Software Kanban

A Visual Process-Managment System for Software Development

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24th November 2016

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History of Kanban

General Information

- Kanban = signboard
- Developed by Taiichi Ohno in 1947
- Worked for Toyota
- Scheduling system for lean manufacturing and just-in-time manufacturing

History of Kanban

Taiichi Ohno

Figure: Taiichi Ohno, father of Kanban (1912 - 1990)

History of Kanban

Goals and Reasons

Reasons:

- Too high storage cost
- Too little productivity
- Increasing customer requirements

History of Kanban

Goals and Reasons

Reasons:

- Too high storage cost
- Too little productivity
- Increasing customer requirements

Goal:

- Steady flow in the production process
  $\Rightarrow$ less inventory needed

History of Kanban

Kanban in SWE

- First use in 2004 by Microsoft
- Lean Software Development
- First public presentation in 2007 by David J. Anderson
- Anderson: Father of Software Kanban

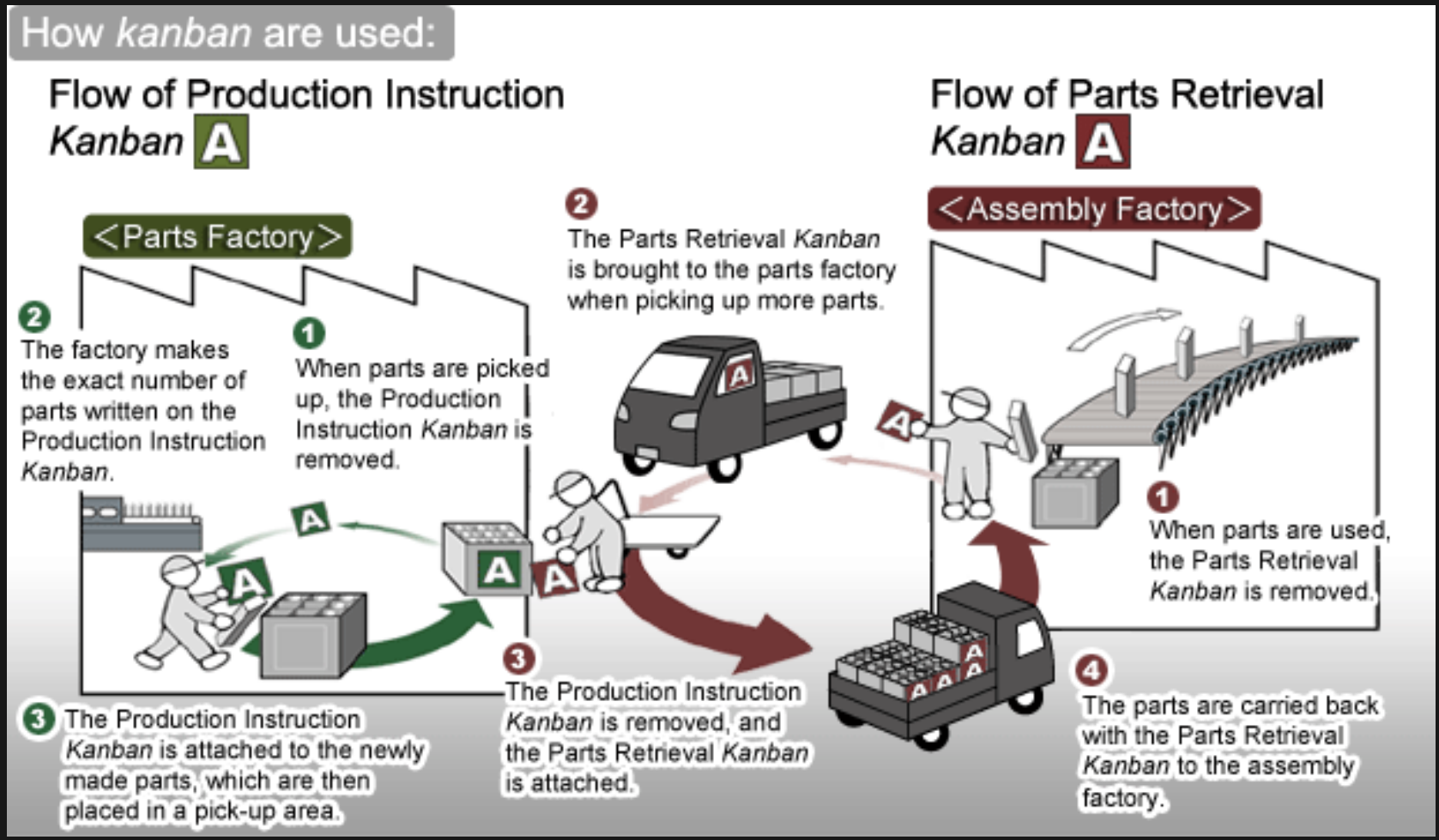
Kanban outside of Software Development

Production Kanban (P-Kanban)

- Release an order to preceding stage
- Card authorizes to produce fixed amount of products

Kanban outside of Software Development

Production Kanban (P-Kanban)



Kanban outside of Software Development

Transportation Kanban (T-Kanban)

- Authorizes the transportation of full container to another workstation
- Gets parts and moves to next process
- Until all part were consumed by current process
- Travels back to preceding process

