**Quality: Test Plan**

1. **Introduction**
2. Goals and Objectives

* To be able to create a system capable of tracking a user’s location.
* To be able to send out an alert notification given that the user has gone beyond the premises.
* To be to show to the user’s location on the map and provide emergency locations nearest to the user’s current location.

1. Statement of Scope

* The system is designed to monitor the location of patients suffering from Dementia with the use of a tracking device, a mobile application and a web application.

1. Major Constraints

* There would be one user of the device and one guardian monitoring the user’s location
* Each guardian has to register one account to monitor one patient.
* The test location would be in Makati city.
* Internet connection should be present for the system to work.
* The proximity sensor is not part of the device therefore, removing the device cannot be detected.

1. Roles and Responsibilities

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| --- | --- |
| Jose Ricardo Milandro Hibaler | Project Manager, Hardware Programmer, Assistant Developer |
| May Rose Rubianes | Lead Mobile Application Developer, Documentations Head |
| Sheena Christine Coronel | Assistant Mobile Application Developer |
| Nasia Santos | Web Application Developer, Documentations Assistant |

1. Test Schedule

Testing of the system is scheduled every after completion of milestones.

1. **Test Plan**
2. Software Application/Hardware to be tested:

* Web Application
  + JavaScript
  + HTML5
  + CSS
* Mobile Application
  + HTML5
  + JavaScript
  + CoffeeScript
  + AngularJS
* LifeTag Wearable Device
  + GPS Module
  + Arduino
  + Raspberry pi 2
  + Python

1. Testing Strategy

* Black box Testing
* White box Testing
* Integration Testing
* Functional Testing
* System Testing
* User Acceptance Testing

1. Description of Type of Testing

* Black box Testing
  + Tests are based on requirements and functionality.
* White box Testing
  + This testing is based on knowledge of the internal logic of an application’s code. Also known as Glass box Testing. Internal software and code working should be known for this type of testing. Tests are based on coverage of code statements, branches, paths, conditions.
* Integration Testing
  + Testing of integrated modules to verify combined functionality after integration. Modules are typically code modules, individual applications, client and server applications on a network, etc. This type of testing is especially relevant to client/server and distributed systems.
* Functional Testing
  + This type of testing ignores the internal parts and focus on the output is as per requirement or not.
* System Testing
  + Entire system is tested as per the requirements. Black-box type testing that is based on overall requirements specifications, covers all combined parts of a system.
* User Acceptance Testing
  + This type of testing is done to verify if system meets the customer specified requirements. User or customer do this testing to determine whether to accept application.

1. **Test Procedure (Test Cases)**
2. Test Case Group 1: User Interface
3. Registration/Log-in Web Page

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| UIRLP\_TC1 | Display registration form | Display textbox for LifeTag device serial number and Continue button |
| UIRLP\_TC2 | Display log-in form | Display username and password textboxes and Submit/Send button |

1. Registration Main Form

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| UIRMF\_TC1 | Display Registration Form | 1. Display textboxes for the following:  * Serial number of LifeTag device (disabled textbox) * Last name of relative * First name of relative * E-mail address * Cell phone number  1. Display Submit and Cancel buttons |
| UIRMF\_TC2 | Display Successful Registration | 1. Form must be successfully submitted 2. A notification is shown to the user that the registration is successful |
| UIRMF\_TC3 | Display Unsuccessful Registration | 1. A notification is shown to the user when there are errors detected before submitting the form. 2. The form must not be submitted |

1. LifeTag Mobile Application

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| UILTM\_TC1 | Display map with no information | Default layout of Google Maps must be shown |
| UILTM\_TC2 | Display map with current location of patient | Google Map with current location and track layer must be shown |
| UILTM\_TC3 | Display map with nearest locations icons | Google Map with icons of nearest emergency locations must be shown |
| UILTM\_TC4 | Display patient information | Fields should have the correct values (e.g. first name, last name etc.) |

1. LifeTag Web Application

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| LTWA\_TC1 | Display Account Information | The Page must show to the user the following information:   * Serial Number of the device * Information of the registered patient * Information of registered relatives |
| LTWA\_TC2 | Display Patient’s Location through Google Maps | The page must show the current location of the patient using Google Maps |
| LTWA\_TC3 | Display Configuration Page for the LifeTag Device | The page must show the information needed for the configuration of the LifeTag device |
| LTWA\_TC4 | Fields can be updated in the Configuration Page | The fields for the configuration page of the LifeTag device should be editable |

