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# 6 Testing

When a programmer implementing and building a software, there can be some mistakes or errors. These mistakes and errors are called as bugs. With the intent of finding these bugs and fix make the application or product more efficiency and that is why we do software testing.

Testing is not a process of making the software product 100% error free. If the testing is not done properly, it will lead to a poor quality software. There for we had to do it carefully.

These testing strategies vary from product to product and a software can fail in different ways unlike a physical product. Because of that detecting all the ways of failures and fixing bugs is not possible to do easily.

Testing is a process of system development life cycle. To every other stage from the requirement gathering, this testing process is linked.

## 6.1 Testing Strategy for Orasi 2.0 World

|  |  |  |  |
| --- | --- | --- | --- |
| Unit Testing | Integration Testing | System testing | Accepted Testing |
| Connect device with Bluetooth and set up test | Via Bluetooth module mobile phone is connected with Orasi device and test | Integrated components are tested as one system | System tested in real world environment |
| Connect device with OTG and set up test | Via OTG cable mobile phone is connected with Orasi device and test |
| Get the location with GPS module | Emergency button in the Orasi device and the GPS module are connected and test |
| Sound detection module test | Sound detection module with hardware test |
| Face and emotion detection module test | Camera capture and hardware modules are connected with face and emotion detection module and test |
| Sound output module test | Sound output module connect with OCR translation, describe and test |

## 6.3 Unit Testing

In the unit testing we test single function or procedure. It is tested by unit by unit and both black box and white box testing can be done here. We do unit testing to find out errors within a module of a software.

### 6.3.1 Test Plan for Unit Testing

Test plan contains complete test cases for system along with the information. This test plan shows the requirements and use cases drawn previous.

*Table 6. 1 - Test Plan*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test case no** | **Test case** | |  | | --- | | **Procedure to Check** | | **Expected Outcome** | **Priority Level** |
| Connect device with Bluetooth and set up test | | | | |
| 01 | Check device is connected with mobile phone | On the Bluetooth of both devices and pair | Mobile phone open the Orasi 2.0 world app | HIGH |
| Connect device with OTG and set up test | | | | |
| 02 | Check device is connected with mobile phone | Connect both of devices using OTG cable | Mobile phone open the Orasi 2.0 world app | HIGH |
| Get the location with GPS module | | | | |
| 03 | Check nearby places is detected | When press search for current location then it voice output current location and nearby places | Voice output of nearby places with destination | MEDIUM |
| 04 | Check location is detected when press emergency button | When press emergency button in the orasi device then detect the current location from GPS module | send the device location details for emergency contacts | HIGH |
| Sound detection module test | | | | |
| 05 | Detect voice | When voice command button is pressed | User expected search results as a voice output | LOW |
| 06 | No detection by the sensor when there is sound. | When voice command button pressed and the place silent or with less noisy sounds. | Voice output saying that I can’t hear please speak in higher voice | LOW |
| Face, describe surroundings and emotion detection module test | | | | |
| 07 | Check face is detected | Give guidelines to align face with the camera of the mobile phone | Face is detected voice output | LOW |
| 08 | Face is not detected | Place camera where no face is detected | No face found | LOW |
| 09 | Detect emotions | Give guidelines to align face with the camera of the mobile phone | Voice output of emotions of the face of the person | HIGH |
| 10 | Describe surroundings | Get a photograph of the area | Describe the items, no of persons etc. | HIGH |

### 6.3.2 Test Results for Unit Testing

*Table 6. 2- Test Result table 1*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 01 | |
| **Test Case** | Check device is connected with mobile phone | |
| **Test Data** | **Actual output** | **Status** |
| On the Bluetooth of both devices and pair | Screenshot from application | PASS |

*Table 6. 3- Test Result table 2*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 02 | |
| **Test Case** | Check device is connected with mobile phone | |
| **Test Data** | **Actual output** | **Status** |
| Connect both of devices using OTG cable | Screenshot from application | PASS |

*Table 6. 4- Test Result table 3*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 03 | |
| **Test Case** | Check nearby places is detected | |
| **Test Data** | **Actual output** | **Status** |
| When press search for current location then it voice outputs current location and nearby places | Voice output of nearby places with destination | PASS |

*Table 6. 5- Test Result table 4*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 04 | |
| **Test Case** | Check location is detected when press emergency button | |
| **Test Data** | **Actual output** | **Status** |
| When press emergency button in the orasi device then detect the current location from GPS module | Screenshot from application | PASS |

*Table 6. 6- Test Result table 5*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 05 | |
| **Test Case** | Detect voice | |
| **Test Data** | **Actual output** | **Status** |
| When voice command button is pressed | User expected search results as a voice output | PASS |

*Table 6. 7- Test Result table 6*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 06 | |
| **Test Case** | No detection by the sensor when there is sound. | |
| **Test Data** | **Actual output** | **Status** |
| When voice command button pressed and the place silent or with less noisy sounds. | Voice output saying that I can’t hear please speak in higher voice | PASS |

*Table 6. 8- Test Result table 7*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 07 | |
| **Test Case** | Check face is detected | |
| **Test Data** | **Actual output** | **Status** |
| Give guidelines to align face with the camera of the mobile phone | Face is detected voice output | PASS |

*Table 6. 9- Test Result table 8*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 08 | |
| **Test Case** | Face is not detected | |
| **Test Data** | **Actual output** | **Status** |
| Place camera where no face is detected | No face found voice output | PASS |

*Table 6. 10- Test Result table 9*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 09 | |
| **Test Case** | Detect emotions | |
| **Test Data** | **Actual output** | **Status** |
| Give guidelines to align face with the camera of the mobile phone | Screenshot from application | PASS |

*Table 6. 11- Test Result table 10*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 10 | |
| **Test Case** | Describe surroundings | |
| **Test Data** | **Actual output** | **Status** |
| Get a photograph of the area | Describe the items, no of persons etc. | PASS |

## 6.4 Integration Testing

In the integration testing, we are checking that the units tested earlier are working properly when they are put together.

