Smart Seat

Test Plan V1.0

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# 1 Introduction

## 1.1 Purpose of writing

Test each function module in Smart Seat to meet the user requirements and test whether there is a bug. Expected to achieve rapid system improvement and system improvement. In order to find software errors as much as possible before the software is put into production.

## 1.2 Background

The smart seat system is divided into eight different modules. In this article, the main test is to separately test the eight different modules, and then combine the modules and integrate them to test the corresponding test plan. Different modules must meet different performance standards during the test.

## 1.3 Scope

Whether the functions of the main test software meet the needs of the customer, whether the performance is superior and the problems of the system. Perform detailed tests on each module of the system, record the results of the test, and analyze the results of the test in detail. During the test, each functional module of the system is split and tested, and each module is tested. Test all possible outcomes, as well as analyze problems that exist during the test, and then submit a record of the tests. Finally, a comprehensive analysis of the software problems and performance tests is given and recorded.

In the process of testing, it is necessary to make assumptions about each problem, and to improve the system according to the project function modules and user requirements existing in the requirements report document. List all risks or unexpected events that may affect the design, development, or implementation of the test. List all constraints that may affect test design, development, or implementation.

## 1.4 Reference

《Software project management》Rajeev T Shandilya Science press

《UML and pattern applications》Craig Larman Machinery industry press

National standards document for software engineering

## 1.5 Test Environment

|  |
| --- |
| Environment (related software, hardware, operating system, etc.) |
| Windows10, Operating system, Browser |
| Server deployment is as follows:   1. Operating system: Windows10 Professional 2. Processor: Intel® Core™ i7-7700 CPU @ 3.60GHz 3. Memory Capacity: 8.00G 4. Hard drive capacity: 512G 5. Browser: Google Chrome |
| System internal type: 64-bit operating system, x64-based processor |

# 2. Module test

## 2.1 Software description

## 2.2 Test content

1.Login&Register module test

2.Seat Reservation module test

3.Seat Repair module test

4.Seat Information Inquiry module test

5.Personal Information Query module test

6.Administrator Mailbox module test

7.PIR sensor remote monitoring seat module test

8.Socket communication remote access indicator module test

## 2.3 Login & Register module test

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Function test | | | | | | |
| Overview | | | | | | |
| Test number | | | GN001 | | | |
| Functional description | | | User use login and register functions | | | |
| Module manager | | | Yikang Tao | | | |
| tester | | | Huiying Han | | | |
| Use purpose | | | Whether the user can enter the system normally when logging in or registering | | | |
| Precondition | | | User login through the login interface | | | |
| Test operation | | | | | | |
| Number | Input/action | Expected output response | | The actual situation | Correct or not? | Error number |
| 1 | Enter the correct username and password | The system prompts that login/register succeed. | |  |  |  |
| 2 | Enter a username that does not exist, do not fill in the password | The system prompts that login/register failed. | |  |  |  |
| 3 | Enter the correct username and enter the wrong password | The system prompts that login/register failed. | |  |  |  |
| 4 | Enter the wrong username and enter the correct password. | The system prompts that login/register failed. | |  |  |  |
| 5 | Do not fill in the username and password | The system prompts that login/register failed. | |  |  |  |

## 2.4 Reserve module test

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Function test | | | | | | |
| Overview | | | | | | |
| Test number | | | GN002 | | | |
| Functional description | | | User use reserve functions | | | |
| Module manager | | | Yikang Tao | | | |
| tester | | | Huiying Han | | | |
| Use purpose | | | Whether the user can use the reserve function normally | | | |
| Precondition | | | User login through the login interface | | | |
| Test operation | | | | | | |
| Number | Input/action | Expected output response | | The actual situation | Correct or not? | Error number |
| 1 | Click on the free seat to reserve a seat | The system prompts that the reservation is successful. | |  |  |  |
| 2 | Low credit users use the reserve function | The system prompts that the reservation is failed. | |  |  |  |
| 3 | Click on the damaged seat to reserve a seat | The system prompts that the reservation is failed. | |  |  |  |
| 4 | Click on the reserved seat to reserve a seat | The system prompts that the reservation is failed. | |  |  |  |
| 5 | Click on the using seat to reserve a seat | The system prompts that the reservation is failed. | |  |  |  |

