Information Bachelor Course System Design

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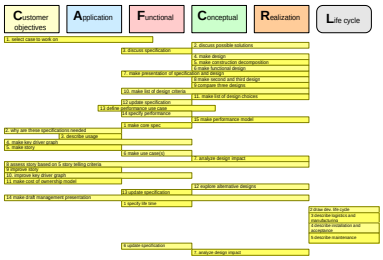

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Abstract

The bachelor Course System Design is a course for third year students Mechanical Engineering at Buskerud University College. This document provides the program and exercises.

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1 Introduction

This part of the bachelor course *System Design 2* focuses on multi-view architecting. During the course the students are guided through the design process in many small time-boxes. The idea is to let them experience the impact of time-boxes, iteration, and multiple (technical and non-technical) views. The first day focuses on the system itself, the second and third day address the customer context and the life cycle context.

2 Program

Figure 1 shows the program for the two and half days of the course. The course days have several weeks in between. During these weeks the students make homework. The homework is a consolidation of the work done during the lecture itself.

Step 1, 2 half days
Multi-view system design based on CAFCR method;
Iteration and time boxing;
Functional, Conceptual and Realization view
Functional decomposition, construction decomposition modelling
Step 2, 2 half days
Customer objectives and application view
Story telling
Use cases and scenarios
Step 3, half day (optional)
Life Cycle view
product creation process, manufacturing and logistics, life cycle model

Figure 1: Program

3 Exercises

3.1 Week 1 Exercises

Figure 2 shows the steps for week 1.

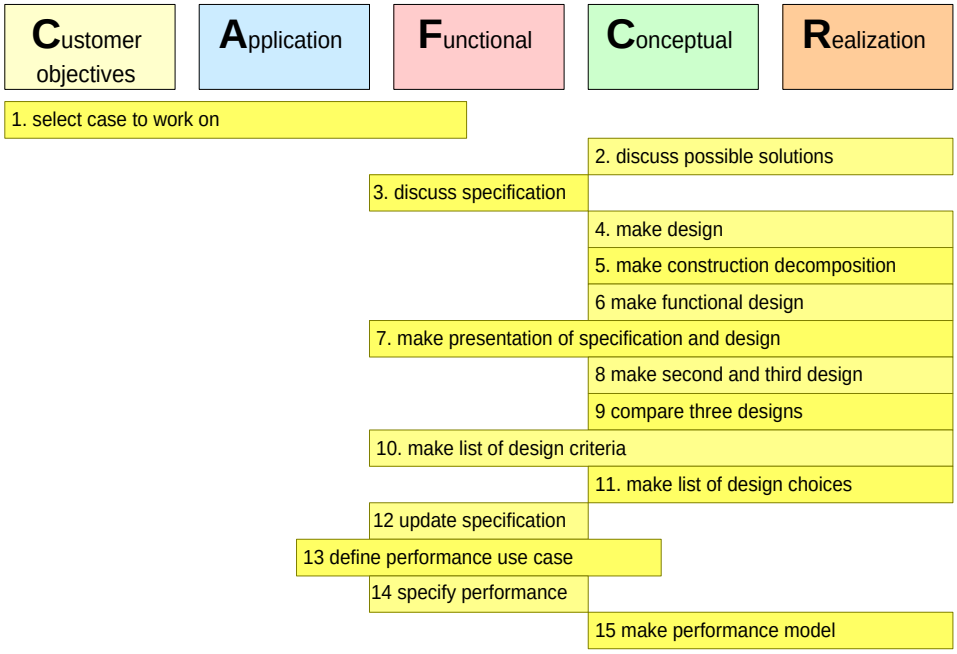

Figure 2: Exercises Week 1

3.2 Week 1 home work

Figure 3 gives the instructions for sending in home work.

The homework for week 2 is to consolidate the work of the first week. Make a presentation of specification and design, including a list of highlights and risks. Note that this presentation is intended for the management team of your company.

3.3 Week 2 Exercises

Figure 4 shows the steps for week 2.

3.4 Week 2 home work

The instructions for sending in homework are the same as for week 1, see Figure 3.

