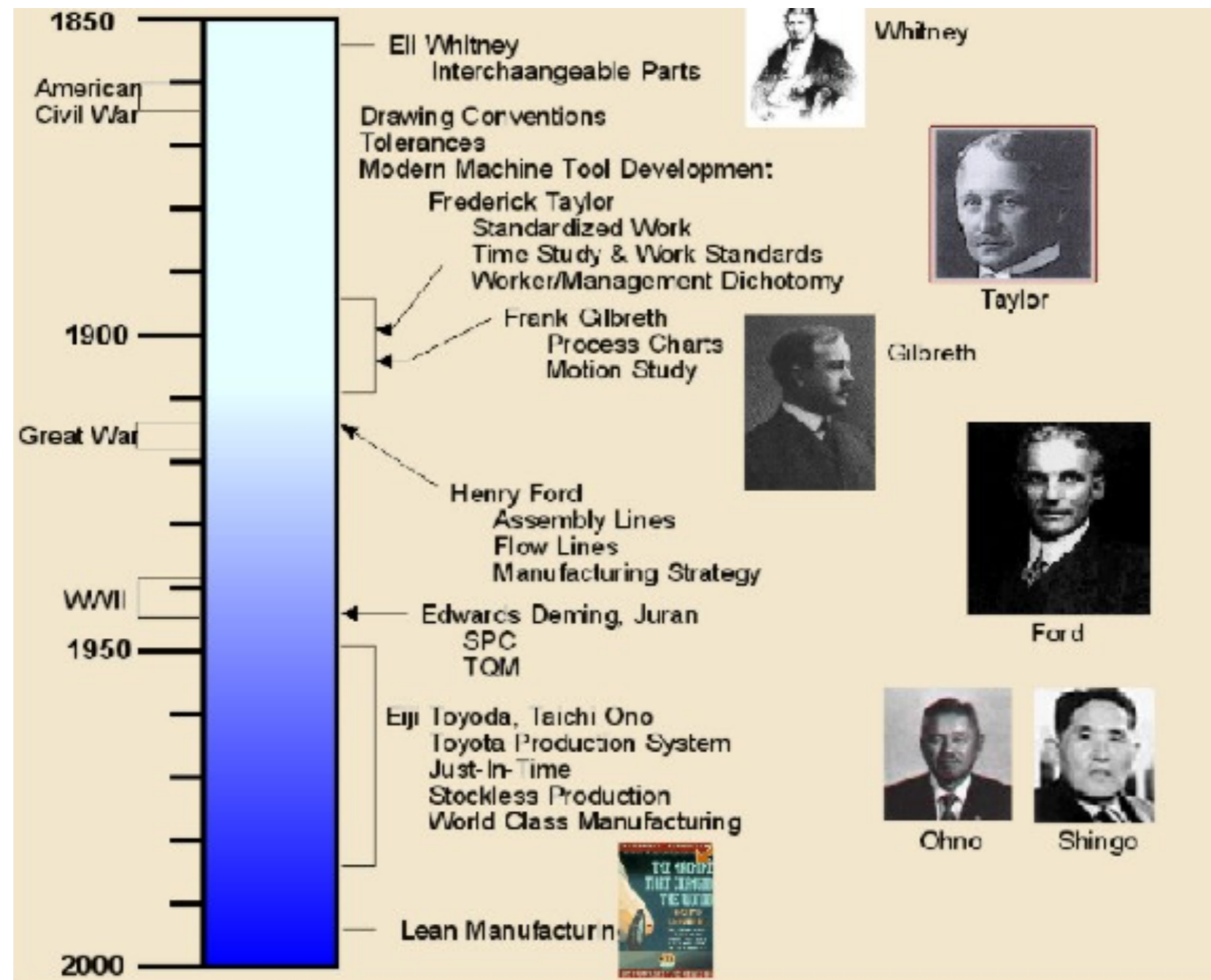# Agile Methods

Morgan Ericsson
<morgan.ericsson@chalmers.se>

Lean Manufacturing

- Japan and Toyota in the '40-'50s
- Bad economy, need to survive
  - maximize customer value, minimize waste
  - continuous process improvement
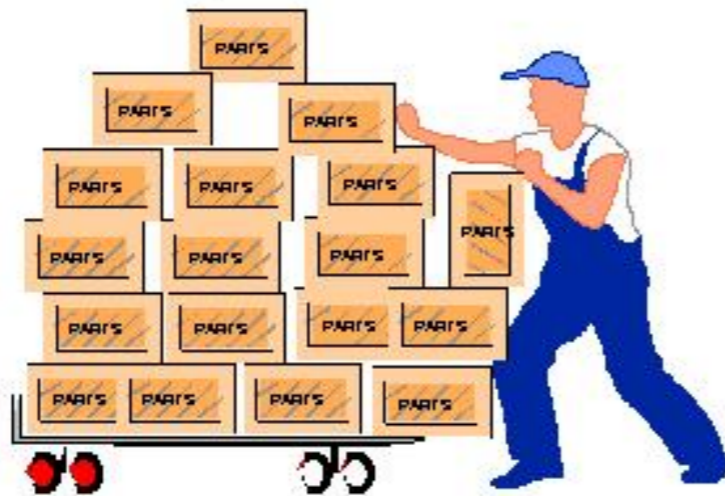 - bring out the best in people

History of Lean

Kanban

- Pull-based inventory control system

- Why a need to control inventory?

- Inventory is waste

  - and waste should be eliminated

- Physical card system

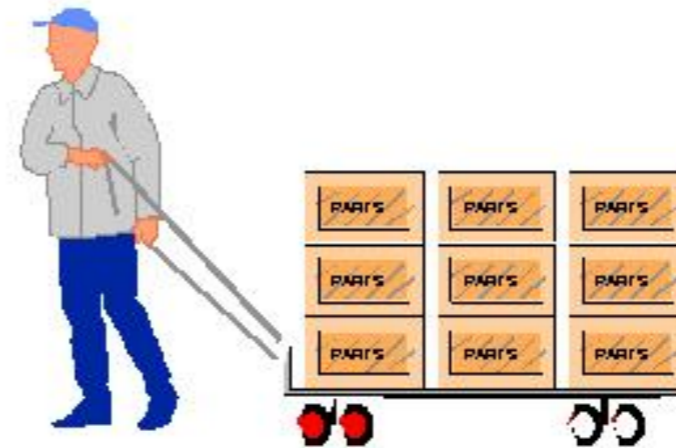- (Kan = visual, ban = card/board)

Push/Pull

Waste

- Three kinds of waste
    - muda
    - mudi
    - mura

Muda (waste)

- Transportation

- Inventory

- Motion

- Wait

- Over-processing

- Over-production

- Defect

Mura (unevenness)

