MAXIMIZING THE SALES OF AN AUTOMOBILE STORE

Final report for the BDM capstone Project

Submitted by

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Contents

Executive Summary and Title

The aim of this project report is to Maximize the sales of an automobile store, named **"M.V. Motors"** located in Kanpur. The project describes the various analysis methods used during the business data analysis of "M.V. Motors" and the recommendations for the business to increase their sales. The store deals in the sales of EV scooters, automobile spare parts and also provide repairing services.

In this project, I have tried to used different steps during data analysis process like **data extraction, data cleaning, data visualization**. The main tool used for this process is **MS Excel**. Using these methods, I have tried to find the results, identify different problems and also identify the different reasons behind the problems faced.

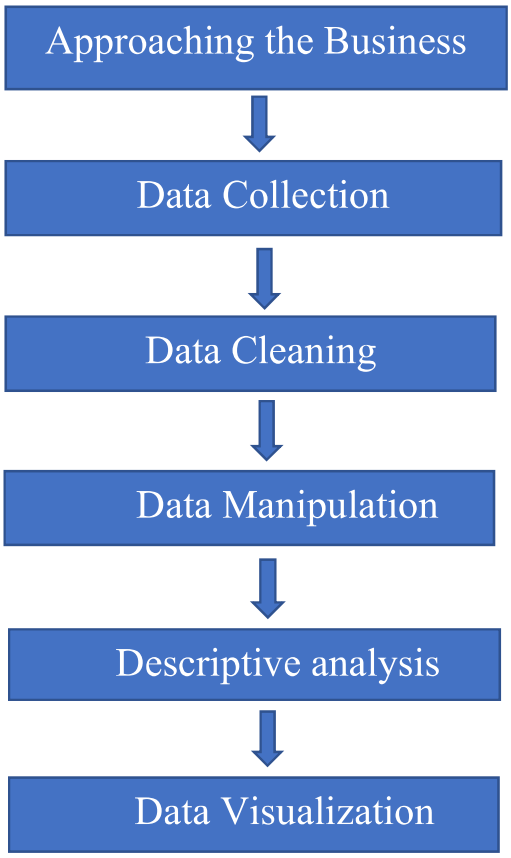
During the interaction with the owner and the analysis process, a few problems were noticed, which the business was facing:

1. Low sales of EV Scooters
2. Overstocking
3. Market competition
4. Low revenue generated through repairing services
5. Old and unskilled staff

In this report, I have tried to provide the solutions of these problems faced by the business.

Detailed Explanation Analysis Process

Steps of the Analysis process



- I approached the automobile store business M.V. Motors for this project. After interacting with the owner of the store and the workers, I found a few problems that the business was facing. He had no issue in providing me the data of his business.

- The data was then collected from the business in pdf format. It was then converted into excel sheet. The data collected was the record of sales and purchases made by business over the period of 3 months.

- I organized and structured the data properly. The data was then cleaned as there were a few errors like spelling mistakes and missing values. The errors were corrected and the missing values were imputed using **"Fill Down"** method. Firstly, I filtered the data on the basis of the name of the product. Then I used Fill down method to fill the missing values.

PRODU	QTY	SERVICI	SEVICIN	AMT	CGST	SGST	NET AM	BILL ST
SILENCER	1	YES	400	1,359.38	58.73	58.73	1876.84	Paid
SILENCER	1	YES	400	1,304.68	58.73	58.73	1822.14	Paid
SILENCER	1	YES	400					
SILENCER	1	YES	400	1,359.38	58.73	58.73	1876.84	Paid
SILENCER	1	YES	400	1,304.68	58.73	58.73	1822.14	Paid

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SILENCER	1	YES	400	1,359.38	58.73	58.73	1876.84	Paid
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SILENCER	1	YES	400	1,304.68	58.73	58.73	1822.14	Paid
SILENCER	1	YES	400	1,359.38	58.73	58.73	1876.84	Paid
SILENCER	1	YES	400	1,304.68	58.73	58.73	1822.14	Paid

Handling missing values using Fill Down method

- After cleaning the data, I created **"Category"** column, to categorize different product on the basis of their categories. For example, there were 3 different types of tyres being sold, so I categorized those tyres, rims and other such products in **"Tyres"** Category. Similarly, I categorized Backrest, Bike Guards, Helmets in **"Accessories"** category. I used **Filtering**, to filter the products and then I used **Fill-Down** method to categorize them.

