A

Mini Project Report

on

Airwings: The Pinnacle of Flight Reservation

Submitted in partial fulfillment of the requirements for the

degree

Second Year Engineering – Computer Science & Engineering (Data Science)

by

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Academic year: 2024-25

CERTIFICATE

This to certify that the Mini Project report on **Airwings : Airline Management System** has been submitted by **Nihar Chavan (23107012)**, **Aryan Madhavi (23107024), Shreepad Haldankar (23107031)** and **Anish Dighe (23107008)** who are bonafide students of A. P. Shah Institute of Technology, Thane as a partial fulfillment of the requirement for the degree in **Computer Science Engineering (Data Science)**, during the academic year **2024-2025** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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1.

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Date:

ACKNOWLEDGEMENT

This project would not have come to fruition without the invaluable help of our guide **Mr. Vaibhav Yavalkar**. Expressing gratitude towards our HoD, **Ms. Anagha Aher**, and the Department of Computer Science Engineering (Data Science) for providing us with the opportunity as well as the support required to pursue this project. We would also like to thank our project coordinator **Ms. Rajashri Chaudhari and Mr. Vaibhav Yavalkar** who gave us his/her valuable suggestions and ideas when we were in need of them. We would also like to thank our peers for their helpful suggestions.

TABLE OF CONTENTS

Chapter 1

Introduction

The Airwings Airline Reservation System is a robust software application developed in Java, designed to facilitate the booking and management of airline tickets. This system aims to streamline the reservation process for both customers and airline staff, enhancing overall efficiency and user experience. Featuring a user-friendly interface, the application allows users to easily search for flights, view schedules, and make bookings. Real-time flight availability ensures that customers can secure seats on their preferred journeys, while integrated customer management features enable users to create profiles, view booking history, and manage personal information.

1.1. Purpose:

The purpose of the Airwings Airline Reservation System is to provide a comprehensive and efficient platform for managing airline bookings and reservations. It aims to streamline the travel process, from searching for flights to making secure payments, thereby enhancing the user experience for both travelers and airline staff. Key objectives include increasing efficiency by automating the reservation process to minimize the time and effort required for booking tickets. The system also prioritizes accessibility, allowing users to easily search for flights, check availability, and manage their bookings from a single platform.

1.2. Problem Statement:

In the rapidly evolving travel industry, traditional airline booking methods often lead to inefficiencies, customer frustration, and lost revenue opportunities. Current systems may lack real-time availability, making it difficult for customers to find and secure flights promptly. Manual booking processes are prone to errors and can result in poor user experiences, including long wait times and complicated cancellation procedures. Additionally, airline staff face challenges in managing bookings, monitoring flight schedules, and generating reports, which hinders operational efficiency.

1.3. Objectives:

The objectives of the Airwings Airline Reservation System focus on enhancing the overall efficiency and user experience of airline bookings. Primarily, the system aims to automate the reservation process, significantly reducing the time and effort required for customers to book tickets. It seeks to provide an easy-to-use interface that allows users to effortlessly search for flights, check availability, and manage their bookings. Flexibility is also a key objective, as the system will enable users to modify or cancel their reservations, accommodating any changes in travel plans. Security is paramount; thus, the system will implement secure payment processing to protect user data and financial transactions.

1.4. Scope:

The scope of the Airwings Airline Reservation System encompasses a wide range of functionalities aimed at improving the airline booking experience for both customers and staff. It includes features such as flight search and booking, real-time availability checks, and secure payment processing, making it easy for users to plan and manage their travel. The system will also provide customer account management capabilities, allowing users to create profiles, view booking history, and handle modifications or cancellations with ease. For airline staff, the system will offer administrative tools for managing flight schedules, monitoring bookings, and generating reports, facilitating efficient operations. Additionally, the scope includes ensuring data security and compliance with industry standards, as well as providing scalability to accommodate future growth in user numbers and additional features.

Chapter 2

Proposed System

The proposed Airwings Airline Reservation System is designed to be a comprehensive solution that addresses the current challenges faced in airline booking processes. Built using Java and leveraging a MySQL database, the system will provide a user-friendly interface for customers to effortlessly search for flights, check real-time availability, and make secure reservations. It will feature a robust customer management module that allows users to create and manage their profiles, view booking histories, and handle modifications or cancellations easily. For airline staff, the system will include an administrative dashboard that streamlines operations by providing tools for managing flight schedules, monitoring bookings, and generating insightful reports. Security will be a top priority, with integrated payment processing that ensures the protection of user data and transactions.