## 2.5 Repair module test

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| --- | --- | --- | --- | --- | --- | --- |
| Function test | | | | | | |
| Overview | | | | | | |
| Test number | | | GN003 | | | |
| Functional description | | | User use repair functions | | | |
| Module manager | | | Yikang Tao | | | |
| tester | | | Hanyu Zhang | | | |
| Use purpose | | | Whether the user can use the repair function normally | | | |
| Precondition | | | User login through the login interface | | | |
| Test operation | | | | | | |
| Number | Input/action | Expected output response | | The actual situation | Correct or not? | Error number |
| 1 | The user fills in the repair information normally. | The system prompts that the report is successful. | |  |  |  |
| 2 | User does not fill in the repair information | The system prompts “Please fill in the report information.” | |  |  |  |

## 2.6 PIR sensor module test

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| --- | --- | --- | --- | --- | --- | --- |
| Function test | | | | | | |
| Overview | | | | | | |
| Test number | | | GN004 | | | |
| Functional description | | | The PIR sensor senses if there is someone in the seat and sends the data to the background. | | | |
| Module manager | | | TingHui Zhang | | | |
| tester | | | Huiying Han | | | |
| Use purpose | | | Whether the PIR sensor can be sensed normally and whether the data can be sent normally. | | | |
| Precondition | | |  | | | |
| Test operation | | | | | | |
| Number | Input/action | Expected output response | | The actual situation | Correct or not? | Error number |
| 1 | When someone is in the sensing range. | Prompt someone is here successful and the data is successfully sent to the background. | |  |  |  |
| 2 | No one appears in the sensing area for a long time | Always prompt nobody is here successful and the data is successfully sent to the background. | |  |  |  |

## 2.7 Indicate light module test

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| --- | --- | --- | --- | --- | --- | --- |
| Function test | | | | | | |
| Overview | | | | | | |
| Test number | | | GN005 | | | |
| Functional description | | | The indicator light will light according to the seat status | | | |
| Module manager | | | Huiying Han | | | |
| tester | | | Hanyu Zhang | | | |
| Use purpose | | | Whether the indicator light will light according to the seat status | | | |
| Precondition | | |  | | | |
| Test operation | | | | | | |
| Number | Input/action | Expected output response | | The actual situation | Correct or not? | Error number |
| 1 | Reserve a seat. | The indicator light is on normally. | |  |  |  |
| 2 | Confirm reserve succeed | The indicator light goes out | |  |  |  |
| 3 | Unconfirmed for a long time after reserve. | The indicator light goes out | |  |  |  |

# 3 Integration Testing

## 3.1 Purpose

The main purpose is to determine whether the system meets the requirements for the processing of business processes and data flows to meet the standards. The detection system has logic rigor and errors in the processing of business flows, and whether there are unreasonable standards and requirements for detecting requirements. This phase tests tests based on functional completion

## 3.2 Login & Register

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| --- | --- |
| Test target | Detect the functionality and uniformity of the login and registration system |
| Test scope | Login function, registration function, registered user can log in successfully |
| Technology | According to the results obtained by different test cases, infer the completeness of the system function, robustness |
| Starting standard | The test case is complete and the system is running normally. |
| Completion criteria | 1 After the login is successful, the interface jumps to the user's main interface.  2 After successful registration, jump to the recommended login interface.  3 Unregistered user login display is not registered  4 substandard input shows the corresponding error message |
| Test focus and priority | The test focuses on whether the registered user can log in successfully, and whether the registered user can register repeatedly.  First test login, then register |
| Special matters to consider | Should take into account the test error caused by incorrect input |

## 3.3 Reserve & Repair seat

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| --- | --- |
| Test target | Timeliness and accuracy of inspection repair function |
| Test scope | Whether the user's application for repair can be viewed by the administrator, and the repair information submitted by the user is accurate. |
| Technology | Submit the repair information through user login with different permissions, and view these repair information through the administrator interface. |
| Starting standard | The system is running normally, and the login registration function is perfect. |
| Completion criteria | 1 different users submit repair information in the same location, no error message will appear  2 The repair information submitted by users with different permissions can be viewed by the administrator.  3 After the administrator finishes the repair information, it will return the processed signal to the corresponding user. |
| Test focus and priority | The key point is whether the repair information submitted by the user can be viewed by the administrator accurately.  The first is to test the submission of repair information, and then the accuracy of the test information. |
| Special matters to consider | The repair information should be sorted in chronological order and repair level. It is necessary to consider that the low-level repair information has been delayed and not processed. |

