Requirements Engineering

Master Digital Sciences / Master Computer Science

SS 2022

Prof. Dr. Stefan Bente

Agile Backlog

Technology
Arts Sciences
TH Köln

Ausgewählte Literaturempfehlungen

[Ambler]   Ambler, Scott, and Lines, Mark W. *Disciplined Agile Delivery: A Practitioner's Guide to Agile Software Delivery in the Enterprise*. S.l.: Ibm Press, 2012.

[Beck]   Beck, Kent, and Cynthia Andres. *Extreme Programming Explained: Embrace Change*. 2nd ed. Boston, MA: Addison Wesley, 2004.

[Cockburn]   Cockburn, Alistair. *Agile Software Development: The Cooperative Game*. 0002 ed. Upper Saddle River, NJ: Addison Wesley Pub Co Inc, 2006.

[Cohn04]   Cohn, Mike. *User Stories Applied: For Agile Software Development*. 1st ed. Addison-Wesley Professional, 2004.

[Cohn05]   Cohn, Mike. *Agile Estimating and Planning*. Upper Saddle River, NJ: Prentice Hall, 2005.

[Cohn09]   Cohn, Mike. *Succeeding with Agile: Software Development Using Scrum*. 1st ed. Upper Saddle River, NJ: Addison Wesley, 2009.

[LarmanVodde]   Larman, Craig, and Bas Vodde. *Practices for Scaling Lean and Agile Development: Large, Multisite, and Offshore Product Development with Large-Scale Scrum*. 1st ed. Upper Saddle River, NJ: Addison Wesley, 2010.

[Leffingwell]   Leffingwell, Dean. *Agile Software Requirements: Lean Requirements Practices for Teams, Programs, and the Enterprise*. 1st ed. Upper Saddle River, NJ: Addison Wesley, 2010.

[Pichler]   Pichler, Roman. *Agiles Produktmanagement mit Scrum: Erfolgreich als Product Owner arbeiten*. 2., korrigierte Auflage. Heidelberg: dpunkt.verlag GmbH, 2013.

Technology
Arts Sciences
TH Köln

Agile Backlog in 90 Minutes

- Motivation & History
- Agile Backlog
- How to set up an agile backlog

Motivation & History of Agile

Technology
Arts Sciences
TH Köln

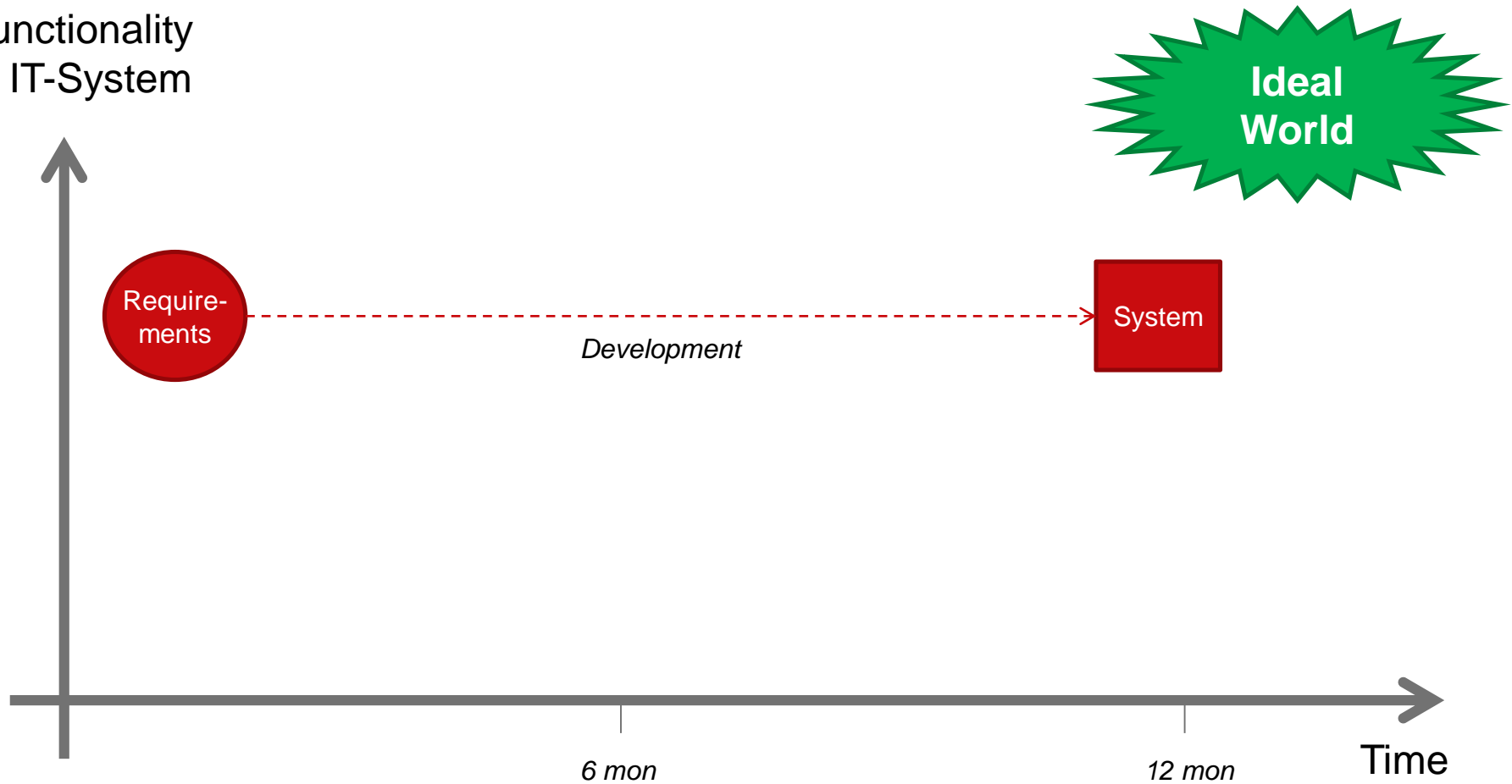# Example: Safeguard Ballistic Missile Defense System

- Developed for the US army between 1969 and 1975

- Effort >5400 person years (!)

