Data4Help

POLITECNICO
MILANO 1863

Requirement Analysis and Specification Document

Deliverable:	RASD
Title:	Requirement Analysis and Verification Document
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Version:	1.0
Date:	19-October-2018
Download page:	https://github.com/lucaalessandrelli/AlessandrelliCaraffaBionda.git
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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).
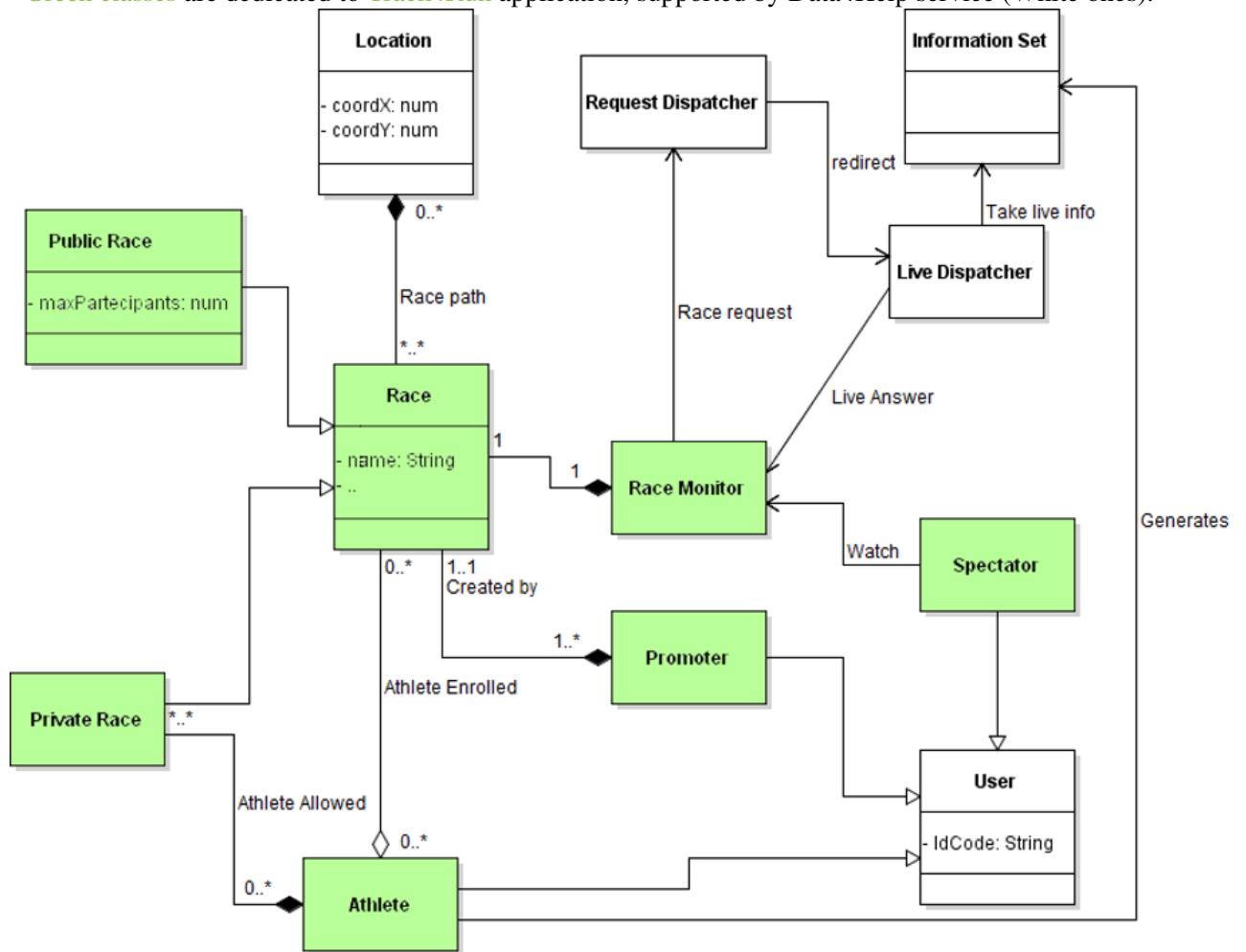
The following image represent the StateChart of a Request Object.

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

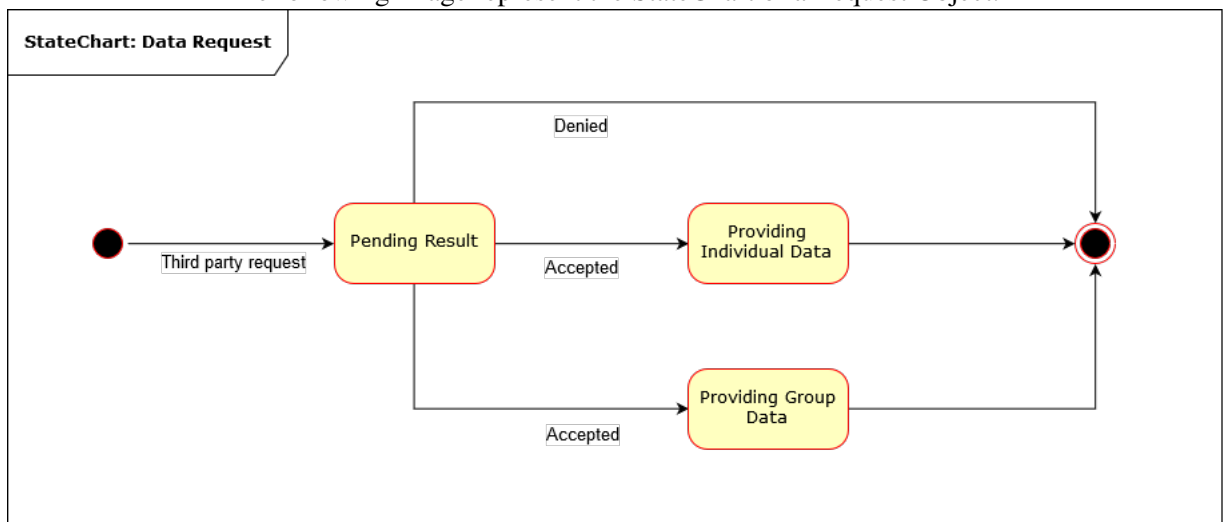This is the core function that Data4Help has to ensure. After collecting users position and health status information from external partner applications, Data4Help provides these data to the third party interested in having them. Data4Help provides data on demand sending to the third party all the available 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 iterative 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) Partner applications can be all the sport assistant apps, gps assistant apps or all the other applications that can retrieve location and health status of individual for such reason.

