Software Design Document

for

Airline Reservation System

Version 1.0

Prepared by

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Course:	**Software Engineering**
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1. INTRODUCTION

1.1 Purpose

This software design document describes the architecture and system design of the Airline Reservation System project, which helps the customers to search the availability and prices of various airline tickets.
The purpose of the Software Design Document is to provide a description of the design of a system fully enough to allow for software development to proceed with an understanding of what is to be built and how it is expected to built.

1.2 Scope

This project designs and implements ARS to fulfill all the vision statements. The Airline Reservation System project is an implementation of a Airline Ticketing website. This project also covers various features like online registration of the users, reports generation, as well as managing all the data.
In general, this website shall be designed to perform like any other airline ticketing website available online.
Subject facet: User Interface, Searching one-way flights, Searching round trip flights, Searching multiple destinations, Flight reservations, Reservation cancellation, Online payment, Request and response for reservation cancellation, Displaying warning messages.
Usage facet: Searching, Sorting of flights, Reservation of tickets, Managing existing reservation, Managing flight details, Keeping the flights up to date.
IT facet: Database, Web-based software system, AAS for logins, Performance maintenance.
Development facet: Internal policy and culture of the airlines company should be taken under consideration.

1.3 Overview

For this particular Software Design Document, the focus is placed on the architecture and the design of the application. In this section you can find general information about the project, such as the purpose and the scope. The remainder of this document consist of six chapters:

- *SYSTEM OVERVIEW - gives general description of the functionality, context and design of your project*
- *SYSTEM ARCHITECTURE - describes the architectural style and includes subsystem diagrams.*
- *DATA DESIGN - describes how the major data is stored and lists the database and each class's attributes and methods.*
- *COMPONENT DESIGN*
- *HUMAN INTERFACE DESIGN - describes the functionality of the system from the user's perspective and displays schemes showing the interface.*

- *REQUIREMENTS MATRIX*

1.4 Reference Material

1. IEEE Software Engineering Standards Committee, "IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications", October 20, 1998.
2. https://online.visual-paradigm.com/
3.https://www.visual-paradigm.com/guide/data-flow-diagram/what-is-data-flow-diagram/
4.https://www.coursehero.com/file/p51lrjg4/Explain-how-the-user-will-be-able-to-use-your-system-to-complete-all-the/

1.5 Definitions and Acronyms

Definitions

#	Term	Definition
1	User	Someone who interacts with the web application
2	Admin/Administrator	System administrator who is given specific permission for managing and controlling the system
3	Web-Portal	A web application which present special facilities for the airline company and admin.
4	Stakeholder	Any person who has interaction with the system who is not a developer

Acronyms

#	Acronym	Meaning
1	ARS	Airline Reservation System
2	AAS	Authentication and Authorization System
3	IEEE	The Institute of Electrical and Electronics Engineers
4	SDD	Software Design Document
5	DFD	Data Flow Diagram

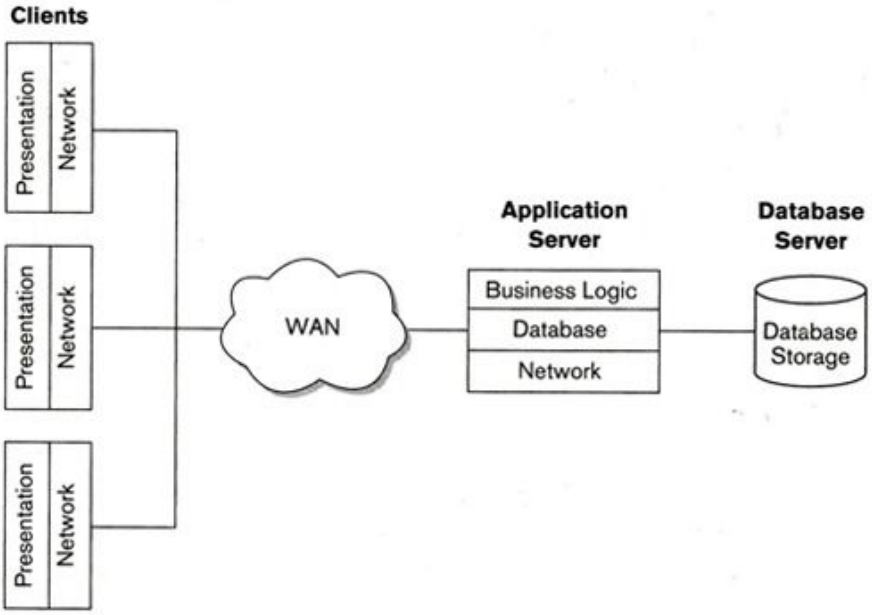
2. SYSTEM OVERVIEW

The Airline Reservation System Project will provide the following functions:

- *Flight Booking System: The system allows the customers to search for flights that are available between two cities for a particular date. It gives the list of available flights and allows the users to choose a ticket and make a reservation if there are seats available. The customers can also cancel reservations.*
- *User Accounts System: Creating and maintaining an online account on the system, in order to see status and updates on booked flights. A user can login into his account by providing its authorised username and password and alternatively a new user can register into the system and hence become and authorised user.*

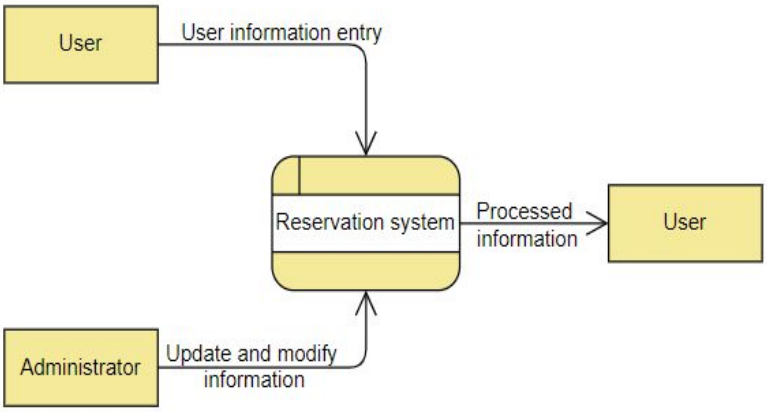
3. SYSTEM ARCHITECTURE