	DATE	CATEGO	PRODU	QTY	SERVICI
8	04-Oct-2023	ACCESSOR	HELMET	1	NO
11	05-Oct-2023	ACCESSOR	HELMET	1	NO
30	**08-Oct-2023**	ACCESSOR	HELMET	1	NO
38	12-Oct-2023	ACCESSOR	HELMET	1	NO
55	18-Oct-2023	ACCESSOR	HELMET	1	NO
64	20-Oct-2023	ACCESSOR	HELMET	1	NO
82	28-Oct-2023	ACCESSOR	HELMET	1	NO
94	02-Nov-2023	ACCESSOR	BACKREST	1	YES
95	02-Nov-2023	ACCESSOR	BIKE GUAF	1	YES
99	03-Nov-2023	ACCESSOR	BACKREST	1	YES
12	07-Nov-2023	ACCESSOR	BIKE GUAF	1	NO
33	16-Nov-2023	ACCESSOR	BACKREST	1	YES
66	27-Nov-2023	ACCESSOR	HELMET	1	NO

Categorizing the data using Filtering and Fill down method.

- After data cleaning and data manipulation, I performed various descriptive analysis. I used different **Pivot Tables** to for doing different computations. I computed values such as **Sum, Minimum, Maximum, Average and Standard Deviation.**

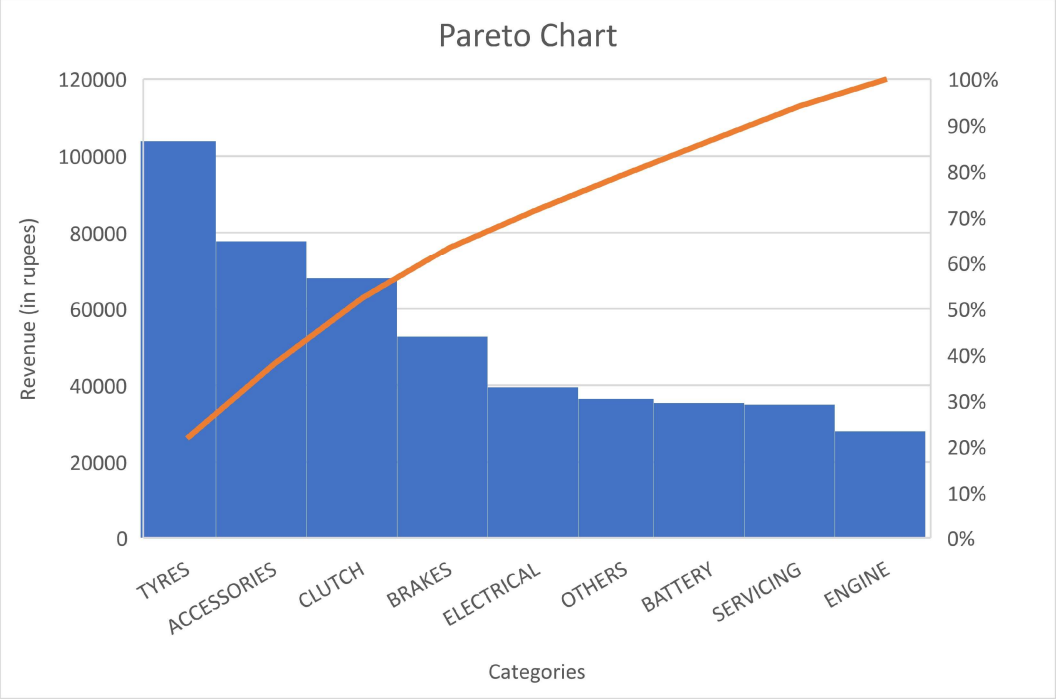
Categories	Sum of NET AMT	Average of NET AMT	Max of NET AMT	Min of NET AMT	Std Dev of NET AMT
ACCESSORIES	77854.32	1810.565581	2642.5	253.44	572.6455408
BATTERY	35464.72	1773.236	2130	1151.88	355.5710128
BRAKES	52786.62	1820.228276	2121.26	1304.22	229.4826187
CLUTCH	67958.13	1941.660857	2775	440.62	560.1362084
ELECTRICAL	39525.68	1796.621818	2249.22	525.32	441.4692866
ENGINE	28071.38	1871.425333	2114.36	1522.04	247.3512378
OTHERS	36476.88	3039.74	15865	1822.14	4039.250077
SERVICING	35000	686.2745098	1000	500	244.1471752
TYRES	103898.01	2210.595957	3950	1472.18	589.067825
Grand Total	**477035.74**	**1741.00635**	**15865**	**253.44**	**1084.629757**

Months	Sum of NET AMT	Average of NET AMT	Max of NET AMT	Min of NET AMT
EV	**525000**	**75000**	**75000**	**75000**
Oct	150000	75000	75000	75000
Nov	225000	75000	75000	75000
Dec	150000	75000	75000	75000
Grand Total	**525000**	**75000**	**75000**	**75000**

Pivot tables showing descriptive statistics

- Like this, I made various pivot tables in different sheets for different types of analysis:
  1. Analysis of the sales of EV scooters
  2. Analysis of auto parts based on categories
  3. Analysis of repairing services
  4. Analysis of the purchase data
  5. Analysis of different products sold
  6. Daily revenue analysis

- I also used different types of data visualizing techniques for visualizing the data. For example, I used time series graph to see the trends in the sales over the period of 3 months. I also used **"Pareto chart"** for Pareto analysis.



