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Data4Help

Requirement Analysis and Specification Document

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1 Introduction

1.1 Purpose

The following Requirements Analysis and Specification Document examines a possible solution for a specific system-to-be provided by the TrackMe company. Therefore, this document contains the description of the scenarios, the use cases that described them, and the models describing requirements and specification for the system-to-be.

Data4Help is a location-based health information service-to-be that allows third parties to monitor the location and health status of individuals. The given problem is to design and develop this service and other two services, AutomatedSOS and Track4Run, which exploit the features offered by Data4Help.

AutomatedSOS is a service-to-be thought to help elderly people. Constantly monitoring the health status of the subscribed customers, this service sends to the user's location an ambulance as soon as the recorded values are anomalous, for example when some health parameters are below certain thresholds.

Finally, Track4Run is a service-to-be that tracks athletes participating in a run. The service, allows organizers to define the path for the run, participants to enroll to the run and spectators to see on a map the position of all the runners during the run.

1.2 Scope

1.2.1 Goals

- Data4Help

  G.1 Collect users' position and health status.

  G.2 Provide to Third Parties users' position and heath status.

  G.2.1 Provide data on-demand to non-subscribed third parties.

  G.2.2 Provide data in real-time to subscribed third parties.

  G.3 Allow third parties two different ways to get users' data.

  G.3.1 Allow third parties to get data of a single person.

  G.3.2 Allow third parties to get data of a group of people.

  G.4 Provide data in an anonymous way, to protect users' privacy.

- AutomatedSOS

  G.5 Retrieve user's position and health status.

  G.6 Allow health-interested third parties the access to data detected by AutomatedSOS.

  G.7 Monitor user's health parameters.

  G.8 Send an ambulance to users' location whenever certain parameters are below the threshold.

- Track4Run

  G.5 Retrieve user's position and health status.

  G.9 Allow promoters to manage a run.

  G.9.1 Allow promoters to define a path for the run.

  G.9.2 Allow promoters to invite athletes to the run.

  G.10 Allow athletes to enroll on a specific run.

  G.11 Allow spectators to watch in real time the position of every athletes in a specific run.

1.2.2 World Phenomena

... what are world phenomena???

1.3 Definitions, Acronyms, Abbreviations

- Definitions

(a) Single request: request of data from a specific registered individual.

(b) Group request: request of data from many individuals.

(c) Live acquisition: third parties can access to data as soon they are ready, through service updates.

(d) On demand acquisition: third parties can access to data when they request them.

(e) Subscribers: third parties allowed to receive live acquisition about preselected user/group.

(f) User credentials: information that an individual has to provide to become a registered user: name, surname, date of birth, address, email, telephone number, job, marital status and fiscal code.

(g) Third parties' credentials: information that a company has to provide to become a registered one: company name, p.iva.

(h) Race information: all the information about the run: name, date, promoters, maximum number of participants and race path.

(i) Private race: race that can be performed only by athletes invited by the promoter.

(j) Public race: race that can be performed by everyone.

(k) Partner Application: Application installed on users' device, not necessarily developed by TrackMe, that is in charge with retrieve location and health status.