3.1 Architectural Design

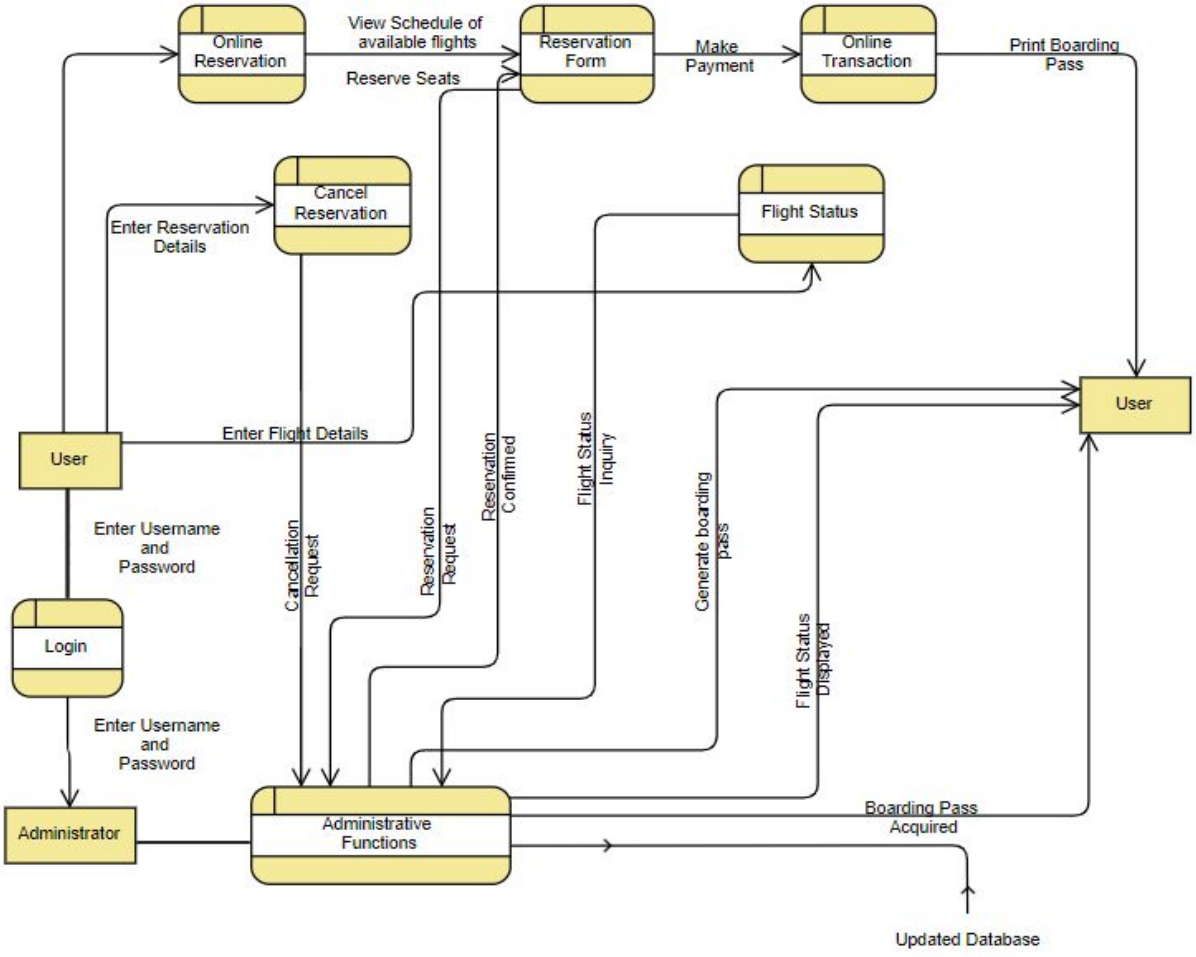


3.2 Decomposition Description

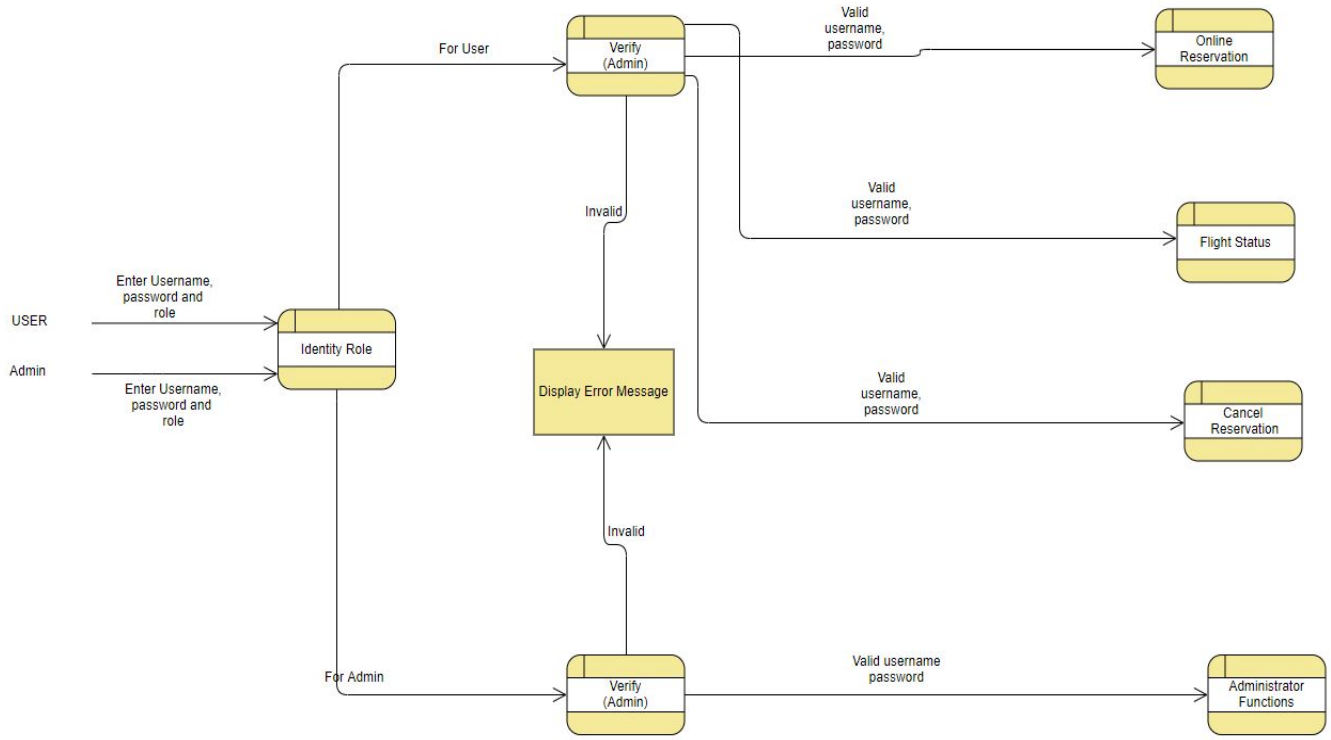
Context level



Level -1 DFD

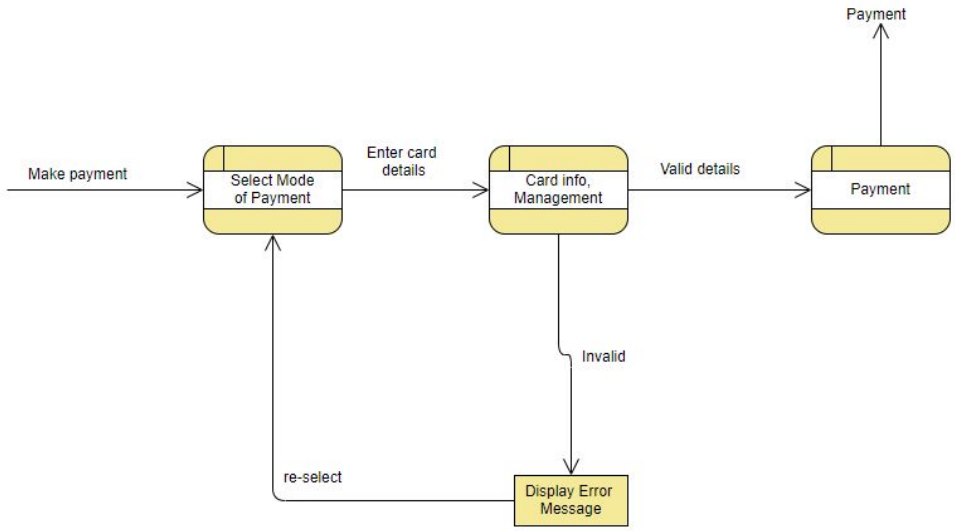

Online Reservation
View Schedule of available flights
Reserve Seats
Reservation Form
Make Payment
Online Transaction
Print Boarding Pass
Cancel Reservation
Enter Reservation Details
Flight Status
User
Enter Flight Details
Enter Username and Password
Login
Cancellation Request
Reservation Request
Reservation Confirmed
Flight Status Inquiry
Generate boarding pass
Flight Status Displayed
Enter Username and Password
Administrator
Administrative Functions
Boarding Pass Acquired
Updated Database

