TB141 – ICT System Engineering and Rapid Prototyping Formative Assignment - UML Modeling

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Learning Objectives

- Identify from the text the most relevant entities and relationships for modeling (entities/relationships).
- Model using the Use Case Diagram formalism
- Model using the Class Diagram formalism
- Model using the Sequence Diagram formalism
- Model using the Activity Diagram formalism

Disclaimer

All characters and other entities appearing in this work are fictitious. Any resemblance to real persons or other real-life entities is purely coincidental.

Introduction

Project Due - Recap

The second project (codename Due) is developed in collaboration with a small non-profit association collecting second-hand clothes. The association would like to develop a small application to keep track of the inventory of clothes that have been gifted to the association, and to have an easy way to visualize its stocks as well as to track the shipping of the clothes to the warehouse. The members of the non-profit are non tech-savvy volunteers, which have provided some specifications for the application during an introductory meeting. Ideally, they would like to have access as soon as possible to the application, but they will be willing to tolerate some delays in the development.

Project Due - Requirements

The proposed inventory management application is a local computer program used to keep track of the second-hand clothes received by the association.

The application should allow to register the arrival of new clothes, classify the clothes according to their properties and level of wear, visualize the clothes stock in the warehouse of the local branch of the association, prepare and track the shipping of the clothes to the central warehouse.

The classification of the clothes size should be done according to the standard ISO 8559-1:2017 Size designation of clothes — Part 1: Anthropometric definitions for body measurement and an export of the full

content of the warehouse should be allowed at any moment in time, in order to comply with the audit requirements set by the Dutch law. The export format should be compatible with the following operating systems: Linux (Ubuntu, Debian and Arch at least), Windows (starting from XP version) and Mac OS (starting from 10.0).

Only one among the aforementioned activities must be active at a time and the switching time between two activities should be shorter than 3 seconds.

The registration of new clothes starts by a manual sorting by the operator. The operator can choose to discard the clothes in case they are excessively worn-out or unhygienic. If the clothes are kept, the registration starts by loading a photo of clothes at hand. After processing the photos, the system provides an identification code for the considered object, in the form of a QR code (according to the standard ISO/IEC 18004:2006).

After the registration step, the operator should be able to enter all the details concerning the clothes, including at least: size, color and level of wear. The system should support the possibility of auto-completing the insertion with the most frequent items as well as to be able to select the most-used categories from a drop-down menu. The operator needs to be able to save a partial registration for later completion. In case of a sudden error during this step, the system also needs to be able to perform a temporary save on a persistent device (such as a hard drive), and to restore the content at the following restart of the application. Besides that, the visual representation of the registration on the screen has to be accessible by visually impaired people (for instance by allowing high contrast mode or adapting the text size).

The visualization of the local warehouse stock is done through a dashboard. The dashboard should contain the current occupation percentage of the warehouse, as well as a set of plots summarizing the distribution of the clothes by color, size and level of wear respectively. The visualization should respect the same accessibility constraints as before, in addition to a support of colorblind-friendly color palettes.

The shipping to the central warehouse is made through an additional window. In this window, the operator is able to filter the content of the warehouse through simple filters. On one hand, through a text box, the operator can search for a specific term inside the warehouse. On the other hand, he/she can apply some filters on the features of the clothes (color, size or state of wear) to reduce the number of visible items. Once the desired item is found, it can be added through the current shipping list, either via drag-and-drop, or via a dedicated button.

When the shipping list is completed, the approval by the director of the local branch is required in order to finalize the shipping to the central warehouse, taking place once per week.

Assignment

Given the aforementioned requirements of the application, provide:

- A **Use Case Diagram** and the corresponding specification, including all the relevant actors.

- A **Class Diagram** of the different entities that the application needs to manipulate.

- A **Sequence Diagram** of the registration process for new clothes, including the registration of multiple clothes and regular/exceptional flows.

- An **Activity Diagram** describing the shipping process to the central warehouse.

Make sure to include, along with each diagram, a brief text discussing your modeling hypothesis as well as the motivations behind the choice of certain entities (e.g. actor/classes) and relationships between them (e.g. generalization/composition).

Contact person

The contact person for the assignment is Laura Smit (`L.A.Smit-1@student.tudelft.nl`).

Self-evaluation grading rubric - 10 pts

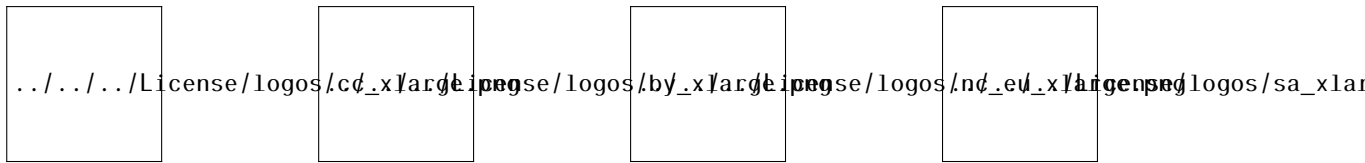| Criterion	0 pts	1 pts	2 pts
Identify from the text the most relevant aspects for modeling (entities/relationships)	Missing/wrong aspects for the category	Partially correct aspects for the category	Correct identification of all the aspects
Model using the Use Case Diagram formalism	Wrong notation/-modeling in the diagram	Partially correct notation/modeling	Correct notation/-modeling in the diagram
Model using the Class Diagram formalism	Wrong notation/-modeling in the diagram	Partially correct notation/modeling	Correct notation/-modeling in the diagram
Model using the Sequence formalism	Wrong notation/-modeling in the diagram	Partially correct notation/modeling	Correct notation/-modeling in the diagram
Model using the Activity formalism	Wrong notation/-modeling in the diagram	Partially correct notation/modeling	Correct notation/-modeling in the diagram

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Rules for the assignment delivery
To be read carefully !

1. The assignment must be developed in groups of 2 students.

2. The assignment must include **your name** and **student id**.

3. The assignment must be submitted in **Brightspace** as a **PDF report**.

4. You have to follow the:

   - Upload of a file `FamilyName1_StudentID1_FamilyName2_StudentID2.pdf` on the course Brightspace.
   - Date: **Tuesday 15 March 2022**
   - Time: **Before 23:59**

   After this deadline the assignment will be considered as late and **will not be corrected**.

5. **Knock-off criteria:**

   - Missing names and id on the document/document name.
   - Document exceeding the number of requested pages.

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