**SOFTWARE REQUIREMENT SPECIFICATIONS**

**REDUCTION OF TRAFFIC AND POLLUTION USING TRANSPORT AUTHENTICATION**

1. **INTRODUCTION:**
   1. **PURPOSE:**

The purpose of our project “REDUCTION OF TRAFFIC AND POLLUTION USING TRANSPORT AUTHENTICATION” is to reduce the traffic and pollution caused by the vehicles by providing the vehicles to the users as per the requirements.

* 1. **SCOPE:**

This project has a very high scope if implemented on a large scale. In the future, this project can be very useful in reducing the traffic and pollution caused by vehicles.

* 1. **DEFINITONS, ACRONYMS, AND ABBREVATIONS:**

**Bharat Standards (BS)**: Bharat stage Emission Standards (BSES) are emission standards instituted by the Government of India to regulate the output of air pollutants from internal combustion engines and Spark-ignition engines equipment, including motor vehicles.

**Air Quality Index (AQI):** Air quality is measured with the Air Quality Index, or AQI. The AQI works like a thermometer that runs from 0 to 500 degrees. However, instead of showing changes in the temperature, the AQI is a way of showing changes in the amount of pollution in the air.

**Database Management System (DBMS):** A database management system (DBMS) is system software for creating and managing databases. The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage data. A DBMS makes it possible for end users to create, read, update and delete data in a database.

**Traffic:** Traffic on roads consists of road users including pedestrians, ridden or herded animals, vehicles, streetcars, buses and other conveyances, either singly or together, while using the public way for purposes of travel.

**DFD :** Data Flow Diagram

**ERD :** Entity Relationship Diagram

**SRS :** Software Requirement Specification

**SQL :** Structured Query Language

**STD :** State Transition Diagram

* 1. **REFERENCES:**

[1] Daniel Fambro, et. al., "Benefits of the Texas Traffic Light Synchronization (TLS) Grant Program II," Texas Transportation Institute, 1995.

[2] Michael Meyer, "A Toolbox for Alleviating Traffic Congestion and Enhancing Mobility," Institue of Transportation Engineers, 1997.

* 1. **OVERVIEW:**

In developing countries, traffic is a major threat which leads to the increase in the number of accidents and pollution rate causing a major threat to the human. Also due to huge traffic peoples get late for their daily life activities. So, gathering effective traffic and pollution rate data is of utmost importance in order to gain a valuable solution to this problem.

We propose to provide user the less polluting vehicles like bikes, e-rickshaw, etc. and will try to reduce usage of huge vehicles like cars and buses. The main factor that we are considering for vehicle selection are the number of peoples and the distance they want to travel. Urgency level is also one of the criteria for vehicle selection. Vehicles will be present at major landmarks from where user can access vehicle via authentication card which will reduce the number of vehicles on the road as well as pollution.

1. **OVERALL DESCRIPTION**
   1. **PRODUCT PERSPECTIVE:**

A distributed transport database system stores the following information:

* **User Details:**

It includes the basic details of the user like user id, username, AADHAR NO, PAN CARD, GENDER, DOB, VALIDITY, etc. This information may be used for keeping the records of the customer for any emergency or for any other kind of information.

* **Vehicle Details:**

It includes the details of the vehicle no, vehicle type, fuel type, BS type, Seating type, User id, Insurance, etc.

A prediction-based system in which vehicles are selected according to the need of the customer by comparing within the dataset that contains the

* + 1. **System interfaces**

The modern transportation system maintains information on vehicles, 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.

System interfaces 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.

* + **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.
  + 1. **User interfaces**

The user interface provides the actual view of our application.

It contains following components :

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

* + 1. **Hardware interfaces**
* Windows.
* A browser which supports CGI, HTML & Javascript.
* Android
  + 1. **Software interfaces**

Following are the software used for the flight management online application :

|  |  |
| --- | --- |
| **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. |

* + 1. **Communications interfaces**

This project supports all types of web browsers. We are using simple electronic forms which is provided in our application for the vehicles booking etc.

* 1. **PRODUCT FUNCTIONS:**

A distributed airline database system stores the following information.

* **Vehicles detail :**  
  It includes the originating vehicle access point 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.
  1. **USER CHARACTERISTICS:**

Users of the system should be able to retrieve vehicle 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 vehicles 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 vehicles management functions. The customer should be able to do the following functions:

* Make a new booking
  + - One- way
    - Round Trip
    - Multi-city
    - Flexible Date/time
    - Confirmation
* Cancel an existing bookings
* View his itinerary

The Employee should have following management functionalities:

* **CUSTOMER FUNCTIONS :** 
  + Get all customer who have vehicles booked
  + Get all vehicles for a give access point
  + View vehicle schedule
  + Calculate total sales for a given vehicles
* **ADMINISTRATIVE :**
* Add/delete a vehicle
* Update fare for vehicles
  1. **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.
  1. **ASSUMPTIONS AND DEPENDENCIES:**

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

* A request for booking/cancellation of a vehicles from any source to any destination, giving connected vehicles in case no direct vehicles between the specified Source-Destination pair exist.
* Calculation of high fliers (most frequent fliers) and calculating appropriate reward points for these fliers.

**2.6 BLOCK DIAGRAM**

2 - BLOCK FOR VEHICLES LIKE CARS, ETC.

CAR

2

Fig 2.6.1. Proposed Model for vehicles like car, etc.

1 - BLOCK FOR BIKES AND BICYCLES.

BIKE/BICYCLE

1

Fig 2.6.2 Proposed model for bike and bicycles

4 – BLOCK FOR TRUCKS/BUSES.

BUS/TRUCK

4

Fig 3. Proposed model for heavy vehicles like bus, etc.

Fig 2.6.3 Proposed model for truck

1. **SPECIFIC REQUIREMENTS:**

**NON-FUNCTIONAL REQUIREMENTS :**

* 1. **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.

1. **SUMMARY :**

We can conclude that we can overcome all the limitations of the transporation system i.e. save money, reduce pollution, reduce traffic. If this project is implemented on large scale then major problem like accidents, traffic, pollution can be reduced to the greater extent.