

Functional Specification Document

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Project Name: Take Me There

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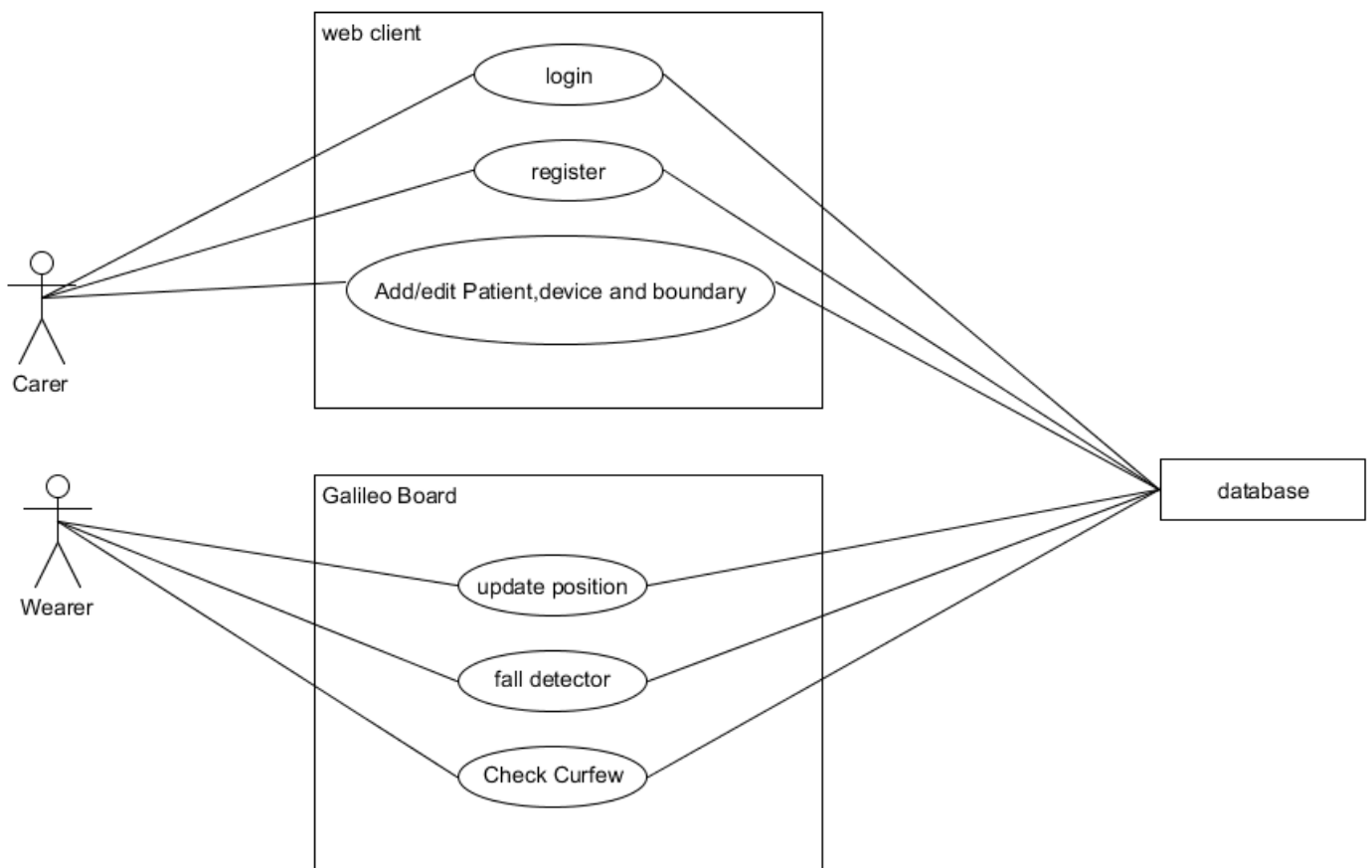
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Introduction

The purpose of this functional specification document is to describe all of the functions and behaviours of this project. The goal of this project is to develop a wearable device (based on Galileo) that will lead the wearer to a particular location. When activated the device will lead the wearer along the correct path to their destination by signaling when to turn left or right. It will do this by getting directions from google maps (or similar). It will also upload the wearers current position and route to the cloud. Another feature of this device is letting the carer know if the wearer has left the boundary after curfew by sending a text message to the carer. Also if the wearer falls it will alert the carer to let them know that the wearer has fallen via text message.

