

BDM Project Final Submission

(February - April Cycle)



**BSc. in Data Science and Programming
IIT Madras, Chennai**

Title-

**“Revenue Revolution: A Comprehensive Analysis of Sales Insights
to maximize Profit”**

(for Maha Lakshmi Mart, Ghaziabad-201206)

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Date- 22 March 2023

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TITLE

“Revenue Revolution: A Comprehensive Analysis of Sales Insights to maximize Profit”

Executive Summary

I have planned to collect the data from a Maha Lakshmi Mart, a multipurpose store, situated in Ghaziabad-201206 for the last 3 years. It is a retail establishment that sells a wide variety of products and services, catering to the needs of diverse customer segments. It is a B2C business, meaning it sells goods to customers. It caters to customers looking for convenience, affordability, and a broad range of options. From groceries and household items to electronics, and home appliances, it has it all. I went to the store to learn about the supply and sales processes. I have talked to the manager about the monthly money it brings in and identified the issues with its lower sales volume as compared to other establishments in the neighborhood. The other issue he brought up included products that go bad in this undertaking. To identify the underlying causes of the issues, a one-on-one conversation was held with the store manager and collected data. With the investigation of sales variables and other factors like quantity, revenue, and profit analysis, the project is anticipated to answer the issues raised by the management. The project will perform a thorough analysis to identify the improvements required to boost income and reduce waste. After assessing the market conditions, I concluded this study by offering him some additional insights to grow his business in addition to the interpretations of the numerical data.

Problem Statement

The purpose of this study is to determine the factors affecting the sales and analysis of the sales' trends to make a profitable business reducing the wastage of items of a multipurpose store.

Specific Objectives of the study:-

- Analysis of different parameters regarding sales of various products which are affecting the monthly revenue significantly to increase revenue.
- To minimize the rate of expiring products.
- Measures to be taken to increase sales.

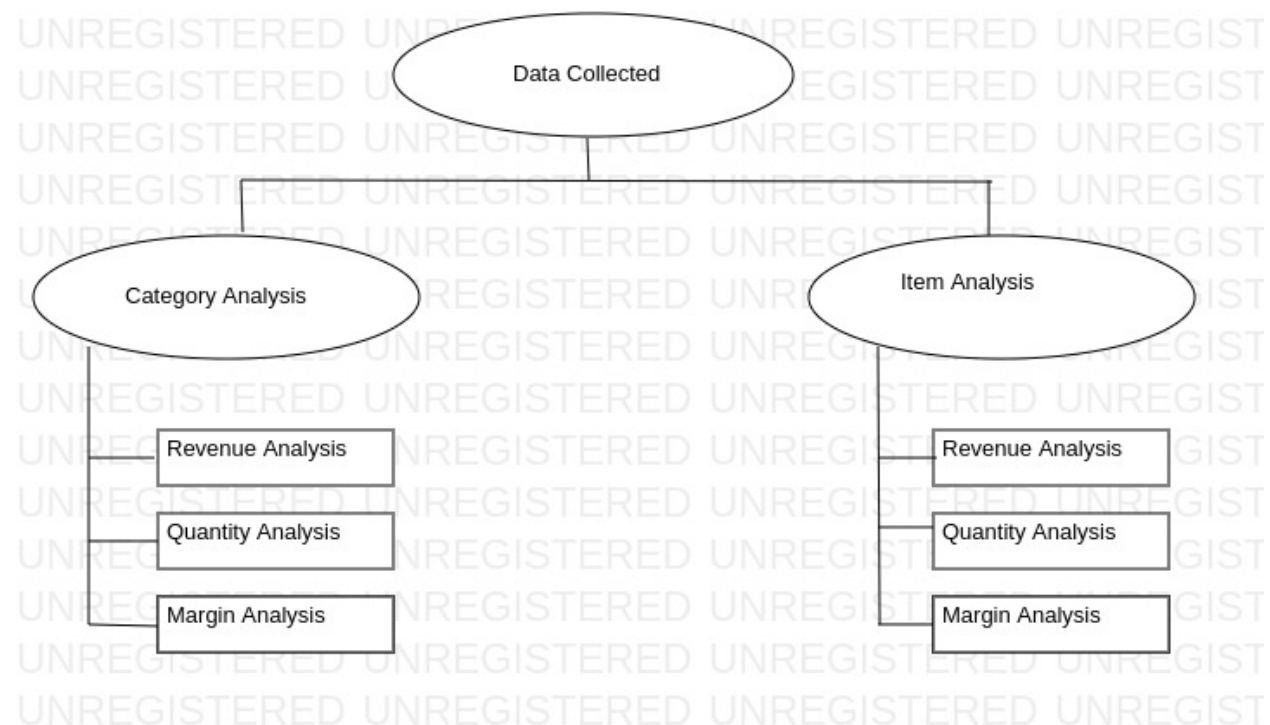
Detailed Explanation of Analysis Process/Method

How is data collected?