Pivot chart showing Pareto analysis of categories v/s revenue generated

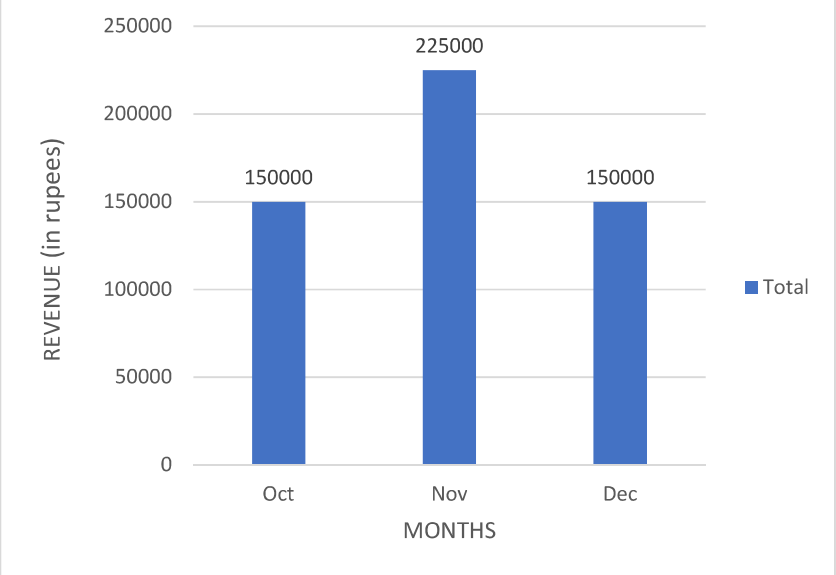
- The main tool used for the data analysis process is **MS Excel**.

Results and Findings

- **Analysis of EV scooter's sales:**

Months	Revenue of EV Scooter (in rupees)
Oct	150000
Nov	225000
Dec	150000
Grand Total	**525000**

Monthly revenue generated through the sales of EV scooters



Pivot chart showing Monthly revenue generated through the sales of EV scooters

The total revenue generated by the Sales of EV in 3 months is **Rs.525000.** If we look at the quantity sold, only 8 scooters were sold in the period of 3 months, which is quiet low. The most revenue was generated during the festive season in November.

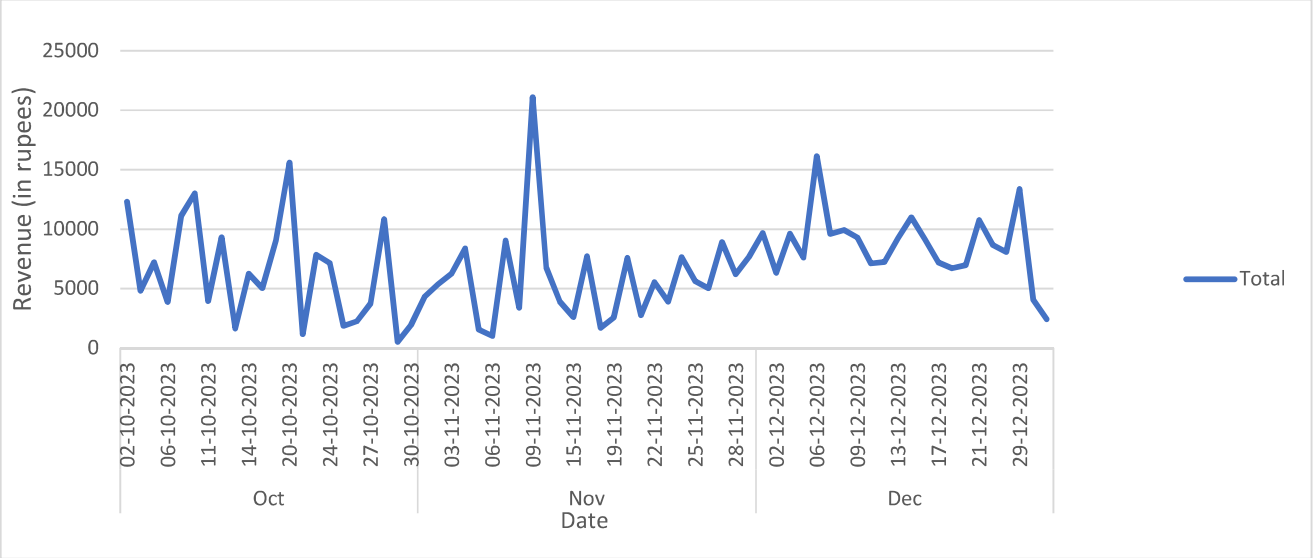
- After performing the descriptive analysis, it was seen that the total revenue generated through the sales auto parts and

repairing services was **Rs.477035.74** and through the sales of EV scooters was **Rs.525000 .**

- **Daily Revenue analysis:** I tried to analyze the auto parts sales data on the basis of daily sales. I made the pivot table and visualized it using a **Time Series Graph**.

