

IIT Madras

B.S. (Programming and Data Science)

BDM capstone project final report

on topic:

**DRIVING SALES GROWTH AND MAXIMIZING PROFITS FOR**



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## **INDEX**

<b>S.No.</b>	<b>Title</b>	<b>Page No.</b>
<b>1.</b>	List of figures and tables	<b>3</b>
<b>2.</b>	Title and Executive summary	<b>4-5</b>
<b>3.</b>	Analysis process/method	<b>6-10</b>
<b>4.</b>	Results and findings	<b>11-20</b>
<b>5.</b>	Interpretation of results and recommendations	<b>20-21</b>

## LIST OF FIGURES AND TABLES

### Figures:

- 1.1.1: October 2022 Spreadsheet Snippet
- 1.2.1: Company Category Mapping
- 1.2.2: Result Spreadsheet
- 2.1: Categories Preferred by Customers
- 2.2: Packed Snacks Inventory
- 2.3: Spices Inventory
- 2.4: Sauces and Spreads Inventory
- 2.5: Pickle Inventory
- 2.6: New Flavour Responses
- 2.7: Organic Products Responses
- 2.8: Factors Affecting Success of a Product
- 2.9: Drink Mixes Inventory
- 2.10: Regional Snacks Inventory
- 2.11: Factors Affecting Footfall and Conversion Rate

### Tables:

- 1.1.1: October 2022 Spreadsheet Snippet
- 1.2.1: Company Category Mapping
- 1.2.2: Result Spreadsheet
- 3.1: Recommended Inventory Quantities

# TITLE

DRIVING SALES GROWTH AND MAXIMIZING PROFITS FOR [REDACTED]

## EXECUTIVE SUMMARY

This report encapsulates a comprehensive analysis undertaken to enhance sales growth and optimize profits for '[REDACTED]'. The project was initiated to address the challenges of declining footfall and sales while formulating strategies for efficient inventory management and expansion. Utilizing Google Sheets and Google Forms, the project unfolded through several strategic phases:

- 1. Problem and Objectives:** The project's outset identified key challenges including reduced footfall and sales compared to competitors. The overarching objectives centered on boosting profitability, refining inventory strategies, and planning for expansion.
- 2. Data Collection and Analysis:** Rigorous data collection primarily focused on sales and purchase records. This data was meticulously organized and subjected to meticulous analysis using Google Sheets. This process included digitizing handwritten records, summarizing billing data, and calculating total billing values across GST categories.
- 3. Inventory Analysis:** An integral component involved deciphering purchasing trends across diverse product categories. The average monthly quantities purchased for each category were meticulously evaluated. Notably, packed snacks, spices, sauces, and regional snacks emerged as high-demand categories, leading to tailored inventory management recommendations.
- 4. Customer Behavior Analysis:** A comprehensive survey was conducted through Google Forms to delve into customer preferences. This analysis provided key insights, such as the impact of shop location and appearance on footfall and conversion rates. These insights served as a foundation for strategic decision-making.
- 5. Strategic Recommendations:** Drawing from the analysis, the report culminated in a series of strategic recommendations. These encompassed the establishment of store fronts near residential and office areas, enhancing the store's aesthetic appeal, and introducing home delivery services. These recommendations were aligned with customer preferences and aimed at elevating the shopping experience.

6. Conclusion and Implications: The project's conclusion emphasized the value of data-driven insights and customer-centric strategies. By aligning inventory practices with demand patterns and improving the shopping environment, [REDACTED] could anticipate sustained growth and increased profitability.

In synthesis, this end-term report embodies a holistic analysis of sales data and customer preferences. The strategic recommendations provided offer a clear roadmap for driving sales growth, refining inventory management, and fortifying the performance of [REDACTED]. These insights are poised to guide the business's trajectory, ensuring a prosperous and thriving future.

## PROBLEM OBJECTIVES

1. Determine the reasons for the decreasing footfall and less sales as compared to the competition.
2. Improve the sales/profit and minimize expenses.
3. Determine strategies for successful expansion (product range, product categories, branding, popularity etc.).
4. Find a way to minimize debts, dead stocks and out of demand products (inventory management).

## ANALYSIS PROCESS/METHOD

**Analysis tool used: Google Sheets and Google Forms**

### Step-1

The main task after data collection was to represent data in a suitable and workable format. I used Google Sheets for the same. Each month's company wise billing data was available which was inserted into separate spreadsheet for every month manually. For reference, a snippet of October month's billing spreadsheet is given below:

---

Date	Company	5%	12%	18%
4Oct22			181	588
11Oct22		2738	1284	
18Oct22			1331	3739
16Oct22			383	

***Table 1.1.1 "October 2022 spreadsheet snippet"***

---

This was a part of the data digitization process explained in the mid-term report. Similar spreadsheets were created for every month starting from October 2022 to March 2023.

