Inventory Management and Sales Revenue Maximization

A mid-term report for the BDM capstone Project

Submitted by

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1 Executive Summary

This report consists of careful analysis of data collected from Mahesh Kirana Store. Data is collected from 5 August to 6 September. Primarily data consists of two tables one for tracking the inventory and other for details of the products. Inventory table contains records of each product on a daily basis, it has information about stock at time opening, inwards, outwards and stock at time of closing. Products table contains information about the products like name of product, cost price and selling price.

The objective of the mid term report is to find which products contribute more to sales and which products contribute more to revenue and to analyse the sales trend over the month on a daily basis. To achieve this task I have used Combo Charts, Line Charts, Bar Charts and Pie Charts. Charts are a great means to draw insights from data and provide a more clear picture, if used properly.

Bar chart is used to visualise the average days of inventory of each product. Pie chart is used to get the proportion of contribution of each product in generation of revenue. Combo chart is used to draw a Pareto chart of both sales and revenue. Line chart is used to visualise the trend of sales over the month.

At the end of the report we can find which groups of products contribute more to sales and which group of products contribute more to revenue. After knowing this the shopkeeper can focus more on revenue generating products and try to increase the sales of revenue generating products thus maximising revenue.

2 Proof of Originality of Data

Images of the shop:



Link of drive for letter, video and images: ProofOfOriginality

Raw Data Link: **ShopData**

Processed Data: **DataProcessed**

3 Metadata

For understanding movement stocks the following data is collected:

Date: It stores the date on which data was recorded.

Name: It contains the name of the product.

Opening: The quantity of each product at the time of opening of the shop on a particular day.

Inwards: It contains the quantity of each product that came inside the particular day (products purchased).

Outwards: It contains the quantity of each product that went outside the shop on that particular day (products sold).

Closing: It contains the quantity of each product remaining at time of closing the shop.

Products table contain the following fields:

Name: Name of the product.

Selling Price: The price at which item was sold.

Cost Price: The price at which item was purchased.

4 Descriptive Statistics

Considering all the products combined and conducting descriptive analysis on a daily basis can be useful.

Opening

Average: 467.9, median: 448, Standard Deviation: 117.5, Min:261, Max: 723

Inwards

Average: 187.2, median: 144, Standard Deviation: 128.7, Min: 0, Max: 571

Outwards

Average: 197.7, median: 196, Standard Deviation: 49.3, Min: 128 , Max: 374

Closing

Average: 457.4, median: 441, Standard Deviation: 109.1, Min: 261, Max: 679

Although these descriptive statistics do not give much information about product detail , there are other things such as what was the average, median, Standard Deviation, Min and Max of total products purchased, sold, opening stock in the month on a daily basis. This helps in understanding overall distribution of sales, purchase, opening and closing. Giving a brief idea of the shop.

Date	Name	Opening	Inwards	Outwards	Closing
5/8/24	Parle Biscuit	144	0	50	94
5/8/24	Gooday Biscuit	72	0	10	62
5/8/24	Namkeen	48	20	30	38
5/8/24	Chips	60	40	20	80
5/8/24	Garam Masala	20	0	5	15
5/8/24	Meat Masala	20	0	5	15
5/8/24	Detergent	27	0	3	24
5/8/24	Soap	55	0	10	45
5/8/24	Maggie	48	0	12	36
5/8/24	Ghee	10	0	1	9
5/8/24	Hair Oil	12	0	3	9
5/8/24	Edible Oil	20	0	5	15
5/8/24	Salt	25	0	7	18
5/8/24	Tooth Paste	10	20	5	25
5/8/24	Tooth Brush	9	12	2	19
5/8/24	AgarBatti	23	0	0	23
5/8/24	Rusk	20	10	10	20
5/8/24	Choclate	100	0	24	76
6/8/24	Parle Biscuit	94	0	40	54
6/8/24	Gooday Biscuit	62	0	21	41
6/8/24	Namkeen	38	0	20	18
6/8/24	Chips	80	0	17	63

Fig 3.1 Screenshot of primary Data Collected

5 Analysis Process/Method

Data is collected from 5 August 2024 to September 6. I have used Google sheets for the majority of my analysis. First of all, data is thoroughly analysed and there were no significant outliers and missing values on raw data. Then the raw data was converted into various pivot tables to extract Sales and Purchase data of each product on a daily basis. (Outwards column implies Sales Data while Inwards column implies Purchase Data).

