

EXAM SOFTWARE MANAGEMENT (192340041)

Date: June 22, 2015, 8:45 – 11.45

Instructions:

This is an open book exam regarding the slides in this course – it is allowed to consult any slides provided by the teacher. Be sure to switch mobile phones off and store them in a closed bag. Be sure to indicate name, program and student number on each sheet. Grade for the exam is Round and is calculated as follows:

(Sum of Points / 10)+1.

Concise yet complete answers are better than long-winded answers.

Note: whenever you have to motivate your answer, 1 point goes for simply writing the answer and the rest of the points go for writing the motivation. Do not forget the motivation!!

Success!!

Question 1 (18 points)

- 1.1 Assume an outsourcing project between the telecom company KPN (Netherland's biggest communication services provider) and Ordina, an IT consulting company. KPN is the client and Ordina is the supplier. The particular solution in this outsourcing project is the development of an Internet-of-Things system (a type of real-time system) that collects data from users' devices (e.g. mobile phones) and uses data mining algorithms to monitor performance of the KPN's services (and hence understand which cells in the cellular network of KPN may cause users' problems). Suggest the most appropriate generic software process model that might be used as a basis for managing the development of this system.

Motivate your choices. (10 points)

- 1.2 Ordina and KPN are designing a fixed-price contract, where Ordina offers a fixed price to complete the development of the system discussed in Question 1. KPN knows that such a contract is generally used to move project risk from client to contractor. If anything goes wrong, the contractor has to pay. Suggest how the use of such a contract may increase the likelihood that product risks will arise.(8 points)

Question 2 (31 points)

- 2.1 KPN wants to improve its internal software development processes and the processes of managing projects with outsourcing partners. What approach to software process improvement (among those approaches that we discussed in this course) would you suggest for KPN? Write your assumptions and motivation. **Hint:** There are important differences between e.g. the agile approach to software process improvement and the process maturity approach to software process improvement. Think what these differences mean for KPN. (7 points)
- 2.2 Imagine the Director of the Cellular Network Performance department at KPN wants to use an agile approach for the project in Question1. The project of KPN is very big and Ordina and KPN will implement a Scrum of Scrums. Would the project organization have a project plan for the project? Motivate your answer. (7 points).
- 2.3 Explain why the rapid delivery and deployment of new systems is often more important to businesses than the detailed functionality of these systems (6 points).
- 2.4 Imagine you are the Project Contact at Ordina, responsible for talking with KPN and negotiating the type of software process to be used. Under what circumstances would you recommend *against* the use of an agile method for developing the system (described in Question 1). (5 points)
- 2.5 Ordina is a CMMI 3 Level organization. They want to further improve their software processes, as this is their competitive advantage. Would it make sense for them to embark on agile as the next step to software process improvement? **Motivate your answer** (6 points).

Question 3 (25 points)

3.1 Consider the KPN-Ordina outsourcing project described in Question 1. Ordina needs to offer a price and needs to provide some reasoning about their effort estimation regarding the time they anticipate to spend on the project. What functional size method would you recommend to the Ordina specialists to use, as part of preparing the offer to KPN? Write your motivation. Write any assumptions you made. (8 points).

3.2. Imagine you are the KPN project management specialist who receives the offer from Ordina, with the price on it. You invite a few experts in the KPN organization and ask them to come up with their own estimation – based on the knowledge that they as KPN employees have about the project. Would you ask them to use expert-based estimation or algorithmic estimation models? Motivate your answer. (12 points).

3.3. Under what circumstances might Ordina justifiably charge a much higher price for the Internet-of-Things system delivery project than the software cost estimate plus a reasonable profit margin? (5 points)

Question 4 (16 points)

4.1. COCOMO 2 offers four models. Which of them you would think fits best for the context of the Internet-of-Things project (discussed in Question 1). Write the assumptions that you make and motivate your answer. (8 points)

4.2. Ordina makes a high level estimate of the Function Points for the Internet-of-Things application by using the requirements document for the project. They will use programming language X for the development. They want to convert the Function Points number to the number of the lines of codes that it would take to implement the functionality by using language X. For this conversion, Ordina will use a factor that Ordina received from a benchmarking agency (that analyses data from hundreds of projects done in various organization). What would be the benefits and disadvantages of using this conversion approach? Motivate your answer. (8 points)