The very first step that I did for analysis was to add up the billing data of each company under their respective GST slabs and add the respective taxes. Rest of the spreadsheet's columns were minimized/compressed and only the company name, and the total billing amounts for the company's that month's respective GST slabs were appended/displayed in the spreadsheet. A snippet of October 2022 spreadsheet's totalling part is given below for reference, the same process was followed for all 6 months' spreadsheets.

---

Company	5%	12%	18%
	2874.9	2829.552	5105.86
	0	428.96	0
	2271.15	0	1300.36
	0	1160.32	1191.8
	1859.55	0	0
	0	19885.6	0
	0	1846.88	0

***Table 1.1.2 "October 2022 total billing snippet"***

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The formulae used for generating the total amount are given as follows:

- For 5%:  
Total billing value for company x under 5% category = sum of all cells of the company under 5% column + 0.05(sum of all cells of the company under 5% column)
- For 12%:

Total billing value for company x under 12% category = sum of all cells of the company under 12% column + 0.12(sum of all cells of the company under 12% column)

- For 18%:

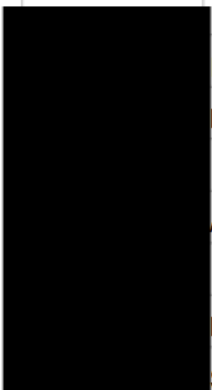
Total billing value for company x under 18% category = sum of all cells of the company under 18% column + 0.18(sum of all cells of the company under 18% column)

## Step 2

The desired output for the analysis was obtaining category wise stock purchased for every month to analyse the trends. This was achievable by looking up the categories which each company provides and then dividing the average price of that category with its respective tax slab bill amount.

The information about each company's categories along with each category's average price range and it's GST range was available in the company\_cat\_mapping spreadsheet, a snippet for reference of the same is given below.

---

Company	category	GST rate	average_price	price_range
	Drink mixes	5	125	50 to 200
	Regional Snacks	12 to 18	125	50 to 200
	Ayurvedic products	5 and 18	280	60 to 500
	Regional Snacks	18	135	70 to 200
	Spices	5 and 12	30	20 to 40

***Table 1.2.1 "Company\_cat\_mapping snippet"***

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For each month's spreadsheets, I looked at each company's category, GST range and average price from company\_cat\_mapping spreadsheet and derived the quantity of a category ordered from that company in that particular month.

I stored the month wise cumulative data in the result spreadsheet as given below:

	Oct22	Nov22	Dec22	Jan23	Feb23	Mar23
	65	84	55	177	82	55
	334	777	306	319	301	411
	174	140	120	82	114	217
	98	50	63	5	91	0
	46	26	8	10	2	7
	39	57	20	59	444	105
	68	33	16	21	170	17
	113	278	167	141	102	369
	129	95	96	73	319	89
	200	97	472	129	118	139

**Table 1.2.2 "Result spreadsheet"**

For example, I looked at the first company in the October 2022 month's spreadsheet which was "Ra [REDACTED]". I searched company\_cat\_mapping spreadsheet for "Ra [REDACTED]" and looked at the GST range it provides a particular category in. for instance, it provides "Drink Mixes" products in the 5% GST slab and average price of 1 item in this category is 125. I then divided the 5% total billing amount for "Ra [REDACTED]" in October month by 125 and rounded it off to the nearest integer. Then, accumulated the "Drink Mixes" category's already existing value (0 in this case) for the month of October 2022 in the Result spreadsheet. I did this for each month's every company.

Clash resolution:

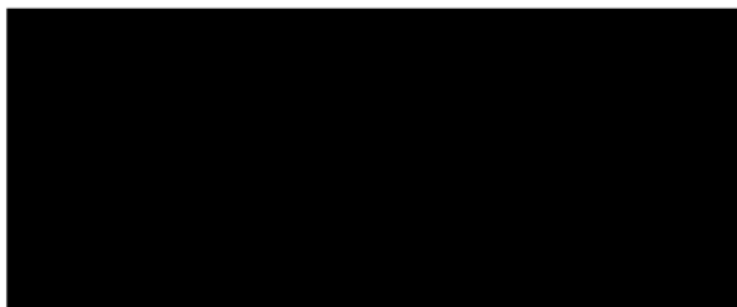
If a company had multiple categories, and some of them have the same GST slab, the total value was divided by the number of coinciding categories to get the average billing amount of the same GST slab for each of each category.

### Step 3

All the required trends about inventory can now be obtained using simple graphs and charts. The resulting trends from this inventory data can then be used in a combination with analysis from the customer survey data to provide a solution for the problem objectives.

The above-mentioned steps were for performing analysis through the billing data spreadsheets. The customer survey form produced data in form of responses which are presented with suitable graphs for every question in the survey.

