



American International University- Bangladesh

SOFTWARE REQUIREMENT ENGINEERING Section: D

Air Ticket Booking Management System

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1. INTRODUCTION

1.1 PURPOSE

The purpose of this document is to build an online system to manage flights and passengers to ease the flight management.

1.2 DOCUMENT CONVENTIONS

DB	Database
DDB	Distributed Database
ER	Entity Relationship

This document uses the following conventions.

1.3 INTENDED AUDIENCE AND READING SUGGESTIONS

This project is a prototype for the flight management system.This project is useful for the flight management team and as well as to the passengers.

1.4 PROJECT SCOPE

The purpose of the online flight management system is to ease flight management and to create a convenient and easy-to-use application for passengers, trying to buy airline tickets. The system is based on a relational database with its flight management and reservation functions. We will have a database server supporting hundreds of major cities around the world as well as thousands of flights by various airline companies. Above all, we hope to provide a comfortable user experience along with the best pricing available.

1.5 REFERENCES

<https://flightbooking.com>

2. OVERALL DESCRIPTION

2.1 PRODUCT PERSPECTIVE

A distributed airline database system stores the following information.

Flight details:

It includes the originating flight terminal and destination terminal, along with the stops in between, the number of seats booked/available seats between two destinations etc.

Customer description:

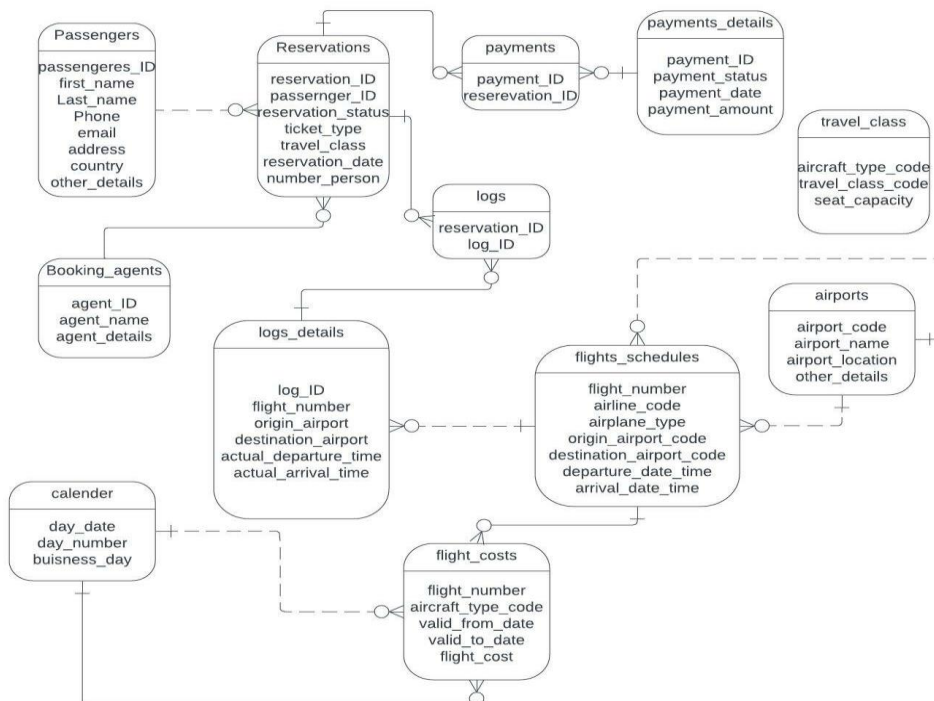
It includes customer code, name, address and phone number. This information may be used for keeping the records of the customer for any emergency or for any other kind of information.

Reservation description:

It includes customer details, code number, flight number, date of booking, date of travel.