The data was generated using sales insights, which included Opening Balance—stock that had been sold out over the time period—Inwards and Outwards—stock that had been purchased from manufacturers during that time—and Closing Balance—stock that had been unsold. I've been gathering data every week for the entire month of February. All of this information will be utilized to determine the most popular product or category that significantly contributes to the revenue earned and to assess the category that is losing money for the shop.

The approach to do a comprehensive analysis of sales insights which can provide valuable information to help maximize profits and reduce losses are as follows-

1. Identification of top-performing products: By analyzing sales data, it has been identified which products are selling the most and generating the most profit. This information helped to focus on marketing and sales efforts on these products to maximize profits. This was accomplished by the analysis shown in the flowchart below:



1.1. Item Analysis: Item wise categorization on the basis of inwards and outwards stock items during the timeline to maximize the profit and minimize the wastage.

Item analysis is done to analyze three different factors :

- A. **Revenue analysis:** The value column under the Outwards sales attribute indicates the revenue generated by each item in each category at the end of the month in the data gathered. The item that generates the most money has the label Maximum revenue, while the item that generates the least revenue has the label Minimum revenue generated item. This helped to determine the behavior of items of each category.
- B. **Quantity analysis:** For each item, the total number of sales for the month have been tallied and labeled. Analysis of the most and least popular items has been evaluated through this analysis.
- C. **Margin analysis:** Margin gain on each item after selling is obtained by the following formula:

Margin of an item=(Total Revenue generated by the item-total cost of the sold out items)/Total Revenue generated by the item

Where,

Total Revenue= Through revenue analysis

Total cost of sold item= Quantity sold of the item*Price of the item

After calculating margins of each item, they are ranked on the basis of their percentage of margins generated. This helped to identify the maximum and minimum generated margin items.

1.2. Category Analysis: Category Analysis helped to determine the most selling category and the least profit making category. It helped to understand product performance and identify trends. Helped in finding places where the store could extend its product selection by looking at the sales data of each category.

This has been achieved through the following approach:

- A. **Revenue analysis:** The value column under the Outwards sales attribute indicates the revenue generated by each item in each category at the end of the month based on the data gathered.

Revenue of a category= Sum of all the revenues generated by each type of item under that category.

- B. **Quantity analysis:** For each category, the total number of sales together of each item under that category for the month have been calculated. Analysis of the most and least popular categories has been done through Quantity analysis.

It is denoted by the Sum of Quantity for each category in the category analysis sheet.

Formula used:

Sum of Quantity= Total sum of items sold out under a particular category.

- C. **Margin analysis:** Margin gain on each category after selling is obtained by the following formula:

Margin of a category=(Sum of revenue of the category- Sum costs of the category)/Sum of revenue of the category

Where,

- i. Sum of revenue of the category= Through revenue analysis
- ii. Sum costs of the category= Total sum of costs of each item falling into that category

After calculating margins of each category, they are ranked on the basis of their percentage of margins generated. This helped to identify the maximum and minimum generated margins categories.

Overall, category analysis helped the management team to identify the market gaps and the mostly sold out categories.

2. Identification of underperforming products: By analyzing sales data, identification of products that are not selling well or are generating losses has been figured out. This information can help to make data-driven decisions about which products to discontinue to minimize loss.

This has been evaluated by calculating the percentage of items sold out at the end of the month.

Formula used to calculate it:

$$\% \text{ of sold out item} = (\text{Outward Quantity} - \text{Closing balance Quantity}) / \text{Outward Quantity}$$

This helps to find the most selling item and the rate of least selling item. This has helped to identify the items which should be discontinued or should be looked for what reasons they are not selling.

3. Analysis of customer behavior: By studying customer behavior patterns, types of customers who are most likely to purchase products and the types of marketing messages that are most effective in converting them. This can help in targeting marketing efforts more effectively and increase sales.

4. Proper Visualization: Through proper visualization tools like pivot tables, bar graphs, line graphs data can be easily interpreted. Further, results can be interpreted easily. It helps in communicating results with others as in this case the manager was easily able to understand the results and findings made. I have used different types of graphs to justify my findings such as Bar graphs, Pivot table, Bubble chart, etc.

Results and Findings

To solve the issues mentioned by the manager of the mart, the above mentioned approach was adopted. Through that approach, analysis has been done which would help the manager to increase his sales and maximize profits with least loss of expired items.

