
Softwaretechnik/Software Engineering

<http://swt.informatik.uni-freiburg.de/teaching/SS2016/swtv1>

Exercise Sheet 2

Early submission: Friday, 2016-05-22, 12:00 Regular submission: Monday, 2016-05-23, 14:00

Exercise 1 – Process Modeling **(13 Points)**

Assume you are the manager of a company that develops radio communication technology for fire alarms. You are hired by an external client to develop the software of a new radio module for fire detectors. Once developed, the module needs to be certified to comply with its corresponding industry standard, and you are also required to provide technical documentation.

- (i) Consider the products, activities and responsibilities in Figure 1. Those are the established activities in your company. Provide a *graphic process model* to deliver a finished radio module by using those building blocks. (6)
- (ii) Assume you have the following staff available, with their corresponding qualifications for roles:
 - Maria: Requirements Analyst, Test manager
 - Jane: Product Manager
 - Karin: Certification Manager, Technical Writer
 - Herbert: Software Developer, Software Tester

All of them have full-time availability (1PM per month), except for Karin, who works only part-time (she has 0.5PM per month available). Consider the effort estimates indicated in Figure 1 and calculate the expected total effort of the project and its expected minimum duration in months by assigning the staff to each of the roles required and considering their availability. Illustrate your calculation of project duration by drawing a *Gantt diagram*¹ of the expected activities and their scheduling. (4)

Now assume that your customer is experiencing delays due to understaffing and extends your contract to also develop the software of the sensor module of the fire detector. You are still responsible for certification and documentation.

- (iii) Extend your graphical process model to include the development of the new software module. (2)
- (iv) Calculate the expected total effort and the minimum duration of the expanded project assuming the same staff availability as in (ii).

For this task, assume you are also allowed to use an intern, with the same capabilities as Herbert, who is available part-time (0.5PM per month). (1)