### 6.4.1 Test Plan for Integrated Testing

Table 6. 12- Test Plan 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case No | Test Case | Procedure to Check | Expected Outcome | Priority Level |
| 01 | Check the performance when the Bluetooth module is connected to hardware. | Connect the Bluetooth hardware module with the Arduino mega | It should be working as we expected when the program is running. | HIGH |
| 02 | Check device is connected with mobile phone | Connect the OTG cable with the Arduino mega | It should be working as we expected when the program is running. | HIGH |
| 03 | Check location is detected when press emergency button | Connect the GPS module hardware with the Arduino mega | It should be working as we expected when the program is running. | HIGH |
| 04 | Detect voice | Connect the //sound module hardware with the Arduino mega | It should be working as we expected when the program is running. | LOW |
| 05 | Describe surroundings | Connect the Arduino mega with the mobile phone and get the photograph | It should be working as we expected when the program is running. | HIGH |

### 6.4.2 Test Results for Integrated Testing

*Table 6. 13- Test Result table 11*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 1 | |
| **Test Case** | Check the performance when the Bluetooth module is connected to hardware. | |
| **Test Data** | **Actual output** | **Status** |
| Connect the Bluetooth hardware module with the Arduino mega | Current status as earlier one | PASS |

*Table 6. 14- Test Result table 12*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 2 | |
| **Test Case** | Check device is connected with mobile phone | |
| **Test Data** | **Actual output** | **Status** |
| Connect the OTG cable with the Arduino mega | Current status as earlier one | PASS |

*Table 6. 15- Test Result table 13*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 3 | |
| **Test Case** | Check location is detected when press emergency button | |
| **Test Data** | **Actual output** | **Status** |
| Connect the GPS module hardware with the Arduino mega | Current status as earlier one | PASS |

*Table 6. 16- Test Result table 14*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 4 | |
| **Test Case** | Detect voice | |
| **Test Data** | **Actual output** | **Status** |
| Connect the //sound module hardware with the Arduino mega | Current status as earlier one | PASS |

*Table 6. 17- Test Result table 15*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 5 | |
| **Test Case** | Describe surroundings | |
| **Test Data** | **Actual output** | **Status** |
| Connect the Arduino mega with the mobile phone and get the photograph | Current status as earlier one | PASS |

## 6.5 System Testing

This will check how the system will perform. System’s error handling and recovery also will be tested here.

### 6.5.1 Test Plan for System Testing

*Table 6. 18- Test Plan 3*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case No | Test Case | Procedure to Check | Expected Outcome | Priority Level |
| 01 | Connects all hardware components to Arduino mega and runs one by one and check when all are connected is it working | Check functional requirements of the system | Each requirement must be given with the required output. | HIGH |

### 6.5.1 Test Results for System Testing

*Table 6. 19- Test Results (System Testing)*

|  |  |  |
| --- | --- | --- |
| **Test case Id** | 1 | |
| **Test Case** | Connects all hardware components to Arduino mega and runs one by one and check when all are connected is it working | |
| **Test Data** | **Actual output** | **Status** |
| Check functional requirements of the system according to the users perspective | Requirements successfully archived | PASS |

## 6.6 Functional Testing

*Table 6. 20- Test Results (Functional Testing)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Function** | **Level of completion** | **Testing status as percentage** | **Priority** |
| Bluetooth connectivity | Fully Completed | 95% | HIGH |
| OTG connectivity | Fully Completed | 100% | HIGH |
| Call | Fully Completed | 100% | HIGH |
| SMS | Fully Completed | 100% | HIGH |
| Language | Fully Completed | 100% | MEDIUM |
| Conversation translation | Fully Completed(Not accurate enough sometimes) | 95% | LOW |
| OCR | Fully Completed | 100% | HIGH |
| Describe | Fully Completed(Not accurate enough sometimes) | 100% | HIGH |
| Current date/time | Fully Completed | 100% | HIGH |
| Current location | Fully Completed | 100% | HIGH |
| Emergency alerts | Fully Completed | 100% | HIGH |
| Voice commands | Fully Completed(Not accurate enough sometimes) | 95% | LOW |

## 6.7 Performance Testing

*Table 6. 21- Test Results (Performance Testing)*

|  |  |  |
| --- | --- | --- |
| **Function** | **Executable time** | **Priority** |
| Bluetooth connectivity |  | HIGH |
| OTG connectivity |  | HIGH |
| Call |  | HIGH |
| SMS |  | HIGH |
| Language |  | MEDIUM |
| Conversation translation |  | LOW |
| OCR |  | HIGH |
| Describe |  | HIGH |
| Current date/time |  | HIGH |
| Current location |  | HIGH |
| Emergency alerts |  | HIGH |
| Voice commands |  | LOW |