BDM CAPSTONE PROJECT:
FINAL REPORT

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IMPORTANCE OF B2B, AND UNDERSTANDING PRICE FLUCTUATIONS OF DIFFERENT ITEMS – A STATIONERY PERSPECTIVE: EXECUTIVE SUMMARY

This report aims to understand the trends in in revenue of a stationary shop across the different months and the contribution of different types of customers to it. We also take a look at how the prices for important products fluctuate throughout the period.

Three main types of analysis have been done for this report – (a) Revenue Analysis (b) Contribution of different types of customers (c) Item price analysis. Most of the analysis has been graphically represented with the help of charts and tables, though some standard statistical measures such as mean and standard deviation are also used. Excel was the primary tool used for the analysis

The end result of the analysis is to highlight the importance of B2B transactions for the purposes of increasing overall sales, as well as understanding that keeping a huge inventory of items does not always amount to a good thing.

The final part of the report gives some recommendations on what the business should change in its day-to-day operations as well as those things which it should continue doing.

DETAILED EXPLANATION OF ANALYSIS PROCESS/METHOD:

All the analysis for this report bearing in mind 3 objectives: 1) Understand the general trends in the sales of the shop, 2) Understand the significance of B2B v. B2C transactions, and 3) Understanding the variability in the price of the individual goods sold.

The sales data used for the analysis was from October 2022 to December 2022.

a) Revenue Analysis

A table was created to show the Revenue, No. of Orders, and the No. of days the shop was open for three months. This was done to understand the sales trends and to check whether there was any seasonality in how the shop operated. Here, by seasonality, we mean whether the shop would remain open during festivities such as Durga Pooja and Christmas, as is it a common practice for staff to go on holiday during these times.

Next, trendlines were constructed for the weekly revenue generation v. the number of orders per week, and to check whether the two were correlated. The main idea behind this was to check whether certain weeks were dominated by the presence of Large Value Orders. This could give some insight into when high-value customers (which would presumably be other businesses) interacted with the shop.

Finally, Histograms were created for the amount of revenue generated per day of the week. This was done to check whether the shop would face increased demand during certain days of the week and therefore should employ additional staff.

b) B2B v. B2C Analysis

Firstly, a pie chart was constructed to check for the contribution of B2B v. B2C transactions in the overall revenue. The shop uses different voucher types to record the different types of transactions – Tax Invoices and Cash Sales for B2B transactions, and Sales for B2C transactions.

This was followed by an analysis of all B2C vouchers. The analysis was done to check whether some transactions were incorrectly marked as B2C when in actuality they were B2B transactions.

This was followed by creating a table detailing the revenue generated across the months by the two types of transactions. Furthermore, stacked bar charts were created to show the percentage contribution of the different types of vouchers to the monthly revenue.

Trendlines were constructed for the number of B2B orders v. the number of B2C orders v. Revenue generated weekly.

All of this analysis was done to check which type of transaction impacted the sales more significantly and hence should be the priority of the shop.

Finally, for B2B transactions, a stacked bar chart was constructed to check the top 20 most valuable customers for each of the three months.

c) Item Analysis

Firstly, a Pareto Analysis was done to see which items contribute what percentage of revenue. As stationery stores have a huge collection of items, this would help to cut down on the number of items to focus on.

Next, a table was created with the contribution of revenue of each item and the distinct transactions in which the item was sold. Then the product of the two columns was taken to arrive at % Contribution to Revenue * No. of distinct transactions. Now the 20 top items were taken based on this new criterion, and we looked for variations in the prices of these items across the weeks (These items are termed as *Useful Items*). The new criterion was created to ensure that the selected items bought played a significant part in revenue generation as well as had sufficient data points to meaningfully understand price fluctuations.

RESULTS AND FINDINGS:

Revenue Analysis

a) Monthly revenue generation vs. No. of Orders

Month	No. of Orders	Revenue	No. of Days of Operation
October (W40-W45)	1541	₹ 3,110,343.33	24
Novemer (W45-W49)	1775	₹ 4,279,211.67	26
December (W49-W53)	1626	₹ 3,909,750.96	27

Figure 1: Monthly Revenue v. No. of Orders

There is a 37% increase in revenue from October to November, and an 8% decrease from November to December.

Similarly, there is a 15% increase in the number of orders from October to November, and an 8% decrease from November to December.