1.4 Revision History

... Here you see a subsubsection

1.5 Reference Documents

... Here you see a subsubsection

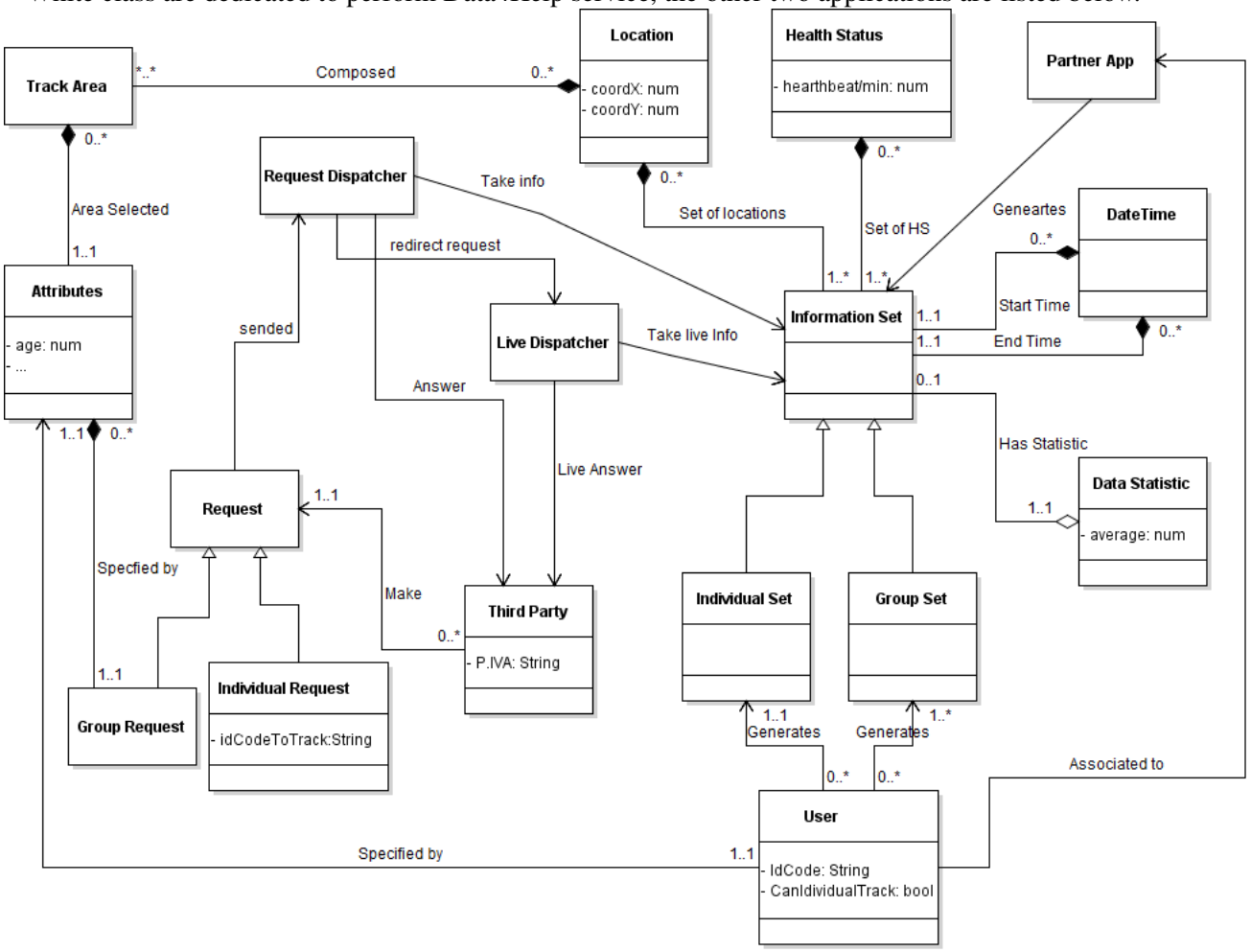
1.6 DocumentStructure

... Here you see a subsubsection

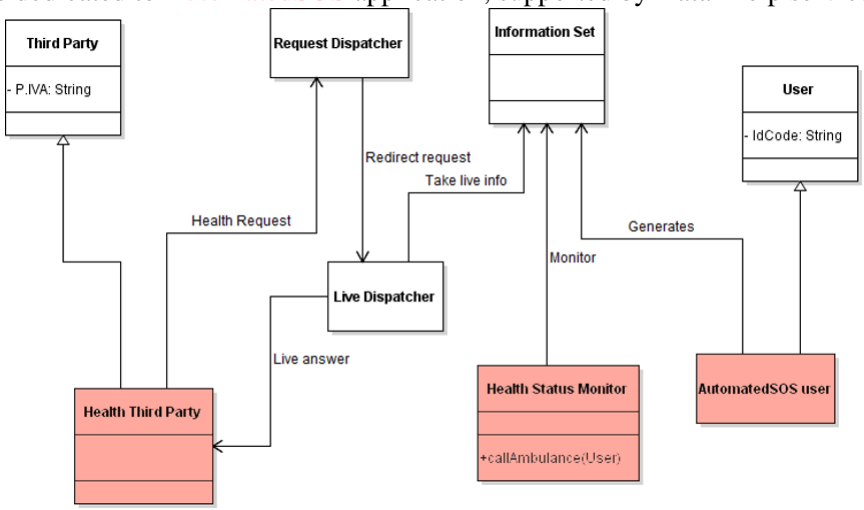
2 Overall Description

2.1 Product perspective

