DATABASE MANAGEMENT AND DATABASE DESIGN

PROJECT MODULE – 2

RENTAL CAR MANAGEMENT SYSTEM

TEAM_ARVS

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DATABASE DESIGN DOCUMENT

BUSINESS PROBLEM:

The purpose of the database is to maintain the inventory, orders, customers details, and transactional payment details. To manage and expand the rental car business and to maximize the profit by attracting more customers and help in making crucial business decisions by analyzing the transactional data and usage pattern reports from the database.

We are going to analyze the below mentioned business problems:

1. Most prevalently used car types based on the number of passengers travelled.

   Purpose: Identifying the most prevalent car models in order to make new car investments for scaling up the business.

   Solution: From the transaction table, we will take the average of data for the number of bookings with respect to car types. So, this will help the business team to identify the most preferred car type among the people.

2. Analyzing booking transactions based upon the distance travelled with respect to the type of car.

   Purpose: Based on the customer booking usage pattern, we are analyzing the data for the business team to make decisions on cost per mile between the range of distance travelled.

   Solution: From Transactions table, we will analyze the data by type of cars which could be further categorized as distance travelled (Ex. 5-10, 10-20 miles ranges). Then we will get the report of the usage patterns with respect to the type of cars. (Ex: Sedan, SUV)

3. Revenue generated per quarter based on the region/location.

   Purpose: Analysing how well the business works in all the regions and identify the best and least performing regions

   Solution: From payments and transactions data, we will sum up the revenue based on the locations. From which we will get information about the performing and non-performing regions.

4. Report based on the usage pattern of $/hr w.r.t $/miles.

   Purpose: Identifying the customer usage pattern, by comparing the distance travelled with the average distance per hour. If it exceeds more than 50% of the average distance, then the business team should re-think on their model in the aspect of $/miles.

Solution: Based on the transaction and distance travelled data, we will generate a report on the distance travelled by customers who exceed the average distance per hour.

5. Improving services based on customer's feedback report.

   Purpose: For enhancing the customer's experience.

   Solution: Based on the feedback data, we will generate the customers ride experience report for the business team.

6. Find out users who have not used services for long time in order send them attractive deals or attract in any manner.

   Purpose: Analysing the customers booking pattern, and to promote offers if any customer does not book a ride for at most 3 months.

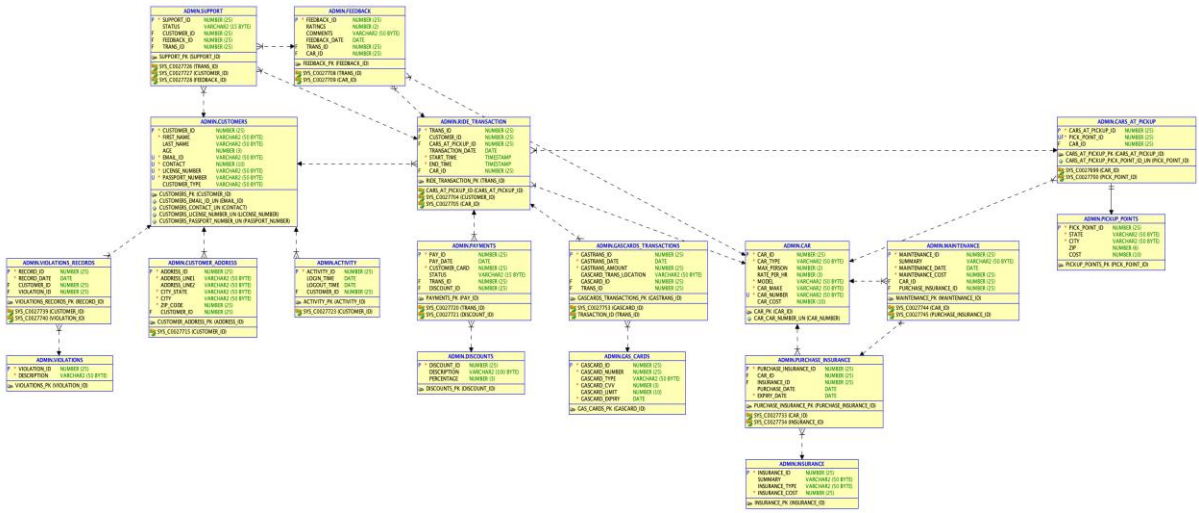
   Solution: Based on the transaction and customers data, we will generate the report based on the feedback ratings and comments.

7. A Survey has been conducted regarding how Organisation can improve, to figure out what customers exactly wants depending on survey categorised by % of vote from given choices. Management needs to consider it for betterment of their services.