1. Test Case Group 2: LifeTag Device

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| LTD\_TC1 | Transmits GPS data | Device should transmit the GPS data of the patient |
| LTD\_TC2 | Sends notification through mobile application | Patient’s relative should receive notification of perimeter breach through push notification |
| LTD\_TC3 | Detects if patient is beyond pre-programmed perimeter | Device should be able to transmit notification |

1. Test Case Group 3: Validation
2. Registration / Log-in Web Page

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| VRLWP\_TC1 | Valid serial number entered in the registration textbox | A message “Valid serial number” should show below the textbox |
| VRLWP\_TC2 | Invalid serial number entered in the registration textbox | A message “Invalid serial number” should show below the textbox |
| VRLWP\_TC3 | Valid username and password are entered into the username and password textboxes | The user should be redirected to the user’s home page. |
| VRLWP\_TC4 | Invalid username and password are entered into the username and textboxes | A message “Invalid username or password” should show below the textboxes |

1. Registration Main Form - Patient

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| VRMFP\_TC1 | Valid last name entered in the last name textbox. Alphabet characters are only accepted | There should be no error shown related to the last name textbox |
| VRMFP\_TC2 | Invalid last name entered in the last name textbox | The form should not be submitted and an error related to the last name textbox should be shown |
| VRMFP\_TC3 | Valid first name entered in the first name textbox. Alphabet characters are only accepted | There should be no error shown related to the last name textbox |
| VRMFP\_TC4 | Invalid first name entered in the first name textbox | The form should not be submitted and an error related to the first name textbox should be shown |
| VRMFP\_TC5 | Valid birthday according to format entered in the birthday textbox. Numerical characters and “/” are only accepted | There should be no error shown related to the birthday textbox |
| VRMFP\_TC6 | Invalid birthday according to the specified format entered in the birthday textbox | The form should not be submitted and an error related to the birthday textbox should be shown |
| VRMFP\_TC7 | Valid contact number according to format entered in the contact number textbox. Numerical characters are only accepted. | There should be no error shown related to the contact number textbox |
| VRMFP\_TC8 | Invalid contact number according to the specified format entered in the contact number textbox | The form should not be submitted and an error related to the contact number textbox should be shown |
| VRMFP\_TC9 | Valid address entered in the address textbox. Alphanumeric characters are only accepted | There should be no error shown related to the address textbox |
| VRMFP\_TC10 | Invalid address entered in the address textbox. | The form should not be submitted and an error related to the address textbox should be shown |
| VRMFP\_TC11 | File format accepted is only jpeg and png formats. | There should be no error shown related to the file upload input element. |
| VRMFP\_TC12 | Wrong file format was uploaded. | The form should not be submitted and an error related to the file upload element should be shown |

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| VRMFP\_TC13 | Form is submitted when Submit button is clicked | Form is successfully submitted and a success message is shown. |
| VRMFP\_TC14 | Form is not submitted when Submit button is clicked | Form is not submitted and failed submission message as well as errors are shown |

1. Registration Main Form – Guardian

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| VRMFG\_TC1 | Valid last name entered in the last name textbox. Alphabet characters are only accepted | There should be no error shown related to the last name textbox |
| VRMFG\_TC2 | Invalid last name entered in the last name textbox | The form should not be submitted and an error related to the last name textbox should be shown |
| VRMFG\_TC3 | Valid first name entered in the first name textbox. Alphabet characters are only accepted | There should be no error shown related to the last name textbox |
| VRMFG\_TC4 | Invalid first name entered in the first name textbox | The form should not be submitted and an error related to the first name textbox should be shown |
| VRMFG\_TC5 | Valid birthday according to the specified format entered in the birthday textbox. Numerical characters and “/” are only accepted | There should be no error shown related to the last name textbox |
| VRMFG\_TC6 | Invalid birthday according to the specified format entered in the birthday textbox. | The form should not be submitted and an error related to the birthday textbox should be shown |
| VRMFG\_TC7 | Valid contact number entered in the contact number textbox. Numerical characters are only accepted | There should be no error shown related to the last name textbox |
| VRMFG\_TC8 | Invalid contact number entered in the contact number textbox | The form should not be submitted and an error related to the contact number textbox should be shown |
| VRMFG\_TC9 | Valid username entered in the username textbox. Alphanumeric characters and symbols are accepted | There should be no error shown related to the last name textbox |
| VRMFG\_TC10 | Invalid username entered in the username textbox. | The form should not be submitted and an error related to the username textbox should be shown |
| VRMFG\_TC11 | Valid password entered in the password textbox. Alphanumeric characters and symbols are accepted. At least 8 characters is needed. | There should be no error shown related to the last name textbox |
| VRMFG\_TC12 | Invalid password entered in the password textbox. | The form should not be submitted and an error related to the password textbox should be shown |
| VRMFG\_TC13 | The same password in the password textbox must be entered in the repeat password textbox. | There should be no error shown related to the last name textbox |
| VRMFG\_TC14 | Different password entered by the user | The form should not be submitted and an error related to the repeat password textbox should be shown |
| VRMFG\_TC15 | Valid address entered in the address textbox. Alphanumeric characters are only accepted | There should be no error shown related to the last name textbox |
| VRMFG\_TC16 | Invalid address entered in the address textbox | The form should not be submitted and an error related to the address textbox should be shown |
| VRMFG\_TC17 | Valid e-mail address entered in the e-mail address textbox. | There should be no error shown related to the last name textbox |
| VRMFG\_TC18 | Invalid e-mail address entered in the e-mail address textbox. | The form should not be submitted and an error related to the e-mail address textbox should be shown |
| VRMFG\_TC19 | Form is submitted when Submit button is clicked | Form is successfully submitted and a success message is shown. |
| VRMFG\_TC20 | Form is not submitted when Submit button is clicked | Form is not submitted and failed submission message as well as errors are shown |

