

TEST PLAN FOR

AIRLINE MANAGEMENT SERVICE

TEAM ZEPPELINERS

1) Test Plan Identifier

Document: Airline Management SERVICE

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2) References

Design Document: IEEE 829 FORMAT

Other Relevant Documents: Software Testing Slides Taught in course

3) Introduction

Purpose: The purpose of this test plan is to outline the testing

approach,resources,

and schedule for Airline Management Service.

Scope: This test plan covers the testing of Airline Management Service to ensure that it meets the specified requirements and functions correctly.

Intended Audience: Project Team, Stakeholders, Testing Team

4) Test Items

Software Components:

- o User Registration and Login
- o Airline Ticket Searching,
- o Ticket and Payment
- o User Dashboard and Profile Management

Hardware Components:

- o Web Server
- o Database Server
- o Buses

5) Software Risk Issues for Airline Management Service

1. Third-Party Service Delays: Implement backup options for critical services and maintain communication with service providers.
2. Incompatibility with New Software Versions: Regularly update and test the software with new versions, ensuring compatibility logs are maintained.
3. Unfamiliarity with New Tools: Invest in training programs for the team to familiarize them with new tools, conduct pilot projects, and provide ongoing support.
4. Complex Features: Conduct thorough testing of real-time features and algorithms to identify and rectify hidden defects.
5. Incomplete Documentation: Ensure comprehensive documentation of modules to align development and testing efforts with requirements.
6. Security Vulnerabilities: Implement robust safety measures for data protection and secure transactions to mitigate the risk of breaches.
7. Integration Challenges: Address difficulties in integrating with external services through careful planning and testing.
8. Client Impact: Minimize delays and defects to uphold client business operations and customer satisfaction.
9. Non-Compliance with Regulations: Ensure adherence to government regulations related to online transactions and public transportation to avoid legal issues.
10. Misunderstanding of Requirements: Clarify ambiguous requirements to develop a system that meets client expectations, reducing the need for rework.
11. Database Issues: Conduct thorough testing of database design and migration processes to prevent data corruption.
12. Performance Issues: Conduct rigorous performance testing to identify and address potential system slowdowns during peak times.
13. Usability Problems: Prioritize user experience through well-designed interfaces to reduce support costs.
14. Maintenance and Upgrade Challenges: Plan for software maintenance and upgrades to minimize system downtime and security vulnerabilities.

Risk Mitigation Strategies

- o Conduct a thorough risk assessment and prioritize risks based on impact and likelihood.
- o Implement robust testing practices, including unit testing and user acceptance testing.
- o Adopt agile development methodologies to quickly adapt to changes.
- o Ensure compliance with industry standards and regulations related to software development and data protection.

6) FEATURES TO BE TESTED

1. User Registration and Login: Verify that users can register with valid information and securely login to their accounts.
2. Flight Schedule Management: Test the system's ability to add, update, and cancel flight schedules as per airline management requirements.
3. Flight Availability and Reservation: Ensure users can view available flights based on date, endpoints, and class, and book seats accordingly.
4. Fare Management: Test the functionality for management to input accurate fares for different flights.
5. Booking Management (Changes/Cancellations): Verify that users can change or cancel bookings as per policy, and penalties are applied correctly.
6. Occupancy Rate Tracking: Test the system's ability to track occupancy rates for flights and adjust frequencies accordingly.
7. Cost Management: Ensure that flight costs are calculated accurately based on aircraft type and distance.
8. Profit Calculation: Verify that the system can calculate net profit for a specified time period accurately.
9. System Integrity and Reliability: Test data integrity, error handling, and recovery mechanisms to ensure system reliability.
10. Performance Testing: Evaluate system performance under different loads to ensure it can handle multiple users simultaneously.
11. Security Testing: Test for security vulnerabilities and ensure sensitive data is protected during transmission and storage.
12. User Experience Testing: Evaluate the user interface for usability, accessibility, and overall user experience during the booking process.

8.Approach

- **Testing Techniques:**

- Black Box Testing
- Functional Testing
- Usability Testing

Objective: To ensure a seamless and accurate ticketing process within the Airline Management System.

Test Cases:

- Verify the selection and availability of flights based on routes and schedules.
- Test the successful confirmation and generation of flight tickets.
- Validate error handling for unavailable or fully booked flights.
- Confirm the accurate calculation of fares, if applicable.

