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TrackMe

Software Engineering II - Prof. Elisabetta Di Nitto

Requirements Analysis and Specification Document

Michele Gatti, Federica Gianotti, Mathyas Giudici

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Contents

Section 1

Introduction

1.1 Purpose

The goal of the Requirement Analysis and Specification Document (RASD) is to give a clear description of the system that is going to be developed, its functional and non-functional requirements, its constraints and its domain. Moreover, it provides information about the relationship between the system taken into account and the external world by providing use cases and scenarios. Finally it gives a more formal specification of the most relevant features of the system to be using the Alloy language. Generally this type of document is mainly addressed to developers, programmers, testers, project managers and system analysists, but it can be useful also for final users. Track Me is a company that wants to develop three different but connected software-based services:

- **Data4Help**: a service that allows third parties to monitor the location and health status of individuals. Through this service third parties can request the access both to the data of some specific individuals, who can accept or refuse sharing their information , and to anonymized data of group of individuals, which will be given only if the number of the members of the group is higher than 1000, according to privacy rules.
- **AutomatedSOS**: a service addressed to elderly people which monitors the health status of the subscribed customers and, when such parameters are below a certain threshold (personalized for every user using the data from Data4Help), sends to the location of the customer an ambulance, guaranteeing a reaction time less than 5 second from the time the parameters are below the threshold.
- **Track4Run**: a service to track athletes participating in a run. It

allows organizers to define the path for a run, participants to enroll to a run and spectators to see on a map the position of all runners during the run. This service will exploit the features offered by Data4Help.

1.1.1 Goals

The three applications of the system have in common the following goals:

- [**G.1**]: Allow unregistered user to sign in to access to the application;
- [**G.2**]: Allow registered user to log in and access to the application;
- [**G.3**]: Allow registered user to manage his/her profile;

The description given above can be summarized as a list of goals, specific for each service.

Data4Help:

- [**G.4**]: Allow registered third parties to request data of a single individual;
- [**G.5**]: Allow registered third parties to request data of a group of people;

AutomatedSOS:

- [**G.6**]: Allow data acquisition through smart watches (or similar);
- [**G.7**]: Allow monitoring the health status of an individual registered user;
- [**G.8**]: Allow sending location of an individual registered user to an ambulance if his/her parameters are below a certain threshold;

Track4Run:

- [**G.9**]: Allow registered user to become organizers or athletes of a run;
- [**G.10**]: Allow organizers to define the date and the path for a new run;
- [**G.11**]: Allow registered athletes to enroll to a run;
- [**G.12**]: Allow unregistered user to access as spectator;
- [**G.13**]: Allow registered/unregistered user to see on a map the position of all runners during a run;

1.2 Scope

According to *The World and the Machine* [4] we can divide every system into two parts:

- The **machine**, which is the portion of system to be developed;
- The **world**, which is the portion of the real-world affected by the machine.

As a consequence we can classify phenomena in three different types:

- **World phenomena**: phenomena that the machine cannot observe;
- **Machine phenomena**: phenomena located entirely in the machine;
- **Shared phenomena**: phenomena that can be controlled by the world and observed by the machine or controlled by the machine and observed by the world;

Below we give an analysis of world and shared phenomena:

World phenomena

- A user doesn't turn on data connection;
- A user forgot wearing his smartwatch during a day;
- The batteries of the smartwatch of a user run out;
- A user doesn't turn on the GPS;
- An enrolled runner for a run doesn't take part in it;
- A runner doesn't wear his smartwach during a run.

Shared phenomena

- New user registeres to Data4Help service;
- A Data4Help registered user logs into the system;
- A user recives a request to share his data;
- A user accept/decline a request to share his data;
- A third party requires data of a specific user;

- A third party requires data of a group of users;
- A user subscribes to AutomatedSOS service;
- An ambulance is called as a consequence of specific acquired data from the system;
- A Data4Help user access to Track4Run for the first time;
- A Track4Run user organizes a new run;
- A Track4Run user enrols for a run;
- An unregistered user access as a spectator to a run.

1.3 Definitions, Acronyms and Abbreviations

API: Application Programming Interface;

GPS: Global Positioning System;

Organizer: A registered user that organizes a run, defining date and path;

OS: Operating System;

RASD: Requirement Analysis and Specification Document;

Run: An event that is organized by one organizer, at which one or more people can partecipate and that can be followed by one or more spectators;

Runner: A registered user that enrols for a run;

Spectator: Unregistered user that access to Track4Run to follow a run;

System: The software system-to-be, including all of its services;

Third party: Any external organization that wants to access to data acquired by Data4Help;

UML: Unified Modeling Language;

User: Any person, registered or not, who accesses to one of the applications (for Data4Help there is a special user called *Third party*);

1.4 Reference documents

1.5 Overview

This document is structured as follows:

Section 1: Introduction. A general introduction to the goals, the phenomena and the scope of the system-to-be. It aims giving general but exaustive information about what this document is going explain.

