TB141 – ICT System Engineering and Rapid Prototyping Formative Assignment 1 - Methodologies & Requirements Engineering

Jacopo De Stefani, Laura Smit, Jai Chahar

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Learning Objectives

- Recognize the software requirements from a textual description
- Classify the requirements into functional, non-function and domain requirements
- Compare the different levels of clarity in the requirements

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

IT-Formativo, a company specialized in software development, has recently accepted a tender for the development of an ICT System. However, as all their consultants are overwhelmed with work, they requested some assistance from TUDelft, in order to determine the best development process for the problem at hand. The project is developed in collaboration with a small non-profit association collecting second-hand clothes, called The Giving Wardrobe.

FIGURE 1 – The Giving Wardrobe Association logo

Development process specification

From a preliminary discussion with the association the following outline description has been drafted:

> 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.

IT-Formativo provides you with some guidelines concerning the development process to employ:

- The process will require several iterations.

- Each iteration should last 2-3 weeks maximum.

- At the end of every iteration, the client should have access to a working application.

- The development process is then structured in the following phases:

    - **Plan:** The definition of the functionalities to be implemented during the iteration is discussed with the client, explicitly discussing the priority for the client, the technical risk for the developers and the available number of working hours.
    - **Design:** The developers (without the client) will design the architecture and the different software modules to be implemented.
    - **Develop:** Following the design, the developers will proceed with the implementation of the software.
    - **Test:** The software will be tested first, without the client, against the requirements discussed during the planning phase. Once all the tests are passed, a demonstration of the software is made with the client.
    - **Deploy:** If all the tests succeed, the working version of the software is delivered to the client and deployed on their system. In case there are problems, they will be discussed during the planning phase of the following iteration.
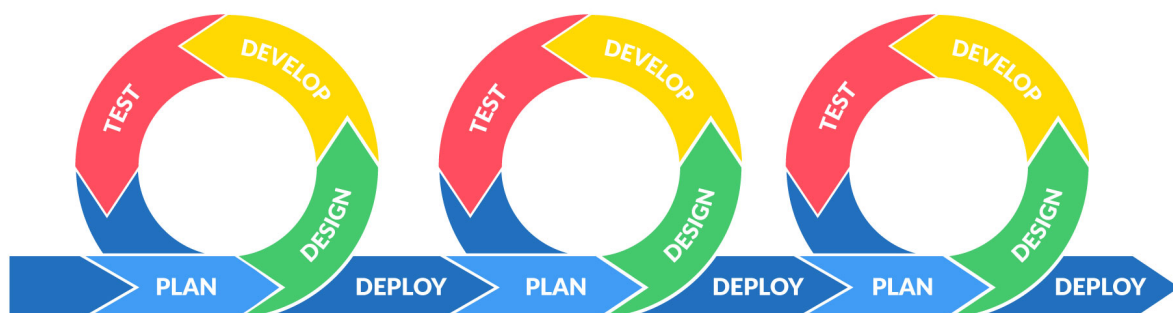

Figure 2 – Schematic representation of the development process of the application for the Giving Wardrobe Association

Requirements specification

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 should be 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

We ask you to analyze both the development process and the proposed requirements for the problem.

You will be providing your analysis in a form of a short report (maximum 3 pages) composed of the following sections. For your convenience, for every section, we identified some questions/tasks that might help you structuring the report.

- **Identification of the development methodology**
    - What methodology is employed here?
    - What are the concepts that allowed you to identify the methodology?

- **Discussion of alternative methodologies**

  - What other methodologies could have been employed here?

  - For one alternative methodology, describe how the development process should look like if that methodology was employed.

- **Requirements identification**

  - Provide a short definition for the different category of requirements (functional, non-functional, domain requirements).

  - Provide a table, for each category of requirements, summarizing the classification of the different requirements in the text and the motivation behind your choices.

  - For 3 requirements of your choice, describe which format (natural language, structured natural language, graphical notation, mathematical specification) you will be using for their specification.

Contact person

The contact persons for the assignment are Laura Smit (L.A.Smit-1@student.tudelft.nl) and Jai Chahar (J.Chahar@student.tudelft.nl).

Answer model

- **Identification of the development methodology**

  - **Q:** What methodology is employed here?
    A: Agile, Iterative, Agile-Hybrid can also be accepted.

  - **Q:** What are the concepts that allowed you to identify the methodology?
    A: Continuous delivery, Iterations, Client involvement

- **Discussion of alternative methodologies**

  - **Q:** What other methodologies could have been employed here?
    A: Waterfall, Re-use based.

  - **Q:** For one alternative methodology, describe how the development process should look like if that methodology was employed.
    A: See slides Lecture 2.

- **Requirements identification**

  - **Q:** Provide a short definition for the different category of requirements (functional, non-functional, domain requirements).
    A: See slides Lecture 3.

  - **Q:** Provide a table, for each category of requirements, summarizing the classification of the different requirements in the text and the motivation behind your choices.
    A:

Functional	Non-functional	Domain
Blue	Purple	Orange

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.

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– **Q:** For 3 requirements of your choice, describe which format (natural language, structured natural language, graphical notation, mathematical specification) you will be using for their specification.
A: See slides Lecture 3.

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 respect the following conditions:

   - Upload of a file TB141IC_FA1_FamilyName1_StudentID1_FamilyName2_StudentID2.pdf on the course Brightspace.
   - Date: **Friday 3 March 2023**
   - Time: **Before 23:59**

   After these 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 (3).
   - Wrong submission format