1. Guardian’s Home Page – Map

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| VGHPM\_TC1 | A marker should appear showing the current location of the patient | The marker should reflect the coordinates retrieved in the database |
| VGHPM\_TC2 | Speed and distance is shown in the map | An info window shown containing information about speed and distance |
| VGHPM\_TC3 | Map should update map location | The map should pan as marker moves on the map |
| VGHPM\_TC4 | Key places near the current location should show up | Icons of the places should show up |

1. Guardian’s Home Page – Account Overview Patient

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| VGHPAOP\_TC1 | Valid last name entered in the last name textbox. Alphabet characters are only accepted | There should be no error shown related to the last name textbox |
| VGHPAOP\_TC2 | Invalid last name entered in the last name textbox | The form should not be submitted and an error related to the last name textbox should be shown |
| VGHPAOP\_TC3 | Valid first name entered in the first name textbox. Alphabet characters are only accepted | There should be no error shown related to the last name textbox |
| VGHPAOP\_TC4 | Invalid first name entered in the first name textbox | The form should not be submitted and an error related to the first name textbox should be shown |
| VGHPAOP\_TC5 | Valid birthday according to format entered in the birthday textbox. Numerical characters and “/” are only accepted | There should be no error shown related to the birthday textbox |
| VGHPAOP\_TC6 | Invalid birthday according to the specified format entered in the birthday textbox | The form should not be submitted and an error related to the birthday textbox should be shown |
| VGHPAOP\_TC7 | Valid contact number according to format entered in the contact number textbox. Numerical characters are only accepted. | There should be no error shown related to the contact number textbox |
| VGHPAOP\_TC8 | Invalid contact number according to the specified format entered in the contact number textbox | The form should not be submitted and an error related to the contact number textbox should be shown |
| VGHPAOP\_TC9 | Valid address entered in the address textbox. Alphanumeric characters are only accepted | There should be no error shown related to the address textbox |
| VGHPAOP\_TC10 | Invalid address entered in the address textbox. | The form should not be submitted and an error related to the address textbox should be shown |
| VGHPAOP\_TC11 | Text fields should be enabled when Edit button is clicked | Text fields should be editable |
| VGHPAOP\_TC12 | Form is submitted when Save button is clicked | Form is successfully submitted and a success message is shown. |
| VGHPAOP\_TC13 | Form is not submitted when Save button is clicked | Form is not submitted and failed submission message as well as errors are shown |