Kanban outside of Software Development

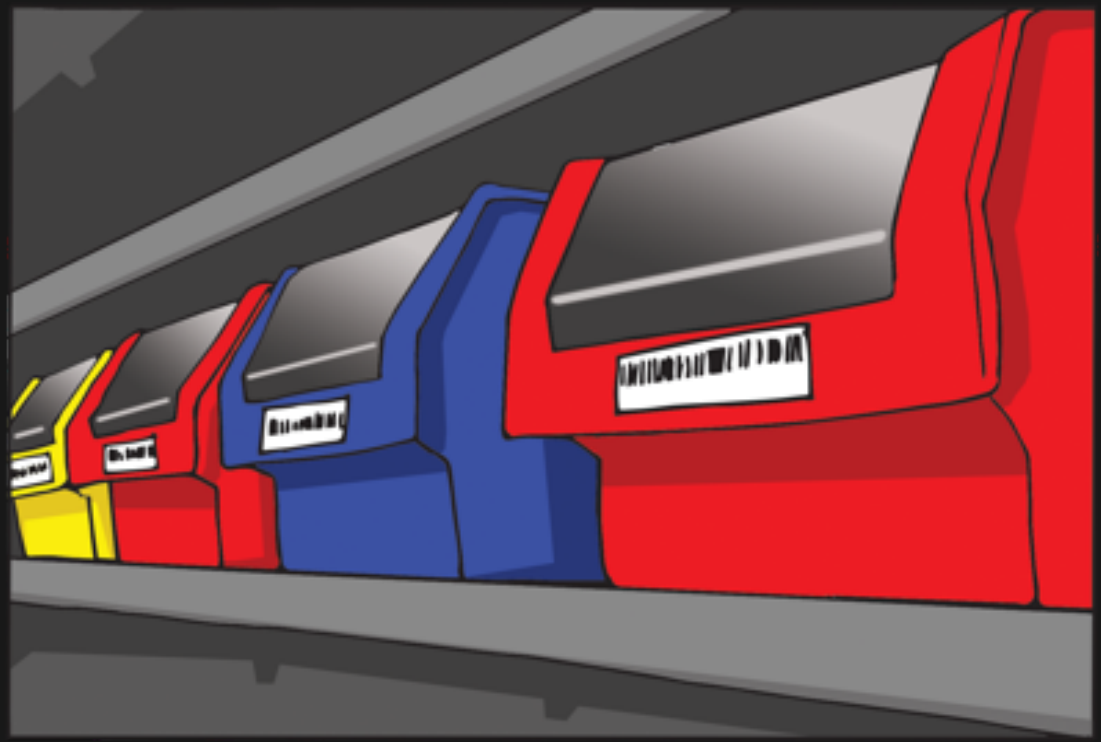
Through Kanban

- Combination of withdrawal and Production Kanban
- Used on close company area

Kanban outside of Software Development

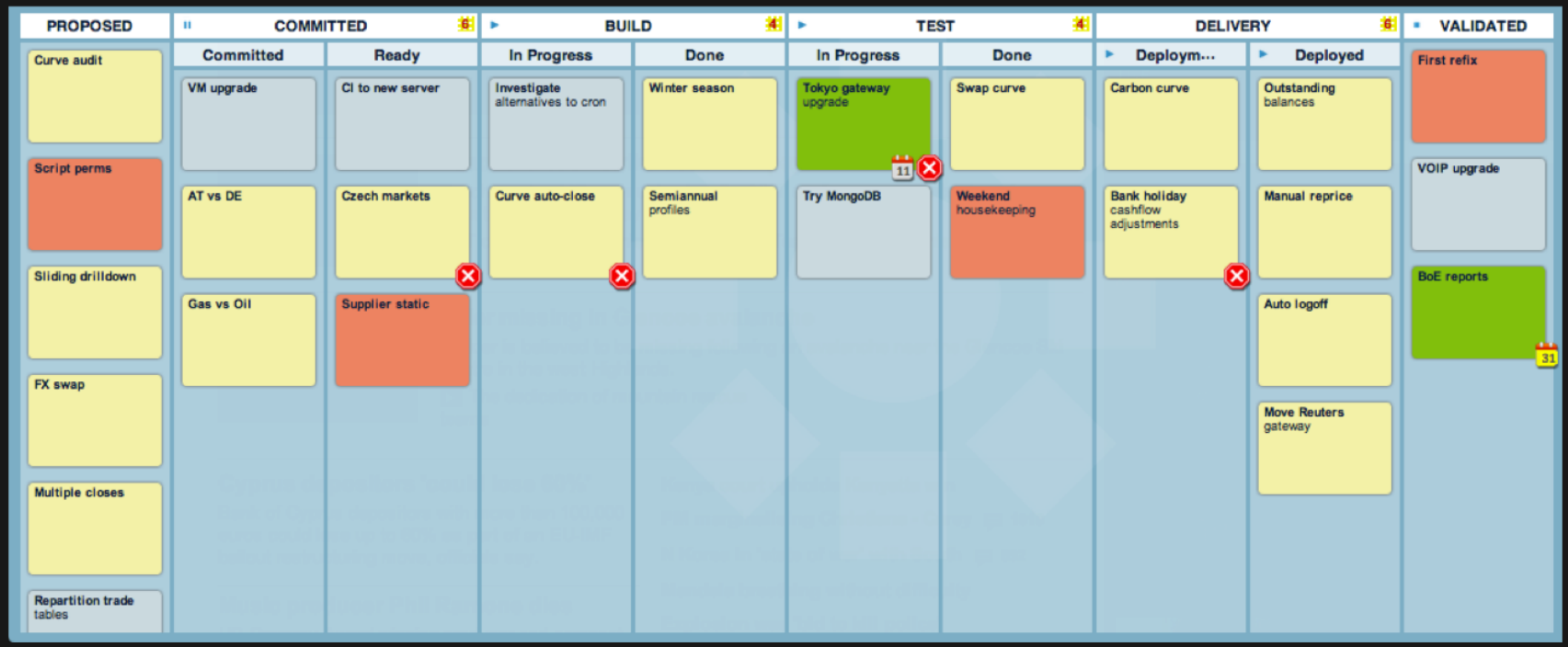
Electronic Kanban (E-Kanban)

