

MGMT 58200

MANAGEMENT OF ORGANIZATIONAL DATA FINAL PROJECT

Group 2

Keerthana Nemili

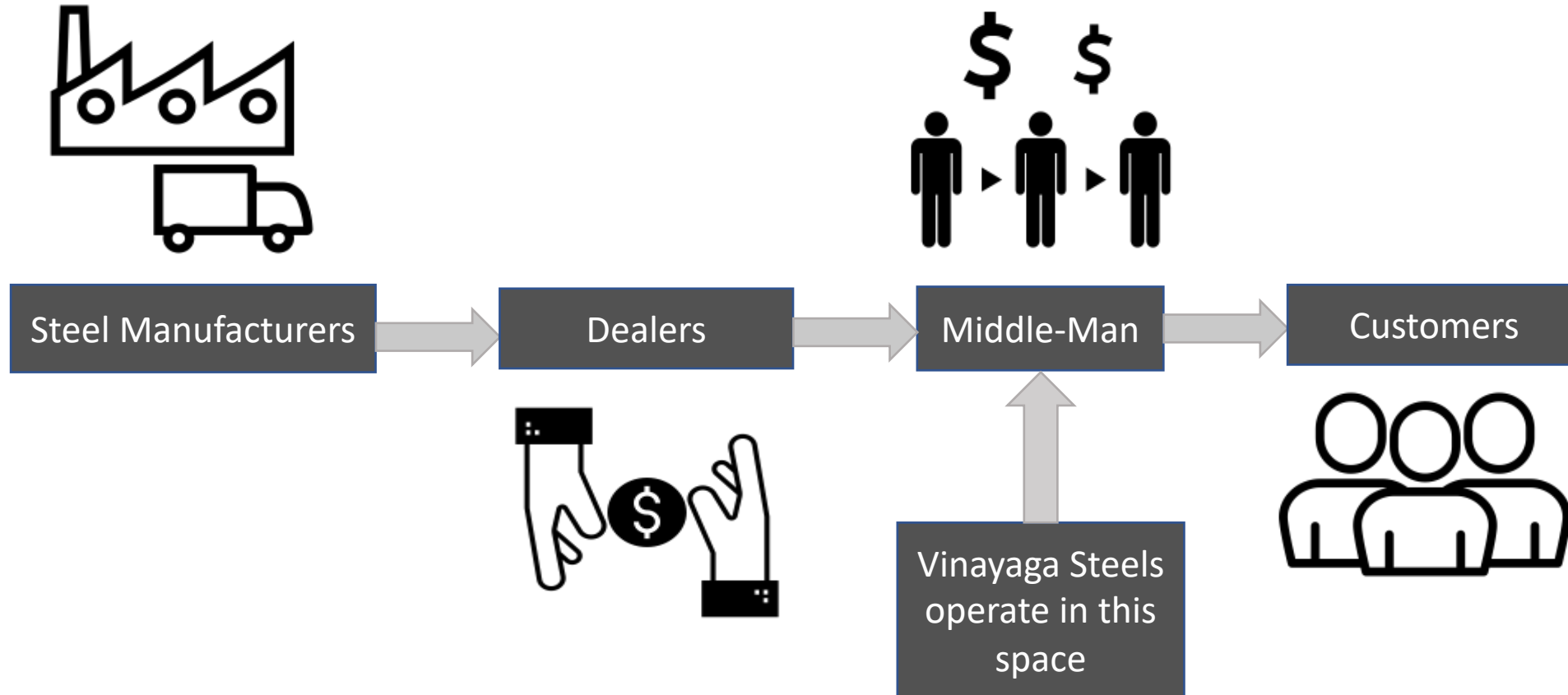
Payal Pandya

Udyog Pati

Girish Sharma

Thannir Malai Annamalai Kumar

General Business Flow



Client Background

Vinayaga Steels

Operates in middle-man space providing steel sheets for credit.



Current Scenario

- Records data as **manual written bills** and **online electronic bills**
- No organized database or structure to record data

GSTIN : 33BBDPK7616K1ZL CASH / CREDIT BILL Phone : 94435 50096
94438 17923

VINAYAGA STEELS
IRON & STEEL MERCHANT
24, V.C.V. ROAD (Near Milk Market) COIMBATORE-641 001

BILL No 108	Dated : 1-2-2022
Your Order No.	Dated :
M/s. LEO ENGINEERING PLANT-2	
21172 A VJP NAHAR PEEDAMPALLI POST	
COIMBATORE-16	
GSTIN: 33AAHFL96863120	Dated :

Materials despatched to
Through **TN-37 DC-9511** Vendor :

S. No.	DESCRIPTION OF GOODS	HSN CODE	QUANTITY	RATE	VALUE Rs.	P.
1.)	8 x 4 5mm Hg plate 3nos	7208	390kg	76/50	29835.00	
2.)	8 x 4 6mm Hg plate 1no	7208	158kg	76/50	12087.00	
3.)	10 x 5 2mm C.P. Sheet 2nos	7209	155kg	81/-	12555.00	
Net Value					54477.00	
SGST 9%					4903.00	
CGST 9%					4903.00	
FREIGHT & LOADING					127.00	
Grand Total					64410.00	

E&OE

Goods once sold cannot be taken back.

