



DBMS RAILWAY RESERVATION

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Abstract

The Railway Reservation System facilitates the passengers to enquire about the trains available on the basis of source and destination, Booking and Cancellation of tickets, enquire about the status of the booked ticket, etc. The aim of case study is to design and develop a database maintaining the records of different trains, train status, and passengers.

This project contains Introduction to the Railways reservation system It is the computerized system of reserving the seats of train seats in advanced. It is mainly used for long route. On-line reservation has made the process for the reservation of seats very much easier than ever before.

In our country Saudi Arabia, there are number of counters for the reservation of the seats and one can easily make reservations and get tickets. Then this project contains entity relationship model diagram based on railway reservation system and introduction to relation model. There is also design of the database of the railway reservation system based on relation model.

Example of some SQL queries to retrieves data from rail management database.

1. Project problem

Saudi Arabia has recently started establishing railways, as it is one of the most important means of transportation, and it plays an important role in the field of transportation and communication. With the rapid economic development, railways, and passengersn and with a huge customer base, they buy train tickets the problem was very prominent. E-commerce can solve the problem of railway tickets and make it easier for customers.

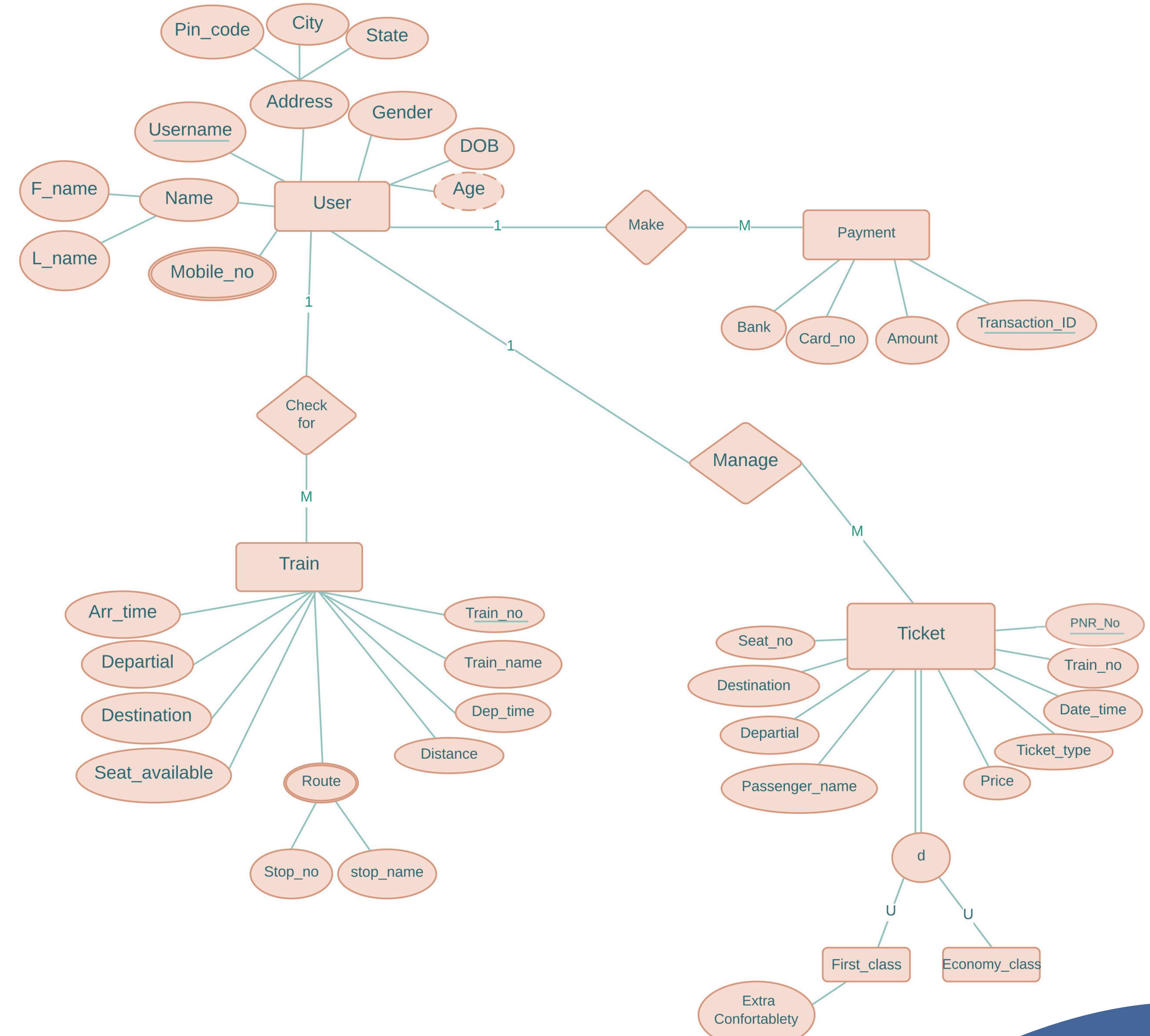
The introduction of the new online ticketing system is not only a technical innovation but also an improvement Railway services, to some extent, solve the difficult problem of issuing railway tickets.

