

Sky Portal Reservation Management System: A Research Paper

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ABSTRACT

The rapid advancement of digital technologies has transformed the way airline services are accessed and managed. This paper presents the development of the Sky Portal Reservation Platform, a web-based application designed to provide an efficient, user-friendly, and reliable solution for airline ticket booking. The system enables users to search flights, view availability, and book tickets in real time through an intuitive interface.

In addition to standard booking features, the platform integrates advanced functionalities such as food selection during booking and an EMI (Equated Monthly Installment) payment option, allowing users to complete transactions flexibly and conveniently. These features enhance the overall user experience and address limitations found in many existing reservation systems.

The system is developed using modern web technologies and follows a modular architecture, ensuring scalability, security, and ease of maintenance. It provides efficient data handling, secure payment processing, and real-time updates, making it suitable for practical deployment.

KEYWORDS

Airline Reservation System, Online Ticket Booking, Web Application, EMI Payment, Flight Management, Food Selection, User Interface, Database Management

1.INTRODUCTION

The rapid growth of the aviation industry has significantly increased the demand for efficient and user-friendly airline reservation systems. Traditional ticket booking methods, such as manual reservations and travel agencies, are often time-consuming, less flexible, and prone to

human errors. With the advancement of internet technologies, online reservation systems have become an essential solution to simplify the booking process and enhance customer experience.

The Sky Portal Reservation Platform is a web-based application designed to provide a seamless and efficient flight booking experience for users. This system allows customers to search for available flights, compare options, and book tickets. The platform aims to integrate multiple services into a single system, reducing complexity and improving accessibility.

2.LITERATURE REVIEW

The development of airline reservation systems has evolved significantly with the advancement of web technologies and digital platforms. Early reservation systems were manual and required physical interaction with travel agencies, which made the process time-consuming and inefficient. With the introduction of computerized reservation systems (CRS), airlines were able to automate booking, scheduling, and ticket management, thereby improving operational efficiency. Modern airline reservation systems are primarily web-based and utilize technologies such as HTML, CSS, JavaScript, and backend frameworks connected with relational databases like my SQL.

2.1 RELATED WORKS

Several researchers have developed airline reservation systems to improve the efficiency and convenience of ticket booking. Earlier systems were manual and required physical interaction, which made the process slow and less reliable. With the introduction of computerized systems, booking operations became faster and more accurate.

2.2 RESEAECH GAP

Despite the advancements in airline reservation systems, several limitations still exist in current solutions. Most existing systems mainly focus on basic functionalities such as flight search, ticket booking, and online payment. However, they lack additional features that improve user convenience and flexibility. One major gap is the absence of flexible payment options, such as EMI, which can help users manage high ticket costs more easily. Additionally

3.SYSTEM DESIGN

The system design of the Sky Portal Reservation Platform defines the overall structure and functioning of the application. It is designed to ensure smooth interaction between the user interface, processing logic, and database.

3.1 System Architecture

The system follows a three-layer architecture:

Input Layer – Users enter details such as source, destination, travel date, and passenger information.

Processing Layer – The system processes user requests, searches available flights, and handles booking and payment operations.

Output Layer – Displays results such as flight details, booking confirmation, and payment status.

3.2 Data Flow Diagram (DFD)

The Data Flow Diagram shows how data moves through the system:

User provides input (search details)

System processes the request

Database stores and retrieves data

Output is displayed to the user

4.METHODOLOGY

The methodology of the Sky Portal Reservation Platform describes the step-by-step process used to design and implement the system. The system follows a modular approach, where each module performs a specific function to ensure smooth operation and easy maintenance.

4.1 Modules

- The system is divided into the following modules:
- Users create an account and log in securely to access the system.
- Users enter source, destination, and date to search for available flights.

- Users select a flight and enter passenger details to confirm booking.
- Users can choose their preferred meal (Veg / Non-Veg) during booking.
- Users can pay the ticket amount either fully or in installments (EMI).