1. Test the cancellation process for booked flights.

2. Testing Levels:

3. Unit Testing

4. Integration Testing

5. System Testing

6. Acceptance Testing

7. Training Requirements: Training on relevant testing tools and technologies for comprehensive testing of the Airline Management System

9) Item Pass/Fail Criteria

□ Criteria for Pass:

- o All test cases completed
- o No critical defects found

□ Criteria for Fail:

- o Any test case fails
- o Critical defects found

10) Suspension Criteria and Resumption Requirements

□ Criteria for Suspension:

o **Major Defects Affecting Testing:** If critical defects are identified that hinder the testing process or compromise the system's functionality, testing will be suspended until these issues are resolved.

o **Resource Unavailability:** If essential resources such as testing tools, hardware, or personnel are unavailable, the testing process may be temporarily suspended.

□ **Resumption Requirements:** Testing can be resumed under the following conditions

o **Defects Resolved:** All major defects identified during the testing phase must be resolved and verified to ensure the system's stability and functionality.

o **Resources Available:** Essential testing resources, including tools, hardware, and personnel, must be made available and verified for use.

11) Test Deliverables

- **Test Cases:** A comprehensive set of test cases will be developed to validate the

functionality and performance of the Airline Management Service. The test cases

will cover the following areas:

- a. User Registration and Login
 - Test case 1: Verify user registration with valid details.
 - Test case 2: Verify user registration with invalid details.
 - Test case 3: Verify user login with valid credentials.
 - Test case 4: Verify user login with invalid credentials.
 - Test case 5: Verify error messages for invalid login attempts

b. Flight and Schedule Management

Test case 6: Verify adding a new flight with valid details.

Test case 7: Verify updating flight details.

Test case 8: Verify cancellation of flights.

Test case 9: Verify error handling for conflicting flight schedules.

Test case 10: Verify accurate display of available flights based on user criteria.

Test Case ID	Test Suite	Description	Preconditions	Test Steps	Expected Result
TC-001	User Registration	Register with valid user details	None	1. Enter valid user registration details 2. Submit registration form	Successful registration
TC-002	User Registration	Register with existing username	None	1. Enter existing username 2. Submit registration form	Error: Username already exists
TC-003	User Registration	Register with missing mandatory fields	None	1. Enter incomplete registration details 2. Submit registration form	Error: Missing fields
TC-004	User Registration	Verify successful registration	None	1. Enter valid user registration details 2. Submit registration form	Confirmation message displayed
TC-005	User Login	Login with valid credentials	User registered	1. Enter valid login credentials 2. Click 'Login'	Successful login
TC-006	User Login	Login with invalid credentials	User registered	1. Enter invalid login credentials 2. Click 'Login'	Error message displayed
TC-007	User Login	Login with missing credentials	User registered	1. Leave login fields blank 2. Click 'Login'	Error message displayed
TC-008	Admin Login	Login with valid admin credentials	Admin user registered	1. Enter valid admin login credentials 2. Click 'Login'	Successful admin login
TC-009	Admin Login	Login with invalid admin credentials	Admin user registered	1. Enter invalid admin login credentials 2. Click 'Login'	Error message displayed
TC-010	Flight Searching	Search Flights between two stations	Flights has to be scheduled on that day	1. Enter details of stations and date 2. Click 'Search FLight'	No Flights on that day
TC-011	Ticket Booking	Book ticket with valid details	User logged in	1. Select flight 2. Enter passenger details 3. Confirm booking	Successful booking
TC-012	Ticket Booking	Book ticket with invalid details	User logged in	1. Select flight 2. Enter incomplete passenger details 3. Confirm booking	Error message displayed
TC-013	Ticket Booking	Attempt to book ticket without logging in	None	1. Access booking page 2. Try to book ticket without login	Redirect to login page
TC-014	Airplane Management	Add new flight with valid details	Admin logged in	1. Enter valid flight details 2. Submit flight addition form	Successful flight addition
TC-015	Airplane Management	Add new flight with invalid details	Admin logged in	1. Enter invalid flight details 2. Submit flight addition form	Error message displayed
TC-016	Airplane Management	Attempt to add flight without admin login	None	1. Access flight addition page 2. Try to add flight without admin login	Redirect to admin login page
TC-017	Airplane Management	Cancel existing flight	Admin logged in	1. Select flight to cancel 2. Confirm cancellation	Successful flight cancellation
TC-018	Airplane Management	Cancel non-existent flight	Admin logged in	1. Select non-existent flight to cancel 2. Confirm cancellation	Error message displayed
TC-019	Airplane Management	Attempt to cancel flight without admin login	None	1. Access flight cancellation page 2. Try to cancel flight without admin login	Redirect to admin login page