2. Objectives

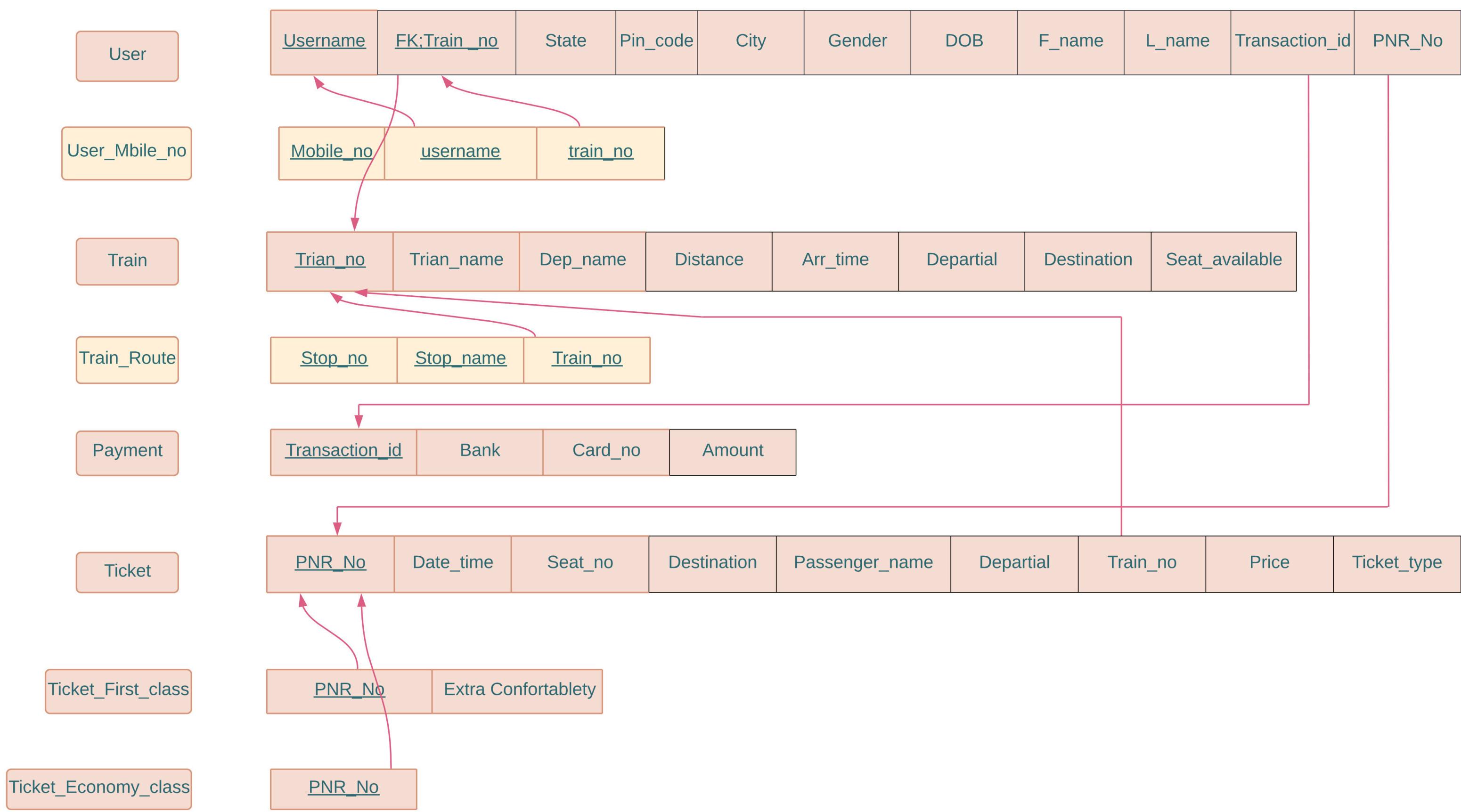
The main features of a railway reservation system project typically includes the following:

1. Train schedule and availability: The system allows passengers to search for train schedules and check seat availability on specific trains.
2. Ticket booking and cancellation: The system allows passengers to book and cancel train tickets online, including selecting their preferred seat or berth.
3. Payment processing: The system allows passengers to pay for their train tickets online using various payment methods, such as credit cards or e-wallets.
4. User account management: The system allows passengers to create and manage their user accounts, which can be used to store their booking history and personal information.

3. Enhanced entity relationship (EER) diagram



4. Convert EER to schema



5.System architecture

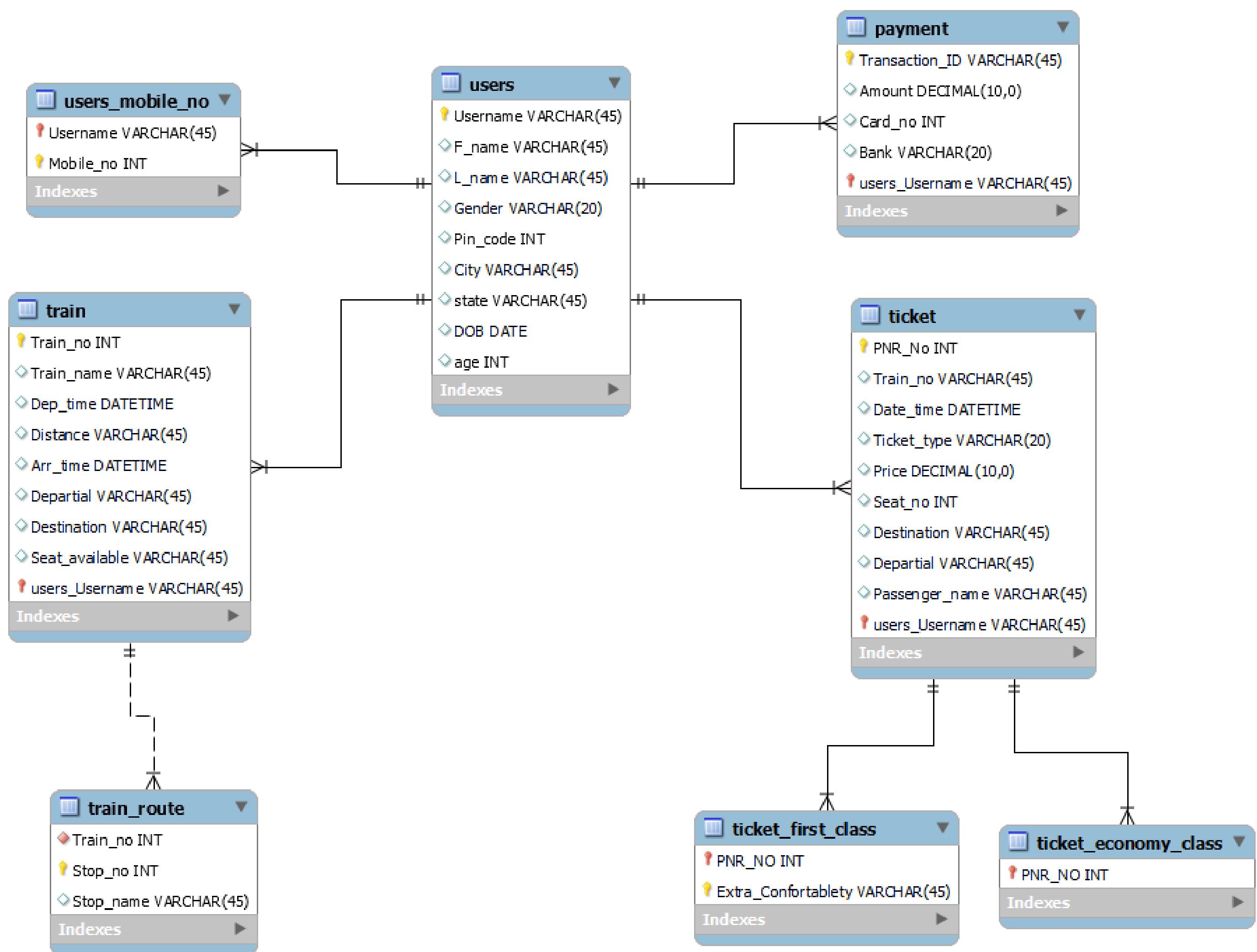
A typical one-layer structure is used in the system: the database layer. Contains the entire databases of railways and their relationship models. It is used to hold data, including user registration information, ticket ordering information, ticket information and all of the other information.