- Imbalance

- Fluctuation

- Irregularity

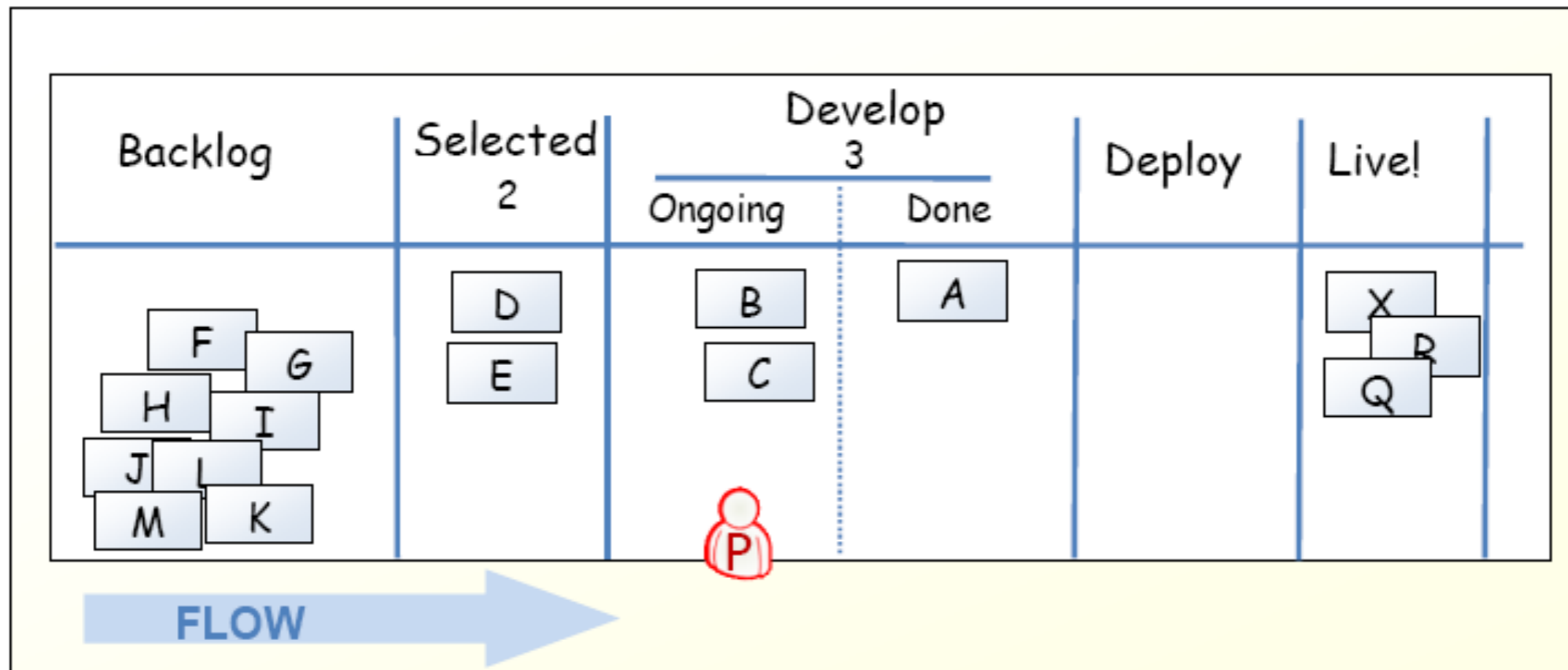- Deviation

Muri
(unreasonableness)

- Overload

- Overburden

- Congestion

Practices

- Visualize the Work

- Limit Work in Progress

- Enable continuous improvement

Kanban Board

Limiting Work in Progress

- Reduce multi-tasking

  - prevent context switching

  - performing tasks sequentially yields results sooner

- Maximize throughput

- Enhance teamwork

  - working together to make things done

  - increase cross-functionality

WiP Limit Strategy

- Start with some initial value

  - small constant (1-3)

  - number of developers

  - number of testers

- Measure the cycle time

  - average time of one piece full cycle flow

- Change limit to decrease cycle time

Idle Members

- Can you help progress and existing kanban? – Work on that.

- Don't have the right skills? – Find the bottleneck and work to release it.

- Don't have the right skills? – Pull in work from the queue.

- Can't start anything in the queue? – Check if there any lower priority to start investigating.

- There is nothing lower priority? – Find other interesting work (refactoring, tool automation, innovation).
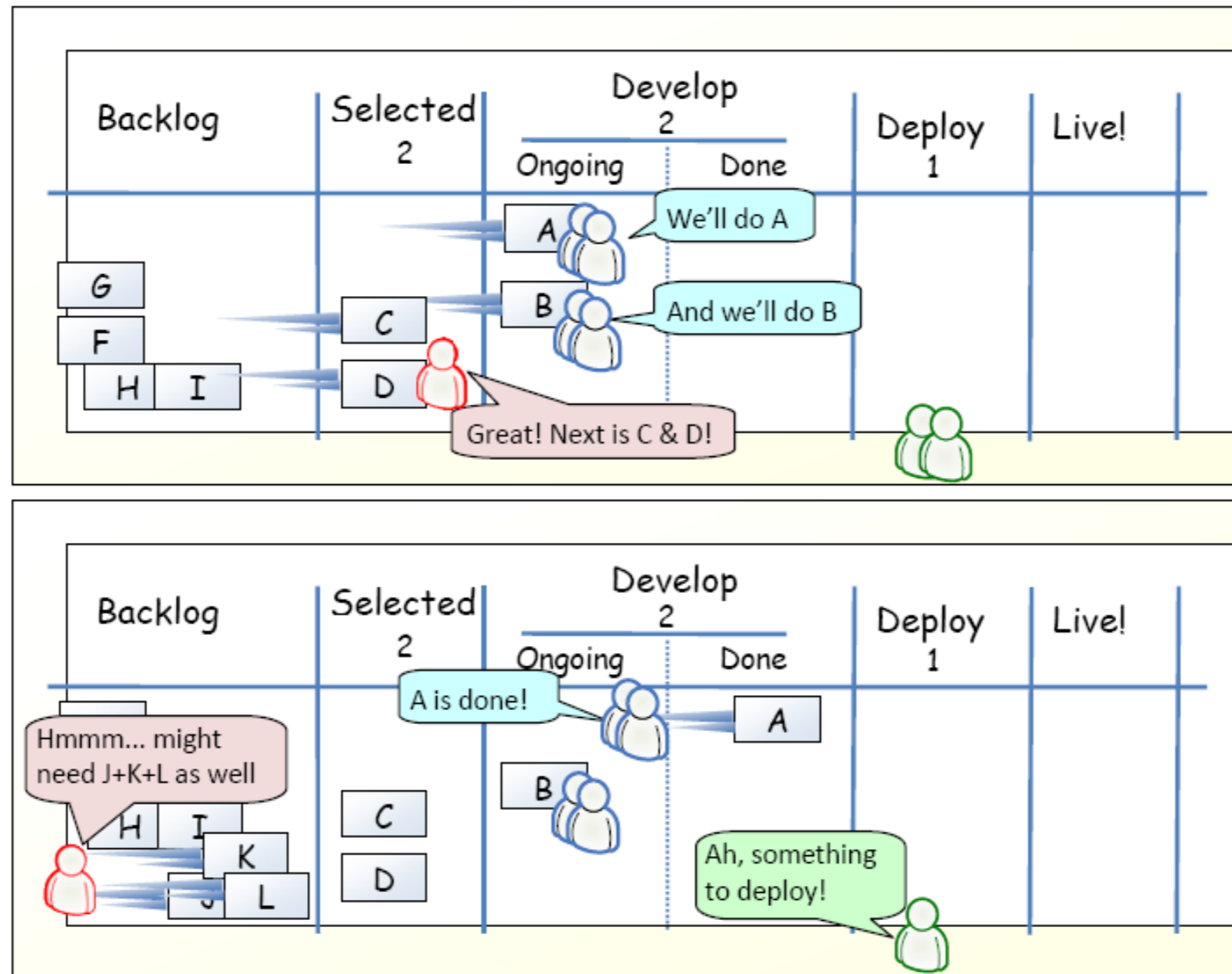
Metrics

