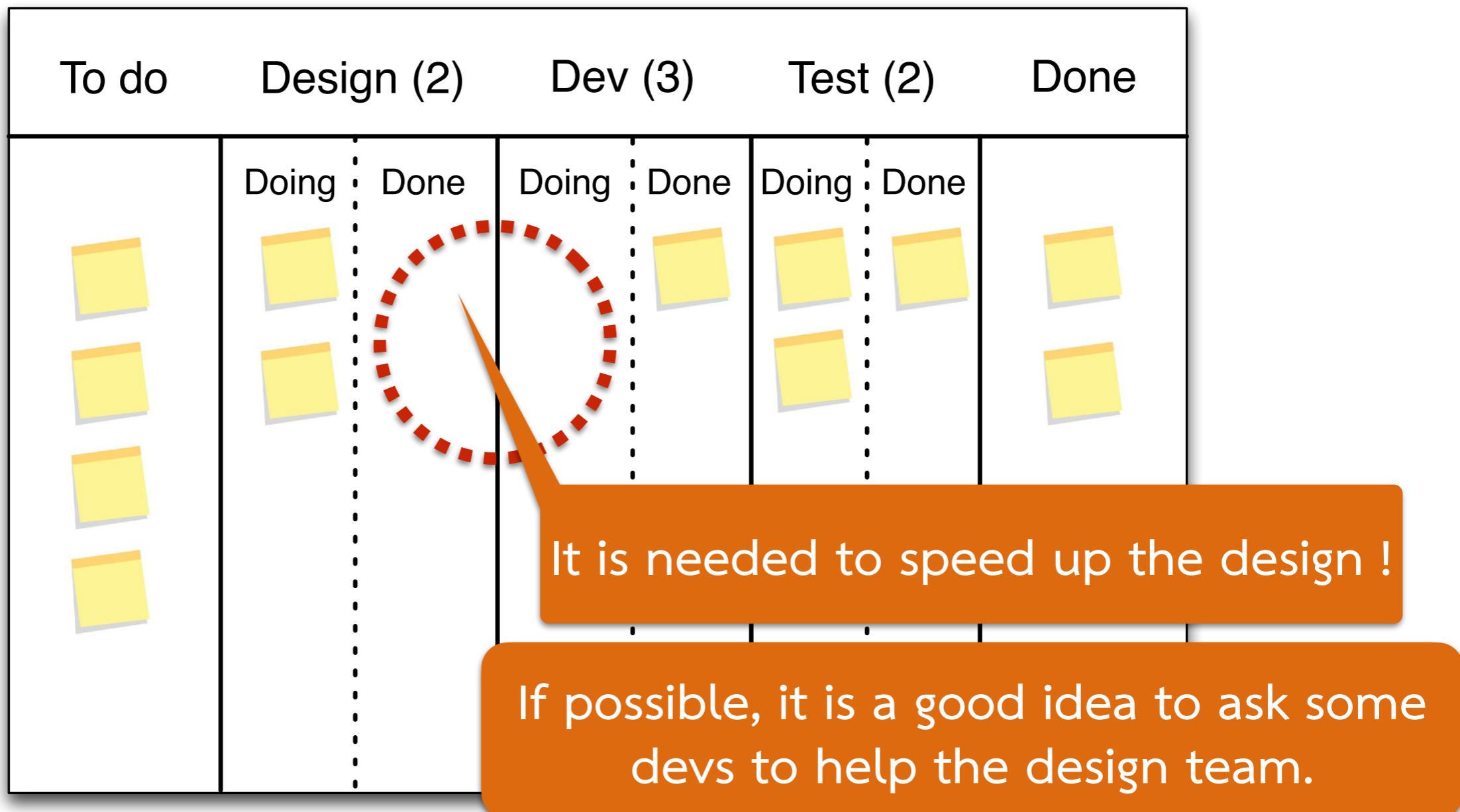
Process

3. The number of tasks per stage is limited by WIP limit.



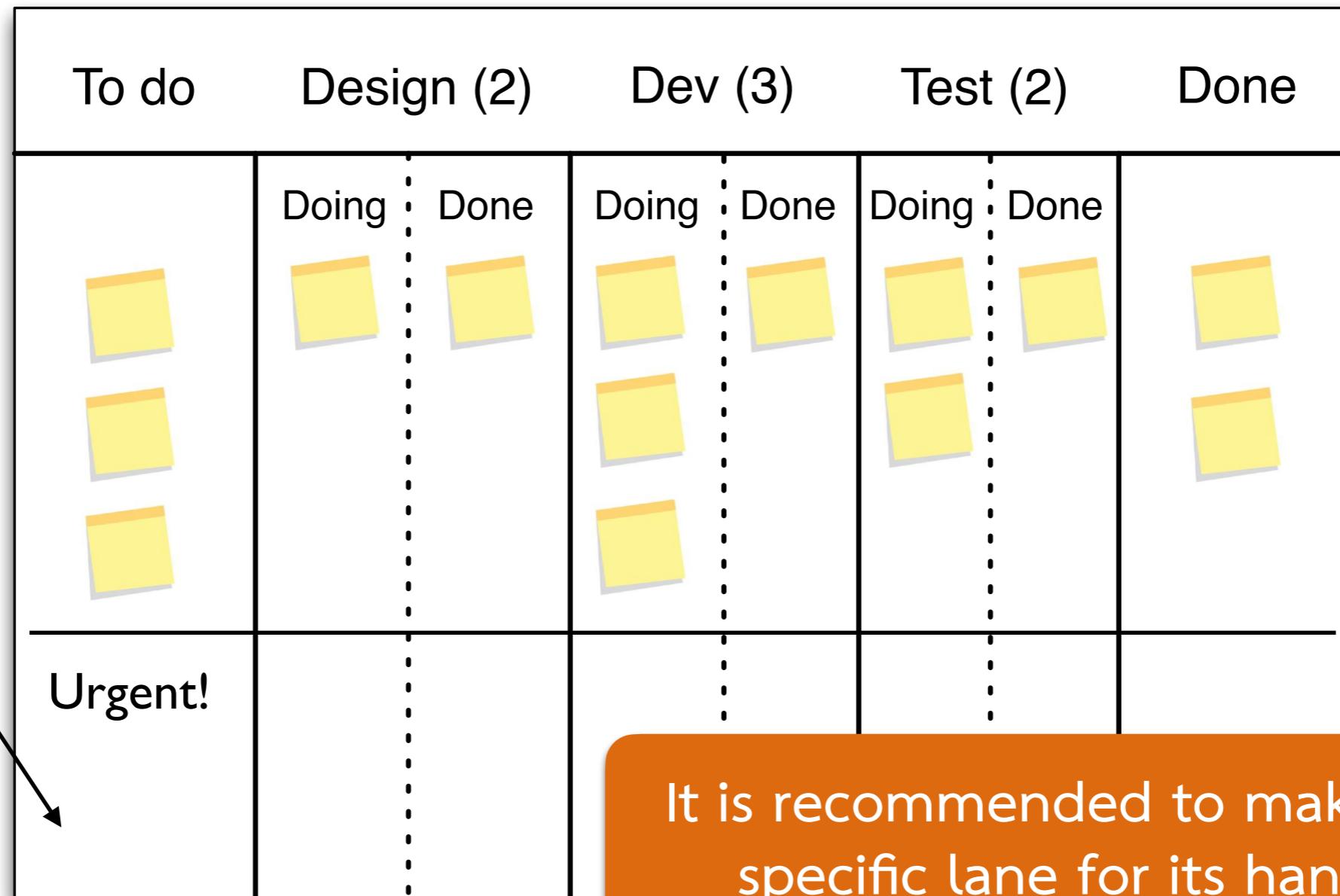
Process

4. Identify and eliminate the bottleneck, e.g.,



Process