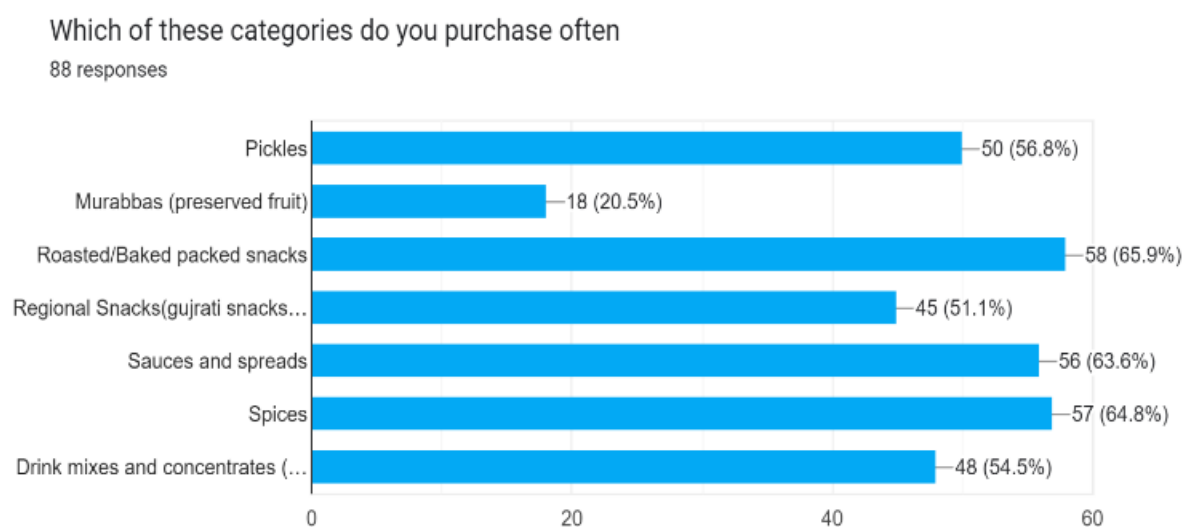
The required links for the data are given below:



Since I already have the customer preference data from the survey and the respective analysis for the questions, I've tried to find the most purchased categories by the customers. Also, I am trying to find what all factors lead to a product being more popular than other products of the same category. I am also trying to find the factors responsible for making a customer choose a particular shop over another.

## RESULTS AND FINDINGS

First, we will have a look at the survey response to determine the categories preferred by the customers:



**Fig. 2.1 "Categories preferred by customers"**

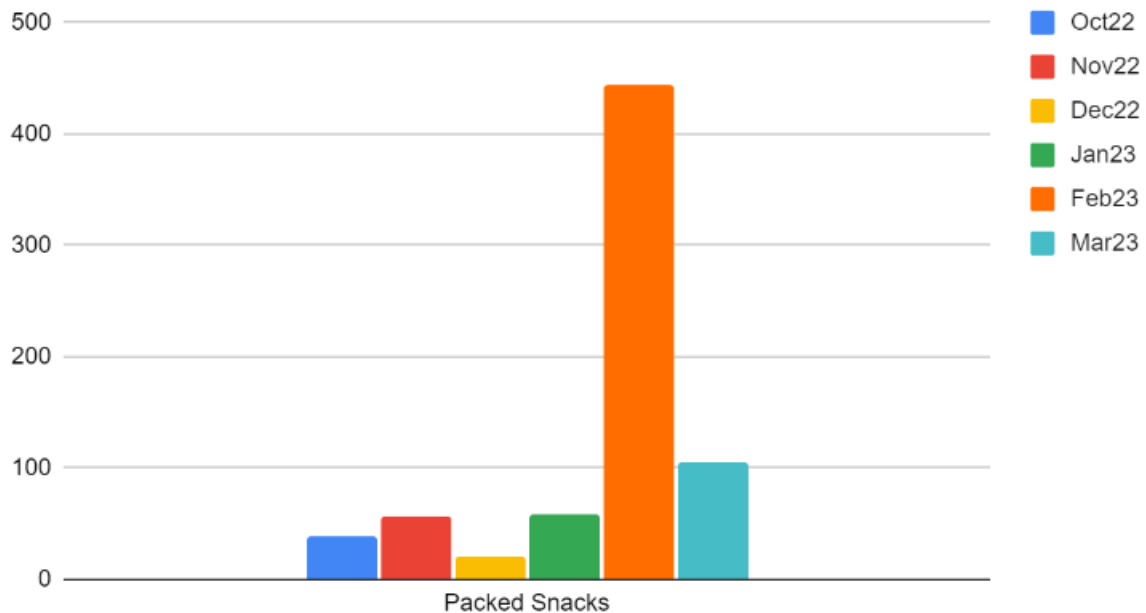
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65.9% of the people who filled the survey purchase roasted/baked packed snacks often.

