



International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.699

Volume 14, Issue 4, April 2025

Development of an Airline Ticket Reservation System: Design, Implementation, and Insights

Prof. Sayali.S.Bandal¹, Rupesh Kundan Dahire², Aditya Dattatray Kamble³,

Akansha Dattatray Khunte⁴, Kshitij Narendra Rokade⁵

Professor, Navsahyadri Group of Institutions, Pune, India¹

Student, Navsahyadri Group of Institutions, Pune, India^{2,3,4,5}

ABSTRACT: This paper presents the design and implementation of an Airline Ticket Reservation System, which simplifies the booking and management of flight tickets. The system ensures efficient database handling, supports real-time ticket generation, and integrates web-based functionality. Developed using HTML and a WAMP server with the Waterfall model, the project offers a practical understanding of database-driven applications.

I. INTRODUCTION

Airline ticketing has evolved from handwritten logs to sophisticated computerized systems. A ticket now serves not just as proof of payment, but also as a means to store passenger data, flight information, and identification. The digitization of ticketing systems has greatly enhanced user experience, minimized human errors, and optimized operations across the airline industry.

Objectives of the System

The main objectives of the Airline Ticket Reservation System include:

- To offer a user-friendly interface for airline ticket booking.
- To minimize manual effort and streamline ticket management.
- To securely store passenger and transaction data.
- To provide easy access to flight schedules and booking history.
- To enable report generation and data analytics for administrators.

II. LITERATURE REVIEW

Historically, systems like SABRE and Galileo revolutionized airline booking. Research in recent years shows a shift towards AI-powered and cloud-based solutions for handling reservations. Most modern systems are expected to provide mobile support, integrate third-party APIs, and guarantee real-time synchronization.

System Design and Architecture

The proposed system follows a three-tier architecture:

- Client Tier: HTML-based user interface for customers.
- Server Tier: Application logic running on a local WAMP server.
- Database Tier: MySQL database that stores user data, ticket details, and flight info.

This structure ensures separation of concerns and allows scalable growth.

III. METHODOLOGY

The Waterfall Model was employed for project development. The phases include:

1. Requirement Analysis
2. System Design
3. Implementation
4. Testing

5. Deployment and Maintenance

Each phase is completed before moving to the next, ensuring structured progress.

Implementation Details

The frontend was developed using HTML and CSS, enabling users to log in, search flights, and book tickets. Backend logic was handled using PHP and MySQL via WAMP. The system features login authentication, session management, and confirmation ticket generation.

Security Measures

To ensure data security:

- Passwords are encrypted before database storage.
- All user inputs are validated to prevent SQL injection.
- Admin pages are protected with role-based access.
- Session timeouts are implemented to avoid unauthorized use.

Key Features

- Intuitive user interface
- Real-time ticket generation
- Admin dashboard
- Reporting tools
- Multi-user login system
- Data validation and feedback mechanism

Challenges Faced

- Handling concurrent bookings without data loss.
- Creating responsive UI across devices.
- Optimizing database performance under multiple queries.

Testing and Results

Manual and automated testing ensured system reliability. Functional tests validated ticket booking, while security tests checked for login vulnerabilities. The system successfully handled multiple simultaneous bookings during stress testing.

Future Enhancements

- Integration with payment gateways
- Mobile app development
- AI-based chat assistant
- Real-time notifications
- Support for multiple airlines and international booking

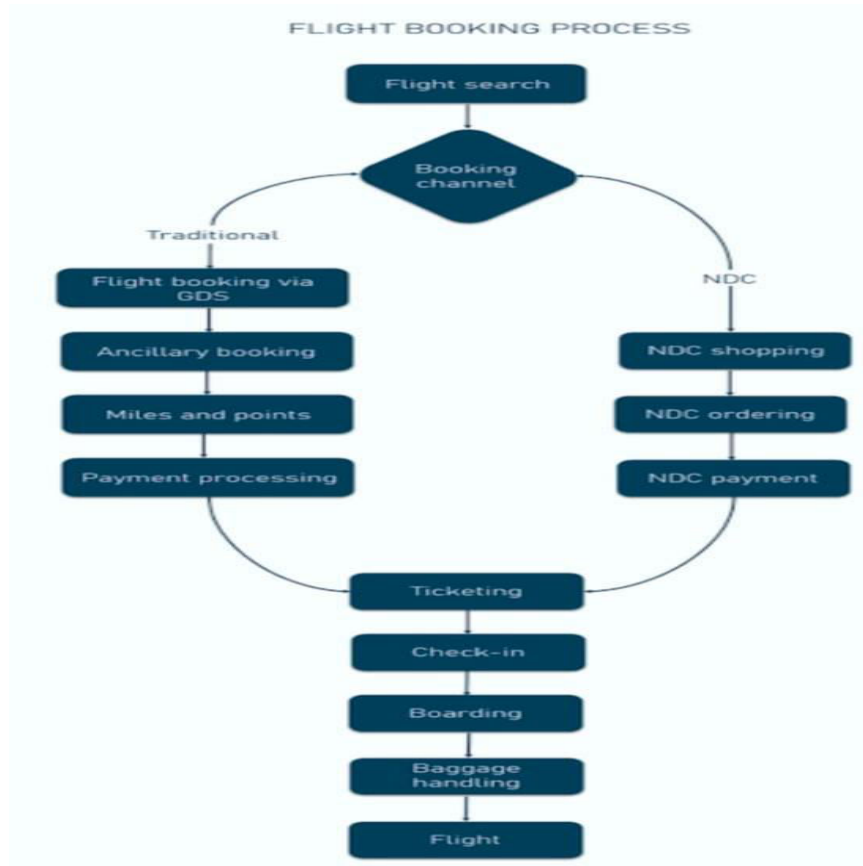
Real-Time Scenarios

Some real-time examples:

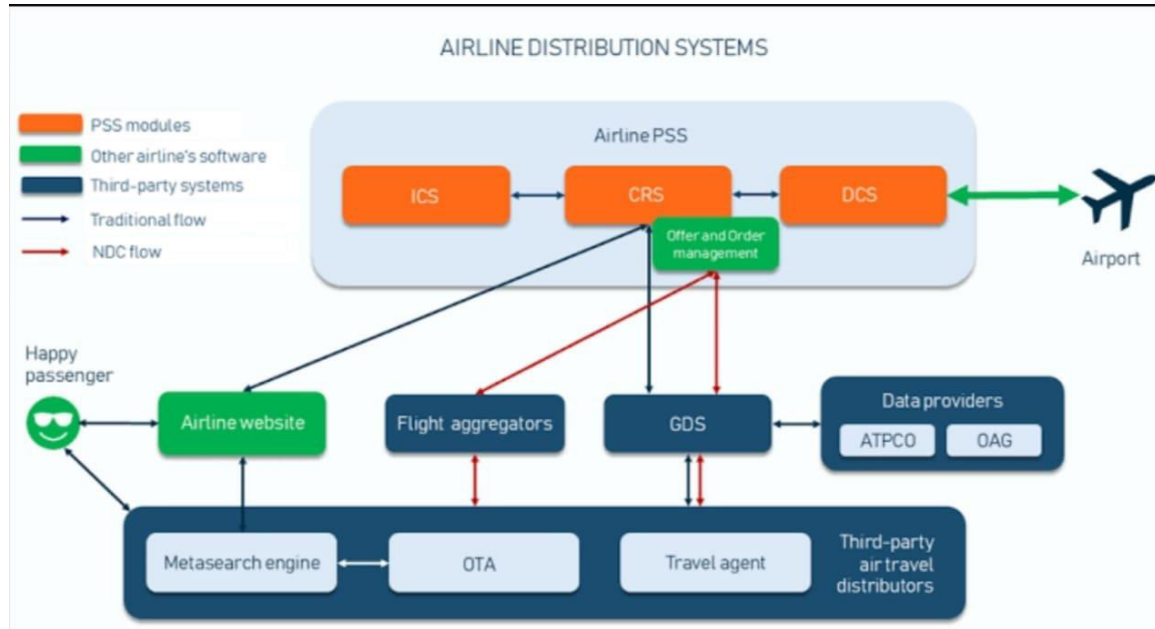
- Booking a ticket during peak hours (data load handling)
- Admin generating a daily report of booked flights
- User canceling a reservation and auto-refund logging

These scenarios prove the system's reliability and transaction consistency

Booking Process:



1. Choose a booking platform: You can book through airline websites, online travel agencies (OTAs) like MakeMyTrip or EaseMyTrip, or even through travel agents.
2. Enter trip details: Provide your origin and destination cities, departure and return dates, number of passengers, and preferred class of travel.
3. Compare flight options: The platform will display a list of available flights, allowing you to compare prices, airlines, and flight times.
4. Select your preferred flight: Choose the flight that best suits your needs.
5. Fill in passenger details: Provide the necessary information for each passenger, including names, dates of birth, and any required passport or identification details.
6. Proceed to payment: Confirm your booking and make payment using your chosen method.
7. Receive confirmation: You should receive a booking confirmation via email or SMS, along with your Passenger Name Record (PNR) or booking reference number.



Flight Booking Pipeline

1. Search and Booking: The customer searches for flights, selects their preferred option, and books the ticket.
2. Availability Check: The airline's system checks for seat availability on the requested flight.
3. Pricing and Fare Calculation: The system calculates the fare based on factors like route, travel dates, and passenger type.
4. Payment Processing: The customer pays for the ticket using a secure payment gateway.
5. Ticket Generation: The airline's system generates a unique ticket number and issues an electronic ticket (e-ticket).
6. Booking Confirmation: The airline sends a booking confirmation email to the customer with flight details and ticket information.

Supporting Processes

1. Inventory Management: The airline manages seat inventory across different flights and fare classes.
2. Fare Rules and Restrictions: The airline applies fare rules and restrictions, such as change fees or cancellation policies.
3. Passenger Information Management: The airline collects and manages passenger information, including names, contact details, and travel documents.
4. Security and Verification: The airline verifies passenger identities and ensures compliance with security regulations.
5. Integration with Third-Party Systems: The airline's system integrates with third-party providers, such as payment gateways, travel agencies, and global distribution systems (GDSs).

Key Systems Involved

1. Airline's Reservation System: Manages flight bookings, seat inventory, and passenger information.
2. Payment Gateway: Processes secure payments for ticket purchases.
3. Email and Notification System: Sends booking confirmations and other important notifications to customers.
4. Global Distribution System (GDS): A platform that connects airlines with travel agencies and other distribution channels.

The flight booking pipeline involves multiple complex processes and systems working together to provide a seamless experience for customers.

IV. CONCLUSION

This project provided insights into real-world application development, integrating frontend and backend systems. The Airline Ticket Reservation System not only streamlined ticket booking but also taught the team valuable lessons in security, testing, and user interface design. It lays the groundwork for future, more advanced systems.

REFERENCES

- [1] <http://developer.android.com/guide/basics/what-is-android.html>
- [2] <http://developer.androidstudio.com>
- [3] <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=5578355>
- [4] <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6234344>
- [5] Merril Wells. Database Concepts, 2002.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details