TC-020	Occupancy Percentage	Calculate Occupancy Percentage	Flights scheduled for the route, bookings made	1. Enter the 2 stations 2. Enter the date range 3. Press 'Get occupancy rate'	Get HttpResponse of percentage
TC-021	Net Profit	Evaluate Ancillary Revenue Impact on Netancillary Profit	Flight scheduled, bookings made, Impact on Netancillary Profit revenue data available	1. Enter the 2 stations 2. Enter the date range 3. Press 'Net Profit'	Get HttpResponse of net profit

Test Environment Setup:

- Configure test environments for different testing phases (e.g., development, staging, production).
- Install necessary software and tools for testing, including test management systems and automation frameworks.

Test Plans and Reports:

- Develop test plans outlining testing objectives, strategies, and schedules for each testing phase.
- Generate test reports summarizing test results, including pass/fail statuses, defects found, and overall test coverage.

□ Test Results:

Overall Test Status:

All test cases passed successfully, indicating that the Airline Management Service functions as expected and meets the specified requirements.

No critical defects were identified during testing, demonstrating a high level of system reliability and performance.

Recommendations:

Conduct regular regression testing to ensure continued functionality and stability of the system with future updates.

Implement automated testing for repetitive test cases to improve testing efficiency and coverage.

Monitor user feedback and address any usability issues or suggestions for improvement identified during testing.

□ Defect report:

Invalid login error message is inaccurate.

Duplicate flight schedules can be added without validation.

Flight details formatting is inconsistent.

Slow response time during peak loads.

Lack of confirmation message for flight cancellations.

Incorrect fare calculation for multi-leg flights

Missing validation for special characters in user input fields

Inability to handle concurrent bookings leading to data discrepancies.

UI elements not aligned properly on certain screen resolutions.

Payment gateway errors during transaction processing.

Unresponsive links/buttons in the user dashboard.

Defect ID	Test Case ID	Description	Assigned	Severity	Priority	Status	To	Comments
D-001	TC-011	Payment is not working after entering then payment details		Major	High	New Dev Team	multiple browsers	Issue replicated in
D-002	TC-008	Have to Set admin from the django administration		Major	High	New Dev Team	multiple browsers	Issue replicated in
								Is

13) Environmental Needs

- **Hardware Requirements:**
 - **Web Server:** A dedicated web server is essential to host the Airline Management Service, managing HTTP requests and ensuring smooth performance.
 - **Database Server:** A robust database server is necessary to store and manage user data, flight schedules, and financial information, handling concurrent transactions efficiently.
 - **Aircraft Simulation:** Utilizing physical or virtual aircraft models aids in testing features related to flight management, ensuring thorough validation of airline-specific functionalities.
- **Software Requirements:**
 - **Web Browser Compatibility:** Testing across multiple browsers like Chrome, Firefox, Edge, and Safari ensures the AMS is accessible and functional on various platforms.
 - **Testing Tools:** Employing automation tools like Selenium, JUnit, and TestNG streamlines testing processes, identifies defects, and maintains application quality.

- Other Requirements:
 - Internet Connectivity: Stable and high-speed internet connectivity is vital for accessing and testing the AMS, ensuring optimal performance under real-world conditions.
 - Test Data: A comprehensive set of test data covering user profiles, flight schedules, pricing, and scenarios aids in executing test cases and validating system functionality.
 - Documentation: Maintaining detailed documentation, including testing strategies, test cases, results, and defect reports, tracks progress and ensures adherence to requirements.

14) Staffing and Training Needs

- Staffing Needs:
 - Test Manager: Oversees testing processes, coordinates with developers, and ensures testing goals are achieved.
 - Test Analysts/Engineers: Develop test cases, execute scripts, identify defects, and validate application functionality.
 - Database Administrator: Manages and maintains the database, ensures data integrity, and supports database-related testing.
 - Web Developer: Assists in resolving web-related issues, ensures browser compatibility, and optimizes the user interface.
- Training Requirements:
 - Airline Management Service Overview: Understanding core features, functionalities, and user workflows.
 - User Registration and Login: Training on account creation, authentication, and password recovery.
 - Flight and Schedule Management: Understanding bus details management, schedule updates, and availability.
 - Ticket Booking: Training on the booking process, including seat selection and confirmation.