DATE	Sum of NET AMT (in rupees)
Oct	**140441.655**
02-10-2023	12304.955
04-10-2023	4802.32
05-10-2023	7222.2
06-10-2023	3876.84
07-10-2023	11120.92
08-10-2023	13016.74
11-10-2023	3952.14
12-10-2023	9315.26
13-10-2023	1643.44
14-10-2023	6239.16
16-10-2023	5024.08
18-10-2023	9057.82
20-10-2023	15618.76
21-10-2023	1151.88
23-10-2023	7851.94
24-10-2023	7132.18
25-10-2023	1876.54
26-10-2023	2239.06
27-10-2023	3739.06
28-10-2023	10840.32
29-10-2023	500
30-10-2023	1916.04

Table showing daily revenue of auto parts in the month of October



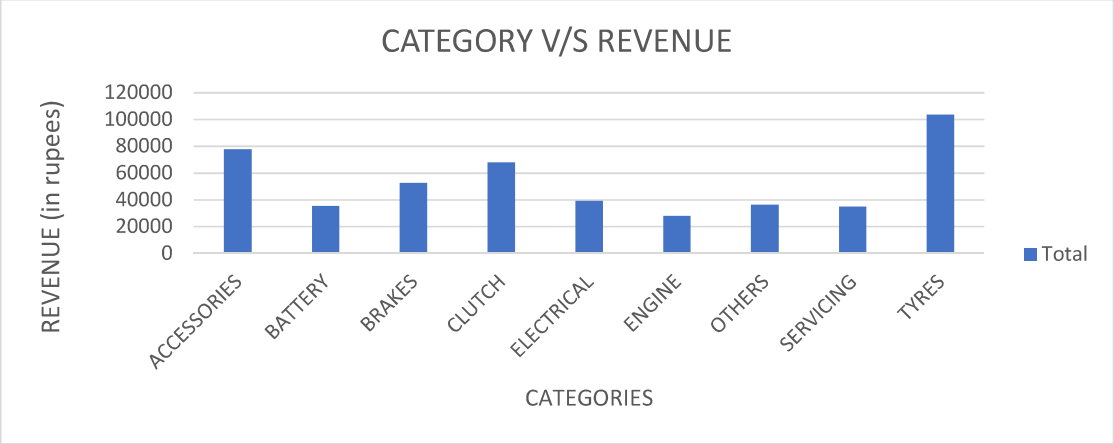
Time series graph showing daily revenue of auto parts

- **<u>Category based analysis</u>:** I tried analyzing the auto parts data on the basis of different categories of products sold. I made pivot tables for that with "**different categories" as rows** and "**sum of revenue"** and **"sum of quantity sold" as columns**.

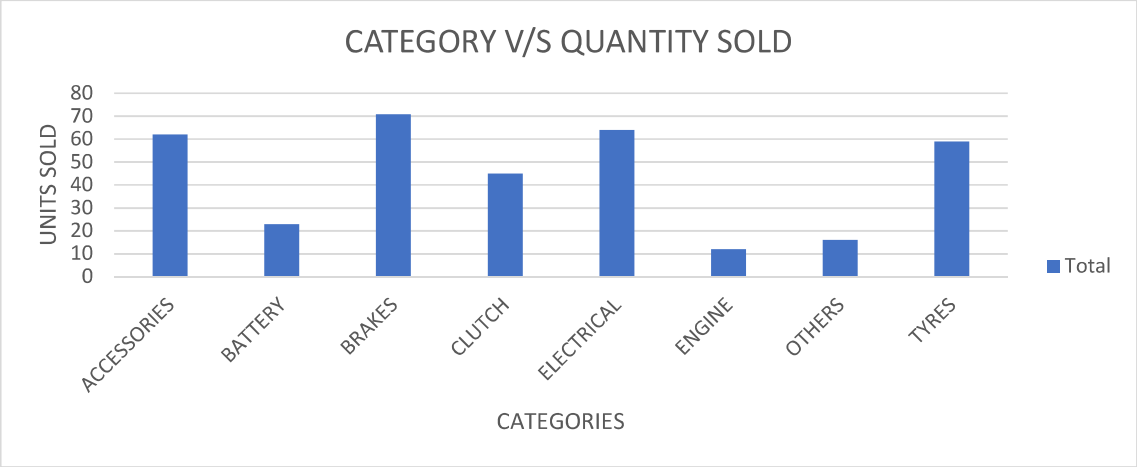
CATEGORY	Sum of NET AMT (in rupees)
ACCESSORIES	77854.32
BATTERY	35464.72
BRAKES	52786.62
CLUTCH	67958.13
ELECTRICAL	39525.68
ENGINE	28071.38
OTHERS	36476.88
SERVICING	35000
TYRES	103898.01
Grand Total	**477035.74**

Category	Sum of QTY
ACCESSORIES	62
BATTERY	23
BRAKES	71
CLUTCH	45
ELECTRICAL	64
ENGINE	12
OTHERS	16
TYRES	59
Grand Total	**352**

Pivot Tables for category based analysis



Pivot chart showing revenue generated for different categories of spare parts



Pivot chart showing the units sold for different categories of spare parts

Here, we can clearly see that the **most revenue generating category is Tyres,** which generated, the total revenue of **Rs.103898.01**, while the **most selling category being brakes**, of which **71 units** were sold in 3 months.