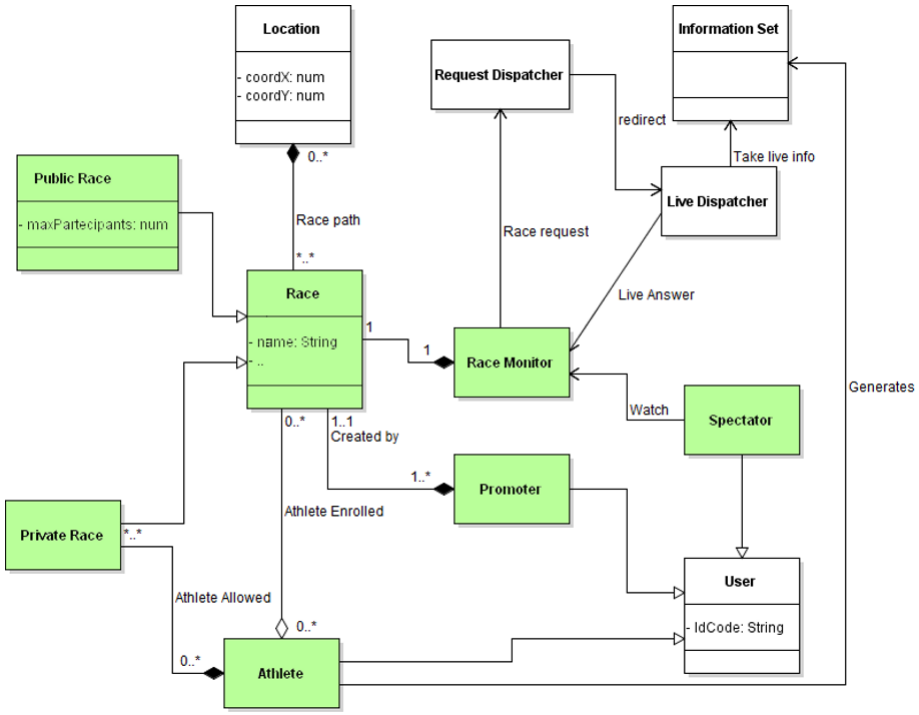
White class are dedicated to perform Data4Help service, the other two applications are listed below.



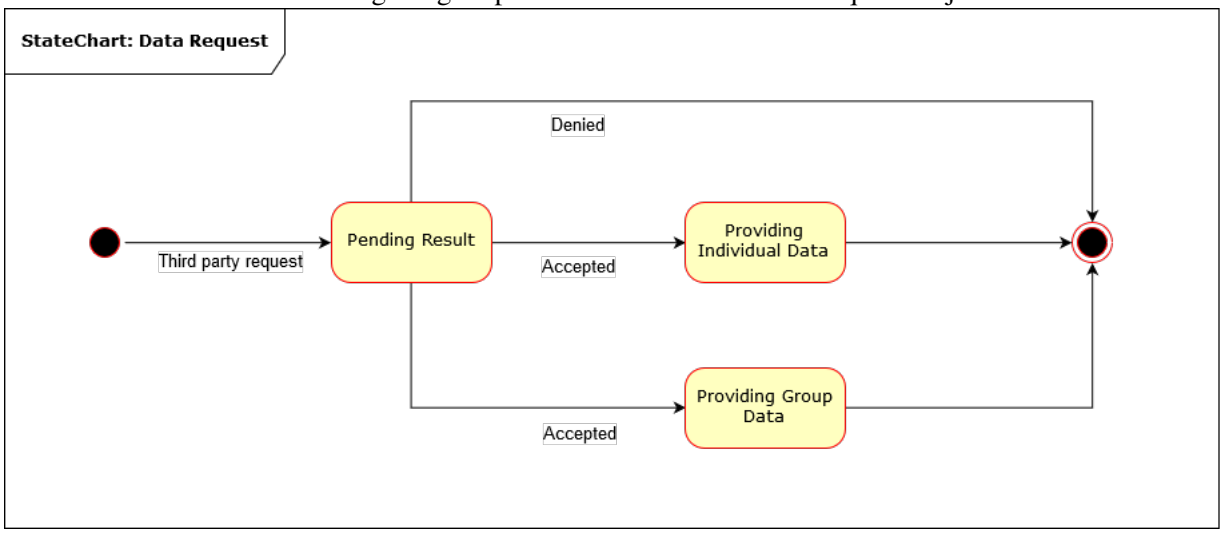
Red classes are dedicated to AutomatedSOS application, supported by Data4Help service (White ones).