Descriptive statistics helped in understanding the distribution of data. My analyses are mostly made with the help of bar charts, line charts and pie charts. Sales volume pareto chart is the combination of bar chart and line chart. It helped in visualising which products have more

sales and which products have lesser sales along with cumulative percentage contribution in sales of prior products.

Pie charts are the one of the best ways to represent the proportion which adds up to 1 or 100%. Here the pie chart is used to depict the percentage contribution of each product to the revenue.

Average days of inventory is represented with the help bar chart. Here the goal is to know for how many days inventory of each item would last if no products are purchased. This would give us understanding how often a product must be purchased in what quantity. Average days of inventory is calculated by using formula Average of Opening Stock divided by Average sales of that item i.e (Average Opening/Average Sales).

To analyse sales over time, line charts are the most appropriate tool to visualise. It effectively illustrates trends and changes over time, allowing in easy identification of patterns. At last I have used the Revenue Pareto chart to see which group of items contribute more to the revenue. It gives us a basic understanding of the most revenue generating product and least revenue generating product. Thus focus more on revenue generating products without compromising sales of lesser revenue generating products.

6 Results and Findings

Here are some of the graphs and pictorial representations which have been used for problem solving.

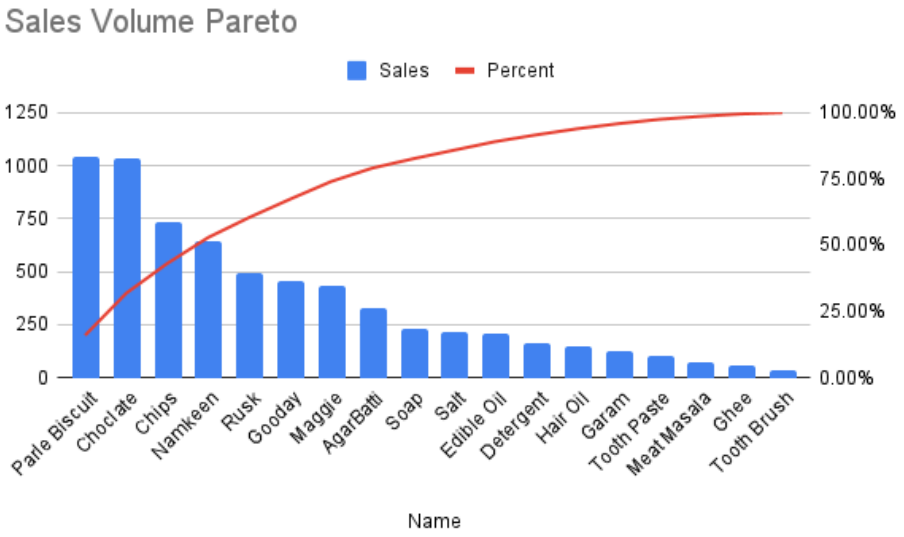

Fig 6.1 Sales volume Pareto chart

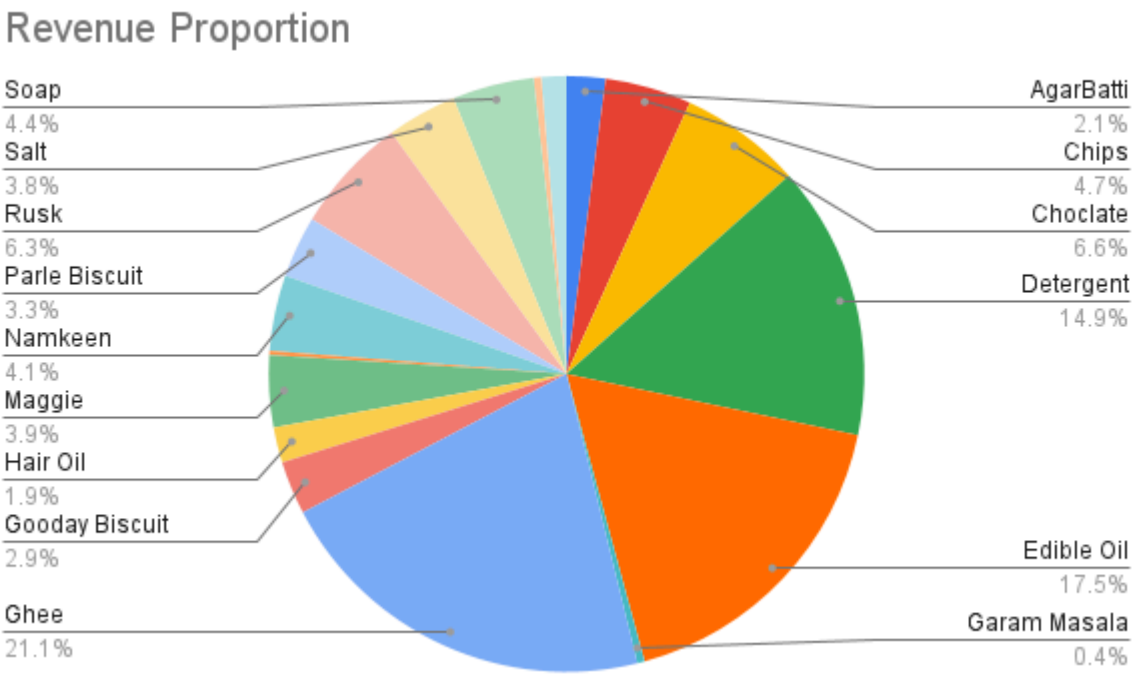

Fig 6.2 Revenue Proportion Chart

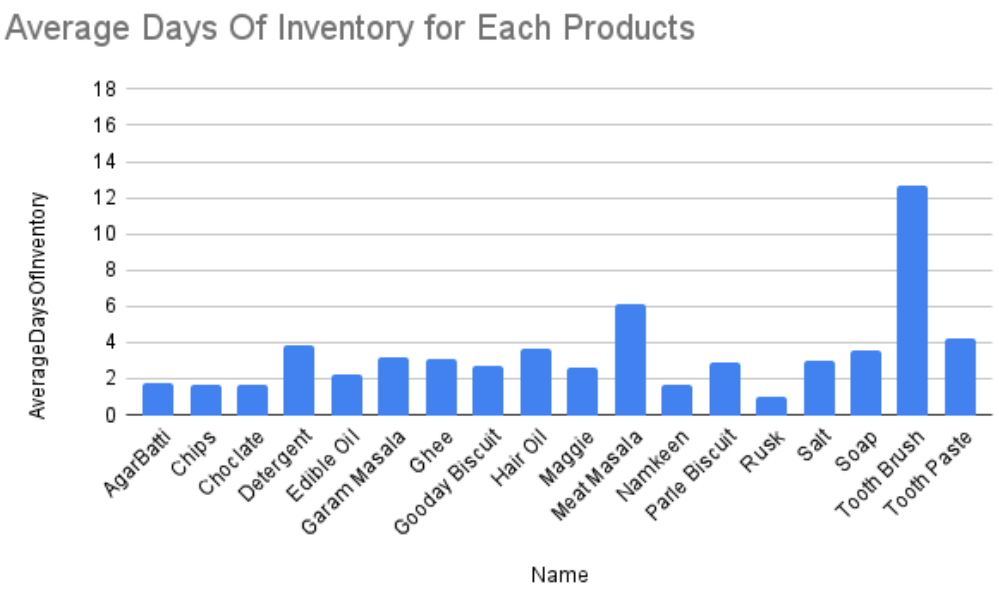

Fig 6.3 Average number of days of inventory of Each Product

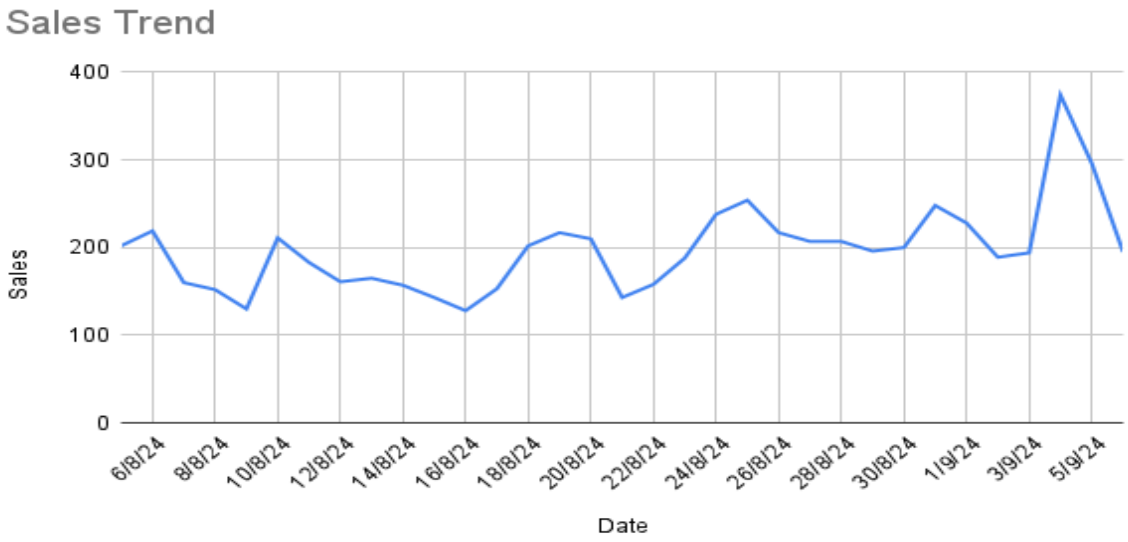

Fig 6.4 Analysis of Sales Trend

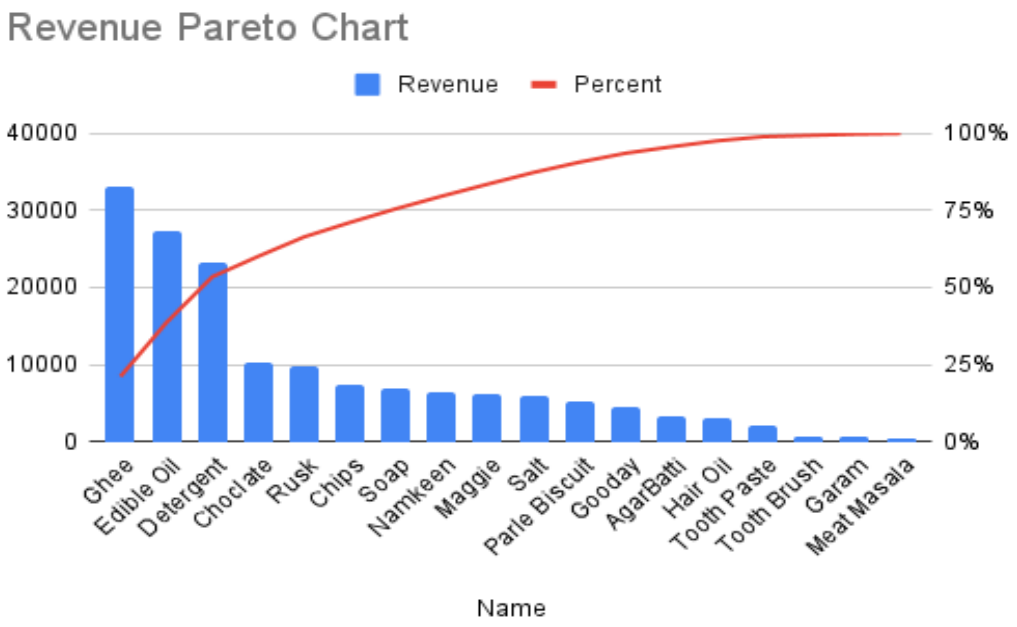

Fig 6.5 Revenue Pareto Chart

- From the volume pareto chart it can be inferred that products like Parle Biscuit, Chocolate, Namkeen, Rusk have higher sales on the other hand products like ToothBrush, Ghee, Garam Masala have lesser sales. About 44% of products contribute to 80% of sales.
- Although Ghee is among the few selling products, there is a significant contribution of Ghee in generating revenue, almost about 21.1% of total revenue. It's quite significant compared to the number of sales it has. It's due to the higher selling price of ghee.
- Average days of inventory for most of the products falls between 1 to 3. So, if a significant amount of concentration is not made on improving average days of inventory then it might lead to the problem of stockout. So efforts must be
- Although there are many fluctuations in sales trends (fig 6.4) , there is only one significant spike that can be seen on 4th of September. This spike is due to chocolate sales due to the occasion of Teachers' Day where school students bought chocolates in bulk quantity.

- From the revenue pareto chart (Fig 6.5) it can be inferred that, out of these 18 products 27% of products contribute to nearly 60% of revenue while nearly 50% of products contribute to 80% of revenue.
- Meat masala, Garam masala, ToothBrush are the least revenue generating products.