**Testing & Integration Plan**

Fotoball

Version 1.0

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# 1.0 Introduction

**1.1 Purpose** - The main purpose of the system integration and testing is to validate the hardware and software.

This is to make sure the product released is ready to be used by the public. The Integration phase includes test cases for each module, as well as testing to ensure that every module ties together properly.

**1.2 Scope** - The integration testing routines follow the “White Box” approach to test and integrate the software. The white box approach will help us to understand the behavior of each module and to build quality software. Integration is carried on a modular approach.

# 2.0 Modular

## 2.1 Validation Requirements

2.1.1 Validation Requirements

|  |  |
| --- | --- |
| Requirement Number | 2.1 |
| Requirement Name | Validation Requirements |
| Requirement Description | Validation is handled via the mobile devices internal security system |
| Pre-conditions |  |
| Procedures | Since our system will not verify individual users, just individual balls, validation can be piggy-backed to the mobile system’s verification. The app will live within the device’s existing ecosystem, thus transferring any user clearances to the device’s operating system.  If a user is provisioned to use the device, they are provisioned to use the application. |
| Post Conditions | The system will return the message: user the validation is completed. |
| Test Results | PASS/FAIL |

## 2.2 User Interface Requirements

### 2.2.1- User Interface – GUI

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| --- | --- |
| Requirement Number | 2.21 |
| Requirement Name | User Interface – GUI for Fotoball |
| Requirement Description | All users can access the GUI for Fotoball |
| Pre-conditions | The user must have the application installed on the phone. |
| Procedures | 1. Using your mobile device, locate the Fotoball application 2. Click on the application 3. The user will be see the Main Fotoball screen. |
| Post Conditions | The Fotoball GUI can be controlled by the user |
| Test Results | PASS |

### 2.2.2 User Interface – To Allow authorized individuals to view the Fotoball

|  |  |
| --- | --- |
| Requirement Number | 2.22 |
| Requirement Name | User Interface |
| Requirement Description | Allow authorizing individuals to live stream from Fotoball |
| Pre-conditions | The user must be logged into the system. |
| Procedures | 1. On the Main screen, click activate ball. 2. Now the user will be asked for the required Fotoball details 3. Enter the details and proceed |
| Post Conditions | The system will display a message that confirms the fotoball access and live stream |
| Test Results | PASS |

## 2.3 Performance Requirements (I think we should have this section after the User Platform and Fotoball Device Access requirements sections - update requirement numbers if sections are moved)

### 2.3.1 – Performance Requirements – Booting up/ live stream authentication

|  |  |
| --- | --- |
| Requirement Number | 2.31 |
| Requirement Name | Performance Requirements – Booting up and Live stream authentication |
| Requirement Description | Users will be able to boot into the hardware through Fotoball application and access the live stream. |
| Pre-conditions | User must have the required access details for Fotoball.  Measuring it using a chronograph |
| Procedures | 1. Open the application 2. Click on the activate ball 3. Enter the required fotoball authentication 4. Click on submit   (<5 seconds) |
| Post Conditions | The system will verify the details and show the live stream from fotoball device |
| Test Results | PASS |

### 2.3.2- Performance Requirements – Accessing video and live streaming it back to the application

|  |  |
| --- | --- |
| Requirement Number | 2.32 |
| Requirement Name | Performance Requirements – Accessing video and live streaming it back to the application. |
| Requirement Description | The User will be able to access the video and live stream it from the fotoball hardware into the application. |
| Pre-conditions | User must have the fotoball hardware and authentication requirements for accessing live stream.  Have a time measurements device available. (chronometer) |
| Procedures | 1. Open the application in mobile device 2. Click on the activate ball option 3. Using your chronometer, be ready for calculating the performance 4. Enter the required fotoball authentication and click submit 5. Start the chronometer simultaneously when you click submit 6. Measure the time taken from accessing the live stream to the application   (It should be less than 5 seconds) |
| Post Conditions | The System will be in live feed window |
| Test Results | PASS |