¹See https://en.wikipedia.org/wiki/Gantt_chart

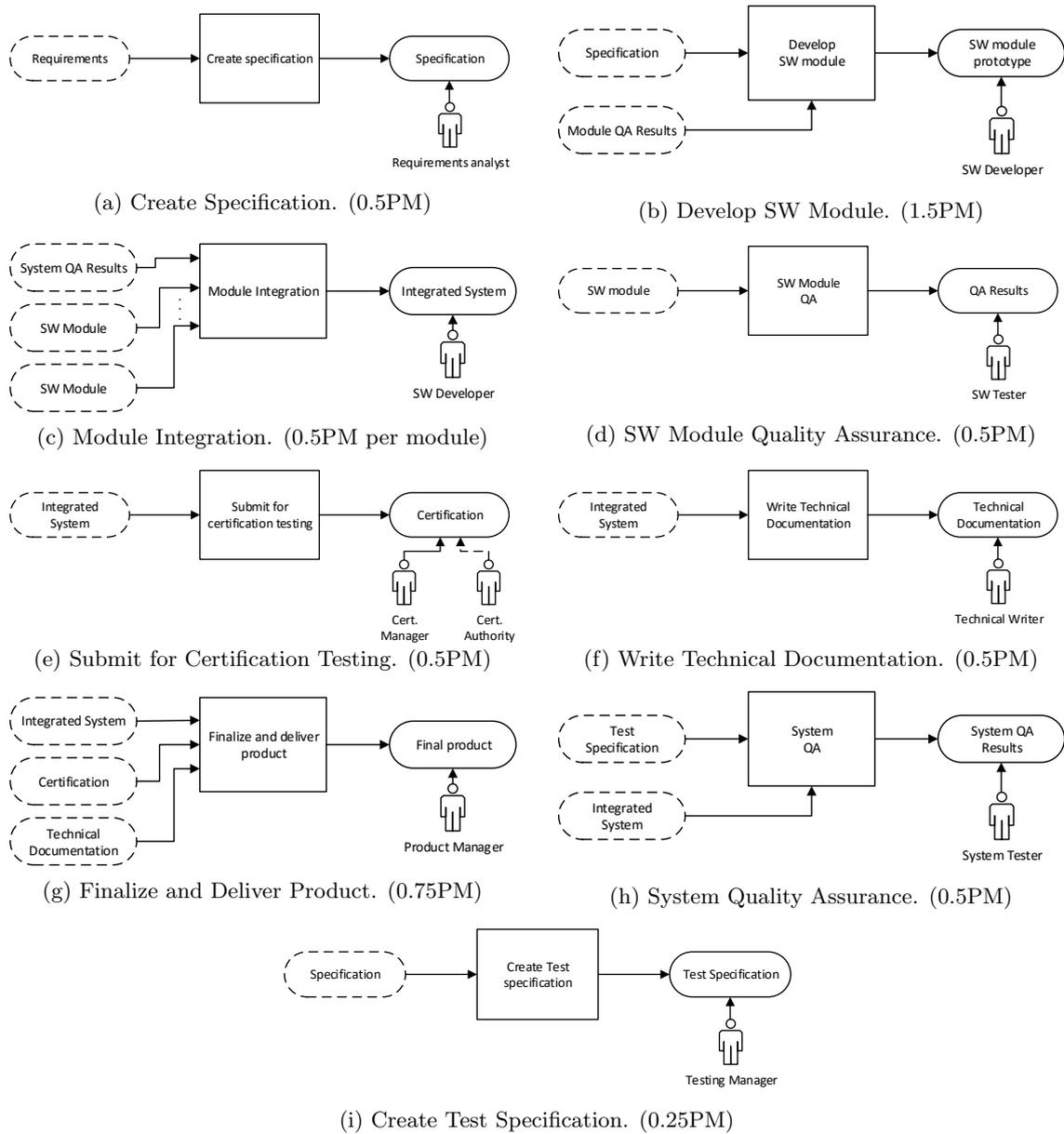


Figure 1: Products, Activities and Responsibilities of your company. Products are rounded containers, activities are boxes and the roles responsible for products are shown as a human figure. Input products are products with dashed borders. External roles are connected to products with a dashed line.

Exercise 2 – Requirements Elicitation

(7 Points)

At the *Softwarepraktikum*, one requirement from the customer is the following:

“Das Spiel muss entweder 2D oder 3D Grafik (kein ASCII) haben.”

“The game must have either 2D or 3D graphics (no ASCII).”

In this exercise, you are asked to clarify and specify that requirement as precise as possible, i.e. to assume the role of an analyst or requirements engineer:

- (i) State what terms or conditions need to be clarified. For that, name at least two plausible interpretations that you can apply to the requirement to highlight its ambiguity. (3)

Hint: If you consider the requirement to be already clear, give a specification and ask your tutor by mail to give you possible interpretations of your specification.

- (ii) Clarify which of your interpretations is correct and give a **specification** for our requirement. Use any means available to make it as precise as possible (e.g., a term glossary, formalization, a list of positive and negative examples, etc.).

In order to obtain sufficient information to clarify the requirement, you will have to ask the customer any questions you consider necessary.

Note: For the course of this exercise, your tutor has been hired by the Softwarepraktikum team to represent the customer in the requirements analysis.

Document which questions you would ask the customer in order to disambiguate the interpretations you found in (i). For each question, explain what information you expect to receive, or which interpretation are you trying to refute or confirm.

Ask the questions to the customer and document the answers received. If you are not satisfied with the answer, reformulate your question and ask again; elicit the exact conditions. So ask your questions to your software engineering tutor by mail, your tutor's answer is authoritative; if necessary, your tutor will clarify with the “big bosses” of Softwarepraktikum. Please be aware that relaying your questions to the organizers of the Softwarepraktikum takes some time. For this reason, we will be able to answer only questions submitted up to 24 hours before the early submission deadline.

(4)