

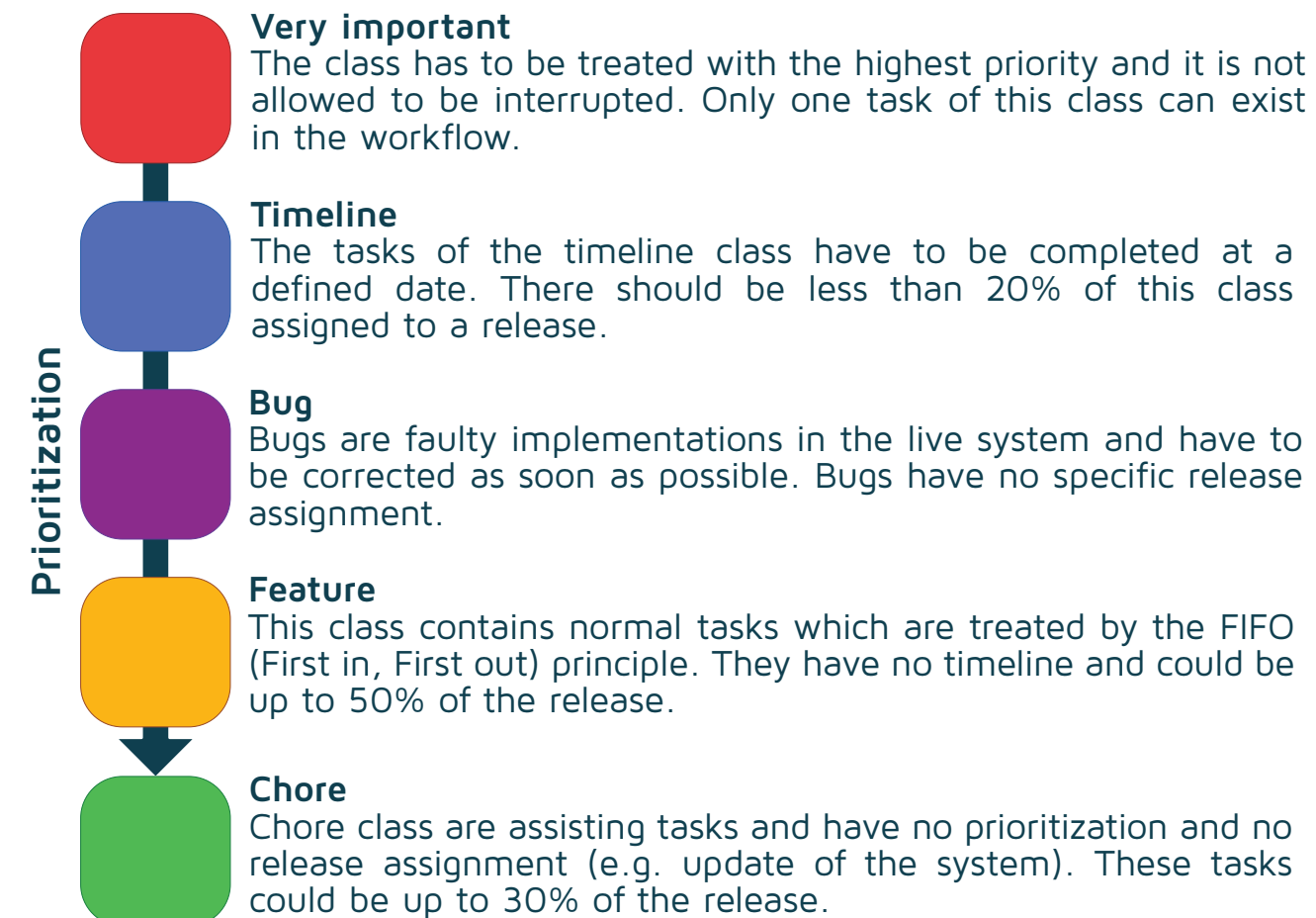
KANBAN

VISUALIZATION

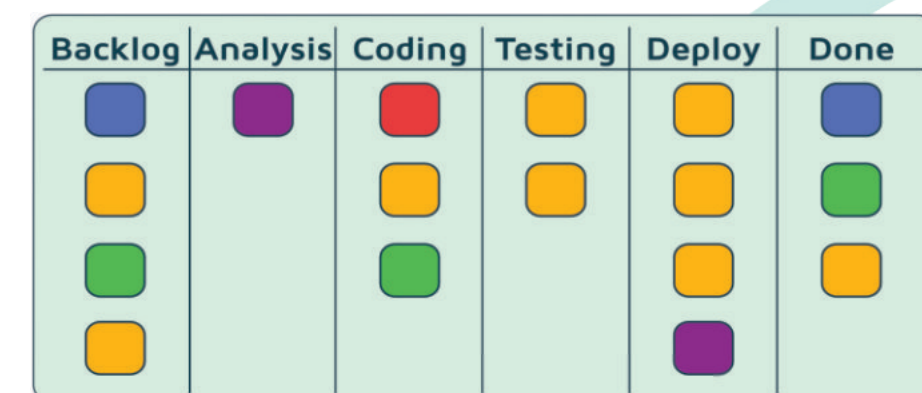
Classes of service

Each class of service has its own rules for prioritization in the Kanban workflow. All classes of service allow self organization as well value and risk assessment of the classes. Every class of service has its own rules for the **lead and cycle time**.

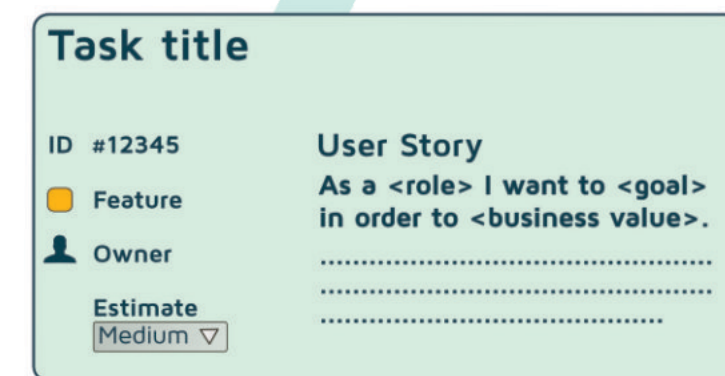
The common classes of service are:



Kanban board



Task structure



Process of visualization

Kanban board - column

The structure of the board is separately defined and can be optimized as needed. The common used columns are:

Backlog | Analysis | Coding | Testing | Deploy | Done

Many of the columns are limited by the amount of work (**Work In Progress - WIP**).

Task structure

The structure of the tasks is important for the transparency and smooth running of the tasks. The structure needs the following attributes:

- o title and description (User Story and acceptance criteria)
- o task number
- o owner
- o classes of service
- o timeline (optional)
- o estimation (exclusively for the prioritization of tasks)

With these information everyone can make independent decisions on the processing of the tasks, based on the risk and classes of service. The explicit rules are defined in the **Kanban policy**.

GENERAL

Key features of Kanban

- o visualize the workflow
- o limit the Work In Progress
- o measure and manage flow
- o make process policies explicit
- o use models to recognize improvement opportunities

Values of Kanban

- o optimize predictability
- o creation of transparency
- o flexible reaction to incoming variability
- o focus of the current work
- o significant and continuous quality improvement

MEASUREMENT

In the Kanban system areas can be measured, which provide information about the quality of the process.