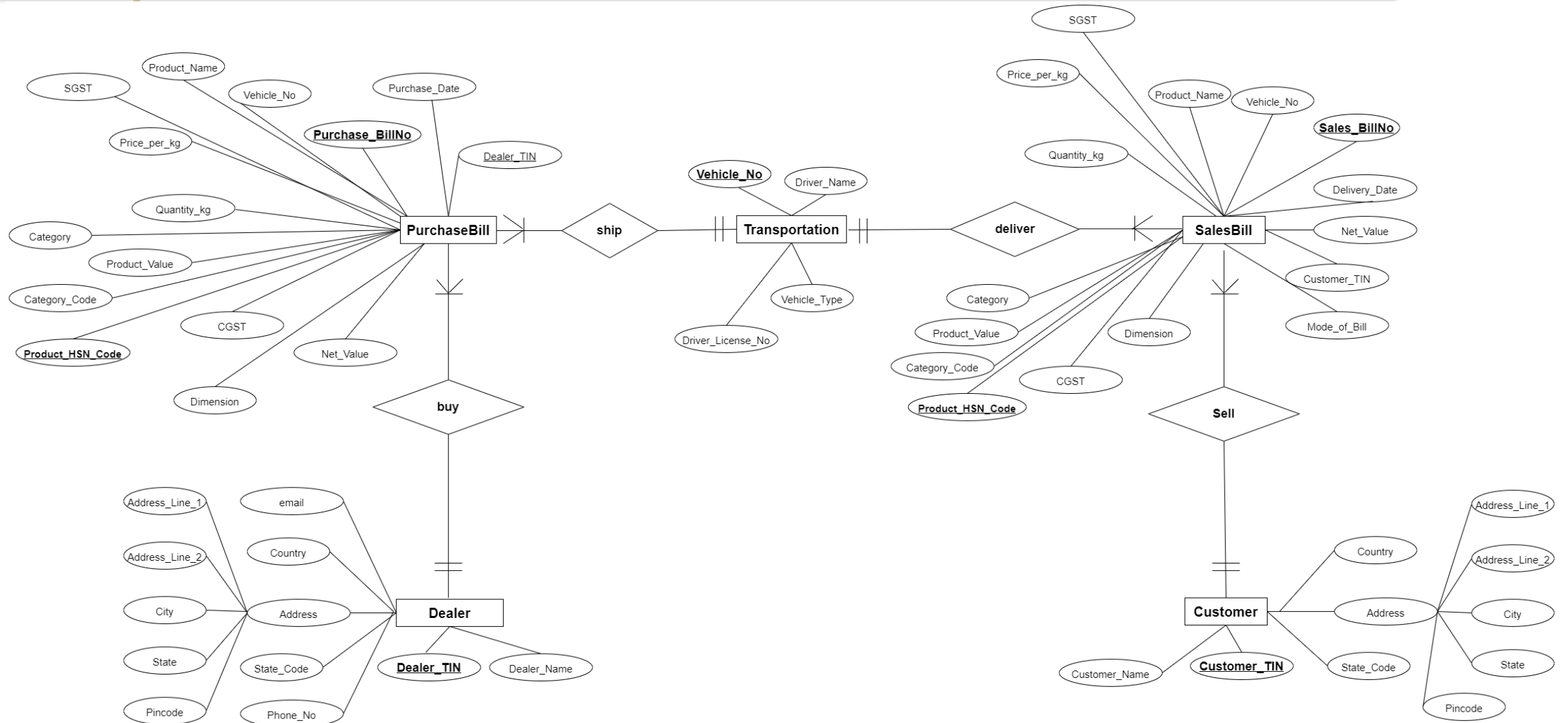
Rupees **Sixty four thousand four hundred & ten only -**
Customer's Signature. For VINAYAGA STEELS
S. Gopinath

Project Objective

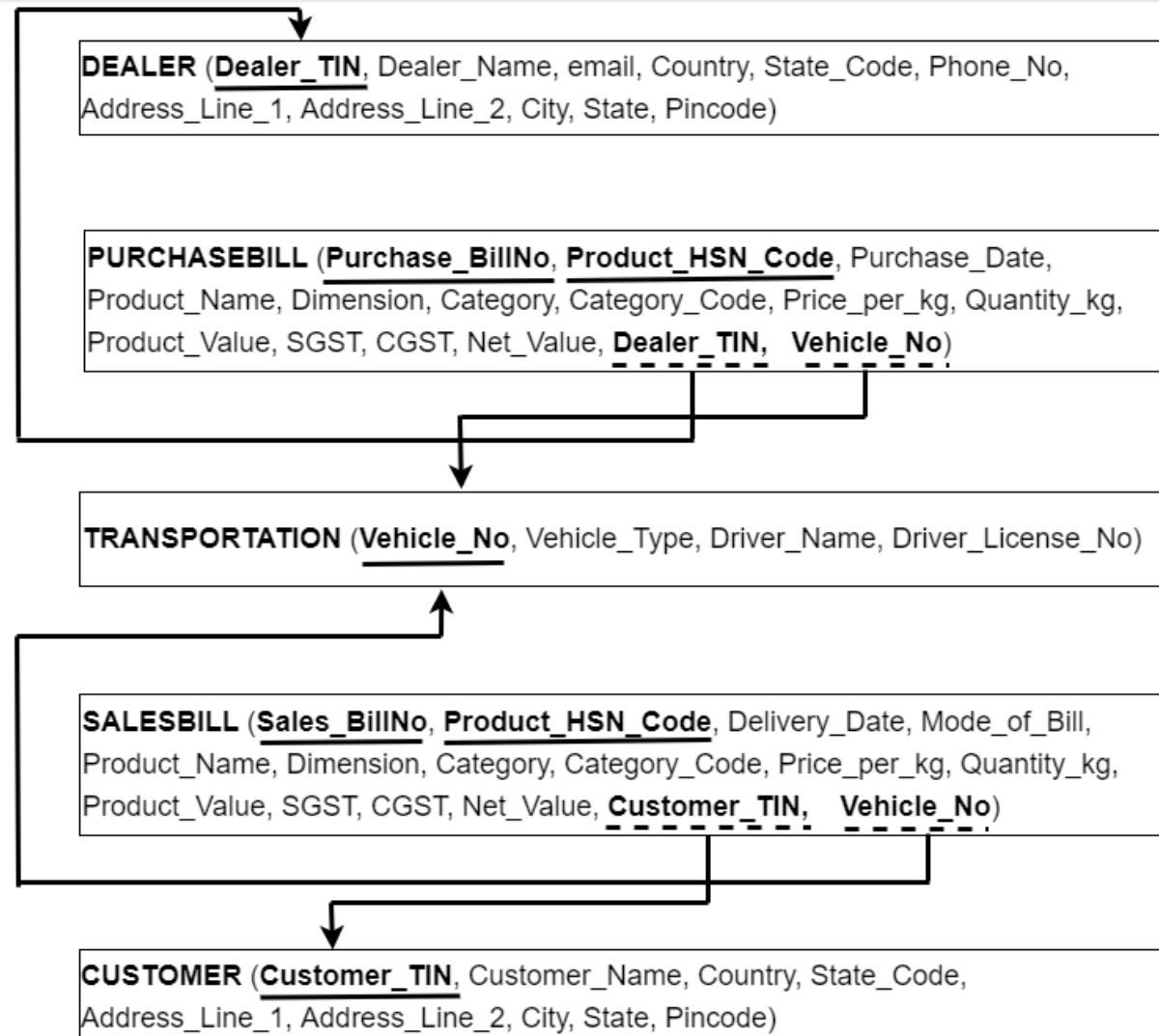
Design and implement a Database for Vinayaga steels