Green classes are dedicated to Track4Run application, supported by Data4Help service (White ones).



The following image represent the StateChart of a Request Object.



2.2 Product functions

The systems-to-be under analysis have to offer several functions. Below, the main functions provided by each system are more precisely specified, considering all the aspects emerged from the previous list of goals.

2.2.1 Data4Help - Providing data to third parties

This is the core function that Data4Help has to ensure. After collecting users position and health status information from external partner applications, Data4Help provides these data to the third party interested in having them. Data4Help provides data on demand sending to the third party all the available data about an individual (or a group of individual) collected so far. So the third party is provided with all the data about a user from the begin to now. In addition, Data4Help offers a providing data service in real time, allowing the third party to subscribe to new data and to receive them as soon as they are produced

2.2.2 AutomatedSOS - Sending ambulance request in critical situation

AutomatedSOS monitors the health status of the subscribed customers and, when such parameters are below certain threshold, sends to the location of the customer an ambulance, guaranting a reaction time of less than 5 seconds from the time parameters are below the threshold.

Therefore, the main function offered by AutomatedSOS is sending an ambulance request, with the relative user position, to the near hospital to the user. In order to optimize the times, the ambulance request contains all the data about the user health status. Providing these infomations, when rescures arrive can immediately act accordingly to the alleged anomalous data.

2.2.3 Track4Run - Run management

Track4Run offers three different functionaly for its users, which can be all grouped under the 'run management' function. A user can be a promoter, in this case the user can create the event run , which will be visible to every other users. Once created a run, the promoter can define the path in a iteractive way, that is by drawing the path directly on a map. Track4Run allows the promoter to set other additional information, like the start time or an overrall description of the run. Finally, the promoter can invite to the run all the partecipants.

The atheletes have to be user too. Once recevied a run request, the athlete can enroll the run or reject it. In the first case, Track4Run tracks in real time the partecipant position for all the run through a GPS device. Therefore the athelte must must wear this device, that for example can be a smartwatch

A user can also be a simple spectator and see on a map the position of all runners during the run. A spectator is also provided with the main information about the partecipants and with live time laps.

Both athlete and spectator users have to agree data treatment by Data4Help.

2.3 User characteristics

1. Third Party: Registered company interested in retrieve useful data from TrackMe's users. Usually this information can be useful for marketing strategy.

   (a) Health Third Party: Non-Profit Company interested to monitor individuals in order to prevent critical diseases.

2. User: Individual that provides information about himself. His privacy must be protected by the system.

   (a) Athlete: Track4Run's user that is enrolled in one or more race.

   (b) Promoter: Track4Run's user that is the promoter of one or more race.

   (c) Spectator:Track4Run's user that want follow athletes in one or more race.

2.4 Assumptions, dependencies and constraints

In the specification document certain parts were not specific and were ambiguous. So we decided to make the following assumptions.

2.4.1 Text Assumptions

- Data4Help

  (a) Users' information are collected from partner applications or from the other two TrackMe applications installed on users' devices.

  (b) All the partner applications require to submit user credentials.

  (c) When the partner application is installed and credentials are submitted the user is required to accept privacy policy, composed in two parts:

    i. The first, mandatory, user accept to be tracked in group mode.

    ii. The second, optional, user accept to be tracked in single mode.

  (d) Individual monitoring requests are not accepted or denied one by one by the specific user. If the user agreed on the treatment of his data as information of an individual (second part of privacy policy) all Individual request by third parties are automatically accepted.

  (e) Data are collected from partner application only when they are active on users' device.

  (f) Only third parties that are registered to Data4Help can request the monitoring service.

  (g) Groups are characterized by its member's attributes (age, gender, city, etc. . .).

  (h) Health status parameters that can be acquired are all the ones supported by a standard smartwatch as: Heart Rate, Blood Pressure, Pedometer, Calories Calculation.

- AutomatedSOS

  (a) AutomatedSOS exploit only smartwatches devices to retrieve all the information needed.

  (b) AutomatedSOS is an application that needs to be installed into the user's device.

  (c) All data retrieved by AutomatedSOS are sent to Data4Help.

  (d) In order to keep under systematic review the user's health status all the historical information about the user are received by Data4Help's Database.

