High Priority ----------

Exercise 1 Importance of RE (Understanding)

Name five problems that can be solved in software and system development through sound requirements engineering.

Additional question: What does "sound" requirements engineering mean anyway?

- Incomplete/ hidden reqs.
- Moving targets
- Time boxing
- Separation reqs. from known solutions
- underspecified reqs.

Sound RE

- aims at an efficient and effective adminstrations and use of requirements throughout the entire system life cycle

Exercise 5 Classification and Analysis of Requirements (Analyse)

Solve the following subtasks:

a) Classify the following text examples into: Functional Requirements, Quality Requirements, and Process Requirements.

b) For each example, mark a possible requirement source, a possible author, the stakeholders involved, the requirement rationale, and the actual requirement.

Text examples:

1. The system can be controlled easily and intuitively with the aid of two control elements. A button is used to discard hints. A switch is used to turn the system on or off.
2. The vehicle's radio frequency warning (RFW) system can then compare the intended direction of travel with the observed direction of travel. If the intended direction of travel and the vehicle's direction of travel match, the information is processed further; otherwise, the information is filtered out. The vision of the Radio Frequency Warning (RFW) system is to help drivers cope with the flood of information on the road with the help of radio frequency signals (hereafter RaSi).
3. The RFW system is intended to provide the user with an alternative to traffic signs that are visually difficult to see.
4. For the development of the RFW system the V-model XT shall be used to simplify quality assurance.
5. The supplier shall comply with the applicable standards and laws, even if they are not explicitly mentioned in the agreements. It should be noted that not only the laws applicable in Germany must be complied with, but also those of other EU countries.

1. Functional Req.

Exercise 1 Classification and Analysis of Requirements (Analysis)

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Exercise 3 Analysis of Requirements for separation of problem and solution (Analysis)

When stakeholders describe requirements, they often put forward concrete solution proposals. Those can distract from the actual problem and unnecessarily restrict the solution space. As a requirements engineer, it is your task to question such proposed solutions in order to approximate an adequate problem description.

Consider the e-scooter: One stakeholder poses the specific request "The handle should be made of stainless steel". You as a requirements engineer question this specific request: "Why stainless steel?" and receive the answer: "Because it is easier to clean". From this, you deduce the requirement: "The handle should be easy to clean". During system design, the decision is made to use carbon because it is even easier to clean than stainless steel and is also cheaper.

Extract a possibly problematic solution constraint from the following statements. Reformulate these statements so that their solution space is not unnecessarily restricted:

- "The microwave oven should be equipped with a video camera that analyzes the food in the microwave and automatically adjusts the power intensity and duration from it."
- "The user should be able to choose the appropriate category from the drop-down menu via GUI."
- "A typical third party 'load balancer' shall distribute user requests to the different servers to ensure a response time below 2 seconds."
- "To avoid distracting the driver, the desired speed shall be adjustable via two buttons, + and −, on the steering wheel." "
- "The vehicle shall not accelerate at more than $2m/s^2$."
- "All new data fed into the system must be backed up once per hour." .
- "Before creating a new text entry, the character set to be used should always be queried."
- **Create 2 more examples that may include a solution constraint. Have your partner analyse them (or re-use your results of Exercise 2)**

Exercise 4 How to achieve flexibility: artefact-orientation vs 'no documentation' (Discussion)

Comment on the following statement:

In agile software development, flexibility is achieved, among other things, by reducing the number of artifacts to be created. Consequently, the statement artifact orientation increases flexibility *from the lecture is false.*

Exercise 1 Stakeholder and Project Success (Discussion)

Consider the following proposition:

Only those stakeholders who also participate in the acceptance test are relevant considering the success of a project.

Do you agree or disagree with the thesis? Support your opinion by formulating three arguments, including an example, that either refute or support the thesis.

