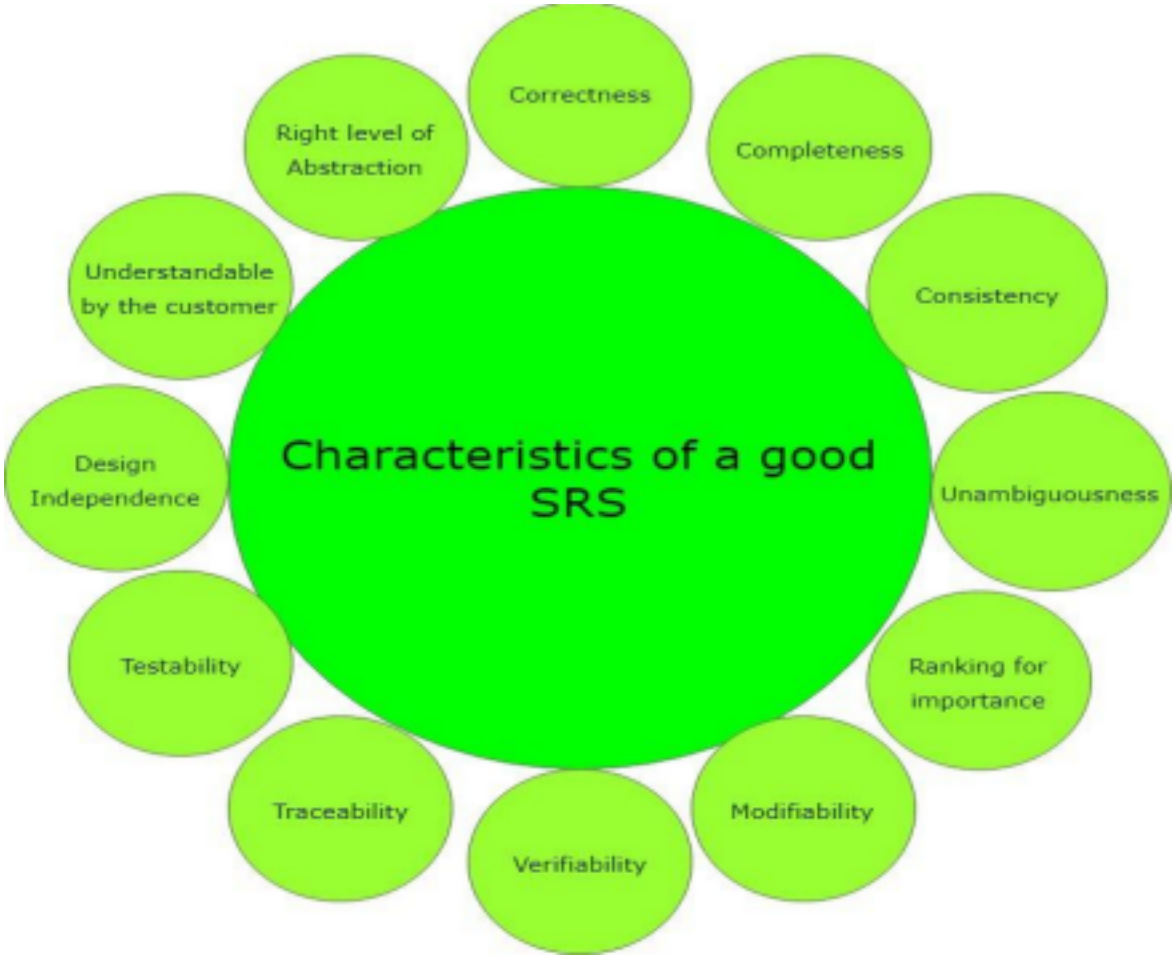
Software Requirements Specification document with example

Qualities of SRS:

- Correct
- Unambiguous
- Complete
- Consistent
- Ranked for importance and/or stability
- Verifiable
- Modifiable
- Traceable

Characteristics



Characteristics

Correctness

User review is used to ensure the correctness of requirements stated in the SRS. SRS is said to be correct if it covers all the requirements that are actually expected from the system.

Completeness

Completeness of SRS indicates every sense of completion including the numbering of all the pages, resolving to be determined parts to as much extent as possible as well as covering all the functional and non-functional requirements properly.

Consistency

Requirements in SRS are said to be consistent if there are no conflicts between any set of requirements.

Examples of conflict include differences in terminologies used at separate places, logical conflicts like time period of report generation, etc.