- Often used and has many advantages
- Signaling system with movement-trigger
- Using bar-codes and electronic messages



Kanban outside of Software Development

Electronic Kanban (E-Kanban)



Kanban outside of Software Development

Other Forms

Express Kanban

- If unexpected shortages of parts
- Is used to keep production smoothly

Kanban outside of Software Development

Other Forms

Express Kanban

- If unexpected shortages of parts
- Is used to keep production smoothly

Emergency Kanban

- Replace defective parts

Kanban outside of Software Development

Other Forms

Express Kanban

- If unexpected shortages of parts
- Is used to keep production smoothly

Emergency Kanban

- Replace defective parts

Supplier Kanban

- Connection between external vendors and Kanban System

Kanban in Software Development

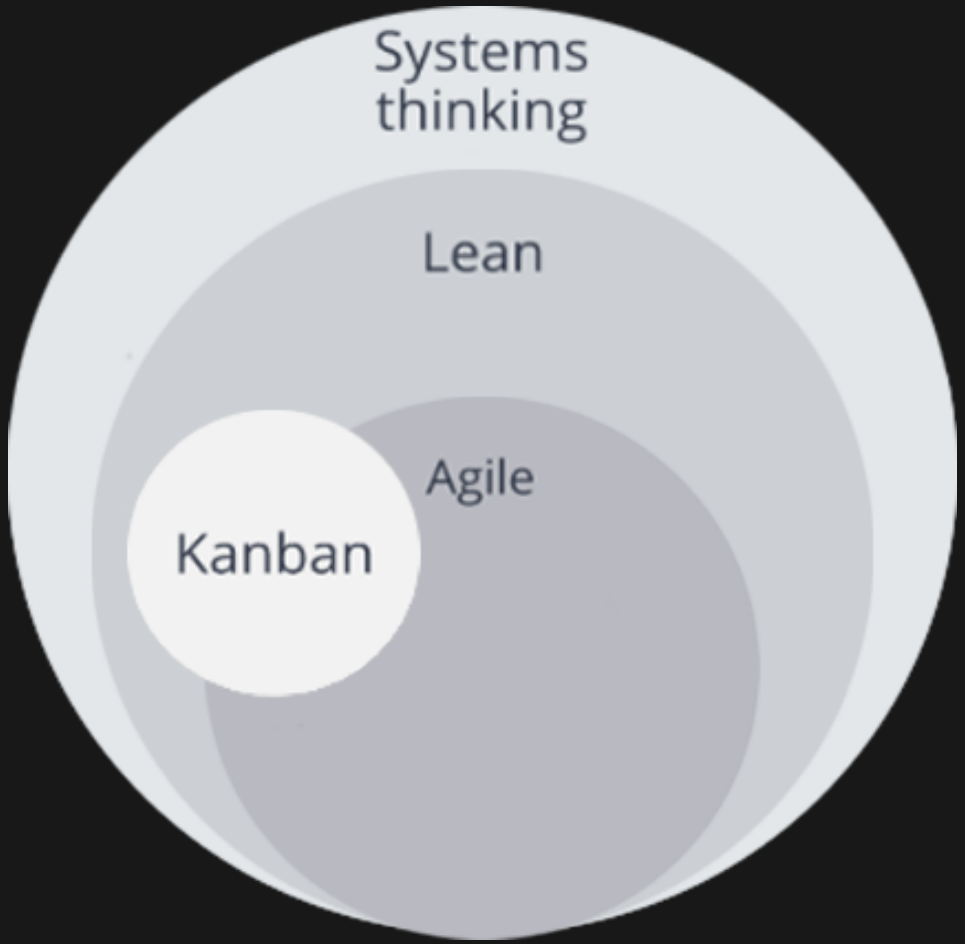


Figure: Kanban has elements of Agile and Lean SWE

Kanban in Software Development

Agile Software Engineering

Values:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

Kanban in Software Development

Agile Software Engineering

	Pull	Limited Tasks	Transp. Information	Cont. Improvement
Individuals & Interactions	✓	–	✓	✓
Working Software	–	–	–	✓
Customer Collaboration	–	–	–	–
Responding to Change	✓	✓	✓	✓

Figure: Values of Agile SWE and Kanban

Kanban in Software Development

Lean Software Engineering

Values:

- Estimate Waste
- Amplify Learning
- Decide as late as possible
- Deliver as fast as possible
- Empower the Team
- Build Integrity in
- See the whole

Kanban in Software Development

Lean Software Engineering

	Pull	Limited Tasks	Transp. Information	Cont. Improv.
Eliminate Waste	✓	✓	✓	✓
Amplify Learning	✓	✓	✓	✓
Decide as Late as Possible	✓	✓	✓	–
Deliver as Fast as Possible	✓	✓	✓	–
Empower the Team	✓	–	✓	✓
Build Integrity in	–	–	✓	✓
See the Whole	–	–	–	✓