Section 2: Overall Description.

Section 3: Specific Requirements.

Section 4: Effort Spent. A summary of the worked time by each member of the group.

At the end there is the bibliography.

Section 2

Overall Description

Section 3

Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

The user interfaces of *AutomatedSOS* and *Track4Run* must be intuitive and user-friendly in order to permit an easy interaction with all the services offered by the systems.
Moreover both the application and the web site must support multiple languages.

3.1.2 Hardware Interfaces

3.1.3 Software Interfaces

3.1.4 Communication Interfaces

3.2 Functional Requirements

3.2.1 Individual Sign In

Purpose
Anyone who wants to subscribe to one or both services offered by *Data4Help* must go through the registration process, which can be carried out either through *AutomatedSos* and *Track4Run* apps or through the web site. The process requires exactly the same steps regardless the platform through which it is carried out:

1. The new user is required to fill in all the fields in which she/he is asked for his name, his surname, his date of birth, his city of birth, his city of residence and a valid e-mail address;

2. The user must accept the conditions regarding his privacy, in particular the collection of his data by *Data4Help* and the sharing of them in anonymous way with third parties.

After that the system will check the correctness of the inserted data, in particular it will check that the user it isn't already registerd and that the inserted e-mail isn't already used by someone else. If the result of this control is positive the registration is authorized and the user will recive a conferma-tion e-mail to the specified e-mail address with the password she/he has to use to access to all *Data4Help* services.

Scenario 1
Sara would like to register her grandmother to *AutomatedSos* to not worry about her helth status when they are not together. She opens the browser on his personal computer and search for *Data4Help* web site, then she clicks on the "*Sign In*" button, which is located in the main page. She passes through the steps of the registration process, inserting his grandmother data and accepting the required conditions. Finally, if the inserted data are accepted by the system, she recives the confirmation e-mail.

Scenario 2
Marco wuold like to organize an amateur run with his friends and remembers that someone told him something about a new application called *Track4Run* so he decides to try it. He downloads the app on his smartphone and turn it on. The first page that is shown to him contains the "*Sign In*" button and the "*Log In*" one, he presses on the first one and starts his registration process. He doesn't use his personal e-mail address, but an e-mail address

he has in common with his brother that they usually use to make purchase online. Unexpectedly he is informed by the system that the insert e-mail is already registered in the database and so he has to change it and this time he inserts his personal e-mail address. This time the registration is succesfull and he recives the confermation e-mail.

Use Case

Actor	**Individual user to be**
Goal	[**G.1**]
Input Condition	A person wants to subscribe to one of *Data4Help* services
Event Flow	1. The **Individual user to be** opens the main page of *Data4Help* web site from his personal computer or of *AutomatedSos* or *Track4Run* apps from his smartphone; 2. The system shows the form the **Individual user to be** has to fill up; 3. The **Individual user to be** fills up the form with his name, his surname, his date of birth, his city of birth, his city of residence and an e-mail address; 4. The **Individual user to be** accepts the required conditions; 5. The **Individual user to be** clicks on "*Submit*" button; 6. The system checks wheter the inserted information are acceptable or not; 7. The **Individual user to be** recives a confirmation e-mail containing the password he has to use to access to all *Data4Help* services.
Output Condition	The system the **Individual user to be** that his registration is completed
Exceptions	• If functional requirements 1 or 2 are not satisfied the process goes back to step 3; • If functional requirement 3 is not satisfied the process goes back to step 4; • If the **Individual user to be** decides to leave the registration process this one is aborted.

Functional requirements

1. The system must not accept an e-mail address that is already used by an already registered user;
2. The system must not authorize the registration untill all the fields are filled up;
3. The system must not authorize the registration untill the required conditions aren't accepted;
4. The system must send the confirmation e-mail to the inserted e-mail address with the password when "*Submit*" button is clicked only if all the inserted data are acceptable and the required conditions has been accepted;
5. The system must let the **Individual user to be** leave the registration process at anytime.

Section 4

Effort Spent

4.1 Michele Gatti

Task	**Hours**
Analysis of given RASD	*3*
Purpose and Goals	1
Team revision	1

4.2 Federica Gianotti

Task	**Hours**
Analysis of given RASD	*3*
Purpose and Goals	4
Scope, Definitions, Acronyms and Abbreviations	2
Team revision	1
Functional Requirements	4

4.3 Mathyas Giudici

Task	**Hours**
Analysis of given RASD	*3*
GitHub and LaTeX setup	2
Purpose and Goals	1
Scope, Definitions, Acronyms and Abbreviations	2
Team revision	1

Appendix A

Appendix

Bibliography

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[2] ISO/IEC/IEEE 29148:2011 *Systems and software engineering - Life cycle processes - Requirements engineering*

[3] IEEE 830:1998 *Recommended Practice for Software Requirements Specifications*

[4] M.Jackson & P. Zave, *The World and The Machine*, 1995