Characteristics

Unambiguousness

A SRS is said to be unambiguous if all the requirements stated have only 1 interpretation. Some of the ways to prevent unambiguousness include the use of modelling techniques like ER diagrams, proper reviews and buddy checks, etc.

Ranking for importance and stability

There should a criterion to classify the requirements as less or more important or more specifically as desirable or essential. An identifier mark can be used with every requirement to indicate its rank or stability.

Modifiability

SRS should be made as modifiable as possible and should be capable of easily accepting changes to the system to some extent. Modifications should be properly indexed and cross-referenced.

Characteristics

Verifiability

A SRS is verifiable if there exists a specific technique to quantifiably measure the extent to which every requirement is met by the system. For example, a requirement stating that the system must be user-friendly is not verifiable and listing such requirements should be avoided.

Traceability

One should be able to trace a requirement to design component and then to code segment in the program. Similarly, one should be able to trace a requirement to the corresponding test cases.

Independence

There should be an option to choose from multiple design alternatives for the final system. More specifically, the SRS should not include any implementation details.

Characteristics

Testability

A SRS should be written in such a way that it is easy to

generate test cases and test plans from the document.

Understandable by the customer

An end user maybe an expert in his/her specific domain but might not be an expert in computer science. Hence, the use of formal notations and symbols should be avoided to as much extent as possible. The language should be kept easy and clear.

Right level of abstraction

If the SRS is written for the requirements phase, the details should be explained explicitly. Whereas, for a feasibility study, fewer details can be used. Hence, the level of abstraction varies according to the purpose of the SRS.

SRS document

- A Software Requirements Specification (SRS) is a

document that describes the nature of a project, software or application.

- In simple words, SRS document is a manual of a project provided it is prepared before you kick-start a project/application.
- This document is also known by the names SRS report, software document. A software document is primarily prepared for a project, software or any kind of application.

SRS document

- There are a set of guidelines to be followed while preparing the software requirement specification

document.

- This includes the purpose, scope, functional and non-functional requirements, software and hardware requirements of the project.
- In addition to this, it also contains the information about environmental conditions required, safety and security requirements, software quality attributes of the project etc.

SRS document

- A Software requirements specification document describes the intended purpose, requirements and nature of a software to be

developed.

- It also includes the yield and cost of the software.

Table of Contents for a SRS Document

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.

<<*Include the purpose as applicable to your project*

>> **1.2 DOCUMENT CONVENTIONS**

- This document uses the following conventions.

<<*Include the conventions as per your application*

>> • DB Database

- DDB Distributed Database
- ER Entity Relationship

1.3 INTENDED AUDIENCE AND READING SUGGESTIONS

- This project is a prototype for the flight management system. and it is

restricted within the college premises. This has been implemented under the guidance of college professors. 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://krazytech.com/projects
- Fundamentals of database systems by ramez elmarsi and shamkant b.navathe.
- Other relevant web resources.

2. OVERALL DESCRIPTION

2.1 PRODUCT PERSPECTIVE

- A distributed airline database system stores the following information.

Flightdetails:

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

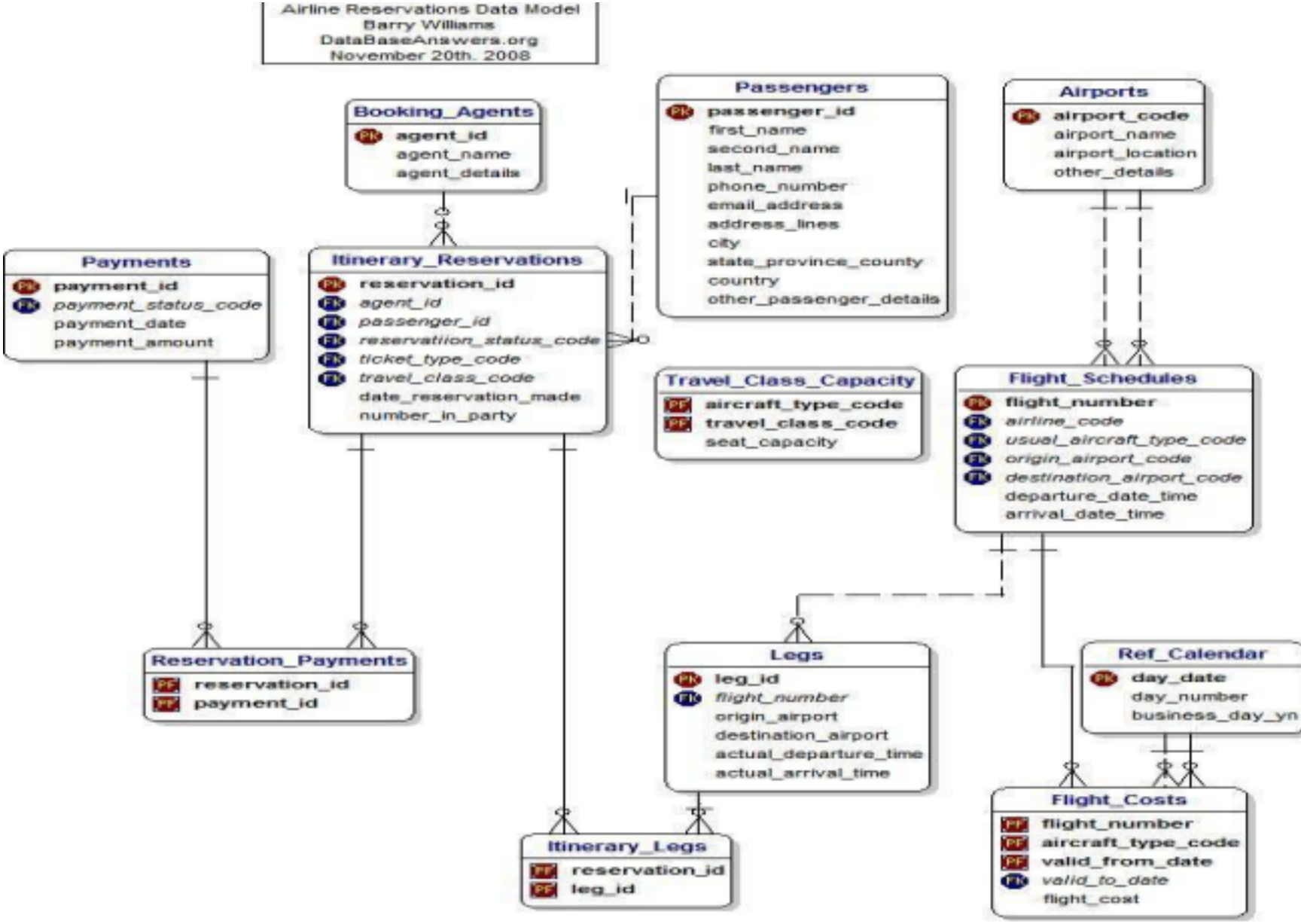
may be used for keeping the records of the customer for any emergency or for any other kind of information.

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** (**ER 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.

<<*Include the details as per your application* >>

- 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 Kolkatta 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.