Exercise 2 Stakeholder (Modeling, Analysis)

The Trans-European Ecological Bank (TEB) is currently going through the international merge of smaller industry-related companies in its banking group. Thus, they renew the automated end customer services to increase sales and customer satisfaction as well as to reduce costs. This creates the need to consolidate and optimize the various business processes (especially B2C). In this context, the expansion of ATM devices is to be tackled. In a working group with TEB, as the RE representative, you will meet the representatives of management, end customer support and the device maintenance service, where the previous processes will be analyzed and documented as part of the discussion. It becomes apparent that the current status of the ATM network consists of very different device types in terms of function and age, which do not meet current customer needs, the expectations of maintainability, user-friendliness and the streamlining of conventional end customer processes. The TEB Board of Directors has therefore decided to adapt and partially replace the previous device and network concept.

The first workshop is about identifying and classifying the relevant stakeholders. You take on the role of an RE expert.

a) Find all relevant *stakeholders* (at least 10) and specify a goal that is characteristic of this stakeholder or a more specific requirement for each of them.

b) A distinction is sometimes made between *active* and *passive* stakeholders. In contrast to passive stakeholders, such as legislators, active stakeholders interact directly with the system (e.g. the user). Decide whether the stakeholders you found are passive or active stakeholders. Also state the interests of the stakeholder.

c) Discuss characteristics and relationships that you consider important for the documentation of stakeholders and create a stakeholder model.

Exercise 4 Applied Elicitation Techniques: E-Scooter (Hands-on)

You accompany the development of the physical E-Scooter as a requirements engineer. Consult with your team which elicitation techniques are suitable to elicit requirements for the hardware. Then carry out these techniques!

Exercise 1 Personas E-Scooter (Homework)

A startup company would like to build an E-Scooter platform. They decide for a smartphone app to allow users to conveniently book the scooters. As you are responsible for the elicitation of requirements you decided to use *personas* for a better collection of the needs of your customers.

Please choose one of the following stereotypes and create a *persona* using the criteria explained in the lecture. Remember to provide a specific scenario how the persona uses the system.

Stereotypes:

1. Business customer who wants to get to his meeting fast
2. Young person who has fun to drive a scooter
3. Retired person with no technology affinity

Exercise 3 Applied Elcitation Techniques: E-Scooter (Hands-on)

You accompany the development of the physical E-Scooter as a requirements engineer. Consult with your team which elicitation techniques are suitable to elicit requirements for the hardware. Then carry out these techniques! If you decide to perform a workshop or other techniques that involve external participants, try to plan the workshop as explicitly as possible and research appropriate participants (e.g. 'we need someone from the transportation department of the city'; figure out the exact contact person and how to get in touch with them.)

Exercise 4 Goal-Question-Metric (Modeling)

Apply the GQM-Approach to the following goals in order to quantify to which extent they are fulfilled.

1. Improve the usability of the smartphone frontend for the user of the booking system.
2. Improve the handling of the hardware scooter device for the operators in charge of maintaining the scooters.
3. Improve the maintainability of the source code of the software backend system.

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.

Exercise 2 Cockburn's Use Case Template (Modelling)

Your boss wants you to write down some *use cases* for the procedure of reserving an e-scooter with the app. In our case an user can reserve any scooter for free for up to 15 minutes. Luckily, you heard about *Cockburn's use case template* in the Requirements Engineering lecture and recall that it is a good method for eliciting and breaking down use cases.

a) Start with the template given below: Formulate the goal of the use case as a short active verb phrase.

b) Formulate the "goal in context", "scope", "level", "preconditions", "success end condition", "failed end condition", "primary actor", and "the triggering event".

c) Come up with a meaningful *Description* of the main success scenario of at least 6 steps, some *Extensions* and one *Sub-Variation*.

d) Write down the "priority", the "performance target", the "frequency" and one "open issue".

e) Now transfer the documentation from the template into a corresponding model. To do this, create a UML activity diagram that describes the set of scenarios specified in the use case.

You can use the following table template for writing down the use case:

USE CASE 1	
Goal in Context	
Scope	
Level	
Preconditions	
Success End Condition	
Failed End Condition	

Primary Actor	
The Triggering Event	
MAIN SUCCESS SCENARIO	
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	
EXTENSIONS	
2. 7a. 7a1. 7a2. 9a. 9a1. 10a. 10a1. 10a2.	
SUB-VARIATIONS	
1. 7.	
Priority	
Performance Target	
Frequency	
Open Issues	

Exercise 4 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 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 User Stories (Hands-on)

Many agile teams work with user stories. However, the Scrum Guide does not prescribe them.