Average Revenue earned per day:

October = Rs. 129,597.65

November = Rs. 164,585.03

December = Rs. 144,805.59

Quarter = Rs. 146,744.20

Average Revenue per Order:

October = Rs. 2,143.58

November = Rs. 2,410.84

December = Rs. 2404.52

Quarter = Rs. 2286.38

b) Weekly Trends in Revenue and No. of Orders

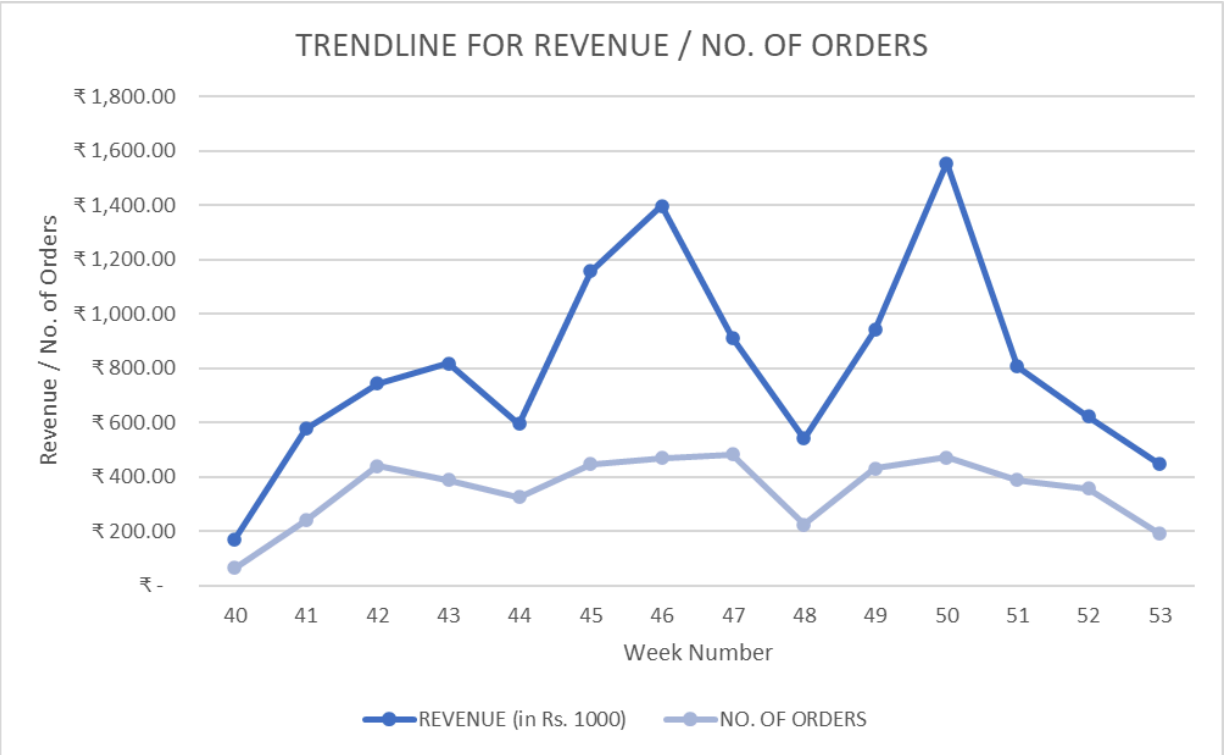

Figure 2: Weekly Trends in Revenue v. No. of Orders

There is a high correlation of 0.84 between revenue and the number of orders. The trendline also follows a trimodal pattern, with the middle weeks of each month being the most significant for revenue generation. A similar trend can be observed in the number of B2B orders and is likely the cause for the above trend as well.