5. Handle the urgencies



Process

5. Use different colors to maximize the visibility.

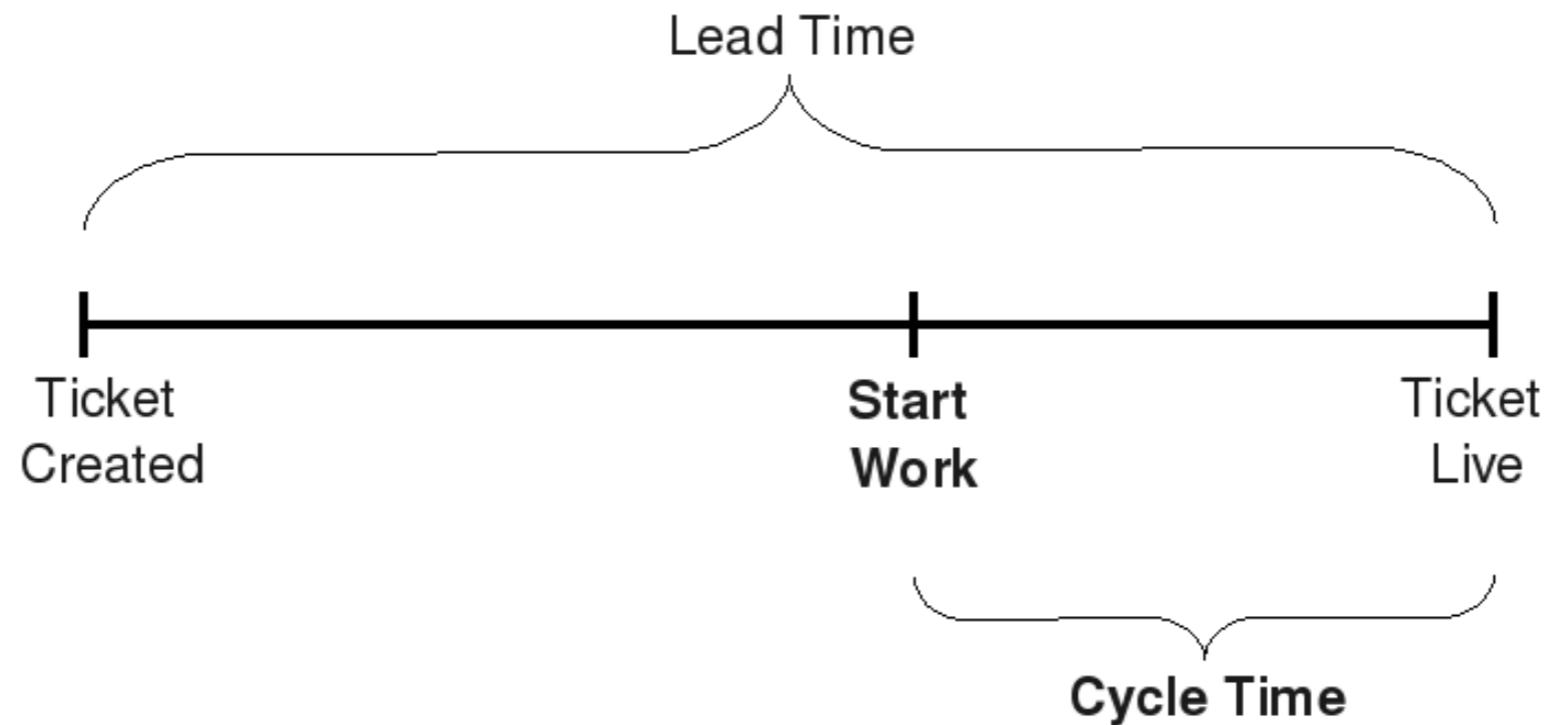


The benefits

- The team will know exactly what to do.
- You will not get overwhelmed by the huge flow of tasks.
- The products can be continuously delivered.
- Bottleneck can be identified at a glance.
- If the process is measured further, several additional advantages will be offered.
 - Shorten the time cycles.
 - Fewer bottlenecks.