- Stories in progress (SIP)

- When story enters stories queue set entry date (ED)

- When story enters first process step set start processing date (SPD)

- When story is done set finish date (FD)

- Cycle time (CT) = FD – SPD

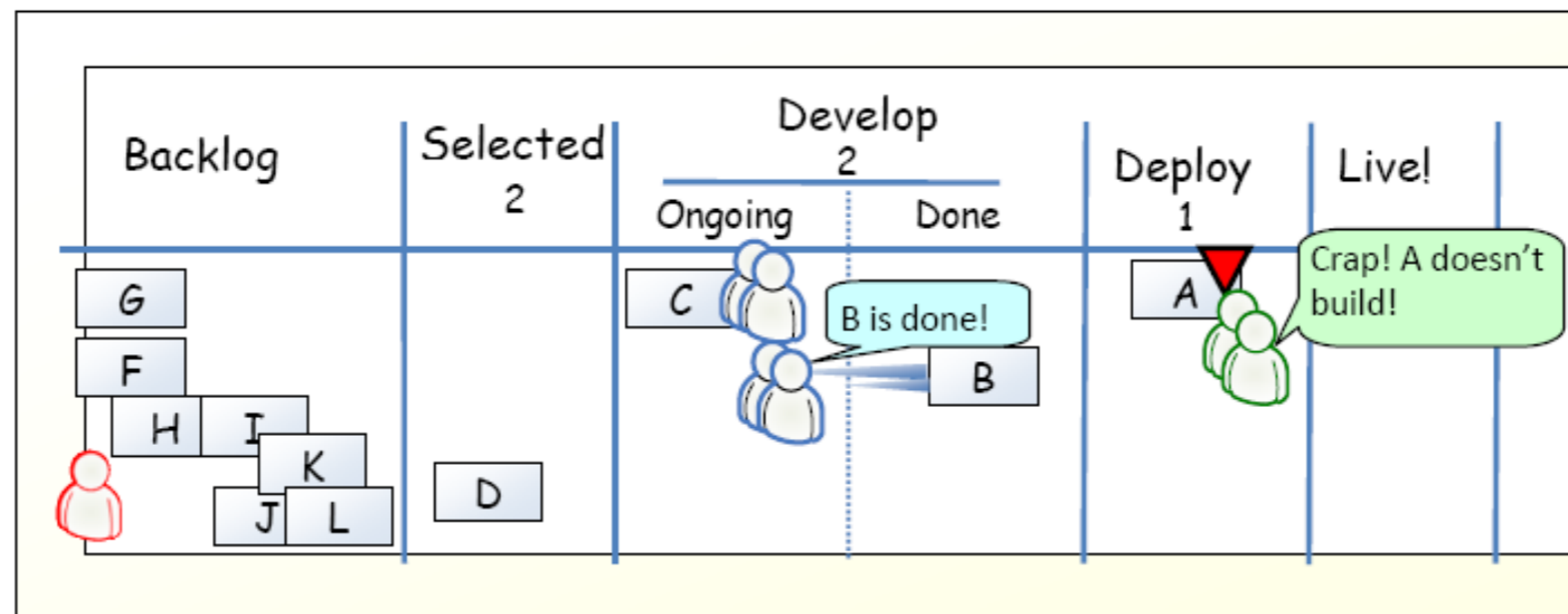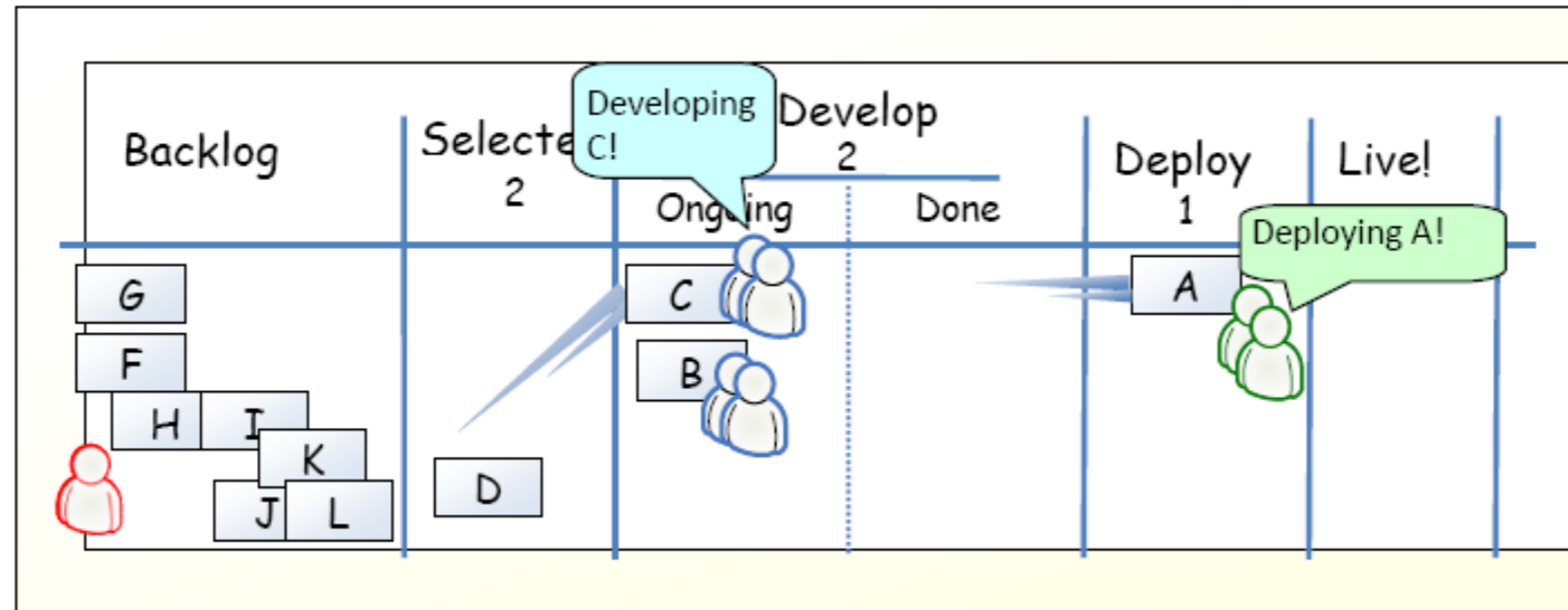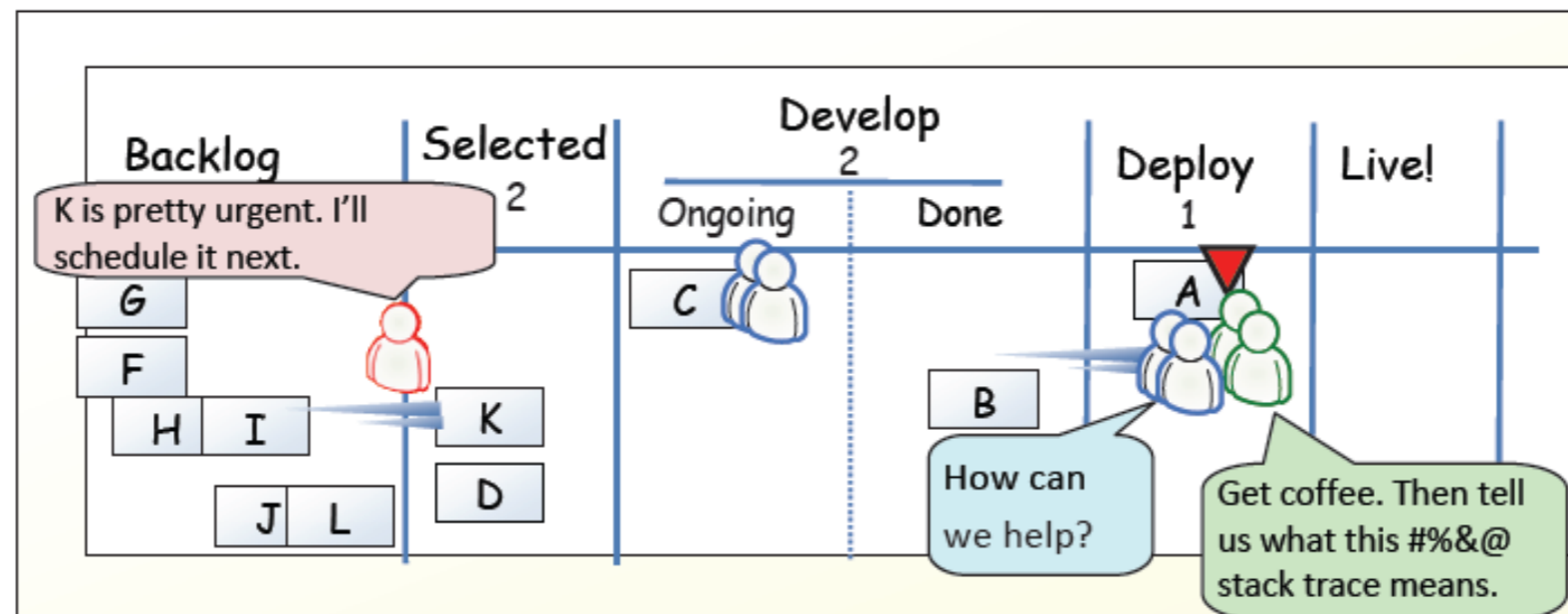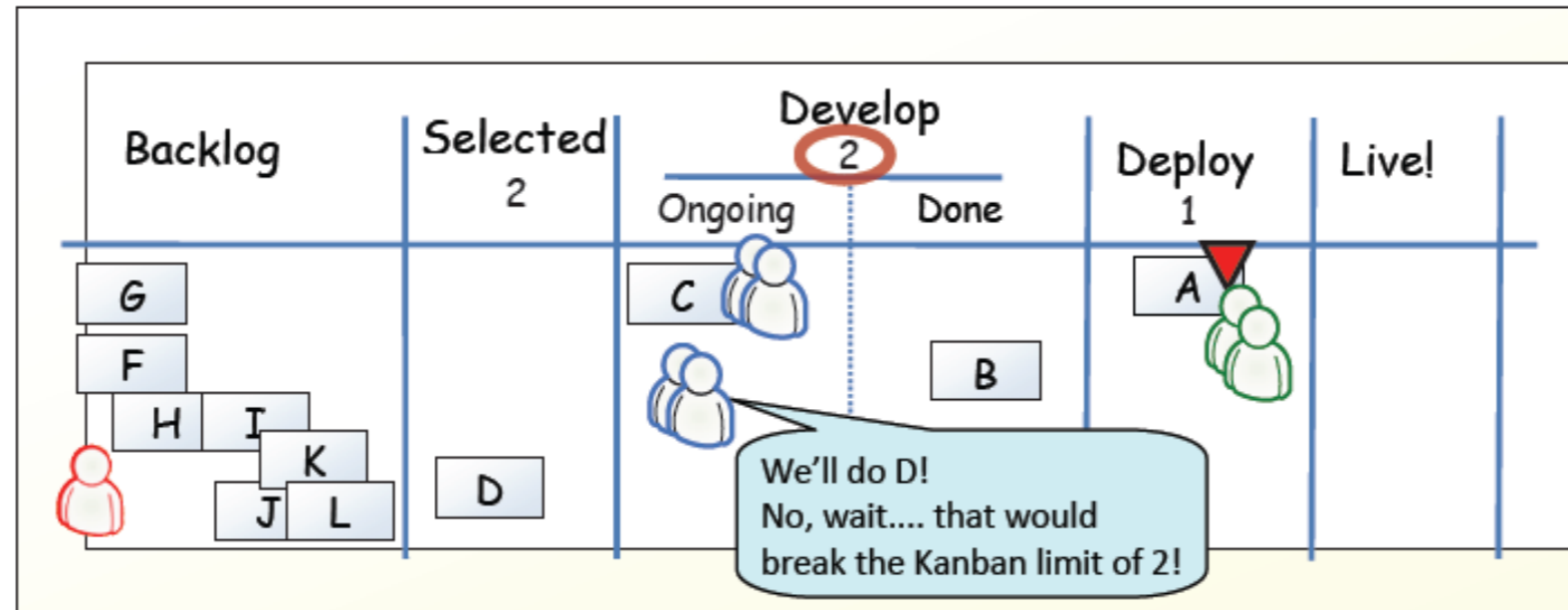- Waiting time (WT) = SPD – ED