## 3.4 Tip light

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| --- | --- |
| Test target | 1. Test whether the database data acquisition is normal;  2. The correctness of the format after the test data is parsed;  3. Test the correctness of the data stream transmitted to each node (small light). |
| Test scope | Starting from the acquisition of the database data by the coordinator, the operation of turning on or off the small lamp is normally completed. |
| Technology | Use valid and invalid data to perform data acquisition and transmission, verify the following:  1. If the database data is invalid (the structure is empty), the function execution is interrupted, and the status code is 0. If there is data, the status code is returned to 1.  2. If the data is successfully transmitted to the small light node and responds successfully, the function returns the status code 1, otherwise the function is interrupted and returns 0;  3. Test the sample data multiple times to see if it can achieve the desired goal. |
| Starting standard | 1. The data structure of the data acquisition package cannot be empty;  2. The parsed data format must be in json format;  3. The small light node must have a response when transmitting the opposite instruction. |
| Completion criteria | All functional requirements are implemented when the module is running, and all defects found have been resolved. |
| Test focus and priority | Test focus: The data needs sufficient stability in the process of coordinator transmission to the small light node, multiple transmission tests, the success rate of the transmission, and consider adding the ack mechanism to avoid message loss.  priority:  1. Data transmission;  2. Acquisition of database data;  3. Analysis of the data. |
| Special matters to consider | 1. Because it is wireless data transmission, it is susceptible to external interference, so there may be a delayed response;  2. When the data of the database is obtained, since the module is de-duplicated by the timestamp, when the seat occupancy is performed by multiple people at the same time, the information acquisition may be lost. It may be considered to use the snowflake algorithm to alternately generate the random id to avoid the above problem. |

## 3.5 PIR sersor

|  |  |
| --- | --- |
| Test target | Check if the PIR sensor can detect people |
| Test scope | Within a few meters of the desk with PIR sensor |
| Technology | Infrared technology-based automatic control products, when someone enters the switch sensing range, the special sensor detects the infrared spectrum change of the human body, the switch automatically turns on the load, the person does not leave and is active, the switch continues to conduct, and the person leaves, the switch delays Automatically turn off the load |
| Starting standard | The human body activity is detected within the detection range, the induction light is on, and the sensor light is off after the person leaves. |
| Completion criteria | The test light is on as scheduled and the monitor successfully displays the presence or absence of human activity |
| Test focus and priority | The focus of the test is whether the monitor can successfully display the results |
| Special matters to consider | Due to financial and technical constraints, the PIR sensor can only detect one human activity signal at a time. |

# 4 Risks and measures taken during the testing phase

* Personnel cannot be in place in time

Measures taken: 1. Report staff requirements in advance, 2. Subdivision work

* Insufficient staff skills need to be strengthened

Measures taken: 1. Strengthen training and practice; 2. Modify plans appropriately to reduce task intensity

Delay in development submission date, insufficient test time

Measures taken: 1. Complete the preparatory work as early as possible; 2. Examine the test plan and make certain adjustments if allowed.

* Insufficient estimate

Measures taken: 1. Adjust resource input; 2. Correct the plan in time and report the amendment

# 5 Evaluation criteria

## 5.1 System structure

The system architecture is advanced and simple. The system adopts advanced B/S architecture, back-end supports various size databases, and the system structure is clear and clear, which can meet the requirements of network software applications.

## 5.2 Functional aspect

The software consists of Seat reservation, repair modules, etc. covering all the business functions of the smart seat system, so as to ensure the normal use of a series of functions such as scheduling and repair, and the normal transmission of data.

## 5.3 Safety

The system must have strict permission setting function. Different rights personnel can only see the content that they have permission to access, effectively guarantee data security, and encrypt data with encryption technology to improve data security.

## 5.4 Reliability

For the user to input data that does not meet the requirements, a brief and accurate prompt message is given, and assistance is provided if necessary.

## 5.5 Compatibility

Can meet the normal use of software in various operating systems.