- Improvise the current data capturing mechanism
- Efficiently record, manage and store data
- Enable them make data driven decisions

Conceptual Data Modelling: ERD



Relational Data Model: Relational Schema



First Normal Form (1NF)

Dealer

Dealer_TIN	Dealer_Name	Address_Line_1	Address_Line_2	City	State	Pincode
33AANCM9034G1ZC	MATHA STEELS PRIVATE LIMITED	29-30 Narasimha Street, No2 SPN Layout	Godown: 16, Narasimhanaidu Street	Coimbatore	Tamilnadu	641001
33BBDPK7616K1ZL	MEGHALAI STEELS	S/F NO. 10/3A Krishnarayapuram (V)	F.C.I Road, Ganapathy	Coimbatore	Tamilnadu	641006
33AACFC0315N1ZU	CSK TUBE CORPORATION (PG 26)	#229, Chellppan Street	Kattoor	Coimbatore	Tamilnadu	641301
33ADIPR8026Q1ZW	ALFA METALS	No:1, Venkatalakshmi Nagar	Singanallur	Coimbatore	Tamilnadu	641005

Customer

Customer_TIN	Customer_Name	Address_Line_1	Address_Line_2	City	State	Pincode
33AAHFL9686J1Z0	LEO ENGINEERING PLANT 2	2/172 A VIP Nagar	Peedampalli Post	Coimbatore	Tamilnadu	641016
33AAHCPN7839D1ZE	GK CONTROLS	112, 113 Kamadhenu Nagar	KR Puram	Coimbatore	Tamilnadu	641006
33AAOFB5844K1Z5	BRIGHTSUN ENGINEERING & FABRICATION	2/34, A337 Millroad	Chinniyampalayam	Coimbatore	Tamilnadu	641062
33AULPR4079D1ZG	R2 ENGINEERING SOLUTION	3/101/A2, SuryaNagar	Peedampalli Post	Coimbatore	Tamilnadu	641016
33AJKPM0457G1ZC	ANNAI INDUSTRIES	18/31 A	Luna Nagar	Coimbatore	Tamilnadu	641025

DEALER - Functional Dependencies

Dealer_TIN → Dealer_Name, email, Country, State_Code,
Phone_No, Address_Line_1, Address_Line_2, City, State, Pincode

No partial or transitive dependencies identified!

CUSTOMER - Functional Dependencies

- Customer_Tin → Customer_Name, Country, State_Code, Address_Line_1, Address_Line_2, City, State, Pincode

No partial or transitive dependencies identified!

PURCHASEBILL - Functional Dependencies

- Purchase BillNo, Product HSN Code -> Price_per_kg, Quantity_kg, Product_Value, SGST, CGST, Net_Value, Dealer_TIN, Vehicle_No
- Purchase BillNo -> Purchase_Date : **PARTIAL DEPENDENCY**
- Product HSN Code -> Product_Name, Dimension, Category, Category_Code : **PARTIAL DEPENDENCY**
- Category_Code -> Category : **TRANSITIVE DEPENDENCY**

PURCHASEBILL – 3NF

PURCHASEBILL (Purchase_BillNo, Purchase_Date)

PURCHASEBILL_PRODUCT (Purchase_BillNo, Product_HSN_Code, Purchase_Date, Price_per_kg, Quantity_kg, Product_Value, SGST, CGST, Net_Value, Vehicle_No, Dealer_TIN)

PRODUCT(Product_HSN_Code, Product_Name, Dimension, Category_Code)

CATEGORY(Category_Code, Category)

TRANSPORTATION - Functional Dependencies

- Vehicle_No -> Vehicle_Type, Driver_Name, Driver_License_No
- Driver_License_No -> Driver_Name : **TRANSITIVE DEPENDENCY**

TRANSPORTATION – 3NF

TRANSPORTATION (Vehicle_No, Vehicle_Type, **Driver_License_No**)

DRIVERS (Driver_License_No, Driver_Name)