Level -2 DFD of login

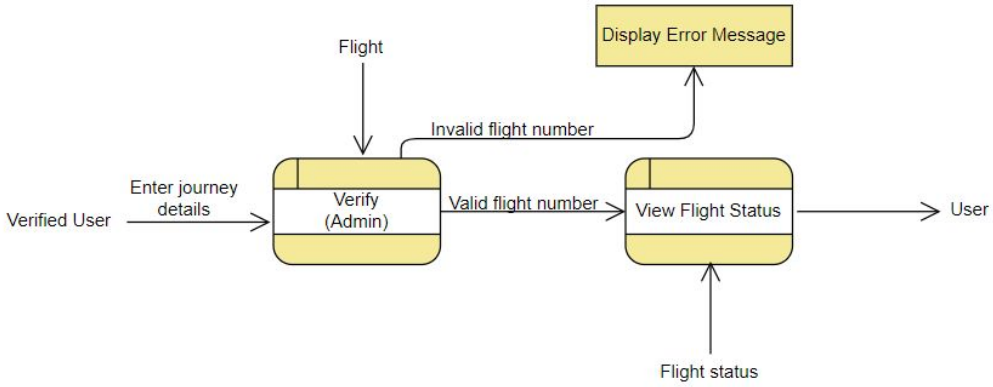


Level -2 DFD of online reservation

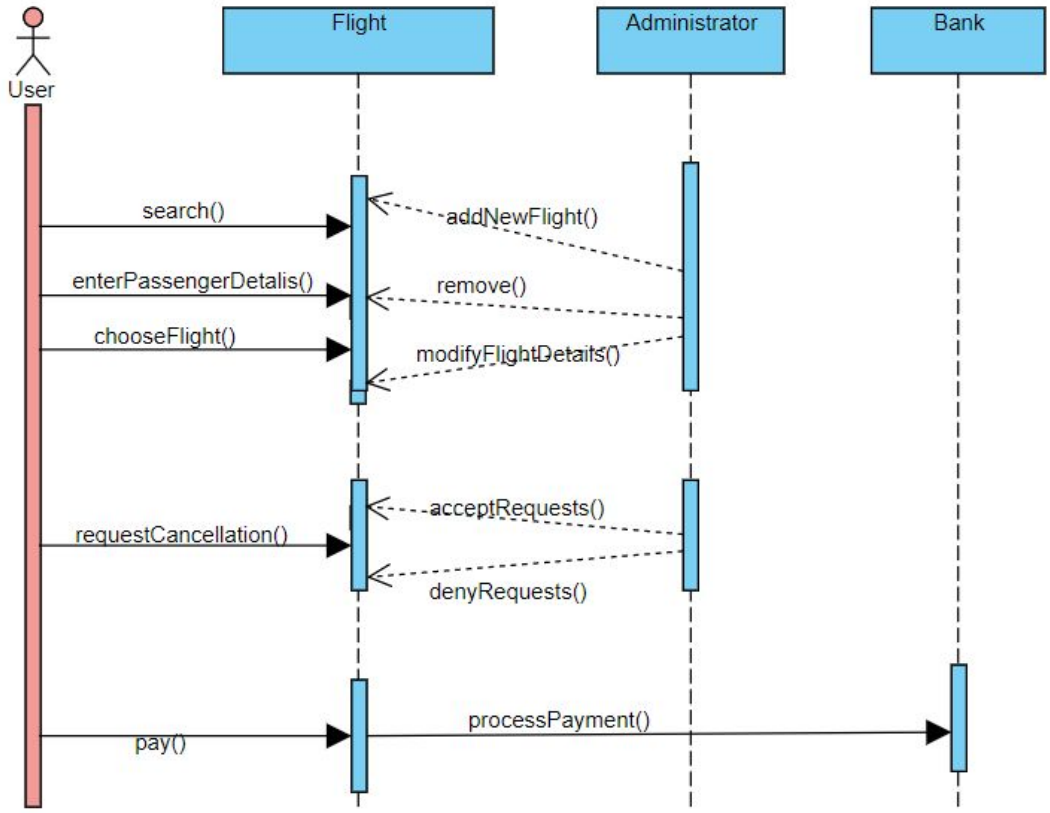
Level -2 DFD of online transaction



Level -2 DFD of web check-in



Sequence Diagram

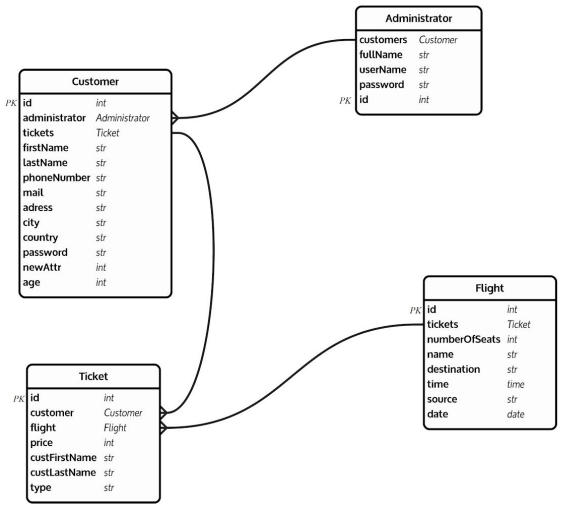


3.3 Design Rationale

The algorithm is developed as flow chart and the data flow diagrams, to