Railway Reservation System -Kathyayani Bolgam

Abstract:

This project titled ***'Railway Reservation System'*** is the automation of the whole process of managing the Railway Information. The purpose of the Railway Reservation System is to manage the details of Railway bookings and cancellation, trains, passengers and train staff. The project is totally built at the administrative end and thus only the administrator is guaranteed access.

The purpose of the project is to build a database and manage information regarding the ticket booking and train services. The objective of the proposed project is to increase the efficiency of managing the railway information and to electronically handle the airline related record to enhance the accuracy, flexibility, reliability, to remove the human's error and provide a robust structure that can handle any amount of data. Some of its features are searching facilities based on various factors, editing, adding and updating the records which results in proper resource management of Railway. This system can lead to error-free, secure, reliable and fast management of records. Their valuable data can be stored for a longer period with easy accessing and manipulation of the same. This project is developed using MySQL as an open source relational database management system.

Introduction:

Database and database systems have become an essential component of everyday life in modern society. In the course of a day, most of us encounter several activities that involve some interaction with the database. For example, if we go to the bank to deposit or withdraw funds or if we make a Hotel or Railway Reservation, chances are that our activities will involve someone accessing a database. The above interactions are examples of what we may call traditional database applications, where most of the application that is stored and accessed is either textual or numeric.

In our project we will concentrate on this aspect of computer application. It is obvious that everything that is sustainable would have to go through advancement. In science and technology, the desire for improvement is a

constant subject which triggers advancements. This is visible in every industry and the railway industry is not an exemption. The railway industry is a very particular system. Railways provide a service, which is to transport a passenger between two cities at an agreed price. Railways also exhibit very particular economics that, over time, have motivated specific management concepts, tools and practices. Railway information systems used to be standalone systems. Each railway has its own system, disconnected from other railways or ticket agents, and usable only by a designated number of railway employees. Today, railway travel information is linked, stored, and retrieved by a network of Computer Reservations Systems (CRS), accessible by multiple railways.

Methodology:

Entity Creation:

- User
- Train
- Ticket
- Staff
- Station

Entity-Attributes:

User - user_id, user_password, user_fname, user_lname, user_age, user_gender, user_contact

Train - train_no, train_name, train_source, train_destination, departure, arrival, no_of_stoppages, train_status