I found out that the inventory for packed snacks was always under 100 products from October 2022 to January 2023. The volume increased to 400+ units in February 2023 i.e., more than 300% increase in the purchased quantity showing inconsistency in purchasing the product but high demand for the product. These combined results from the Packed snacks inventory and the customer survey data, indicate that the Inventory for the product is not being restocked consistently even when the demand is quite high which in turn leads to discrepancies in the budget for some months.

The average demand for packed snacks units per month as indicated by the purchasing data, is 121 units.

### Packed Snacks inventory

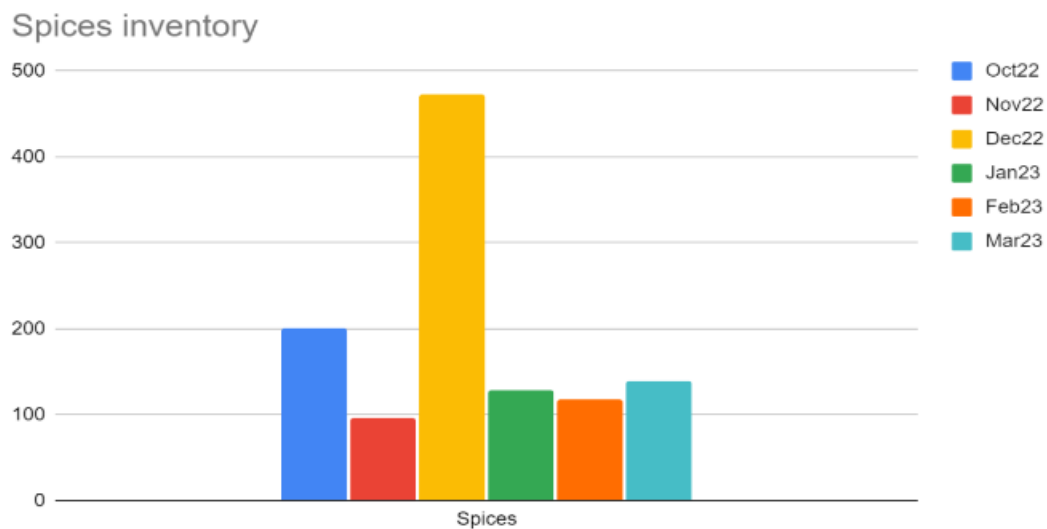


***Fig. 2.2 “Packed snacks inventory”***

Thus, **keeping the purchase quantity of packed snacks around 121 units a month** would provide for an efficient inventory stocking.

The next most popular category that was purchased by surveyors is “Spices”. Given below is the purchase trend for the spices category from the purchasing data. The average quantity of spices purchased each month is 193 units. We can see the same inventory inconsistency as the one seen in packed snacks.

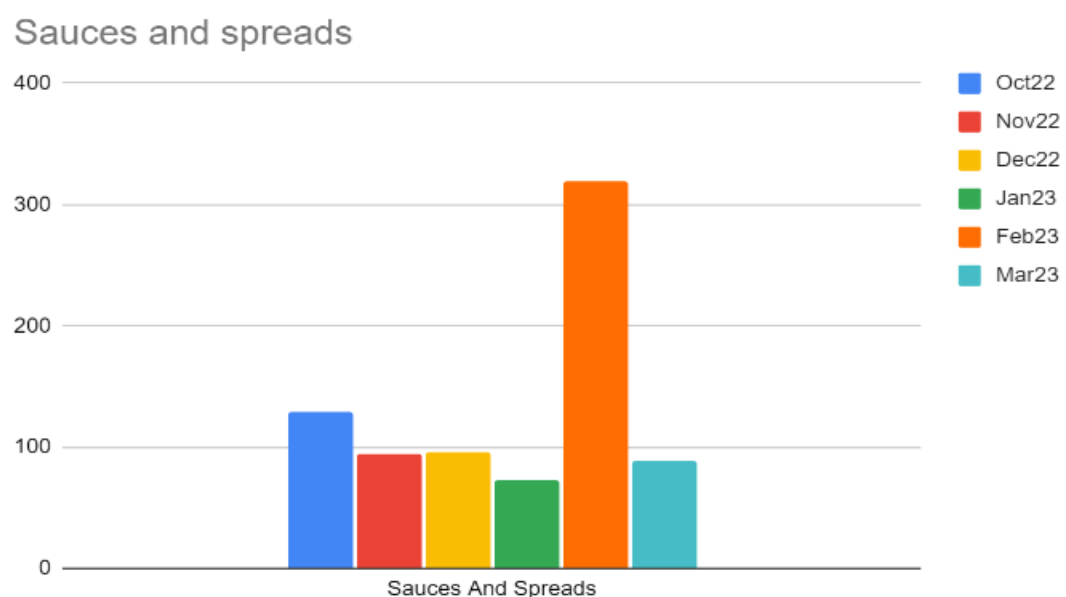
Therefore, **keeping the purchase quantity of spices around 193 units each month** would provide an efficient spices inventory management.