## 2.4 User Platform Requirements

### 2.4.1 Test User Platform Requirements

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| --- | --- |
| Requirement Number | 2.41 |
| Requirement Name | User Platform Requirements |
| Requirement Description | The User platform is to be initially tested in a desktop environment using an Android-like simulator |
| Pre-conditions | The User needs a Device with an Android Operating System |
| Procedures | 1. Find an Android device or simulator 2. Verify that it is running Android version 5.0 or later 3. Connect the Device to the System. 4. Install the application initially from an external source that is provided to the user |
| Post Conditions | * If the Application is successfully installed, it will open. * If the Application is not successfully installed, it will prompt the user “Application installation failed” |
| Test Results | Pass if all the Post Conditions are met. |

## 2.5 Fotoball Device Access requirements

### 2.5.1 Test Fotoball Device Access requirements- full name

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| --- | --- |
| Requirement Number | 2.51 |
| Requirement Name | Fotoball Device Access requirements |
| Requirement Description | The Fotoball device will contain specific name and IP address to access it. The user will need to know the details of the Fotoball to access it |
| Pre conditions | The User needs to be in Main page |
| Procedures | 1. Enter the Name 2. Enter the IP Address. 3. Enter the valid information (network, port number) 4. Click Submit after entering the above information. |
| Post Conditions | The User will access the Fotoball live stream if all the information matches it. |
| Test Results | Pass if all the Post Conditions are True. |

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### 2.5.2 Test User Account Requirements - Registered Fotoball

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| --- | --- |
| Requirement Number | 2.52 |
| Requirement Name | User Account Requirements – Registered Fotoball |
| Requirement Description | The User account contains registered fotoball device. |
| Pre conditions | The User needs to be in the Main menu and add a fotoball device to their account |
| Procedures | * The User needs to fill valid information for the rest of the form to register the fotoball device |
| Post Conditions | * The Default User is assigned to a Fotoball device |
| Test Results | Pass if all the Post conditions are True |

## 2.6 Hardware Requirements

### 2.6.1 Power Test

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| --- | --- |
| Requirement Number | 2.61 |
| Requirement Name | Power Test |
| Requirement Description | Verify that Fotoball is able to be charged and retain charge |
| Pre-conditions | Battery < 50% charged |
| Procedures | 1. Power on Fotoball 2. Open the Fotoball  3. Check if the power LED lit  4. Use volt meter measure across +5V and Gnd and check the power for camera  5. Plug in Fotoball to a charger  6. Check battery voltage  7. Wait for 2 minutes  8. Check if battery voltage went up. |
| Post Conditions | Battery > 50% charge |
| Test Results | PASS only if all post conditions are true,  FAIL otherwise. |

### 2.6.2 Communication Test

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| --- | --- |
| Requirement Number | 2.62 |
| Requirement Name | Communication Test |
| Requirement Description | Ensure Fotoball is able to wirelessly sync with mobile device |
| Pre-conditions | Fotoball not connected |
| Procedures | 1. Power on Fotoball  2. Wait for 2 minutes  3. Check if you can see the Fotoball wireless SSID  4. Connect to Fotoball wireless SSID  5. Ping Fotoball IP address. |
| Post Conditions | Fotoball connected |
| Test Results | PASS only if all post conditions are true,  FAIL otherwise. |

## 2.7 Database Requirements

2.7.1 Type Check Test

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| --- | --- |
| Requirement Number | 2.71 |
| Requirement Name | Type-Check Test |
| Requirement Description | Ensure Fotoball database is immune to invalid input |
| Pre-conditions |  |
| Procedures | 1. Connect to Fotoball database via backend 2. Attempt to input erroneous data types for each relation of each table |
| Post Conditions | No invalid inputs allowed |
| Test Results | PASS only if all post conditions are true,  FAIL otherwise. |

2.7.2 Concurrency/Stability Test

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| --- | --- |
| Requirement Number | 2.72 |
| Requirement Name | Concurrency and Stability Test |
| Requirement Description | Ensure each Fotoball element can only be accessed by one external source at a time |
| Pre-conditions | At least 1 Fotoball loaded into database |
| Procedures | 1. Connect to Fotoball database via backend 2. Attempt to access/change information from source A 3. Attempt same access from source B |
| Post Conditions | Source B access is denied |
| Test Results | PASS only if all post conditions are true,  FAIL otherwise. |