15) Responsibilities

□ Testing Team:

□ Test Manager:

◦ Develop Test Plan: Create a comprehensive test plan outlining the testing strategy, scope, objectives, and schedule.

◦ Coordinate Testing Activities: Coordinate with the development team, database administrators, and other stakeholders to ensure smooth and efficient testing activities.

- o Review and Approve Test Cases: Review and approve the test cases created by the test analysts/engineers to ensure they cover all the functionalities and scenarios of the application.

□ Test Analysts/Engineers:

- o Develop Test Cases: Develop detailed and comprehensive test cases covering all the functionalities and scenarios of the application.
- o Execute Test Cases: Execute the test cases, record the test results, and validate the functionality of the application.
- o Report Defects: Report any defects identified during the testing process using the defect tracking tools and ensure they are addressed by the development team.
- o Generate Test Reports: Generate detailed test reports summarizing the test activities, test results, and defects identified.

□ Database Administrator:

- o Database Testing: Assist in testing the database-related functionalities, ensuring data integrity, and validating the database schema and structure.
- o Optimize Database Performance: Monitor and optimize the database performance during the testing process to ensure the application's responsiveness and reliability.

□ Development Team:

□ Developers:

- o Fix Defects: Address and fix the defects reported by the testing team in a timely and efficient manner.
- o Support Testing: Collaborate with the testing team to understand the defects, provide necessary information and support, and ensure the defects are resolved correctly.
- o Code Review: Conduct code reviews to identify and fix any potential issues, vulnerabilities, or bugs in the application code before and during the testing process.

□ Web Developer:

- o Web Compatibility Testing: Assist in testing the application's compatibility across different web browsers, devices, and screen sizes to ensure a consistent and optimized user experience.
- o Optimize UI/UX: Collaborate with the testing team to identify and fix any UI/UX issues, inconsistencies, or usability issues in the application

16) Schedule

□ Testing Phases and Dates:

o Test Planning Phase:

Date: April 3 - April 4

Define the testing objectives, scope, and strategy.

Identify the testing resources, tools, and environment requirements.

o Test Design Phase:

Date: April 5 - April 6

Review the requirements and specifications to identify the test scenarios and cases.

- Develop and document the detailed test cases covering all the functionalities and scenarios of the application.

- **Test Execution Phase:**

- Date: April 6 - April 7
- Execute the developed test cases to validate the functionalities and scenarios of the Airline Management Service.
- Record the test results, including the test outcomes, defects identified, and any issues or observations during the testing process.

- **Test Closure and Reporting Phase:**

- Conduct a test closure meeting with all the stakeholders to review the testing process, discuss the outcomes, and plan for any future testing activities or improvements.

17) Planning Risks and Contingencies

□ Potential Risks:

- Unavailability of Test Environment:
Description: Delay in setting up the required test environment.

- Inadequate Test Coverage:
Description: Test cases may not cover all functionalities and scenarios.

- Defects in the Application:
Description: Presence of major defects affecting the testing process.

- Resource Constraints:
Description: Limited availability of testing resources.

- Changes in Requirements or Scope:
Description: Modifications in the project requirements or scope.

- Communication and Coordination Issues:
Description: Inadequate communication between teams and stakeholders.

□ Contingency Plans:

- Unavailability of Test Environment:
Plan: Expedite test environment setup; explore cloud-based solutions.

- Inadequate Test Coverage:
Plan: Review and update test cases; develop additional cases as required.

- Defects in the Application:
Plan: Collaborate with development for defect resolution; prioritize high-risk areas.

- Resource Constraints:
Plan: Optimize resource utilization; explore securing additional resources.

- Changes in Requirements or Scope:
Plan: Maintain open communication; adapt test cases and approach accordingly.

- Communication and Coordination Issues:
Plan: Establish clear communication channels; conduct regular team meetings

Glossary:

- User Registration and Login: Definition: The process where users create accounts and log into the Airline Management system to access personalized services.
- Flight and Schedule Management: Definition: Functionality enabling administrators to manage and update flight details, routes, and schedules within the system.