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

  (d) 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.

  (e) 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.

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

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

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

  (i) 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 Scenarios

- Scenario 1

  The company StatisticsDispenser is interested into weekly providing public statistics about people living in London. For this reason the company, which is already registered to Data4Help, need to send a group monitoring request. After logging into the Data4Help website, StatisticsDispenser open the group request section. The website loads a new page where the company can filter groups through some attributes regarding his members like the age, the gender, the city and many more. For the specific purpose StatisticsDispenser chooses only to filter people who live in London and people who's age is between 20 and 60. Then, due to the fact that the company need future data, StatisticsDispenser subscribes to the group. From now on every time new data is available the system sends a notification to StatisticsDispencer.

- Scenario 2 L'utente si registra in una partner application

- Scenario 3 L'utente collega l'account in una partner application

- Scenario 4 Ambulanza viene mandata (ricordati che il diagramma è sbagliato)

- Scenario 5 Promote a run

- Scenario 6 spectate a run

3.3 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 users already registered in Data4Help world to sign in with his account without provide user credentials again.

    R.3 Allow individuals to agree with privacy policy (first part). Registered users, now, can be tracked in group mode request through installed application.

    R.4 Allow individuals to specify, during registration, if they are also interested to be tracked in single mode request (second part) through installed application.

    R.5 After registration the system provides, through provided e-mail, the password to access the data.

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.6 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.7 Allow third parties registration to Data4Help service, where they have to specify all their credentials.

R.5 After registration the system provides, through provided e-mail, the password to access the data.

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

R.8 For each user registered ,the system has to automatically retrieve and store data from partner applications with a resolution of 10 minutes; independently from the requests reached.

R.9 The system has to collect inside his database all the useful information that match the request.

R.10 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.11 Allow third parties subscription to interested group in order to receive live data.

R.12 When a real time request is performed the system has to collect and store specific users' data with a resolution of 2 minutes.

R.13 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.14 Allow third parties to insert fiscal code of user that want to track.

R.15 Deny third parties to receive information about users in single mode, that have not accepted second part of privacy policy.

R.16 Collect all the useful information retrieved by Data4Help that are produced by the interested users

R.17 Send all the collected information to request applicant.

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

R.18 Allow third parties to insert attributes in which they are interested to restrict their field of search.

R.19 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.16 Collect all the useful information retrieved by Data4Help that are produced by the interested users

R.17 Send all the collected information to request applicant.

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

R.15 Deny third parties to receive information about users in single mode, that have not accepted second part of privacy policy.

R.19 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.20 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.21 The application has to interact with Smartwatch/Smartphone APIs in order to retrieve location and health status.

  R.22 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.23 Allow non-profit organizations to register into AutoatedSOS portal and becoming health third parties.

  R.24 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.21 The application has to interact with Smartwatch/Smartphone APIs in order to retrieve location and health status.

  R.25 The application has to retrieve users' health status every 2 seconds in order to guarantee reaction time of 5 seconds.

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

  R.26 The application has to control health status with data retrieved in local to realize immediately if certain parameters are critical.

  R.27 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.28 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.29 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.21 The application has to interact with Smartwatch/Smartphone APIs in order to retrieve location and health status.

  R.22 The application is able to send to Data4Help service all the informations already retrieved in live acquisition.

  R.30 The application is able to send to Data4Help service updated daata with a resolution of 5 seconds.

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

  R.31 Allow users to create a run providing all the general information about the competition.

  R.32 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.33 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.34 Allow promoters to invite athlete to be runner of their private race.

R.35 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.36 Allow users to see all the public races and private races in which he is invited.

R.37 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.38 Allow user to select a race to be viewed.

R.39 The application must be able to request to Data4Help the positions of all the other athletes involved.
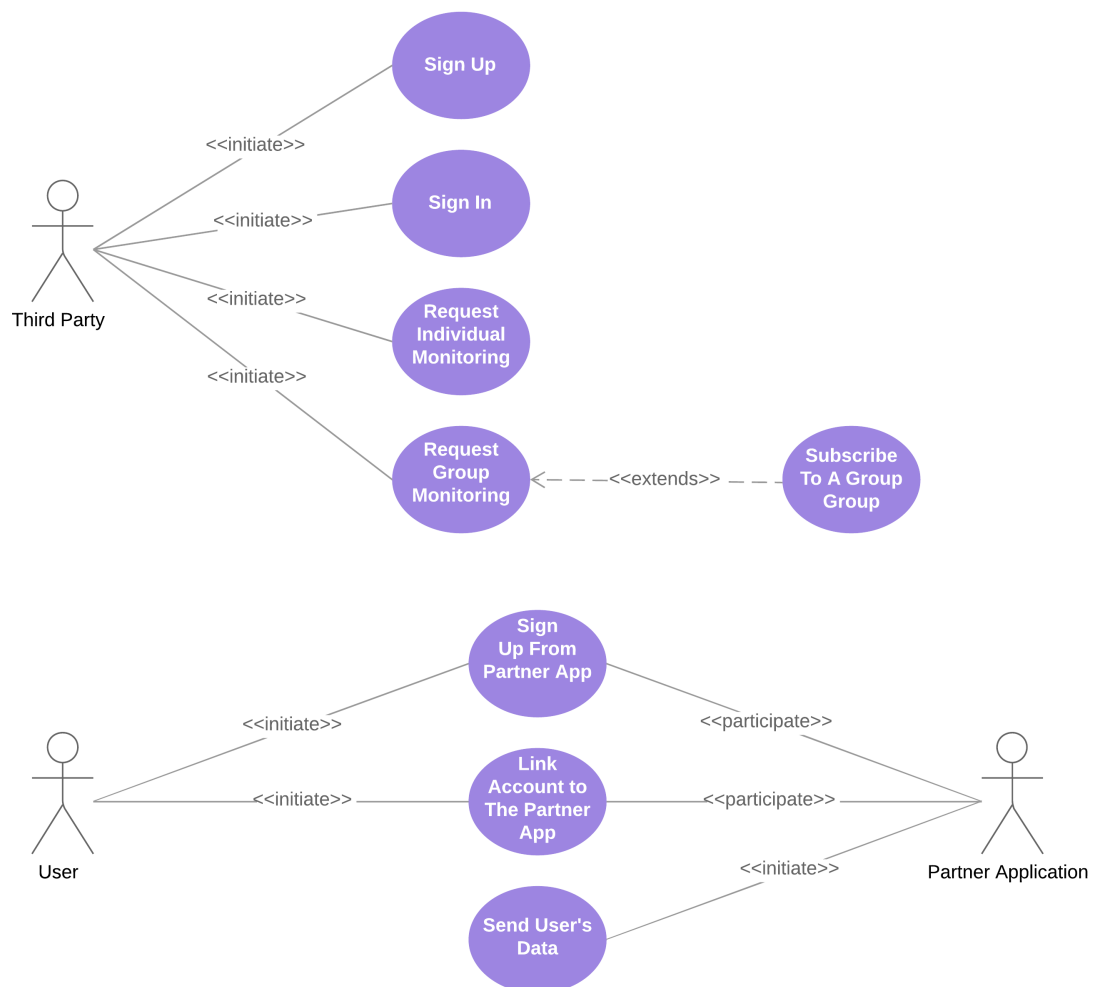
R.40 The application must be able to receive and display the positions of all the other athletes involved.