Measure and learn

- Cycle time
 - Finish date minus the date a card is pulled from to do.



Measure and learn

- Cycle time
 - Tracking the cycle time gives you an accurate overview of how long individual cards take to complete.
 - You can't improve what you can't measure

Measure and learn

- Cycle time — discussion



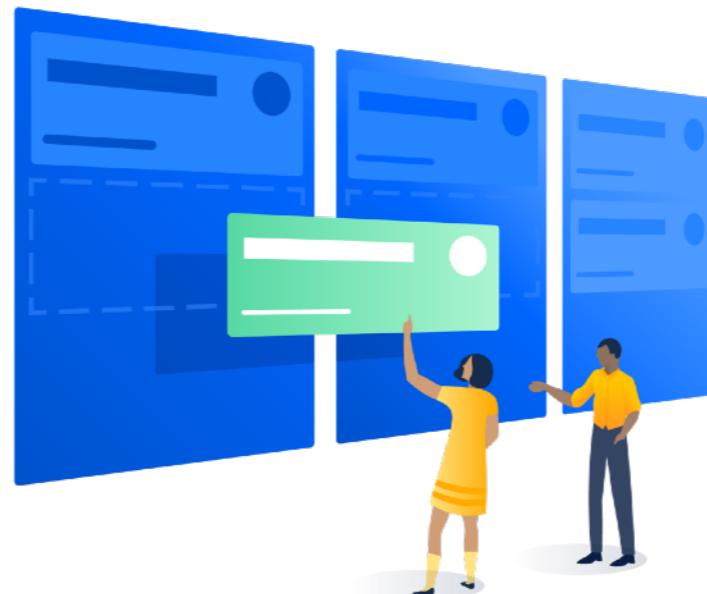
Disneyland's public display of cycle-times

Measure and learn

- Cycle time
 - A supportive materials to negotiate the budget with a client.
 - A good resource used in project planning, e.g., time, cost, and resource estimation
 - A good resource used in predicting the scalability — hiring decision.
 - If you suddenly find that the entire of your programmer team are spending extra hours every day working on issues, it means that it is time to hire a new full time employee.
- Overlapping skill sets lead to smaller cycle times.