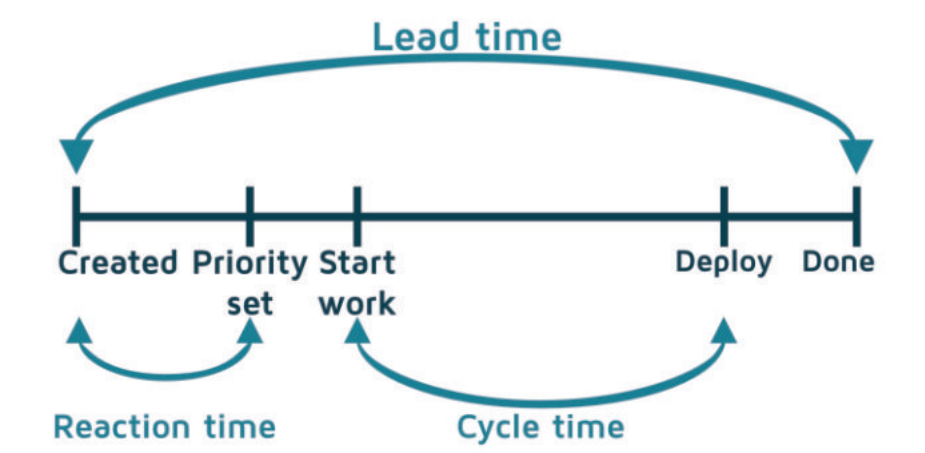
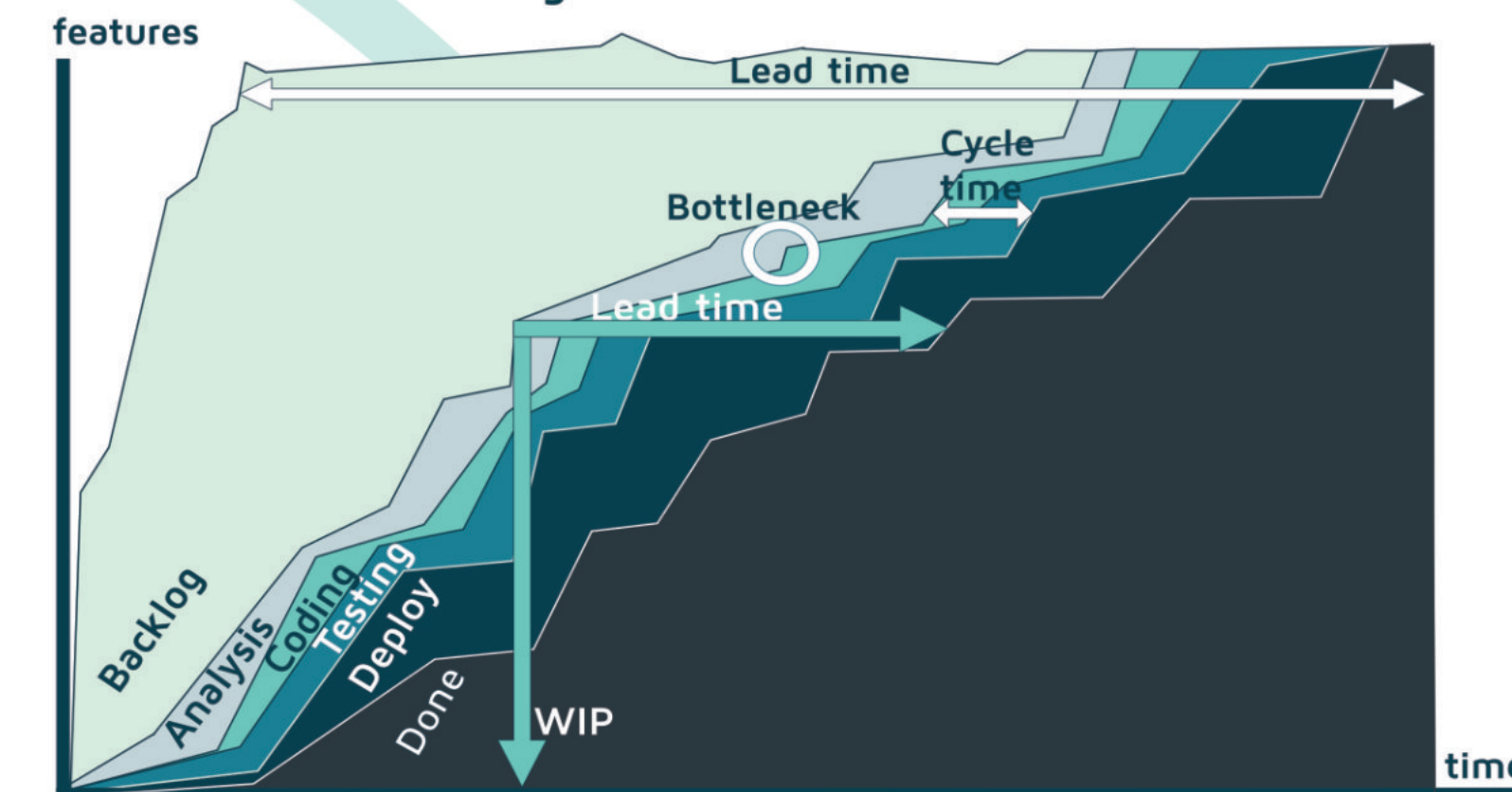
Interrelationship: ↓ WIP