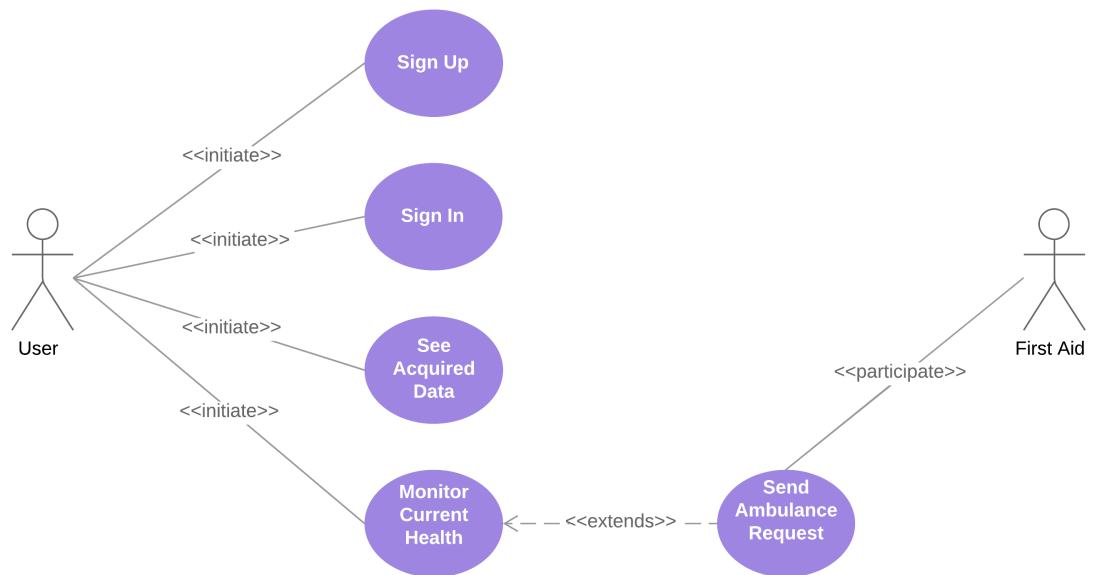D.18 Athletes never go out of the defined path.
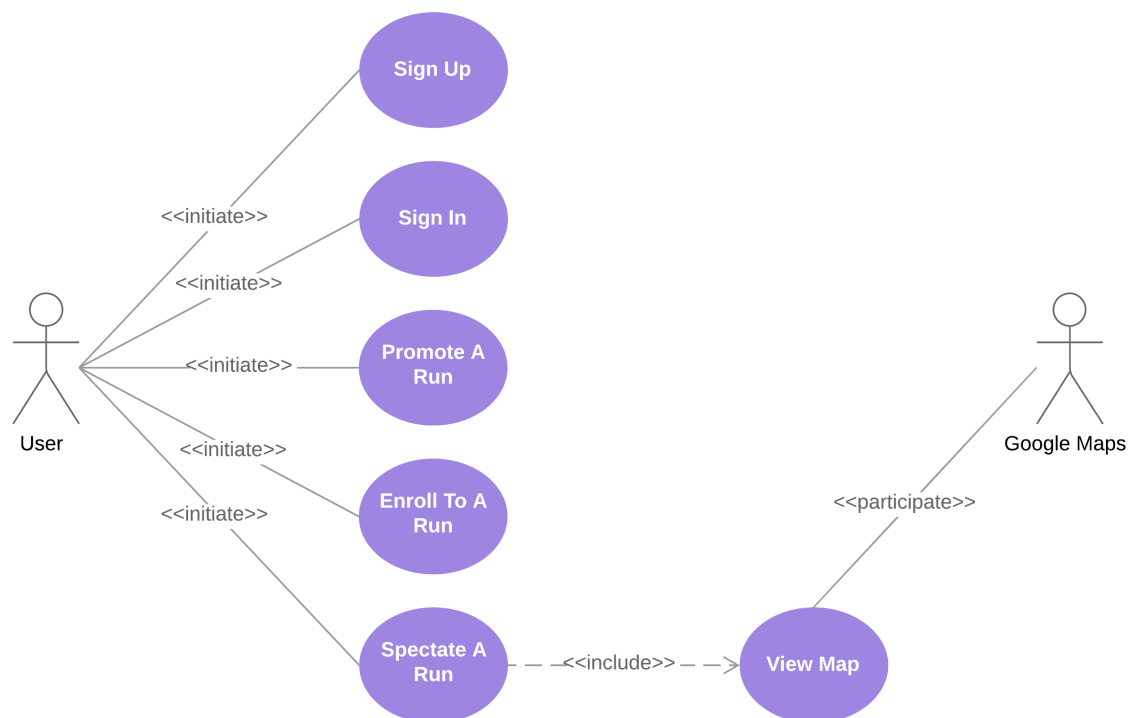
3.3.1 Use Case Diagram

- Data4Help

- AutomatedSOS

- Track4Run

- Data4Help Use Cases

Name	Sign Up
Actors	Third Party
Entry Conditions	The third party has the registration website page opened.
Event Flow	(a) The Third Party clicks on the "Sign Up" button. (b) The Third Party fills all the attribute fields (c) The Third Party clicks on "Register Now" button. (d) The system creates and saves the third party's account.
Exit Condition	The third party's account has been created and the third party is now registered.
Exceptions	• If the system notices that attributes used in the registration are already linked to an existing account then a warning is generated saying that there is already a third party registered with the given credentials.