{ Train_coach - coach_type, no_of_seats

Route - train_no, route[][] }

Ticket - ticket_source, ticket_destination, ticket_fare, user_id

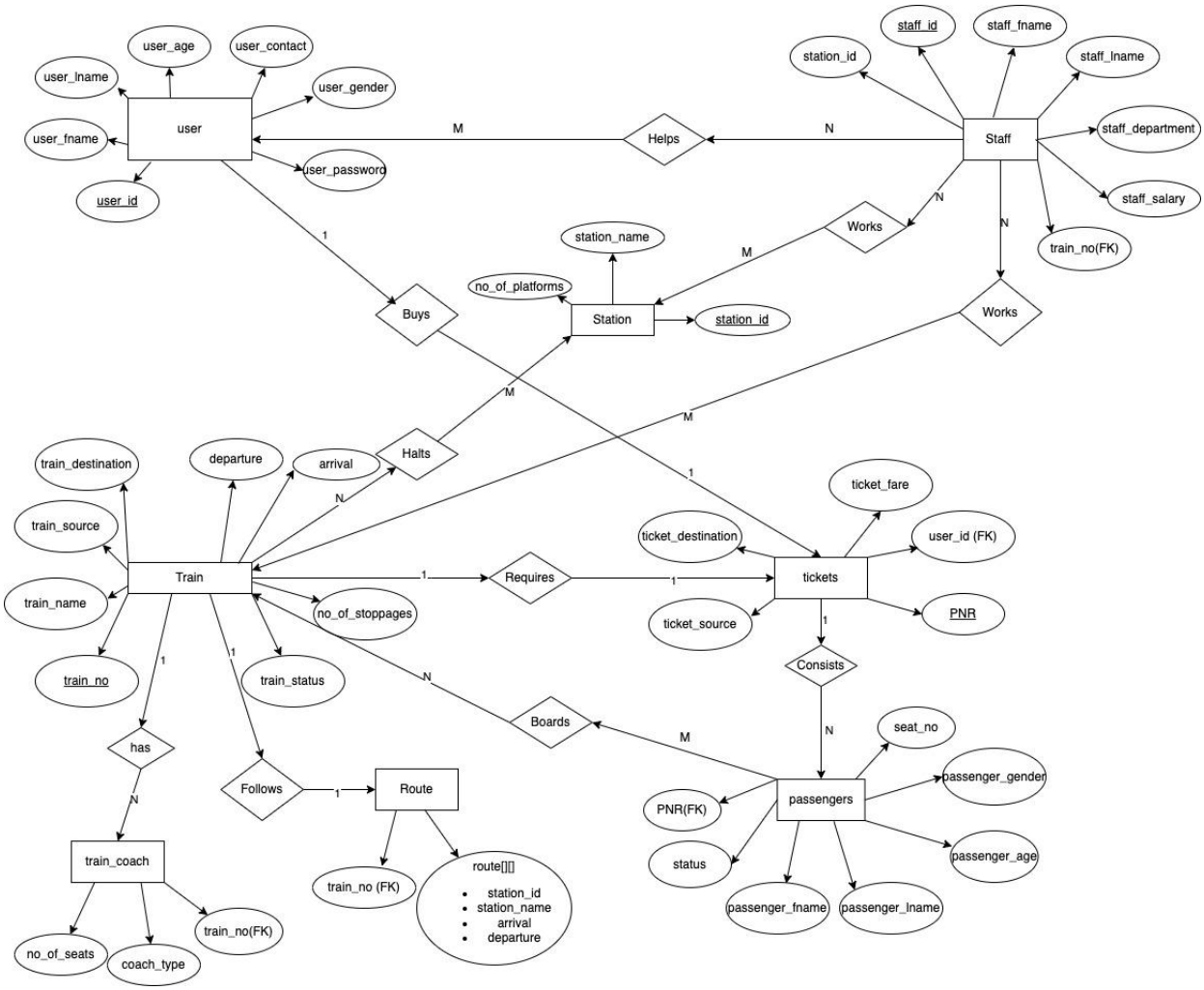
{ PNR - status

Passenger - passenger_fname, passenger_lname, passenger_age, passenger_gender, seat_no }

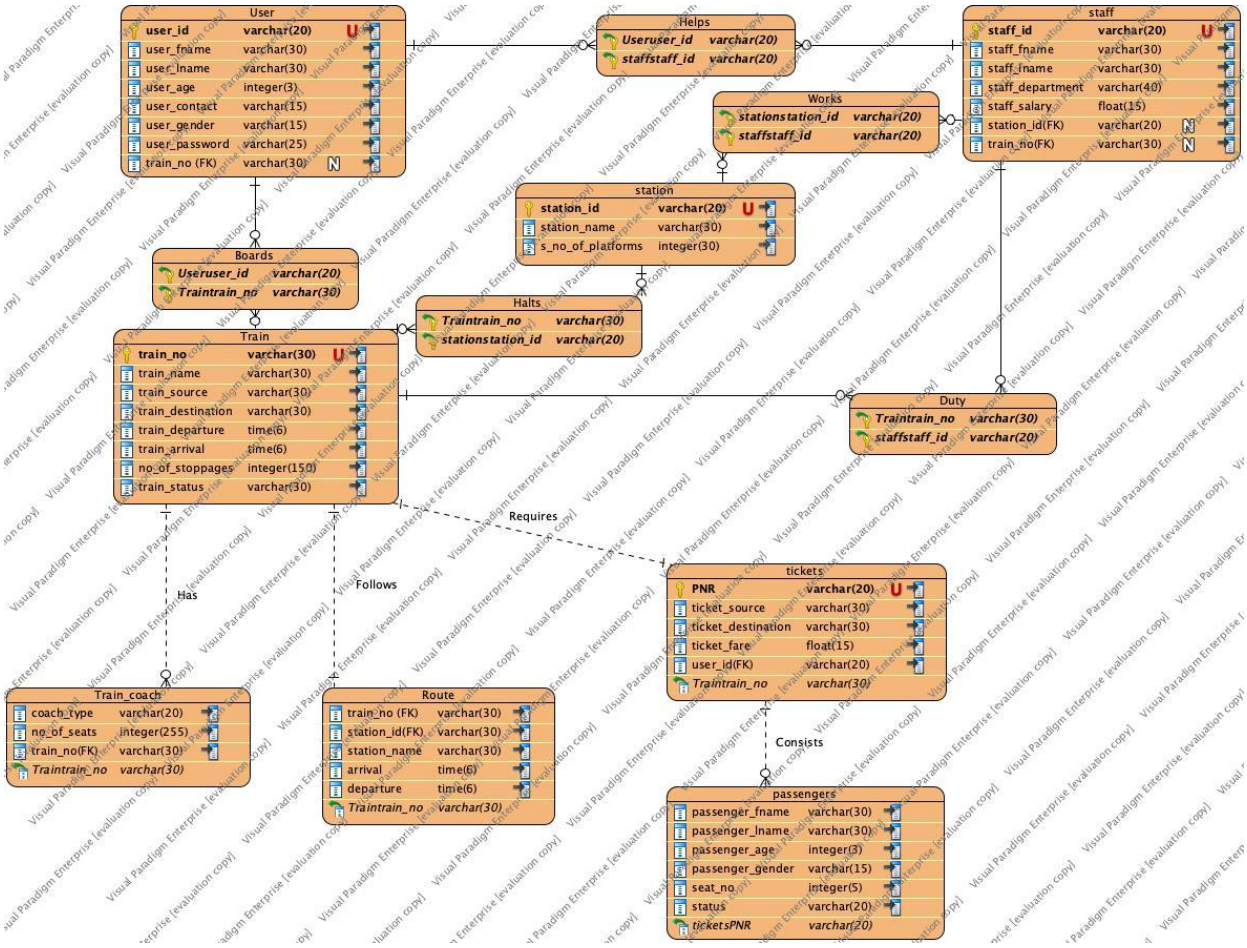
Staff - staff_id, staff_fname, staff_lname, staff_department, staff_salary