2.1. Features and Functionality:

- **User-Friendly Interface:** Intuitive design for easy navigation and booking.
- **Flight Search and Booking:** Allows users to search for available flights based on criteria like destination, date, and number of passengers.
- **Real-Time Availability:** Displays current availability of seats to ensure accurate booking options.
- **Customer Account Management:** Enables users to create and manage profiles, view booking history, and update personal information.
- **Booking Modification and Cancellation**: Allows users to easily change or cancel their bookings as needed.
- **Admin Handles**: Provides airline staff with tools for managing flight schedules, monitoring bookings, and generating reports.
- **Reporting and Analytics**: Offers insights into booking trends, revenue, and customer behaviour for better decision-making.

Chapter 3

Project Outcomes

Developing an airline management system like "Airwings" can lead to several significant outcomes. Firstly, you'll enhance your understanding of object-oriented programming, learning to design and implement classes effectively. Additionally, you'll gain valuable experience in database management, particularly using JDBC to handle data operations, which includes connecting to databases, executing queries, and ensuring data integrity. The project will also help you improve your user interface development skills, whether through a console-based application or a graphical user interface. You'll engage in real-world problem solving by addressing challenges related to flight management, booking processes, and user authentication. Throughout this process, you'll experience project management, from planning and development to testing and deployment.

Moreover, you'll learn the importance of error handling and input validation to create a stable and reliable system. Documenting your work will provide a comprehensive reference for future users and developers. If working in a team, you'll enhance your collaboration skills, learning to divide tasks and integrate components effectively. Additionally, you'll familiarize yourself with testing practices, ensuring your application functions correctly through unit and integration testing. Following best coding practices and design patterns will further solidify your development skills. Ultimately, you'll create a substantial project for your portfolio, showcasing your abilities and enhancing your employability.

Chapter 4

Software Requirements

The Airwings: Airline Reservation System project requires specific software for development and deployment, as follows:

- **Java Development Kit (JDK):** Provides the libraries and tools needed for developing the java-based front end of the system.
- **NetBeans IDE:** Used for writing, testing, and debugging Java code, Netbeans offers an integrated environment to streamline development processes.
- **MySQL Database Server:** Manages and Stores Flight and Passenger data, handling SQL queries and Transactions for backend operations.
- **MySQL Workbench:** A graphical tool for database design, management, and maintenance, facilitating schema design and query execution.
- **Java Runtime Environment (JRE**): Required to run the Java application on user
- Machines, ensuring smooth operations in the production environment.

Chapter 5

Project Design

This chapter focuses on the architectural and design decisions that shape the system's development, covering both the architecture and the system components.

User Interface Design

- **Main Menu:** Options: Search Flights, Book Flight, View My Bookings, Cancel Booking, Generate Boarding pass.
- **Search Flights:** Prompts for Origin, Destination, and Departure Date, Display of available flights.
- **Booking Flight:** Show selected flight details (Flight Number, Origin, Destination, Departure Time, Available Seats.
- **View My Bookings:** Display of booking details (Booking ID, Flight Number, Flight Code, Status).
- **Cancel Booking:** Input for Booking ID and confirmation prompt for cancellation.
- **Home Page:** Title: "Airwings Airline Management System." Menu Bar: Options for Details, Ticket.
- **Flight Search Panel:** Labels and text fields for Origin, Destination, and Departure Date. Search button and results table for flight options. Book button for selected flights.
- **Booking Panel:** Display of flight details (Flight Number, Origin, Destination, Departure Time, Available Seats). Seat selection options (Dropdown or Radio Buttons). Confirm Booking button.
- **My Journey Panel:** Table displaying all bookings (Booking ID, Flight Number, Seat Number, Status). View Details.

Database Design

The Database is designed to store Passenger Information, login details for user, Reservation, Cancellation, and Customer. The System uses MySQL as the Database.

Users (For adding Details of Them.)

Flights (For Storing the Flights Details like flight name, flight code, flight price, Flight Timings based on their source and destination).

Reservation (For storing Booking Details of Every Passenger With proper PNR Number).

Cancellation Information (For storing cancel details of each Passenger With their cancellation number).

Workflow of Airwings

This block diagram represents the flow of a Airwings airline reservation system. Here's an explanation of the different components and their relationships in Figure 5.1:

1. **Start**: From Here Process begins at the start node of the project Airwings. 2. **Admin and Login Branches**: The diagram splits into two main branches: "Admin" and "Login," indicating two different user roles or functions.

3. **Admin Branch**: Flight Update: The admin can update flight information, such as schedules, prices, or availability.

PNR Generate: This step involves generating the Passenger Name Record (PNR), a unique code that identifies a specific passenger's booking.

4. **Login Branch**: Home Page: After logging in, the user reaches the home page, where different functionalities are accessible.

Details: The user can view or input details about the flight or booking.

Add Customer: The user can add customer information to the booking.