1. What is the difference between Use Cases and User Stories?
2. In what kind of project do you use Use Cases, when would you prefer User Stories?
3. What does the abbreviation INVEST stand for in User Stories?
4. Analyze, critique and refine the following User Stories:
   - As a marketing manager, I want a text editor so that I can edit text.
   - As a product owner, I want to learn about user stories, so that I can write user stories.
   - As a scooter renter, I want to rent a scooter, so that I can ride it.
   - As a user, I want a test coverage of 90% to make sure I get the correct results.
   - As a user, I want the app to work correctly, so that I can rent a scooter.
5. Formulate own user stories in the context of the E-Scooter. Focus on
   - payment of a ride
   - analysis of user data

   Who is the user, which roles can they take? Which function do they demand, what are the reasons for that?
6. Have a partner analyse and critique your user stories. Incorporate the feedback and continue with the partner's user stories.

Exercise 3 Requirements Smells (Analysis)

In the following, the quality of natural language requirements is considered using the following examples. Evaluate the examples against the quality criteria discussed in the lecture by pointing out any problems that may arise and marking the appropriate place in the text.

Examples:

- As far as possible, the input data should be checked for plausibility.
- We want to hide or show an object. In particular, the 'un-hide' must be performed on the 'parent' folder.
- Both the architecture and the programming style should ensure easy and efficient maintainability.
- The document handler can refine the search result and set further filters by using the facets on the left side of the screen.
- As a visitor, I want to see the checkboxes in the different categories displayed more clearly, so that i can see more quickly that i can select and deselect categories.

- As a developer, i want a simpler deployment process.
- If needed, the app provides support.
- As a customer of this provider, I want to be able to store a larger number of emails.
- As a visitor, I want to have a meaningfully structured side menu.
- The pictures should load quickly, so that unnecessary waiting time is avoided.
- The current logo should be switched to the new one.
- A user-friendly design has to be introduced.
- The runtime should be decreased significantly.
- Arial must no longer be the font used on the website.
- For further information, see the attached document.
- Weakly meetings with the user/customer take place to ensure a short feedback cycle.
- The throughput shall be increased and the consumed power decreased. If possible, the achieved delta should be 20 percent.
- The interface of the new module does not match with the socket of the system. It has to be changed.

Exercise 3 Example Exam Questions (Exam)

The following questions are comparable to questions possibly asked during the exam.

1. 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. Do you agree or disagree? Which problems might occur?
2. In the context of a web store selling shoes, perform a goal refinement and goal abstraction for the goals usability and security.
   Where can you identify possible conflicts between those goals or their subgoals? Resolve the identified conflicts!
3. Which are problematic aspects of the following user story? Provide a refined version and explain how the identified flaws have been improved.
   'As a user, I want to edit my credit card details so that I can add a second card'
4. Name three advantages of using goal models (given a specific project context)!

After completing all self-study exercises, create a list of all exercises ranked by their priority for the exam. Compare your list with the list of priorities provided in Moodle.

Medium Priority ----------

Exercise 3 First Try (Hands-on)

Imagine you work in games engineering and are responsible for the game AI of a soccer simulation. Collect requirements for a soccer team with the highest possible chance of success. Example: *'the player in possession of the ball passes the ball to a teammate only if the pass cannot be intercepted by an opponent'*.

What problems could occur when these requirements are send to the development team?

Exercise 4 Brainstorming: Challenges and Types of Projects (Discussion)

Discuss one of the following scenarios in groups. Use the flipchart paper to collect challenges for requirements engineers in this context, the importance of requirements engineering for project success, and what should be in the focus of the documentation.

Scenarios:

- insurance system for offers, premium calculations, conclusion of contracts and data maintenance.
- a transrapid train
- web shop for shoes

Additional task: Find one challenge that your scenario has in common with each of the other scenarios, as well as one challenge that *only* your chosen scenario has.

