**Journal**

**Exercise 2 HW/SW Co-design**

Date: **07/12-10**

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# Introduction

In this journal contains our findings and conclusions for Exercise 2. The first part of the Journal will contain the answers to the questions posed in the assignment, and the appendix contains the detailed rationales and minutes of meetings that lead us to these answers.

# Assignment 2.1

During our first meeting we arranged to come up with our individual suggestions and then agree on a method.

The individual suggestions may be found in the appendix.

The conclusion was that we would use SysML as much as possible, and amend with custom timing diagrams if needed. We did however decide to not use the requirements diagram, but instead simply use a table for the non-functional requirements. We also decided to try and map our diagrams to the Y-chart, in order to maintain a good link to the HW/SW co-design methodology.

For details about the individual diagrams please refer to the appendix, or simply see them in the following parts of the journal.

# Assignment 2.2

We decided to do assignment 2.2 and 2.3 in plenum during our first design session, based on prepared input from the participants with respect to use cases. The final Use-case diagram came to be as follow:



It may be seen that we have included a HW/SW separation, and though this is not officially a part of the Use-case diagram, we would like to illustrate that we already here started to notice an “obvious” separation into HW and SW components.

The rational for this separation may be found in detail in the appendix, but will also be discussed in assignment 2.3, but it is a matter of how likely the functionality is to change, how math-intensive it is, and what its performance requirements is. As for performance we talked about the non-functional requirements, and decided on the following:

|  |  |  |
| --- | --- | --- |
| ReqID | Related UseCase(s) | Description |
|  |  |  |
|  |  |  |
|  |  |  |

Finally there are some design constraints dictated by the assignment.

|  |  |  |
| --- | --- | --- |
| ReqID | Related UseCase(s) | Description |
|  |  | VGA |
|  |  | S-Video |
|  |  | 2 microphones |
|  |  |  |

This is clearly not a complete requirement specification, just like the detailed Use-case descriptions have been left out. This is done on purpose to focus on the architectural design and not the requirements.

Furthermore the assignment calls for analyzing the functionality with diagrams, but this we would like to postpone to assignment 2.3, where the architecture and design will describe the functionality and design.

# Assignment 2.3

There are many ways to document a system like this, and many different diagrams one may choose, but to keep the journal manageable we have decided to use the block diagram type (general and internal) to describe the composition and communication flow of some of the important components.

Firstly we look at the static structure of the overall system with a general block diagram



As it may be seen no decision has been made as to what is implemented in HW or SW, except for the parts that is a physical unit, e.g. the physical microphone, which has been moved from actor to HW block.

Looking at the internal block diagram we start adding more detail, and yet we still do not have to decide on HW or SW implementation, but the added details may aid us in our decision.





Add one of the slow ones (implemented in SW)

# Conclusion