↓ lead time

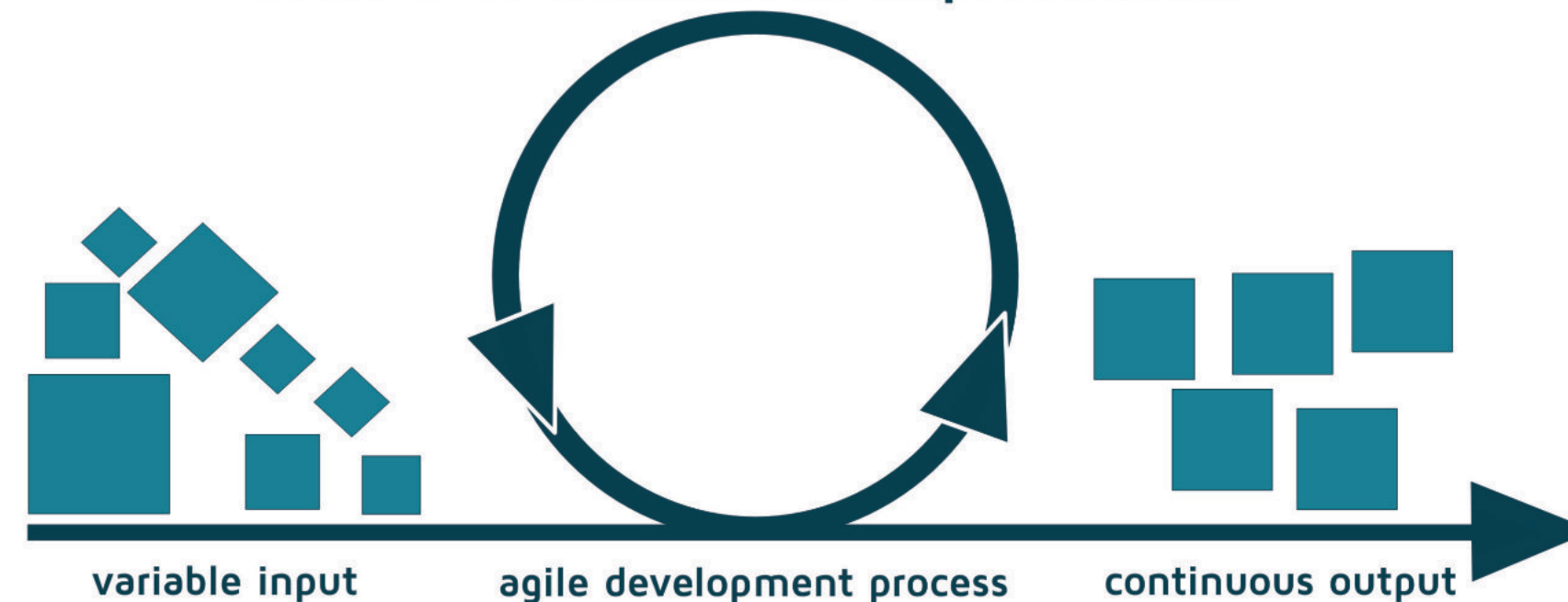
↓ error rate

↓ delivery time

Cumulative Flow Diagram



KAIZEN culture of continuous improvement



OPTIMIZATION

Kaizen - the culture of **continuous improvement** - is the main component of the Kanban system. There is no clearly defined procedure for the optimization. There are several options to optimize the Kanban system.

Meetings

Daily standup

A daily brief analysis of the project process. Problems are identified faster, discussed in detail and dissolved in the connecting meeting.

Kanban meeting

The Kanban meeting can be conducted weekly or as needed. It includes a detailed view on the board, dissolving problems and prioritization of the current and future tasks of the next releases. Customer involvement is always aspired. The meetings support the continuous improvement for the work, quality and keep up the focus.

There are other meeting types: follow-up meeting, release planning meeting, operation meeting and many more.

Source of variability

External variations with assignable cause can be managed, reduced and eliminated by using the **Root Cause Analysis**. Irregular incoming and varying requirements can be handled. **Internal (random) variations** can be defined by rules control, e.g. with classes of service and their rules. High variability reduces the predictability.

Theory of constraints

To optimize the bottlenecks use the five **focusing steps**:
1. identify the constraint
2. decide how to exploit the constraint
3. subordinate everything else in the system to the decision made in step 2
4. elevate the constraint
5. avoid inertia, identify the next constraint and return to step 2

Cumulative Flow Diagram (CFD)

The Cumulative Flow Diagram shows the amount of Work In Progress (WIP) for a specified period and condition. From the diagram can be read the number of tasks, **bottlenecks** and **lead times**.

Bottlenecks

Bottlenecks are stations in the Kanban system where too many tasks are accumulated. They arise when too many tasks vary the processing times of tasks between the stations. Bottlenecks caused by blockers or temporal events and are fixed with the **theory of constraints**.

Work in Progress (WIP)

The WIP limits the number of begun work for each column, person and the whole board. The WIP should be kept as low as possible. Exceeding the WIP points out problems in the system that need to be immediately examined and treated. A tool for optimization is the consideration of **source of variability**.

Lead time

Kanban aims at a short lead time. This can be achieved by high quality. The condition is a low error. The **lead time** begins with the backlog and ends with the done column. The pure coding time is called **cycle time**. Target: lead time has to be kept **constant** over time.

GENERAL

Kanban policy

Make process policies explicit!

The Kanban policy includes the responsibilities and rules for the classes of service, board and columns and the WIP. The policy has to be kept up to date.

Template for Kanban meetings

A template is used to ensure continuous improvement of the workflow:
o view the tasks, dissolve blocker and bottlenecks
o analyze the risks
o measure improvement
o keep-watch-change