Flight Information: Users can view flight schedules, destinations, and other relevant information.

Book Flight: After entering the required details, the user can book a flight.

Journey Details: Information related to the journey, such as departure, arrival, & details.

Cancellation: Users can cancel a booking if needed.

5. **Ticket and Boarding Pass**: users can access boarding pass from Tickets.

Overall, the diagram depicts the process flow for both the admin and user roles within the system, covering functionalities from updating flight information to booking, issuing tickets, and managing cancellations.

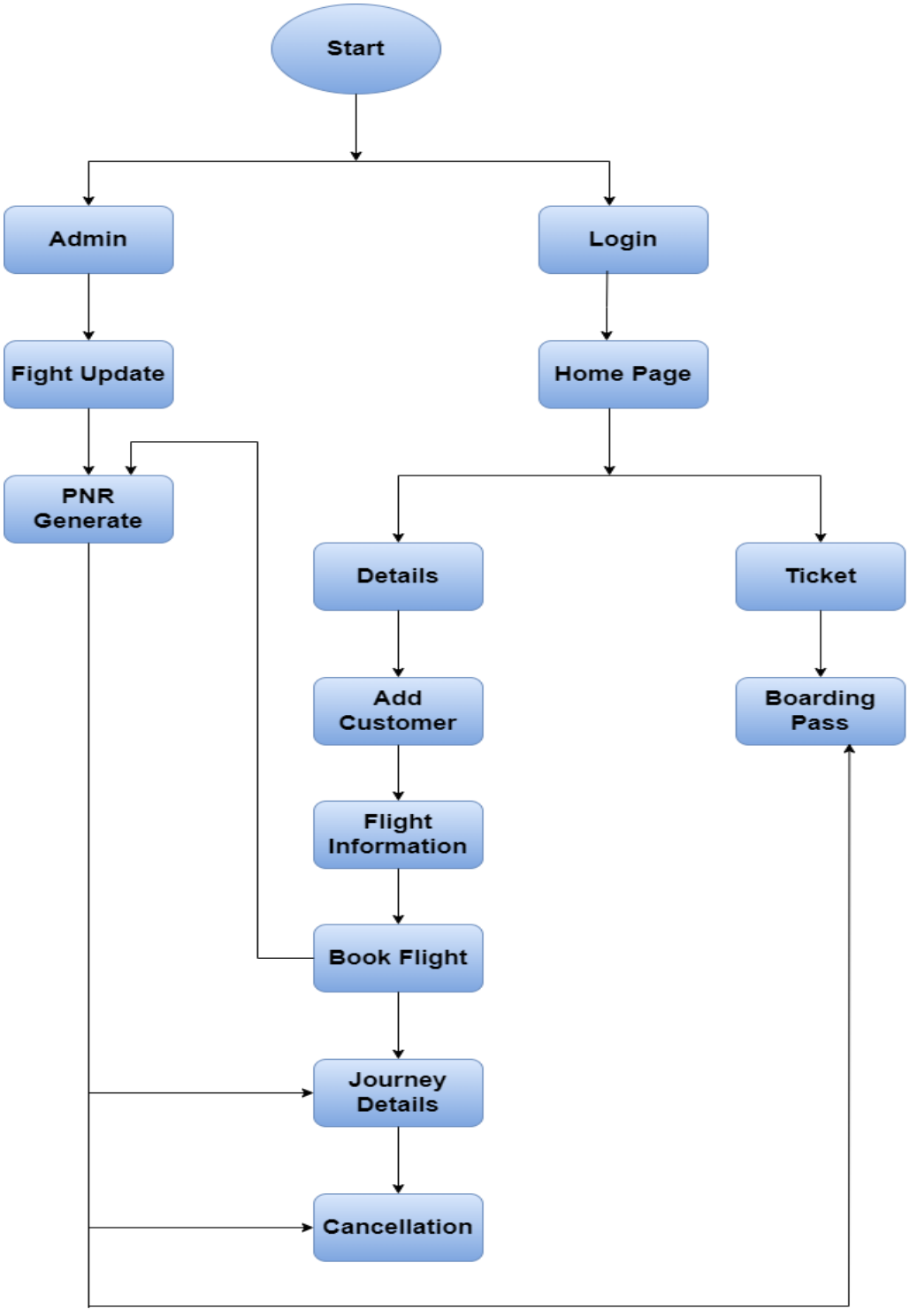


Figure 5.1. Workflow of Airwings: Airline Reservation System

Chapter 6

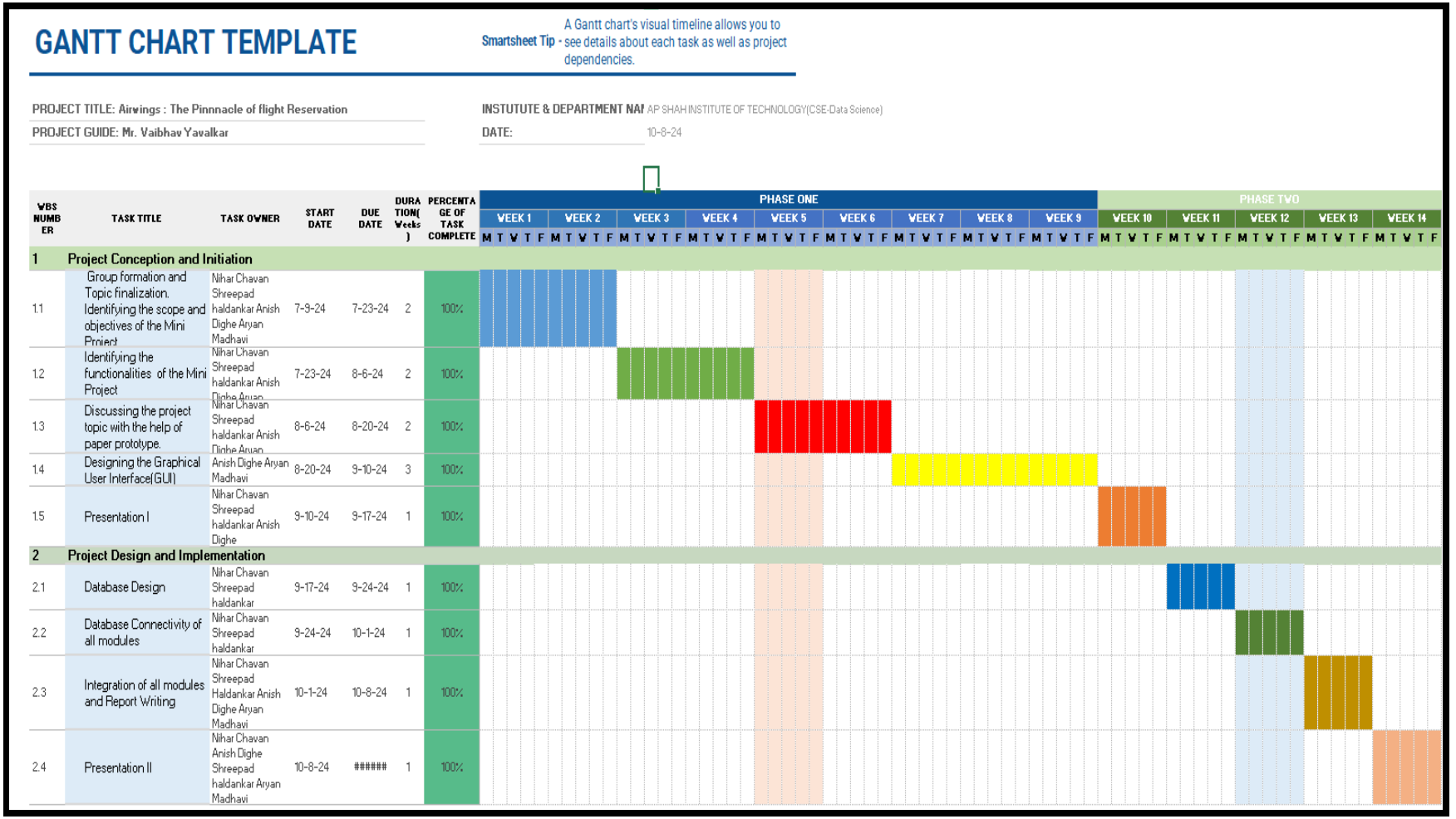
Project Scheduling

Gantt Chart: A Gantt chart is a visual project management tool that displays a timeline of a project. It consists of horizontal bars representing tasks or activities, with the length of each bar corresponding to the duration of the task.

In the second & third week of July, Nihar Chavan, Shreepad Haldankar, Aryan Madhavi, Anish Dighe formed a group for our mini project. We have discussed and finalized the project's topic, scope, and objectives during this meeting. In the following weeks, Nihar Chavan, Shreepad Haldankar, Aryan Madhavi, Anish Dighe used a paper prototype to explore and refine project ideas, completing this phase by the 2nd week of August.

In late August, Aryan Madhavi, Anish Dighe executed the design and integration of the graphical user interface (GUI). Afterward, on 12th of September, the first project review took place, and the faculty suggested some changes to the GUI, which were subsequently approved. Following this, Nihar Chavan, Shreepad Haldankar, Anish Dighe collaborated to create a structured database system, facilitating the systematic storage of information.