***Fig. 2.3 "Spices inventory"***

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The next most purchased category is "sauces and spreads" with 63.6% surveyors purchasing it often. The same trend as displayed by the previous two categories is shown by the sauces and spreads category:

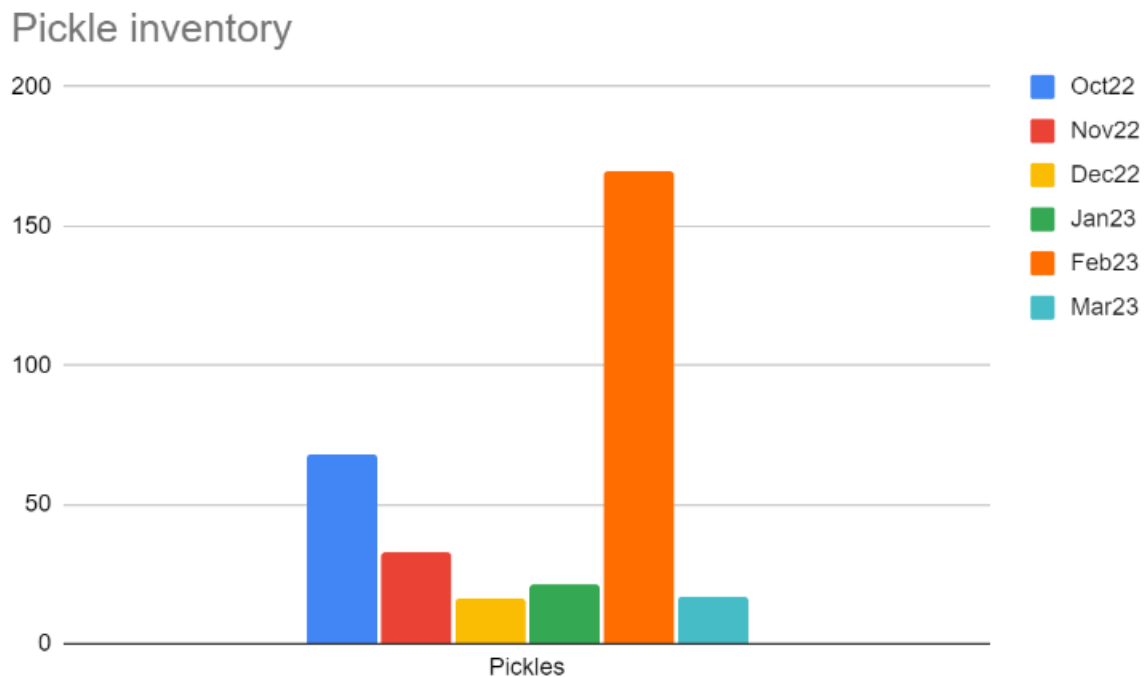


***Fig 2.4 "Sauces and spreads inventory"***

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Therefore, **keeping the purchase quantity of sauces and spreads around 134 units each month** (avg. purchasing quantity) as indicated would provide an efficient inventory management.

The next most popular product is “Pickles” which is purchased often by 56.8% surveyors.



**Fig 2.5 “Pickle inventory”**

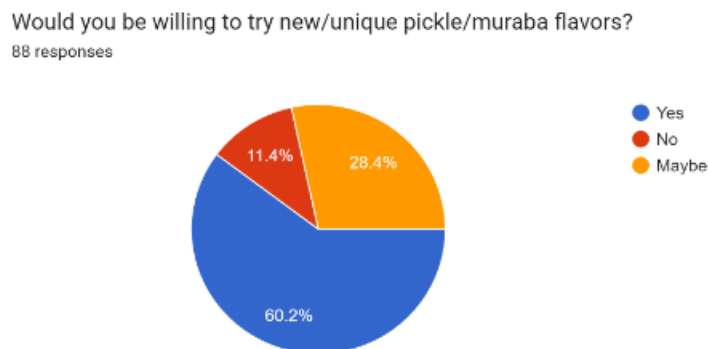
After a talk with the owner, I found out that towards the end of January, they launched a new flavour in their mango pickle lineup called [REDACTED]. The product was purchased by many people to try and lead to an increase in the purchase of the same flavour in February 2023 month.

This flavour of the pickle was out sourced along with several other pickle flavours. For certain speciality pickles, the production is done in-house.

The owner also told that pickle demand has never been constant and thus it is hard to keep track of when to restock a particular flavour and if it will be in constant demand in the future.

Thus, the only solution to manage the pickle inventory has been actual real time inventory stocking based on the demand of pickles in the previous month.