The homework for week 3 is to consolidate the work of the second day. Make a presentation of customer context and product specification, including a list of

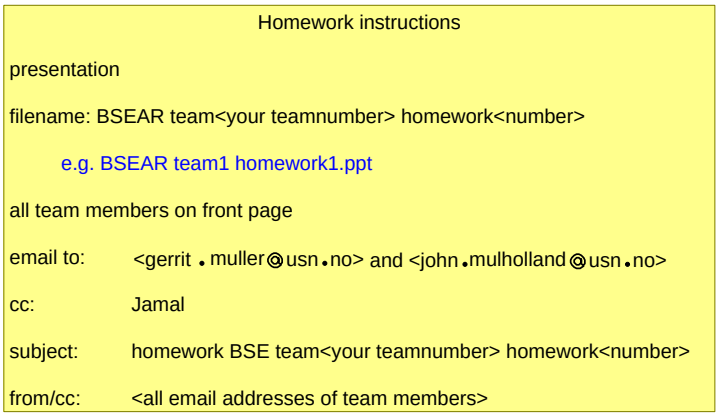

Figure 3: Home work instructions

conclusions and consequences for the design. Note that this presentation is intended for the management team of your company.

3.5 Week 3 Exercises

Figure 5 shows the steps for week 3.

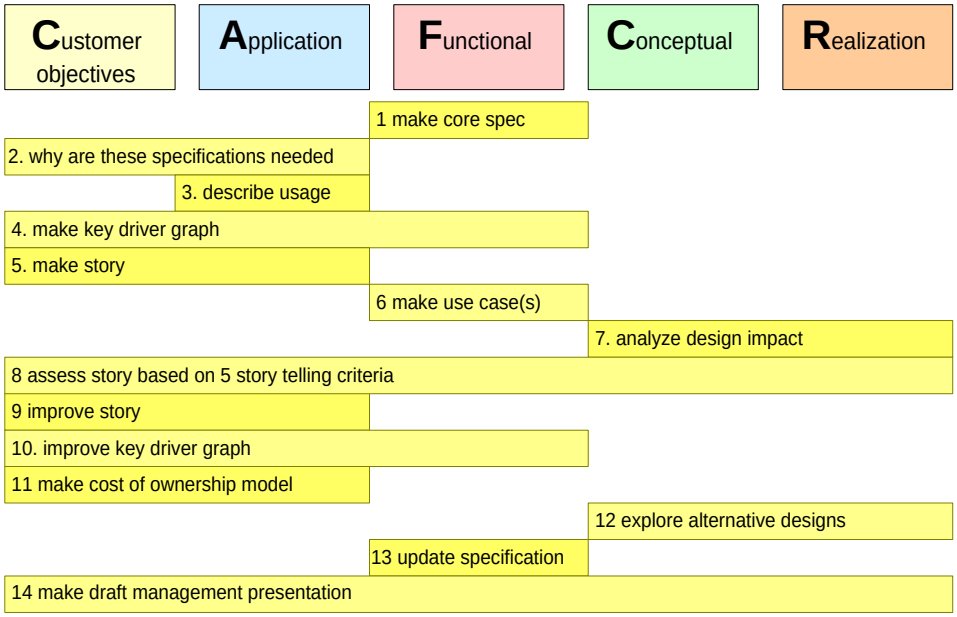

Figure 4: Exercises Day 2

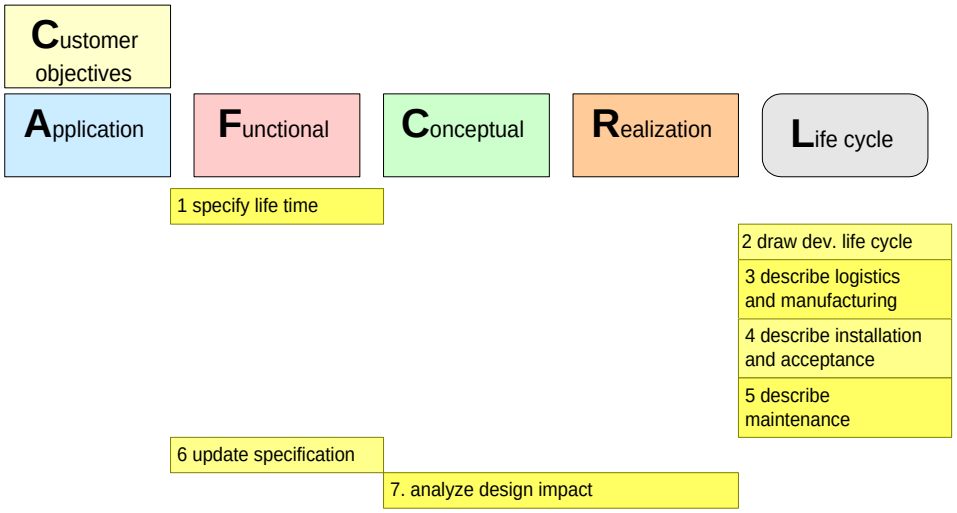

Figure 5: Exercises Week 3

4 Summary

During the lectures we have iterated over the CAFCR+ views in time-boxes of 15 minutes. Figure 6 visualizes the all exercise steps on the CAFCR+ model. The iteration that we followed has been bottom-up: we started with the system and its design and in due time we have spend more time in understanding the customer context and the life cycle context. This order has been chosen on purpose. By exploring the system and its possible design we create feeling for the problem and possible solutions. With this knowledge we can approach the stakeholders and have more meaningful interaction than would be the case if start from scratch.

