

VEHICLE SHOWROOM MANAGEMENT DATABASE

MEMBERS	ROLL_NO.
PUSHPRAJ BHURIYA	197164
AKSHAT DHIMAN	197108
ABHINAV	197202
-CSE 2 nd Year (2020-2021)	

INTRODUCTION:

This Database can be used by an automobile center for keeping the records of items which is to be transacted for purchase and sell.

ADVANTAGES:

- It is much faster than manual system.
- Easy to generate report for any transaction
- It is very much flexible to work
- Easy and fastest record finding technique

Contents:

- Characteristics
- ER Model Assumption
- Functional Dependencies and Primary Key
- Normalization
- Relational Schema with Normalized tables
- Queries

CHARACTERISTICS:

Entity:

- VENDOR (VENDOR_CODE, VENDOR_NAME, CITY, ADDRESS, PHONE_NO)
- PURCHASE (PURCHASE_CODE, DESC)
- ITEM_TABLE (ITEM_CODE, ITEM_NAME, PURCHASE_PRICE, SALE_PRICE, CURR_STOCK)
- VEHICLE (VEHICLE_CODE, VEHICLE_NAME)
- COMPANY (COMPANY_ID, COMPANY_NAME, CITY, PHONE_NO, ADDRESS, EMAIL)
- SALES (SALES_CODE, DESC)
- CUSTOMER (CUST_ID, CNAME, CITY, PHONE_NO, EMAIL)

Relations:

- VENDOR_SELLED (VENDOR_CODE, PURCHASE_CODE)
- PURCHASE_TRANS (PURCHASE_CODE, ITEM_CODE, QTY, AMOUNT)
- READY_FOR_SALE (VEHICLE_CODE, ITEM_CODE)
- BUILD (COMPANY_ID, VEHICLE_CODE)
- SALES_TRANS (SALES_CODE, ITEM_CODE, QTY, AMOUNT)
- CUSTOMER_PURCHASED (CUST_ID, SALES_CODE)

ER Model Assumption -

- A Customer can have any no. of items or zero items from the sold items while a particular sold item can be sold to only one customer. Hence CUSTOMER PURCHASED relation is 1:M (CUSTOMER to SALES). Each sold item must have the customer hence entity SALES has total participation.
- Each item which is sold from the available items must have single and unique transaction ID. So, SALES_TRANS is 1:1 relation and the entity SALES has total participation in it.
- A company can make any no. of vehicles or there may be some new established company which didn't made any vehicle till now, but for every vehicle there is a company which made him, So BUILD is 1:M relation (COMPANY TO VEHICLE) and entity VEHICLE has full participation in BUILD relation.

- Among the built vehicles there may be some vehicles which are not ready to include in the ready to sell item list. Hence it is READY_FOR_SALE is a 1:1 relationship and both the entities has partial participation.
- A vendor can sell any no. of items but each item which is sold by vendors must be built by a particular vendor. Hence VENDOR_SELLED is 1:M relation (VENDOR TO PURCHASE) and entity PURCHASE HAS full participation.
- Similar to SALES_TRANS relation we can define PURCHASE_TRANS, so it's a 1:1 relationship in which entity purchase has full participation.

Functional Dependencies and Primary Key -

1.) Customer-

Cust_id -> {Fname, Lname, City, Phone_no, Email}

Since all the fields depend on Cust_id ,

(Cust_id)⁺ -> R.

Hence ,Cust_id is Primary Key.

2.) Vendor-

Vendor_code \rightarrow {Fname, Lname, City, Address, Phone_no}

Since all the fields depend on Vendor_code ,

(Vendor_code)⁺ \rightarrow R.

Hence , Vendor_code is Primary Key.

3.) Company-

Comany_id \rightarrow {Company_name, City, Phone_no, Email, Address}

Since all the fields depend on Company_id ,

(Company_id)⁺ \rightarrow R.

Hence , Company_id is Primary Key.

4.) Sales-

{Sales_code, Cust_id} \rightarrow Desc

Since all the fields depend on {Sales_code, Cust_id},

({Sales_code, Cust_id})⁺ \rightarrow R.