SALESBILL - Functional Dependencies

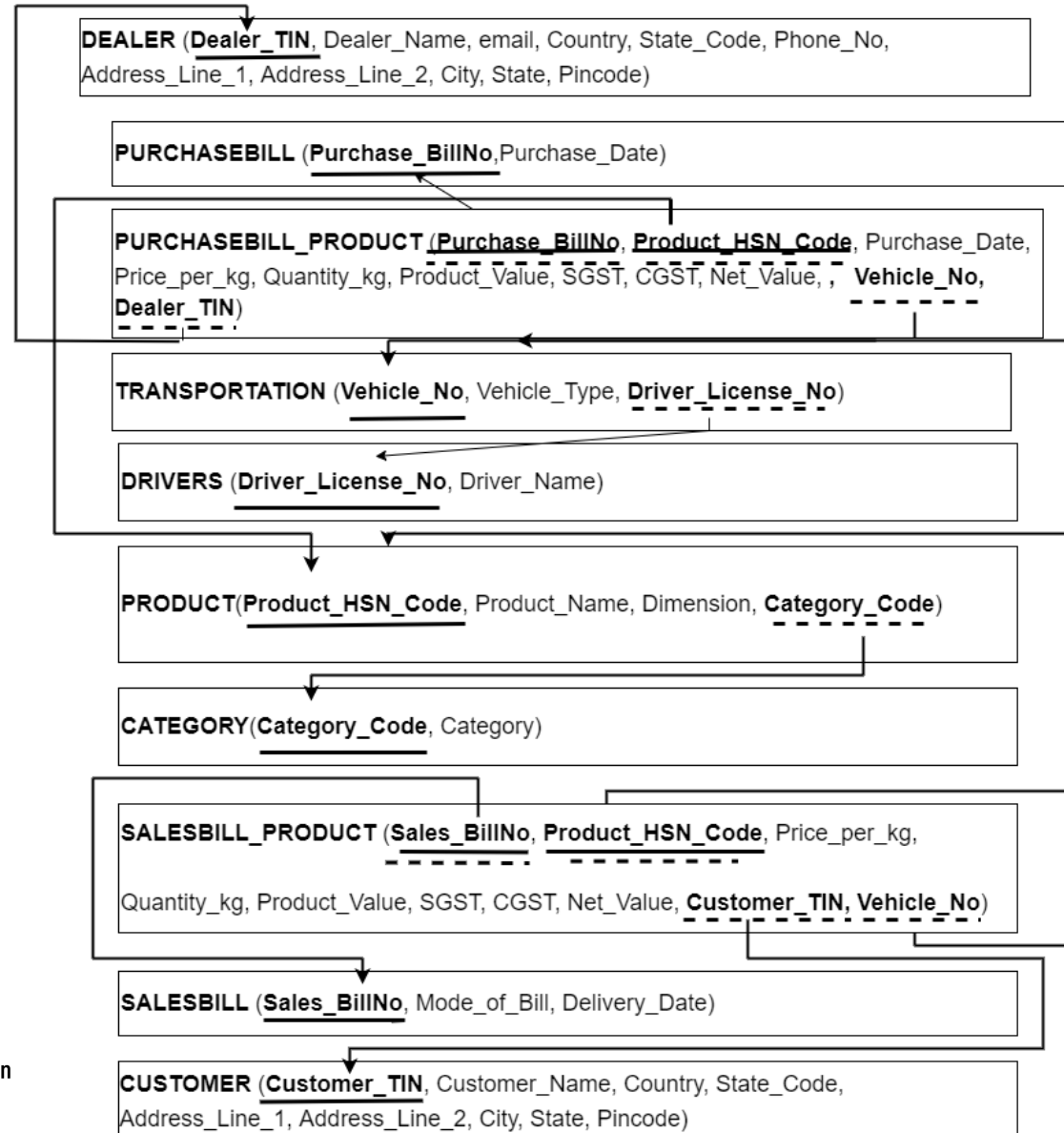
- Sales_BillNo, Product_HSN_Code -> Price_per_kg, Quantity_kg, Product_Value, SGST, CGST, Net_Value, Customer_TIN, Vehicle_No
- Product_HSN_Code -> Purchase_Date, Product_Name, Dimension, Category, Category_Code : **PARTIAL DEPENDENCY**
- Category_Code -> Category: **TRANSITIVE DEPENDENCY**
- Sales_BillNo -> Mode_of_Bill, Delivery_Date : **PARTIAL DEPENDENCY**

SALESBILL – 3NF

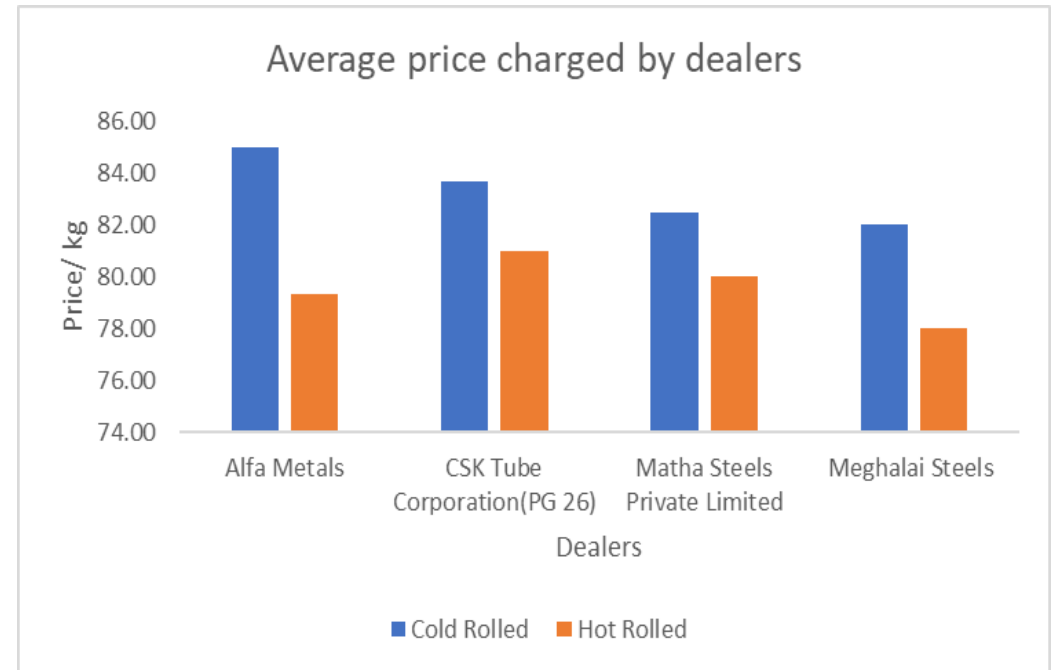
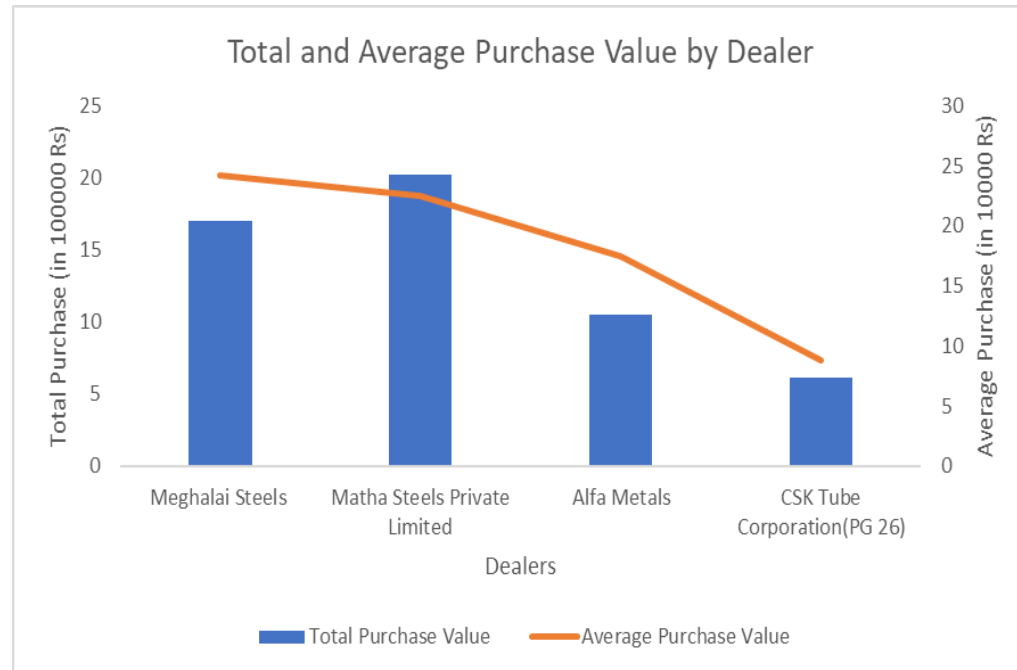
SALESBILL_PRODUCT (Sales_BillNo, Product_HSN_Code, Price_per_kg,
Quantity_kg, Product_Value, SGST, CGST, Net_Value, Customer_TIN, Vehicle_No)