Station - station_id, station_name, no_of_platforms

ER - Diagram:



Relational Schema:



Creation of Relational Table:

Train:

create table train(train_no varchar(30) primary key unique, train_name varchar(30) not null, train_source varchar(30) not null, train_destination varchar(30) not null, train_departure time(7) not null, train_arrival time(7) not null, no_of_stoppages int(150) not null, train_status varchar(30) not null);

User:

create table user(user_id varchar(20) primary key unique, user_fname varchar(30) not null, user_lname varchar(30) not null, user_age int(3) not null, user_contact varchar(15) not null, user_gender varchar(15) not null,

user_password varchar(25) not null, train_no varchar(30) references train_no(train));

Train_coach:

create table train_coach(coach_type varchar(20) not null, no_of_seats int(1000) not null, train_no varchar(30) references train_no(train));

Route:

create table route(train_no varchar(30) references train_no(train), station_id varchar(20) references station_id(station), station_name varchar(30) references station_name(station), arrival time(6) not null, departure time(6) not null);

Station:

create table station(station_id varchar(20) primary key unique, station_name varchar(30) not null, no_of_platforms int(30) not null);

Staff:

create table staff(staff_id varchar(20) primary key unique, staff_fname varchar(30) not null, staff_lname varchar(30) not null, staff_department varchar(40) not null, staff_salary float(15) not null, station_id varchar(20) references station_id(station), train_no varchar(30) references train_no(train));

Tickets:

create table tickets(PNR varchar(20) primary key unique, ticket_source varchar(30) not null, ticket_destination varchar(30) not null, ticket_fare float(15) not null, user_id varchar(20) references user_id(user), train_no varchar(30) references train_no(train));

Passengers:

create table passengers(passenger_fname varchar(30) not null, passenger_lname varchar(30) not null, passenger_age int(3) not null, passenger_gender varchar(15) not null, seat_no int(5) not null, status varchar(20) not null, PNR varchar(20) references PNR(tickets));

Normalization:

All the tables are normalized upto BCNF.