Figure: Values of Lean SWE and Kanban

The Kanban-Board

Variations

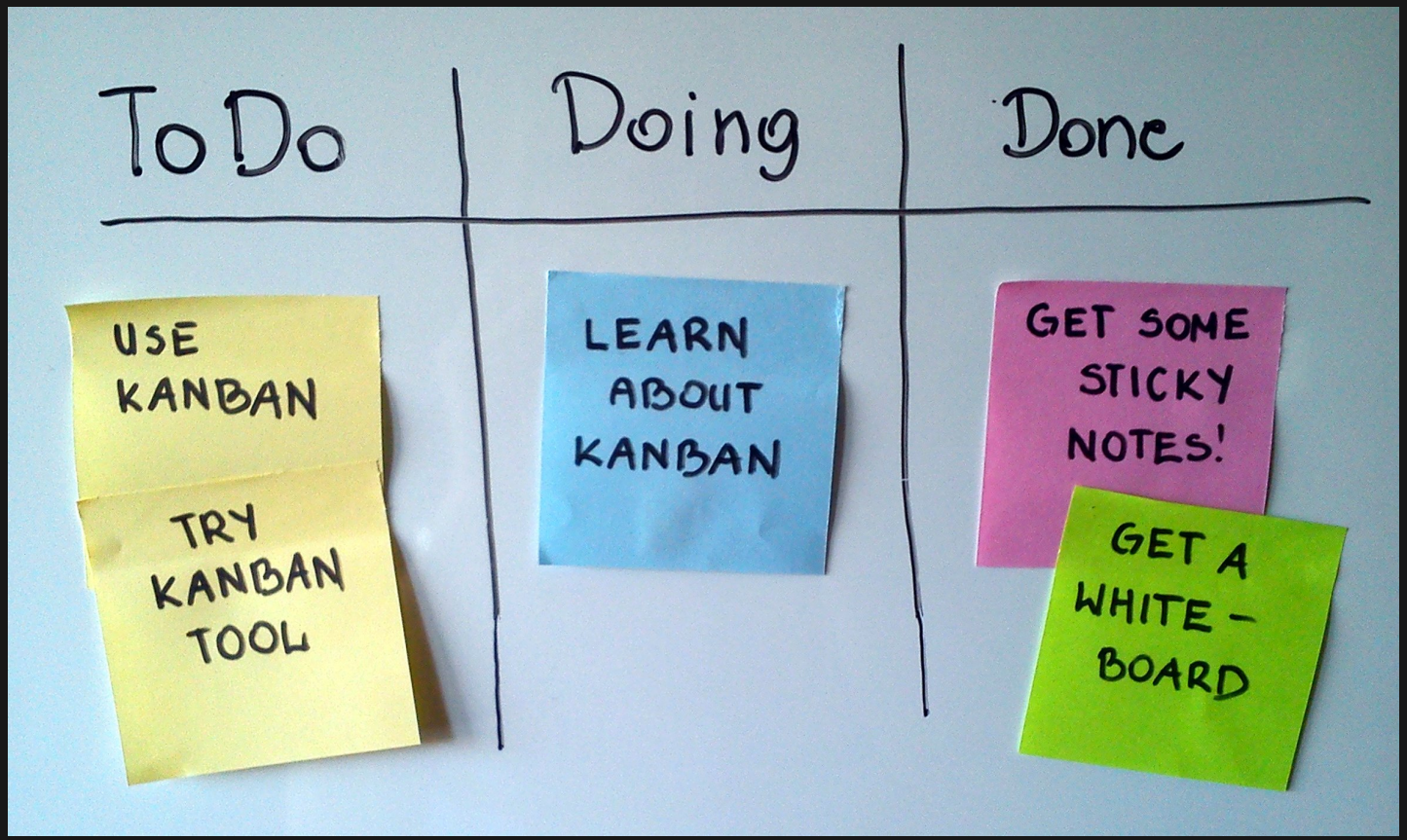


Figure: A very basic Kanban-Board

The Kanban-Board

Variations

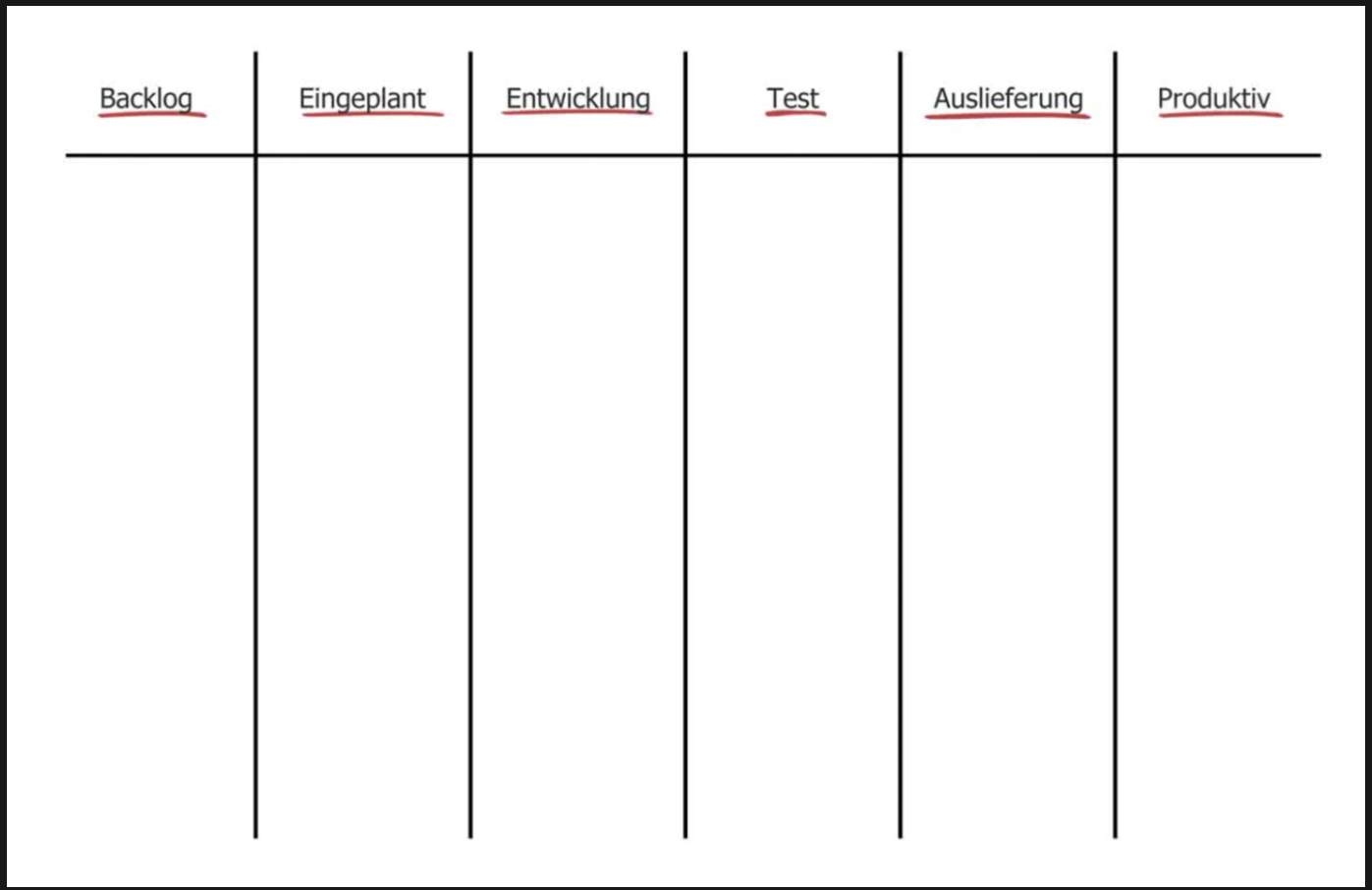