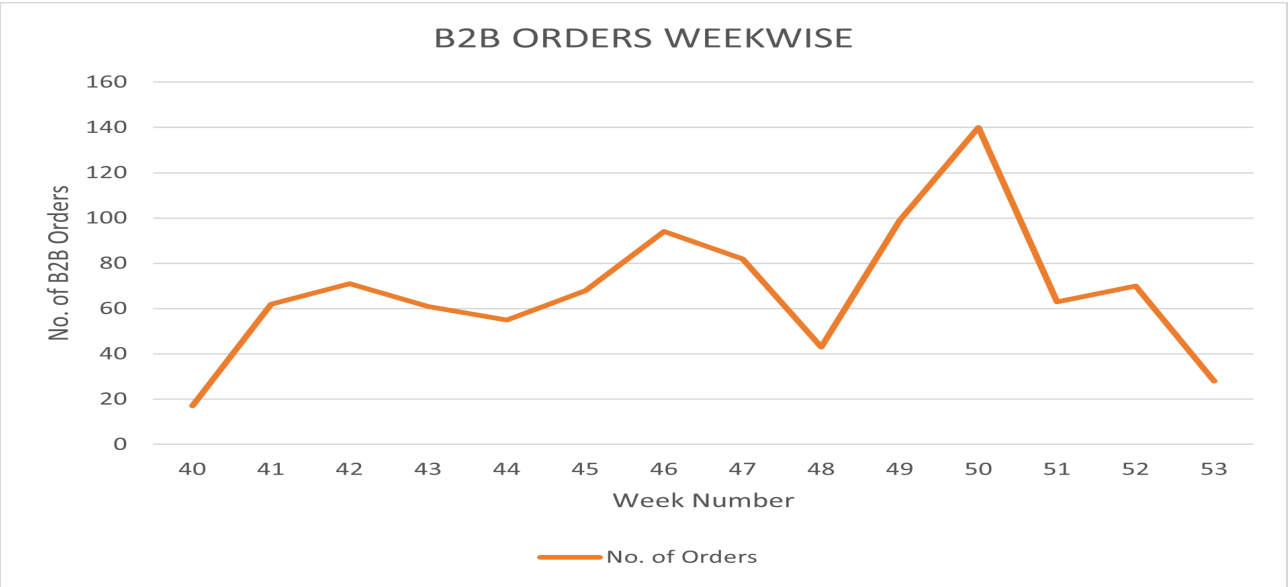

Figure 3: Weekly Trends in B2B Orders

c) Sales per Day of the Week

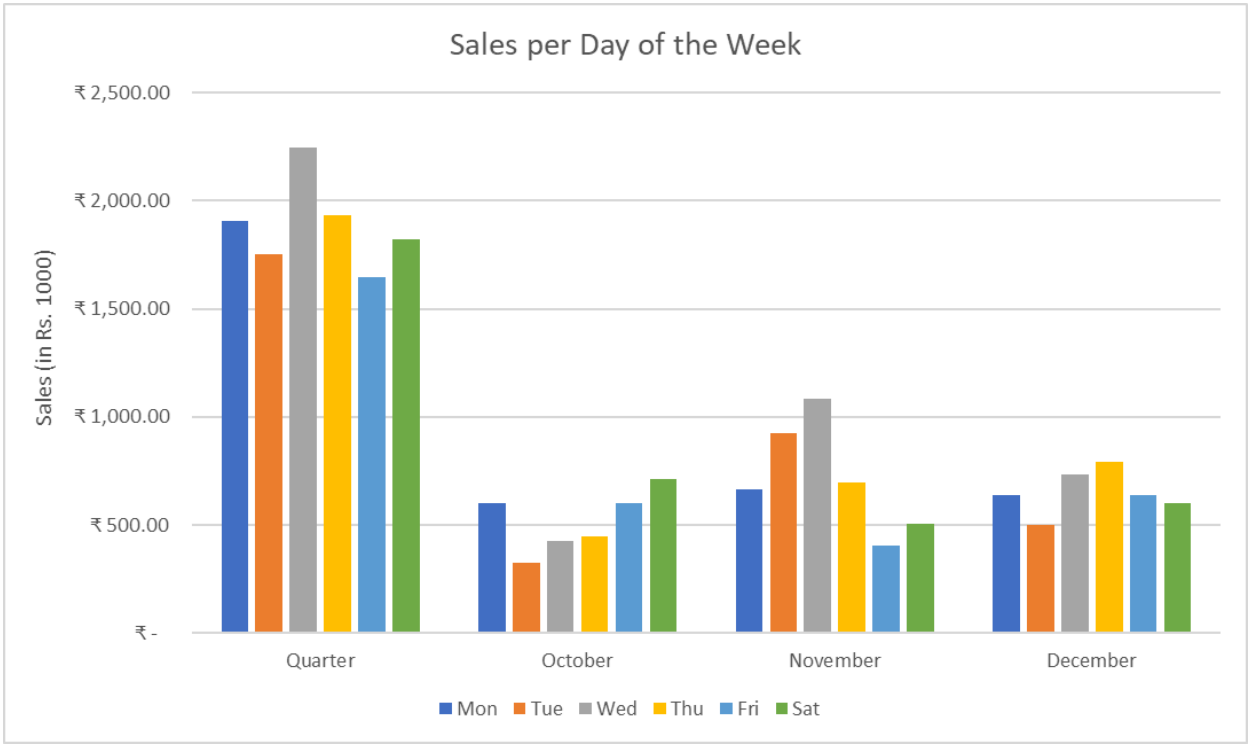

Figure 4: Sales / Weekday - Month Wise

Mondays and Saturdays bring in the most consistent amount of revenue across the months.