To maximize the profits, item analysis and category analysis has been done over the data collected.

1. Item Analysis findings:

The manager may make sure he has enough inventory to meet demand and increase earnings by concentrating on the best-selling items. On the other hand, by identifying underperforming products, he can decide whether to stop selling them, raise their prices, or change their marketing tactics in order to boost sales.

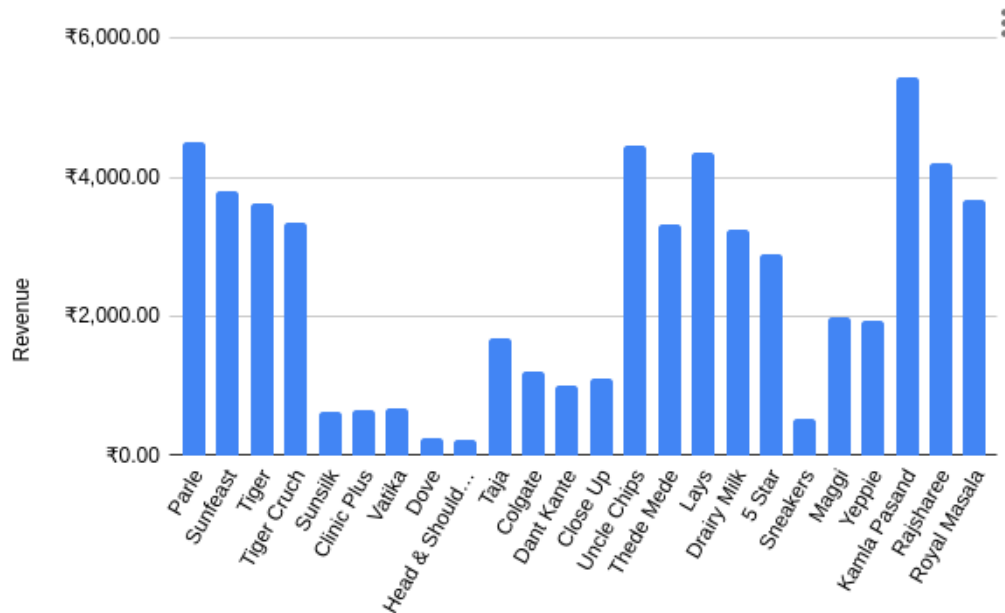
This can help him optimize his items sales and improve profitability.

Analysis done over items :

Category	Item	Revenue	Quantity	Price of one item	Cost of item sold	Margin %	Rank
Biscuit	Parle	₹4,500.00	900	₹4.58	₹4,125.00	8.33%	21
Biscuit	Sunfeast	₹3,800.00	760	₹4.58	₹3,483.33	8.33%	18
Biscuit	Tiger	₹3,625.00	725	₹4.58	₹3,322.92	8.33%	20
Biscuit	Tiger Cruch	₹3,350.00	670	₹4.58	₹3,070.83	8.33%	17
Shampoo	Sunsilk	₹620.00	620	₹0.88	₹542.50	12.50%	6
Shampoo	Clinic Plus	₹660.00	660	₹0.88	₹577.50	12.50%	6
Shampoo	Vatika	₹670.00	670	₹0.88	₹586.25	12.50%	6
Shampoo	Dove	₹256.00	128	₹0.88	₹112.00	56.25%	1
Shampoo	Head & Shoulders	₹224.00	112	₹0.88	₹98.00	56.25%	1
Tea	Taja	₹1,680.00	168	₹9.11	₹1,530.00	8.93%	16
Tooth Paste	Colgate	₹1,200.00	120	₹9.00	₹1,080.00	10.00%	10
Tooth Paste	Dant Kante	₹1,000.00	100	₹9.00	₹900.00	10.00%	10
Tooth Paste	Close Up	₹1,100.00	110	₹9.00	₹990.00	10.00%	10
Chips	Uncle Chips	₹4,450.00	890	₹4.17	₹3,708.33	16.67%	3
Chips	Thede Mede	₹3,325.00	665	₹4.58	₹3,047.92	8.33%	19
Chips	Lays	₹4,350.00	870	₹4.53	₹3,944.00	9.33%	15
Chocolate	Drairy Milk	₹3,250.00	325	₹9.00	₹2,925.00	10.00%	10
Chocolate	5 Star	₹2,890.00	289	₹9.00	₹2,601.00	10.00%	10
Chocolate	Sneakers	₹525.00	105	₹4.40	₹462.00	12.00%	9
Noodles	Maggi	₹1,980.00	165	₹11.00	₹1,815.00	8.33%	21
Noodles	Yeppie	₹1,932.00	161	₹11.00	₹1,771.00	8.33%	21
Pan Masala	Kamla Pasand	₹5,445.00	1089	₹4.23	₹4,607.31	15.38%	4
Pan Masala	Rajsharee	₹4,195.00	839	₹4.33	₹3,635.67	13.33%	5
Pan Masala	Royal Masala	₹3,662.50	1465	₹2.33	₹3,418.33	6.67%	24

