

# **Exam Software Architecture**

**February 2015**

This exam is centered around the case study 'EASYMOVE'.

EASYMOVE's customers are people who move to a new home address. When people move, they obviously need to provide their new address to every company they do business with, such as banks and insurance companies, utilities (electricity, water, gas), telecommunication providers, publishers of subscriptions they read (magazines, newspapers), et cetera. Customers pay EASYMOVE to coordinate this process and to send address changes on their behalf to the companies they have a relation with.

To this end, EASYMOVE maintains a large database of companies and their contact details. Through the EASYMOVE website, customers build a profile in which they select the companies they do business with. When necessary, they may add contact information for companies that are not in the EASYMOVE database. Once the profile has been built, EASYMOVE prepares the address changes that must be sent. When possible, it sends the address changes directly to the company's administrative system (EASYMOVE has made arrangements with some of the larger companies) or via email (when a direct link has not been arranged). EASYMOVE also keeps track of the company's response to the address change and updates the status of the address change in the customer's profile. In some cases, automatic processing is not possible, for instance because the customer's signature is needed. In that case, EASYMOVE prepares a letter that can be downloaded, printed, signed, and sent to the company via regular post.

Note: this problem description may be ambiguous and incomplete. In answering the questions, you are free to complete it (if needed) and to briefly motivate your assumptions.

## **Question 1: Software Life Cycle and Architecture**

- a) Concisely explain the Architecture Influence Cycle.
- b) Give three reasons why architecture is important.

## **Question 2: Architecture representation**

- a) Concisely explain the main characteristic of a component & connector view.
- b) Provide one viewpoint specification for the EASYMOVE case study. Explain why and for whom that viewpoint is relevant.
- c) Give the architectural view of the EASYMOVE system for the viewpoint you defined under b). Present adequate documentation of your view.

## **Question 3: Design**

- a) Give three reasons why it is hard to make purely rational design decisions
- b) Give five elements of design decisions that one needs to document. Motivate your choice.
- c) Document two selected design decisions you would take as an architect for the EASYMOVE case study. Use the five elements you listed under b).

*please turn over*

#### Question 4: Software quality

- a) Describe the parts of a quality attribute scenario
- b) Give an example of a concrete quality attribute scenario for the EASYMOVE case study
- c) Give the definition of an architectural tactic
- d) Provide an example of a tactic relevant to the EASYMOVE case study. Explain why this tactic is relevant, and which quality attribute it targets.

#### Question 5: Architecture Analysis

- a. Give the definition of a 'sensitivity point'
- b. What is the key difference between a sensitivity point and a tradeoff point?
- c. Describe the steps that are executed in phase 1 and phase 2 of the ATAM.

#### Scoring

With this exam, you can gain 90 points at most. Your final mark for the written exam is calculated as follows:

$$\text{Final mark} = (\text{\#points} + 10) / 10$$

The weight of each question is as follows:

1a: 5	b: 5			= 10
2a: 5	b: 5	c: 10		= 20
3a: 5	b: 5	c: 10		= 20
4a: 6	b: 6	c: 4	d: 4	= 20
5a: 5	b: 5	c: 10		= 20