SALESBILL (Sales_BillNo, Mode_of_Bill, Delivery_Date)

Normalization



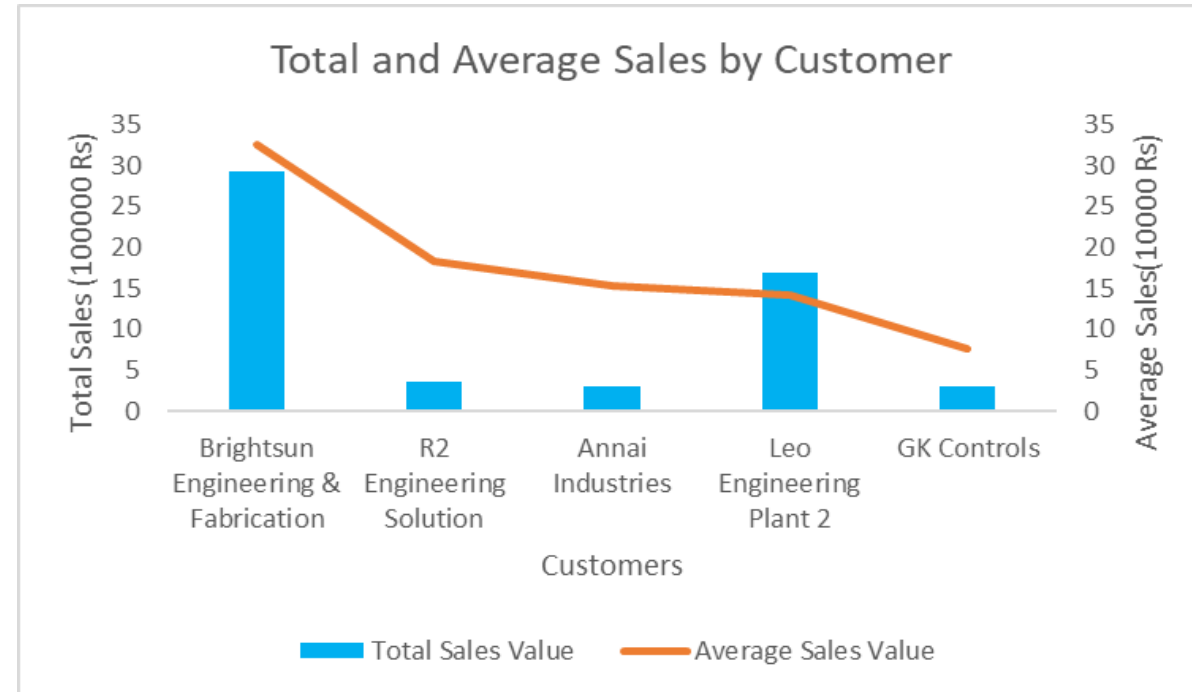
Insights - Dealers



- Highest total purchase is from Matha Steels but Meghalai Steels have highest average purchase
- Alfa Metals and CSK Tube Corporation charge the most

