Group assignment

Problem description

Health Care at Home (System level 2):

IHA is currently running a research project called SIH (Healthcare at Home) with the purpose of supporting people to live longer and more independent in their own home. This could be functions to support monitoring of vital healthcare signals or to help people in remembering to take their medicine etc.

In this exercise try to incorporate the following components in the home:

- An ADSL connection and modem
- A router
- A healthcare computer (running the healthcare applications)
  Consisting of: a touch screen and a computer HW with Bluetooth and TCP/IP communication if.
- An Automatic Pill Dispenser (more about this later),
  wireless connected to the healthcare computer
- A blood pressure meter and wireless connected to the healthcare computer
- An ECG-sensor (Electro Cardio Gram) mounted on the person and wireless connected to the healthcare computer
- A fall detector (mounted on the person) and wireless connected to the healthcare computer

National Health Care System (System level 1):

In a larger system context the home can be regarded as a block called “HealthCareAtHome”. Other entities at this larger abstraction level could be Hospitals, Local Care Centres, Local Doctors and Monitoring Facilities (like SOS/Falck-Securitas).

Automatic pill dispenser (System level 3):

The purpose of this system is to assist people in taking their medicine in form of pills at the right doses and at the right time.

The system shall support two different pill dispenser mechanisms.

The first mechanical mechanism is based on pill boxes and can be loaded with pill boxes for 14 days. The local nurse will fill the machine every 14 days with new pills based on the receipt information from a care system. Using pill boxes is very convenient when the medicine could be changed during the 14 days period.

The second mechanical mechanism is based on doses packages received from the local pharmacy. Pills for a given time in a day are collected together in a bag which should be dispensed or ejected from the machine. These bag packages are also typically delivered for a 14 days period and are very convenient when a person has a stable condition.

It is a requirement that it should be very easy to change the dispensing mechanism and the system shall consist of the same user interface and control mechanism (SW/HW).

The pill dispenser shall be connected to the healthcare computer with a wireless Bluetooth connection.

The system shall be based on RFID identification of the person using the system. Only a person with the right RFID-tag can release the pills from the system.

The system shall have a display showing the next time interval for dispensing. If this interval is exceeded a local alarm shall be given and after a further time interval an alarm message is send to the local care centre or other registered persons.

For the pill box version the time intervals for dispensing are loaded from the HealthCare computer. For the doses package version the time intervals shall be read automatically from the bags which contains readable information about the dose and the day time.

Prototype of a pill dispenser based on pill boxes.

Group Assignments

1. **Draw a SysML Block Definition Diagram (bdd) for level 1**
   (a getting started exercise)

2. **Draw a SysML Block Definition Diagram (bdd) for either the level 2 or the level 3 system** (choose on of them)

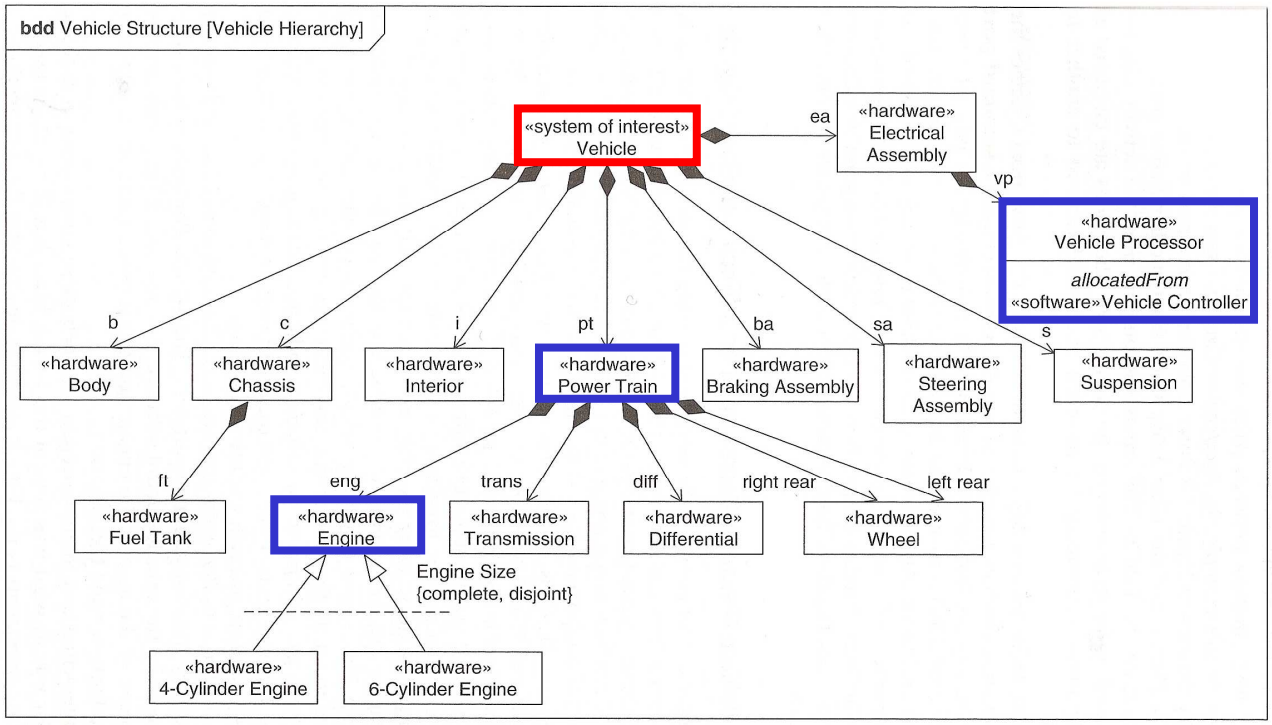
3. **Draw a SysML Internal Block Diagram (ibd) for the selected system in step 2.**

Hand in - deadline:

Monday the 11th of October – email your solution to foh@iha.dk

NB!
Be prepared to present your solution for the audience the 15th of October.
2-3 groups will be selected for presenting their solution.

Example: SysML Block Definition Diagram (bdd)



Example: SysML Internal Block Diagram (ibd)