This, in turn, made it easier for Nihar Chavan and Shreepad Haldankar to connect the database to the project. This database work was completed by end of September. Finally, the team integrated all modules and completed the report writing, resulting in our final presentation on 8 th october, which was approved by the faculty.



GANTT CHART TEMPLATE

Smartsheet Tip - A Gantt chart's visual timeline allows you to see details about each task as well as project dependencies.

PROJECT TITLE: Airwings : The Pinnnacle of flight Reservation

INSTUTUTE & DEPARTMENT NA: AP SHAH INSTITUTE OF TECHNOLOGY(CSE-Data Science)

PROJECT GUIDE: Mr. Vaibhav Yavalkar

DATE: 10-8-24

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION(Weeks)	PERCENTAGE OF TASK COMPLETE
1	**Project Conception and Initiation**					
1.1	Group formation and Topic finalization. Identifying the scope and objectives of the Mini Project	Nihar Chavan Shreepad haldankar Anish Dighe Aryan Madhavi	7-9-24	7-23-24	2	100%
1.2	Identifying the functionalities of the Mini Project	Nihar Chavan Shreepad haldankar Anish Dighe Aryan	7-23-24	8-6-24	2	100%
1.3	Discussing the project topic with the help of paper prototype.	Nihar Chavan Shreepad haldankar Anish Dighe Aryan	8-6-24	8-20-24	2	100%
1.4	Designing the Graphical User Interface(GUI)	Anish Dighe Aryan Madhavi	8-20-24	9-10-24	3	100%
1.5	Presentation I	Nihar Chavan Shreepad haldankar Anish Dighe	9-10-24	9-17-24	1	100%
2	**Project Design and Implementation**					
2.1	Database Design	Nihar Chavan Shreepad haldankar	9-17-24	9-24-24	1	100%
2.2	Database Connectivity of all modules	Nihar Chavan Shreepad haldankar	9-24-24	10-1-24	1	100%
2.3	Integration of all modules and Report Writing	Nihar Chavan Shreepad Haldankar Anish Dighe Aryan Madhavi	10-1-24	10-8-24	1	100%
2.4	Presentation II	Nihar Chavan Anish Dighe Shreepad haldankar Aryan Madhavi	10-8-24	######	1	100%

PHASE ONE: WEEK 1 WEEK 2 WEEK 3 WEEK 4 WEEK 5 WEEK 6 WEEK 7 WEEK 8 WEEK 9

PHASE TWO: WEEK 10 WEEK 11 WEEK 12 WEEK 13 WEEK 14

M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F M T W T F

Figure 6.1: Gantt Chart

Chapter 7

Results

In the context of the Airwings airline reservation system, "result" refers to the output or feedback provided to users after they perform specific actions or queries within the application.

The Airwings airline reservation system offers several key features to enhance user experience. Users can easily register and log in, with clear messages confirming their success or informing them of errors. The system allows users to search for flights, displaying available options along with important details like flight numbers, departure and arrival times, and available seats. After making a reservation, users receive confirmation that includes their reservation ID and flight information. They can also view their active reservations at any time. For administrators, the system provides functionalities to add, update, or delete flights, along with feedback on the success or failure of these actions. Overall, the design prioritizes simplicity and clarity, ensuring that users can navigate the system effortlessly.

Figure 7.1: Airwings: Airline reservation system: User Login Page

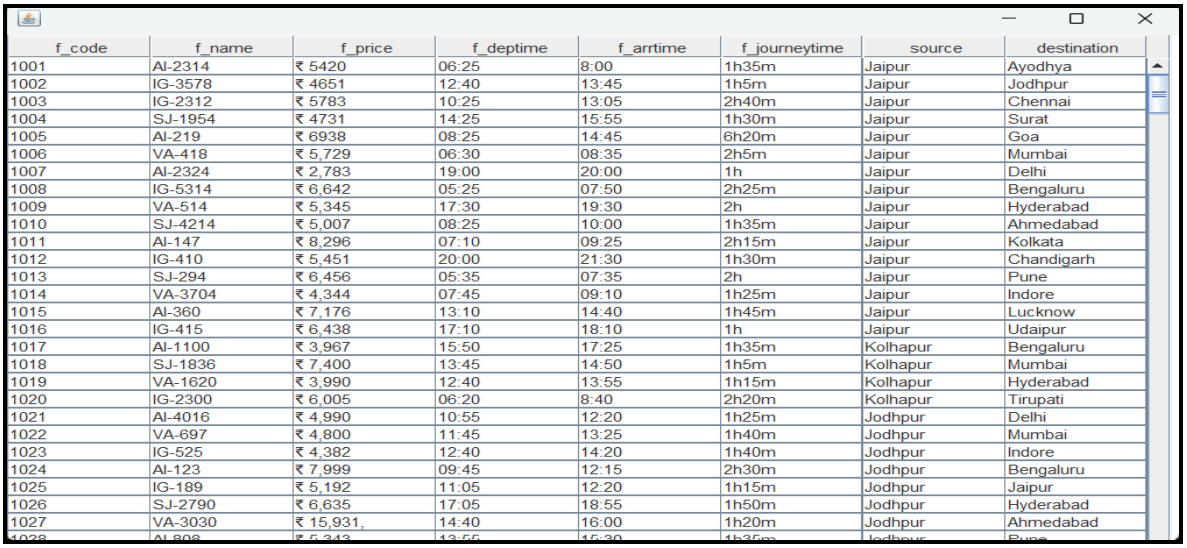
In Figure 7.1. Page showing User Login Page where user can enter their credentials and enters the next page, Home Page.