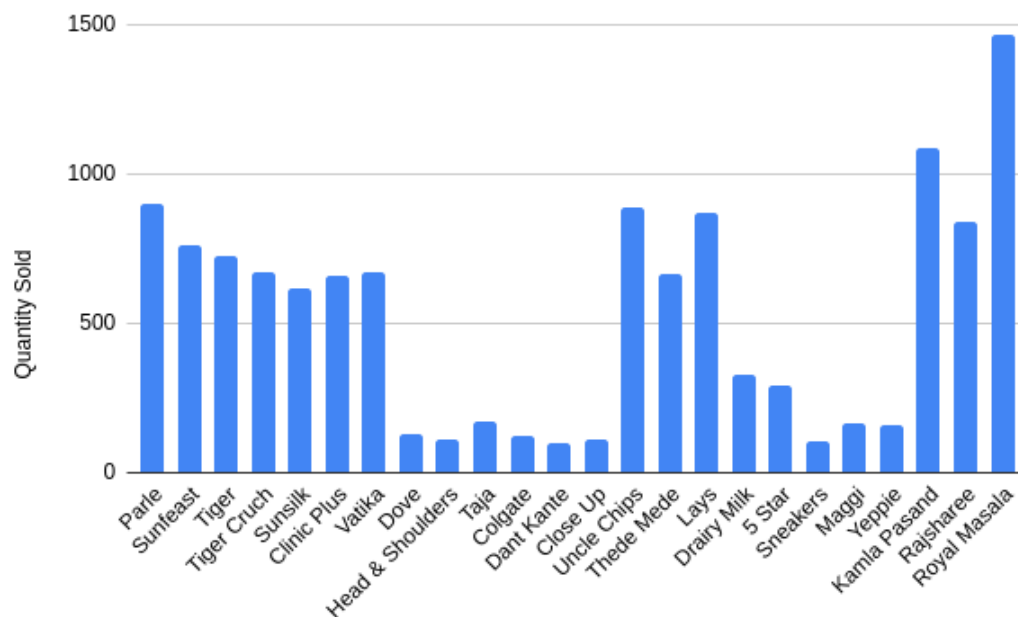
This data is interpreted and a revenue graph is generated donating the most and least revenue making items.

Revenue graph :



Another interpretation done is over quantity sold in the month of February. Graph of Quantity sold per item is given below:

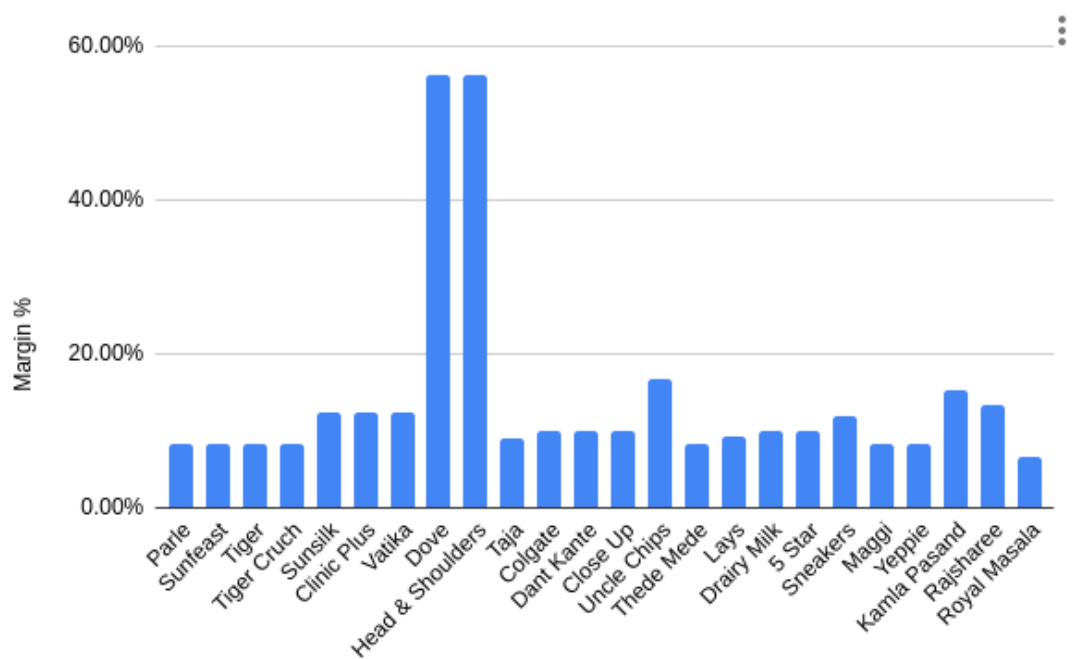
Quantity Graph:



Last interpretation for item analysis done is regarding analysis of margins of each item sold.