- Stayed operational for merely 133 days (!), after six years (!) of development
  - The system had been overtaken by both political and technical developments
  - ABM disarmament treaty with the Soviet Union had been signed
  - new Soviet missiles had actually become faster than the anti-missile-missiles

Quelle: Broad, W. J. (2000, June 30). A Missile Defense With Limits. New York Times, p. A10.
Retrieved February 13, 2012, from http://www.nytimes.com/2000/06/30/world/nuclear-shield-repelling-attack-missile-defense-with-limits-abc-s-clinton-plan.html?pagewanted=4
Bild: U.S. Navy. Public Domain, https://commons.wikimedia.org/w/index.php?curid=8210862

Ideal World: Requirements => desired System

Functionality of IT-System

Require-ments

System

Development

Ideal World

6 mon

12 mon

Time

Technology
Arts Sciences
TH Köln

Real World: Requirements => desired System

Functionality
of IT-System

Real World

Require-ments

System

Development

Communication losses

ca. 2% **scope creep**
per month (*)

System
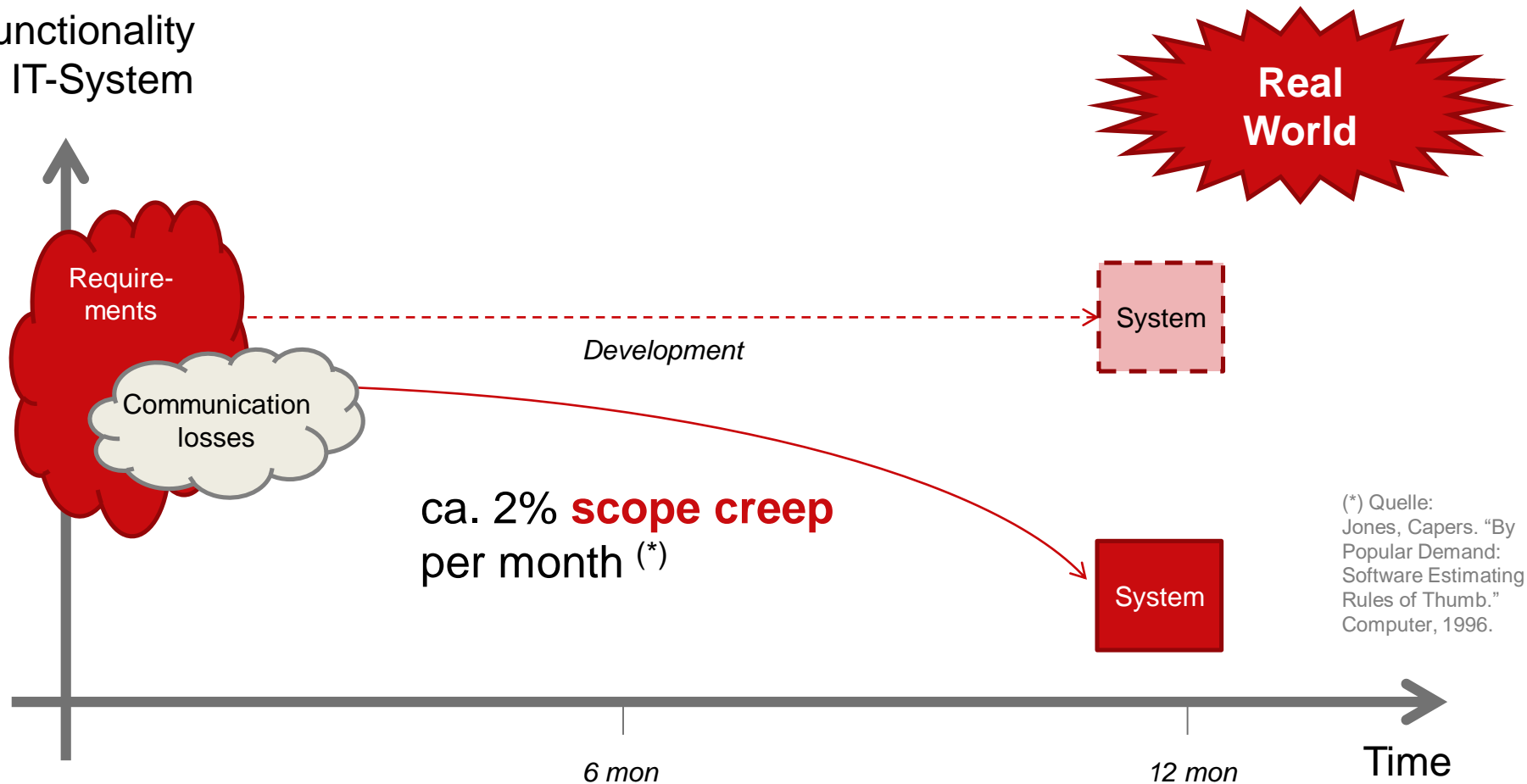
(*) Quelle:
Jones, Capers. "By Popular Demand: Software Estimating Rules of Thumb." Computer, 1996.