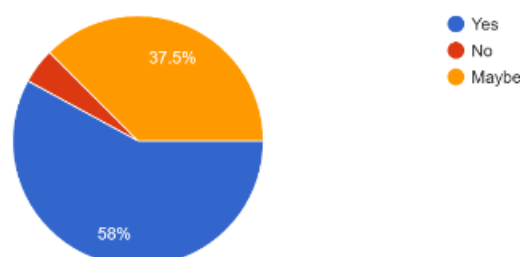
The new flavour demand hike indicates that people are willing to purchase newly launched flavours and this can also be seen from the survey response as follows:



**Fig 2.6 "New flavour responses"**

Pickle and murabba being the main focus of the shop, attracts a unique customer base. The shop specializes in pickle and murabba where several pickles are out sourced and are sometimes not completely made using organic/completely natural ingredients. This can be a reason for people not purchasing pickles and murabbas from the shop as the below figure suggests, people are willing to pay more for organically produced pickles/murabbas.

Would you be willing to pay more for pickle-murabba products that are made using organic or natural ingredients?  
88 responses



**Fig 2.7 "Organic products responses"**

It is clearly visible from the survey that the demand for Murabbas is significantly lower than the demand for other categories. The murabbas are also produced completely in-house which increases one more process to manage but yields an efficient product which only caters to around 20.5% of surveyors.

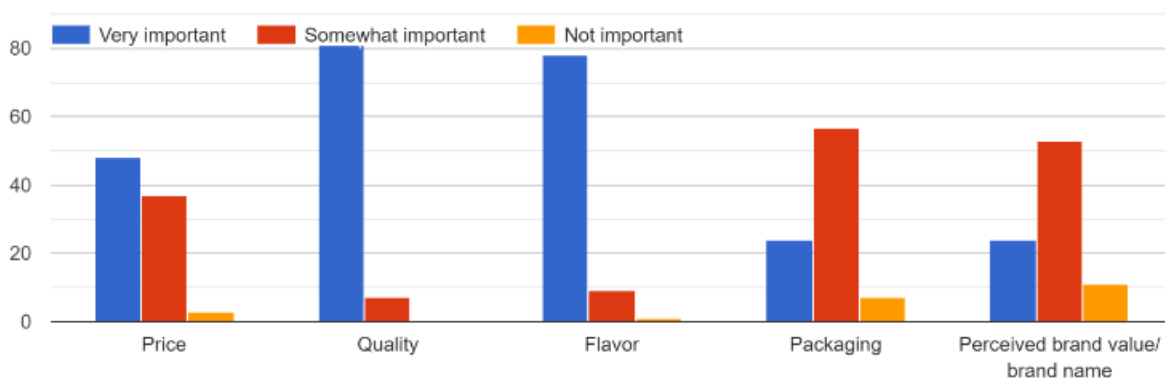
Therefore, to increase the profits from the shop, **new flavours of pickles should be launched with attractive discounts and murabbas should be produced in minimal quantity.**

Also, all of the **existing pickle flavours and any future new flavours should be produced organically** to attract more customers and provide a better profit.

Another survey response shows that people prefer the taste and the quality of the product over packaging or perceived brand value. Price of the commodity being the next most affecting factor for a product's success.

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How important do you consider the following factors when purchasing the above selected items



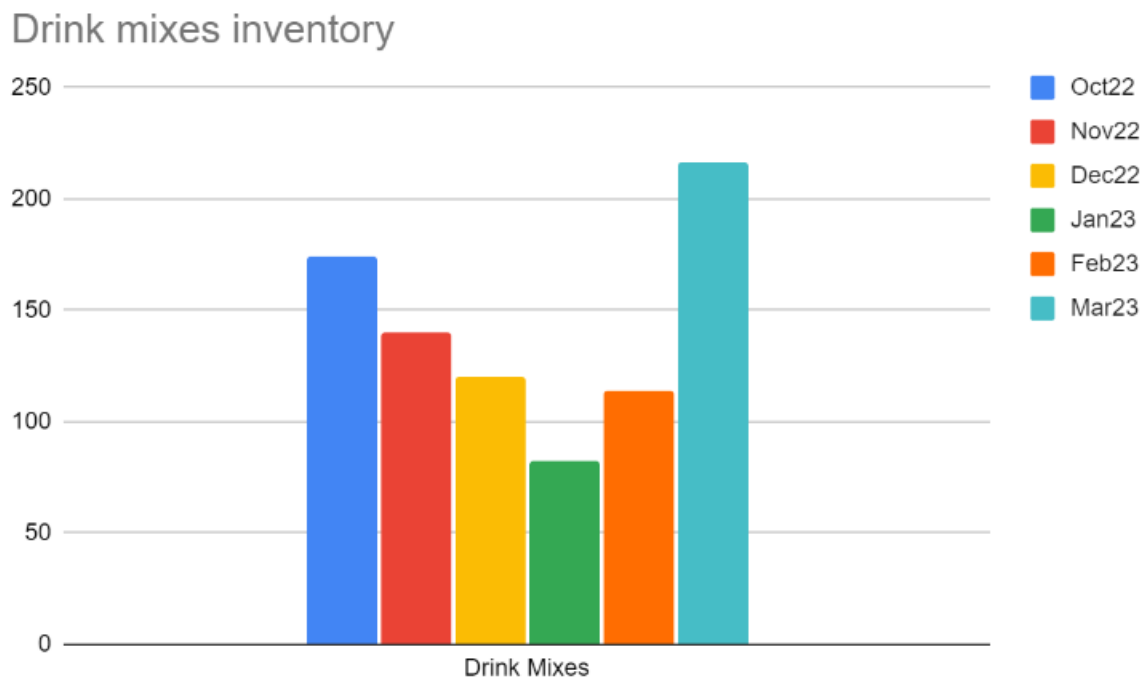
***Fig. 2.8 "Factors affecting success of a product"***