Name	Sign In
Actors	Third Party
Entry Conditions	The third party has the registration website page opened.
Event Flow	(a) The Third Party clicks on the "Sign In" button. (b) The Third Party fills all credentials fields. (c) The Third Party clicks on "Log in" button. (d) The system accept the log in request.
Exit Condition	The third party is now logged in.
Exceptions	• If the third party inserts invalid log in credentials a warning is generated saying the credentials are invalid.

Name	Request Individual Monitoring
Actors	Third Party
Entry Conditions	The third party is logged in.
Event Flow	(a) The Third Party clicks on the "Individual Request" button. (b) The Third Party inserts the fiscal code or the social security number of the individual to track . (c) The system shows all the individual's information that have been tracked until the request.
Exit Condition	The request's outcome is shown to the user.
Exceptions	• If the inserted fiscal code or social security number are not linked to any account then a warning message is displayed saying that the individual is not registered. • If the individual with the fiscal code or social security number inserted didn't accept the individual treatment of data policy then a warning message is displayed saying that the request is rejected.

Name	Request Group Monitoring
Actors	Third Party
Entry Conditions	The third party is logged in.
Event Flow	(a) The Third Party clicks on the "Group Request" button. (b) The Third Party inserts the all the attributes that will define the group of interest. (c) The system accepts the request. (d) The system shows all the group's information that have been collected until the request.
Exit Condition	The request's outcome is shown.
Exceptions	• If the group request get rejected by the system a warning message will be displayed saying the request is rejected.
Special Requirements	The system rejects group monitoring requests when the group's information can compromise users' privacy. For this purpose requests of groups composed by less than 1000 users get rejected.

Name	Subscribe To A Group
Actors	Third Party
Entry Conditions	The third party has just sent an accepted monitoring request to a group.
Event Flow	(a) Third Party clicks on the "Subscribe to this Group" button. (b) The system links the third party to the group. (c) The system sends new data to the third party.
Exit Condition	The Third Party is subscribed to the selected group.
Exceptions	(a) If the third party is already subscribed a warning message is shown saying the subscription have been already done.

Name	Sign Up From Partner App
Actors	User, Partner Application
Entry Conditions	The user accepted the treatment of data policy and wants to create an account.
Event Flow	(a) The user start the sign up function on the partner app. (b) The Partner Application shows to the user all the attributes needed for the registration. (c) The User fills all the attribute fields. (d) The Partner Application sends to the system the attributes inserted by the user. (e) The system receives by the partner application all the attributes inserted by the user. (f) The system creates the user account and saves the received data.
Exit Condition	The system registered the user.
Exceptions	• If the system notices that the social security number or fiscal code used in the registration are already linked to an existing account then a message is sent back to the partner application in order to let the user know what happened.

Name	Link Account To The Partner App
Actors	User, Partner Application
Entry Conditions	The user accepted the treatment of data policy and wants to link his already existing account to the partner application.
Event Flow	(a) The user start the account linking function on the partner app. (b) The Partner Application shows to the user all the attributes needed for the linking process. (c) The User fills all the attribute fields. (d) The Partner Application sends to the system the attributes inserted by the user. (e) The system receives by the partner application all the attributes inserted by the user. (f) The system send back to the partner application the outcome of the operation.
Exit Condition	The system registered the user.
Exceptions	None.

Name	Send User's Data
Actors	User, Partner Application
Entry Conditions	The user accepted the treatment of data policy.
Event Flow	(a) The User uses the partner application. (b) The Partner Application sends the user's information to the the system. (c) The system receives and saves the user data sent by the partner application.
Exit Condition	The system saved the user data.
Exceptions	None

- AutomatedSOS Use Cases

Name	Sign Up
Actors	User
Entry Conditions	The User launched AutomatedSOS on his smartwatch.
Event Flow	(a) The User clicks on the "Sign Up" button. (b) The User accepts the treatment of data policy. (c) The User fills all the attribute fields. (d) The User clicks on "Register Now" button. (e) The system creates and saves the user's account.
Exit Condition	The user's account has been created and the user is now registered.
Exceptions	• If the User does not accept the treatment of data policy then a warning is generated saying that ,in order to register, the policy must be accepted. • If the system notices that the social security number or fiscal code used in the registration are already linked to an existing account then a warning is generated saying that an account with the given credentials is already registered.

Name	Sign In
Actors	User
Entry Conditions	The User has AutomatedSOS application installed on his smartwatch.
Event Flow	(a) The User clicks on the "Sign In" button. (b) The User inserts his social security number or fiscal code and his password. (c) The User clicks the "Enter" button. (d) The system accept the log in in request and redirect the user to the menu.
Exit Condition	The User user is now logged in.
Exceptions	• If user inserts invalid log in credentials a warning is generated saying the credentials are invalid.

Name	See Acquired Data
Actors	User
Entry Conditions	The User is logged in.
Event Flow	(a) The User clicks on the "Acquired Info" button. (b) The system gets all the user information that have been retrieved by the application until that moment. (c) The system display the user information.
Exit Condition	All the information retrieved by the system are shown on the app.
Exceptions	• If the system do not find information about the user then a warning message is shown to the user saying that until now the application did not record any information.