Figure: Kanban-Board with more sections

The Kanban-Board

Variations

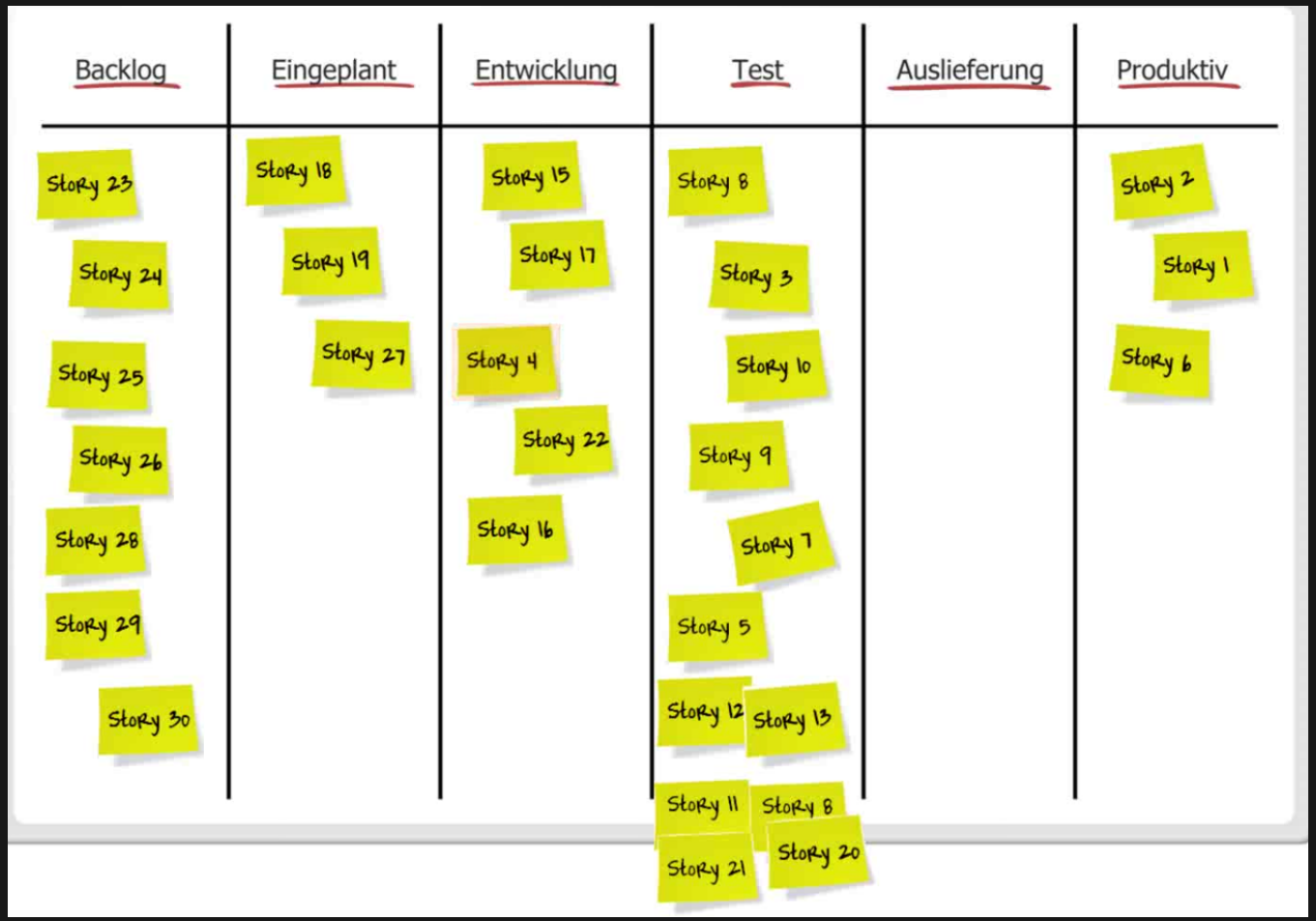


Figure: Same Kanban-Board in Action

The Kanban-Board

Variations