Exercise 2 Creating and analyzing your own requirements: Jodel (Hands-on, Analysis)

Inform yourself about the business model and target audience of the app Jodel. Use your existing knowledge about this app as well as this article to figure out how content published in the app is moderated.
Create three requirements for a 'Moderation' module. Be sure to adhere to the characteristics of good requirements according to the quality model!

Next, have a partner analyze your requirements. The partner identifies the possible author (role), the affected stakeholders, the rationale as well as the actual requirement. Finally, discuss and compare your partner's findings to your intent.

Exercise 4 RE and Project Success (Discussion)

Consider the following hypotheses and discuss arguments for and against it.

The more time spent on RE activities, the greater the likelihood of project success.
or:
The less time spent on RE activities, the lower the likelihood of project success.

Exercise 5 Quality Standards (Understanding)

In the lecture, ISO/IEC/IEEE Std. 29148 was introduced as the quality model for requirements

a) What are advantages of a standardized quality model?

b) What are disadvantages of a standardized quality model?

c) For each aspect of ISO/IEC/IEEE Std. 29148, think about an example requirement violating it.

Exercise 1 Qualitätsmodell von Anforderungen (Analyse)

Im Rahmen der nächsten Übungen wird die Qualität von natürlichsprachlichen Anforderungen anhand einiger Beispiele betrachtet.

Überlegen Sie sich nun zunächst, welche Qualitätskriterien für Anforderungen in natürlicher Sprache gelten. **Erstellen Sie auf dem Flipchart / Whiteboard / in einem Tool Ihrer Wahl ein Qualitätsmodell, in dem Sie diese Merkmale strukturieren.**

Exercise 2 Quality Standards (Understanding)

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c) For each aspect of ISO/IEC/IEEE Std. 29148, think about an example requirement violating it.

Exercise 3 Artefact-orientation in related fields (Understanding)

While we put specific focus on artefact-oriented and activity-oriented methods, these techniques exist implicitly in other domains as well:

1. In database queries, there exist at least three strategies how to specify search results: tuple calculus, domain calculus and relational algebra. Quickly recap how each of them specifies the results of a query. Which strategy is *activity-oriented* and which is *artefact-oriented*?
2. Is Scrum an activity or an artefact-oriented process framework? Which artefacts are specified (and required!) by the Scrum framework, which activities are required?
3. Think about your last major university projects (practical course, seminar, bachelor's thesis). Recap how the advisors specified the expected results and categorize the approach (activity or artefact-oriented). Where would you have taken the same approach, and where a different one? Why?

Exercise 5 AMDiRE (Verständnis)

The lecture briefly introduced AMDiRE, which includes an artifact model for the relevant results of the RE core activities. If needed, additional information can be found at Mendez et al..

1. Explain the basic levels of the AMDiRE model and outline the goals, content, and involved stakeholders of each item.
2. Outline at least four aspects how you would use this model in a project with several project partners and a large development team distributed in terms of roles and locations. Specify the required content items, including appropriate representations (e.g., textual, models).
3. Discuss two issues that may arise in the process.

Exercise 2 Suitability of Elicitation Techniques (Understanding)

Create a matrix that shows for each elicitation technique *interview/workshop, user observation, prototyping, problem report analysis, user studies* and *comparison with competitor products*, how appropriate each technique is to

1. express desires and needs
2. show possibilities
3. analyse the current state
4. clarify market potential.

Exercise 5 Goal Model for Corona-App (Modeling)

Throwback to 2020: To contain the COVID-19 pandemic, many nations are using so-called corona exposure notification apps. In Germany, such an app is currently planned - as a renowned requirements engineer, you were tasked to model the goals of the project.