6 mon

12 mon

Time

- Project definition & constraints are a fuzzy – and a moving target!
- … therefore, deviations from initial specification accumulate over time

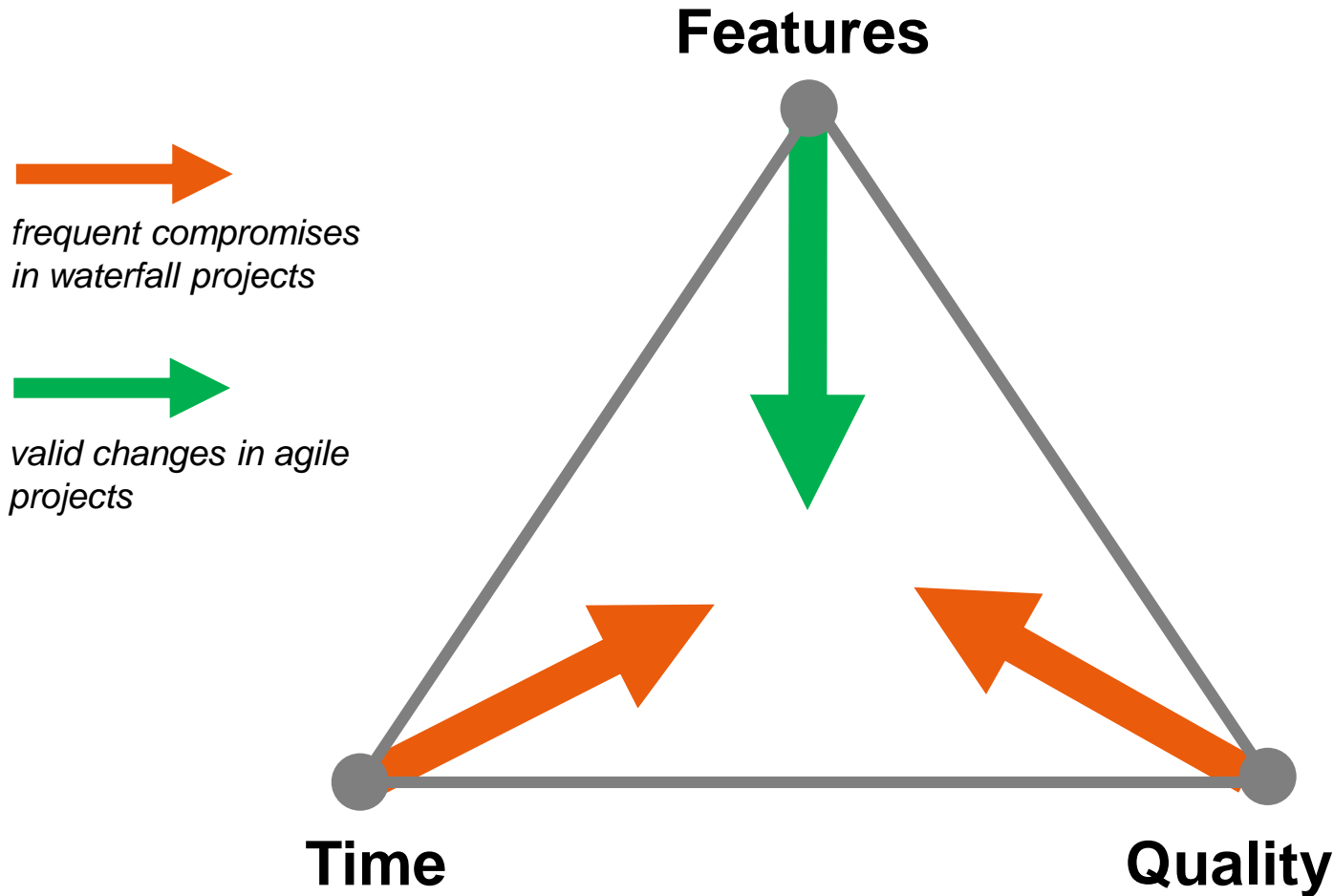Technology
Arts Sciences
TH Köln

The Agile Manifesto

We are uncovering better ways of developing
software by doing it and helping others do it.
Through this work we have come to value:

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

That is, while there is value in the items on
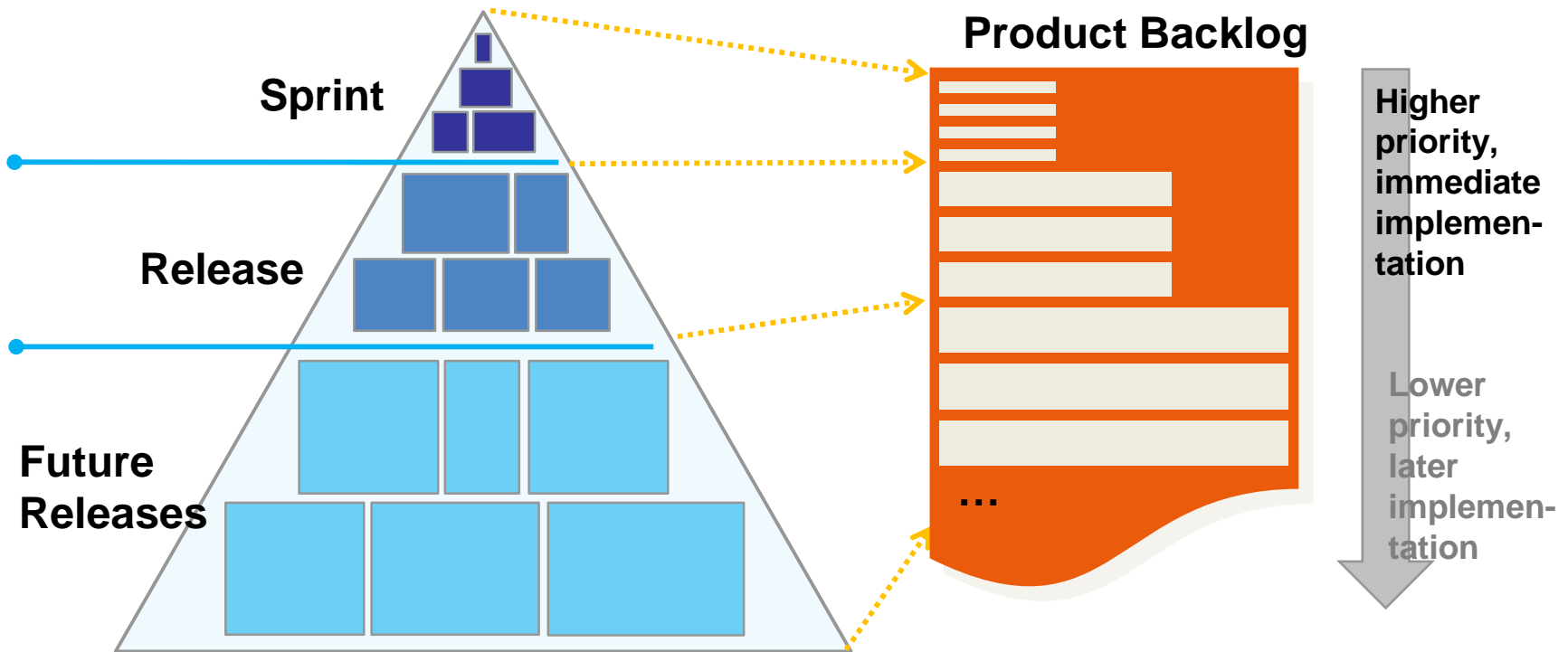the right, we value the items on the left more.

**Technology
Arts Sciences
TH Köln**

Dealing with the „magic triangle"

Features

→ *frequent compromises in waterfall projects*

→ *valid changes in agile projects*

Time

Quality

Technology
Arts Sciences
TH Köln

Agile Backlog

Technology
Arts Sciences
TH Köln

Product Backlog: Anforderungen verschied. Granularität

Sprint

Release

Future Releases

Product Backlog

Higher priority, immediate implementation

Lower priority, later implementation

...

Technology
Arts Sciences
TH Köln

Mapping of Product Backlog to releases

**Technology
Arts Sciences
TH Köln**
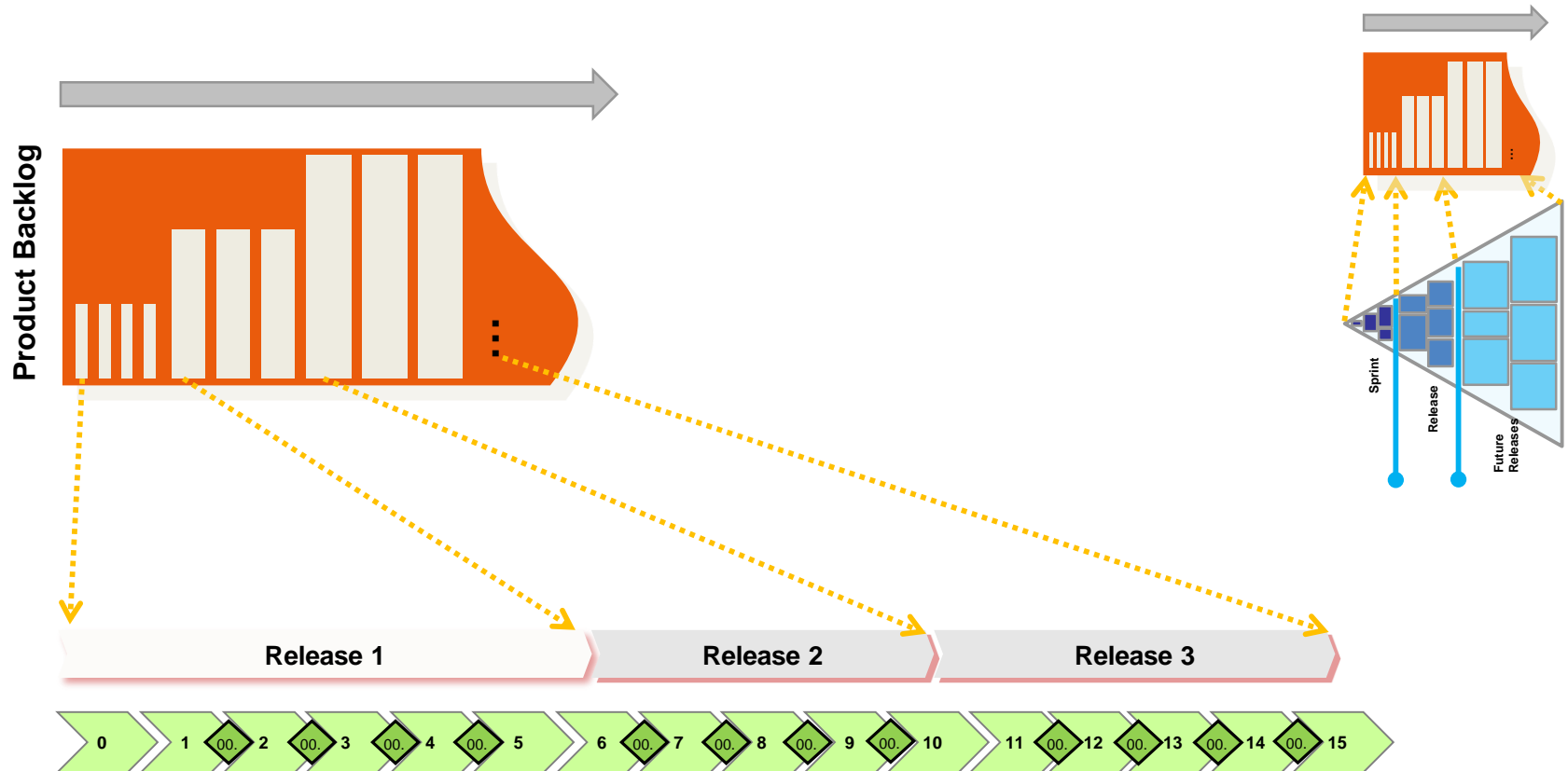
User Story als Hauptelement agiler Anforderungen