Hence , {Sales_code, Cust_id} is Primary Key.

5.) Purchase-

{Purchase_code, Vendor_code} \rightarrow Desc

Since all the fields depend on {Purchase_code, Vendor_code},

$(\{\text{Purchase_code}, \text{Vendor_code}\})^+ \rightarrow R.$

Hence , $\{\text{Purchase_code}, \text{Vendor_code}\}$ is Primary Key.

6.) Vehicle-

$\{\text{Vehicle_code}, \text{Company_id}\} \rightarrow \text{Vehicle_name}$

Since all the fields depend on $\{\text{Vehicle_code}, \text{Company_id}\},$

$(\{\text{Vehicle_code}, \text{Company_id}\})^+ \rightarrow R.$

Hence , $\{\text{Vehicle_code}, \text{Company_id}\}$ is Primary Key.

7.) Item_Table-

$\text{Item_code} \rightarrow \{\text{Item_name}, \text{Purchase_price}, \text{Curr_stock}, \text{Sale_price}\}$

Since all the fields depend on $\text{Item_code} ,$

$(\text{Item_code})^+ \rightarrow R.$

Hence , Item_code is Primary Key.

8.) Sales_Trans-

$\{\text{Item_code}, \text{Sales_code}\} \rightarrow \{\text{Amount}, \text{Qty}\}$

Since all the fields depend on $\{\text{Item_code}, \text{Sales_code}\},$

$(\{\text{Item_code}, \text{Sales_code}\})^+ \rightarrow R.$

Hence , $\{\text{Item_code}, \text{Sales_code}\}$ is Primary Key.

9.) Purchase_Trans-

{Item_code, Purchase_code} -> {Amount, Qty}

Since all the fields depend on {Item_code, Purchase_code},

({Item_code, Purchase_code})⁺ -> R.

Hence , {Item_code, Purchase_code} is Primary Key.

10.) Ready_For_Sale-

In this relationship the only attributes are Primary Key attributes .

Normalization-

**** All the tables contain only atomic values , therefore all the tables are in 1NF.**

1.) Customer

- Primary key : Cust_id
- All the attributes depend on the Cust_id ,hence the table is in 2NF
- All the attributes depend on Cust_id directly , hence the table is in 3NF
- All determinants(Cust_id) are candidate keys, hence the table is in BCNF

2.) Vendor

- Primary key : Vendor_code
- All the attributes depend on the Vendor_code, hence the table is in 2NF
- All the attributes depend on Vendor_code directly , hence the table is in 3NF
- All determinants(Vendor_code) are candidate keys, hence the table is in BCNF

3.) Comapany

- Primary key : Company_id
- All the attributes depend on the Company_id , hence the table is in 2NF
- All the attributes depend on Company_id directly , hence the table is in 3NF
- All determinants(Company_id) are candidate keys, hence the table is in BCNF

4.) Vehicle

- Primary key : {Vehicle_code, Company_id}
- All the attributes depend on the {Vehicle_code, Company_id}, hence the table is in 2NF
- All the attributes depend on {Vehicle_code, Company_id} directly , hence the table is in 3NF

- All determinants({Vehicle_code, Company_id}) are candidate keys, hence the table is in BCNF

5.) Item_Table

- Primary key : Item_code
- All the attributes depend on the Item_code, hence the table is in 2NF
- All the attributes depend on Item_code directly , hence the table is in 3NF
- All determinants(Item_code) are candidate keys, hence the table is in BCNF

6.) Sales

- Primary key : {Sales_code, Cust_id}
- All the attributes depend on the {Sales_code, Cust_id}, hence the table is in 2NF
- All the attributes depend on {Sales_code, Cust_id} directly , hence the table is in 3NF
- All determinants({Sales_code, Cust_id}) are candidate keys, hence the table is in BCNF

7.) Purchase

- Primary key : {Purchase_code, Vendor_code}
- All the attributes depend on the {Purchase_code, Vendor_code}, hence the table is in 2NF

