Exercise for the Lecture **Requirements Engineering (Elite)**
Summer Semester 2022
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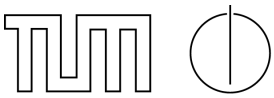

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Tutorial 8: System Models, Formalization

This exercise sheet covers the contents of the **8th lecture**.

Exercise 1 System models, artefact orientation, and their problems (Understanding, Discussion)

One major challenge for model-based software engineering or requirements engineering is the synchronization of various models. Name and describe two ways to achieve consistency among all used models!

Remember our discussions about artefact-orientation and activity-orientation. Discuss reasons why consistency management may or may not be a problem when using frameworks like AMDIRE.

Exercise 2 LTL specifications (hands-on)

Translate the following requirements from natural language to LTL formulas.

1. Every time the user hits the break, the motor stops accelerating within the next step.
2. If the reservation is confirmed, the reservation fee will always be charged.
3. If a scooter gets reserved, after 5 steps it either is booked or the reservation is cancelled.

Exercise 3 $\square$(formal_description > empirical_validation) (Discussion)

Do you agree with the assertion or do you think it is wrong? Support your opinion by formulating three arguments, including an example, that either refute or support the statement.

The more formally the requirements are described, the better the requirements engineering.

Exercise 4 Formal vs empirical formulations (Analysis, hands-on)

Turn *each of the following requirements* into either an empirically formulated or formally substantiated statement. Pay attention to objectivity, comprehensibility, precision, and verifiability.

1. There is no strong distraction caused by using the system.
2. Incorrect operation is largely ruled out.
3. The system is self-explanatory.
4. Even during a service interval, the system must continue to be highly reliable.
5. The development of the sytem is cheap.
6. The scooter will not be released for use until a default amount has been blocked on the user's credit card.

Exercise 5 Executable Models (Discussion)

Discuss the following hypothesis:

The goal of requirements engineering should always be to specify business processes using executable languages (e.g. BPEL). These allow their immediate execution by means of workflow engines.