  (e) This service can be used only by elderly people (70+) or by who really need it, in order to avoid useless waste of resources.

  (f) Users can see all his personal information that are sent to the Data4Help service.

- Track4Run

  (a) When the user register to the application he's asked to accept or deny the treatment of his data by the Data4Help service.

  (b) The application has three functions:

    i. Promoter: allow the user to manage a run.

    ii. Athlete: allow the user to participate to a run. In order to be an athlete the request of data treatment by the Data4Help service need to be accepted.

    iii. Spectator: Allow the user to watch in real time the positions of all the athletes in a given run.

  (c) Any user can organize an event.

  (d) All the events can be spectated by users.

  (e) All users invited to a run can accept or discard the request.

  (f) Race path are always composed by citizen routes (never in private circuits or stadiums)

2.4.2 Domain Assumptions

- Data4Help

D.1 Users' information are collected from partner applications or from the other two TrackMe applications installed on users' devices.

D.2 All the partner applications require to submit user credentials.

D.3 The identification (fiscal code, social security number) and the secondary data (attributes) given by the individual during the registration are correct.

D.4 Devices used to monitor individuals always report correct values.

D.5 Partner application always report correct values to Data4Help.

D.6 In order to perform an individual request, third parties has to know the user's fiscal code or security number.

D.7 Security number and fiscal code are not information given to third parties by Data4Help.

D.8 Live acquisition lasts 24 hours to reduce waste of resources.

- AutomatedSOS

D.4 Devices used to monitor individuals always report correct values.

D.9 The user always dresses a smartwatch on which AutomatedSOS is installed.

D.10 The ambulance system is always up and ready to receive messages from AutomatedSOS.

D.11 The ambulance successfully reach the location of the individual.

D.12 The ambulance always get to the location in the minimum amount of time.

- Track4Run

D.4 Devices used to monitor individuals always report correct values.

D.13 During a run athletes always dress a smartwatch on which Track4Run is installed.

D.14 The path defined by the organizer actually exist.

D.16 If an athlete enroll to a run then he also participates to the run.

D.17 All athletes have their tracking devices with them for the entire duration of the run.

D.18 Athletes never go out of the defined path.

3 Specific Requirements

Organize this section according to the rules defined in the project description.

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

- Data4Help

G.1 **Collect users' position and health status.**

D.1 Users' information are collected from partner applications or from the other two TrackMe applications installed on users' devices.

D.2 All the partner applications require to submit user credentials.

D.3 The identification (fiscal code, social security number) and the secondary data (attributes) given by the individual during the registration are correct.

R.1 Retrieve user credentials inserted into partner application as group attributes.

R.2 Allow individuals to become registered users when policy is approved (first part). Registered users, now, can be tracked in group mode request.

R.3 Allow individuals to specify, during registration, if they are also interested to be tracked in single mode request (second part).

D.4 Devices used to monitor individuals always work and report the correct values.

D.5 Partner application always report correct values to Data4Help.

R.4 The system has to correctly receive data from partner applications installed on users' device.

G.2 **Provide to Third Parties, the users' position and heath status.**

R.5 Allow third parties registration to Data4Help service, where they have to specify all their credentials.

G.2.1 **Provide data on-demand to non-subscribed third parties.**

R.6 For each user registered ,the system has to automatically retrieve and store data from partner applications with a resolution of 10 minutes.

R.7 The system has to collect inside his database all the useful information that match the request.

R.8 The system has to send to applicant all the data already collected.

G.2.2 **Provide data in real-time to subscribed third parties.**

D.8 Live acquisition lasts 24 hours to reduce waste of resources.

R.9 Allow third parties subscription to interested group in order to receive live data.

R.10 When a real time request is performed the system has to collect and store specific users' data with a resolution of 1 minute.

R.11 Provide to subscribed third parties data as soon as they are available by the system.

G.3 **Allow third parties two different ways to get users' data.**

G.3.1 **Allow third parties to get data of a single person.**

D.6 In order to perform an individual request, third parties has to know the user's fiscal code or security number.

D.7 Security number and fiscal code are not information given to third parties by Data4Help.

R.12 Allow third parties to insert fiscal code of user that want to track.

R.13 Deny third parties to receive information about users in single mode, that have not accepted second part of privacy policy.

R.14 Collect all the useful information retrieved by Data4Help that are produced by the interested users

R.15 Send all the collected information to request applicant.