2.2 PRODUCT FEATURES

The major features of airline database system as shown in below entity–relationship model



2.3 USER CLASS and CHARACTERISTICS

Users of the system should be able to retrieve flight information between two given cities with the given date/time of travel from the database. A route from city A to city B is a sequence of connecting flights from A to B such that: a) there are at most two connecting stops, excluding the starting city and destination city of the trip, b) the connecting time is between one to two hours. The system will support two types of user privileges, Customer, and Employee. Customers will have access to customer functions, and the employees will have access to both customer and flight management functions. The customer should be able to do the following functions:

Make a new reservation

- One-way
- Round-Trip
- Multi-city
- Flexible Date/time
- Confirmation

Cancel an existing reservation

View his itinerary

The Employee should have following management functionalities:

CUSTOMER FUNCTIONS.

- Get all customers who have seats reserved on a given flight.
- Get all flights for a given airport.
- View flight schedule.
- Get all flights whose arrival and departure times are on time/delayed.
- Calculate total sales for a given flight.

ADMINISTRATIVE

- Add/Delete a flight
- Add a new airport
- Update fare for flights.
- Add a new flight leg instance.
- Update departure/arrival times for flight leg instances.

Each flight has a limited number of available seats. There are a number of flights which depart from or arrive at different cities on different dates and time.

2.4 OPERATING ENVIRONMENT

Operating environment for the airline management system is as listed below.

distributed database

client/server system

Operating system: Windows.

database: sql+ database

platform: vb.net/Java/PHP

2.5 DESIGN and IMPLEMENTATION CONSTRAINTS

The global schema, fragmentation schema, and allocation schema.

SQL commands for above queries/applications

How the response for application 1 and 2 will be generated. Assuming these are global queries. Explain how various fragments will be combined to do so.

Implement the database at least using a centralized database management system.

2.6 ASSUMPTION DEPENDENCIES

Let us assume that this is a distributed airline management system and it is used in the following application:

A request for booking/cancellation of a flight from any source to any destination, giving connected flights in case no direct flight between the specified Source-Destination pair exist.

Calculation of high fliers (most frequent fliers) and calculating appropriate reward points for these fliers.

Assuming both the transactions are single transactions, we have designed a distributed database that is geographically dispersed at four cities Delhi, Mumbai, Chennai, and as shown in fig. below.

3.SYSTEM FEATURES

DESCRIPTION and PRIORITY

The airline reservation system maintains information on flights, classes of seats, personal preferences, prices, and bookings. Of course, this project has a high priority because it is very difficult to travel across countries without prior reservations.

STIMULUS/RESPONSE SEQUENCES

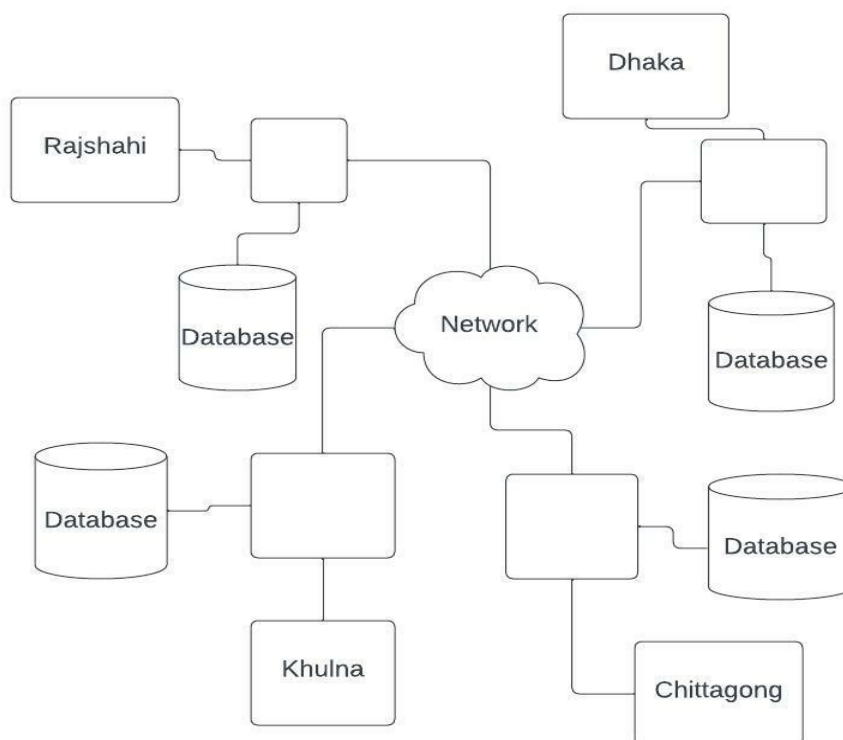
- Search for Airline Flights for two Travel cities
- Displays a detailed list of available flights and make a “Reservation” or Book a ticket on a particular flight.
- Cancel an existing Reservation.

