

Technische Universität München
 Fakultät für Informatik

Tutorial 6: Goals, Non-functional requirements

This exercise sheet covers the contents of the **5th and 6th lecture**.

Exercise 1 Solving conflicts through power

(Discussion)

Clear hierarchies make conflicting goals easy to resolve - the decision is simply made by the highest-ranking person or funder.

Do you agree with the statement or do you think it is wrong? Justify your opinion.

Exercise 2 Specification and classification of non-functional Requirements (Understanding)

Axel van Lamsweerde developed a taxonomy to classify non-functional requirements [1], which is illustrated in Figure 1. In the following, requirements from the context of Rent-a-Scooter are provided.

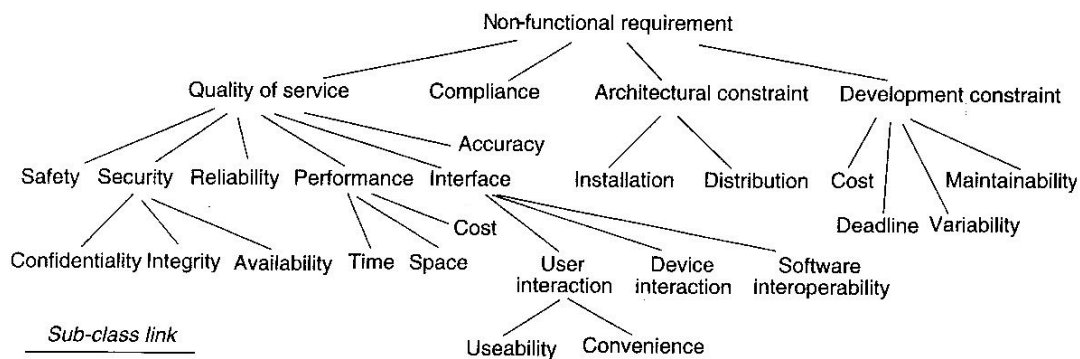


Figure 1: Exercise 2: Classification of non-functional requirements according to van Lamsweerde [1].

1. All information collected for maintenance and usage statistics may only be viewed by the maintenance technician or product support.
2. The information collected for maintenance and usage statistics must be available at all times via the maintenance interface or via internet for maintenance technicians and product support.
3. The embedded scooter control software may use max. 15 kB for storing internal data.

4. The navigation menu of the app has to be provided in 15 languages (de, en, it, es, ...).
 5. All sensors offer an XYZ interface.
 6. The electric engine and the battery of the e-scooter must comply with the specifications according to the CE test mark and the VDE guidelines.
 7. All control functions are to be accommodated on one control unit for reasons of cost and space.
 8. The development of the App version 2021.10 is budgeted at 100k euros, so the implementation of 2021.10 features may not exceed this total amount.
 9. Users' data should be stored securely.
 10. The system has a high performance even with many simultaneous accesses.
 11. The interface should be easy to comprehend.
 12. The interface should look trustworthy.
- a) Match the described features to Lamsweerde's categories and
 - b) explain how you would verify the requirements.
 - c) For each of van Laamsweerde's categories not yet covered in this exercise, give an example requirement from the Rent-a-Scooter context.

Exercise 3 Refining non-functional requirements

(Understanding)

You present the Rent-a-Scooter idea including scooter, backend, and various mobile apps to the mayor of your hometown. She agrees to let you use her city for a test phase, but on one condition: *Es muss sicher sein*. ('It has to be secure and safe')

- a) Refine the given abstract requirement into at least **seven** more specific requirements. Classify the resulting requirements as either functional or one of the non-functional requirements in van Lamsweerde's taxonomy.
- b) Formulate guidelines under which circumstances a distinction between functional and non-functional requirements is useful. What are benefits of such a distinction?

Exercise 4 Performance, Security, and Safety: non-functional vs functional? (Discussion)

Consider the following statement:

*Temporal behaviour and performance are non-functional properties.
Safety and security are functional properties.*

Do you agree with the statements or do you disagree? Support your opinion by three arguments, including examples, that either refute or support the thesis.

References

[1] Van Lamsweerde, A. (2009). Requirements engineering: From system goals to UML models to software (Vol. 10, p. 34). Chichester, UK: John Wiley & Sons.