Use Case Diagram



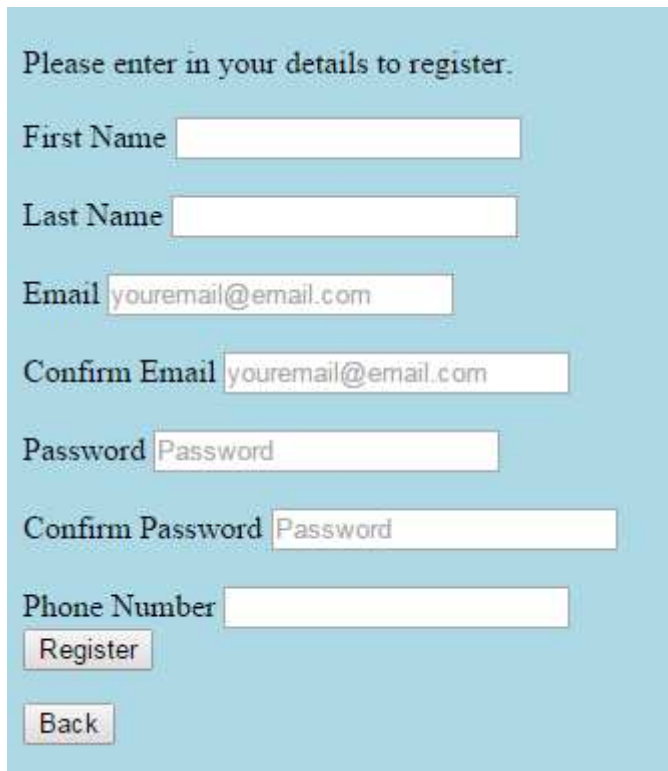
Use Cases

Register use case

Use case 1: Register

Actors: Carer, system

Description: This use case begins with a carer wishing to sign up to use the services provided by the Take Me There product. The carer is asked for their name, age, email address, home address, contact number, a password. The carer enters in the details the system asks for and clicks register. The system stores the data into the database. The system displays a thank you page. The system returns them back to the login screen.



Please enter in your details to register.

First Name

Last Name

Email

Confirm Email

Password

Confirm Password

Phone Number

Login Use Case

Use case 2: Login

Actors: Carer, system

Description: This use case begins with a carer wishing to log on to the web client of the take me there product. The carer enters in their email address and password and clicks login. The system brings them to their home screen where they can check where the device is.



Please enter in your login details.

E-mail

Password

Amend Patient Use Case

Uses case 3: Add/edit patients, device and boundary details

Actors: Carer , system

Description: This use case begins when the carer logs into the client and wishes to add the patients details, the device details and boundary details. The carer clicks the amend details button to unlock the textboxes. The carer can also edit the details. The carer can change the patients name, add or edit the devices number, set the boundary latitude and longitude, the boundary radius and set the curfew time. The carer clicks the update button the system takes the data and stores it in the database. The system redirects the carer back to the edit details page.

Please add or edit patients, device, or boundary details.

Patients First Name

Patients Last Name

Device Sim Number

Device Issue Date

Boundary Latitude

Boundary Longitude

Boundary Radius

Curfew Time

Check History Use Case

Use case 4: Check History

Actors: Carer, system

Description: This use case begins when the carer wants to check the wearers history. The carer selects the history button. The system returns the history screen with all the data that is associated with the carers patient. The data shown is the all the places that the wearer has been and shows the impact if the wearer has fallen.

History

FirstName	LastName	Date	Time	Latitude	Longitude	Fall Impact
john	shampoo	2015-03-31	20:14:58	53.783	-8.9164	0
john	shampoo	2015-03-31	22:16:29	53.7833	-8.9167	50
john	shampoo	2015-03-31	23:11:41	53.7835	-8.9168	100

Home

Logout

Check Position Use Case

Use case 5: Check Position

Actors: Carer, system

Description: This use case begins with the carer wanting to check the wearers current position. The carer selects the location option. The system pulls all the locations from the database and displays them on the map.



Home

Logout

Update Position Use Case

Use case 6: Update position

Actors: device, database

Description: This use case begins when the device updates its position. The device updates itself every few minutes and when it updates its geo location the location is then sent up into the database in the system and the row in the location table that is connected to the to the device is updated.

Fall Indicator Use Case

Uses case 7: Fall indicator

Actors: Wearer, device, database

Description: This use case begins when the wearer of the device falls over and hits the ground. The device then measures the impact and sends an alert to the carer via a text message. The impact is uploaded to the database.

Out Of the Boundary Use Case

Uses case 8: Out of the boundary

Actors: Wearer, device, database

Description: This use case begins when the device checks the database to check if the wearer leaves the boundary after curfew. The device will then send an alert to the carer via text message stating that the wearer has left the boundary after curfew.

Detailed Use Cases

Register Detailed Use Case

Name: Register

Actors: Carer , System, database

Main Scenario:

1. The carer selects the option to register.
2. The system asks for the carers credentials.
3. The carer enters in their credentials.
4. The carer clicks the register button.
5. The system checks to see if the email is in the database.
6. The system stores their information into the database.
7. The system displays a thank you page.
8. The system returns the carer back to the login screen.

Alternatives:

3a

1. The carer does not fill out all the required information.
2. The system returns an error.
3. Return to step 3.

3b

1. The password the carer enters in does not match the re-entered password.
2. The system returns an error.
3. Return to step 3.