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Therefore, since organic products are preferred by the customers and flavour and quality are the most preferred factors, it will be suitable to **produce all pickles/murabbas in house, organically and focusing on these major 2 factors, quality and flavour.**



The next most popular product is “Drink Mixes”. The total units purchased each month of drink mixes is given as follows:



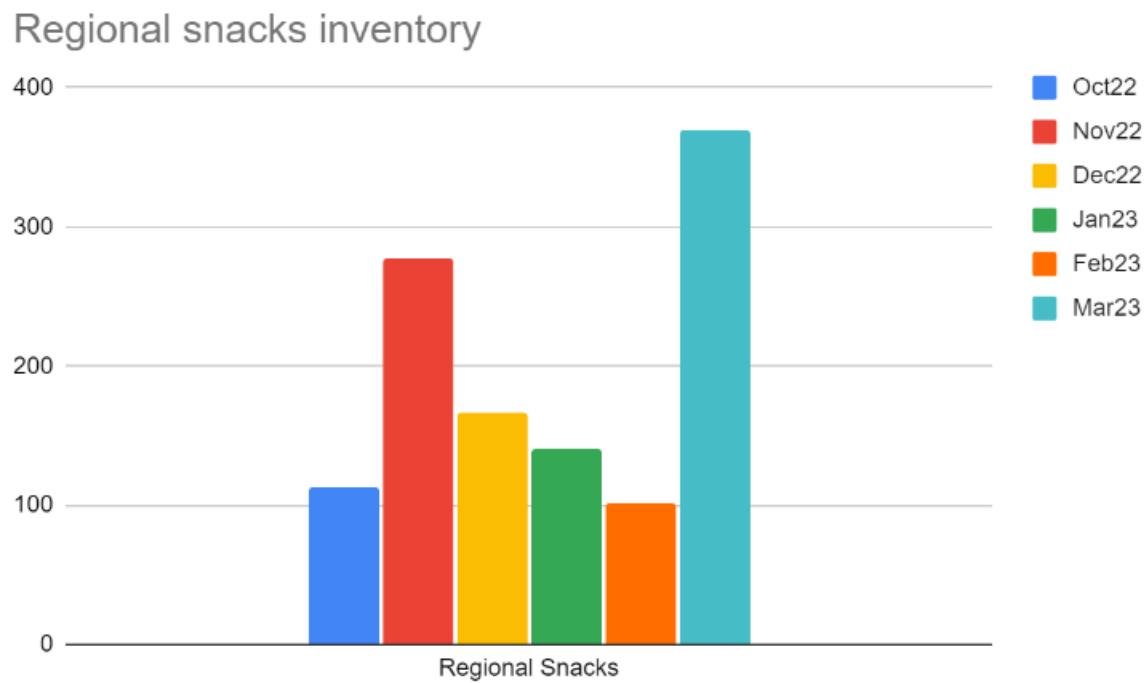
***Fig. 2.9 “Drink mixes inventory”***

The drink mix inventory shows a steady decline from October to January, a slight rise in February and a significant rise in March. This trend is in-line with the general seasonal preferences of the customers and as these items are perishable and not in demand year-round, **the purchasing trend is very good and provides efficient inventory management of Drink mixes stock.**

The next and final most purchased product category indicated by the survey is “Regional Snacks”. This category is purchased by 51.1% of the surveyors. The month-wise purchased units of this category are depicted in the graph given below.

The average inventory purchased under this category is 195 units each month. The products under this category are completely outsourced. This category does not fluctuate in demand seasonally. Therefore, the inventory’s irregular trends cause the mismanagement of funds and

resources. Thus, **keeping the purchase quantity of Regional Snacks around 195 units each month** would provide an efficient regional snack inventory management.



***Fig. 2.10 "Regional Snacks inventory"***

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The problems related to dead stock, mismanaged inventory, and less profit can be improved based on the analysis done above.

