

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

To use the invoice without Apptivo logo, download this invoice for free from invoice.apptivo.com

**INVOICE**

SOLD TO: 12259
Company Name
PO BOX 206
Spokane, wa 99210

SHIP TO:
Company Name INC
140 South Arthur Suite 515
Spokane, wa 99210

DATE: 31/3/11 **PO NUMBER:** 10062 **SHIP VIA:** WC

TERMS: Net 10th prox REMIT TO: KEYSTONE; PO 206; SPOKANE WA 99210 FEDERAL ID# 93-8571872

ORD#	SHIP	PART #	PART DESCRIPTION	PRICE	TOTAL
10	10	BP712	12x 7amp sealed lead acid battery	18.91	189.10
INVOICE TOTAL					\$189.10

**Our Services**

- Service one
- Service two
- Service one
- Service two

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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	Aditya	CKD	9898989898	2233	Air Filter	12345	2	250	500	1300	221	Ankit	9797979797	Sales Associate
							2134	Break Pedal	12346	1	300	300	1300	221	Ankit	9797979797	Sales Associate
							2452	Suspension	12346	1	500	500	1300	245	Ankur	9696969696	Sales Executive
1006	01-07-2022	67	4258	Yograj	NDLS	8181818181	2134	Break Pedal	22472	2	300	600	1600	245	Ankur	9696969696	Sales Executive
							2452	Suspension	12348	2	500	1000	1600	245	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_Addre	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	Aditya	CKD	9898989898	2233	Air Filter	12345	2	250	500	1300	221	Ankit	9797979797	Salesman
1005	02-01-2022	23	3123	Aditya	CKD	9898989898	2134	Break Pedal	12346	1	300	300	1300	221	Ankit	9797979797	Salesman
1005	03-01-2022	23	3123	Aditya	CKD	9898989898	2452	Suspension	12348	1	500	500	1300	245	Ankur	9696969696	Executive
1006	01-07-2022	67	4258	Yograj	NDLS	8181818181	2134	Break Pedal	22472	2	300	600	1600	245	Ankur	9696969696	Executive
1006	02-07-2022	67	4258	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- [Trans_No, Prod_ID]

Trans_No.	Date	Cust_No	Cust_ID	Cust_Name	Cust_Add	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	Aditya	CKD	9898989898	2233	Air Filter	12345	2	250	500	1300	221	Ankit	9797979797	Sales Associate
1005	02-01-2022	23	3123	Aditya	CKD	9898989898	2134	Break Pedal	12346	1	300	300	1300	221	Ankit	9797979797	Sales Associate
1005	03-01-2022	23	3123	Aditya	CKD	9898989898	2452	Suspension	12348	1	500	500	1300	245	Ankur	9696969696	Sales Executive
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1006	02-07-2022	67	4258	Yograj	NDLS	8181818181	2452	suspension	12348	2	500	1000	1600	245	Ankur	9696969696	Sales Executive

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

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
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- 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