## 3.0 System Integration

### 3.1.1 Integration Phase -1 – Testing system components independently

The first step of system integration plan will consist of making sure each one of the system components are working as given in the requirement specification. This consists of making sure the hardware and software are thoroughly testing and integrated. In the Fotoball Application, the main system components is fully operational and tested independently before trying to integrate or try to test any interaction with any of the other mayor system components. The phase-1 will validate the system have all the necessary components to start with a formal system integration. The integration phase will include, testing the application, hardware and the database independently

**Phase 1 Integration Testing:**

* Testing the application installation
* Testing GUI and classes that don’t have dependencies
* Testing the hardware to make sure it is working
* Testing database installation and finding tables are created.

### 3.2.1– Integration Phase -2 – Database and Communication

The Phase 2 of the system integration will consist of integrating the database system with the application. As part of this phase, we will test the communications interfaces. In addition, this phase includes testing the functionality and the interaction between the server and the application

**Phase 2 Integration Testing:**

* Testing Wireless communication between the application and hardware
* Testing Server

### 3.3.1– Integration Phase -3 Functionality and Performance

The Phase 3 of the system integration will consist of testing the functionality of integrated modules and performance. As a part of this test, we will conduct the performance test of the live stream from the hardware to the system GUI.

**Phase 3 Integration Test**

* Testing Functionality
* Testing Performance

### 3.4.1– Integration Phase -4 –Complete system Integration software and hardware

The Phase 4 of the system integration will test and integrate all the system components as a one whole system. This will include testing both the hardware and software component together

**Phase 4 Integration Test**

* Testing Wireless between all systems simultaneously (Hardware/Software)
* Testing client to database request
* Testing database to fotoball
* Testing system performance requirements.

# 4.0 Testing Schedule

|  |  |
| --- | --- |
| Test Schedule ID: | FbT-0001 |
| Product ID / Name: | Fotoball |
| Product Version: | v1.0 |
| Created On: | Document created on April 01, 2015 |
| Review On: | Document reviewed on April 08, 2015 |
| Review By: | Cipoletta, David  Herrera, AbrAhAm Jilling, Adam Rejeleene, Rick |
| Current Status: | Test & Integration Plan In Progress |

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Step** | **Start Date** | **End Date** | **Responsibility / Comments** |
| 1. Hardware Requirements | Jan 29, 2015 | Feb 19, 2015 |  |
| 2. Fotoball Device Access requirements | Feb 23, 2015 | Feb 26, 2015 |  |
| 3. User Interface | Mar 02, 2015 | Mar 05, 2015 |  |
| 3.1 GUI installation | Mar 02, 2015 | Mar 05, 2015 |  |
| 3.2 Login access | Mar 02, 2015 | Mar 05, 2015 |  |
| 4. Database Requirements | Mar 09, 2015 | Mar 12, 2015 |  |
| 5. Performance Requirements | Mar 23, 2015 | Mar 26, 2015 |  |
| 5.1 Live Streaming Authentication Performance | Mar 23, 2015 | Mar 26, 2015 |  |
| 5.2 Live Streaming Performance | Mar 23, 2015 | Mar 26, 2015 |  |
| 6. System Integration | Mar 30, 2015 | Apr 02, 2015 |  |
| 6.1 Testing system components independently | Mar 30, 2015 | Apr 02, 2015 |  |
| 6.2 Database and Communication | Mar 30, 2015 | Apr 02, 2015 |  |
| 6.3 Functionality and Performance | Mar 30, 2015 | Apr 02, 2015 |  |
| 6.4 Complete system Integration software and hardware | Mar 30, 2015 | Apr 02, 2015 |  |
| Prepare Final Test Report | Apr 09, 2015 | Apr 13, 2015 |  |
| Review / Approve the Final Test Report | Apr 13, 2015 | Apr 16, 2015 | Final test will be performed a week prior the last day of class |
| **Test Step** | **Start Date** | **End Date** | **Responsibility / Comments** |