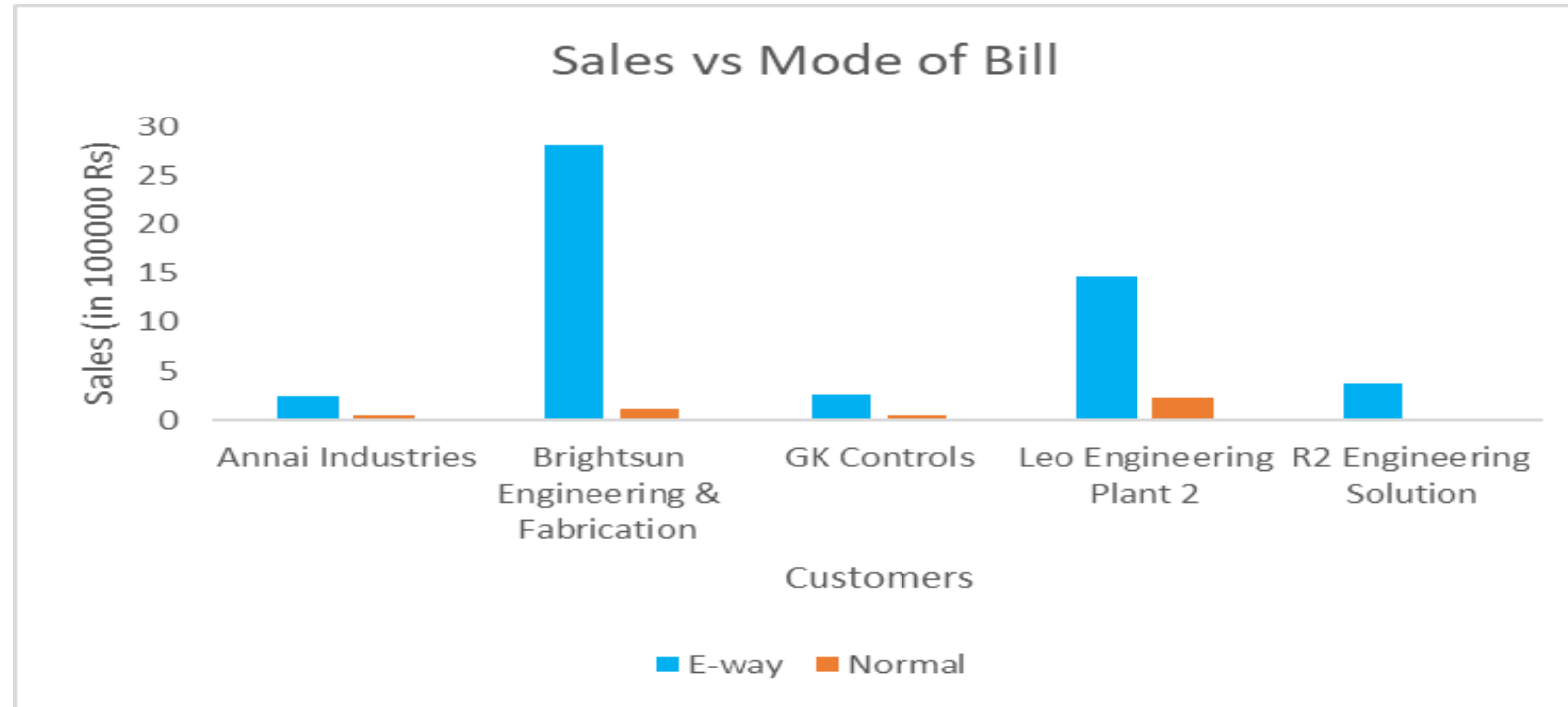
Insights - Customers

Customer Name	Number of Bills
Leo Engineering Plant 2	12
Brightsun Engineering & Fabrication	9
GK Controls	4
Brightsun Engineering & Fabrication	2
Annai Industries	2



- Brightsun Engineering provided highest total and average sales value
- Leo Engineering provided highest number of sales bill

Insights- Mode of bill



- E-way bills are done the most
- Average sales value for Rs. 2,57,367 for E-Way bills and Rs. 51,160 for normal bills.

Recommendations

Database Design Recommendations:

- Implement a for database to record and store data to make data driven decisions
- Record category and product information separately
- Record vehicle and drivers information separately

Business Recommendations:

- Purchase from Meghalai Steels and Matha Steels more as they offer better prices and higher volumes
- Provide incentives to increase sales for Brightsun Engineering as they have highest sales value per bill

APPENDIX

- SQL Queries and Results

1. Top 3 products purchased the most overall

```
3 • SELECT B.Product_Name, COUNT(A.Product_HSN_Code) AS "No. of times Purchased/Sold"
4 FROM purchasebill_product A
5 LEFT JOIN product B
6 ON A.Product_HSN_Code = B.Product_HSN_Code
7 GROUP BY B.Product_Name
8 ORDER BY COUNT(A.Product_HSN_Code) DESC
9 LIMIT 3;
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:
Product_Name	No. of times Purchased/Sold				
8 X 4 X 2 CR Sheet	15				
8 X 4 X 1 CR Sheet	13				
8 X 4 X 5 HR Plate	10				

2. Total categories purchased or sold by Vinayaga Steels




11 # Categories:

12 • `SELECT DISTINCT Category FROM category`

Result Grid		Filter Rows:	Export:	Wrap Cell
	Category			
▶	Hot Rolled			
	Cold Rolled			
	Cold Pressed			




3. Which product was most sold under each category

```
24 • SELECT * FROM
25 (SELECT C.Category, A.Product_Name, COUNT(B.Product_HSN_Code) AS "No. of times Purchased/Sold",
26 ROW_NUMBER() OVER (PARTITION BY C.Category ORDER BY COUNT(B.Product_HSN_Code) DESC) AS Rank_No
27 FROM product A
28 LEFT JOIN purchasebill_product B
29 ON A.Product_HSN_Code = B.Product_HSN_Code
30 LEFT JOIN category C
31 ON A.Category_Code = C.Category_Code
32 GROUP BY C.Category, A.Product_Name) C
33 WHERE C.Rank_No = 1;
```

Result Grid  Filter Rows: <input type="text"/> Export:  Wrap Cell Content: 				
	Category	Product_Name	No. of times Purchased/Sold	Rank_No
▶	Cold Pressed	8 X 4 X 1 CP Plate	1	1
	Cold Rolled	8 X 4 X 2 CR Sheet	15	1
	Hot Rolled	8 X 4 X 5 HR Plate	10	1




4. Total Dealers

```
108      # total number of dealers
109      SELECT DISTINCT Dealer_TIN, Dealer_Name
110      FROM dealer
111
```

Result Grid  Filter Rows: <input type="text"/> Export:  Wrap Cell Content: 		
	Dealer_TIN	Dealer_Name
▶	33AANCM9034G1ZC	MATHA STEELS PRIVATE LIMITED
	33BBDPK7616K1ZL	MEGHALAI STEELS
	33AACFC0315N1ZU	CSK TUBE CORPORATION (PG 26)
	33ADIPR8026Q1ZW	ALFA METALS

5. Average purchase value, Total purchase value, Number of bills at dealer level