- All the attributes depend on {Purchase_code, Vendor_code} directly , hence the table is in 3NF
- All determinants({Purchase_code, Vendor_code}) are candidate keys, hence the table is in BCNF

8.) Sales_trans

- Primary key : {Item_code, Sales_code}
- All the attributes depend on the {Item_code, Sales_code}, hence the table is in 2NF
- All the attributes depend on {Item_code, Sales_code} directly , hence the table is in 3NF
- All determinants({Item_code, Sales_code}) are candidate keys, hence the table is in BCNF

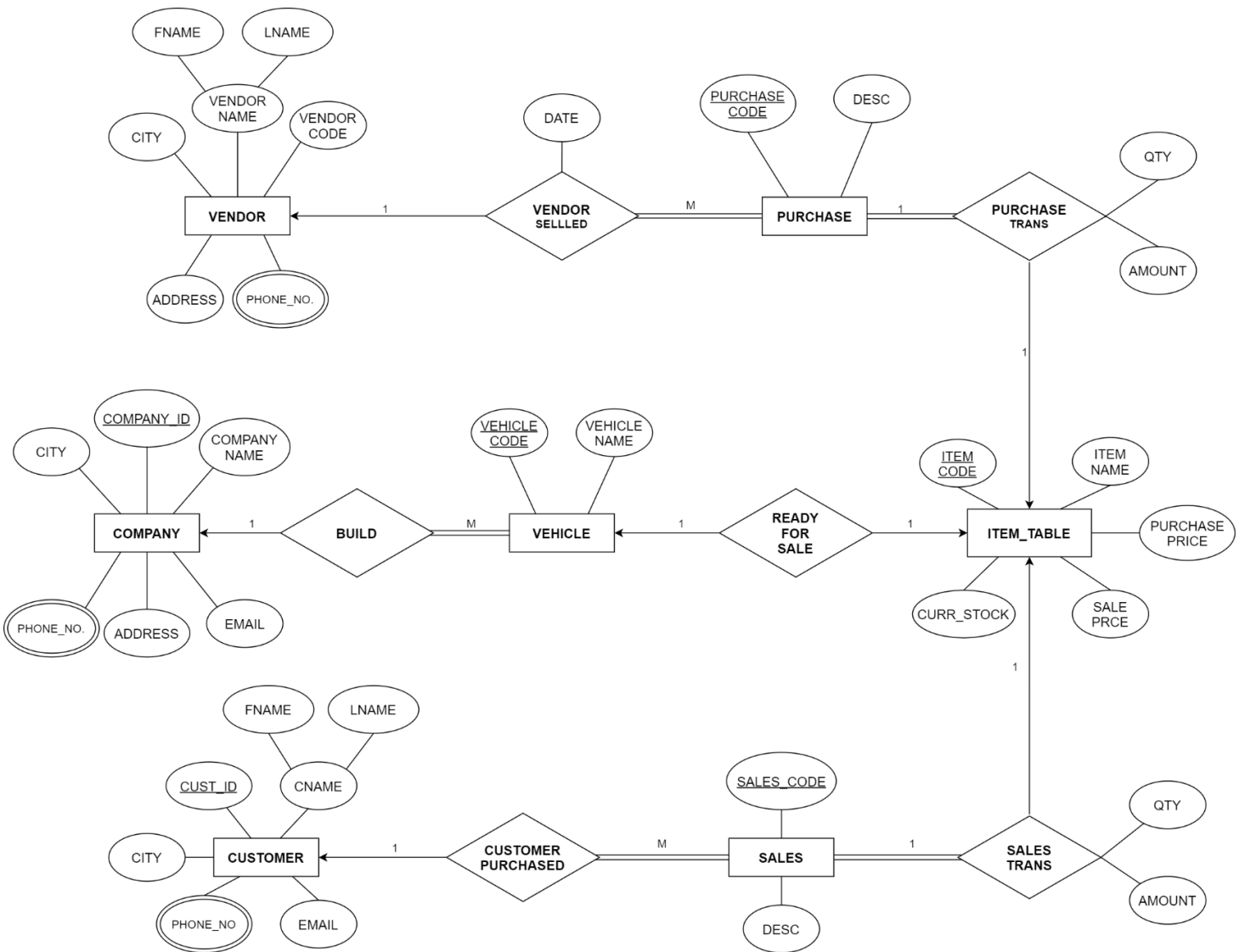
9.) Purchase_trans

- Primary key : {Item_code, Purchase_code}
- All the attributes depend on the {Item_code, Purchase_code}, hence the table is in 2NF
- All the attributes depend on {Item_code, Purchase_code} directly , hence the table is in 3NF
- All determinants({Item_code, Purchase_code}) are candidate keys, hence the table is in BCNF