G.3.2 **Allow third parties to get data of a group of people.**

R.16 Allow third parties to insert attributes in which they are interested to restrict their field of search.

R.17 Deny third parties to receive information if the provided information can hurt users' privacy, for this purpose group request under 1000 users involved are rejected.

R.14 Collect all the useful information retrieved by Data4Help that are produced by the interested users

R.15 Send all the collected information to request applicant.

G.4 **Provide data in an anonymous way, to protect users' privacy.**

R.13 Deny third parties to receive information about users in single mode, that have not accepted second part of privacy policy.

R.17 Deny third parties to receive information if the provided information can hurt users' privacy, for this purpose group request under 1000 users involved are rejected.

- AutomatedSOS

G.5 **Retrieve user's position and health status.**

R.18 Allow users to be tracked from AutomatedSOS filling up the registration and agreeing to both parts of privacy policy.

D.4 Devices used to monitor individuals always report correct values.

D.9 The user always dresses a smartwatch on which AutomatedSOS is installed.

R.19 The application has to interact with Smartwatch/Smartphone APIs in order to retrieve location and health status.

R.20 The application is able to send to Data4Help service all the informations already retrieved in live acquisition.

G.6 **Allow health-interested third parties the access to data detected by AutomatedSOS.**

R.21 Allow non-profit organizations to register into AutoatedSOS portal and becoming health third parties.

R.22 Allow health third parties to receive informations about all the users registered to AutomatedSOS through Live Acquisition performed by Data4Help.

G.7 **Monitor user's health parameters.**

R.19 The application has to interact with Smartwatch/Smartphone APIs in order to retrieve location and health status.

G.8 **Send an ambulance to users' location whenever certain parameters are below the threshold.**

R.24 The application has to control health status with data retrieved in local to realize immediately if certain parameters are critical.

R.25 The application has to call an ambulance, if parameters are critical.

D.10 The ambulance system is always up and ready to receive messages from AutomatedSOS.

R.26 Supply to hospital user's location and all the useful information to provide efficient first aid.

D.11 The ambulance successfully reach the location of the individual.

- Track4Run

G.5 **Retrieve user's position and health status.**

R.27 Allow users to be tracked from Track4Run filling up the registration and agreeing to both parts of privacy policy.

D.4 Devices used to monitor individuals always report correct values.

R.19 The application has to interact with Smartwatch/Smartphone APIs in order to retrieve location and health status.

R.20 The application is able to send to Data4Help service all the informations already retrieved in live acquisition.

G.9 **Allow promoters to manage a run.**

R.21 Allow users to create a run providing all the general information about the competition.

R.22 Allow users to specify if the race is public or private.

D.4 Devices used to monitor individuals always report correct values.

D.13 During a run athletes always dress a smartwatch on which Track4Run is installed.

G.9.1 **Allow promoters to define a path for the run.**

R.21 Allow promoters to define a path for the race by selecting the routes inside a map.

D.14 The path defined by the organizer actually exist.

G.9.2 **Allow promoters to invite athletes to the run.**

R.21 Allow promoters to invite athlete to be runner of their private race.

R.22 Allow promoters to specify maximum number of athletes that can take part to their public race.

G.10 **Allow athletes to enroll on a specific run.**

R.23 Allow users to see all the public races and private races in which he is invited.

R.24 Allow user to select a race and add him to the athletes involved.

D.16 If an athlete enroll to a run then he also participates to the run.

G.11 **Allow spectators to watch in real time the position of every athletes in a specific run.**

D.17 All athletes have their tracking devices with them and the application enabled for the entire duration of the run.

R.25 Allow user to select a race to be viewed.

R.26 The application must be able to request to Data4Help the positions of all the other athletes involved.

R.27 The application must be able to receive and display the positions of all the other athletes involved.

D.18 Athletes never go out of the defined path.

3.3 Performance Requirements

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

Organize this section according to the rules defined in the project description.

5 Effort Spent

In this section are provided information about how much effort each group member spent in working at this document.

5.0.1 Luca Alessandrelli

Date	Task	Hours
18/10/18	Goals	1
19/10/18	Domain Assumptions	3
	Total	4

5.0.2 Andrea Caraffa

Date	Task	Hours
18/10/18		
19/10/18		
	Total	

5.0.3 Andrea Bionda

Date	Task	Hours
18/10/18		
19/10/18		
	Total	

6 References

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