```
35      # Most Purchased from which dealer
36 •    SELECT B.Dealer_Name, COUNT(DISTINCT(A.Purchase_BillNo)) AS "No. of bills",
37      SUM(A.Net_Value) AS "Total purchase value",
38      SUM(A.Net_Value)/COUNT(DISTINCT(A.Purchase_BillNo)) AS "Average Purchase Value"
39      FROM purchasebill_product A
40      LEFT JOIN dealer B
41      ON A.Dealer_TIN = B.Dealer_TIN
42      GROUP BY A.Dealer_TIN
43      ORDER BY SUM(A.Net_Value)/COUNT(DISTINCT(A.Purchase_BillNo)) DESC;
44
45      # Total Purchase from each dealer
```

Result Grid  Filter Rows: <input type="text"/> Export:  Wrap Cell Content: 				
	Dealer_Name	No. of bills	Total purchase value	Average Purchase Value
▶	MEGHALAI STEELS	7	1696307.82	242329.6885714286
	MATHA STEELS PRIVATE LIMITED	9	2025006.2600000002	225000.69555555558
	ALFA METALS	6	1049303.79	174883.965
	CSK TUBE CORPORATION (PG 26)	7	613268.4199999999	87609.77428571427





6. Best and worst price by each dealer for each category across months

```
86 # Which dealer gave the best and worst price for each category across months
87 • SELECT DISTINCT DATE_FORMAT(D.Purchase_Date, "%M-%Y") AS "Month", c.Category, E.Dealer_Name, (B.Price_per_kg) AS "Price Per Kg"
88 FROM product A
89 LEFT JOIN purchasebill_product B
90 ON A.Product_HSN_Code = B.Product_HSN_Code
91 LEFT JOIN category C
92 ON A.Category_Code = C.Category_Code
93 LEFT JOIN PurchaseBill D
94 ON B.Purchase_BillNo = D.Purchase_BillNo
95 LEFT JOIN dealer E
96 ON B.Dealer_TIN = E.Dealer_TIN
97 GROUP BY C.Category, month(D.Purchase_Date), B.Dealer_TIN
98 ORDER BY month(D.Purchase_Date), C.Category, (B.Price_per_kg) DESC;
99
```

Result Grid				
Filter Rows:		Exports:	Wrap Cell Content:	
Month	Category	Dealer_Name	Price Per Kg	
February-2022	Cold Pressed	ALFA METALS	86.5	
February-2022	Cold Rolled	ALFA METALS	81	
February-2022	Cold Rolled	CSK TUBE CORPORATION (PG 26)	78	
February-2022	Cold Rolled	MATHA STEELS PRIVATE LIMITED	77.5	
February-2022	Cold Rolled	MEGHALAI STEELS	76.5	
February-2022	Hot Rolled	CSK TUBE CORPORATION (PG 26)	75	
February-2022	Hot Rolled	ALFA METALS	74.5	
February-2022	Hot Rolled	MATHA STEELS PRIVATE LIMITED	73	
February-2022	Hot Rolled	MEGHALAI STEELS	72	
March-2022	Cold Rolled	ALFA METALS	82	
March-2022	Cold Rolled	CSK TUBE CORPORATION (PG 26)	81	
March-2022	Cold Rolled	MEGHALAI STEELS	79.5	
March-2022	Cold Rolled	MATHA STEELS PRIVATE LIMITED	79	
March-2022	Hot Rolled	ALFA METALS	76	
April-2022	Cold Rolled	ALFA METALS	92	
April-2022	Cold Rolled	CSK TUBE CORPORATION (PG 26)	92	
April-2022	Cold Rolled	MATHA STEELS PRIVATE LIMITED	91	
April-2022	Cold Rolled	MEGHALAI STEELS	90	
April-2022	Hot Rolled	ALFA METALS	87.5	
April-2022	Hot Rolled	CSK TUBE CORPORATION (PG 26)	87	
April-2022	Hot Rolled	MATHA STEELS PRIVATE LIMITED	87	
April-2022	Hot Rolled	MEGHALAI STEELS	84	




7. Vinayaga Steels Profit by month

```
100      # Profit Per Month
101 •    SELECT SUM(A.Net_Value) AS Purchase, SUM(B.Net_Value) AS Sales,
102      SUM(B.Net_Value) - SUM(A.Net_Value) AS Profit,
103      ROUND((((SUM(B.Net_Value) - SUM(A.Net_Value))/SUM(A.Net_Value))*100,2) AS "Profit %"
104      FROM purchasebill_product A, salesbill_product B
105
106      # total number of customers
```

Result Grid   Filter Rows: <input type="text"/> Export:  Wrap Cell Content: 				
	Purchase	Sales	Profit	Profit %
▶	586843605.6100081	611249121.9899931	24405516.379984975	4.16

8. Unique Vehicle type that was used the most for supply chain

```
70 # Vehicle type mostly used for transportation
71 • SELECT B.Vehicle_Type, COUNT(DISTINCT(A.Purchase_BillNo)) AS "No. of drops/pickups"
72 FROM purchasebill_product A
73 LEFT JOIN transportation B
74 ON A.Vehicle_No = B.Vehicle_No
75 GROUP BY B.Vehicle_Type
76 ORDER BY COUNT(DISTINCT(A.Purchase_BillNo)) DESC;
77
```

Result Grid  Filter Rows: <input type="text"/> Export:  Wrap Cell Content: 		
	Vehicle_Type	No. of drops/pickups
▶	Truck	14
	Tempo	11
	Mini Van	6


9. Vehicle type that was used the most for supply chain