Name	Monitor Current Health
Actors	User
Entry Conditions	The User is logged in.
Event Flow	(a) The User clicks the "Monitor Health" button. (b) The system shows in real time all the health values that are being retrieved.
Exit Condition	All the health parameters retrieved by the application are shown in real time on the app.
Exceptions	• If no health parameters are retrieved a warning message is displayed saying to the user he actually must wear the smartwatch in order to see parameters in real time.

Name	Send Ambulance Request
Actors	AutomatedSOS, First Aid
Entry Conditions	A critical health parameter value is below the threshold.
Event Flow	(a) AutomatedSOS sends to First Aid a form that contains all important information about the user, like his current location, his gender, his age, his health profile, and the list of parameters that got below the threshold. (b) First Aid sends an acknowledge message to AutomatedSOS (c) First Aid sends immediately an ambulance to the user's location. (d) AutomatedSOS displays on the app a warning message saying that an ambulance is currently heading to the user's location.
Exit Condition	A warning message is shown saying that an ambulance is currently heading to the user's location.
Exceptions	• If no acknowledge message is received by AutomatedSOS after the form has been sent, as soon as a certain time out expires AutomatedSOS resend the form with updated information.
Special Requirements	The form need to be sent to First Aid with a reaction time of less than 5 seconds from the time the parameters are below the threshold.

- Track4Run Use Cases

Name	Sign Up
Actors	User
Entry Conditions	The User has Track4Run application installed on his device.
Event Flow	(a) The User clicks on the "Sign Up" button. (b) The User accepts the treatment of data policy. (c) The User fills all the attribute fields. (d) The User clicks on the "Register Now" button. (e) The system creates and saves the user's account.
Exit Condition	The user's account has been created and the user is now registered.
Exceptions	• If the User does not accept the treatment of data policy then a warning is generated saying that ,in order to register, the policy must be accepted. • If the system notices that the social security number or fiscal code used in the registration are already linked to an existing account then a warning is generated saying that an account with the given credentials is already registered.

Name	Sign In
Actors	User
Entry Conditions	The User has Track4Run application installed on his smartwatch.
Event Flow	(a) The User clicks on the "Sign In" button. (b) The User inserts his social security number or fiscal code and his password. (c) The User clicks the "Enter" button. (d) The system accept the log in in request and redirect the user to the menu.
Exit Condition	The User user is now logged in.
Exceptions	• If user inserts invalid log in credentials a warning is generated saying the credentials are invalid.

Name	Promote A Run
Actors	User
Entry Conditions	The User is logged in.
Event Flow	(a) The User clicks on the "Promote a Run" button. (b) The system show a new tab where the user can define the path, name, date and athletes. (c) The system create the event and adds it to the event list visible in the "Enroll to A Run" section. (d) The system automatically sends notifications to all athletes specified by the promoter asking them if they want to participate to the run.
Exit Condition	The run event has been created and is visible in the list of promoted events.
Exceptions	• If the user do not insert critical information (like the path, the name or the date) a warning message is shown saying that critical parameters are missing. The user can close the warning message and fill the remaining parameters or cancel the operation, going back to the main menu.

| Name	Enroll To A Run
Actors	User
Entry Conditions	The User is logged in.
Event Flow	(a) The User clicks on the "Enroll to a Run" button. (b) The system shows a new tab where the list of all runs created is visible. (c) The User can filter the runs with attributes like the name, the date and the location. (d) The User clicks on the specific run he wants to participate to. (e) The system adds the user to the list of athletes enrolled to the run.
Exit Condition	The user is inside the list of athletes of the run.
Exceptions	• If the number of athletes has already capped the max amount in the run clicked by the user then a warning message is displayed saying that no more athletes are allowed to participate to the run. • If the user didn't accept the treatment of data policy, a warning message is displayed, asking the user to accept it in order to enroll to the run.

Name	Spectate A Run
Actors	User
Entry Conditions	The User is logged in.
Event Flow	(a) The User clicks on the "Spectate a Run" button. (b) The system shows a new tab where the list of all live runs is visible. (c) The User can filter the runs with attributes like the name, and the location. (d) The User clicks on the specific run he wants to spectate. (e) The system opens a tab which contains the map of the run and also the position of all athletes in real time.
Exit Condition	The spectator tab on the application is open.
Exceptions	None.

| Name	View Map
Actors	AutomatedSOS
Entry Conditions	The user has just started spectating a run.
Event Flow	(a) AutomatedSOS uses Google Maps API in order to retrieve the map of the run. (b) AutomatedSOS represents athletes on the map in their current position.
Exit Condition	The current position of athletes is present on the map of the run.
Exceptions	None.