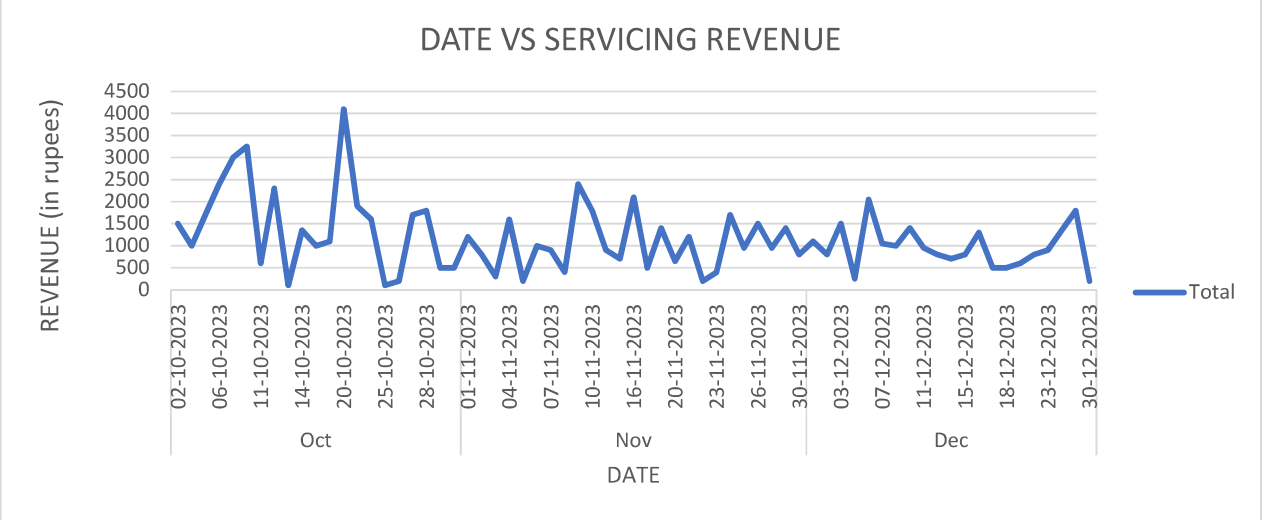
- **Analysis of Repairing services:** To analyze the total revenue generated by repairing services, I made a pivot table, with months as rows and **"sum of servicing charges"** and **"count of services done"** as columns.

Month	Sum of SERVICING CHARGES (in rupees)	Count of SERVICES DONE
Oct	31700	89
Nov	25950	84
Dec	20350	101
Grand Total	**78000**	**274**

Pivot table for repairing services analysis

It can be seen that the revenue generated by repairing services is gradually decreasing every month even though the count of services done is increasing.

I also made another pivot chart for analyzing the repairing services date by date.



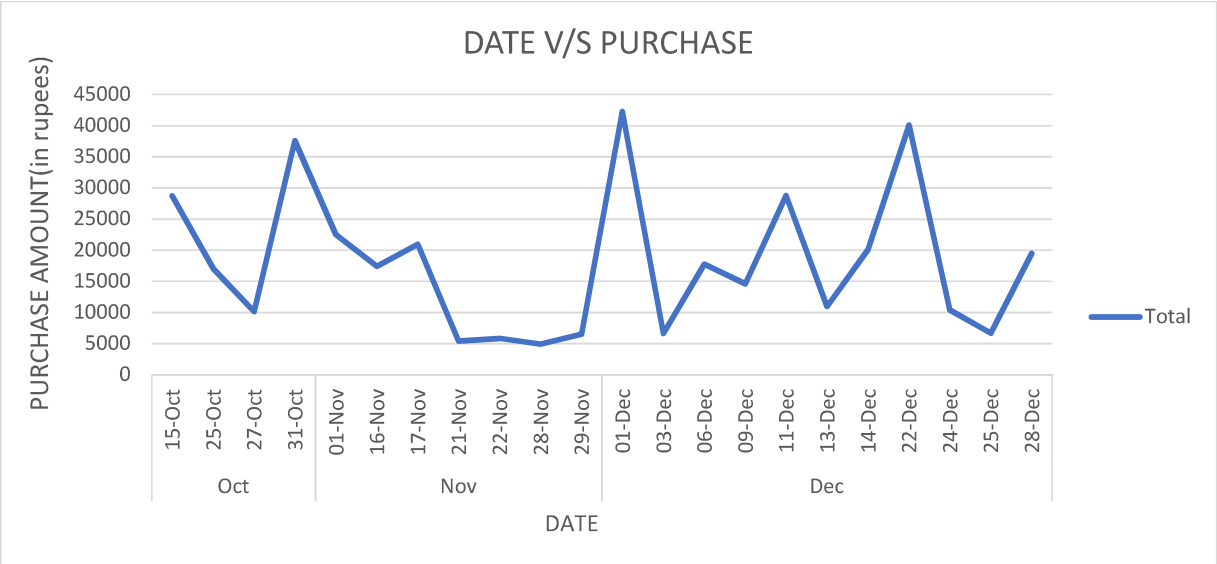
Pivot chart showing time series graph of revenue generated by repairing services