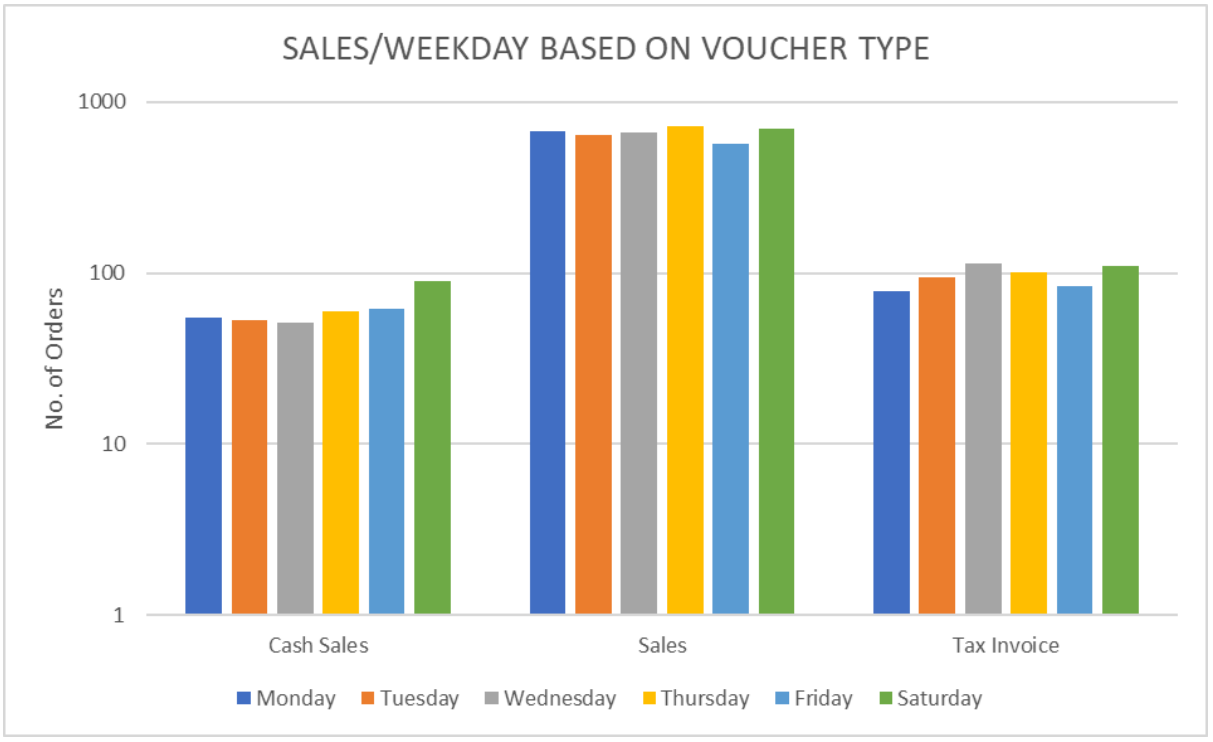

Figure 5: Sales / Weekday - Voucher Type - Quarterly

There was a possibility that the shop chooses to settle its B2B transactions on certain days of the week, which would make it understandable why certain days performed better than others. However, looking at the above graphs there seems to be no such pattern.