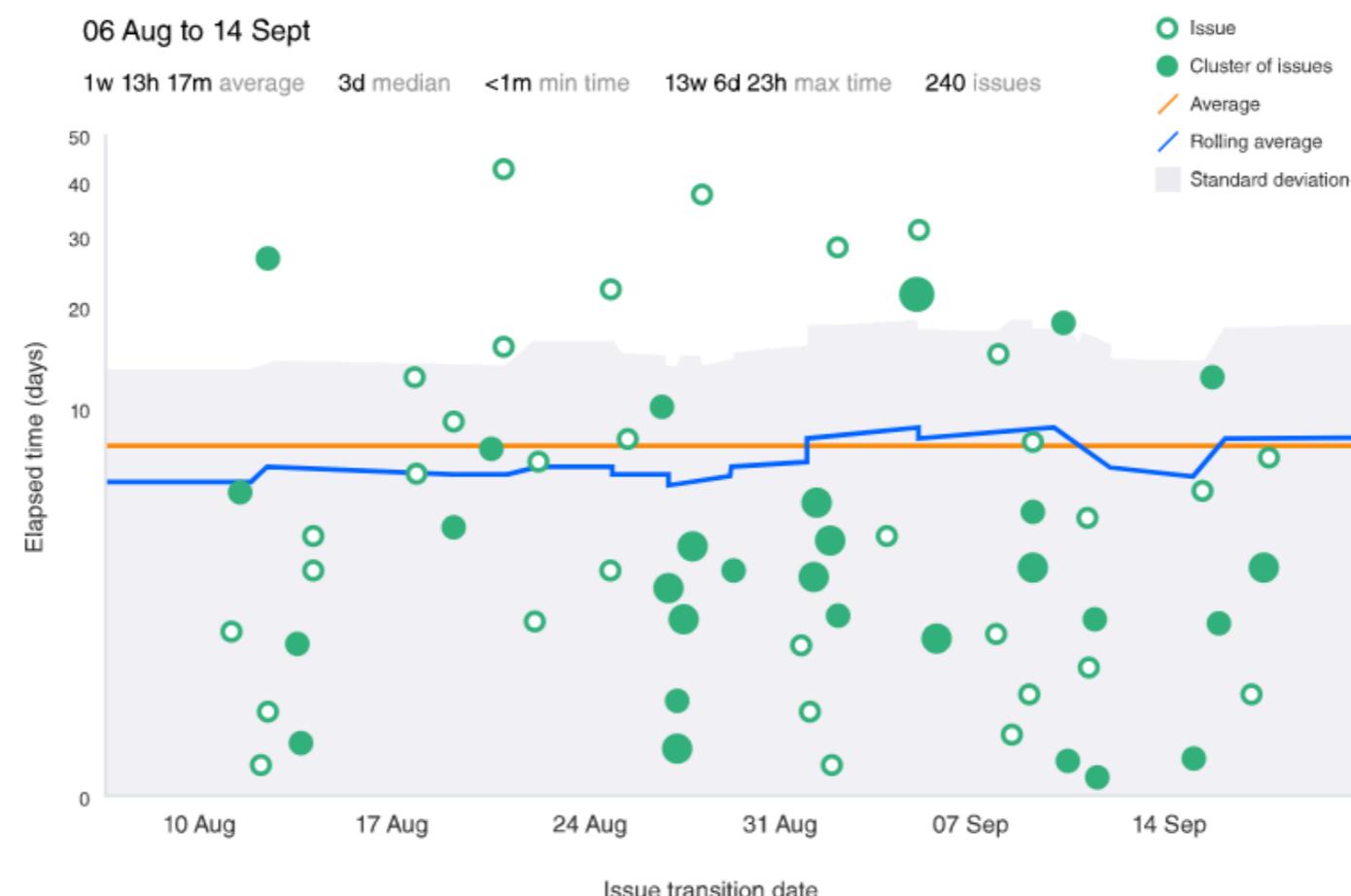
Measure and learn

- Flow
 - When the team can clearly see the data, it seems to be easier to spot bottlenecks in the process.
 - Two common reports are **control charts** and **cumulative flow diagrams**.