Figure 7.2: Airwings: Airline reservation system: Home page

In Figure 7.2. This is Dashboard of Airwings, showing buttons of Details & Ticket for the user.

Figure7.3: Airwings: Airline reservation system: Add Passenger

In Figure 7.3. This is Add Passenger page where user can fill his personal details.



f_code	f_name	f_price	f_deptime	f_arrtime	f_journeytime	source	destination
1001	AI-2314	₹ 5420	06:25	8:00	1h35m	Jaipur	Ayodhya
1002	IG-3578	₹ 4651	12:40	13:45	1h5m	Jaipur	Jodhpur
1003	IG-2312	₹ 5783	10:25	13:05	2h40m	Jaipur	Chennai
1004	SJ-1954	₹ 4731	14:25	15:55	1h30m	Jaipur	Surat
1005	AI-219	₹ 6938	08:25	14:45	6h20m	Jaipur	Goa
1006	VA-418	₹ 5,729	06:30	08:35	2h5m	Jaipur	Mumbai
1007	AI-2324	₹ 2,783	19:00	20:00	1h	Jaipur	Delhi
1008	IG-5314	₹ 6,642	05:25	07:50	2h25m	Jaipur	Bengaluru
1009	VA-514	₹ 5,345	17:30	19:30	2h	Jaipur	Hyderabad
1010	SJ-4214	₹ 5,007	08:25	10:00	1h35m	Jaipur	Ahmedabad
1011	AI-147	₹ 8,296	07:10	09:25	2h15m	Jaipur	Kolkata
1012	IG-410	₹ 5,451	20:00	21:30	1h30m	Jaipur	Chandigarh
1013	SJ-294	₹ 6,456	05:35	07:35	2h	Jaipur	Pune
1014	VA-3704	₹ 4,344	07:45	09:10	1h25m	Jaipur	Indore
1015	AI-360	₹ 7,176	13:10	14:40	1h45m	Jaipur	Lucknow
1016	IG-415	₹ 6,438	17:10	18:10	1h	Jaipur	Udaipur
1017	AI-1100	₹ 3,967	15:50	17:25	1h35m	Kolhapur	Bengaluru
1018	SJ-1836	₹ 7,400	13:45	14:50	1h5m	Kolhapur	Mumbai
1019	VA-1620	₹ 3,990	12:40	13:55	1h15m	Kolhapur	Hyderabad
1020	IG-2300	₹ 6,005	06:20	8:40	2h20m	Kolhapur	Tirupati
1021	AI-4016	₹ 4,990	10:55	12:20	1h25m	Jodhpur	Delhi
1022	VA-697	₹ 4,800	11:45	13:25	1h40m	Jodhpur	Mumbai
1023	IG-525	₹ 4,382	12:40	14:20	1h40m	Jodhpur	Indore
1024	AI-123	₹ 7,999	09:45	12:15	2h30m	Jodhpur	Bengaluru
1025	IG-189	₹ 5,192	11:05	12:20	1h15m	Jodhpur	Jaipur
1026	SJ-2790	₹ 6,635	17:05	18:55	1h50m	Jodhpur	Hyderabad
1027	VA-3030	₹ 15,931,	14:40	16:00	1h20m	Jodhpur	Ahmedabad

Figure 7.4: Airwings: Airline reservation system: Flight Details

In Figure 7.4. This is Flight Details page where user can see the details of Flights that are available.