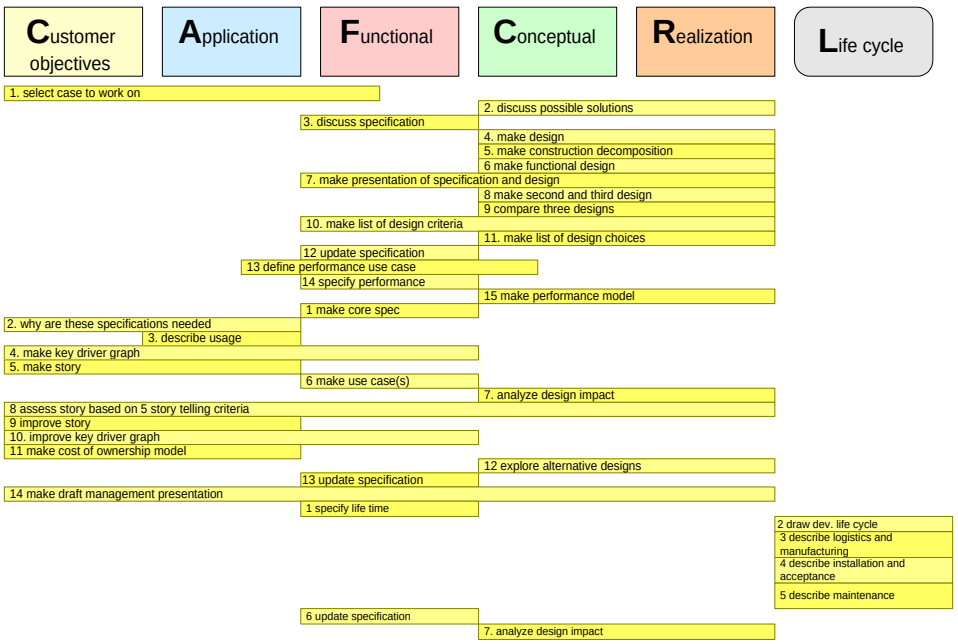

Figure 6: Summary

In two and half days we have covered many aspects of the system, the design, the customer context, and the life cycle context. However, we have only started with the system design. Many aspects have not been addressed. Figure 7 shows a number of aspects per view that still needs to be addressed.

We should also realize that we didn't do any mono-disciplinary design and engineering yet nor did we make any realization and test it. So actually, we have scratched the surface of an actual system development. At the same time, however, we have learned to bring in many different views to the design process.

Keep on iterating!

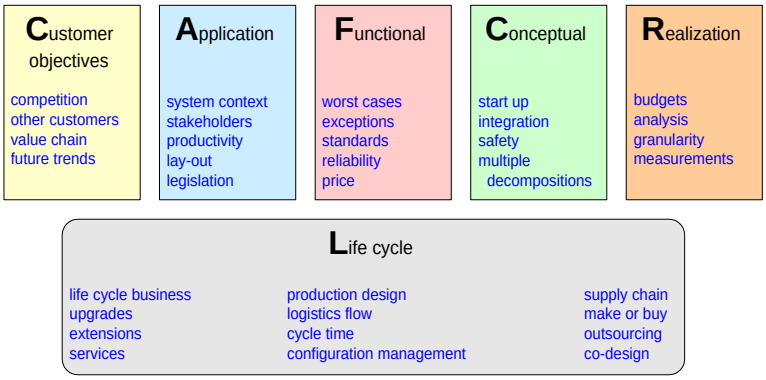

Figure 7: What we did not do...

References

[1] Gerrit Muller. The system architecture homepage. `http://www.gaudisite.nl/index.html`, 1999.

History

Version: 0.4, date: August 30, 2011 changed by: Gerrit Muller

- added didactic model
- moved slides to course material

Version: 0.3, date: October 28, 2009 changed by: Gerrit Muller

- changed program in weeks with two half days
- added cases

Version: 0.2, date: September 4, 2008 changed by: Gerrit Muller

- added text
- changed status to draft

Version: 0.1, date: September 1, 2008 changed by: Gerrit Muller

- added exercises, summary, home work instructions
- changed logo
- changed status to preliminary draft

Version: 0, date: August 29, 2008 changed by: Gerrit Muller

- created as subset of MOSAD course
- specific exercises for bachelor level students