describe the stepwise procedure of the application.The requirements should all be covered in this algorithm.

4. DATA DESIGN

4.1 Data Description



4.2 Data Dictionary

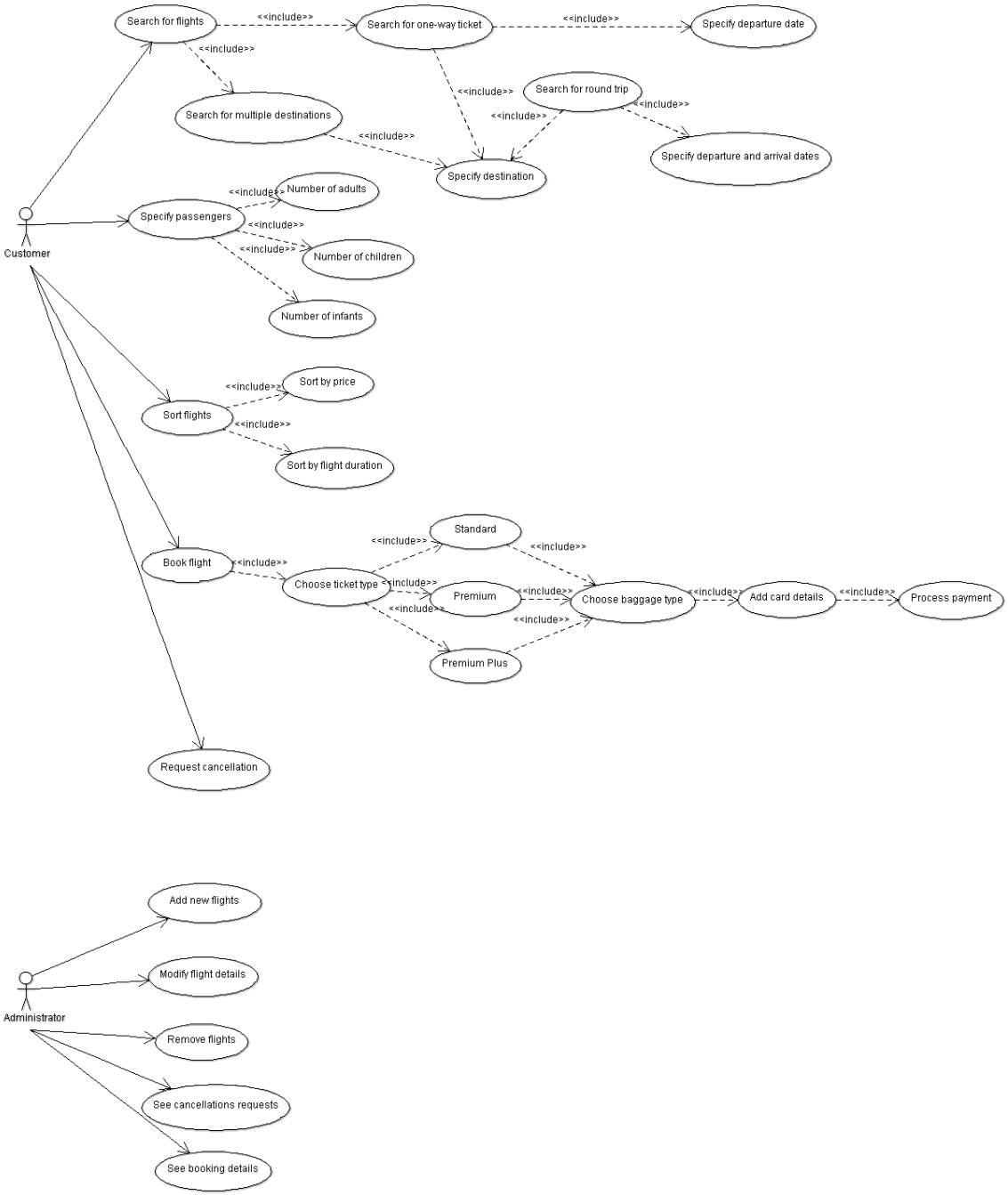
Administrator:
-fullName
-userName
-password
Methods*:*
-Login()
-AddFlight()
-AcceptRequest()
-DenyRequest()
-GetFlightInfo()
-CheckAvailability()
-Logout()