Here we can see that, the maximum revenue generated through repairing services was on **20-10-2023.**The revenue generated was **Rs.4100**.

- **Purchase analysis:** I made pivot tables and charts to analyze the purchase data of the business.

The maximum purchase was made on **01-12-2023**, for **Rs.42264**.

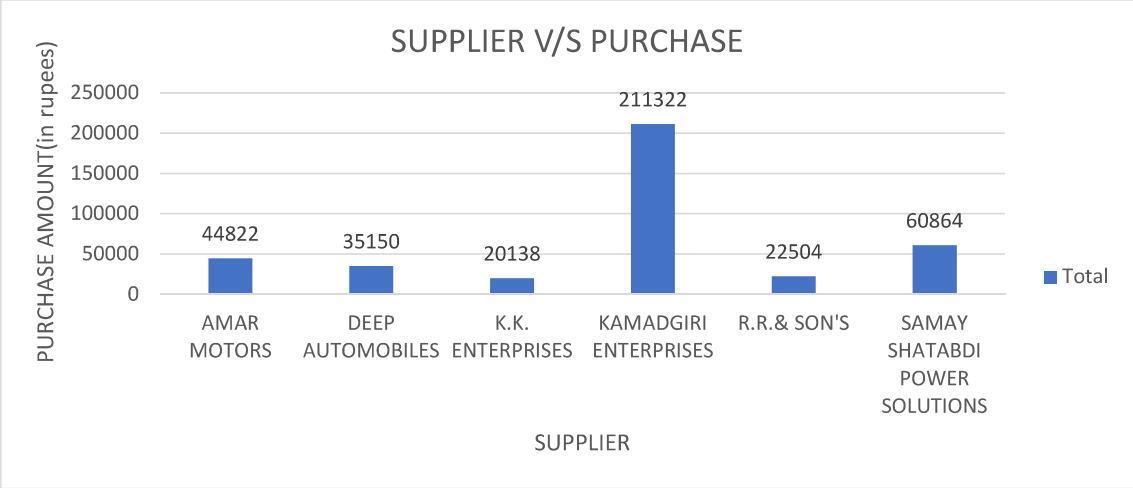
Date	Amount purchased (in rupees)
Oct	
15-Oct	28740
25-Oct	17050
27-Oct	10168
31-Oct	37570
Nov	
01-Nov	22504
16-Nov	17425
17-Nov	20934
21-Nov	5430
22-Nov	5833
28-Nov	4900
29-Nov	6525
Dec	
01-Dec	42265
03-Dec	6612
06-Dec	17725
09-Dec	14600
11-Dec	28770
13-Dec	10964
14-Dec	20138
22-Dec	40110
24-Dec	10400
25-Dec	6660
28-Dec	19477
Grand Total	**394800**



Pivot table and pivot chart showing time-series analysis of the purchases made by the store

Row Labels	Sum of Amount (in rupees)
AMAR MOTORS	44822
DEEP AUTOMOBILES	35150
K.K. ENTERPRISES	20138
KAMADGIRI ENTERPRISES	211322
R.R.& SON'S	22504
SAMAY SHATABDI POWER SOLUTIONS	60864
Grand Total	**394800**