- Throughput (T) = SIP / CT

Example
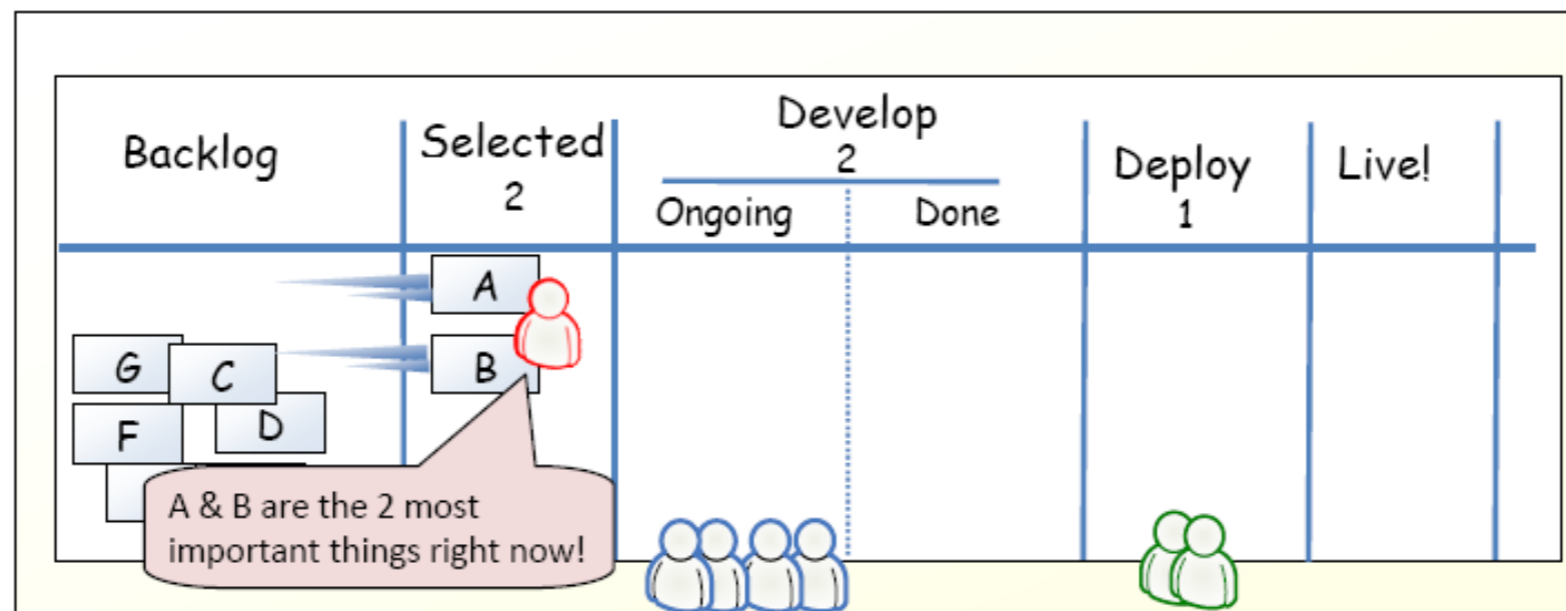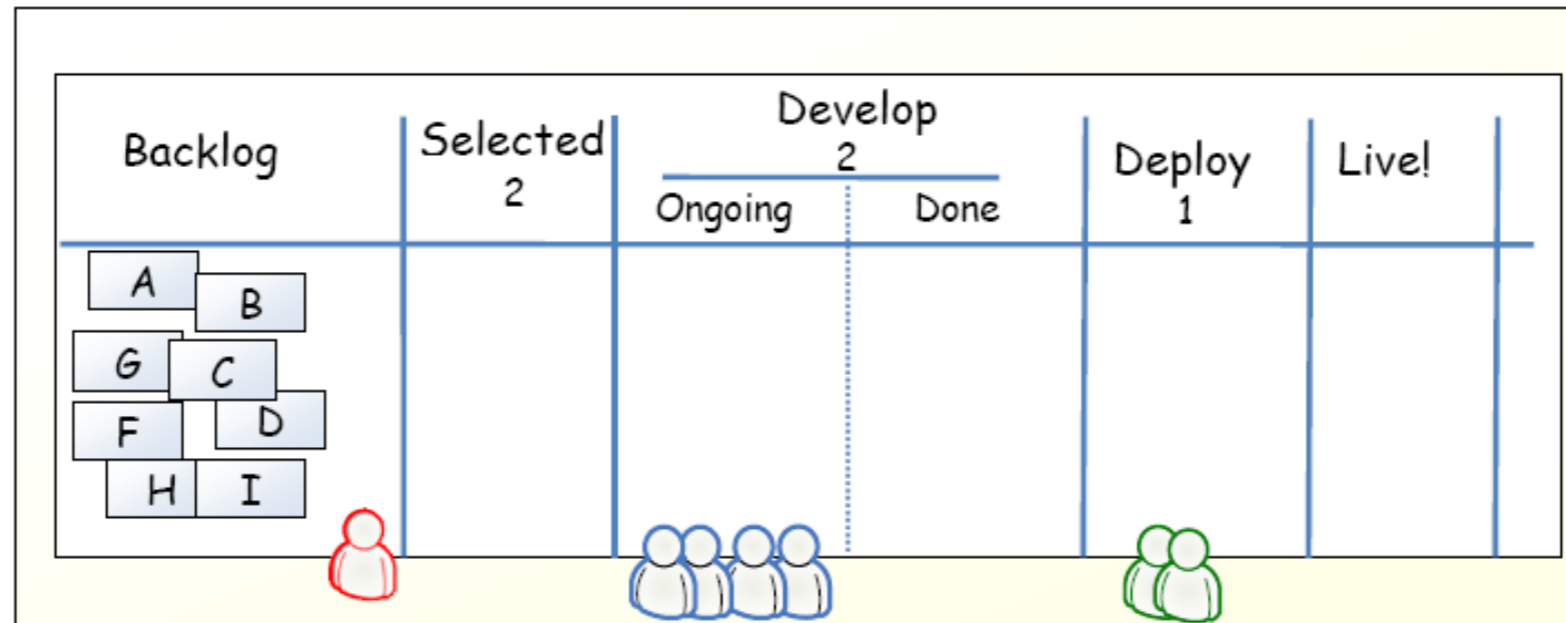
Example

