POLITECNICO
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RASD

Software Engineering 2 Project - TrackMe

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1 Introduction

1.1 Purpose

TrackMe is a company that wants to offer the following services to individuals and to third party companies:

- Data4Me, that allows people to register and provide their data to TrackMe through devices such as smartwatches or smartphones, while allows companies to get data from a particular group of people;

- AutomatedSOS, that allows individuals, mainly elderly people, to register in order to have their health monitored and to receive an immediate assistance in emergency cases;

- Data4Run, a sport-oriented service that tracks athletes participating in a run. It allows organizers to define the path of the run, participants to enroll to the run, and spectators to see on a map the position of all runners during the run. Track4Run will exploit the features offered by Data4Help

1.2 Scope

The *The World and the Machine* approach is used in defining the scope of the project. By defining the real world entities that interact with the system and the properties of the system itself we can determine the intersection between the two sets: the *shared phenomena*.
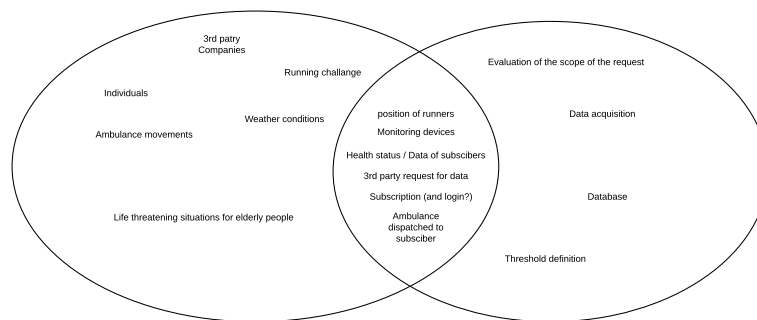
The system-to-be uses 3 components with different roles in order to work:

- **Data4Help SmartWatch App**: Acquires the data from the smartwatch sensors (heart rate, sleep quality, position, phisical activities) and sends them via Bluetooth to the Data4Help Mobile App

- **Data4Help Mobile App**: Gathers data from the smartwatch, shows various statistics, and sends them to the Data4Help Core Database. Each user can choose which service subscribe to

- **Data4Help Website**: Gives third-party companies the ability to request data, either anonymized or user specific.

- **Data4Help Core**: is intended to connects all other components together providing the logic of the application. It is also responsible for the acceptance of all third-parties requests of data. It also evaluate health status of individuals deciding whether is at risk or not.

The list below shows the main goals the system should be able to accomplish:

- **G1**: The system should be able to read sensor data from smart devices.

- **G2**: The system should be able to show acquired data via the Mobile App and the Website.

- **G3**: The system should allow users to register.

- **G4**: The system should allow companies to register.

- **G5**: The system should allow registered companies to request data either from specific individuals or from an anonymized group of individuals.

- **G6**: The system should allow users to accept or decline a company request for their specific data.

- **G7**: The system should provide a payment method to registered companies requesting user data.

- **G8**: The system should be able to communicate directly to ambulances.

- **G9**: The system should be able to react to the lowering of the health parameters below threshold in less than 5 seconds and send the position of the person to the ambulance.

- **G10**: The system should be able to communicate iteroperably with its services: *AutomatedSOS* and *Track4Run*

1.3 Definitions, Acronyms, Abbreviations

w.r.t	with respect to
w.l.o.g.	without loss of generality
The company	TrackMe
BLE	Bluetooth Low Energy

1.4 Revision history

1.5 Reference documents

—**REFD1**— The World And The Machine

1.6 Document structure

This RASD document is made of the following parts:

- **Introduction**: this section provides a general and low-detailed description of the system-to-be.

- **Overall description**: this section provides general aspects of the system, like interfaces, constraints, domain assumptions, software dependencies and users' characteristics.

- **Specific requirements**: this section provides scenarios, use cases and a set of diagrams in order to represent the functionalities of the system-to-be.

- **Appendix**: this section contains the Alloy model used to model and verify the system, a list of the tools used to develop this document and the working hours tracking table.

2 Overall description

2.1 Product perspective

Data4Help Core is the central component of the system that connects all the other parts of the structure. It has the role of .....
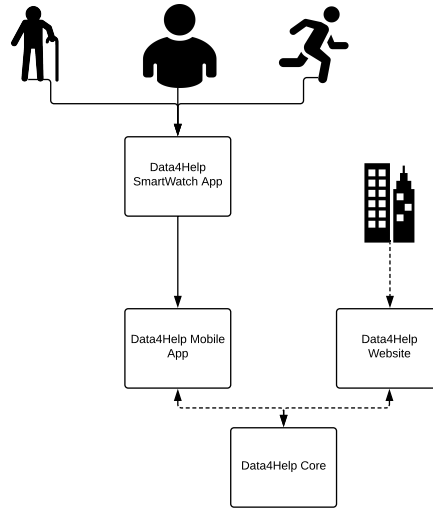
The Smartwatch App should be directly connected to the Mobile App to acquire data and let them be shown in the smartphone. In turn, the Mobile App has to communicate with the Data4Help Core that will register the data of the user. The Data4Help Website should communicate with the Data4Help Core as well in order to query directly on the company database.

2.1.1 User Interfaces

2.1.2 Hardware Interfaces

2.1.3 Software Interfaces

2.1.4 Communication Interfaces

In the system there are 2 types of communication.

1. The Mobile App and the Web Site need a bidirectional channel with the Core component of the system to operate properly.
   This can be achived by providing a REST API on the *Data4Help Core* component.

2. The Smartwatch App needs a direct connection with the Mobile app to give it user's data.
   The communication between the smart device and the smartphone is achieved via *BLE* and, once the channel is established, the Smartwatch App sends JSON messages to the Mobile App concerning all activities performend from the last syncronization.

```
{
    userId: "ka8c57pno3",
    last_synchronization: "1512518400",
    heart_rate: {
        "1512518400": 60,
        "1512519000": 61,
        ...
    },
    activities: {
        "1512518400": {
            "_lat": "",
            "_long": ""
        },
        "1512519000": {
            "_lat": "",
            "_long": ""
        },
        ...
    }
}
```

2.1.5   Memory Constraints

2.2   Product functions

This chapter listing all the functionalities that the system-to-be must offer.

2.2.1   Functional requirements

Functional requirements for every system component:
Data4Help Mobile App

- Users can register

- Users can log-in

- Logged-in users can edit their account info

- Logged-in users can see their data statistics

- Logged-in can specify the nature of the daily activities (i.e. running, biking, swimming, hiking)

- Logged-in users can edit their account info

- And so on and so for

Data4Help Smartwatch App

- Users can see their health data in real time (i.e heart rate, pressure)

- Users can see their sleep monitoring of the previous night

- And so on and so for

Data4Help Website

- Companies can register

- Companies can log-in

- Logged-in companies can see their history and account information

- Logged-in companies can subscribe to a payment service of Data4Help

- Logged-in companies can update their account information

- And so on and so for

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Data4Help Core

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3   Specific requirements

4   Hours tracking

Date	Nicola Fossati	Daniele Montesi	Francesco Sgherzi
15/10/2018	2,5	2,5	2,5
20/10/2018	0	4.0	4.0