   Purpose: To identify the % of customers who has opted from the given choices.

   Solution: Based on the survey data we will generate the report based on customers % of vote share for given choices.

ER DIAGRAM:



Please find the attached ER Diagram PDF document.

TABLE ENTITY AND ATTRIBUTES:

ENTITY	ATTRIBUTE	DATA TYPE	CONSTRAINTS
CUSTOMERS	CUSTOMER_ID	NUMBER(25)	PRIMARY KEY
	FIRST_NAME	VARCHAR(50)	NOT NULL
	LAST_NAME	VARCHAR(50)	
	AGE	NUMBER(3)	CHECK (AGE > 16)
	EMAIL_ID	VARCHAR(50)	NOT NULL UNIQUE
	CONTACT	NUMBER(10)	NOT NULL UNIQUE
	LICENSE_NUMBER	VARCHAR(50)	NOT NULL UNIQUE
	PASSPORT_NUMBER	VARCHAR(50)	NOT NULL UNIQUE
	CUSTOMER_TYPE	VARCHAR(50)	CHECK (CUSTOMER_TYPE IN ('STUDENT', 'EMPLOYEE', 'OTHER'))
CAR	CAR_ID	NUMBER(25)	PRIMARY KEY
	CAR_TYPE	VARCHAR(50)	NOT NULL
	MAX_PERSON	NUMBER(2)	DEFAULT(4)
	RATE_PER_HR	NUMBER(3)	DEFAULT(4)
	MODEL	VARCHAR(50)	NOT NULL
	CAR_MAKE	VARCHAR(50)	NOT NULL
	CAR_NUMBER	VARCHAR(50)	NOT NULL UNIQUE
	CAR_COST	NUMBER(10)	
	CAR_ID	NUMBER(25)	FOREIGN KEY (CAR_ID) REFERENCES FEEDBACK(CAR_ID)
RIDE_TRANSACTION	TRANS_ID	NUMBER(25)	PRIMARY KEY
	CUSTOMER_ID	NUMBER(25)	FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMERS(CUSTOMER_ID)
	CARS_AT_PICKUP_ID	NUMBER(25)	FOREIGN KEY (CARS_AT_PICKUP_ID) REFERENCES CARS_AT_PICKUP (CARS_AT_PICKUP_ID)
	TRANSACTION_DATE	DATE	DEFAULT SYSDATE
	START_TIME	TIMESTAMP	NOT NULL
	END_TIME	TIMESTAMP	NOT NULL
	CAR_ID	NUMBER(25)	FOREIGN KEY (CAR_ID) REFERENCES CAR (CAR_ID)
PICKUP_POINTS	PICK_POINT_ID	NUMBER(25)	PRIMARY KEY
	STATE	VARCHAR(50)	NOT NULL
	CITY	VARCHAR(50)	NOT NULL
	ZIP	NUMBER(6)	
	COST	NUMBER(10)	

CARS_AT_PICKUP	CARS_AT_PICKUP_ID	NUMBER(25)	
	PICK_POINT_ID	NUMBER(25)	FOREIGN KEY (PICK_POINT_ID) REFERENCES PICKUP_POINTS (PICK_POINT_ID)
	CAR_ID	NUMBER(25)	FOREIGN KEY (CAR_ID) REFERENCES CAR (CAR_ID)
FEEDBACK	FEEDBACK_ID	NUMBER(25)	PRIMARY KEY
	RATINGS	NUMBER(2)	
	COMMENTS	VARCHAR(50)	
	FEEDBACK_DATE	DATE	DEFAULT SYSDATE
	TRANS_ID	NUMBER(25)	FOREIGN KEY (TRANS_ID) REFERENCES RIDE_TRANSACTION (TRANS_ID)
	CAR_ID	NUMBER(25)	FOREIGN KEY (CAR_ID) REFERENCES CAR (CAR_ID)
CUSTOMER_ADDRESS	ADDRESS_ID	NUMBER(25)	PRIMARY KEY
	ADDRESS_LINE1	VARCHAR(50)	NOT NULL
	ADDRESS_LINE2	VARCHAR(50)	
	CITY_STATE	VARCHAR(50)	NOT NULL
	CITY	VARCHAR(50)	NOT NULL
	ZIP_CODE	NUMBER(25)	NOT NULL
	CUSTOMER_ID	NUMBER(25)	FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMERS (CUSTOMER_ID)
DISCOUNTS	DISCOUNTS_ID	NUMBER(25)	PRIMARY KEY
	DESCRIPTION	VARCHAR(100)	
	PERCENTAGE	NUMBER(3)	
PAYMENTS	PAY_ID	NUMBER(25)	PRIMARY KEY
	PAY_DATE	DATE	DEFAULT SYSDATE
	CUSTOMER_CARD	NUMBER(25)	NOT NULL
	STATUS	VARCHAR(15)	CHECK (STATUS IN ('IN PROGRESS','COMPLETED','PENDING'))
	TRANS_ID	NUMBER(25)	FOREIGN KEY (TRANS_ID) REFERENCES RIDE_TRANSACTION (TRANS_ID)
	DISCOUNT_ID	NUMBER(25)	FOREIGN KEY (DISCOUNT_ID) REFERENCES DISCOUNTS (DISCOUNT_ID)