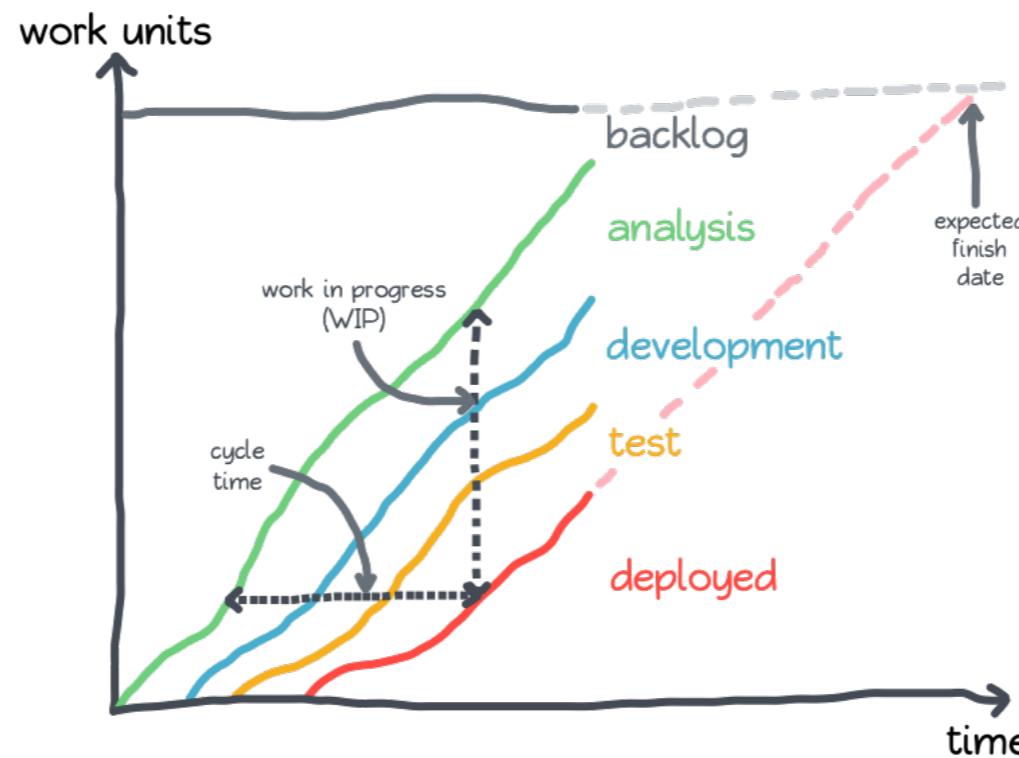
Measure and learn

- Control chart
 - It shows the cycle time for each issue as well as the overall mathematical mean.



Measure and learn

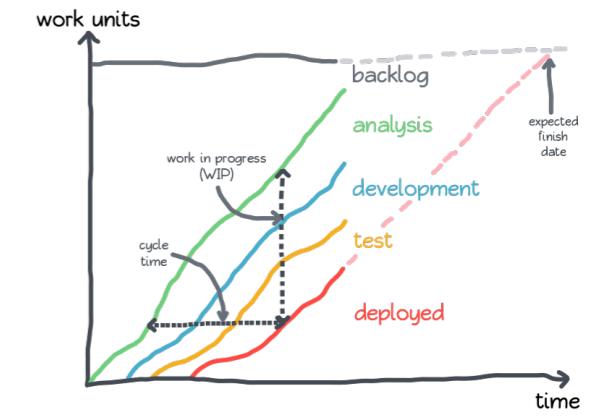
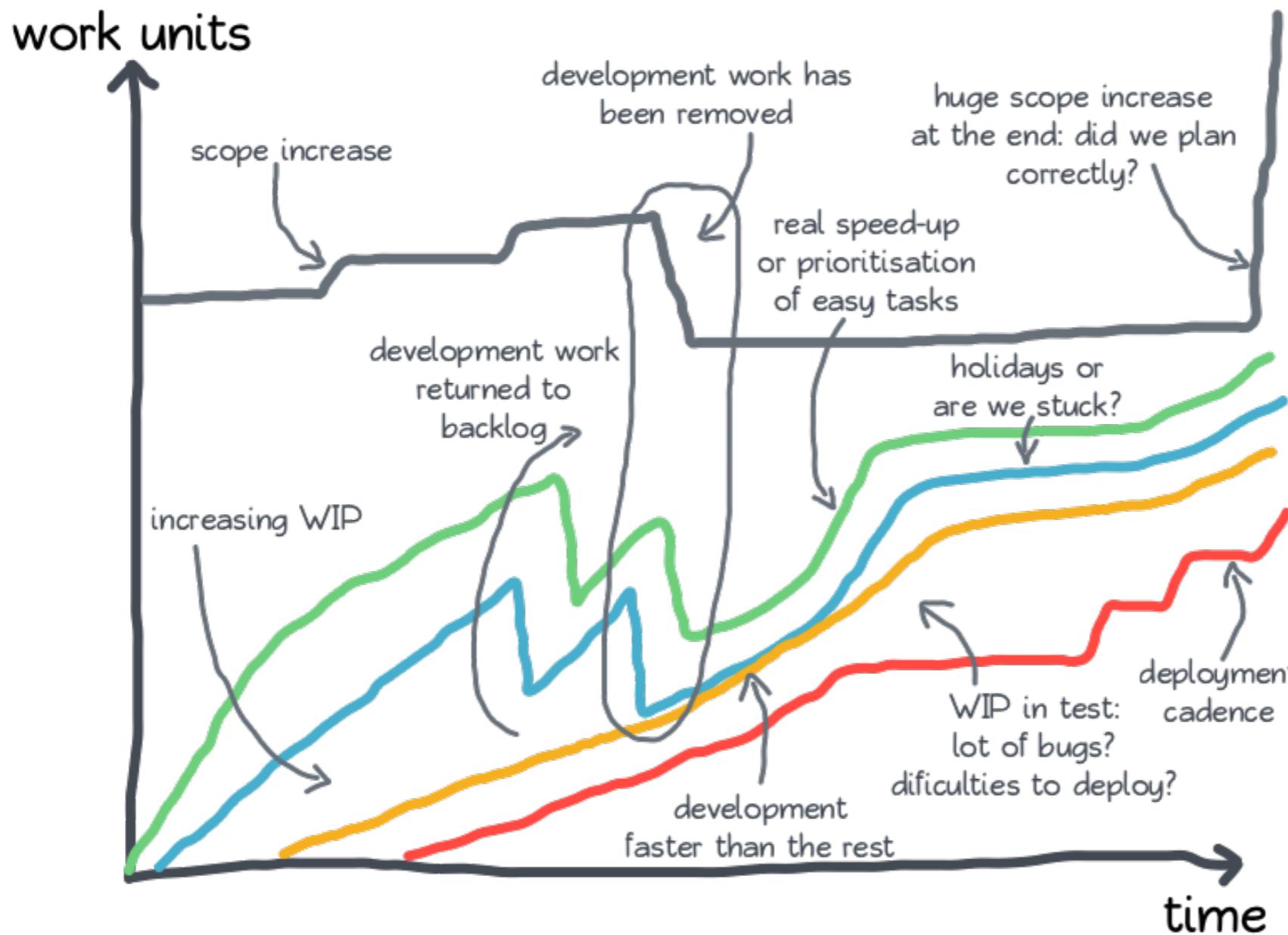
- Cumulative flow diagram
 - It shows the number of issues in each state.
 - Blockages can be simply identified by seeing the number of issues increase in any given state.