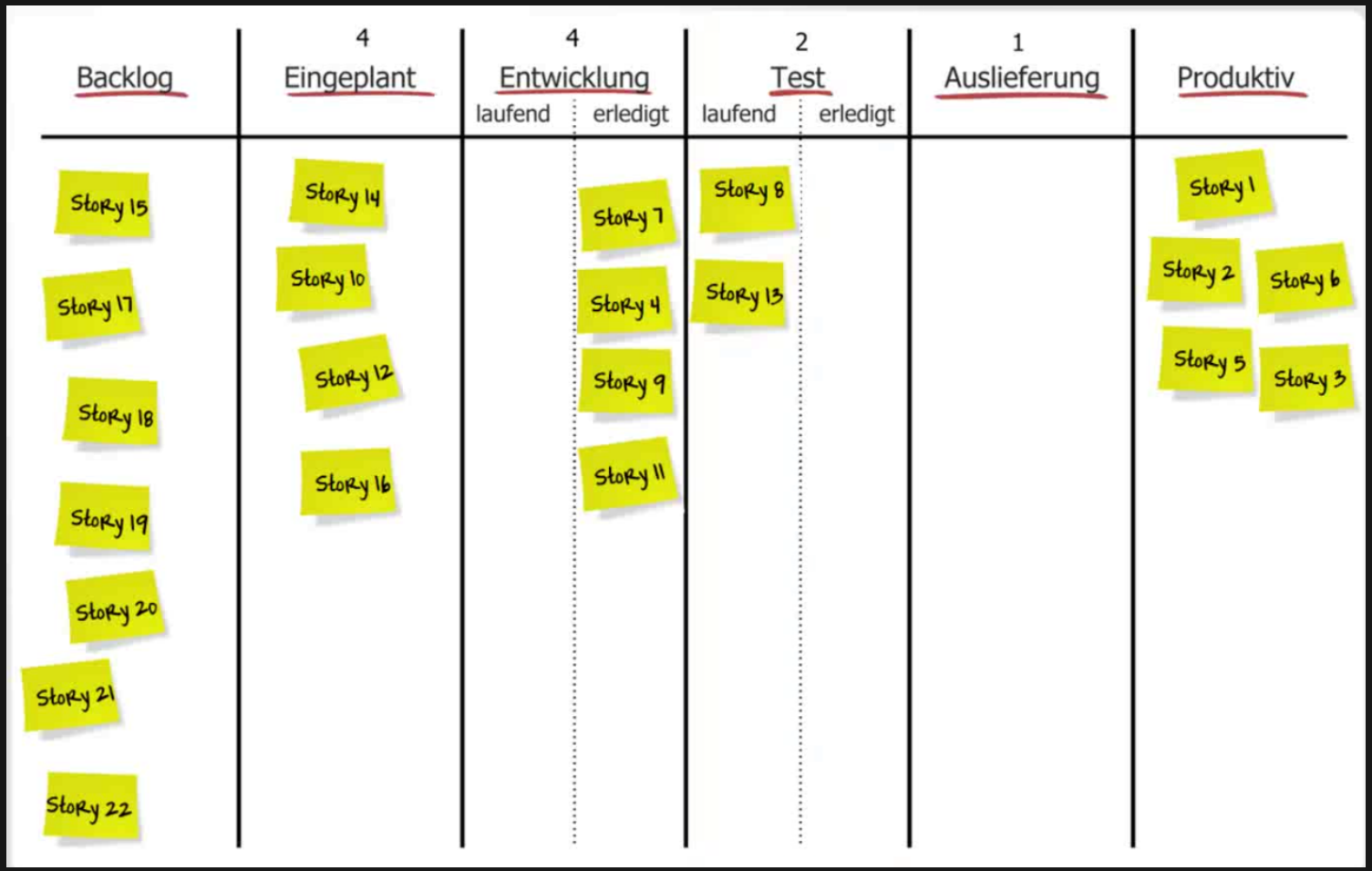


Figure: Kanban-Board with limits

The Kanban-Board

Other useful Information

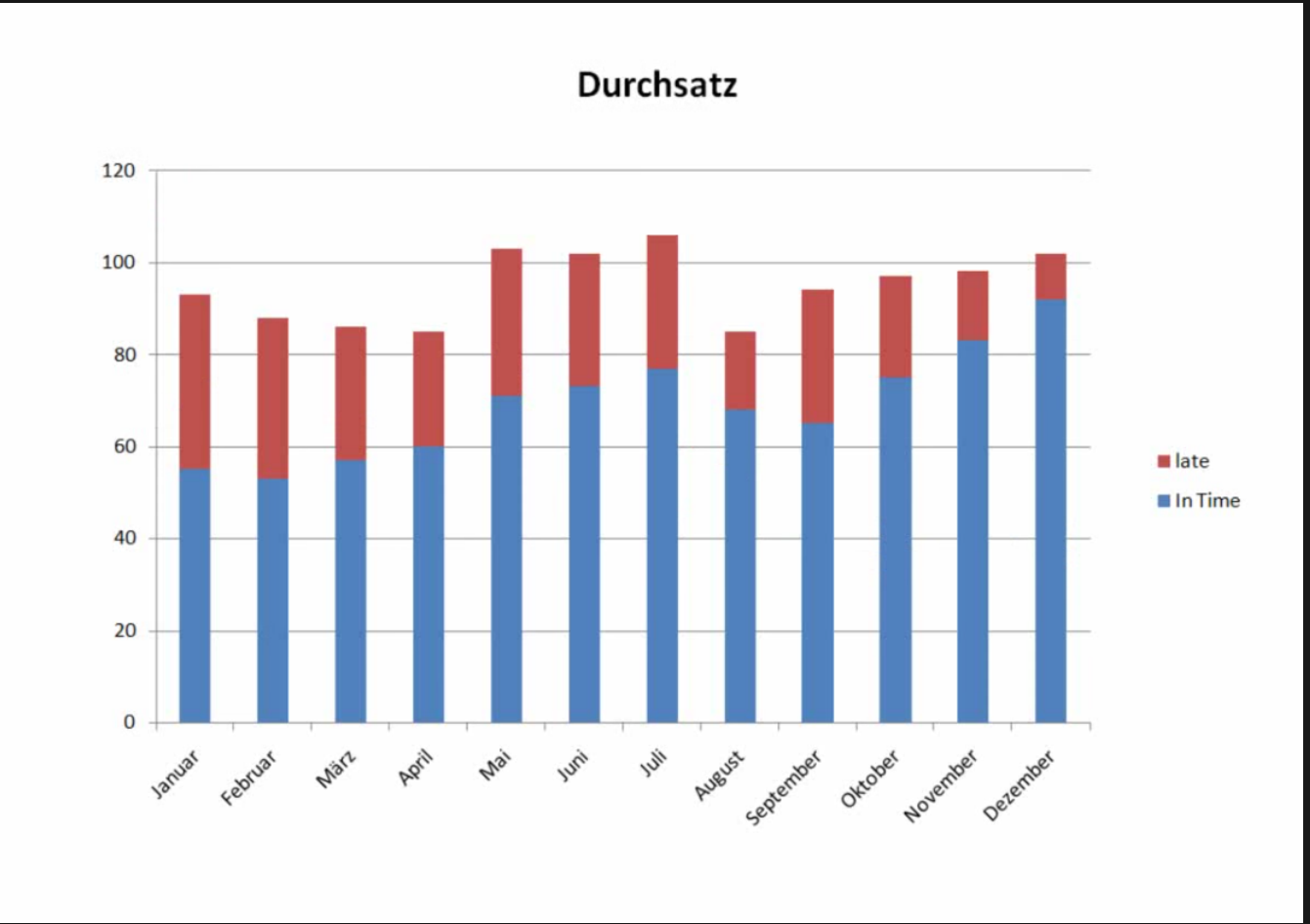


Figure: Throughput

The Kanban-Board