Margin of each item has been calculated using the formula explained above. Through which this graph is obtained.

Margin Graph:



2. Category analysis findings:

Through this analysis the manager can obtain insight into customer preferences, market trends, and competition dynamics by evaluating sales data by category. With this information, the store can then make educated decisions about inventory management, pricing, promotions, and merchandising.

This would help him to identify the product gap in the market. Each category has been analyzed over different areas like Revenue, Quantity and margins.

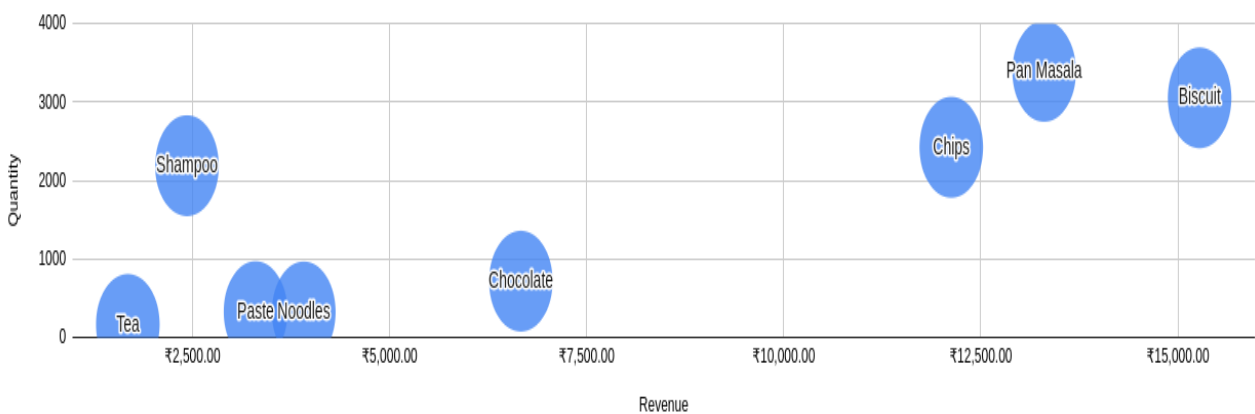
Given table shows how data has been evaluated

Category Analysis:

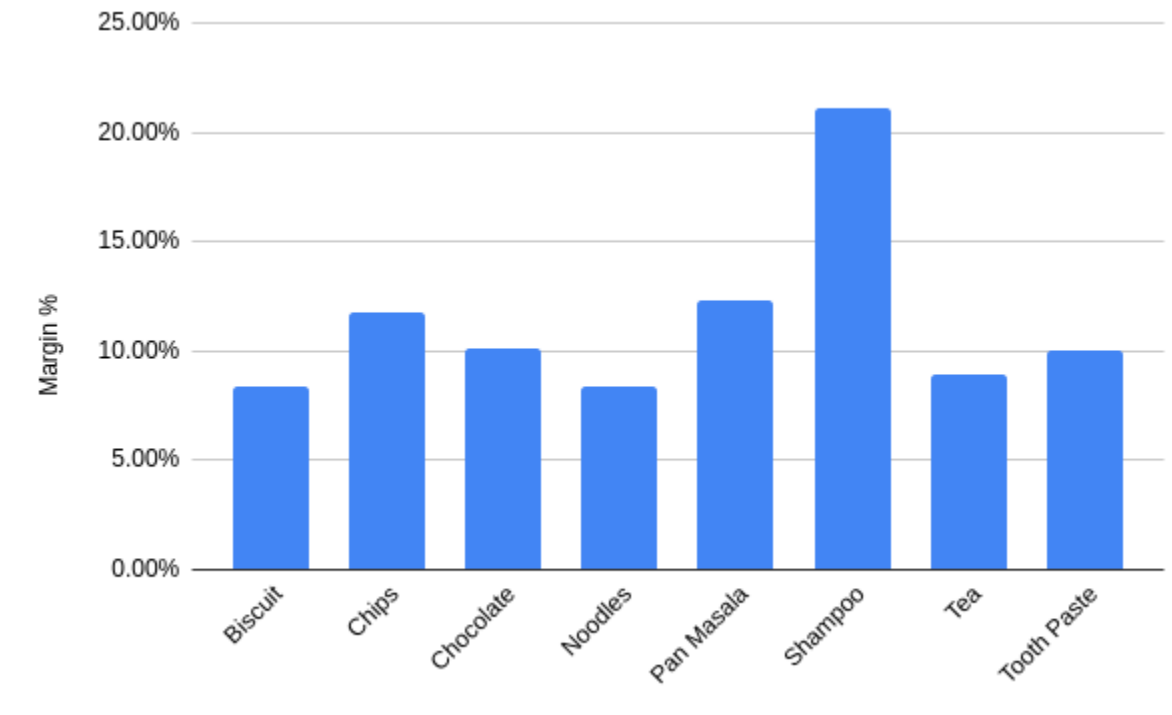
Category	SUM of Revenue	SUM of Quantity	SUM of Cost of item	Margin %	Rank
Biscuit	₹15,275.00	3055	14002.08	8.33%	7
Chips	₹12,125.00	2425	10700.25	11.75%	3
Chocolate	₹6,665.00	719	5988.00	10.16%	4
Noodles	₹3,912.00	326	3586.00	8.33%	8
Pan Masala	₹13,302.50	3393	11661.31	12.34%	2
Shampoo	₹2,430.00	2190	1916.25	21.14%	1
Tea	₹1,680.00	168	1530.00	8.93%	6
Tooth Paste	₹3,300.00	330	2970.00	10.00%	5
Grand Total	58689.5	12606	52353.89		