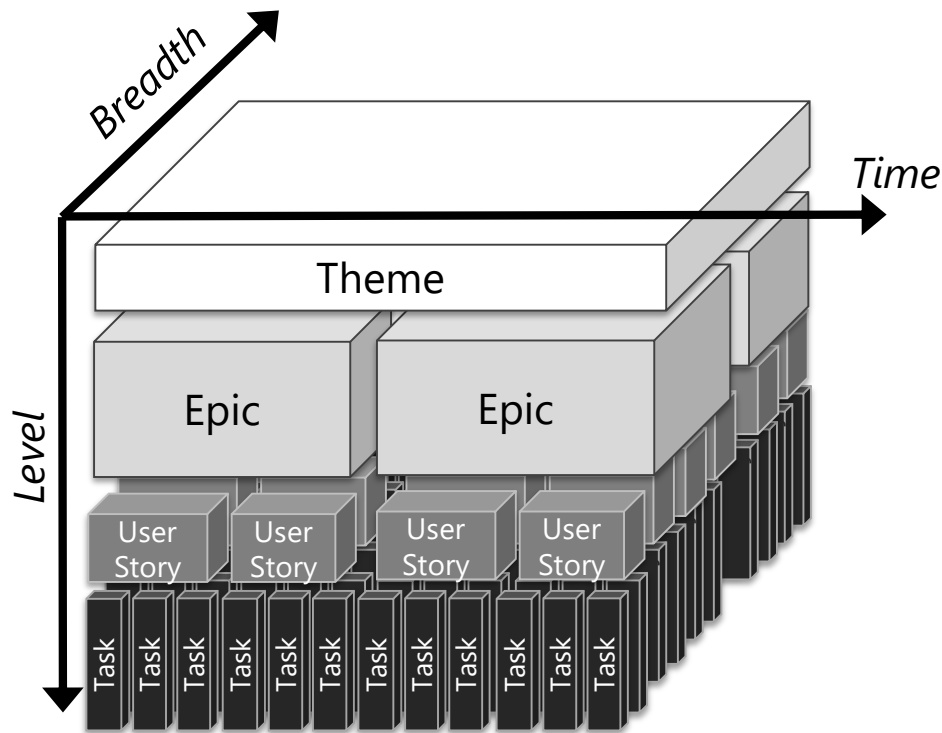- As a **<role>**,
- I want to **<activity>**,
- so that **<business reason>**

- Als **<Rolle>**,
- möchte ich **<Aktivität>**,
- so dass **<Geschäftszweck>**

Useful additional information

- Acceptance criteria
  - One or several bullet points describing in detail under what condition the customer is willing to accept the story
  - Input for unit and system tests

- How to demo
  - It doesn't hurt to add a small storyboard for the sprint demo
  - Complements the acceptance criteria

- Dependencies
  - Technical dependency (or other relation) to another story should be noted

Technology
Arts Sciences
TH Köln

Hierarchy of agile requirements

- **(Investment) Theme**
  - High-level value proposition
  - Ex.: *Role-Based Authorization*
  - Spans across teams and releases
  - Free-format

- **(Business) Epic**
  - Coarse-grain, customer-facing
  - Usually new features or services
  - Free-format (recommended: use User Story format)

- **User Story**
  - Level used for sprint planning
  - Estimated in story points

- **Tasks**
  - Implementation task
  - Estimated in hours

Source: [Leffingwell], own experience

**Technology
Arts Sciences
TH Köln**

Examples for a web site for managing training courses

- **TH:** Trainer profiles

- **TH:** Courses and Events

- **TH:** Resources and Documentation
  - **EP:** As a site visitor, I can read FAQs.
  - **EP:** As a site editor, I can maintain an FAQ section.
    - **US:** As a site editor, I can enter a new FAQ with fields for headline and body text, so that I can add content when I encounter user questions multiple times.
    - **US:** As a site editor, I can use simple wiki markup in my FAQ body text, so that I can format the text with ease. *[Additional documentation: *bold*, _italics_]*
      - **TA:** Define format for wiki markup rule
      - **TA:** Implement configuration data store and API for wiki markup rule
      - **TA:** Implement HTML converter