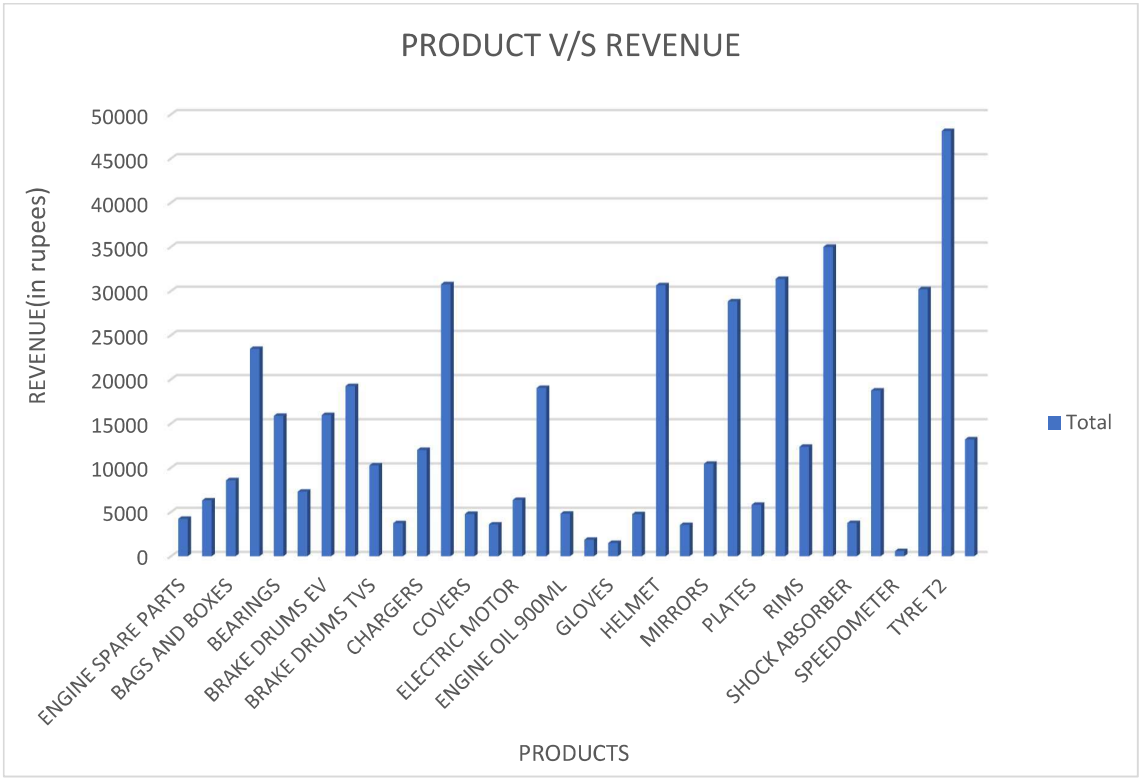
Pivot table showing supplier v/s amount purchased



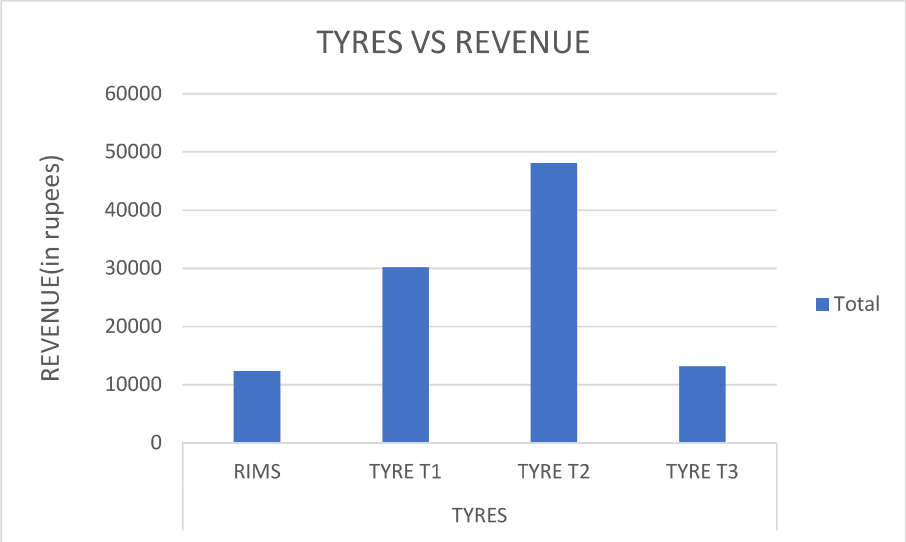
Pivot chart showing supplier v/s amount purchased

The maximum purchase was made from the supplier **Kamadgiri Enterprises,** which was **Rs.211322.**

- **Analysis of products sold:** After analyzing the sales of all the auto parts sold, we saw that the most revenue generating product was **Tyre of second type**. The total revenue generated by it for the period of 3 months was **Rs.48123.36.**