Example
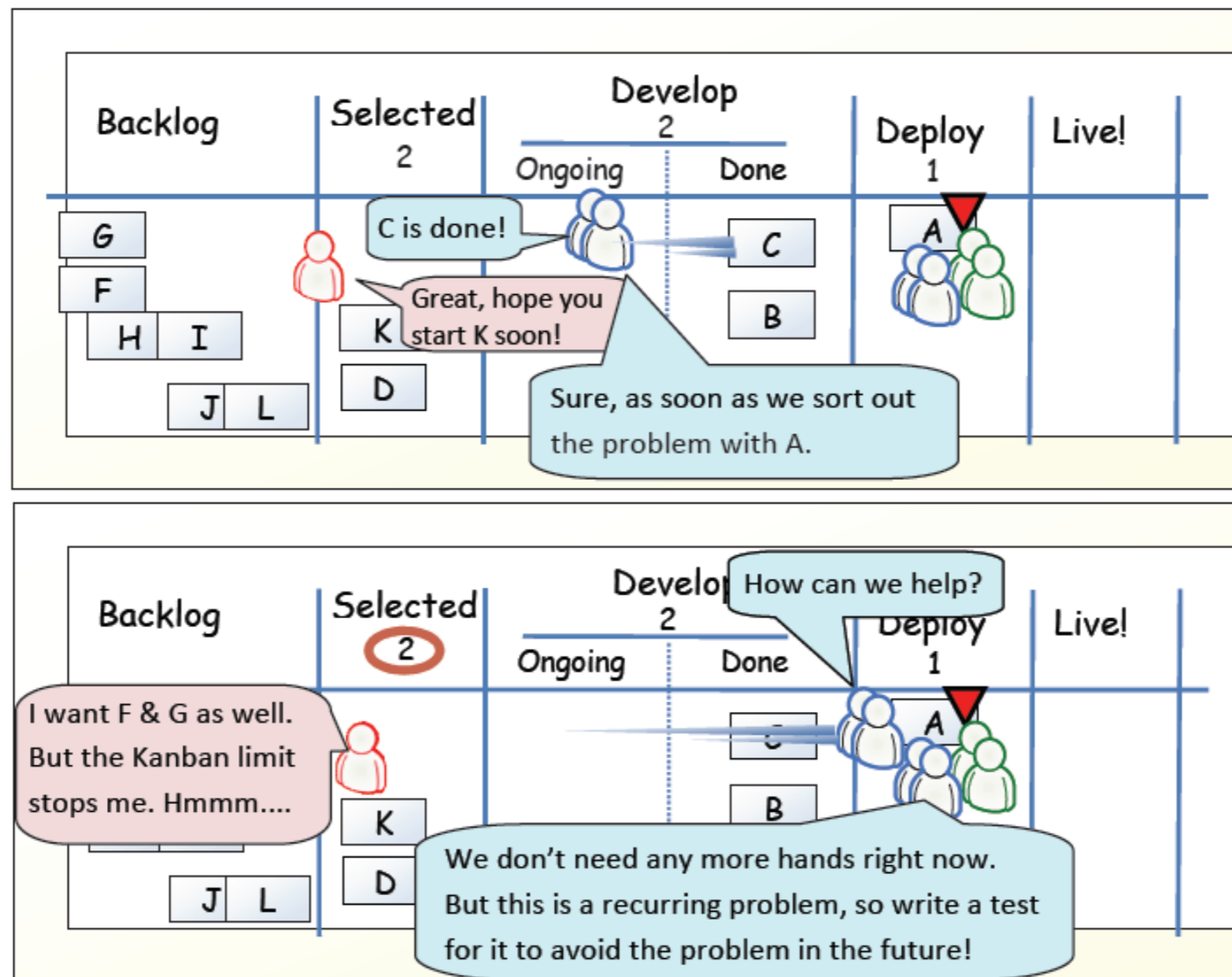
Example

Example

Example
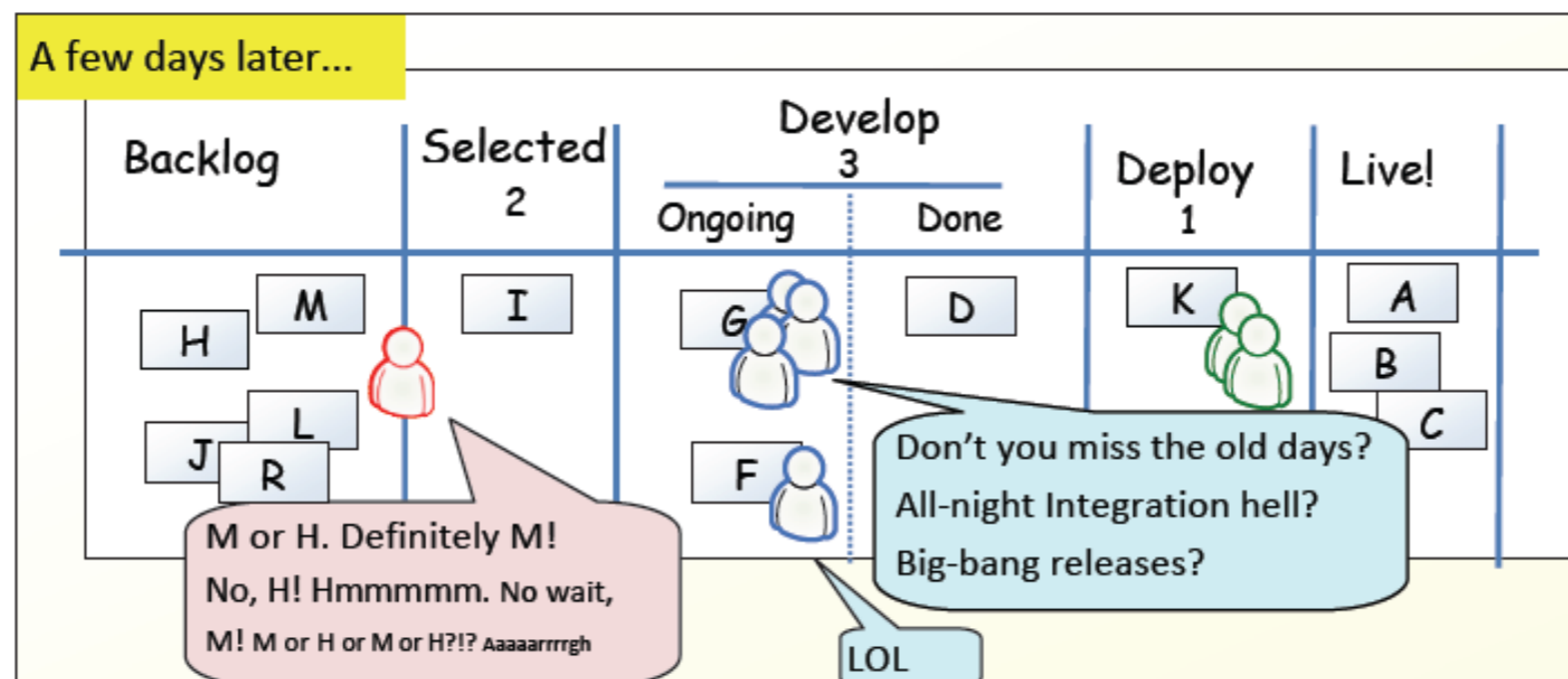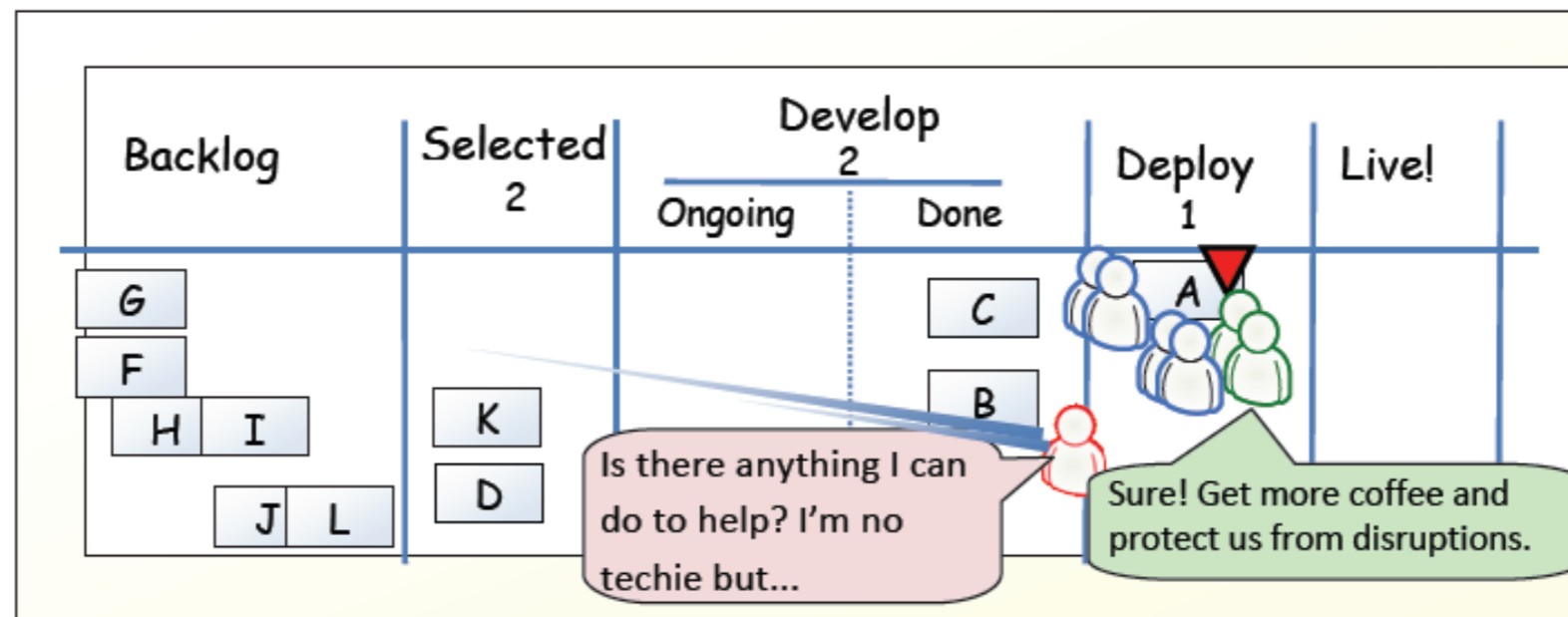
vs Scrum
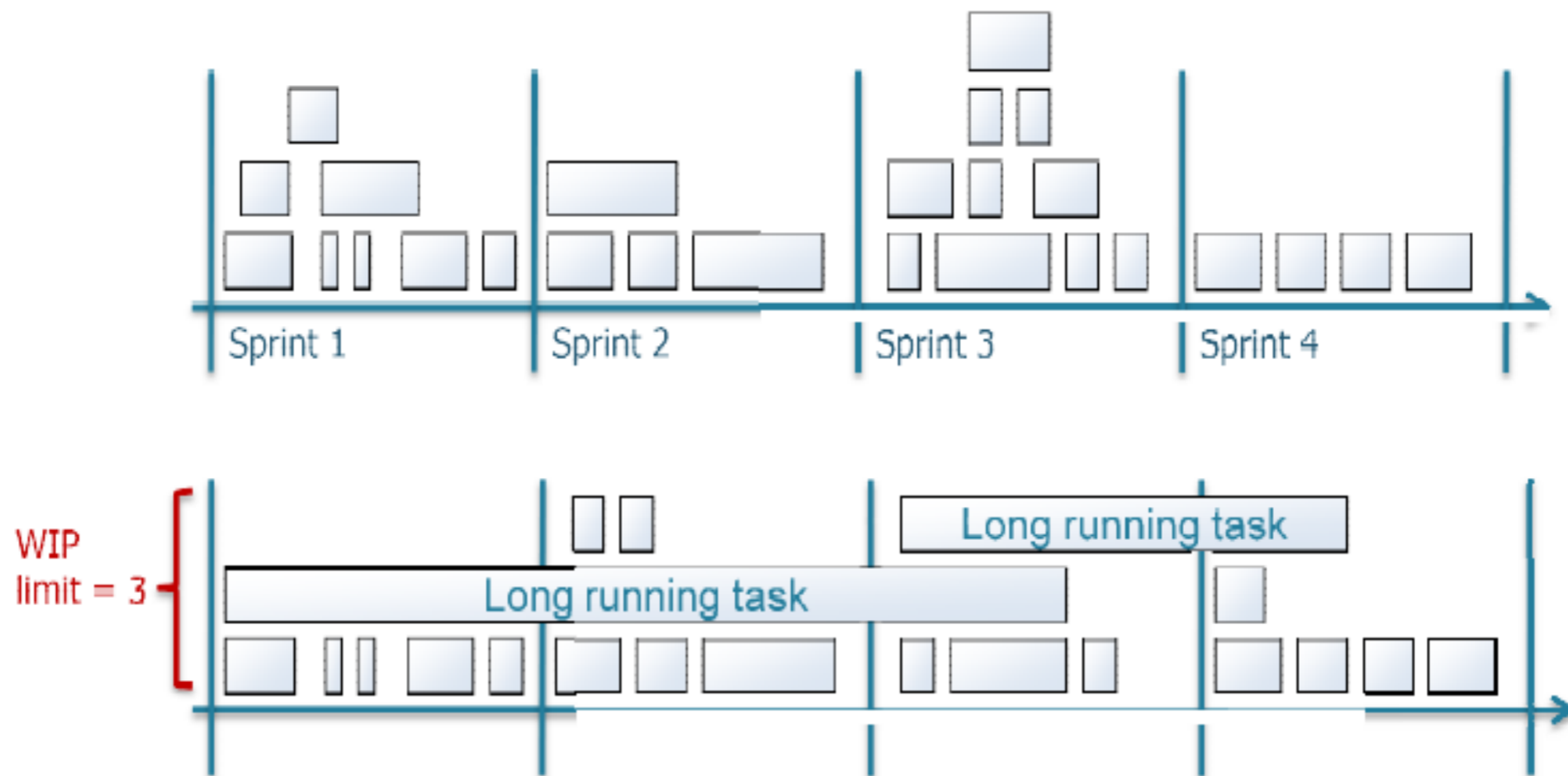
vs Scrum
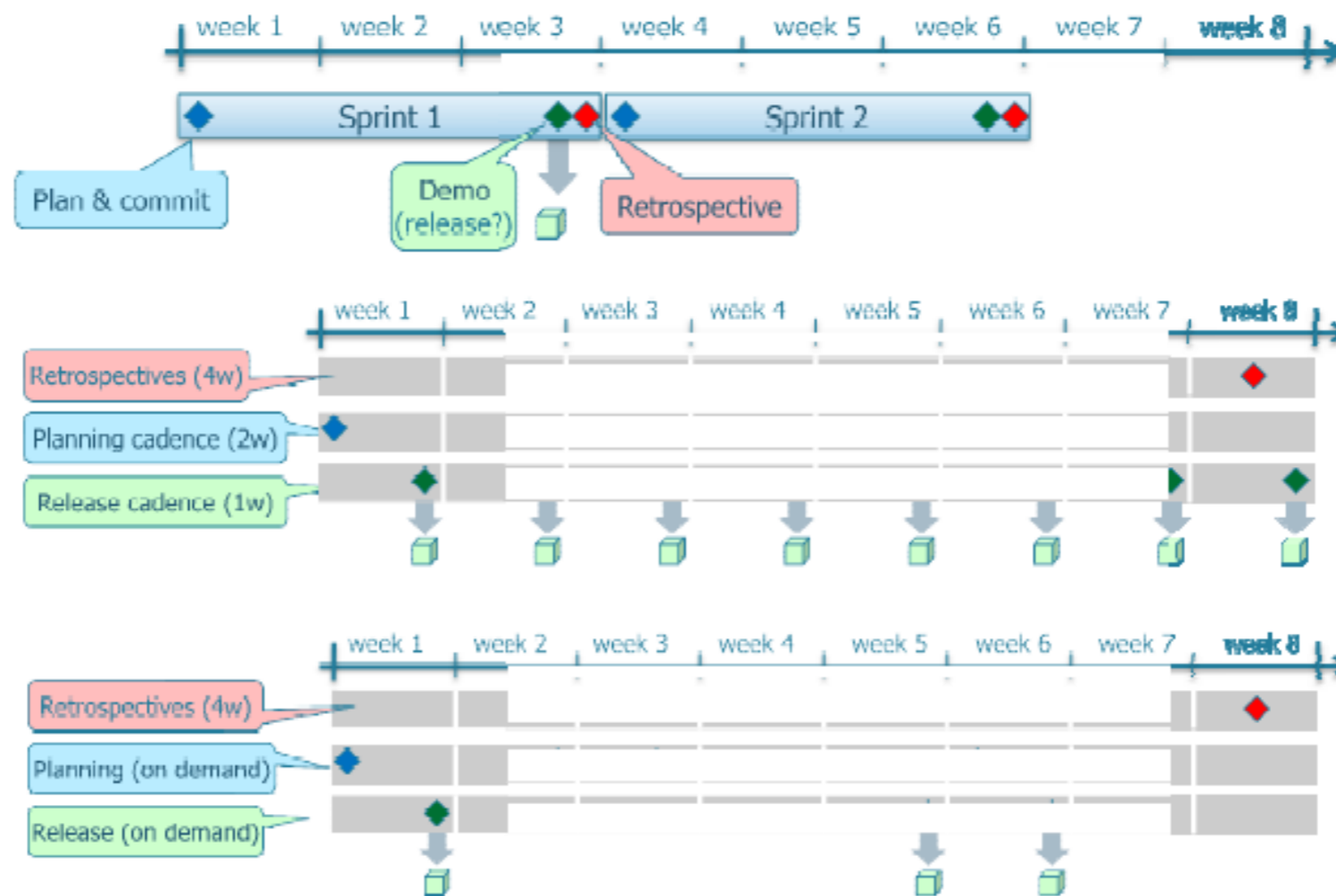
vs Scrum

Scrum	Kanban
Timeboxed iterations prescribed.	**Timeboxed iterations optional.** Can have separate cadences for planning, release, and process improvement. Can be event-driven instead of timeboxed.
Team commits to a specific amount of work for this iteration.	**Commitment optional.**
Uses **Velocity** as default metric for planning and process improvement.	Uses **Lead time** as default metric for planning and process improvement.
Cross-functional teams prescribed.	Cross-functional teams optional. **Specialist teams allowed.**
Items must be broken down so they can be completed within 1 sprint.	No particular item size is prescribed.
Burndown chart prescribed	No particular type of diagram is prescribed

vs Scrum

Scrum	Kanban
WIP limited indirectly (per sprint)	**WIP limited directly** (per workflow state)
Estimation prescribed	**Estimation optional**
Cannot add items to ongoing iteration.	**Can add new items whenever capacity is available**
A **sprint backlog is owned by one specific team**	A **kanban board may be shared by multiple teams** or individuals
Prescribes 3 roles (PO/SM/Team)	**Doesn't prescribe any roles**
A **Scrum board is reset** between each sprint	A **kanban board is persistent**
Prescribes a prioritized product backlog	**Prioritization is optional.**