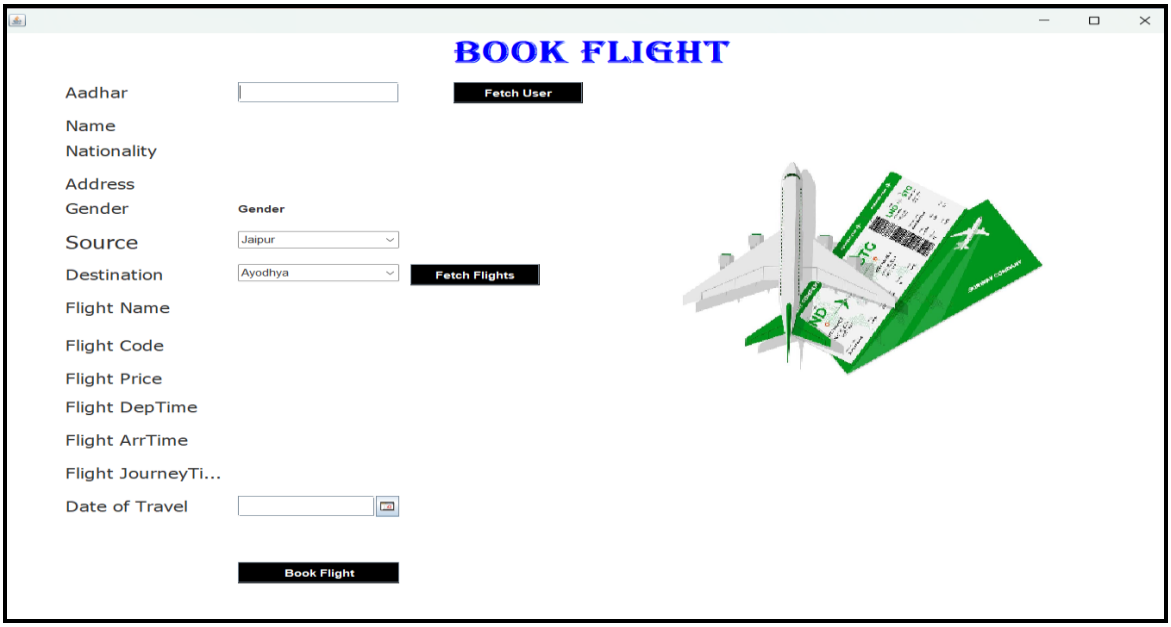


Figure 7.5: Airwings: Airline reservation system: Flight Booking

In Figure 7.5. This is Book Flight Page where user can book flights using Personal details with Aadhar user fetch details & book flights.

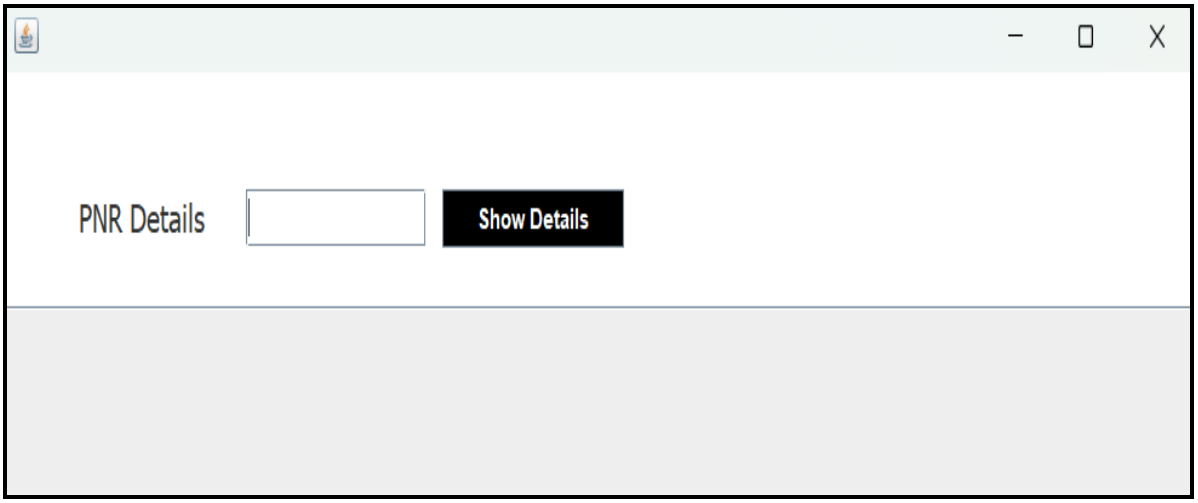


Figure 7.6: Airwings: Airline reservation system: Journey Details

In Figure 7.6. User can enter their PNR Details of Flight and View Journey Details.

Figure 7.7: Airwings: Airline reservation system: Ticket Cancellation

In Figure 7.7. If User want to cancel his flights using this page with PNR Details of Tickets.

