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Computer Science and Engineering
Software engineering 2

TrackMe RASD

Requirements Analysis and Specification Document
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Diego Piccinotti, Umberto Pietroni, Loris Rossi

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1 Introduction

1.1 Purpose

The purpose of this document is to analyze and illustrate a specification description of the TrackMe system. This will be accomplished through a detailed analysis of the solution proposed and of the goals, assumptions and requirements that are necessary to realize it. This document is intended to be used by the clients requiring the development of the system, its end users and all those who are involved in the development process, mainly project managers, analysts and development teams.

TrackMe is designed as a platform to enable third parties to access its users' health and location data. The system continuously collects this data through wearable devices given for free to the end users and stores it to enable later access and/or aggregated statistics analysis.

Third parties can request data of some specific individuals, whose collection has to be approved by the user, or aggregated statistical data on a group of user which must be larger than 1000 individuals to allow for proper anonymization of the data.

TrackMe is then extended in its functionality by **AutomatedSOS**, an additional service built on top of the existing data collection platform, which monitors elderly users' health parameters and automatically requests an ambulance to their location if they exceed a risk threshold determined by a preventive medical checkup.

Finally, TrackMe platform can be used also in run competitions to collect runners' statistics and enable their registration to the runs through the Track4Run service, which enables the run organizers to manage runs' participants and broadcast the live coverage to spectators through a map showing the live position of the runners.

1.2 Scope

*(here we should include an analysis of the world and of the shared phenomena – identify the product and application domain, boundaries)
(here and in 2.1 Product Perspective)*

1.2.1 Goals

- G1:** The user can be recognized by providing a form of identification
- G2:** Allow third parties to monitor data about location and health status of individuals.
- G3:** Allow third parties to access data relative to specific individuals
- G4:** Allow third parties to access anonymized data of groups of individuals
- G5:** Allow third parties to offer a personalized and non-intrusive SOS service to elderly people so that an ambulance arrives to the location of the customer in case of emergency.
- G6:** Allow athletes to enroll in a run
- G7:** Allow organizers to manage runs
- G8:** Allow spectators to see on a map the position of all runners during the run

1.3 Definitions, acronyms, abbreviations

- The user

- Third parties
- Athletes
- Organizers
- Spectators
- Run
- Risk threshold
- Some more..

1.4 Revision History

1.5 Reference Documents

1.6 Document Structure

(Anything that will limit the developer's options (e.g. regulations, reliability, criticality, hardware limitations, parallelism, etc.)

2.5 Assumptions and Dependencies

Domain Assumptions

D1: Users are uniquely identified by their ID number or fiscal code. [G1, G2]

D2: Information provided by the user during the registration process are assumed to be true. [G1, G2, G3]

D3: User's position is available through GPS. [G1]

D4: User's health related data (heart rate and blood pressure) values are available through a wearable personal device [G1]

D5: A partner of TrackMe provides an ambulance service 24/7. [G4]

D6: The risk threshold for each user is obtained through a preventive hospital check. [G5]

D7: There is an external provider offering a map service [G8]

3 Specific Requirements

(the IEEE standard suggests 8 different templates for this section, we may have a look at them – All the requirements go in here)

3.1 External Interface Requirements

3.1.1 User Interfaces

3.1.2 Hardware Interfaces

3.1.3 Software Interfaces

3.1.4 Communication Interfaces

3.2 Functional requirements

(Taken from Prof document:

Definition of use case diagram, use cases and associated sequence/activity diagrams, and mapping on requirements. Scenarios)

*It's important to keep track of the relation between use cases and requirements – **Traceability Matrix***

3.2.1 Data4Help

Users: source users and third-party services.

G1: The user can be recognized by providing a form of identification

[D1]: Users are uniquely identified by their ID number or fiscal code.

[D2]: Information provided by the user during the registration process are assumed to be true

[R1]: The system must allow registration of individuals through the creation of a username and a password.