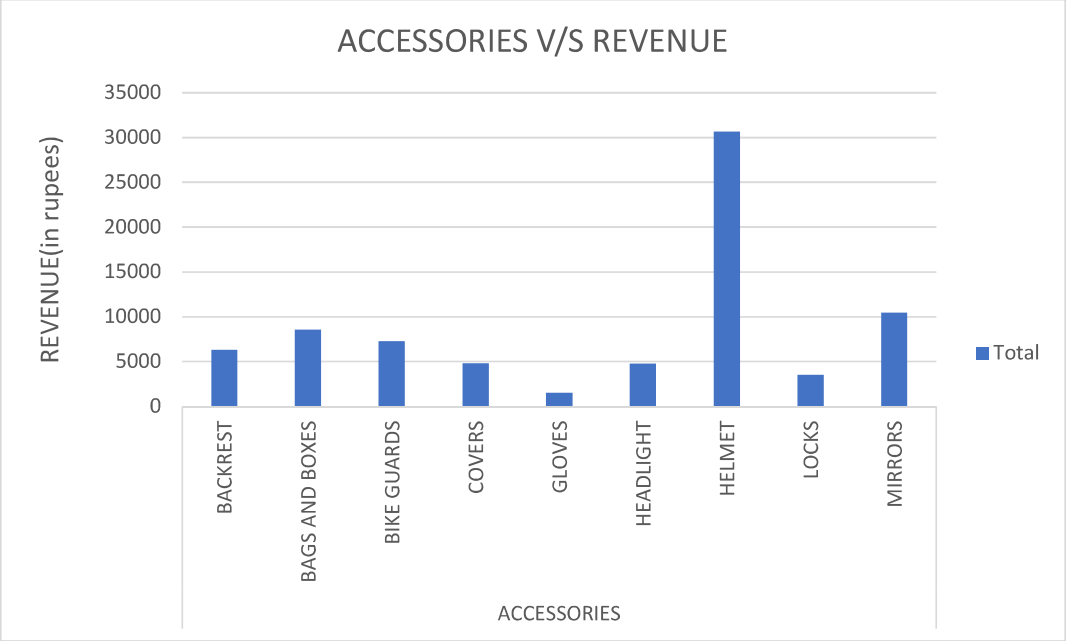


Pivot chart showing revenue generated by different products



Pivot chart showing revenue generated by different types of Tyres

The most revenue generating accessory is **Helmet**, which generated revenue of **Rs.30651.66** in the period of 3 months.



Pivot chart showing revenue generated by different accessories

Link for the workbook:

https://docs.google.com/spreadsheets/d/14U_8NZy7wZSaYQ3ex-APUoNvHNvKCfkk/edit?usp=drive_link&ouid=101692695088928596840&rtpof=true&sd=true

Interpretation of Results and Recommendations

- It was noticed from the analysis that the sales of EV scooters was the most during the festive season. To increase the sales, the shop can give different offers to the customers on the purchase of scooters. For example:
  1. **Free servicing for 1 year on the purchase of EV Scooter**
  2. **Free Helmet on the purchase of EV Scooter.**

- Providing free helmets is also a good alternative to overcome the problem of overstocking, as it was seen that many helmets were overstocked.

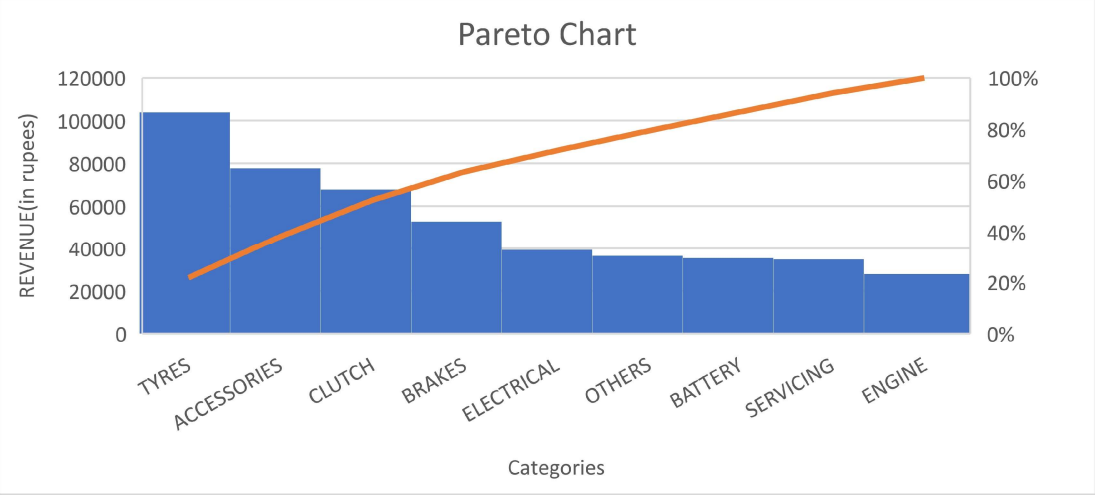
- During my visit to the store, I also noticed that they don't take any servicing charges if there is minimal to no problem in the vehicle. To increase the revenue generated by servicing, they should start taking servicing charges for checking up the vehicles, even if there is no problem found.

- Market Competition is one of the main reasons for the low sales of the business as there are many automobile stores in the same area. To stand out, there are a few recommendations:

  1. Doorstep servicing: They should start providing doorstep services to their customers by sending their staff to the customer's place.

  2. Online Presence: They should also start promoting their business online, this will help them in standing out in the competitive market.

- During the Pareto analysis, it was seen that the most revenue is generated through the categories**: Tyres, Accessories and Clutch**. To increase the revenue, they should try selling and promoting more of these categories during servicing.



Pareto chart for analysis of most revenue generating categories of spare parts

- They should try to replace the old staff by new and more skilled workers.

- It was noticed that on many days the store was closed as the owner was out of the city. This has clearly affected the sales of the store. It is recommended that they should hire a person who could supervise and manage the store properly.