In the railway reservation Database system a architecture type known as distributed system is used. Where large amounts of data are processed and accessed by many users simultaneously. It is designed for homogeneous database platforms. Maintains confidentiality and data integrity of databases.

6.Network Topology

In our project we used Mesh topologies for the railway where the reliability of network communication is very important, extremely robust and redundant, as any node or link failure, affects a minimum, robust security and privacy and Highly efficient data transfer due to dedicated point-to-point links for all devices.

7. Database schema



8. Database Queries:

8.1.Index Queries:

Input :

```
1   use railway;
2 • CREATE INDEX index_payment
3   ON payment (Transaction_ID, Amount, Card_no,Bank);
```

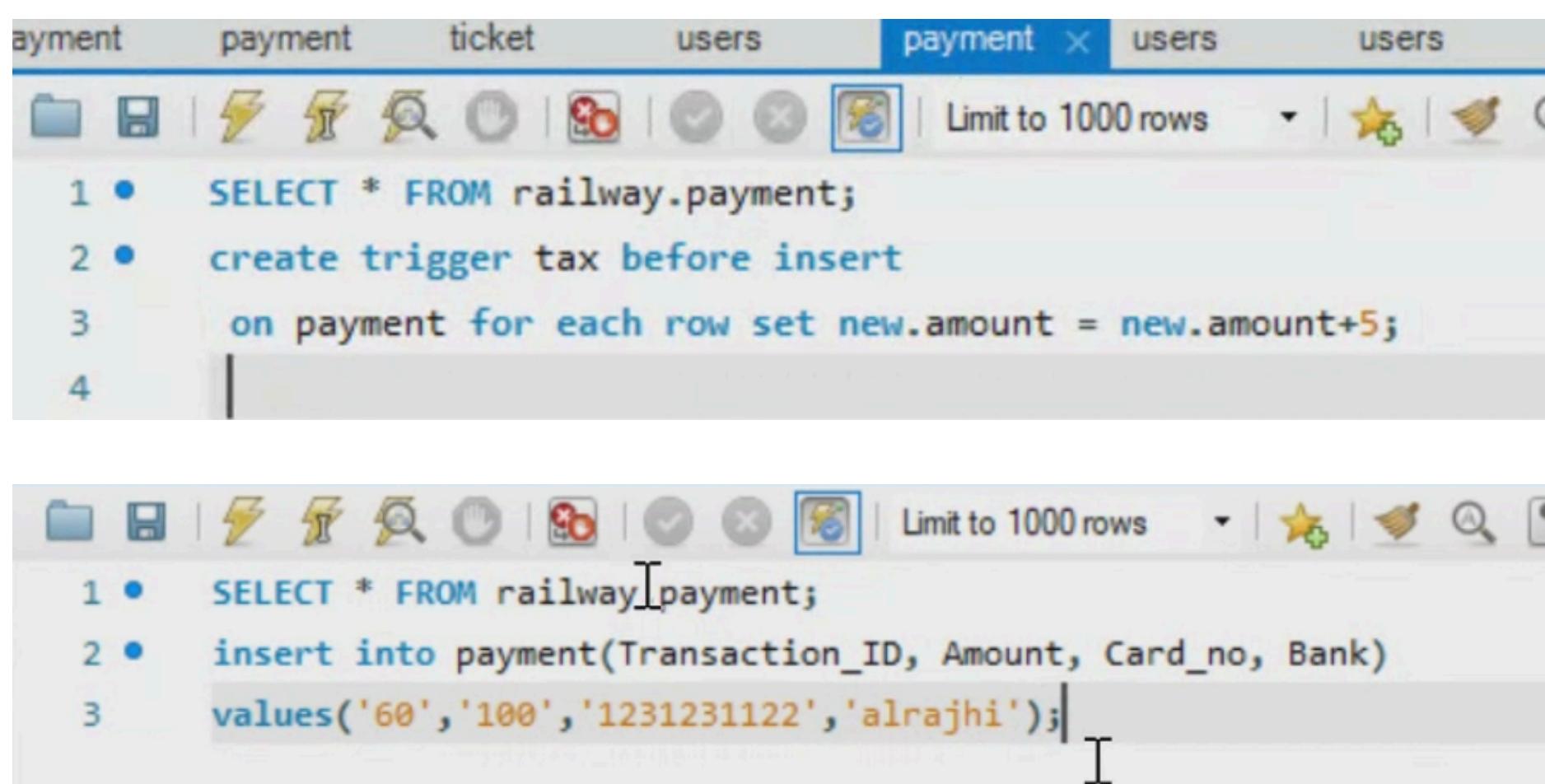
Output:

	Transaction_ID	Amount	Card_no	Bank
▶	1	700	1234567890	alrajhi
	2	79	778877887	alrajhi
	5	907	445555555	alenma
	9	86	1233333333	alrajhi
	90	997	999999999	alrajhi
	999	79	77877887	alrajhi

8. Database Queries:

8.2 Triggers Queries:

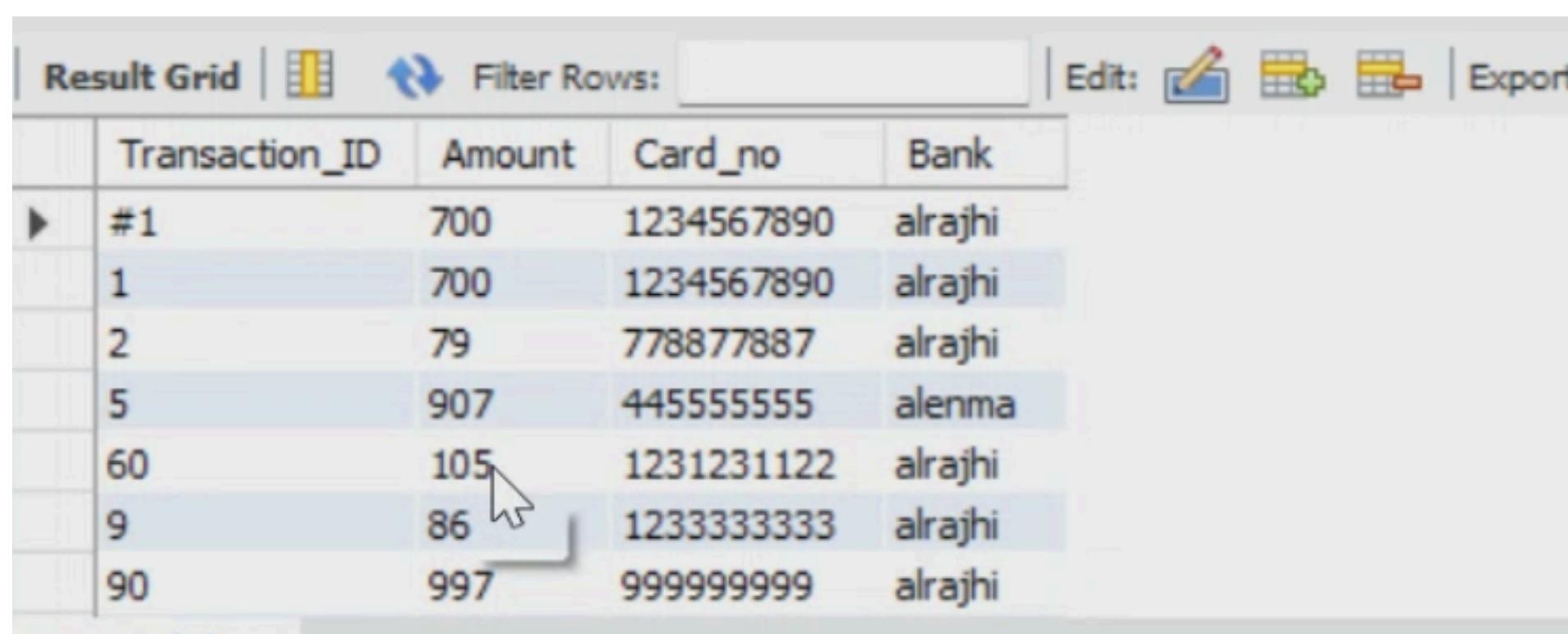
Input :



```
1 •  SELECT * FROM railway.payment;
2 •  create trigger tax before insert
3     on payment for each row set new.amount = new.amount+5;
4
```

```
1 •  SELECT * FROM railway.payment;
2 •  insert into payment(Transaction_ID, Amount, Card_no, Bank)
3     values('60','100','1231231122','alrajhi');
```