3.4 Sequence Diagram

- ## Data4Help
  Individual request with on-demand acquisition performance.
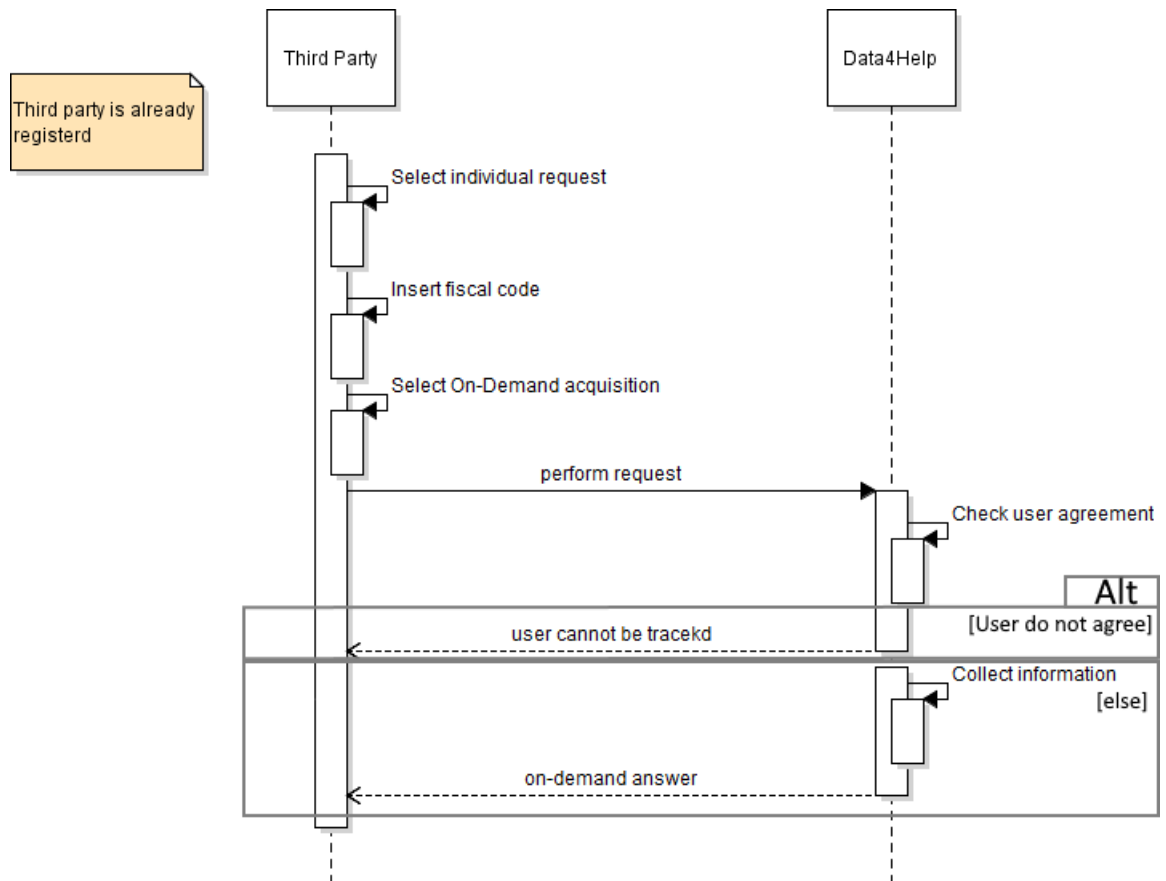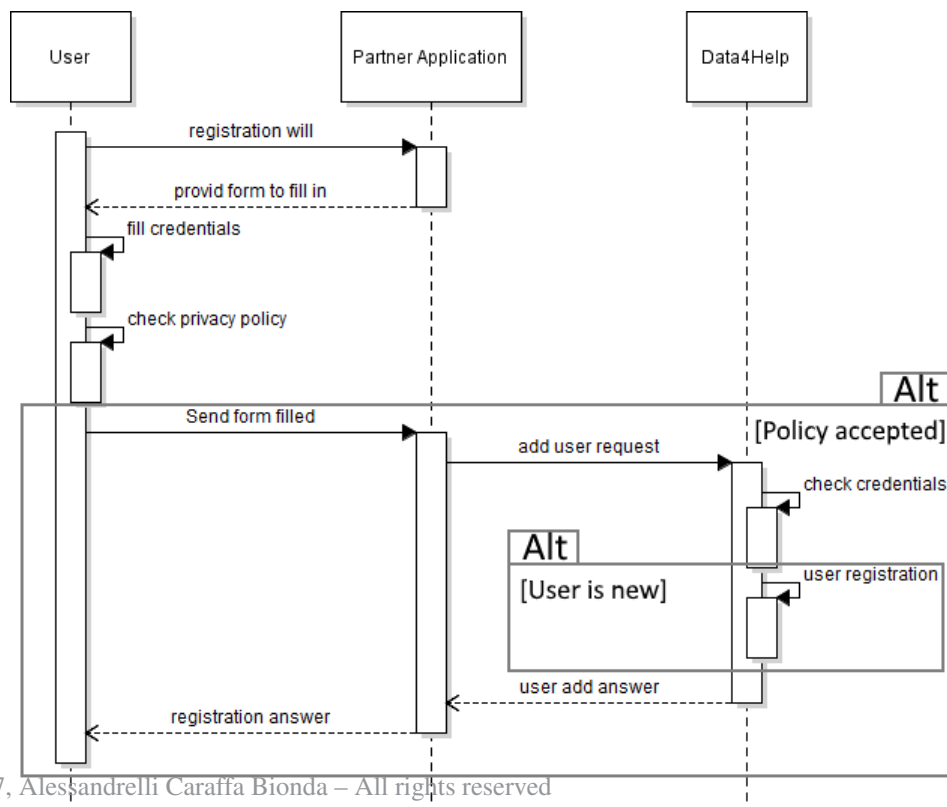