1. Guardian’s Home Page – Account Overview Guardian

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| VGHPAOG\_TC1 | Valid last name entered in the last name textbox. Alphabet characters are only accepted | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC2 | Invalid last name entered in the last name textbox | The form should not be submitted and an error related to the last name textbox should be shown |
| VGHPAOG\_TC3 | Valid first name entered in the first name textbox. Alphabet characters are only accepted | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC4 | Invalid first name entered in the first name textbox | The form should not be submitted and an error related to the first name textbox should be shown |
| VGHPAOG\_TC5 | Valid birthday according to the specified format entered in the birthday textbox. Numerical characters and “/” are only accepted | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC6 | Invalid birthday according to the specified format entered in the birthday textbox. | The form should not be submitted and an error related to the birthday textbox should be shown |
| VGHPAOG\_TC7 | Valid contact number entered in the contact number textbox. Numerical characters are only accepted | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC8 | Invalid contact number entered in the contact number textbox | The form should not be submitted and an error related to the contact number textbox should be shown |
| VGHPAOG\_TC9 | Valid username entered in the username textbox. Alphanumeric characters and symbols are accepted | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC10 | Invalid username entered in the username textbox. | The form should not be submitted and an error related to the username textbox should be shown |
| VGHPAOG\_TC11 | Valid password entered in the password textbox. Alphanumeric characters and symbols are accepted. At least 8 characters is needed. | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC12 | Invalid password entered in the password textbox. | The form should not be submitted and an error related to the password textbox should be shown |
| VGHPAOG\_TC13 | The same password in the password textbox must be entered in the repeat password textbox. | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC14 | Different password entered by the user | The form should not be submitted and an error related to the repeat password textbox should be shown |
| VGHPAOG\_TC15 | Text fields should be enabled when Edit button is clicked | Text fields should be editable |
| VGHPAOG\_TC16 | Valid address entered in the address textbox. Alphanumeric characters are only accepted | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC17 | Invalid address entered in the address textbox | The form should not be submitted and an error related to the address textbox should be shown |
| VGHPAOG\_TC18 | Valid e-mail address entered in the e-mail address textbox. | There should be no error shown related to the last name textbox |
| VGHPAOG\_TC19 | Invalid e-mail address entered in the e-mail address textbox. | The form should not be submitted and an error related to the e-mail address textbox should be shown |
| VGHPAOG\_TC20 | Form is submitted when Save button is clicked | Form is successfully submitted and a success message is shown. |
| VGHPAOG\_TC21 | Form is not submitted when Save button is clicked | Form is not submitted and failed submission message as well as errors are shown |

1. Guardian’s Home Page – Device Configuration

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| **Test Case ID** | **Condition Being Tested** | **Expected Result** |
| VGHPDV\_TC1 | Valid data entered for first complete address field for home network | No errors should be shown for the field. |
| VGHPDV\_TC2 | Invalid data entered for first complete address field for home network | Errors should be shown for the field and save button won’t submit the form |
| VGHPDV\_TC3 | Valid data entered for second complete address field for home network | No errors should be shown for the field. |
| VGHPDV\_TC4 | Invalid data entered for second complete address field for home network | Invalid data entered for first complete address field for home network |
| VGHPDV\_TC5 | Valid data entered for first complete address field for pocket wi-fi network | No errors should be shown for the field. |
| VGHPDV\_TC6 | Invalid data entered for first complete address field for pocket wi-fi network | Invalid data entered for first complete address field for home network |
| VGHPDV\_TC7 | Valid data entered for second complete address field for pocket wi-fi network | No errors should be shown for the field. |
| VGHPDV\_TC8 | Invalid data entered for second complete address field for pocket wi-fi network | Invalid data entered for first complete address field for home network |
| VGHPDV\_TC9 | Form is submitted when Save button is clicked | A success message should be shown |
| VGHPDV\_TC10 | Form is not submitted when Save button is clicked | A failed message should be shown |
| VGHPDV\_TC11 | Text fields should be enabled for editing | All text fields should be edittable |

1. **Risk and Contingencies**

* **Risk**: Any unexpected error that was not included in the test cases.  
  **Contingency:** Additional testing and appropriate modifications in the code
* **Risk**: Malfunctioning Device

**Contingency**: Perform troubleshooting and required maintenance

* **Risk:** Malfunctioning server

**Contingency:** Seek the provider’s support

* **Risk:** Capacity of the battery for the GPS tracking device is not enough

**Contingency:** Look for a battery with more capacity to support the device’s power requirements.

* **Risk:** The patient takes off the device

**Contingency:** Make the device more portable by making it smaller than the current development.

1. **Conclusion**

We therefore conclude that testing is an integral part of system development and must be performed to guarantee the maximum potential of the system.

1. **Recommendation**

With the current state of the project and its testing procedures, there are additional requirements needed to be carried out to make the project more feasible and effective. For the wearable device to extend its functionality, measuring the vital signs of the patient such as heart rate and blood pressure is a good start. Embedded pedometer will also be helpful to measure patient's calories for his activity. These additional functions are the most ideal and next steps to accomplish to make the most out of the project and to reach more of the target market when it is ready for mass production. With all these in hand, the project is indeed a great help not just for Dementia patients but also to the people caring for them.