```
79 • SELECT A.Vehicle_No, B.Vehicle_Type, COUNT(DISTINCT(A.Purchase_BillNo)) AS "No. of drops/pickups"
80 FROM purchasebill_product A
81 LEFT JOIN transportation B
82 ON A.Vehicle_No = B.Vehicle_No
83 GROUP BY B.Vehicle_Type, A.Vehicle_No
84 ORDER BY COUNT(DISTINCT(A.Purchase_BillNo)) DESC;
85
```

Result Grid |   Filter Rows: | Export:  | Wrap Cell Content: 

	Vehicle_No	Vehicle_Type	No. of drops/pickups
▶	TN 37 DC 9511	Truck	11
	TN 38 AH 0174	Tempo	6
	TN 66 H 7589	Tempo	5
	TN 47 W 6091	Mini Van	4
	TN 37 BP 0473	Mini Van	2
	TN 99 S 3395	Truck	2
	TN 37 DK 6237	Tempo	1
	TN 37 CM 8096	Truck	1

10. Total customers

```
106      # total number of customers
107  SELECT DISTINCT Customer_TIN, Customer_Name
108      FROM Customer
109
```

Result Grid   Filter Rows: Export:  W

	Customer_TIN	Customer_Name
▶	33AAHFL9686J1Z0	LEO ENGINEERING PLANT 2
	33AAHCPN7839D1ZE	GK CONTROLS
	33AAOFB5844K1Z5	BRIGHTSUN ENGINEERING & FABRICATION
	33AULPR4079D1ZG	R2 ENGINEERING SOLUTION
	33AJKPM0457G1ZC	ANNAI INDUSTRIES

11. Average purchase value, Total purchase value, Number of bills at customer level

```
115 SELECT B.Customer_Name, COUNT(DISTINCT(A.Sales_BillNo)) AS "No. of bills",
116 SUM(A.Net_Value) AS "Total purchase value",
117 SUM(A.Net_Value)/COUNT(DISTINCT(A.Sales_BillNo)) AS "Average purchase value"
118 FROM salesbill_product A
119 LEFT JOIN Customer B
120 ON A.Customer_TIN = B.Customer_TIN
121 GROUP BY A.Customer_TIN
122 ORDER BY SUM(A.Net_Value)/COUNT(DISTINCT(A.Sales_BillNo)) DESC;
123
```

Result Grid |   Filter Rows: | Export:  | Wrap Cell Content: 

	Customer_Name	No. of bills	Total purchase value	Average purchase value
▶	BRIGHTSUN ENGINEERING & FABRICATION	9	2931222.07	325691.3411111111
	R2 ENGINEERING SOLUTION	2	366567	183283.5
	ANNAI INDUSTRIES	2	307425.4	153712.7
	LEO ENGINEERING PLANT 2	12	1696306.64	141358.88666666666
	GK CONTROLS	4	306269.00000000006	76567.25000000001

12. Average state and government tax

```
140      # General CGST %, SGST %
141 •    SELECT CONCAT(ROUND((AVG(CGST/Product_Value)*100),2), '%') AS "Average CGST %",
142      CONCAT(ROUND((AVG(SGST/Product_Value)*100),2), '%') AS "Average SGST %"
143      FROM purchasebill_product
```

Result Grid |   Filter Rows: | Export:  | Wrap Cell Content: 

	Average CGST %	Average SGST %
▶	9%	9%

13. Number of bills in each type




```
145      # Which Mode of Billing was done the most
146 ✖     SELECT Mode_of_Bill, COUNT(*) AS "No of bills"
147      FROM salesbill
148      GROUP BY Mode_of_Bill
149      ORDER BY COUNT(*) DESC
150
```

Result Grid |   Filter Rows: | Export:  | Wrap Cell Content: 

	Mode_of_Bill	No of bills
▶	E-Way	20
	Normal	9

14. Average sales value for each bill type

```
151 # Average value of bill for EWay vs Normal
152 SELECT B.Mode_of_Bill, SUM(A.Net_Value)/COUNT(DISTINCT(A.Sales_BillNo)) AS "Average purchase value"
153 FROM salesbill_product A
154 LEFT JOIN salesbill B
155 ON A.Sales_BillNo = B.Sales_BillNo
156 GROUP BY B.Mode_of_Bill
157 ORDER BY SUM(A.Net_Value)/COUNT(DISTINCT(A.Sales_BillNo)) DESC
158
```

Result Grid |   Filter Rows: | Export:  | Wrap Cell Content: 




	Mode_of_Bill	Average purchase value
▶	E-Way	257367.499
	Normal	51160.01444444445

15. Customer that made highest number of bills in E-way and normal

```

159 # Which customers bills were most for EWay and Least for Eway
160 SELECT B.Mode_of_Bill, C.Customer_Name, SUM(A.Net_Value) AS "Total Purchase Value",
161 COUNT(DISTINCT(A.Sales_BillNo)) AS "No. of bills",
162 SUM(A.Net_Value)/COUNT(DISTINCT(A.Sales_BillNo)) AS "Average purchase value"
163 FROM salesbill_product A
164 LEFT JOIN salesbill B
165 ON A.Sales_BillNo = B.Sales_BillNo
166 LEFT JOIN customer C
167 ON A.Customer_TIN = C.Customer_TIN
168 GROUP BY B.Mode_of_Bill, C.Customer_Name
169 ORDER BY SUM(A.Net_Value)/COUNT(DISTINCT(A.Sales_BillNo)) DESC

```

Result Grid  Filter Rows: <input type="text"/> Export:  Wrap Cell Content: 					
	Mode_of_Bill	Customer_Name	Total Purchase Value	No. of bills	Average purchase value
▶	E-Way	BRIGHTSUN ENGINEERING & FABRICATION	2807776.9600000004	7	401110.99428571435
	E-Way	ANNAI INDUSTRIES	251965.4	1	251965.4
	E-Way	R2 ENGINEERING SOLUTION	366567	2	183283.5
	E-Way	LEO ENGINEERING PLANT 2	1463463.14	8	182932.8925
	E-Way	GK CONTROLS	257577.48	2	128788.74
	Normal	BRIGHTSUN ENGINEERING & FABRICATION	123445.10999999999	2	61722.55499999999
	Normal	LEO ENGINEERING PLANT 2	232843.5	4	58210.875
	Normal	ANNAI INDUSTRIES	55460	1	55460
	Normal	GK CONTROLS	48691.52	2	24345.76

BOILER UP!

