T-76.4602 Software Development Methods
Examination, 16th December, 2010

Write the following information in each paper you return: name, student number, course code and name, date, signature.

Important: <u>Answer any 4 out of the 5 questions only.</u> Each question is worth 7,5 points.

1. Requirements engineering. Answer both a) and b).

a) What does a cultural change related to requirements engineering mean and how do use cases support this cultural change?

b) You are a software engineer and are supposed to review the use case diagram presented in Figure 1. Your tasks are to
   - identify strengths of the diagram,
   - record what mistakes and omissions there are in the diagram,
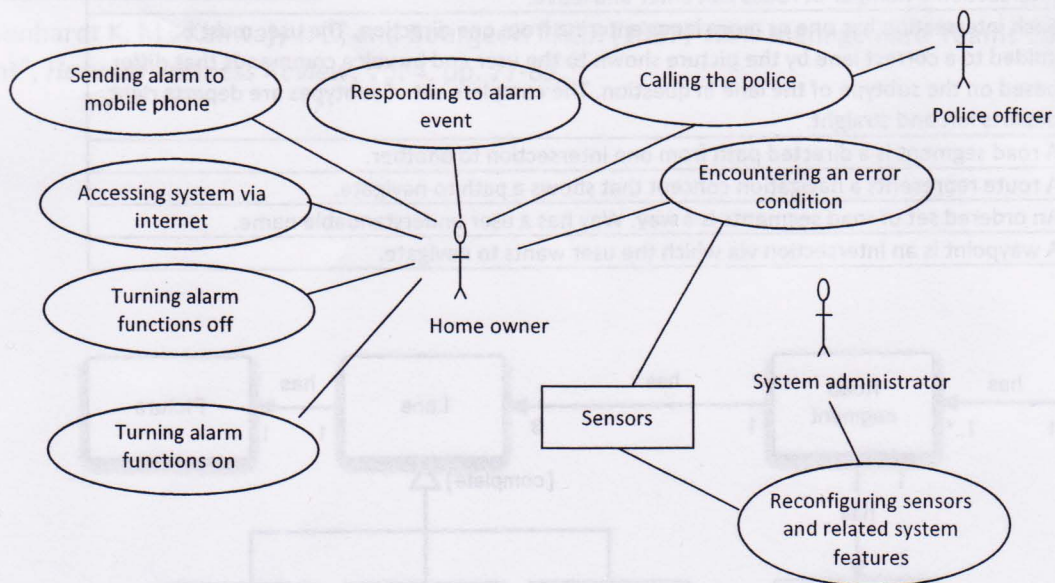   - and draw an improved version of the diagram where these mistakes and omissions have been fixed

Figure 1. Use case diagram for SafeHome system.

2. Testing

Describe the process of test case design. Explain the most relevant topics starting from the operation variable identification up to and including test case development.

3. Linking requirements and architecture design

Describe how the Quper model can support in defining architecturally significant requirements. Please illustrate the use of the Quper model by giving an example of a quality requirement from the navigator exercise of this year's course.

4. Domain modeling. Answer both a) and b).

a) Review the "Preliminary domain model" in Figure 2 below using the glossary provided in Table 1 as the basis. Identify errors and list the required modifications to the domain model.

b) What parts of the domain model are static or dynamic and how exactly? Justify your answers.