Following graph shows relationship between Revenue and Quantities according to category wise:

SUM of Revenue and SUM of Quantity



Margin Graph:



This graph shows the marginal profits gained on each category. It shows which category is profitable for the business and which is making a loss to the business.

3. Under-rated product analysis:

		Opening Balance	Inwards	Outwards	Closing	underrated %	Rank
Item	Category	Quantity	Quantity	Quantity	Quantity		
Parle	Biscuit	20	882	900	2	99.77777778	1
Sunfeast	Biscuit	12	756	760	8	98.94736842	7
Tiger	Biscuit	8	720	725	3	99.5862069	3
Tiger Cruch	Biscuit	9	672	670	11	98.35820896	9
Sunsilk	Shampoo	22	640	620	42	93.22580645	20
Clinic Plus	Shampoo	40	640	660	20	96.96969697	14
Vatika	Shampoo	50	640	670	20	97.01492537	13
Dove	Shampoo	32	128	128	32	75	24
Head & Shoulders	Shampoo	20	96	112	4	96.42857143	15
Taja	Tea	15	155	168	2	98.80952381	8
Colgate	Tooth Paste	12	110	120	2	98.33333333	10
Dant Kante	Tooth Paste	19	96	100	15	85	22
Close Up	Tooth Paste	20	96	110	6	94.54545455	19
Uncle Chips	Chips	12	882	890	4	99.5505618	4
Thede Mede	Chips	10	672	665	17	97.44360902	12
Lays	Chips	6	882	870	18	97.93103448	11
Drairy Milk	Chocolate	5	336	325	16	95.07692308	18
5 Star	Chocolate	7	294	289	12	95.84775087	17
Sneakers	Chocolate	4	120	105	19	81.9047619	23
Maggi	Noodles	3	168	165	6	96.36363636	16
Yeppe	Noodles	7	168	161	14	91.30434783	21
Kamla Pasand	Pan Masala	3	1092	1089	6	99.44903581	6
Rajsharee	Pan Masala	1	840	839	2	99.76162098	2
Royal Masala	Pan Masala	2	1470	1465	7	99.5221843	5

This helped to find the least sold items so that the manager can look into the reason and take appropriate action to reduce loss.

Link of the data and interpretations done with Excel is given below:

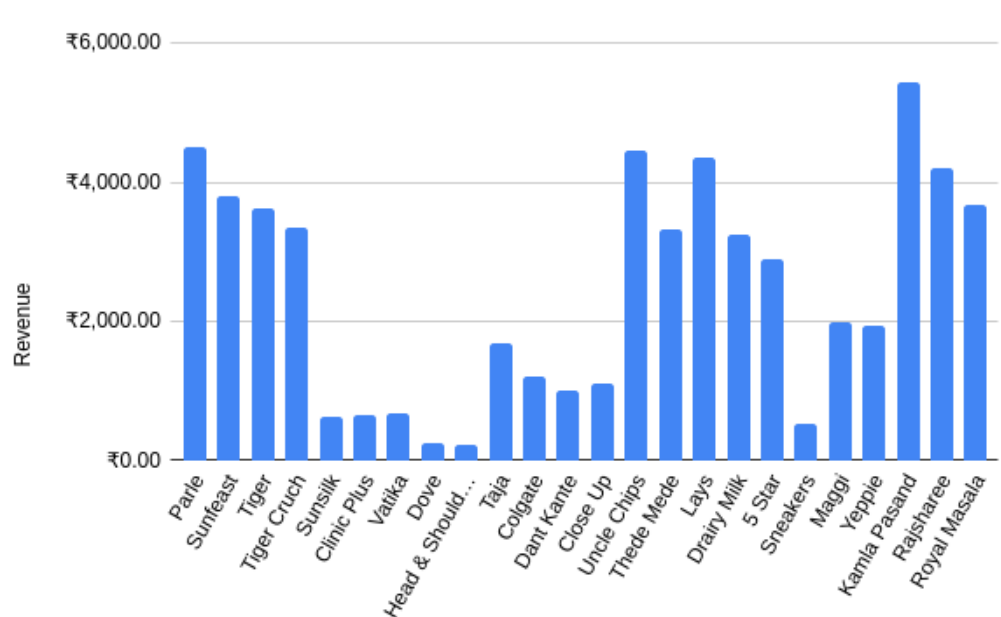
<https://docs.google.com/spreadsheets/d/161BDfJBVsT7ASymC9gDG3j9Yb3Itak4Euhsj5SXo82E/edit?usp=sharing>

Interpretation of Results and Recommendation

The objective of this project includes the identification of factors responsible for revenue generation and evaluation of underperforming products.

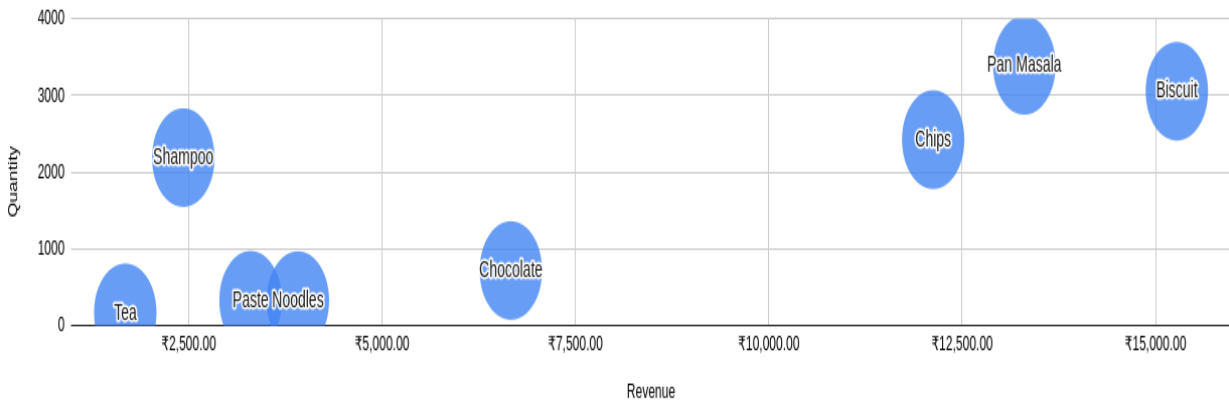
The project was expected to address the above mentioned problems by collecting required data and to find out the most relevant data effective to profits and loss in MahaLakshmi Mart.

1. Revenue Analysis



Through this analysis of items it is observed that **maximum revenue** is generated through **Kamla Pasand** whereas **Head & Shoulders** is responsible for **minimum revenue**.

SUM of Revenue and SUM of Quantity



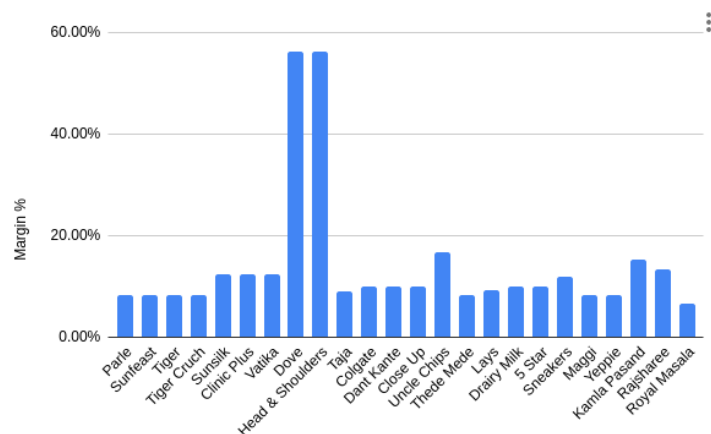
This graph interprets that the **Biscuit category** is profitable whereas the **Tea category** is least profitable.