Technology
Arts Sciences
TH Köln

Rules for user stories: INVEST

- Good stories follow the INVEST(*) theme:
- **I**ndependent
- **N**egotiable
- **V**aluable
- **E**stimable
- **S**mall
- **T**estable

Example(**)

- *As an admin, I can set the consumer's password security roles (…)*
- *As a consumer, I am required to follow the password security set by the admin (…)*

- **Q: What is wrong with these stories?**
- **A: They are not independent. Better:**

- *As an admin, I can set the password expiration period so that users are forced to change their password periodically*
- *As an admin, I can set the password strength characteristics so that users are required to create difficult-to-hack pwds*

Technology
Arts Sciences
TH Köln

How to set up an agile backlog
(with exercise)

Technology
Arts Sciences
TH Köln

If you start an agile project, DO NOT FOLLOW our process …
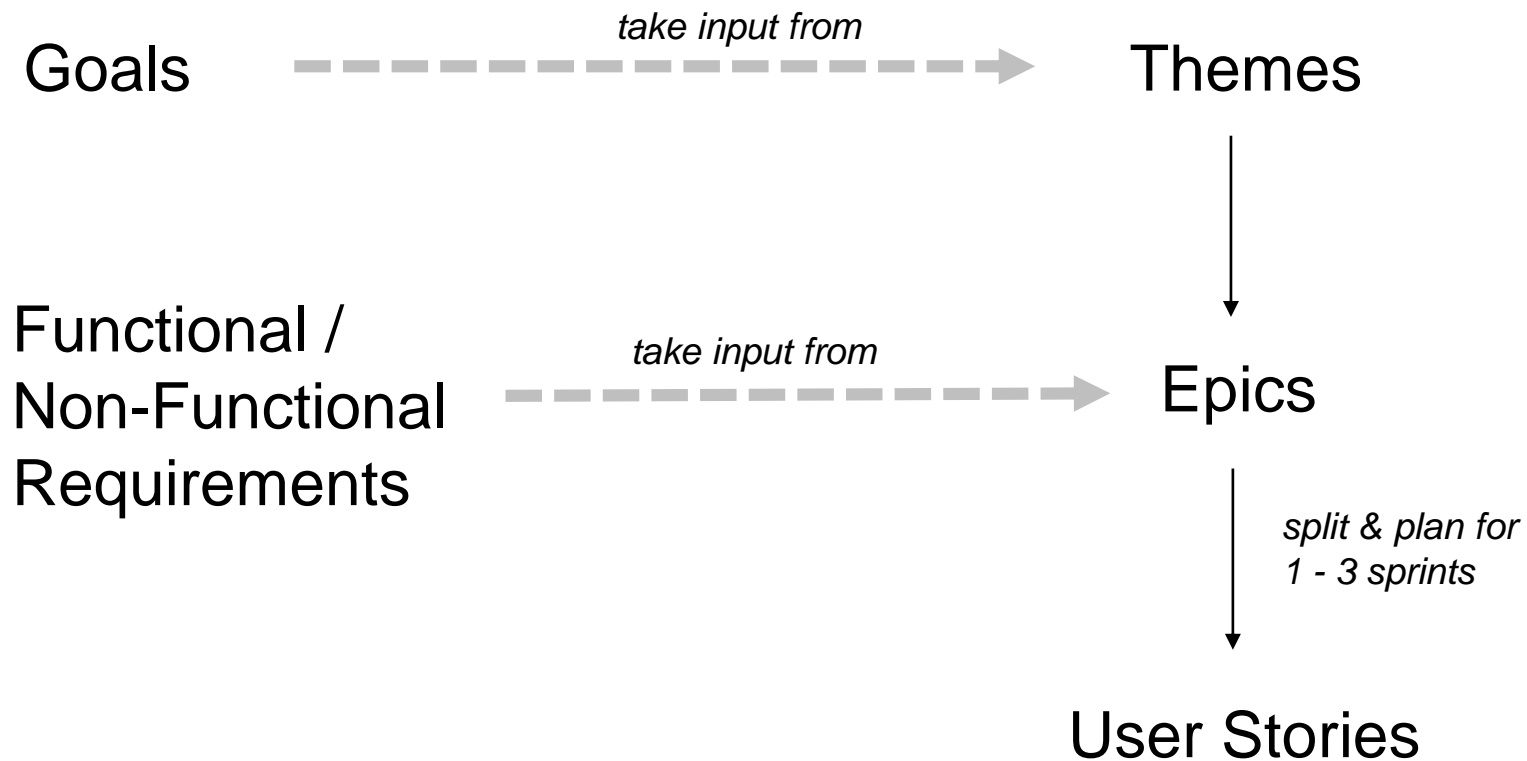

