Progetto di ingegneria del software (5 CFU) 2017/2018

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1 Introduction

1.1 Purpose

The Data4Help system is designed as a distribute software application which can be installed on smartwatches, smartrings and smartphones that dispose of a NFC sensor and a GPS system inside for monitoring the position and the health of the owner. This application is thought for all people that want to keep under control their health during the day or who want to always know the position and the status of health status of a particular person in the world. Indeed, with this system a third party user can send a request to access data of some specific user, by means of his social security number: if the receiver agrees, it is possible to see in real time the last information registered about that person. The service supports the registration of individual who, by signing in, agrees that the company TrackMe acquires their data, which will be used anonymously by third parties for making statistics on groups of people.

Furthermore, in addition to the previous features, an AutomatedSOS service is available. It is thought for people that have serious health problems and, in case of illnesses (i.e. some parameters observed below the threshold), the system contacts, within 5 seconds, an ambulance. Secondly, the Track4Run service is also available. It is developed for organizers of sport events that want to monitor the runners in a race. The service allows organizers to define the path of a run, participants to enroll in the run, and spectators to see the exact position of all runners during the run on a map.

1.1.1 Goals

The goals can be distinguished into two families: the former regarding the users, and the latter regarding the third part customers.
The ones regarding the subscribed users, are the followings:

[G1] Allow a subscribed user to share his location and health status to third parties of his choice

[G2] Once the health parameters of a subscribed user have been observed below the threshold, an ambulance is sent to the user location. (requires further specifications and assumptions: e.g. who owns the ambulances?)

[G3] The time experienced between the moment in which the health parameters of a subscribed user are observed below the threshold and the time in which the ambulance is sent to the user location is equal or less than 5 seconds.

[G4] Allow a subscribed user to enroll in a run, as athlete

[G5] Allow spectators too see on a map the positions of all athletes taking part in a run

[G6] Allow an organizer to set up a run, by defining its path

The goals of the project, regarding the third part customers, are the followings:

[G7] Allow a third party to access the data on a certain individual, only if he accepts. This is satisfied as soon as the request is approved

[G8] Allow a third party to access statistical and anonymized data on group of individual greater than 1000. This is satisfied as soon as the request is approved

[G9] Allow a third party to subscribe to non-existing data. They will have access to them, as soon as the data is generated.

1.2 Scope

As already mentioned, the basic Data4Help service allows to monitor the position and the health status of individuals. When an user registers to the service he accepts the application's contract, that permits the acquirement of user's data from his device. The information, once received, is stored. Each ten second the user's device sends data to Data4Help servers that save them into the system; if a device go offline, the last data will be available on the server.
The people who are probably most interested in this service, is whoever has a particular attention toward his health and toward the health of their family or their close friends (e.g. parents). For instance, this application allows parents to monitor their children, when they are unable to stay with them. Moreover, Data4Help permits to the users to constantly see their health status in order to be conscious of their condition. Indeed, this will keep patients regularly updated on their progress and will provide proactive measures for a better health control. In order to allow a third party customer to see the status of an appointed individual, he needs to send him a request of sharing data by means of the form provided by the system. Here, he must specify the social security number of the individual and a brief description that motives the request. The receiver, obviously, can accept or reject the request according to the sender and the attached reason. If the receiver accepts the demand, the requesting customer can see his data, that is related with the date of its registration into the system.
In addition, the AutomatedSOS service results to be particularly helpful for old people or patients, that, as a matter of fact, are more subjective to health problems: thanks to this instrument they can be assisted in every moment of the day. When their health parameters go down under the standard, the system, within 5 seconds, calls the 118 number autonomously, in order to send an ambulance to the user location. The ambulance is managed by the owner of the vehicle (hospitals, onlus and privates), and it intervenes within the timing defined by the state. TrackMe, with this feature, hopes to help hospitals and private specialists to save lives. Data4Help provides different types of diagnostic procedures: blood pressure monitoring, pulse, and blood oxygen saturation levels.
The GPS system is exploited also by Track4Run feature, which allows third party organizers to define a certain path for a run, and to manage both participants and spectators during the race. For using this service, the organizers need to post a race event on the application, that contains a description and a timetable. Then, all the interest people (i.e. both runner and spectators) must sign up to the race in their specific section. Notes that while registering, a runner accepts to share his data during the competition. During the event, the application will automatically monitor the runners, and spectators will be able to follow the race on their smartphones. The organizers, in addition to the runner position, can also access to the health status of athletes, in order to

intervene in case of illness. Note that the possibility of downloading data from the Track4Run service is allowed only when the competing is taking place.

The TrackMe company business concerns the sale of anonymous statistic data to companies, which can request both the health statuses and the positions of specific groups of people (e.g. people over 40). The policy implemented by TrackMe, prevents third parties from finding real owners of data. Indeed, a request from a company can be accepted only if the group of people involved contains at least 1000 individuals.

1.3 Definitions, Acronyms, Abbreviations

1.4 Revision history

1.5 Reference documents

1.6 Document structure

2 Overall Description

3 Specific Requirements

4 Formal Analysis using Alloy

5 Effort Spent

6 References