1. In the app's repository[1] you will find the following statement: *'This project has the goal to develop an app based on technology with a decentralized approach - heavily inspired by the DP-3T and TCN protocols and based on the Privacy-Preserving Contact Tracing specifications by Apple and Google.'*. Comment on this goal formulation from a requirements engineering perspective!
2. Think about which goals motivate a 'Corona App'. Then create a goal model!
   Incorporate the following terms, among others: *Notification of potentially infected people; Containment of the virus; Voluntary use; Avoiding situations where many infections occur.*
3. Expand your goal model by defining appropriate sub-goals
4. Identify justifying super-goals for each goal
5. What conflicts do you identify between goals?
6. Consider apps used by other countries and evaluate which goals are met, partially met, or not met. To do this, use MIT's database[2] and this overview[3] from the SZ.

   Spoiler:

   - China, India, Qatar: Mandatory use of the app.
   - Iceland: Position tracking with GPS
   - Australia: Central data storage

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 1 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.

Exercise 3 $\Box$(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 1 Code as the best model of a system (Discussion)

Consider the following statement:

Code provides the best view of a system because, first, the code can never become obsolete, and second, there are no costs associated with additional documents or models.

Do you agree with this statement or do you think it is false? Support your opinion by formulating two arguments, including an example, that either refute or support the thesis.

Exercise 2 RE and close interaction with the customer (Discussion)

Consider the following statement.

In the case of close and frequent contact with the customer (e.g. Scrum process), no requirements engineering is needed for a successful development.

Do you agree with this statement or do you think it is false? Support your opinion by formulating two arguments, including an example, that either refute or support the thesis.

Exercise 4 Project Vision (Understanding, Hands-on)

This exercise is concerned with the System Vision (or Project Vision):

1. What is the role of a project vision in an agile project?
2. What content should the vision contain?
3. How is it different from a slogan?
4. Formulate a project vision for the *Rent-a-Scooter* project together with a partner!

Exercise 1 Checklists, Templates and Patterns (Discussion)

What types of quality assurance did you learn about in the course of the lecture?

Now consider the following statements:

Requirements created according to checklists/rules/patterns are automatically good requirements.

Do you agree or disagree with the statement?

Exercise 4 NLP for Requirements (Hands-on)

NLP tools can be used to evaluate the quality of requirements. However, the automatic analysis of natural language also has its shortcomings. Formulate a requirement that is easily understandable for a human but might be a false positive when using a NLP tool.

Exercise 5 Defining Change Request Management Process (Hands-on)

The e-scooter software is implemented and deployed on the hardware scooter. Now, a small test phase begins to collect feedback from various stakeholders.

1. Name 5 stakeholders who are likely to provide feedback after the initial phase
2. Define a process to document, assess, prioritize, and decide on change requests concerning the **iOS app**
3. Define a process to document, assess, prioritize, and decide on change requests with are concerned **with the hardware scooter**
4. Which roles and competencies does your change request management process contain?

Exercise 6 Change Management vs Agile Projects (Discussion)

Consider the following statement:

A well-defined and structured Change Management Process is not compatible with agile project management.

Do you agree with the statement or do you think it is false?

Low Priority ----------

Exercise 2 What is going to be developed here? (Understanding)

Develop an intuition of what system is being described by the tutor. Describe the system using a single term. Update the term if needed after each additional requirement.

- The system has a motor.
- The system can be steered with a steering wheel.
- The system must have 4 wheels.
- The system provides a seat (exactly one).
- The system shall have two gear transmissions.
- The cutting height shall be continuously variable.

Next, describe the system with a user story. What are the advantages compared to the previous description?

Exercise 3 IDEO Method cards (Understanding)

The company Ideo designed a tool to methodically elicit design requirements to better understand users and their needs. 51 methods were gathered for this purpose and divided into four categories *Learn, Look, Ask* and *Try*:

- Learn: Analyze the information you've collected to identify patterns and insights.

- Look: Observe people to discover what they do rather than what thay say they do
- Ask: Enlist people's participation to elicit information relevant to your project
- Try: Create simulations to help empathize with people and to evaluate proposed designs

These method cards are provided to you in a pdf file on Moodle. First, read and analyze the method cards. Next, choose 5 methods (from each of the categories at least one) and justify why you think they are the best. Then, explain the methods to your partner in your own words, and in turn, have them explain the methods they chose. Then, switch to a new partner.