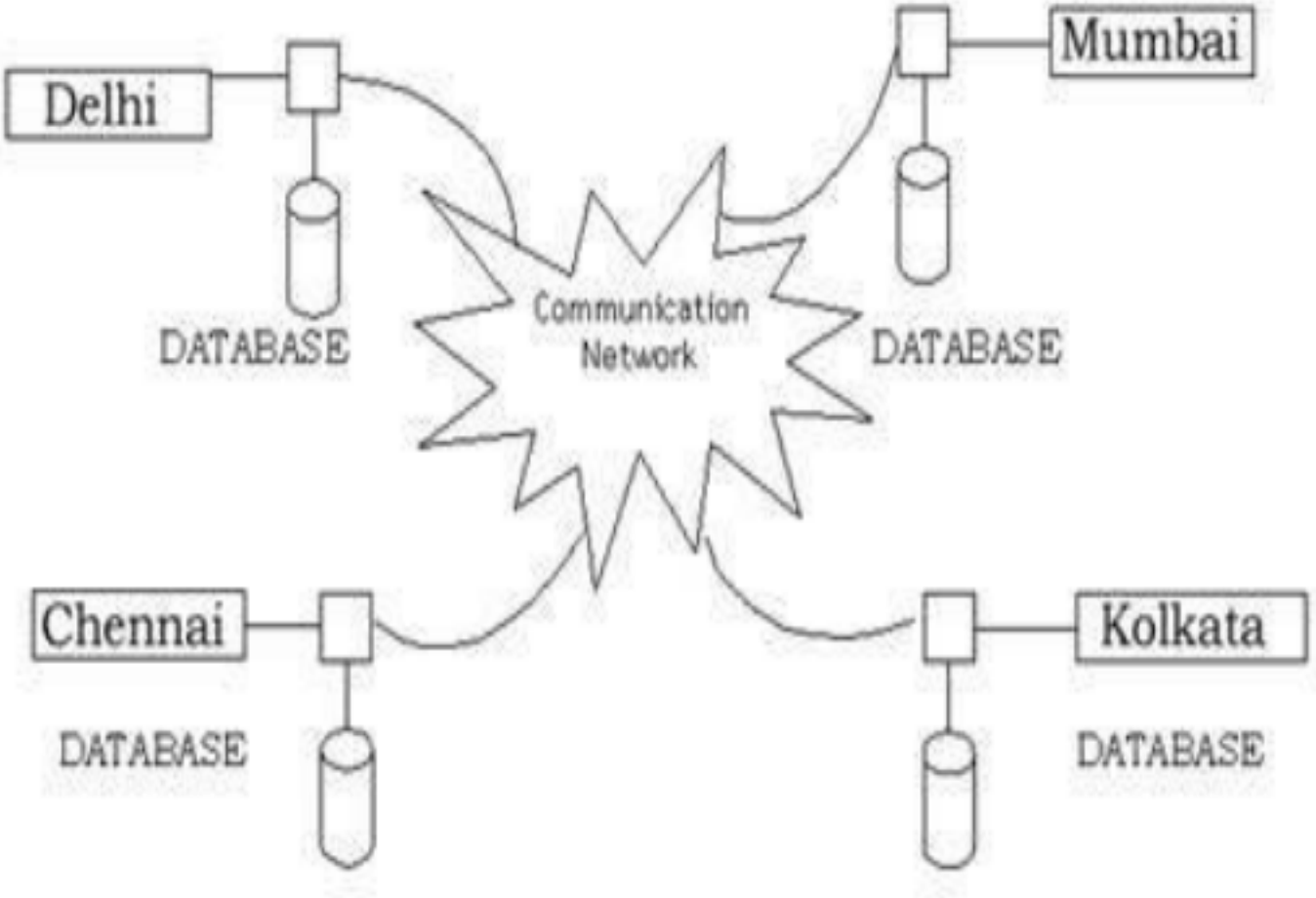
FUNCTIONAL REQUIREMENTS

- 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. DatabaseTo 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

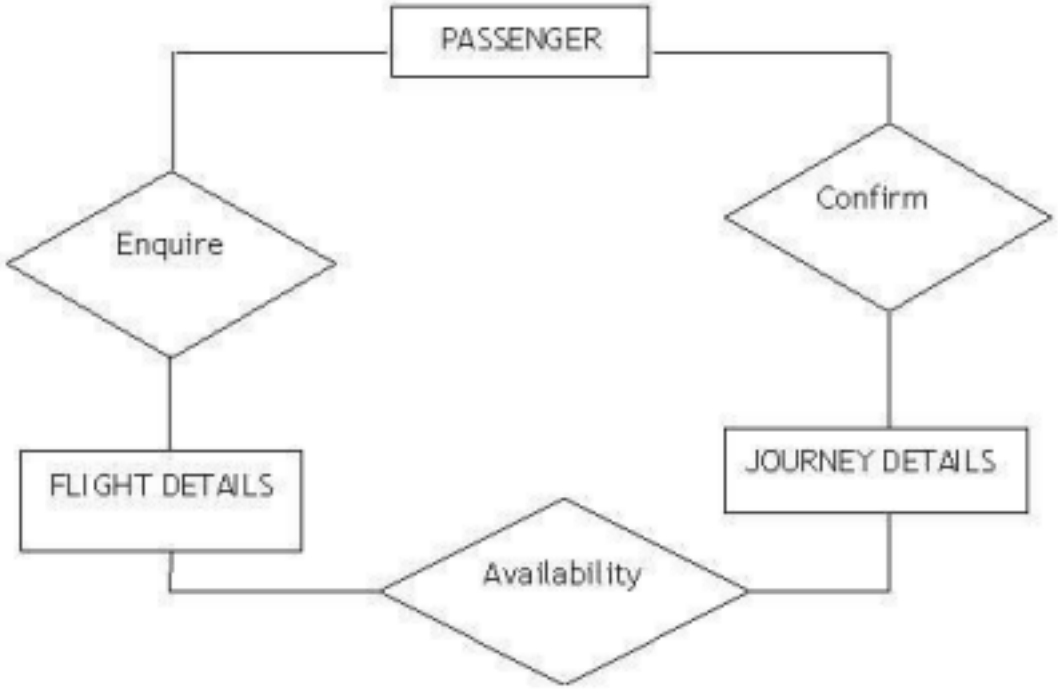
representing the logical structure of a database in a pictorial manner. This analysis is then used to organize data as a relation, normalizing relation and finally obtaining a relation database.

NONFUNCTIONAL REQUIREMENTS

- **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.

ER diagram of airline

database



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.