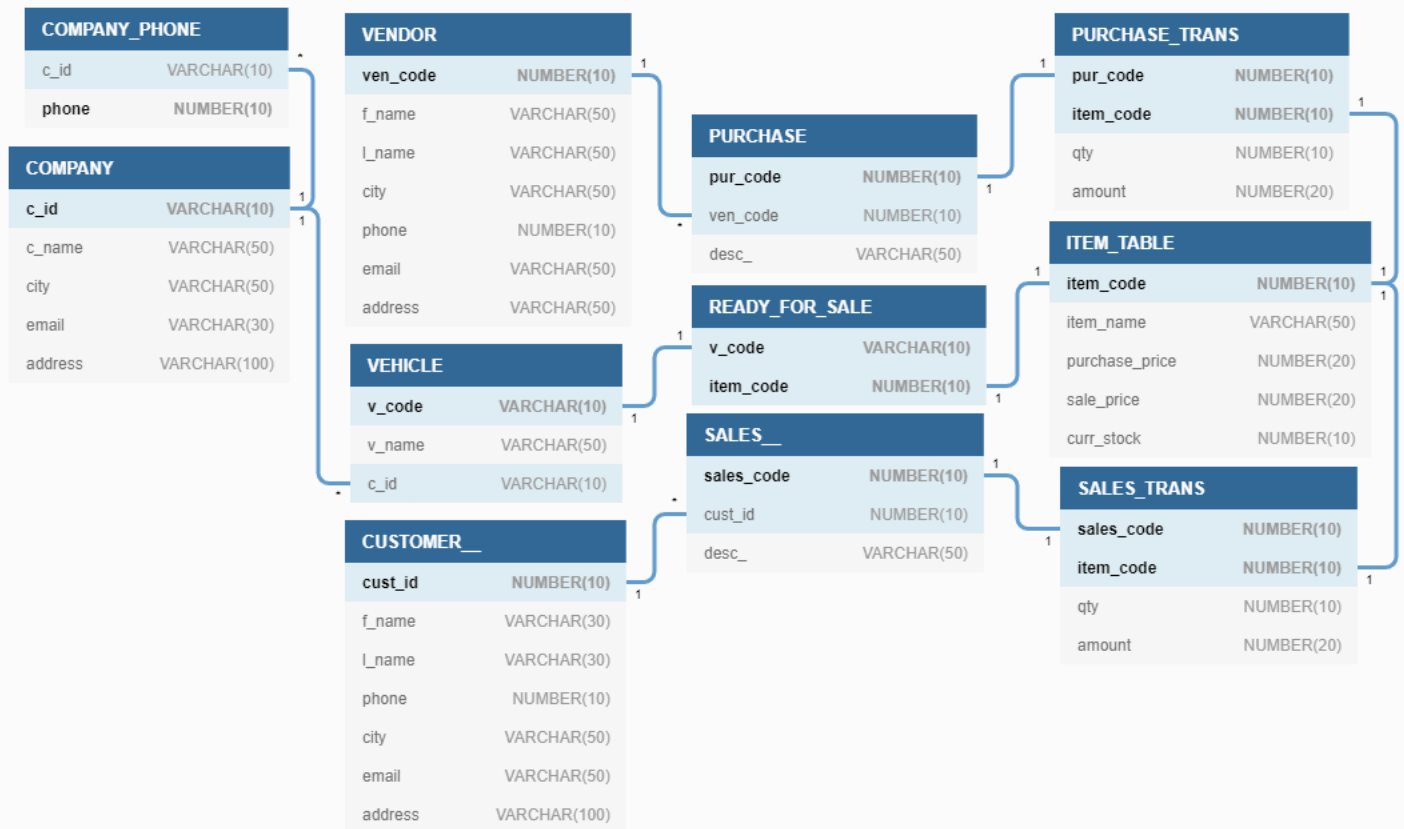
10.) Ready_For_Sale

- Primary key : {Item_code, Vehicle_code}
- All the attributes depend on the {Item_code, Vehicle_code} ,hence the table is in 2NF
- All the attributes depend on {Item_code, Vehicle_code} directly , hence the table is in 3NF
- All determinants({Item_code, Vehicle_code}) are candidate keys, hence the table is in BCNF

ER-DIAGRAM



Relational Schema with Normalized tables



QUERIES

Q-1. Display all the vehicle companies.

```
select c_name from company;
```

	C_NAME
1	Honda
2	Hyundai
3	Maruti Suzuki
4	BMW
5	Audi

Q-2. Display all the vehicle name made by Hyundai.

```
select v.v_name  
from vehicle v,company c  
where v.c_id=c.c_id and c.c_name='Hyundai';
```

	V_NAME
1	Hyundai i20
2	Hyundai Creta
3	Hyundai Aura
4	Hyundai Venue

Q-3. Display the name of the expensive vehicle.

```
select item_name
from item_table
where purchase_price in
(
    select max(purchase_price)
    from item_table
);
```

	ITEM_NAME
1	BMW X5

Q-4. Display the name of the cheapest vehicle.

```
select item_name
from item_table
where purchase_price in
(
    select min(purchase_price)
    from item_table
);
```

	ITEM_NAME
1	Maruti Suzuki Swift

Q-5. Display the number of vehicles made by each company.

```
select c.c_name,count(*)  
from company c,vehicle v  
where c.c_id=v.c_id  
group by(c.c_name);
```

	C_NAME	COUNT(*)
1	BMW	2
2	Hyundai	4
3	Maruti Suzuki	2
4	Audi	2
5	Honda	3

Q-6. Display all the vendor's name.

```