Automatic data update inside Data4Help:
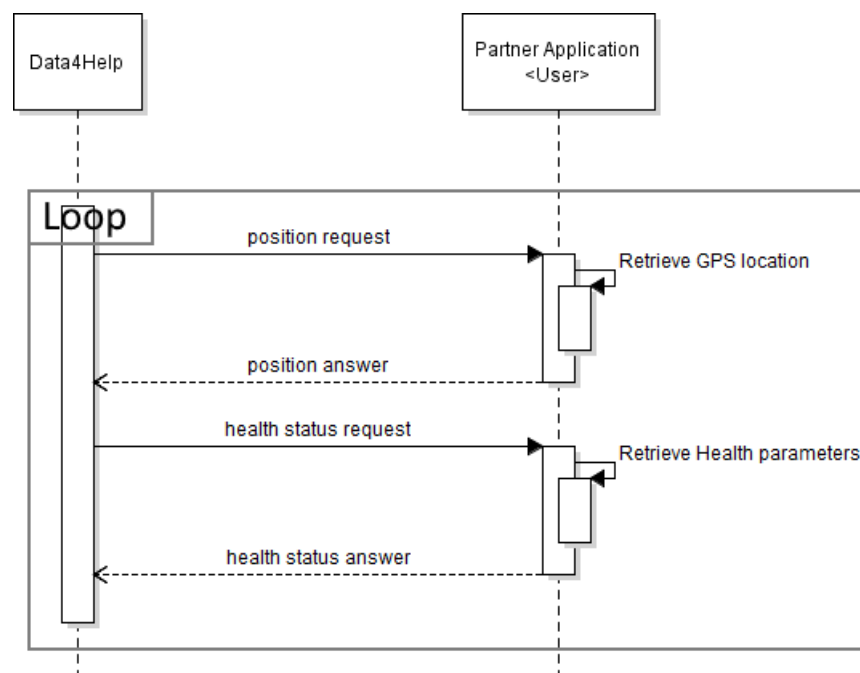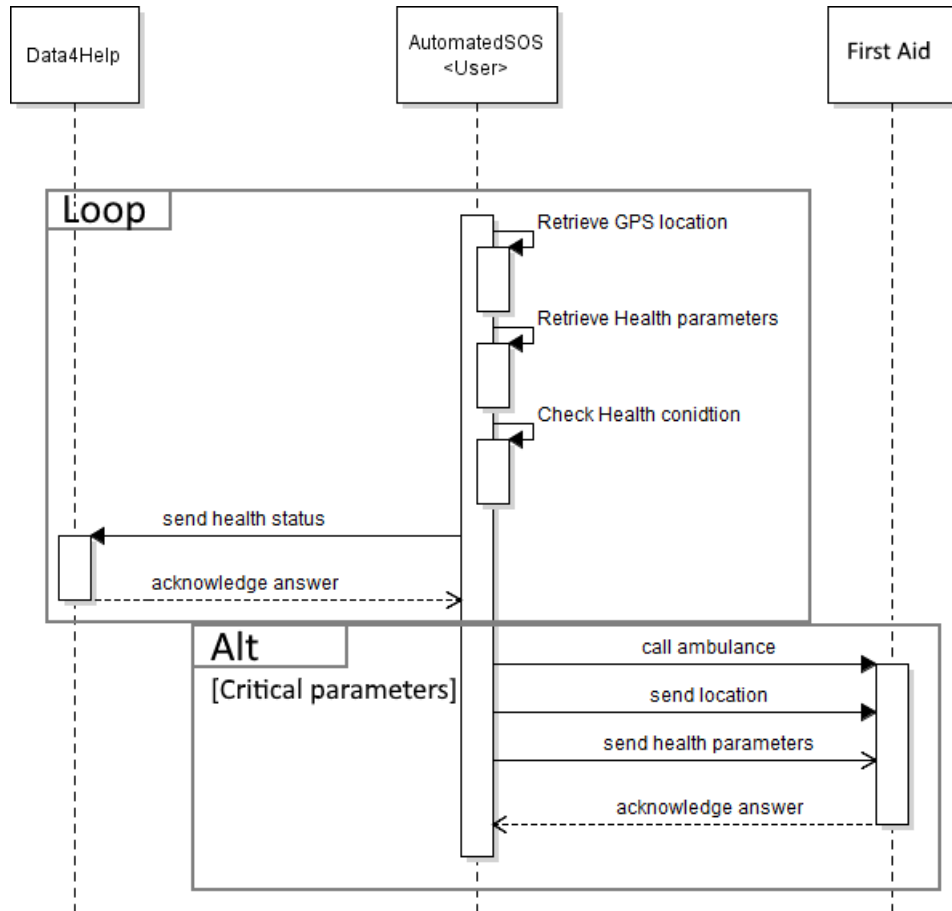
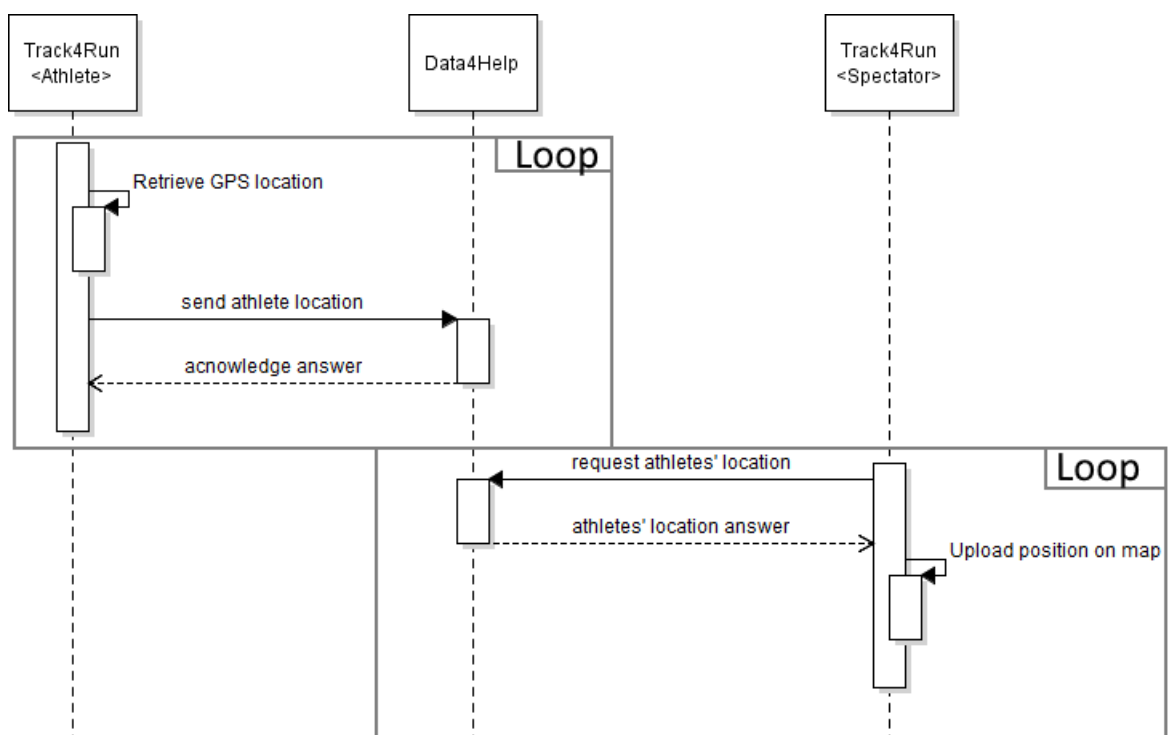Group request with live acqusition performance:
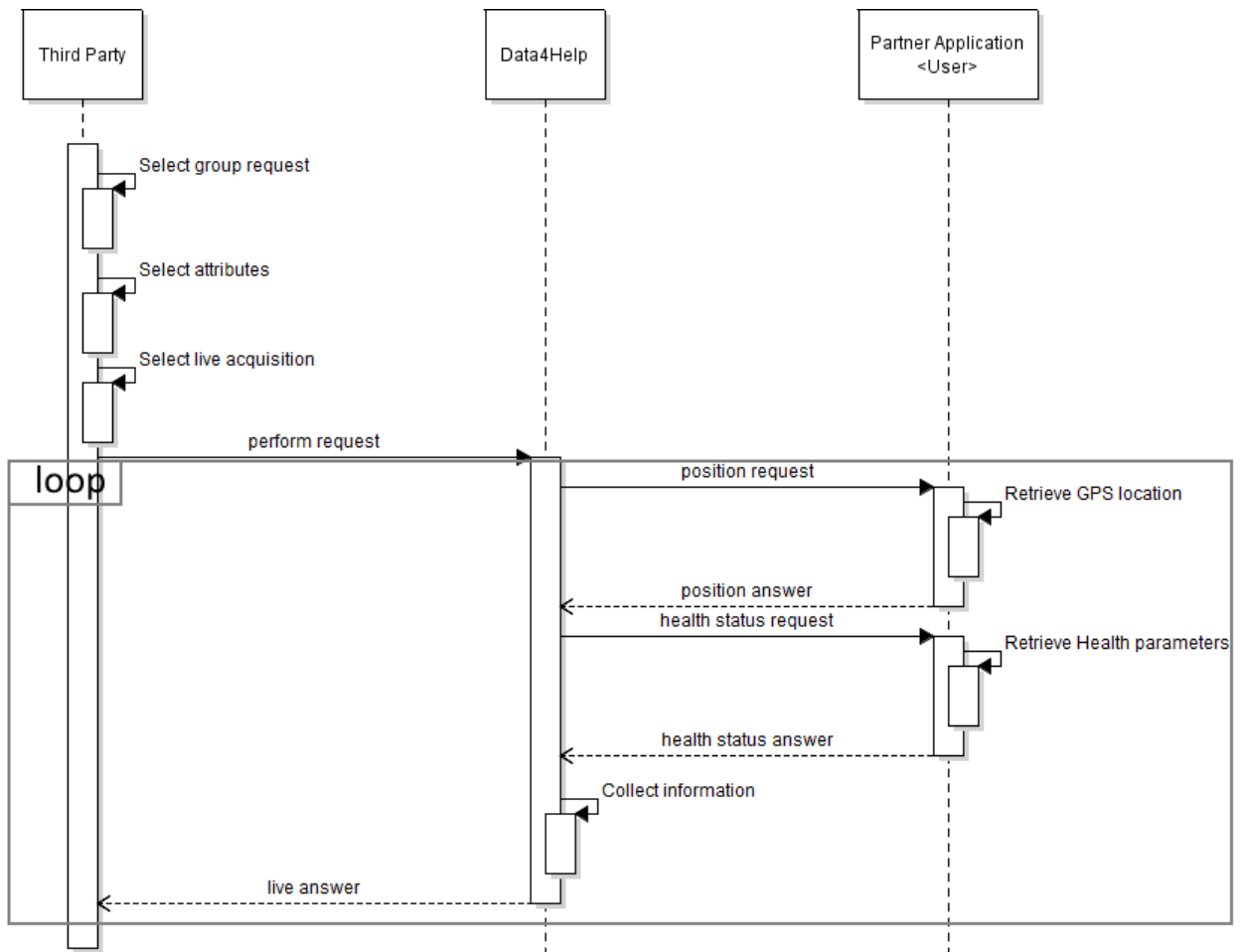
User registration performance:

- ## AutomatedSOS
  AutomatedSOS monitor and ambulance caller services:

- ## Track4Run
  Track4Run automated retrieve athletes' position and update spectators' live map.

3.5 Performance Requirements

- Data4Help service is build to perform trend research from users that download specific partner applications, in order to perform this type of monitoring there is a high use of resources (specially in live acquisition when data must be exchanged within 2 minutes) therefore ,initially, this application is developed to track 10.000 users simultaneously (included users from AutomateSOS and Track4Run). To serve third parties is required less performance because they are very few in comparison to users.

- AutomatedSOS is a very expensive application in terms of performance because it must monitor the individual all the day and guarantee a data collection with an interval of 2 seconds.

- Track4Run is a variable expensive application because it has to monitor individual constantly during the race, but not all day, all the athletes have a run.

3.6 Design Constraints

3.6.1 Standards compliance

- Partner applications request the permission to retrieve location and health status to the device, same for AutomateSOS and Track4Run.

- Data4Help requires that partner applications can use internet connection and users' mobile data to exchange information.

- AutomatedSOS requires all day internet connection in order to call an ambulance every time is needed.

- AutomatedSOS requires internet connection during all the duration of the race to the athletes and to the spectator.

3.6.2 Hardware limitations

- AutomatedSOS application requires that is installed on a smartwatch (smartphone is not enough) in order to acquire location and health status.

- Track4Run application requires that is installed on a smartphone (or a smartwatch) in order to acquire location.

- Smartphone and smartwatch must be iOS or Android platform.

- The devices must have internet connection (mobile data are mandatory).

- The devices must have GPS locator.

- Smartwatch must have Heart Rate monitor, Blood Pressure monitor, Pedometer, Calories Calculator.

3.7 Software System Attributes

3.7.1 Reliability

Data4Help service,clearly, has some moments with less load (as the night) but is important to guarantee a 24/7 service. Some small concessions are possible during the night. In order to guarantee AutomatedSOS monitoring this service must be available 24/7, also the night. Track4Run service has the same consideration of Data4Help.

3.7.2 Availability

In order to guarantee high degree of availability, and considering that the main core of the service are data, is necessary high level of data redundancy about. This system is expected to be available 99.99

3.7.3 Security

Security for sensitive informations are one of the goal of this system, in order to guarantee users' privacy, the system implements certificated security communication protocol. In any cases users can read and agree regulatory policy first.

3.7.4 Maintainability

In order to guarantee maintainability the entire software project is based on Data4Help primitives (as data request, exchange and classification) that must be developed with accuracy and certificated. By using or extending fundamental primitives is possible to construct incremental and interchangeable blocks that can be used to perform all the other services requested.

3.7.5 Portability

Data4Help service can be reached by third parties from http request, so every browser can be perform request and retrieve users' data. AutomatedSOS and Track4Run applications are developed as multi platform technology so either iOS or Android devices can run these two apps. (remember that AutomateSOS requires Smartwatch device).

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