3.1.FUNCTIONAL REQUIREMENTS

Other system features include:

DISTRIBUTED DATABASE:

Distributed database implies that a single application should be able to operate transparently on data that is spread across a variety of different databases and connected by a communication network as shown in below figure.



CLIENT/SERVER SYSTEM

The term client/server refers primarily to an architecture or logical division of responsibilities, the client is the application (also known as the front-end), and the server is the DBMS (also known as the back-end).

A client/server system is a distributed system in which,

- Some sites are client sites and others are server sites.
- All the data resides at the server sites.
- All applications execute at the client sites.

4. EXTERNAL INTERFACE REQUIREMENTS

4.1 USER INTERFACES

- Front-end software: Vb.net version
- Back-end software: SQL+

4.2 HARDWARE INTERFACES

- Windows.
- A browser which supports CGI, HTML & Javascript.

4.3 SOFTWARE INTERFACES

- Following are the software used for the flight management online application. <<Include the software details as per your project >>

Software used	Description
Operating system	We have chosen Windows operating system for its best support and user-friendliness.
Database	To save the flight records, passengers records we have chosen SQL+ database.
VB.Net	To implement the project we have chosen Vb.Net language for its more interactive support.

4.4 COMMUNICATION INTERFACES

This project supports all types of web browsers. We are using simple electronic forms for the reservation forms, ticket booking etc.

5. NONFUNCTIONAL REQUIREMENTS

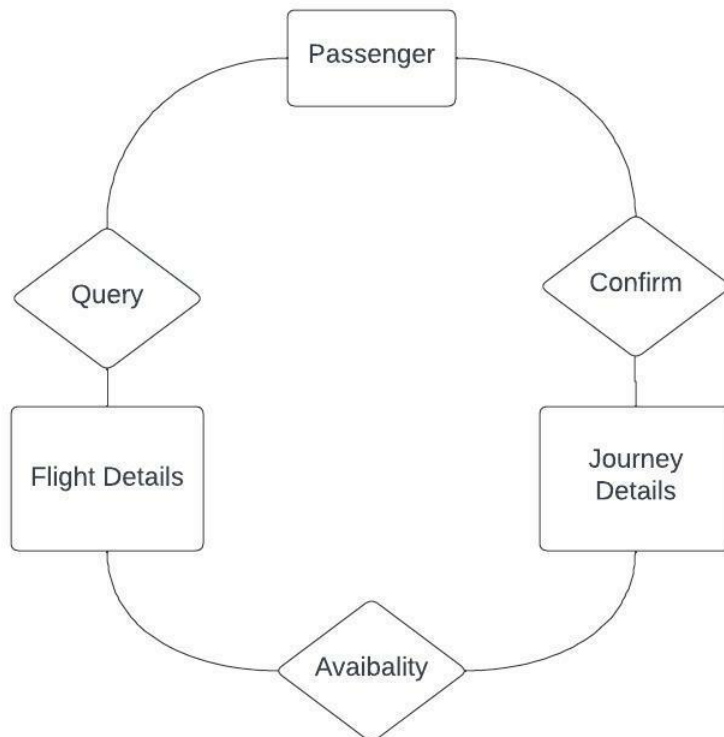
5.1 PERFORMANCE REQUIREMENTS

The steps involved to perform the implementation of airline database are as listed below.

A) E-R DIAGRAM

The E-R Diagram constitutes a technique for representing the logical structure of a database in a pictorial manner. This analysis is then used to organize data as a relation, normalizing relation and finally obtaining a relation database.

