FACULTY OF COMPUTER SYSTEMS & SOFTWARE ENGINEERING

BCS3323 - SOFTWARE TESTING & MAINTENANCE

**Test Design Specifications**

Door Access System via Fingerprint with GSM

(ReSMART)

Independence Verification and Validation

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**1.0 Introduction**

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| **1.1 Purpose**  This test design specification support the following objectives:  i. To identify the test items covered  ii. To further refine the test approach from Test Plan.  iii. To define the sources of the information used to prepare the plan.  iv. To identify the general cases of test to be executed  **1.2 Scope** |

The test design specification covers all the features developed in RESMART.

**1.3 References**

The following IEEE standards have been referenced in preparation of this document:

i. IEEE 829-2008 Standard for Software and System Test Documentation

The following documents provide the test basis for this test design:

i. RESMART Software Requirement Specifications (ReSMART\_SRS\_1.0)

ii. RESMART System Design Specifications (ReSMART\_SDS\_1.0)

**2.0 Test Design**

**2.1 Features To Be Tested**

The following table contains the failures to be tested based on ReSMART Software Requirement Specifications (SRS) for this iteration. Listed together are the function ID and its corresponding functions and estimated risk level.

It is better to put information above in table format.

|  |  |  |
| --- | --- | --- |
| **Feature ID** | **Description** | **Risk Level** |
| F001 | To allow manager to login to ReSMART | High |
| F002 | To allow manager to add the staff to ReSMART | High |
| F003 | To allow manager to search name of staff in ReSMART | High |
| F004 | To allow manager to amend any data of the staff ReSMART | High |
| F005 | To allow manager to delete the staff detail from database and in PIC | High |
| F006 | To allow manager to delete all staffs from database and PIC | High |
| F007 | To allow manager to view the door access report | High |
| F008 | To allow manager to change password to a new one | High |

Note : All other functions will be tested in iteration 2.

**2.2 Approach Refinements**

As discussed in test Plan (ReSMART\_TP\_1.0.0), test cases for RESMART will be designed using five techniques which are covered in this section. Techniques are applied based on suitable of techniques according to nature of features.

## 2.2.6 Deleting Existing User

Test Case ID: TC-05

Feature ID: F005

Test Technique:

1. Equivalence partitioning (EP)
2. Boundary value analysis (BV)
3. State transition testing
4. Use case testing

Result Analysis Method:

### 2.2.6.1 Equivalence partitioning

|  |  |
| --- | --- |
| Equivalence Partitioning | Boundary Value Analysis |
| INPUT  Valid  Input  Invalid    OUTPUT  Valid  Output  Invalid | 500  251  250  1 <= staffID <= 250  staffID > 250  staffID > 250  1 <= staffID <= 250  staffID = null  0  0  Valid  1  Invalid  Invalid  Valid  Invalid  Invalid  staffID = null |

Figure 2.2.6.1a Staff ID Equivalence Partition & Boundary Value analysis

500

250

1

0

|  |  |  |
| --- | --- | --- |
| Invalid  staffID = null | Valid  1 <= staffID <= 250 | Invalid  staffID > 250 |

**Figure 2.2.6.1b staffID Equivalence Partition**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test condition ID** | **Test condition** | **Test coverage ID** | **Test coverage** | **Example of test data** |
| TCON-05-001 | staffID = null | TCOV-05-001 | staffID = null  (Invalid) | 0 |
| TCON-05-002 | 1 <= staffID <= 250  (valid) | TCOV-05-002 | 1 <= staffID <= 250  (valid) | 1 |
| TCON-05-003 | staffID > 250 | TCOV-05-003 | staffID > 250  (Invalid) | 390 |
| TCON-05-004 | Valid ID | TCOV-05-004 | Valid staffID  (Accept staffID) | 250 |
| TCON-05-005 | Invalid ID | TCOV-05-005 | Invalid staffID  (Reject staffID) | 390 |

**Table 2.2.6.1 Staff ID Equivalence Partitioning Test Conditions & Coverage**

### 2.3.6.2 Boundary Value analysis

251

500

250

1

0

0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Invalid  staffID = null |  | Valid  1 <= staffID <= 250 |  | Invalid  staffID > 250 |

**Figure 2.3.6.2 staffID boundary value**

EP1: staffID = 0 digit

EP2: 1 <= staffID <= 250

EP3: 250 < staffID <= 500

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test condition ID** | **Test condition** | **Test coverage ID** | **Test coverage** | **Example of test data** |
| TCON-05-006 | Staff ID = 0 | TCOV-05-006 | Staff ID =0 (Invalid) | 0 |
| TCON-05-007 | Staff ID = 1 | TCOV-05-007 | Staff ID = 1 (Valid) | 1 |
| TCON-05-008 | Staff ID = 250 | TCOV-05-008 | Staff ID = 250 (Valid) | 250 |
| TCON-05-009 | Staff ID = 251 | TCOV-05-009 | Staff ID = 251 (Invalid) | 251 |
| TCON-05-010 | Staff ID = 500 | TCOV-05-010 | Staff ID = 500  (Invalid) | 500 |
| TCON-05-004 | Valid Staff ID | TCOV-05-004 | Valid Staff ID  (Accept Staff ID) | 250 |
| TCON-05-005 | Invalid Staff ID | TCOV-05-005 | Invalid amount  (Reject Staff ID) | 251 |