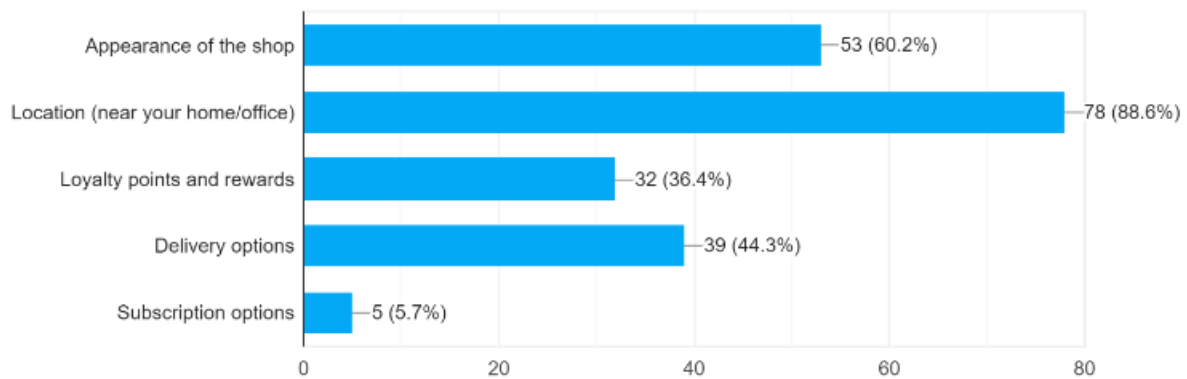
A major problem that is to be addressed now is "Determine the reasons for the decreasing footfall and less sales as compared to the competition." Which is also the very first problem objective.

This problem objective could only be solved by analysis of the customers that why they prefer a particular store more as compared to other stores. This question was included in the survey and the responses to the question were limited to countable options which were found to be affecting the footfall, through extensive market research of the stores in direct competition near both store fronts of the business.

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What all factors about a shop/storefront decide that you would likely purchase something from there?

88 responses



***Fig 2.11 "Factors affecting footfall and conversion rate"***

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As is evident from the survey responses that the location of the shop is primal concern of footfall. People tend to purchase more from the shops that are near their homes and offices which was also observed with a competitor shop in a DDA market near a residence complex.

Around 88.6% surveyors prefer the shops at such locations. Therefore, **opening more store fronts (while expansion) near apartment complexes, residential and office areas** would be very beneficial as it has been observed that the competition in such product categories is also quite low in these areas as compared to the existing shop location in a huge market.

The next most affecting factor towards conversion rate and footfall itself is appearance of the shop, which has been voted for by 60.2% surveyors.

People tend to buy such stuff from mega stores or super markets because the appearance of the store front is good and magnificent plus, these stores often have home delivery options.

Both of these factors would affect the footfall and the conversion rate. Thus, **enhancing the appearance of the store fronts and providing home delivery options** to the customers would play a great role in increasing the footfall and conversion rate.

## INTERPRETATION OF RESULTS AND RECOMMENDATIONS

From the inventory analysis I can successfully conclude and recommend that:

- Keeping the purchase quantity of packed snacks around 121 units a month would provide for an efficient inventory stocking.
- Keeping the purchase quantity of spices around 193 units each month would provide an efficient spices inventory management.
- Keeping the purchase quantity of sauces and spreads around 134 units each month (avg. purchasing quantity) as indicated would provide an efficient inventory management.
- To increase the profits from the shop, new flavours of pickles should be launched with attractive discounts and murabbas should be produced in minimal quantity.
- Also, all of the existing pickle flavours and any future new flavours should be produced organically to attract more customers and provide a better profit.
- Since organic products are preferred by the customers and flavour and quality are the most preferred factors, it will be suitable to produce all pickles/murabbas in house, organically and focusing on these major 2 factors, quality and flavour.
- The purchasing trend of the drink mixes category is very good and provides efficient inventory management of Drink mixes stock.
- Keeping the purchase quantity of Regional Snacks around 195 units each month would provide an efficient regional snack inventory management.

A table showing the recommended inventory units to be purchased each month for each category is given below:

---

<b>Ayurvedic Products</b>	87
<b>Baked Products</b>	408
<b>Drink Mixes</b>	142
<b>Natural Sweeteners</b>	52
<b>Nutritional Snacks</b>	17
<b>Packed Snacks</b>	121
<b>Pickles</b>	55
<b>Regional Snacks</b>	195
<b>Sauces And Spreads</b>	134
<b>Spices</b>	193

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***Table 3.1 “Recommended inventory Quantities”***

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Now, addressing the low footfall problem objective, I recommend that:

- Opening more store fronts (while expansion) near apartment complexes, residential and office areas would be very beneficial as it has been observed that the competition in such product categories is also quite low in these areas as compared to the existing shop location in a huge market.
- Enhancing the appearance of the store fronts and providing home delivery options to the customers would play a great role in increasing the footfall and conversion rate.