***Customer**:*
-firstName
-lastName
-phoneNumber
-mail
-address
-city
-country
-password
-age
Methods*:*
-SearchFlight()
-SelectTicket()
-BookFlight()
-AddCardDetails()
-Pay()
-RequestForCancellation()
-AddPassengerDetails()

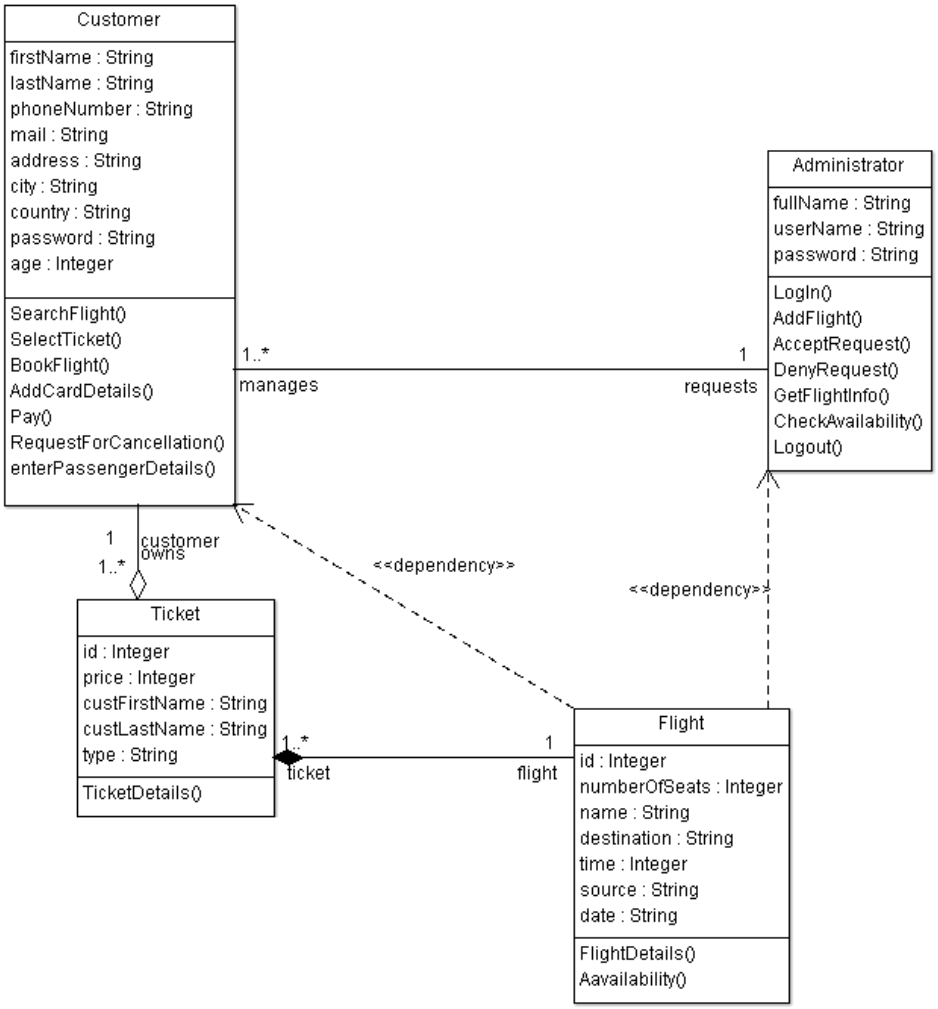
***Flight**:*
-id
-numberOfSeats
-name
-destination
-time
-source
-date
Methods*:*
-FlightDetails()
-Availability()

