Exercise Sheet 2

Exercise 1 Presentation topic 1 *(2 students)*

OOA Example Application: An airline booking system handles reservations and bookings for airlines and passengers over the internet. You are working in the software development department of a software company. The task for your company is to provide a new software for the management of these transactions! The application software should have the following features:

- On-line handling of reservations and bookings of airline flights, e.g., available flights, departure and destination airports, date and time of flights, economy, business or first class tickets, seat reservations, booking cancellations
- Authorization of the passengers for access to the system
- Handling of the payments (cash, credit cards, etc.)
- Database design for Customer Relationship Management (CRM)
- Human-Machine-Interface (HMI) for the end-user to provide the above mentioned functionality.

The application software for the new product has to be developed as a new software.

The requirements have been gathered. Problems are often too large and complex to be understood as a whole. For this reason it makes sense to partition (divide) the problem into parts that can be easier to understand. Now it is the job of the software engineer to create a set of scenarios that describe the functionality of the system in a detailed manner.

1. Write down **one** use-case, which describes the requirements, identify actors and constraints! Think about the operation of the planned software!
2. Draw a Use Case Diagram
3. Determine potential objects and classes by analyzing the use-case!
4. Support the use-case by drawing a Sequence Diagram!
5. Draw a Class Diagram with associations (if necessary include cardinality and composition/aggregation details)!

Exercise 2 Presentation topic 2 *(2 students)*

Example: A company plans a large project with hardware **and** software components. A very crude list of software requirements is available. The milestones are fixed. The project budget (in a public-private partnership) is fixed too, but the different stakeholders are still discussing the details. A Gantt-chart for the project plan outlines the timeline. The company plans to employ three inhouse and five external software engineers.

(As any good story this one is based on real events. This is an active project. All details are confidential, but the basic facts are exactly like stated!)

Please analyze this project and focus on the system's and software engineering:

1. Select an appropriate process model!
2. Where are the key problems in the outline?
3. Where are contradictions?
4. What could happen?
5. Prepare a RMMM-Plan!

Exercise 3 Presentation topic 3 *(2 students)*

Software Process – Models The Unified Process is widely used in the industry:

1. Please describe the major features of the Unified Process in your own words!
2. State the advantages and weaknesses of the Unified Process!
3. Please name the application areas, where the Unified Process could be the process model of choice, where not and explain why!
4. There are many varieties of the Unified Process: Please find them and explain the differences!

For presentation of each task, please prepare a written report in pdf format and a talk with an appropriate tool.

Please note: You have to quote external sources, which you have used in your preparation!

Exercise 4 Get acquainted with MagicDraw *(Everbody!!!)*

Register, download and install MagicDraw 18.1 on your personal computer. You find a link to the according web page and the license key file in Moodle. If you have no laptop, we've installed MagicDraw on some computers in the lab. You may ask your tutor for assistance.

Choose a medium complex UML class diagram (at least 5 classes, 1 aggregation **and** 1 composition) and rebuild it by means of MagicDraw. You may work on your own example, a class diagram of your favorite application (if you find one), or may use Google image search (search term: "uml class diagram") to find an example.

One important learning outcome besides getting to know the tool, is awareness of the interplay of classes in the model (left panel) with its related (class) diagrams. Go and delete a class and add it again (hint: there are two ways of deletion). What happened?

Build groups of **two people** to work as a pair throughout this course.