Other useful Information

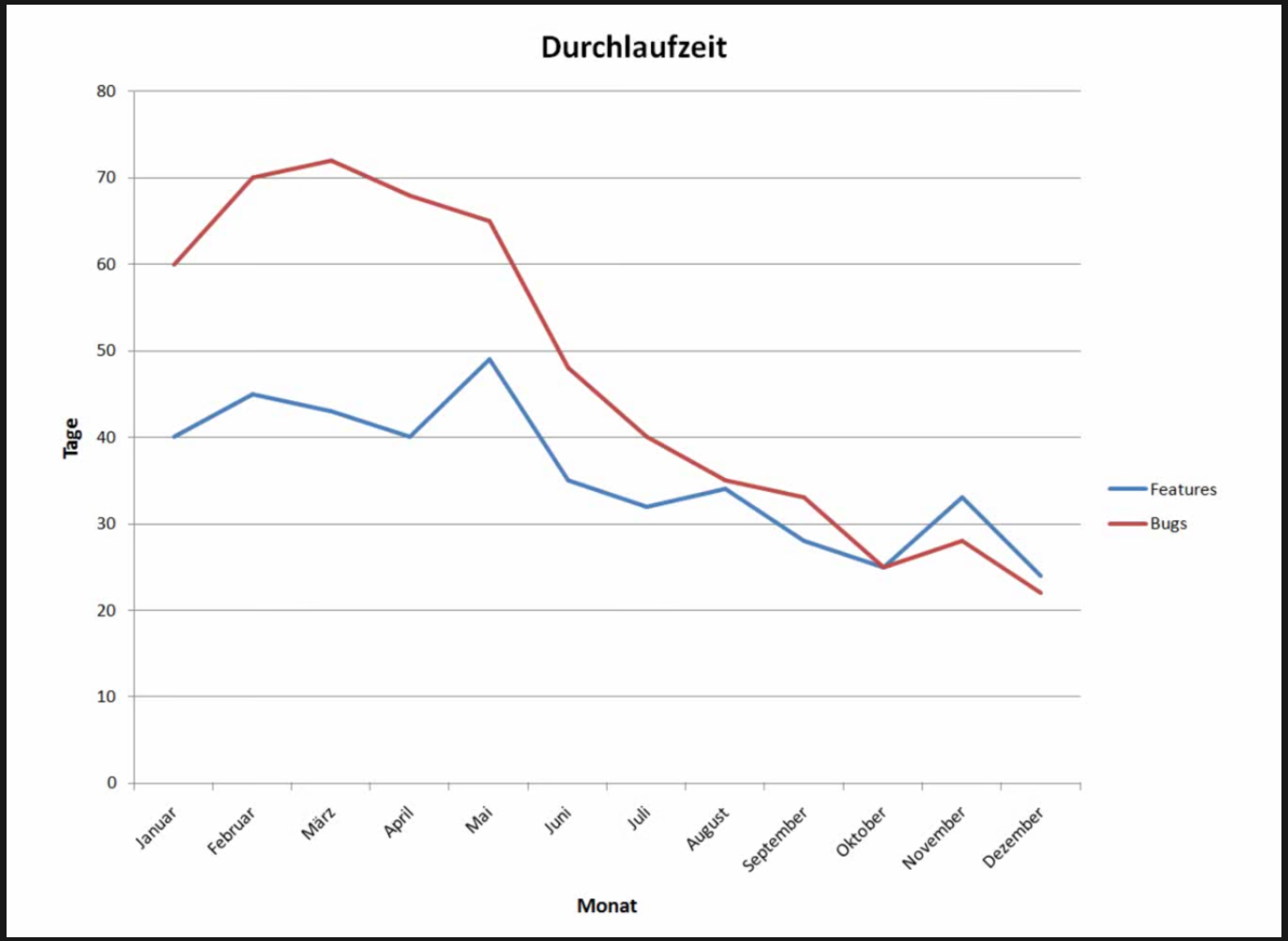


Figure: Cycle Time

The Kanban-Board

Other useful Information

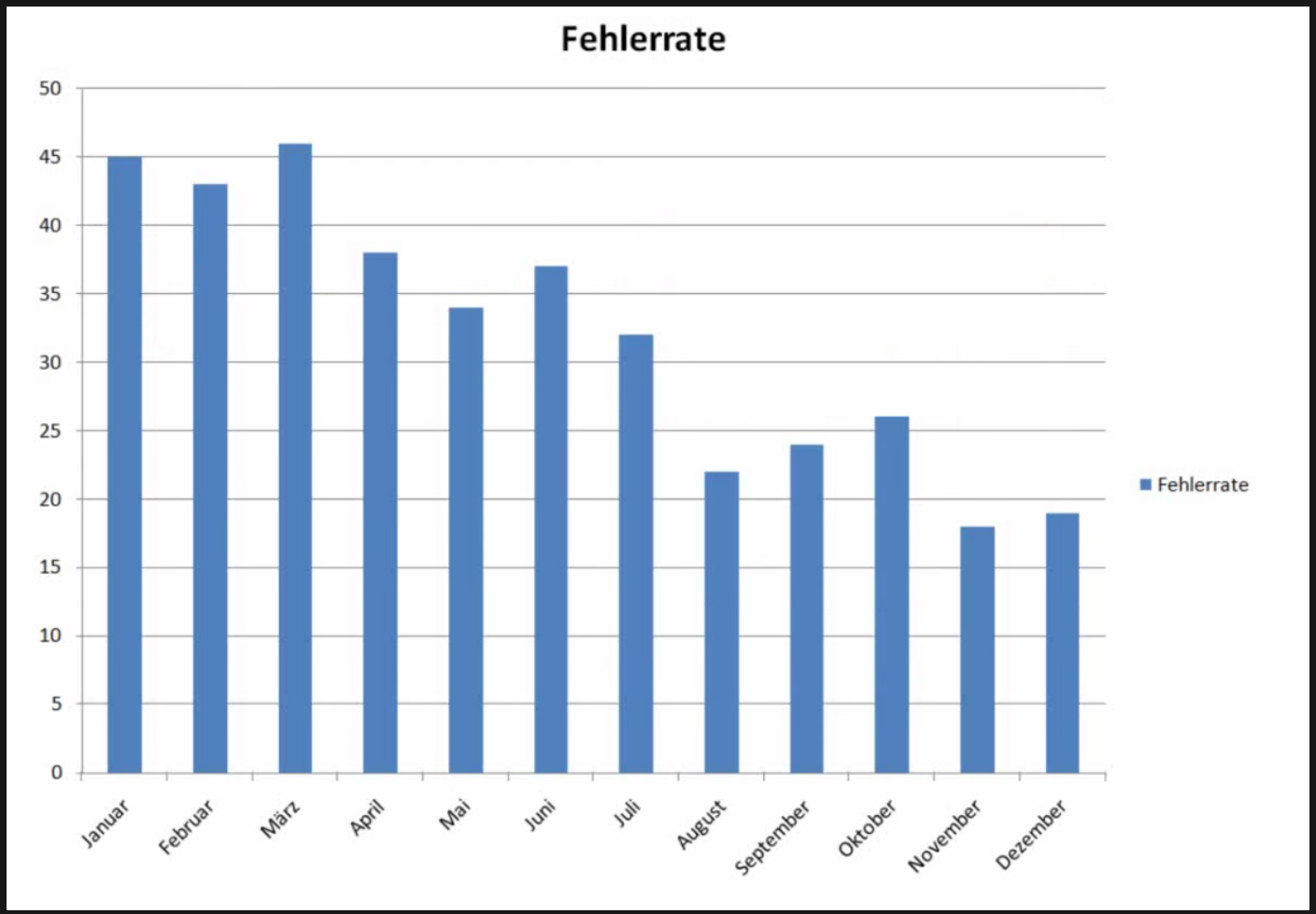


Figure: Rate of Errors

Conclusion

Kanban is

- easy to learn
- versatile

Mehr Zeug einfügen!!!

Sources

- Epping, Thomas: *Kanban für die Softwareentwicklung.* Springer-Verlag 2011
- https://www.youtube.com/watch?v=ndWPFk7GR8k
- Wikimedia