***Ticket**:*
-id
-price
-custFirstName
-custLastNAme
-type
Methods*:*
-TicketDetails()

5. COMPONENT DESIGN



Use Case Diagram



Class Diagram

6. HUMAN INTERFACE DESIGN

6.1 Overview of User Interface

When a user accesses the web application, he/she will see the home page, containing a search form, a list of cheap flights/ deals.
If the user does not have an account, he/she can sign up by clicking the Sign in/ Create an account button. This will redirect the user to the Register page. Otherwise, if the user already has an account, he/she can enter the username and password and the customer will be redirected to the Account page. Here, customers can see the list of their reservations. They can manage flights or request a cancellation.
When searching for a flight, an unregistered user can only see the duration and the remaining number of seats for the price. To complete a booking, the user needs to have an account. If that is the case, the user will be redirected to the Reservation page, where he/she will complete the required fields with the personal data of the passengers and payment details, as well as choosing the type of luggage. On this page they can also see a summary of the flight, including the number of seats, source and destination, baggage and price.
The web application will also have a Contact page, where users will be able to get in touch with the company, and a Blog page, where users will see the latest news.

6.2 Screen Images

The user will see the home page when accessing the web application. (Figure 1)

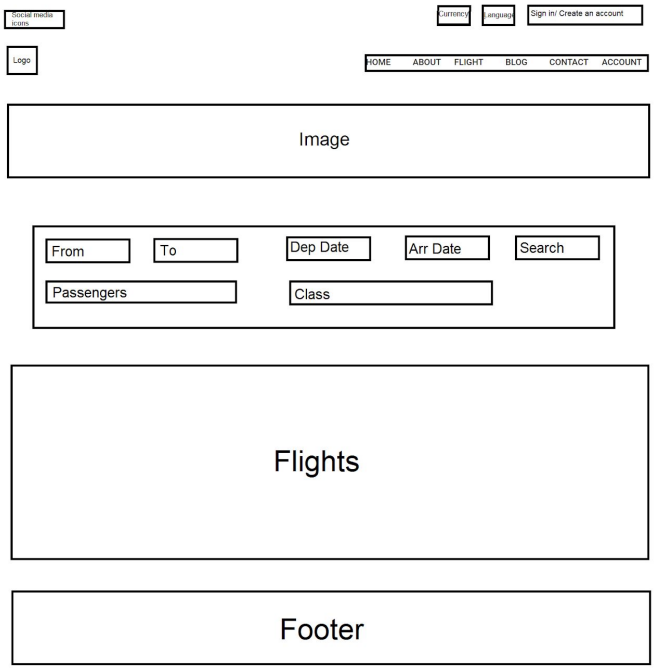


Figure 1

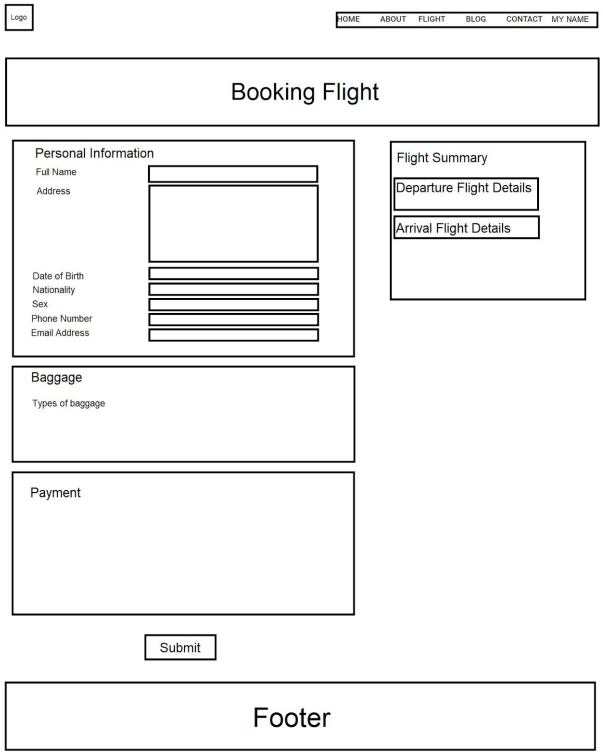


Figure 2

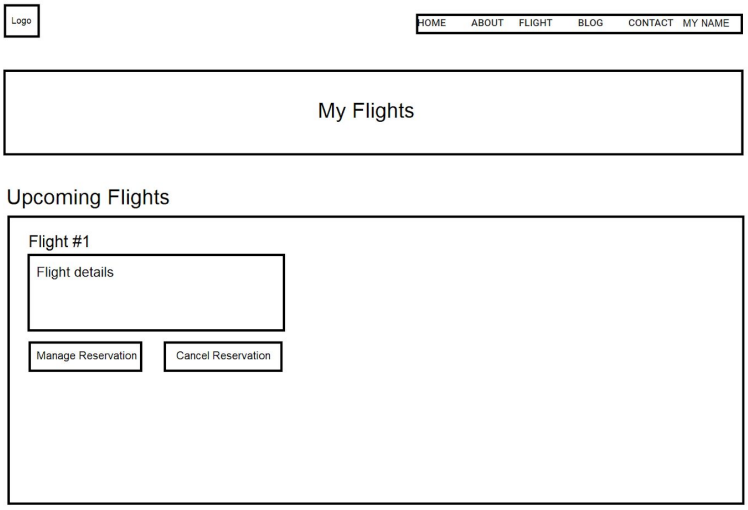


Figure 3

The user needs to have an account to be able to book tickets and manage reservations. The page where the customer will complete a reservation is shown in Figure 2. The customers will have a profile page where they can manage reservations (Figure 3).

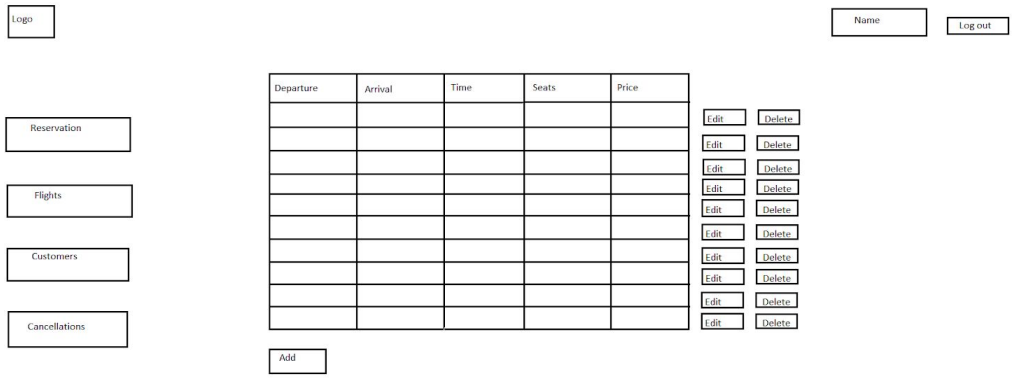


Figure 4

The interface of the administrator showing the list of flights. The administrator can add, edit and delete flights. He/ she can also see the list of reservations, clients and cancellations. (Figure 4)