B2B v. B2C Analysis

a) Contribution to Sales based on Voucher Type

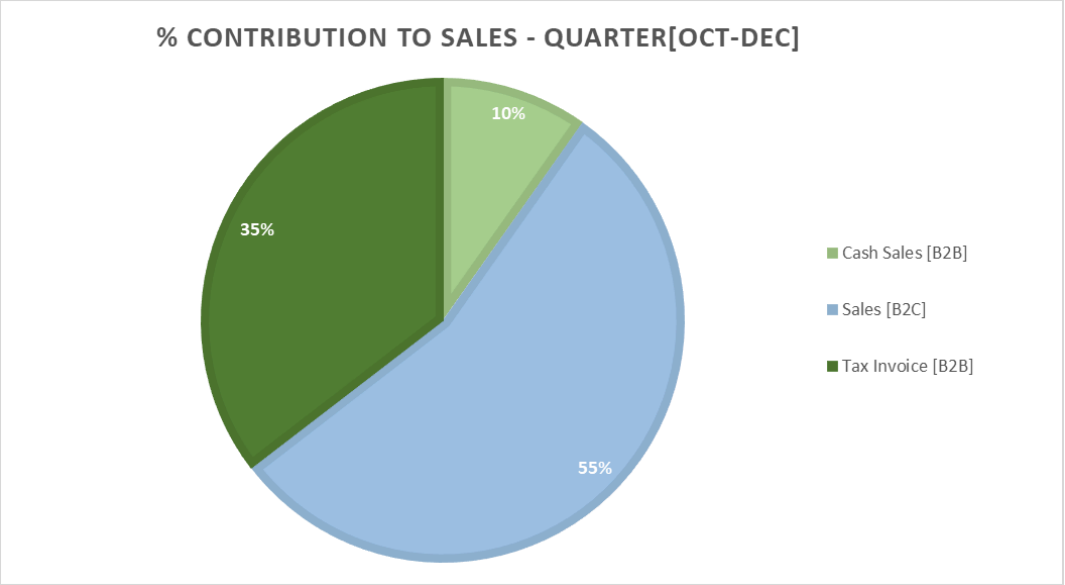

Figure 6: Pie Chart - Voucher Type v. Revenue

The pie chart indicates that across the three months, B2C transactions played a greater role in revenue generation. (55% v. 45%).

However, a further look into the B2C transaction data provided some interesting results.

The average bill amount of a B2C transaction was Rs. 1556 with a standard deviation of Rs. 2596. B2B transactions with a bill value greater than 2 standard deviations from the mean were marked as “Large Value Transactions (LVT)”.

These LVTs accounted for 25% of the overall revenue generated from B2C transactions.