- **ENTITIES:** Which specify distinct real-world items in an application.
- **PROPERTIES/ATTRIBUTES:** Which specify properties of an entity and relationships.
- **RELATIONSHIPS:** Which connect entities and represent meaningful dependencies between them.



B) NORMALIZATION:

The basic objective of normalization is to reduce redundancy which means that information is to be stored only once. Storing information several times leads to wastage of storage space and increase in the total size of the data stored.

If a database is not properly designed it can give rise to modification anomalies. Modification anomalies arise when data is added to, changed or deleted from a database table. Similarly, in

traditional databases as well as improperly designed relational databases, data redundancy can be a problem. These can be eliminated by normalizing a database.

Normalization is the process of breaking down a table into smaller tables. So that each table deals with a single theme. There are three different kinds of modifications of anomalies and formulated the first, second and third normal forms (3NF) is considered sufficient for most practical purposes. It should be considered only after a thorough analysis and complete understanding of its implications.

5.2 SAFETY REQUIREMENTS

If there is extensive damage to a wide portion of the database due to catastrophic failure, such as a disk crash, the recovery method restores a past copy of the database that was backed up to archival storage (typically tape) and reconstructs a more current state by reapplying or redoing the operations of committed transactions from the backed up log, up to the time of failure.

5.3 SECURITY REQUIREMENTS

Security systems need database storage just like many other applications. However, the special requirements of the security market mean that vendors must choose their database partner carefully.

5.4 SOFTWARE QUALITY ATTRIBUTES

- **AVAILABILITY:** The flight should be available on the specified date and specified time as many customers are doing advance reservations.
- **CORRECTNESS:** The flight should reach start from correct start terminal and should reach the correct destination.
- **MAINTAINABILITY:** The administrators and flight in chargers should maintain correct schedules of flights.
- **USABILITY:** The flight schedules should satisfy a maximum number of customers needs.

6. MARKETING PLAN

We must evaluate how users or society members are generally engaged with each social media platform since this will significantly influence the app's public perception. Here are some of the most widely used social networking platforms:

6.1.Facebook: With over 1 billion members globally, Facebook is the biggest social network. This platform will be used to advertise the parking management apps feature. The finest marketing method for promoting any program is to use Facebook ads. As a result, advertising on Facebook may be the best solution Twitter: Another famous social networking tool is

6.2.Twitter:It links us with the most important and influential individuals at the most receptive times. Twitter has indeed been used to create political awareness, disseminate political messages, and organize collective action. As a result, we will be able to bring our software to this social network effortlessly.

6.3.Target audience and the persona:The first stage in developing a successful marketing strategy is identifying and comprehending the target customer. So, to develop a marketing plan, we must first determine who our target customer is. In general, targeting the right audience improves the performance of the marketing efforts and leads to more sales or conversions. Creating an ideal customer profile, also

known as a buyer persona, is the first step in finding potential prospects. We may create customized content for the clients based on their user personas using target audience research.

6.4.Efficient budget use:A marketing budget details how much money a company plans to spend over a quarter or year on marketing efforts. Paid advertising, sponsored site content, additional marketing personnel, a registered blog domain, and marketing automation tools should all be included in marketing budgets.

6.5.Short- and Long-term marketing goals:Short-term objectives are those that we desire to achieve in less than six months. These objectives are usually completed in a couple of days, weeks, or months. With things like email reporting and monitoring outcomes via tracked links, we can more quickly measure the performance of the short-term marketing goals. Long-term marketing objectives should include a plan for managing clients and growing a loyal consumer base. Longterm marketing objectives that are the greatest and most brilliant include a plan to persuade committed clients to pass their brand loyalty on to their offspring

7.Findings and Challenges

7.1.Findings

- o Booking Options
- o Check availability
- o Price of services
- o Provide services
- o Feedback from the customers

7.2. Challenges

- o Setting clear
goals and objectives
- o Lack of communication
- o Mismatched team skills
- o Poor risk management