Pragmatic RE Process Model
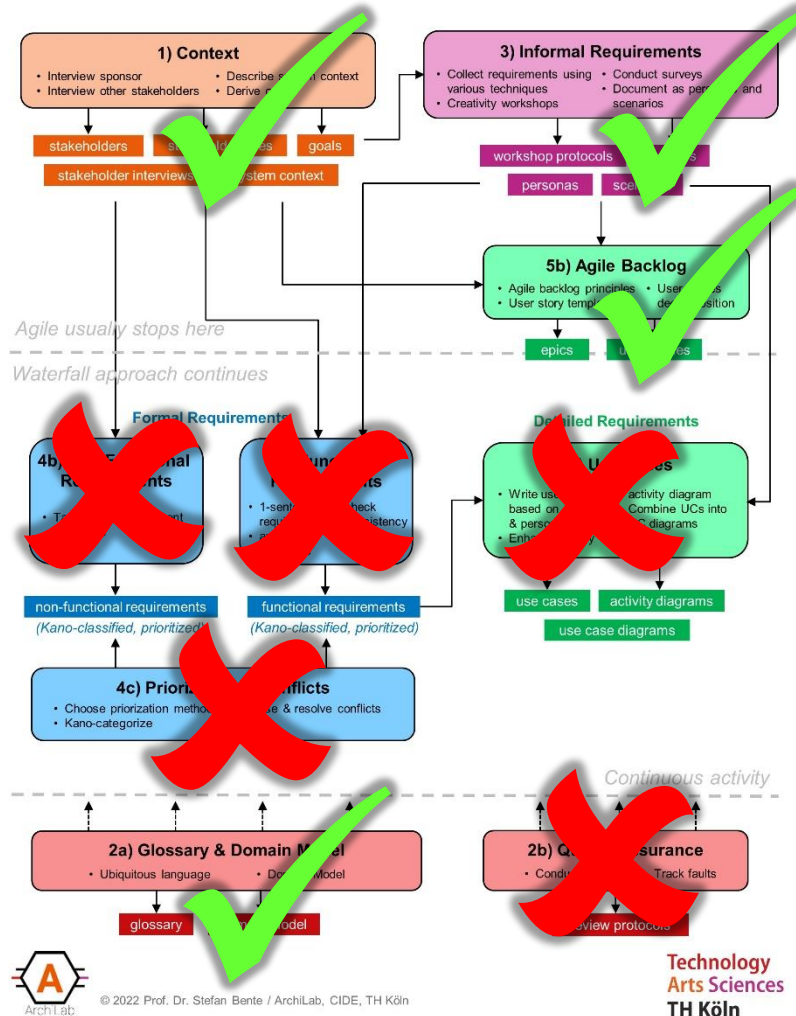
esp. for user-centric project
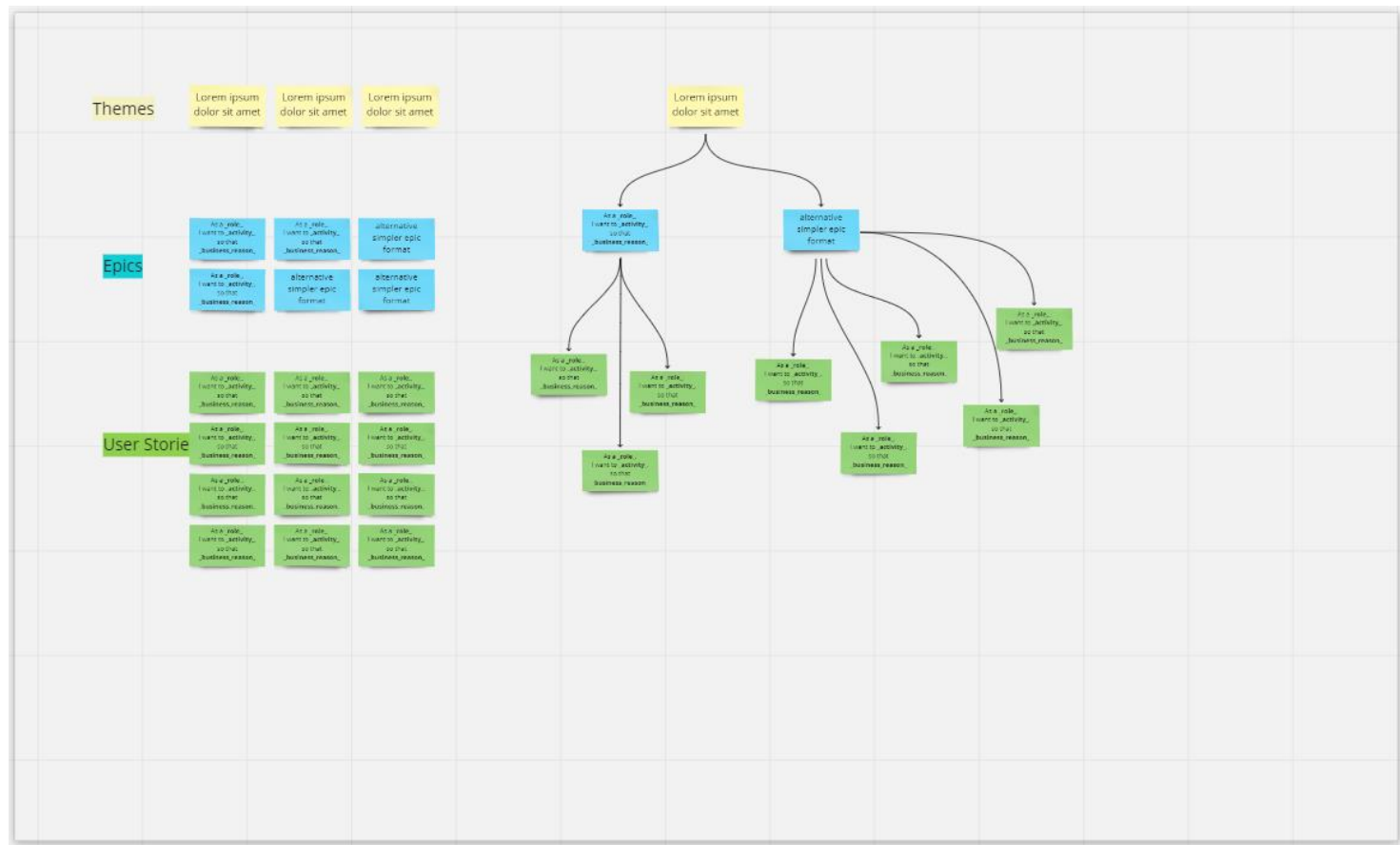
Responding to change
over following a plan