b) Monthly Breakdown of Contribution based on voucher type

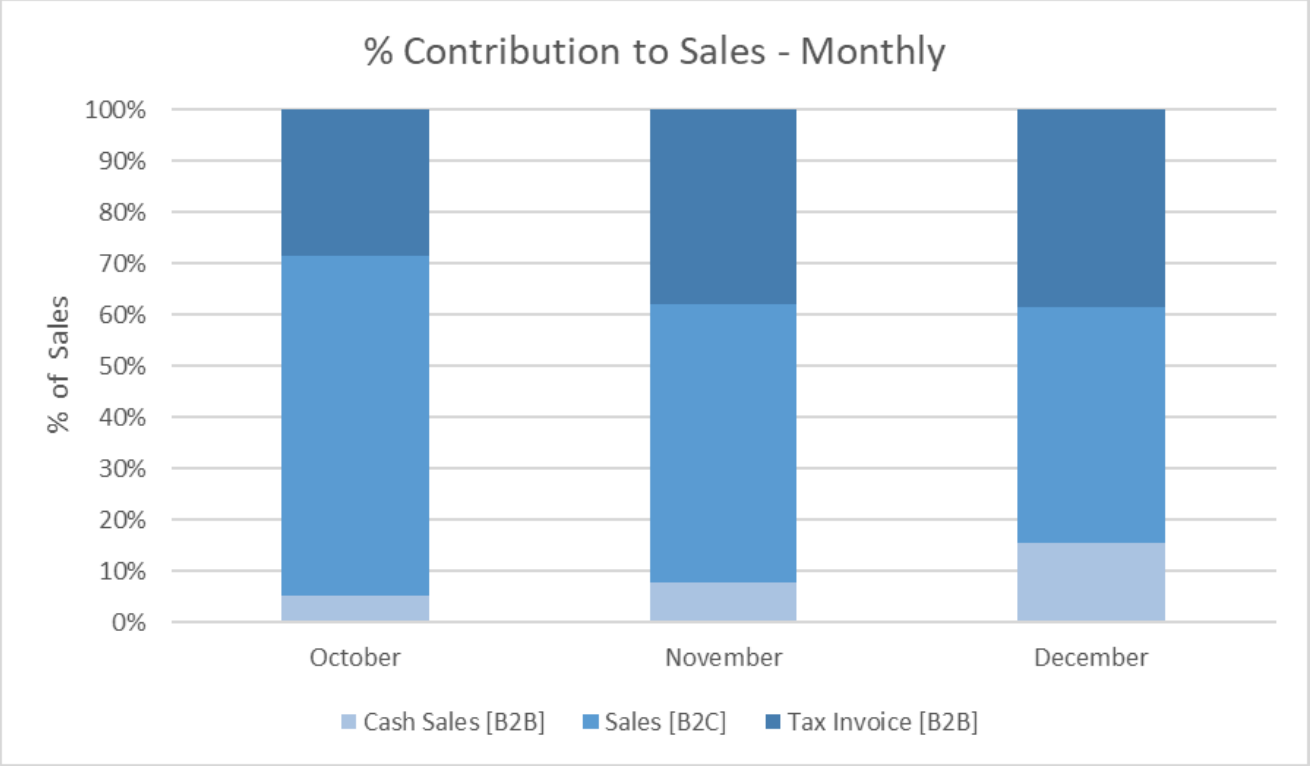

Figure 7: Monthly Contribution to Sales for each Voucher Type

Month	B2B Sales	B2C Sales
October	₹ 1,046,386.55	₹ 2,060,051.78
November	₹ 1,951,286.88	₹ 2,322,934.79
December	₹ 2,108,458.31	₹ 1,800,934.13

Figure 8: Table for Monthly B2B v. B2C Sales

B2C sales dominated the month of October, with them generating nearly double the revenue of B2B transactions. B2B sales picked up in November, with an 86% increase. The trend continued into December with a further 8% increase. B2C revenue also saw an increase of 12% from October to November, however, the trend reversed in the following month with a decrease of 22%.