3c

1. The email address the carer enters in does not match the re-entered email address.
2. The system returns an error.
3. Return to step 3.

5a

1. The email address the carer enters already exists in the database.
2. The system returns the carer to the registration screen.

Login Detailed Use Case

Name: Login

Actors: Carer , System

Main Scenario:

1. The carer selects the option to login.
2. The system asks the carer for their email address and password.
3. The carer enters in their email address and password.
4. The carer clicks the login button.
5. The system checks the database to see if the credentials exist.
6. The system returns the carer to their home screen.

Alternatives:

3a

1. The carer types in the wrong email address.
2. The system returns an error on the problem.
3. Return to step 3.

3b

1. The carer types in the wrong password.
2. The system returns an error on the problem
3. Return to step 3

Amend Patients Detailed Use Case

Name: Add/edit patients, device and boundary details

Actors: Carer, System

Main Scenario:

1. The carer logs on and selects add/edit patient, device and boundary.
2. The system loads the Add/edit patients, device and boundary page.
3. The carer clicks the amend button.
4. The carer adds the patient.
5. The carer adds the device sim number.
6. The carer sets the the boundary latitude, longitude and boundary radius.
7. The carer sets the curfew time.
8. The carer clicks the update button.
9. The system puts the data into the database.
10. The system redirects the carer back to the Add/edit patients, device and boundary page.

Alternatives:

4a

1. The carer edits the patient.
2. The carer clicks the update button.
3. Return to step 9.

5a

1. The carer edits the device details.
2. The carer clicks the update button.
3. Return to step 9.

6a

1. The carer edits the boundary details.
2. The carer clicks the update button.
3. Return to step 9.

7a

1. The carer edits the curfew time.
2. The carer clicks the update button.
3. Return to step 9.

Check History Detailed Use Case

Name: Check History

Actors: Carer, System

Main Scenario:

1. The carer selects the history option.
2. The system returns all of the wearers locations and the impact if they have fallen.
3. The system displays the data into the table on the web page.

Check Position Detailed Use Case

Name: Check Position

Actors: Carer, System

Main Scenario:

1. The carer selects the location option.
2. The system returns all the wearers locations.
3. The system displays the locations on the map.

Update Position Detailed Use Case

Name: Update Position

Actors: Device, Database

Main Scenario:

1. The device refreshes itself.
2. A new latitude and longitude has been received.
3. The device updates the database with the new latitude and longitude.

Alternatives:

2a

1. Device cannot get a new latitude and longitude as it has no internet connection.
2. Repeat step 1.

3a

1. Device cannot connect to database because internet dropped out.
2. Repeat step 1.

Fall Indicator Detailed Use Case

Name: Fall indicator

Actors: Device, Wearer, database

Main Scenario:

1. The wearer falls and hits the ground.
2. The device measures the impact.
3. The device sends a text message to the carer to inform them that the wearer has fallen.
4. The device sends the Impact data, the location and the time and date to the database.

Alternatives:

2a

1. The wearer catches themselves before they fall.
2. The device doesn't read an impact.

Out of the boundary Detailed Use Case

Name: Out of the boundary

Actors: Device, Wearer, Database

Main Scenario:

1. The wearer steps outside of the boundary.
2. The device checks its GPS location.
3. The device checks the GPS location to the boundary radius in the database by using the distance formula.
4. The device checks the curfew time in the database.
5. The device sends a text message to the carer to let them know that the wearer has left the boundary.

Alternatives:

3a

1. The device checks the curfew time.
2. The device time has not past the curfew time.
3. The device does not send a text message to the carer.

Supplementary Specification

Functionality

The device I am creating is to help people with Alzheimer's to find their way back home if they wander off from home and get lost. The device also lets the carers of the patient log into the web client and find where the patient has wandered off to. The device also has a built in accelerometer that measures force so if a patient falls the device will send an alert to the carer.

Usability

The device is made up of the Intel Galileo Gen one board with an accelerometer, a 3g shield, and wifi. The patient would wear the device somewhere on their person and if they get lost they would press the button of the device and the device will guide the patient home.

If the patient has wandered off and forgets to activate the device when they are lost the carer can log into the web client and pinpoint the location of the patient.

If the patient falls the accelerometer in the device will activate and will send an alert to the carer notifying them that the patient has fallen over.

Reliability

For the reliability aspect of this project my aim is that the device does not fail at any stage unless the device gets damaged.

For the website my aim is that the client does not crash for any reason as it is important to make sure that there are no major flaws as it keeps track of Alzheimer's patients.

Performance

The device should update the database with its geo location every couple of minutes provided that the device has internet connection. The database should update as soon as the new geo location has been received by the device. For the accelerometer I expect the carers to be notified by the device if the patient has fallen over no more than a second after the accident took place.

Supportability

The support for the device would be making new parts for the device or upgrading the design of the device to be more compact or more features or better stability. The support for the web client would be changing the layout of the website, adding new features, etc.