<http://leanguru.pro/the-cumulative-flow-chart-cfd-in-a-nutshell/> (Accessed Jan 2018)

Measure and learn

- Cumulative flow diagram



<http://leanguru.pro/the-cumulative-flow-chart-cfd-in-a-nutshell/> (Accessed Jan 2018)

Summary

- Kanban was designed to help you use the available resources in the best possible way.
- Kanban helps you to find the bottlenecks before they become a big problem.
- Workflow visualization is one of the most important components of Kanban.
- Kanban helps you to make incremental improvements.

<https://xbsoftware.com/blog/software-development-life-cycle-sdlc-all-about-kanban/> (Accessed Jan 2018)

Summary — When to start

- A more accurate and predictable delivery time is needed.
- Higher quality in deliverables are required.
- Current commitment to tasks is causing waste and extra reworking.
- The workflow needs to be more smooth.
- The process and staffs are being overloaded.

Summary — Kanban will ensure:

- Fewer customer escalations
- Shorter time to market
- Reduced cost
- Fewer missed deadlines
- Higher product quality

To quickly see the benefits

- Make a personal Kanban board for your everyday task



Assignment #2

- Trello (<https://trello.com>) is good Kanban app that offers a free-tier service.
- For 21 days, try using a Kanban to manage your study and or life activities, e.g., logging tasks you have to do for all the courses you are studying (maybe plus your life tasks).
- Write a report showing the screenshot of your Trello board for the n^{th} day that are divisible by 3.
Then discuss
 - How do you feel about personal Kanban boards.
 - What are missing and you think it is beneficial.

Assignment #2

- This is a solo work.
- Start logging on Mon Jan 4, 2021 and hand in the report on Mon 25, 2021.
- This assignment worth the total of 4 points of your total grade.
 - Each of the significantly different consecutive screenshots worth 0.25 point, e.g., Jan 6 -> Jan 9 -> Jan 12 -> Jan 15 -> Jan 18 -> Jan 21 -> Jan 24
 - The discussion worth 2.25 points

Question Time