**Table 2.2.6.2 Staff ID Boundary Value Analysis Test Condition & Coverage**

### 2.2.6.4 State transition testing

Invalid Staff ID (ISI)

Select “Delete User” button (S2)

Valid Staff ID (VSI)

Re-enter Staff ID (RSI)

Re-enter Staff ID (RSI)

Cancel (C)

Select Staff ID (S1)

Display Message (DM)

Yes (Y)

Delete Staff (S3)

**Figure 2.** **2.6.4 Delete Existing User State transition diagram**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Input  State | Valid Staff ID  (VSI) | Invalid Staff ID  (ISI) | Yes  (Y) | Cancel (C) |
| Select Staff ID (S1) | S2-VSITCOV-05-016 | S1/ - | S1/ - | S1/ - |
| Select “Delete User” button  (S2) | S2/ - | S2/ - | S3- DMTCOV-05-017 | S1/ RSITCOV-05-018 |

**Table 2.2.6.4a Delete Existing User State table**

|  |  |
| --- | --- |
| **Test Coverage ID** | **Test Coverage** |
| TCOV-05-016 | S1 to S2 with input VSI |
| TCOV-05-017 | S3 to S1 with input Y |
| TCOV-05-018 | S2 to S1 with input C |

**Table 2.2.6.4b Delete Existing User State coverage**

### 2.2.6.5 Use case testing

|  |  |  |
| --- | --- | --- |
| **Use case ID** | UC005 | |
| **Use case** | F005 Deleting Existing User | |
| **Purpose** | To allow manager to delete the staff detail from database and in PIC | |
| **Actor** | Manager | |
| **Trigger** | Manager clicks on “Delete User” button. | |
| **Precondition** | ReSMART is in “on” and manager is logged in. | |
| **Scenario name** | Step | Action |
| **Main flow** | 1 | System displays main screen |
| 2 | Manager choose staff from staff list view that is retrieved from tblStaff |
| 3 | Manager clicks on “Delete User” button |
| 4 | System will display message box with message “You are about to delete one record. Are you sure?” with the choice of “Yes” and “Cancel” |
| **Alternate flow- Valid Staff ID** | 4.1 | Manager clicks on “Yes” button |
| 4.1.1 | System will delete one record from database (tblStaff) |
| 4.1.2 | System will delete one record in PIC |
| **Alternate flow- Invalid Staff ID** | 4.2 | Manager clicks on “Cancel” button |
| 4.2.1 | Back to Main Flow Step 1 |
| **Rules** | Staff ID must be between 1 to 250 | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test condition ID** | **Test condition** | **Test coverage ID** | **Test coverage** | **Test data** |
| TCON-05-011 | Main flow | TCOV-05-011 | Main flow | Valid staffID = 1 or Valid staffID = 250 |
| TCON-05-012 | Alternate flow- Valid staffID | TCOV-05-012 | Alternate flow- Valid staffID | Valid staffID = 1 or Valid staffID = 250 |
| TCON-05-013 | Alternate flow- Invalid staffID | TCOV-05-013 | Alternate flow- Invalid staffID | Invalid staffID = 390 |

**Table 2.2.6.5a Delete Existing User use case test condition & coverage**

### 2.3.6 Delete Existing User

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Test Coverage ID** | **Test Condition ID** | **Requirement ID** |
| TC-05-001 | Staff ID (0) Invalid | TCOV-05-006 | TCON-05-006 | REQ-05-001 |
| TC-05-002 | Staff ID (1) Valid | TCOV-05-007 | TCON-05-007 | REQ-05-002 |
| TC-05-003 | Staff ID (250) Valid | TCOV-05-008 | TCON-05-008 | REQ-05-003 |
| TC-05-004 | Staff ID (251) Invalid | TCOV-05-009 | TCON-05-009 | REQ-05-004 |
| TC-05-005 | Staff ID (500) Invalid | TCOV-05-010 | TCON-05-010 | REQ-05-005 |
| TC-05-006 | Staff ID (175) Valid | TCOV-05-014 | TCON-05-014 | REQ-05-006 |
| TC-05-007 | Staff ID (499) Invalid | TCOV-05-015 | TCON-05-015 | REQ-05-007 |
| TC-05-008 | Delete Existing User Main flow | TCOV-05-011 | TCON-05-011 | REQ-05-008 |
| TC-05-009 | Delete Existing User Alternate flow- Valid Staff ID | TCOV-05-012 | TCON-05-012 | REQ-05-009 |
| TC-05-010 | Delete Existing User Alternate flow- Invalid Staff ID | TCOV-05-013 | TCON-05-013 | REQ-05-010 |

**Table 2.3.6 Delete Existing User test identification**