ACTIVITY	ACTIVITY_ID	NUMBER(25)	PRIMARY KEY
	LOGIN_TIME	DATE	
	LOGOUT_TIME	DATE	
	CUSTOMER_ID	NUMBER(25)	FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMERS (CUSTOMER_ID)
SUPPORT	SUPPORT_ID	NUMBER(25)	PRIMARY KEY
	STATUS	VARCHAR(15)	CHECK (STATUS IN ('IN PROGRESS','COMPLETED','PENDING'))
	CUSTOMER_ID	NUMBER(25)	FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMERS (CUSTOMER_ID)
	FEEDBACK_ID	NUMBER(25)	FOREIGN KEY (FEEDBACK_ID) REFERENCES FEEDBACK (FEEDBACK_ID)
	TRANS_ID	NUMBER(25)	FOREIGN KEY (TRANS_ID) REFERENCES RIDE_TRANSACTION (TRANS_ID)
INSURANCE	INSURANCE_ID	NUMBER(25)	PRIMARY KEY
	SUMMARY	VARCHAR(50)	
	INSURANCE_TYPE	VARCHAR(50)	
	INSURANCE_COST	NUMBER(25)	NOT NULL
PURCHASE_INSURANCE	PURCHASE_INSURANCE_ID	NUMBER(25)	PRIMARY KEY
	CAR_ID	NUMBER(25)	FOREIGN KEY (CAR_ID) REFERENCES CAR (CAR_ID)
	INSURANCE_ID	NUMBER(25)	FOREIGN KEY (INSURANCE_ID) REFERENCES INSURANCE (INSURANCE_ID)
	PURCHASE_DATE	DATE	
	EXPIRY_DATE	DATE	NOT NULL
VIOLATIONS	VIOLATION_ID	NUMBER(25)	PRIMARY KEY
	DESCRIPTION	VARCHAR(50)	NOT NULL
VIOLATIONS_RECORS	RECORD_ID	NUMBER(25)	PRIMARY KEY
	RECORD_DATE	DATE	NOT NULL
	CUSTOMER_ID	NUMBER(25)	FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMERS (CUSTOMER_ID)
	VIOLATION_ID	NUMBER(25)	FOREIGN KEY (VIOLATION_ID) REFERENCES VIOLATIONS (VIOLATION_ID)

MAINTENANCE	MAINTENANCE_ID	NUMBER(25)	PRIMARY KEY
	SUMMARY	VARCHAR(50)	
	MAINTENANCE_DATE	DATE	NOT NULL
	MAINTENANCE_COST	NUMBER(25)	NOT NULL
	CAR_ID	NUMBER(25)	FOREIGN KEY (CAR_ID) REFERENCES CAR (CAR_ID)
	PURCHASE_INSURANCE_ID	NUMBER(25)	FOREIGN KEY (PURCHASE_INSURANCE_ID) REFERENCES PURCHASE_INSURANCE (PURCHASE_INSURANCE_ID)
GAS_CARDS	GASCARD_ID	NUMBER(25)	PRIMARY KEY
	GASCARD_NUMBER	NUMBER(25)	NOT NULL
	GASCARD_TYPE	VARCHAR(50)	
	GASCARD_CVV	NUMBER(3)	NOT NULL
	GASCARD_LIMIT	NUMBER(10)	DEFAULT(5000)
	GASCARD_EXPIRY	DATE	NOT NULL
GASCARDS_TRANSCATIONS	GASTRANS_ID	NUMBER(25)	PRIMARY KEY
	GASTRANS_DATE	DATE	
	GASTRANS_AMOUNT	NUMBER(25)	
	GASTRANS_TRANS_LOCATION	VARCHAR(50)	
	GASTRANS_ID	NUMBER(25)	FOREIGN KEY (GASTRANS_ID) REFERENCES GAS_CARDS (GASTRANS_ID)
	TRANS_ID	NUMBER(25)	FOREIGN KEY (TRANS_ID) REFERENCES RIDE_TRANSACTION (TRANS_ID)