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.

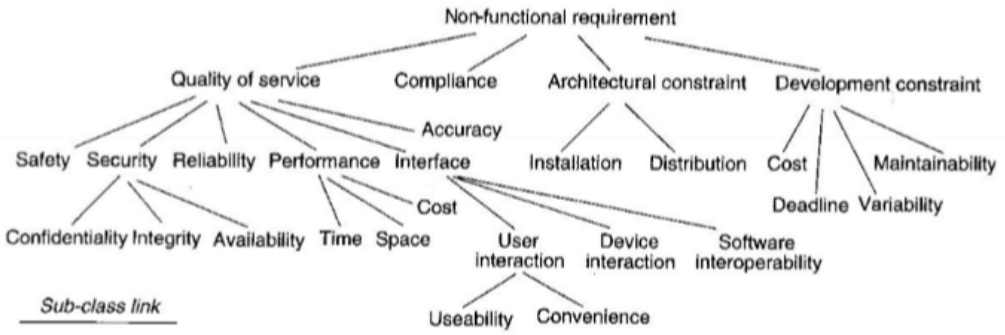

Figure 1: Exercise 2: Classification of non-functional requirements according to van Lamsweerde [1].

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 Laamswerde's categories not yet covered in this exercise, give an example requirement from the Rent-a-Scooter context.

Exercise 3 Function Hierarchies (Modeling)

As you already know from the lecture, function hierarchies are used to structure the functionality of the system interface considered in the RE-task.

1. Create a function hierarchy by extending or refining the individual system functionalities from the use case *withdraw money* of an ATM system. Relate the elaborated collection of functions to each other using decomposition and dependency.
2. Specify input and output channels for your leaf-functions.
3. Identify additional relationships between the functions, e.g., *"excludes/XOR", "interrupts", "as alternative to", "precedes", "enables/disables", "follows", "data (flow) dependency"*.
4. Provide an important reason for creating and using a function hierarchy. How is a function hierarchy different from the functions in the use case?

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.

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Exercise 5 Effort estimation (Hands-on)

As a group, assess the effort of the following tasks, cf. story points in user stories, one after the other. Pay attention to disagreements in the team, how often estimates have to be re-assessed due to new requirements and why. Report your experiences to the other groups afterwards. What influence can the size of a task have on its prioritization? Use

- the S/M/L (and XL if applicable) scale
- absolute time units
- planning poker
- relative time units

Tasks:
Empty the dishwasher, call grandma, vacuum the apartment, call dad, go grocery shopping, mow the lawn, go to the dentist, resolve Git Merge conflict, paint fence, build wooden garden shed , repaint the kitchen, pay bills, plant tulips, repair roof, book white elephant for the niece's birthday party tomorrow, study for RE exam, study for 'Safety and Security' exam.

Exercise 2 Relationship between RE and Change Requests (Discussion)

Consider the following statement:

The number of change requests received during a project shows the quality of the requirements engineering activities. (the more change requests occur, the worse the requirements engineering was)

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

Exercise 1 Relationship between RE and Change Requests (Discussion)

Consider the following statement:

The number of change requests received during a project shows the quality of the requirements engineering activities. (the more change requests occur, the worse the requirements engineering was)

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

Exercise 2 Overview (Understanding)

Create an overview (mind map, drawing) and include the following terms in a way that seems sensible to you. Use arrows to mark where insights from specific activities or artifacts are reused.

List of terms:

- Problem
- Solution
- Implementation and testing of the system
- Artifact-orientation
- Activity-orientation
- AMDiRE
- Context Layer, Requirements Layer, System Layer
- Core Activities
- Elicitation
- Analysis
- Specification
- Validation
- Verification
- Stakeholder
- User-Centered Design
- Personas
- Goal modelling
- function hierarchy
- Goal conflicts
- Smells
- verifiability
- GQM
- Non-functional requirements
- Formal formulation
- Empirical formulation
- Use-Case Template
- Tracking / Tracing
- Change
- Change Management
- Requirements Management
- Quality