Functional Dependencies:

- Table passenger is connected to Table Train with the functional dependency ‘Boards’ as the ‘passenger boards the train’ in a many - many relationship.
- Table Train is connected to Table Tickets with the functional dependency ‘Requires’ as the ‘train requires ticket’ in a many - many relationship.
- Table User is connected to Table Tickets with the functional dependency ‘Buys’ as ‘user buys ticket’ in a one - one relationship.
- Table User is connected to Table Staff with the functional dependency ‘Helps’ as ‘staff helps user’ in a many - many relationship.
- Table Train is connected to Tables Train_coach and Route with functional dependencies ‘Has’ and ‘Follows’ in one - many and one - one relationships respectively.
- Table Ticket is connected to Table Passengers with the functional dependency ‘Consists’ as ‘ticket consists of passengers list’ in a one - many relationship.
- Table Train is connected to Table Station with the functional dependency ‘Halts’ as the ‘train halts at the station’ in a many - many relationship.
- Table Staff is connected to Table Station with the functional dependency ‘Works’ as ‘staff work at the station’ in a many - many relationship.
- Table Staff is connected to Table train with the functional dependency ‘Duty’ as ‘staff work in train’ in a many - many relationship.

Tables:

User:

```
mysql> select * from user;
+---------+------------+------------+----------+--------------+-------------+---------------+
| user_id | user_fname | user_lname | user_age | user_contact | user_gender | user_password |
+---------+------------+------------+----------+--------------+-------------+---------------+
| BCS0016 | Vandana    | Mecharla   |       21 | 8901237843   | Female      | vandana       |
| BCS0032 | Kathyayani | Bolgam     |       19 | 9701020562   | Female      | kathyu        |
| BCS0034 | Shivam     | Kumar      |       21 | 7891234567   | Male        | shivam        |
| BCS0035 | Priyanshu  | Gupta      |       21 | 7480804401   | Male        | priyanshu     |
| BCS0101 | Amrutha    | Polu       |       20 | 9810203981   | Female      | amrutha       |
+---------+------------+------------+----------+--------------+-------------+---------------+
5 rows in set (0.01 sec)
```

Train:

```
mysql> select * from train;
+----------+---------------+---------------------+---------------------+----------------+----------------+---------------+-----------------------+
| train_no | train_name    | train_source        | train_destination   | train_departure | train_arrival  | no_of_stoppages | train_status          |
+----------+---------------+---------------------+---------------------+----------------+----------------+---------------+-----------------------+
| 07469    | CCT-VKB       | Kakinada junction   | Vikarabad Junction  | 20:45:00.000000 | 09:50:00.000000 |            16 | Secunderabad Junction |
| 12577    | Bagmati Express | Darbhanga Junction | Mysuru Junction     | 15:47:00.000000 | 20:00:00.000000 |            38 | Kengeri               |
| 13020    | Bagh Express  | Kathgodam           | Howrah Junction     | 21:50:00.000000 | 12:40:00.000000 |            58 | Kathgodam             |
| 17229    | Sabari Express | Trivandrun Central | Secunderabad Junction | 07:00:00.000000 | 12:20:00.000000 |            42 | Kottayam              |
| 17230    | Sabari Express | Secunderabad Junction | Trivandrun Central | 12:20:00.000000 | 18:30:00.000000 |            42 | Kottayam              |
+----------+---------------+---------------------+---------------------+----------------+----------------+---------------+-----------------------+
5 rows in set (0.00 sec)
```

Train_coach:

```
mysql> select * from train_coach;
+-------------+-------------+----------+
| coach_type  | no_of_seats | train_no |
+-------------+-------------+----------+
| AC tier 1   |          30 | 07469    |
| AC tier 3   |          60 | 07469    |
| AC tier 2   |          60 | 07469    |
| Sleeper     |         120 | 07469    |
| Sleeper     |         120 | 12577    |
| General     |         120 | 12577    |
| Chair-coach |         120 | 12577    |
| AC tier 1   |          30 | 13020    |
| AC tier 2   |          64 | 13020    |
| AC tier 3   |          60 | 13020    |
| Sleeper     |         120 | 13020    |
| General     |         120 | 13020    |
| AC tier 2   |          62 | 17229    |
| AC tier 3   |          62 | 17229    |
| Sleeper     |         120 | 17229    |
| AC tier 2   |          72 | 17230    |
| AC tier 3   |          72 | 17230    |
| Sleeper     |         120 | 17230    |
+-------------+-------------+----------+
18 rows in set (0.00 sec)
```