Output:



	Transaction_ID	Amount	Card_no	Bank
▶	#1	700	1234567890	alrajhi
	1	700	1234567890	alrajhi
	2	79	778877887	alrajhi
	5	907	445555555	alenma
	60	105	1231231122	alrajhi
	9	86	1233333333	alrajhi
	90	997	999999999	alrajhi

8. Database Queries:

8.3 Cascade Queries:

Input :

```
11 • 1 create table train_route(
12     Train_no int not null, Stop_no int primary key , Stop_name varchar(45),
13     foreign key(Train_no)
14         references train(Train_no)
15             on delete cascade
16             on update cascade
17 );
```

We need to delete train_No from train table:

The screenshot shows the MySQL Workbench interface. In the top-left pane, there is a query editor with the following code:

```
1 • 1 SELECT * FROM railway.train_route;
2 • 2 delete from train
3 where Train_no =1;
```

In the bottom-right pane, there is a "Result Grid" displaying the data from the train_route table:

Train_no	Stop_no	Stop_name
1	1	Qassem
2	2	Dammam
4	3	Riyadh
5	4	Riyadh
3	5	Riyadh
6	7	Jeddah
7	9	Abha

Before:

The screenshot shows the MySQL Workbench interface with the train table open. The table has the following columns: Train_no, Train_name, Dep_time, Distance, Arr_time, Departial, Destination, and Seat_avail. The data is as follows:

	Train_no	Train_name	Dep_time	Distance	Arr_time	Departial	Destination	Seat_avail
1	NR00		2023-03-03 00:00:00	2hours	2023-05-05 13:00:00	Riyadh	Abha	90
2	NR51		2023-05-05 10:00:00	5 hours	2023-05-05 13:00:00	Riyadh	Qassem	10
3	NR51		2023-03-01 06:30:00	4 hours	2023-03-01 10:30:00	Abha	Dammam	20
4	NR51		2023-02-01 16:30:00	2 hours	2023-02-01 18:30:00	Qassem	Riyadh	150
5	NR55		2023-02-12 12:30:00	2 hours	2023-02-12 14:30:00	Mecca	Riyadh	22
6	NR55		2023-02-12 12:30:00	2 hours	2023-02-12 14:30:00	Jeddah	Riyadh	50
7	NR55		2023-02-12 12:30:00	2 hours	2023-02-12 14:30:00	Qassem	Jeddah	72

After:

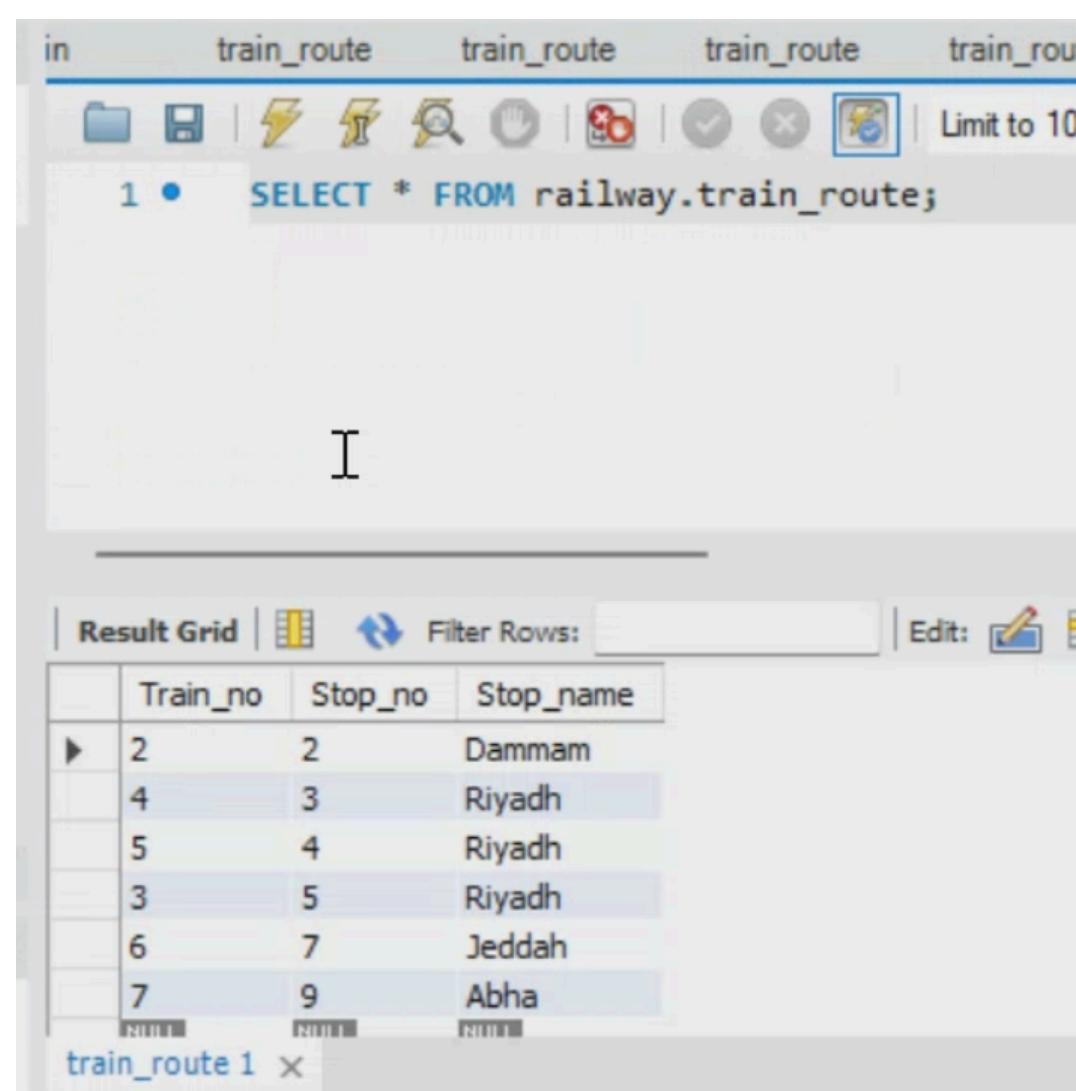
The screenshot shows the MySQL Workbench interface with the train table open. The data has been modified, showing only rows 2 through 6, indicating that row 1 was deleted due to the cascade delete rule defined in the train_route table.

	Train_no	Train_name	Dep_time	Distance	Arr_time	Departial	Destination	Seat_avail
2	NR51		2023-05-05 10:00:00	5 hours	2023-05-05 13:00:00	Riyadh	Qassem	10
3	NR51		2023-03-01 06:30:00	4 hours	2023-03-01 10:30:00	Abha	Dammam	20
4	NR51		2023-02-01 16:30:00	2 hours	2023-02-01 18:30:00	Qassem	Riyadh	150
5	NR55		2023-02-12 12:30:00	2 hours	2023-02-12 14:30:00	Mecca	Riyadh	22
6	NR55		2023-02-12 12:30:00	2 hours	2023-02-12 14:30:00	Jeddah	Riyadh	50

8. Database Queries:

8.3 Cascade Queries:

Automatically Deleted from the second table:



The screenshot shows a MySQL Workbench interface. At the top, there are tabs labeled 'in', 'train_route', 'train_route', 'train_route', and 'train_route'. Below the tabs is a toolbar with various icons. A query editor window contains the SQL command: '1 • SELECT * FROM railway.train_route;'. The result grid below shows the following data:

	Train_no	Stop_no	Stop_name
▶	2	2	Dammam
	4	3	Riyadh
	5	4	Riyadh
	3	5	Riyadh
	6	7	Jeddah
	7	9	Abha

The 'train_route 1' tab is selected at the bottom of the grid.

9.Conclusion

The purpose of this research is to develop a system and increase the effectiveness of the railway system, and database design is the focus of this system which are clearly and effectively designed by the business process diagrams and database ER diagram. Real-time tickets messages will be feededback to customers by the online railway booking system. The efficiency of booking is improved, manual booking errors is reduced, the management of railway passenger transport and customer booking is facilitated. which leads to ease of the system and increase customers. We also hope to develop the system by expanding it by increasing the number of stations.

10.References

- [1] Database system concepts 7th Ed.
- [2] <https://dev.mysql.com/>
- [3] <https://stackoverflow.com>
- [4] <https://www.tutorialspoint.com/>
- [5] Mei Xiaodong. Online booking system feasibility study and practice [J]. Railway Technology Innovation, 2004, (1)