MOTORCYCLE SPARE PARTS INVENTORY MANAGEMENT SYSTEM DATABASE DESIGN

The purpose of this Motorcycle Spare Parts Inventory Management System Database Design Project is to have an easier way to save information to the database and secure the information

The Starting Form



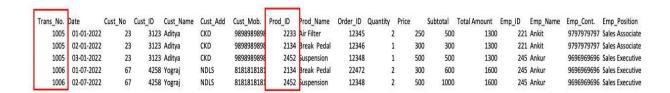
Above information in tabular form

Trans	_No.	Date	Cust_No	Cust_ID	Cust_Name	Cust_Address	Cust_Mob.	Prod_ID	Prod_Name	Order_ID	Quantity	Price		Subtotal	Total Amount	Emp_ID	Emp_Name	Emp_Cont.	Emp_Position
	1005	01-01-2022	23	3123	3 Aditya	CKD	9898989898	2233	Air Filter	12345		2	250	500	1300	22	1 Ankit	9797979797	7 Sales Associate
								2134	Break Pedal	12346		1	300	300	1300	22	1 Ankit	9797979797	7 Sales Associate
								2452	Suspension	12346		1	500	500	1300	24	5 Ankur	9696969696	Sales Executive
	1006	01-07-2022	67	4258	3 Yograj	NDLS	8181818181	2134	Break Pedal	22472		2	300	600	1600	24	5 Ankur	9696969696	Sales Executive
								2452	Suspension	12348		2	500	1000	1600	24	5 Ankur	9696969696	Sales Executive

First Normal Form: No nested tables or Group of elements (No cell should be having multiple elements or a table)

Trans_No.	Date	Cust_No	Cust_ID	Cust_Name	Cust_Addres	Cust_Mob.	Prod_ID	Prod_Name	Order_ID	Quantity	Price		Subtotal	Total Amount	Emp_ID	Emp_Name	Emp_Cont.	Emp_Position
1005	01-01-2022	23	312	3 Aditya	CKD	9898989898	2233	Air Filter	12345		2	250	500	1300	221	Ankit	9797979797	Salesman
1005	02-01-2022	23	312	3 Aditya	CKD	9898989898	2134	Break Pedal	12346		1	300	300	1300	221	Ankit	9797979797	Salesman
1005	03-01-2022	23	312	3 Aditya	CKD	9898989898	2452	Suspension	12348		1	500	500	1300	245	Ankur	9696969696	Executive
1006	01-07-2022	67	425	8 Yograj	NDLS	8181818181	2134	Break Pedal	22472	- 2	2	300	600	1600	245	Ankur	9696969696	Executive
1006	02-07-2022	67	425	8 Yograj	NDLS	8181818181	2452	Suspension	12348		2	500	1000	1600	245	Ankur	9696969696	Executive

Primary Key: Each row has a Trans_No for every Prod_ID. Therefore, Composite Primary key- [Tans_No, Prod_ID]



<u>Database now satisfies the two requirements of First Normal Form: atomicity and uniqueness. Therefore, it fulfil the most basic criteria of a relational database</u>

```
Transaction Trans No (PK)
          Date
         Cust No
         Cust ID
   Cust Name Cust Add
        Cust Mob
 Prod ID (PK) Prod Name
        Order ID
         Quantity
          Price
         Subtotal
      Total Amount
         Emp ID
       Emp Name
        Emp Cont
      Emp Position
```

Second Normal Form: No Dependencies on a part of a Composite Key

Field-by field Description:

- Date depends only on Trans ID
- Cust_No, Cust_ID, Cust_Name, Cust_Add, Cust_Mob depends neither on Trans_ID or Prod ID
- Prod Name depends only on Prod ID
- Order_ID depends neither on Trans_ID or Prod_ID (Assuming customer can order two products in single order with different Prod_ID)
- Price, Quantity depends on Order ID
- Subtotal, Total Amounts are derived fields
- Emp_Name, Emp_Cont, Emp_Position depends on Emp_ID which depends neither on Trans ID or Prod ID
- ➤ Regard Order_ID as dependent on both the transaction and product. For simplicity, assume that price never changes, thus price fails Second Normal Form.
- > Cust_ID (along with rest customer column) does not depend on either primary key. Date and Trans_No are meaningless without Cust_ID

Subtotal and Total Amount seems to depend on both the primary key but as they are derived products, they can be easily constructed outside database and including them would be redundant. Therefore, discard Subtotal and Total Amount

Creating new Tables Transaction and Products

Transaction Trans_No (PK) Date Cust_No Cust_ID Cust_Name Cust_Add Cust_Mob Order_ID Emp_ID Emp_Name Emp_Cont Emp_Position

Products
Prod_ID (PK)
Prod_Name
Quantity
Price

Third Normal Form: No Dependencies on Non-Key Attributes

- Fields Cust_ID, Cust_Name, Cust_Add, Cust_Mob depends on Cust_No, which is not part of primary key. Therefore, these fields belong in their own table with Cust_No as their primary key
- Similarly creating order table with Order_ID as their primary key and employee table with Emp_ID as their primary key

Transaction Trans_No (PK) Date Order_ID (FK) Cust_ID (FK) Emp_ID (FK)

Customer Cust_ID (PK) Cust_No Cust_Name Cust_Mob Cust_Add

Products Prod_ID (PK) Prod_Name Price

Products
Prod_ID (PK)
Prod_Name
Price

Products
Prod_ID (PK)
Prod_Name
Price

ER Diagram for Motorcycle Spare Parts Inventory Management System Database