Route:

```
mysql> select * from route;
+----------+------------+------------------------+-----------------+-----------------+
| train_no | station_id | station_name           | arrival         | departure       |
+----------+------------+------------------------+-----------------+-----------------+
| 07469    | CCT        | Kakinada Junction      | 20:45:00.000000 | 20:55:00.000000 |
| 07469    | KMT        | Khammam                | 23:00:00.000000 | 23:05:00.000000 |
| 07469    | WL         | Warangal               | 01:15:00.000000 | 01:23:00.000000 |
| 07469    | SC         | Secunderabad Junction  | 07:00:00.000000 | 07:10:00.000000 |
| 07469    | VKB        | Vikarabad Junction     | 09:50:00.000000 | 00:00:00.000000 |
| 12577    | DBG        | Darbhanga Junction     | 15:47:00.000000 | 16:10:00.000000 |
| 12577    | BXR        | Buxar                  | 18:45:00.000000 | 19:00:00.000000 |
| 12577    | MZP        | Mirzapur               | 21:30:00.000000 | 21:45:00.000000 |
| 12577    | KGI        | Kengeri                | 05:00:00.000000 | 05:15:00.000000 |
| 12577    | MYS        | Mysuru Junction        | 20:00:00.000000 | 00:00:00.000000 |
| 13020    | KGM        | Kathgodam              | 21:50:00.000000 | 22:00:00.000000 |
| 13020    | GKP        | Gorakhpur Junction     | 12:30:00.000000 | 12:45:00.000000 |
| 13020    | DOL        | Dholi                  | 20:26:00.000000 | 20:28:00.000000 |
| 13020    | DGR        | Durgapur               | 09:27:00.000000 | 09:29:00.000000 |
| 13020    | HWH        | Howrah Junction        | 12:40:00.000000 | 00:00:00.000000 |
| 17229    | TVC        | Trivandrum Central     | 07:00:00.000000 | 07:15:00.000000 |
| 17229    | KTYM       | Kottayam               | 09:57:00.000000 | 10:00:00.000000 |
| 17229    | TCR        | Thrissur               | 12:37:00.000000 | 12:40:00.000000 |
| 17229    | TPTY       | Tirupati               | 01:20:00.000000 | 01:25:00.000000 |
| 17229    | SC         | Secunderabad Junction  | 12:20:00.000000 | 00:00:00.000000 |
| 17230    | SC         | Secunderabad Junction  | 12:20:00.000000 | 12:30:00.000000 |
| 17230    | NLDA       | Nalgonda               | 13:53:00.000000 | 13:57:00.000000 |
| 17230    | GNT        | Guntur Junction        | 17:00:00.000000 | 17:10:00.000000 |
| 17230    | NLR        | Nellore                | 21:00:00.000000 | 21:05:00.000000 |
| 17230    | KTYM       | Kottayam               | 14:27:00.000000 | 14:30:00.000000 |
| 17230    | TVC        | Trivandrum Central     | 18:30:00.000000 | 00:00:00.000000 |
+----------+------------+------------------------+-----------------+-----------------+
26 rows in set (0.00 sec)
```

Station:

```
mysql> select * from station;
+------------+------------------------+-----------------+
| station_id | station_name           | no_of_platforms |
+------------+------------------------+-----------------+
| BXR        | Buxar                  |               6 |
| CCT        | Kakinada Junction      |              15 |
| DBG        | Darbhanga Junction     |               8 |
| DGR        | Durgapur               |               8 |
| DOL        | Dholi                  |               6 |
| GKP        | Gorakhpur              |               8 |
| GNT        | Guntur Junction        |              10 |
| HWH        | Howrah Junction        |              12 |
| KGI        | Kengeri                |               8 |
| KGM        | Kathgodam              |               6 |
| KMT        | Khammam                |               8 |
| KTYM       | Kottayam               |              10 |
| MYS        | Mysuru Junction        |               8 |
| MZP        | Mirzapur               |               8 |
| NLDA       | Nalgonda               |               8 |
| NLR        | Nellore                |               6 |
| SC         | Secunderabad Junction  |              12 |
| TCR        | Thrissur               |               8 |
| TPTY       | Tirupati               |              10 |
| TVC        | Trivandrum Central     |              12 |
| VKB        | Vikarabad Junction     |              10 |
| WL         | Warangal               |               6 |
+------------+------------------------+-----------------+
22 rows in set (0.00 sec)
```

