

Software Engineering 2 Project

Stefano Martina, Alessandro Nichelini, Francesco Peressini

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1 INTRODUCTION

1.1 Purpose

TrackMe is a company aiming to support interactions between users, who like keeping track of the health status and their activities, and third parties which can use data and enhance their value.

TrackMe app is composed of three main important service:

- Data4Help: basic support for health data;
- AutomatedSOS: add support for SOS services to elderly people;
- Track4Run: add support for running events.

Each of them will have as targets:

- Individuals users
- Third parties.

Since each service serves both the targets, the project consists of platform divided in a mobile application and a web-based interface to serve third-parties.

The system allows individual users to add and handle data on the app and to third parties to request and have access to these data.

In particular, a user of the application is able to keep track of his/her position during the activities but also during the normal day-life. The users' data are used to monitor the heartbeat and eventually to send an AutomatedSOS. Furthermore, TrackMe, is able to track all the athletes (that are using the application), during a run previously organised. Indeed TrackMe's app provide a section to setup a group run , specifying the path and other useful information.

1.2 Scope

1.2.1 Description of the problem

Nowadays a lot of persons track their activities with smartphone or smartwatch. For this reason TrackMe provide a new complete user experience allowing all

the user to read briefly all the information about all activities' history. It's also provided a service to organise a group run, during which it's possible to monitor all the athletes information. Furthermore all the users are monitored and, in case of some trouble, an SOS will be launched.

1.2.2 World Phenomena

- *General user's health condition*: the machine doesn't know the information about possible user's disease.
- *First aid services status*: the machine doesn't know the actual first aid services status.
- *Overall third parties knowledge status*: the machine doesn't know which informations third parties already have about users.

1.2.3 Machine Phenomena

- *Third-parties registration*;
- *User's registration*;
- *Data anonymization*.

1.2.4 Shared Phenomena

- *Vital parameters*: the machine can read vital parameters of the user such as BPM.
- *User's location*: the machine knows or can read actual and past user's location.

1.2.5 Goals

- [G1] Users can be recognised by their credentials.
- [G2] Allow users to keep track of their health data.
- [G3] Allow users to have access to an overview of their data, including health parameters and performed activities.
- [G4] Allow users to manage their data access policy.
- [G5] Allow users to monitor their performance during run workouts.
- [G6] Each time vital signs go below a threshold value, first aid services have to be notified.
- [G7] Allow users to organise running events.
 - [G7.1] Allow users to create running events.

[G7.2] Allow users to en-roll to events.

[G7.3] Allow spectators to follow participants' live position during events.

[G8] Allow third parties to access data:

[G8.1] Allow third parties to require access to specific user data.

[G8.2] Allow third parties to retrieve anonymised aggregated data.

[G8.3] Allow third parties to subscribe to da

1.3 Definitions, Acronyms, Abbreviations

1.3.1 Definitions

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1.3.2 Acronyms

- API: Application Programming Interface;
- ASOS: AutomatedSOS;
- BPM: Beats Per Minutes;
- D4H: Data4Help;
- RASD: Requirement Analysis and Specification Document;
- T4R: Track4Run.

1.3.3 Abbreviations

- $[Gn]$: n-th goal
- $[Dn]$: n-th domain assumption
- $[Rn]$: n-th functional requirement

1.4 Revision history

1.5 Reference Documents

1.6 Document Structure

2 OVERALL DESCRIPTION

2.1 Product perspective

2.2 Product functions

The software developed by TrackMe included three different services: Data4Help supports user's data acquiring through smartwatches or similar devices, AutomatedSOS, a personalized and non-intrusive SOS service for elderly people and

Track4Run, a service to track athletes participating to a run. Data4Help is also a service available for third-parties: in fact, organisations can request data to TrackMe and collect them for pursuing their objectives. Data acquisition can be performed in two different way: directly to a single user or to a groups of individuals. Concerning the single user case, companies, through a social security code, ask permission to access the corresponding information. In the other case, organisations can request, directly to TrackMe, data of group of individuals with particular proprieties (e.g. users between 20 and 30 years old or living in a certain district). In the latter, TrackMe provides data only if it can anonymized them correctly. AutomatedSOS it's great for those elderly people who want to monitor their health status and have the support of an ambulance in case their vital parameters are under certain thresholds. Track4Run it's a service dedicated to the runners: it offers the possibility to organise a run between other runners, define the path and the duration, allowing the invited ones to enroll. In addition, Track4Run users who do not participate to the run can see live time on a map the position of all the runners. Finally, Track4Run supports the synchronization of data with Data4Help.

All the goals presented in section 1.2.5 are going to be implemented. Here we describe deeply the requirements needed to implement application's functions.

- [R1] Users can create an account with credentials.
- [R2] Credentials can be retrievable also if forgotten/lost.
- [R3] Users can log manually or automatically their data.
- [R4] Users have to be able to accept/deny access to single data access request.
- [R5] Users have to be able to see current data policies and to change them.
- [R6] The machine has to be able to read health and position data.
- [R7] The machine has to be able to recognise below threshold parameters.
- [R8] The machine has to be able to communicate with third parties.
- [R9] The machine has to be able to recognise data fragmentation level
- [R10] The machine has to be able to store users' data.

2.3 Users characteristics

Users: any person that will use the service to keep track of health data, positioning or automated sos during any kind of activities (walking or running during a loner run or an organized event).

Third parties: Organisation or other parties interested in the acquisition for their usage of the data provided by the user activities.

2.4 Assumptions, dependencies and constraints

2.4.1 Domain assumptions

[D1] Data manually logged by users well describes reality.

[D2] First aid services are ready to handle emergency notifications.

[D3] Data inserted by users are truthful

[D3.1] Data are up to date.

[D3.2] Data are correctly formatted.

[D4] Running paths proposed by users are well formed (e.g: legit by law).

[D5] External services are reliable.

3 SPECIFIC REQUIREMENTS

3.1 External Interface Requirements

- User Interfaces
- Hardware Interfaces
- Software Interfaces
- Communication Interfaces

3.2 Functional Requirements

3.3 Performance Requirements

3.4 Design Constraints

- Standards compliance
- Hardware limitations
- Any other constraint

3.5 Software System Attributes

- Reliability
- Availability
- Security
- Maintainability
- Portability

- 4 FORMAL ANALYSIS USING ALLOY
- 5 EFFORT SPENT
- 6 REFERENCES