Customer collaboration
over contract negotiation

© 2022 Prof. Dr. Stefan Bente / ArchiLab, CIDE, TH Köln

Technology Arts Sciences TH Köln

Technology Arts Sciences TH Köln

… but since we have all these artifacts by now …

Goals - - - - - - - - *take input from* - - - - - - → Themes

Themes ↓ Epics

Functional /
Non-Functional
Requirements - - - - - - - *take input from* - - - - - → Epics

Epics ↓ *split & plan for 1 - 3 sprints*

User Stories

Technology
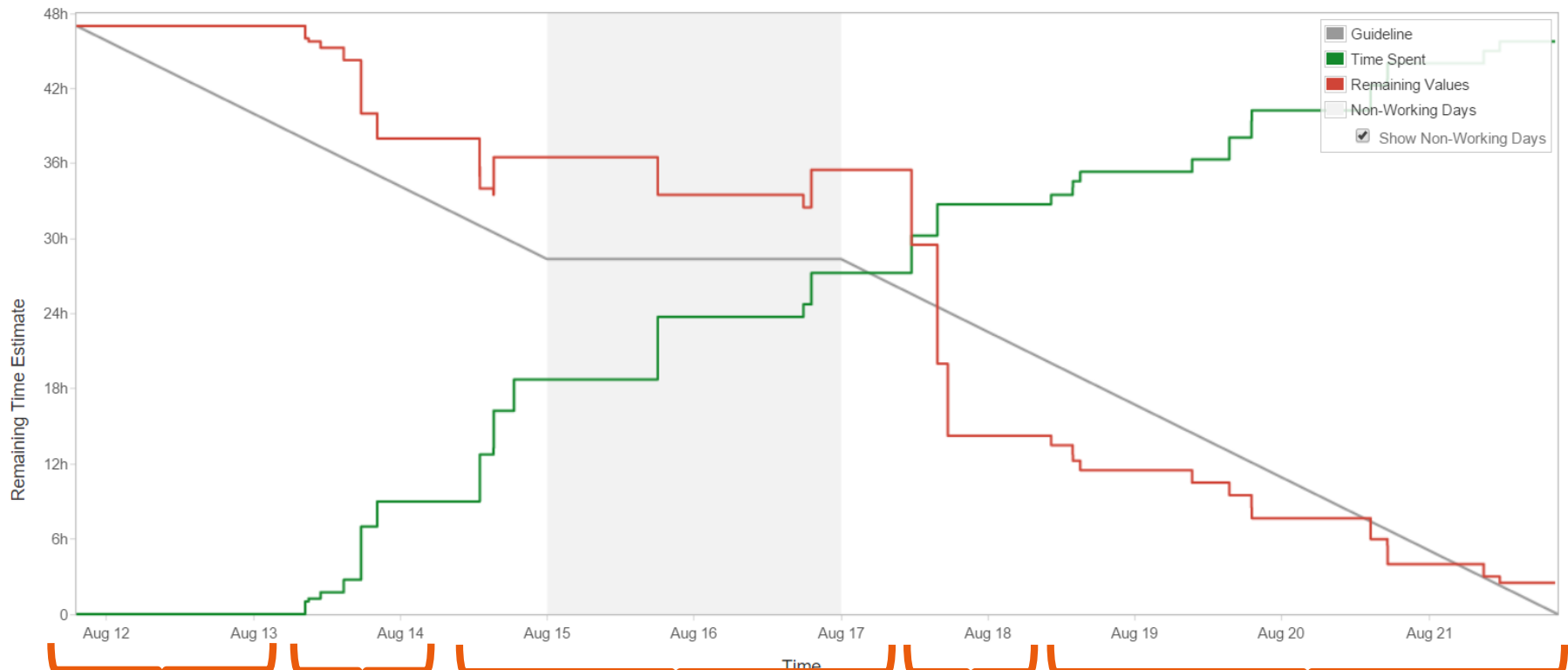**Arts Sciences**
TH Köln

Do this for your case study

Take 60 min and do this for your case study: 1 Theme, 1-2 Epics, >4 User Stories

https://miro.com/app/board/uXjVOnC_S9E=/

Technology
Arts Sciences
TH Köln

How to work with user stories

Technology
Arts Sciences
TH Köln

Monitoring an agile project using Burndown Chart

- 2 days of inertia

- Work started on US 1 & 2
- No US fully done yet

- US 1 completed
- US 2: one of the subtasks turns into a blocker
- Weekend work to fix it
- No success yet: Estimates increased

- Blocker in US 2 finally fixed
- As a result of the fix, US 3-5 require less effort

- Work finalized with steady pace
- US 3-6 worked in parallel
- Despite crisis in middle of sprint, only US 6 not fully done (=> dropped)

Technology
Arts Sciences
TH Köln