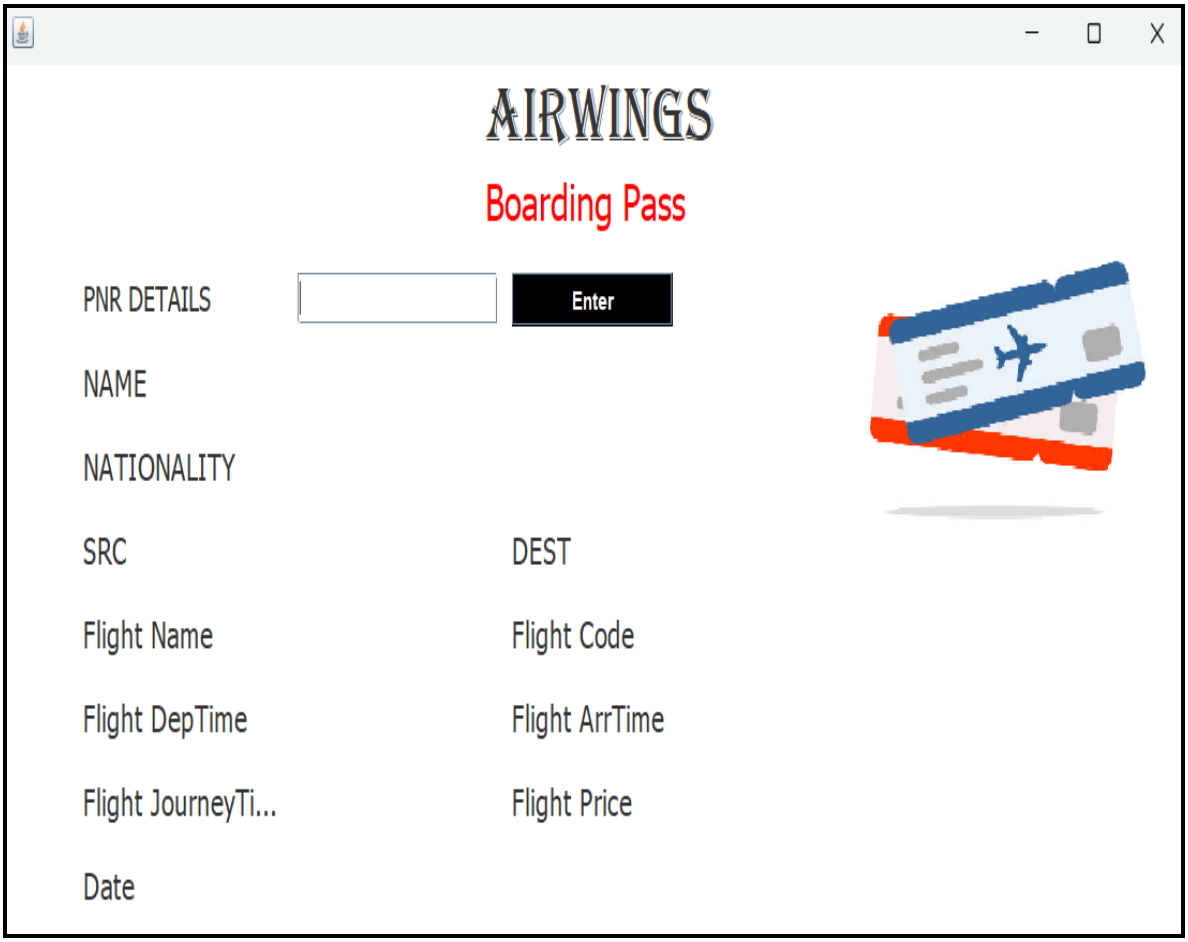


Figure 7.8: Airwings: Airline reservation system: Boarding Pass

In Figure 7.8. User can Mention his PNR Details & Generate his boarding pass using this page.

Chapter 8

Conclusion

In conclusion, the database design for the "Airwings" airline management system provides a robust framework to manage essential data related to users, flights, and bookings. By structuring the database with clearly defined tables-Users, Flights, and Bookings we ensure that all necessary information is efficiently stored and easily accessible.

The design incorporates important relationships, such as the one-to-many connections between users and their bookings, as well as flights and their associated bookings, promoting data integrity and facilitating seamless interactions within the system. Additionally, the implementation of indexes and constraints enhances performance and safeguards against data inconsistencies. Overall, this well-organized database design supports the system’s functionality, enabling efficient management of airline operations, user interactions, and booking processes. It lays a solid foundation for further development and scaling, ensuring that "Airwings" can meet the demands of users and administrators alike in a user-friendly and reliable manner.

Moreover, the clear separation of concerns in the database schema facilitates easier maintenance and updates. For instance, if additional features are introduced—such as loyalty programs, payment processing, or advanced reporting—the existing structure can be expanded with minimal disruption to current operations. New tables can be added or existing tables modified to accommodate new requirements, ensuring flexibility as the system evolves.

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