select f_name||' '||l_name Name  
from vendor;
```

	NAME
1	Ashish Sinha
2	Keshav Rajput

Q-7. Display customer name handled by the vendor 'Ashish Sinha'.

```
select c.f_name||' '||c.l_name NAME
from customer__ c,sales__ s,sales_trans st,purchase_trans
pt,purchase p,vendor v
where c.cust_id=s.cust_id and s.sales_code=st.sales_code
and st.item_code = pt.item_code and pt.pur_code =
p.pur_code and p.ven_code = v.ven_code and
v.f_name='Ashish' and v.l_name='Sinha';
```

	NAME
1	Ayush Singh
2	Parthiv Patel

Q-8. Display name of the customer and purchased car.

```
select c.f_name||' '||c.l_name||' Purchased '||it.item_name
TRANSACTION
from customer__ c,sales__ s,sales_trans st,item_table it
where c.cust_id=s.cust_id and s.sales_code=st.sales_code
and st.item_code=it.item_code;
```

	TRANSACTION
1	Ayush Singh Purchased Honda City
2	Rohit Sharma Purchased Hyundai Aura
3	Parthiv Patel Purchased BMW 3 Series

Q-9. Display address of the customer with highest bill.

```
select c.address
from customer__ c,sales__ s,sales_trans st
where c.cust_id=s.cust_id and s.sales_code=st.sales_code
      and st.amount = (
      select max(amount)
      from sales_trans
      );
```

	ADDRESS
1	D, block, Mahanagar, Lucknow, Uttar Pradesh 226006

Q-10. Display vehicle name with highest stock

```
select item_name,curr_stock
from item_table
where curr_stock in (
select max(curr_stock)
from item_table
);
```

	ITEM_NAME	CURR_STOCK
1	Maruti Suzuki Dzire	6
2	Maruti Suzuki Swift	6
3	Honda Jazz	6