[R2]: The system must guarantee the unicity of usernames.

[R3]: The system must ask the user to provide his personal data (birthdate, gender, residency address, ID number / fiscal code).

[R4]: The system should ask the user to agree to a policy that specifies that, by registering, users agree that TrackMe acquires their data.

G2: Allow third parties to monitor data about location and health status of individuals.

[D3]: User's position is available through GPS.

[D4]: User's health data (heart rate and blood pressure) are available through a wearable personal device

[R5]: The system must store past position and health data of every single user.

[R6]: The system must support the registration of third parties.

[R7]: Third parties must be allowed to subscribe to new data and the system sends data as soon as they are produced. *[also in G3, G4]*

G3: Allow third parties to access data relative to specific individuals

[D2]: Users are uniquely identified by their ID number or fiscal code.

[R7]: see above

[R8]: The third parties must be able to request a specific individual's data through his ID number or fiscal code.

[R9]: Upon every data collection request, the system must ask permission to the user, who can also deny it.

G4: Allow third parties to access anonymized data of groups of individuals

[R7]: see above

[R25]: The system must allow third parties to search for the desired group of individuals.

[R10]: Grouped data collection must be allowed by the system only if the data can be properly anonymized. Anonymization is considered proper if the number of people involved in the request is greater than 1000. *(Same comment as R9)*

3.2.2 AutomatedSOS

Users: elderly people and third parties.

G5: Allow third parties to offer a personalized and non-intrusive SOS service to elderly people so that an ambulance arrives to the location of the customer in case of emergency.

[D6]: The risk threshold for each user is obtained through a preventive hospital check.

[R11]: Frequently enough, health parameters are monitored by the system and compared against the threshold to detect risk situations.

3.2.3 Track4Run

Users: Runners, organizers and spectators

G6: Allow athletes to enroll in a run

[R13]: The system must allow participants to register to the system.

[R14]: The system must allow participants to check a list of available runs.

[R15]: The system must provide the ability to enroll to the desired run only to registered athletes.

[R16]: The system should allow enrolling only if the user has already agreed to share publicly his location for the duration of the run.

G7: Allow organizers to manage runs

[R17] Allow organizers to register to the system

[R18] Allow organizers to create and delete races

[R19] Allow organizers to add a path for the run

[R20] Allow organizers to check a participants list

[R21] Allow organizers to add or remove participants manually

G8: Allow spectators to see on a map the position of all runners during the run

[D7] There is an external provider offering a map service

[R22] The system provides a public list of live runs

[R23] The system must allow the spectator to see a map of the desired run, with live participants' position

[R24] Positions of the runners on the map must be updated by the system as soon as new data is received

3.3 Performance requirements

G5: Allow third parties to offer a personalized and non-intrusive SOS service to elderly people so that an ambulance arrives to the location of the customer in case of emergency.

[R1-NF]: A reaction time of less than 5 seconds from the time the health parameters are below the threshold must be guaranteed by the system.

3.4 Design constraints

3.4.1 Standards Compliance

3.4.2 Hardware limitations

3.4.3 Any other constraint

3.5 Software System Attributes

3.5.1 Reliability

3.5.2 Availability

3.5.3 Security

3.5.4 Maintainability

3.5.5 Portability

4 Formal Analysis using Alloy

(In this section you will include your Alloy model. We require you to comment on the model by discussing the purpose of the model, what you can prove with it and why what you prove is important given the problem at hand. You are also required to show one or more worlds obtained by running your model)

5 Effort Spent

5.1 Piccinotti Diego

Description of the task	Hours
Purpose, Scope, Definition	9
Product Perspective	
Product Functions	
User Characteristics	
Domain Assumptions	
Functional Requirements	
Non-functional Requirements	
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5.2 Pietroni Umberto

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5.3 Rossi Loris

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6 References

[WORD SHARED DOCUMENT](#)