Staff:

```
mysql> select * from staff;
+----------+-------------+-------------+------------------+--------------+------------+----------+
| staff_id | staff_fname | staff_lname | staff_department | staff_salary | station_id | train_no |
+----------+-------------+-------------+------------------+--------------+------------+----------+
| 0001     | Rakesh      | Kumar       | Ticket collector |        20000 | NULL       | 17230    |
| 0002     | Suresh      | Naidu       | Ticket collector |        20000 | NULL       | 13020    |
| 0003     | Madhavi     | Nair        | Reception        |        15000 | DBG        | NULL     |
| 0004     | Akash       | Goud        | Reception        |        15000 | HWH        | NULL     |
| 0005     | Uma         | Rani        | Tickect counter  |        25000 | SC         | NULL     |
| 0006     | Pradeep     | Kumar       | Ticket counter   |        25000 | KTYM       | NULL     |
| 0007     | Rani        | Prem        | Cleaning         |        15000 | TCR        | NULL     |
| 0008     | Vikram      | Reddy       | Cleaning         |        15000 | NULL       | 17229    |
| 0009     | Rajesh      | Kumar       | Security         |        20000 | NLDA       | NULL     |
| 0010     | Surendra    | Kumar       | Security         |        20000 | WL         | NULL     |
| 0011     | Shivam      | Verma       | Driver           |        30000 | NULL       | 12577    |
| 0012     | Sameer      | Ahmed       | Driver           |        30000 | NULL       | 17230    |
| 0013     | Preethi     | Singh       | Help desk        |        15000 | DOL        | NULL     |
| 0014     | Ramya       | Rathod      | Help desk        |        15000 | WL         | NULL     |
+----------+-------------+-------------+------------------+--------------+------------+----------+
14 rows in set (0.00 sec)
```

Tickets:

```
mysql> select * from tickets;
+------------+-----------------------+--------------------+-------------+---------+----------+
| PNR        | ticket_source         | ticket_destination | ticket_fare | user_id | train_no |
+------------+-----------------------+--------------------+-------------+---------+----------+
| ticket0001 | Kathgodam             | Howrah Junction    |        2500 | BCS0032 | 13020    |
| ticket0002 | Kathgodam             | Howrah Junction    |        2500 | BCS0035 | 13020    |
| ticket0003 | Trivandrum Central    | Kottayam           |       10000 | BCS0034 | 17229    |
| ticket0004 | Secunderabad Junction | Nellore            |         700 | BCS0101 | 17230    |
| ticket0005 | Gorakhpur Junction    | Howrah Junction    |          20 | BCS0016 | 13020    |
+------------+-----------------------+--------------------+-------------+---------+----------+
5 rows in set (0.01 sec)
```

Passengers:

```
mysql> select * from passengers;
+-----------------+-----------------+---------------+------------------+---------+-----------+------------+
| passenger_fname | passenger_lname | passenger_age | passenger_gender | seat_no | status    | PNR        |
+-----------------+-----------------+---------------+------------------+---------+-----------+------------+
| Kathyayani      | Bolgam          |            19 | Female           |      32 | Confirmed | ticket0001 |
| Priyanshu       | Gupta           |            21 | Male             |      31 | Confirmed | ticket0002 |
| Shivam          | Kumar           |            21 | Male             |      24 | RAC       | ticket0003 |
| Amrutha         | Polu            |            20 | Female           |      10 | WL10      | ticket0004 |
| Vandana         | Mecharla        |            21 | Female           |      20 | Confirmed | ticket0005 |
+-----------------+-----------------+---------------+------------------+---------+-----------+------------+
5 rows in set (0.00 sec)
```

CONCLUSION:

This project is a humble venture to satisfy the needs to manage railway information. This project shall prove to be effective and reliable. The program is

error-free. The information stored in the form of a database is secure. The system design has been done keeping user friendliness and efficiency in mind. In this project, we have also stored the information about the Trains scheduled and the users booking the tickets and even the status of the train, seats etc. This database is helpful for the applications which facilitates passengers to book the train tickets and check the details of trains and their status from their place itself it avoids inconveniences of going to the railway station for each and every query they get. We had considered the most important requirements only, many more features and details can be added to thist project in order to obtain even more user friendly applications. These applications are already in progress and in future they can be upgraded and may become part of amazing technology.