6.3 Screen Objects and Actions

All the pages that the customer has access to contain a navigation bar. It contains the logo of the airline company, which links to the home page; About, which goes to the general information page, where the users can see instructions on how to make a reservation and more frequently asked questions; Flights, which goes to the Flight page, where users can see a list of upcoming flights; Blog, which redirects the users to the News page; Contact, which redirects users to the Contact page; My Account, which redirects users to the Register page, where they can either login or create an account.

The home page contains a search form, where users can add the details of the desired flight and press the Search button.

If the user is registered, they can choose one or more flights that match the search filters and add them to the reservation by pressing the <<Choose ticket type>> and <<Add>> buttons.

The Contact page contains a button which allows users to send the form to the company.

The application also includes an interface for the administrator, which has buttons allowing the administrator to manage Reservations, Flights, Customers and Cancellations. Each table has buttons to create, edit and delete fields.

7. REQUIREMENTS MATRIX

Scenarios:
S1: Customer wants to search for flights.
S2: Customer wants to see flight prices of different ticket types.
S3: Customer wants to sort available flights according to price.
S4: Customer wants to proceed to payment for booked flight
S5: Customer wants to cancel his/ her booked ticket.
S6: Administrator wants to modify the details about existing flights.
S7: Administrator wants to remove cancelled flights.
S8: Administrator wants to respond to cancellation requests of customers.
S9: Administrator wants to log on the system.

Class/Scenarios	Customer	Ticket	Administrator	Flight	S1	S2	S3	S4	S5	S6	S7	S8	S9
SRS													
FR1	X												
FR2	X												
FR3	X				based_on								
FR4	X					based_on	based_on						
FR5	X												
FR6	X								based_on				
FR7	X							based_on					
FR8			X										
FR9			X										based_on
FR10			X							based_on	based_on		
FR11			X									based_on	