4.2 System Flow

- The overall workflow of the system is as follows:
- User logs into the system
- Searches for available flights
- Selects a suitable flight
- Enters passenger details
- Chooses food options
- Selects payment method (Full / EMI)
- Completes booking
- Receives confirmation

5. IMPLEMENTATION

The implementation of the Sky Portal Reservation Platform involves developing a web-based application using modern technologies to ensure efficiency, usability, and performance. The system is designed with both frontend and backend components to handle user interaction and data processing.

5.1 Technologies Used

- Frontend: HTML, CSS, JavaScript
- Backend: Python / PHP
- Database: MySQL

5.2 User Interface

The user interface is designed to be simple and user-friendly. It includes pages for login, flight search, booking, and payment. The layout ensures easy navigation for all users.

5.3 Backend Processing

The backend handles all system operations such as flight search, booking logic, data validation, and payment processing. It ensures that user requests are processed accurately and efficiently.

5.4 Database Management

The database stores important data such as user details, flight information, booking records, and payment status. It helps in maintaining data consistency and retrieval.

5.5 Payment Integration

The system supports both full payment and EMI options, allowing users to choose flexible payment methods. Secure processing ensures safe transactions.

6. LIMITATIONS

Although the Sky Portal Reservation Platform provides an efficient and user-friendly solution for airline booking, it has some limitations.

The system depends on a stable internet connection, and its performance may decrease with slow or unstable networks. It currently supports only basic security features, and advanced security mechanisms can be further improved to ensure higher data protection.

The platform is designed mainly for web usage, and it does not include a dedicated mobile application, which may limit accessibility for some users. Additionally, the system handles standard booking operations but does not include advanced features such as real-time flight tracking or AI-based recommendations.

7. ADVANTAGES

The Sky Portal Reservation Platform offers several advantages that improve the airline booking experience:

1/ Easy to Use

The system provides a simple and user-friendly interface, making it easy for users to book tickets.

2. Time Saving

Users can search and book flights quickly without visiting travel agencies.

3.Flexible Payment

The EMI option allows users to pay ticket fares in installments.

4.Integrated Food Selection

Users can choose their preferred meals during the booking process.

5.Real-Time Booking

The system provides instant availability and booking confirmation.

8. DESIGN

The design of the Sky Portal Reservation Platform focuses on creating a simple, efficient, and user-friendly system. It defines how different components of the system are organized and how they interact with each other.

8.1 System Architecture

The system follows a three-layer architecture:

Presentation Layer (Frontend)

Handles user interaction through web pages such as login, search, booking, and payment.

Application Layer (Backend)

Processes user requests, manages booking logic, and handles payment operations.

Data Layer (Database)

Stores user details, flight information, booking records, and payment data.

8.2 Interface Design

The user interface is designed to be simple and easy to navigate. It includes:

- Login Page
- Flight Search Page
- Booking Page
- Payment Page

8.3 Database Design

The database manages all system data efficiently. Main tables include:

- User Table
- Flight Table
- Booking Table
- Payment Table

8.4 Security Design

Basic security measures are implemented, such as:

- User authentication (login system)
- Data validation
- Secure payment handling

9. RESULTS AND DISCUSSION

9.1 System Results

The Sky Portal Reservation Platform was successfully developed and tested to evaluate its functionality and performance. The system performs all major operations effectively, including user registration, flight search, ticket booking, food selection, and payment processing.

- The results show that:
- The system provides accurate flight search results based on user input.
- Ticket booking is completed quickly with instant confirmation.
- The food selection feature works properly during the booking process.
- The EMI payment option allows users to choose flexible payment methods.
- The system maintains data consistency in storing booking and payment details.
- Overall, the system demonstrates smooth operation and reliable performance under normal conditions.

9.2 Discussion

The developed system improves the traditional airline booking process by integrating multiple features into a single platform. Compared to existing systems, it provides a more user-friendly interface and flexible payment options, which enhance user satisfaction. The inclusion of EMI

payment and food selection features addresses key limitations found in many current systems. The system also shows good performance in terms of speed and ease of use .However, certain limitations exist. The system depends on internet connectivity, and advanced features such as real-time tracking and enhanced security can be added in future versions.

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