Table 1. Glossary

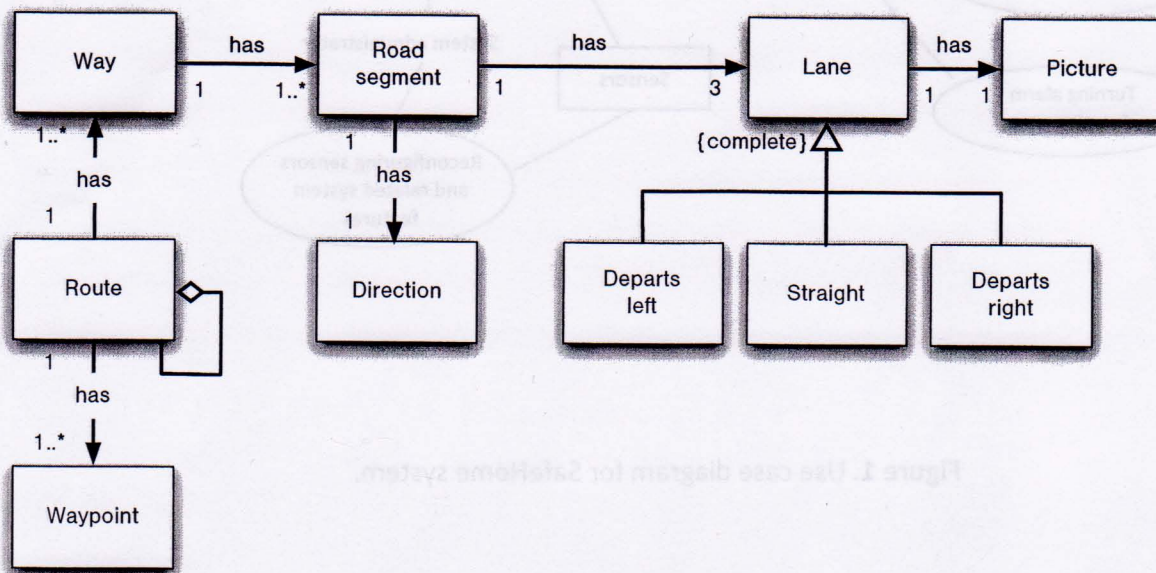| Concept	Description
Direction	Direction is defined by from intersection and to intersection. A road segment must have exactly one direction.
Intersection	An intersection represents a place where route selection must take place. From each intersection a number of roads can enter and leave.
Lane	Each intersection has one or more lanes entering from one direction. The user must be guided to a correct lane by the picture shown to the user and by voice commands that differ based on the subtype of the lane in question. The complete set of subtypes are departs right, departs left and straight.
Road segment	A road segment is a directed path from one intersection to another.
Route	A route represents a navigation concept that shows a path to navigate.
Way	An ordered set of road segments is a way. Way has a user understandable name.
Waypoint	A waypoint is an intersection via which the user wants to navigate.

Figure 2. Preliminary domain model

5. Teamwork

Eisenhardt, Kahwajy and Bourgeois (1997)[i] have discovered six tactics that successful management teams apply for managing conflicts. These six tactics are

- focus on facts
- multiply the alternatives
- create common goals
- use humor
- balance the power structure
- seek consensus with qualification

Select four tactics and analyze the activities of your team during the exercise from the perspective of the tactics.

Guideline: We expect your answer to be an essay with a good structure, reflecting your own experiences from the exercise with the tactics, and justifying and explaining your answer.

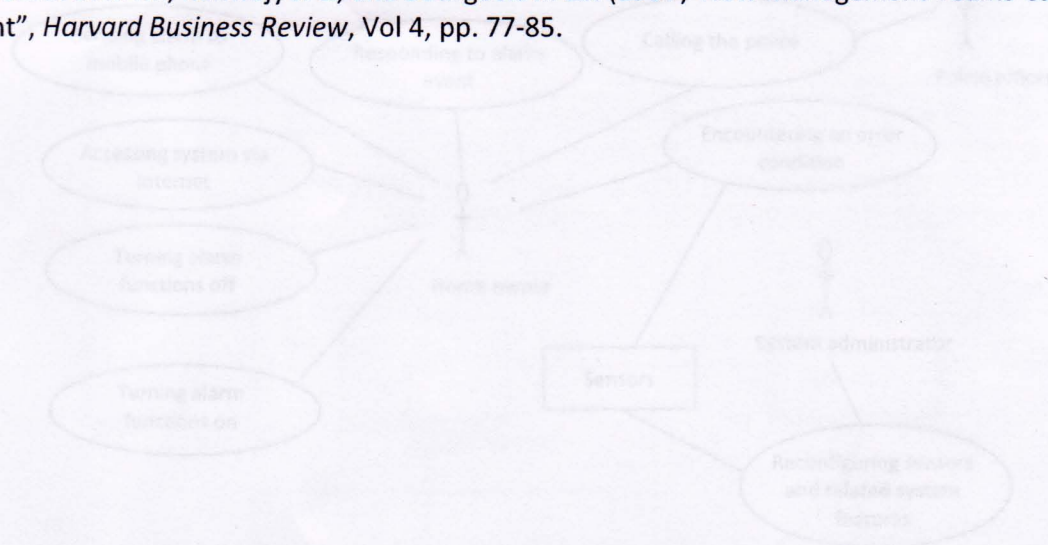[i] Eisenhardt K. M., Kahwajy J. L., and Bourgeois III L.J. (1997)"How Management Teams Can Have a Good Fight", *Harvard Business Review*, Vol 4, pp. 77-85.