Suggestions:

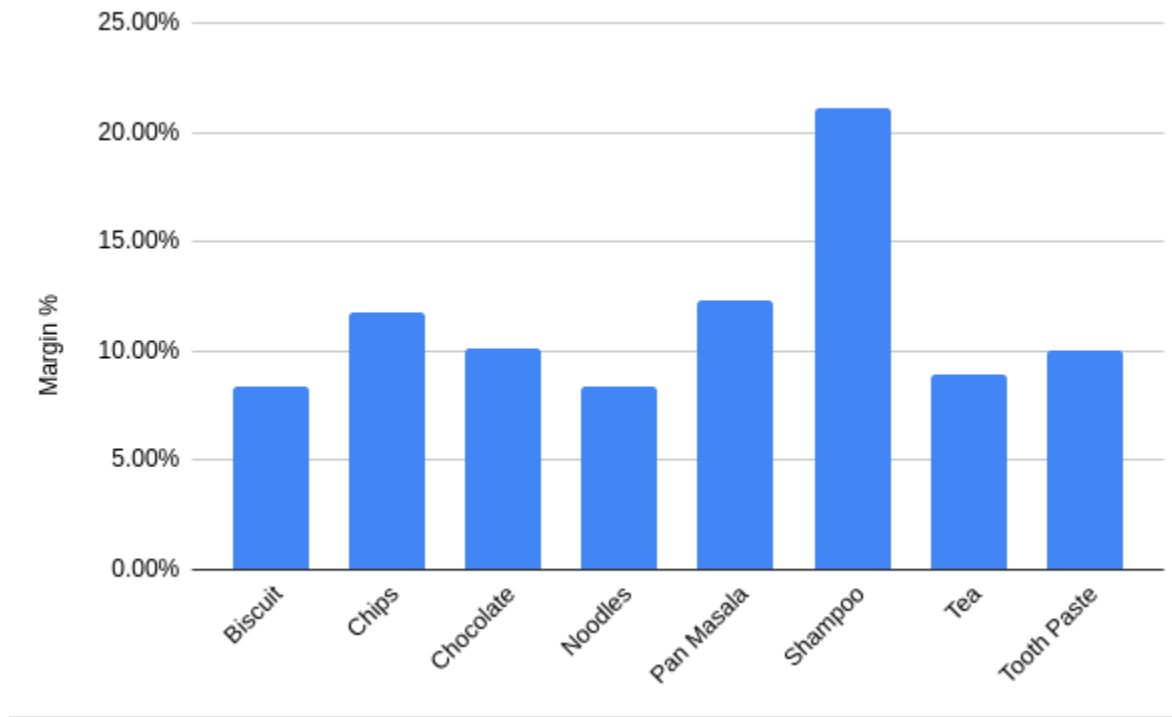
1. The Biscuit category should include more SKUs as this category is very profitable whereas the Tea category should replace its SKUs or should check the quality of tea as it is the least profitable category.
2. Through item analysis, it is observed that Head & Shoulder shampoo should be removed as it contributes least to the revenue.

2. Margin Interpretations:

Margin analysis helps to know which products are making the most profits and are in demand.



According to item sales **Dove** is having maximum margin whereas **Royal Masala** has minimum margins.



This analysis of category wise margin interprets **Shampoo** category has maximum margins whereas **Noodles** category has the least margin.

Suggestions:

1. Shampoo category is making profits so it is suggested to include more SKUs in this category and as noodles are not giving such margins, therefore it is suggested to remove this category or should replace the SKUs.
2. Dove is giving maximum margins in the shampoo category. Hence, it is suggested to keep the dove shampoo and think of adding more dove products.
3. But as we have seen through under-rated analysis of items, dove has the least sale out percentage. So, it is preferred to lower the price of dove to increase its sales and definitely it will also help in revenue generation which will result into a profitable business.

Other Suggestions:

1. Making business profitable doesn't only depend on the numbers. It requires strong marketing strategies and business intelligence.
2. Also, I have analyzed the market situations and talked to nearby people to get their perceptions.
3. It is observed that this shop is famous in the locality but people purchase items from others because they look more clean and items are arranged in a proper manner.
4. So, it is suggested to arrange the items group wise and keep the surrounding clean with regular cleaning and all.
5. Also, as people are more likely to order items online nowadays, so link to different groceries apps like JioMart, OnlineGroceries, etc..
6. Start online delivery of items to multiple areas. It would help in expanding business and maximizing profits.