c) Importance of B2B v. B2C

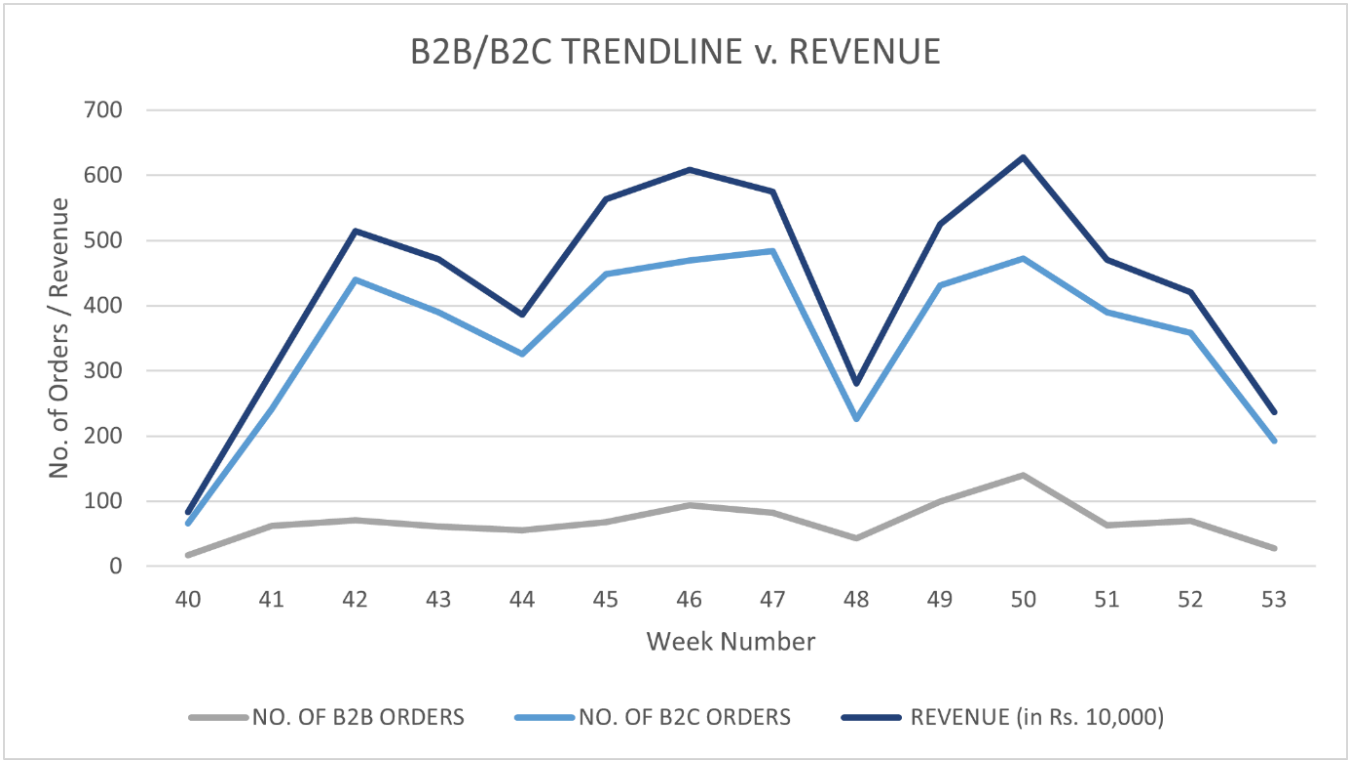

Figure 9: No. of B2B v. B2C Orders

At first glance, it looks like revenue tightly follows the trends in the number of B2C transactions. However, the peaks of revenue generation occur along with the peak in the number of B2C orders. Further, the correlation between B2C orders and revenue is 0.77 while that between B2B orders and revenue is 0.89. This indicates that the business should focus more on its B2B side of things, ensuring that it maintains fruitful relations with other local businesses.

C) Identifying Valuable Customers

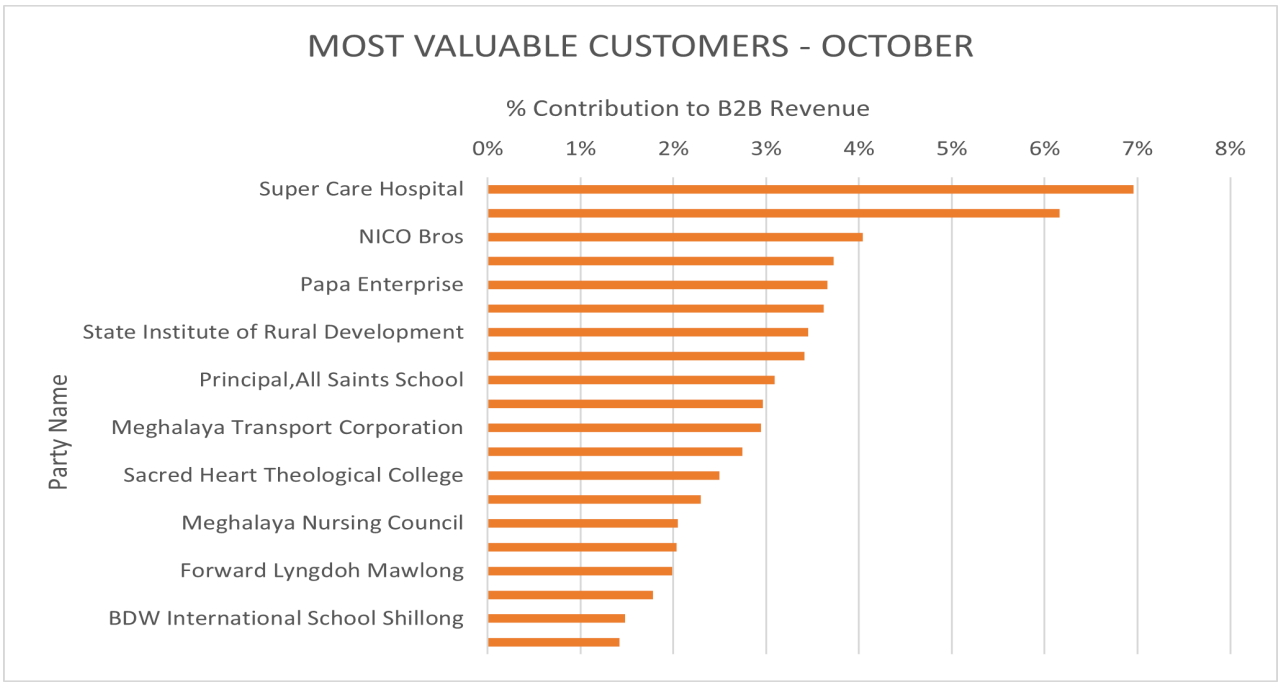

Figure 10: Valuable Customers – Oct

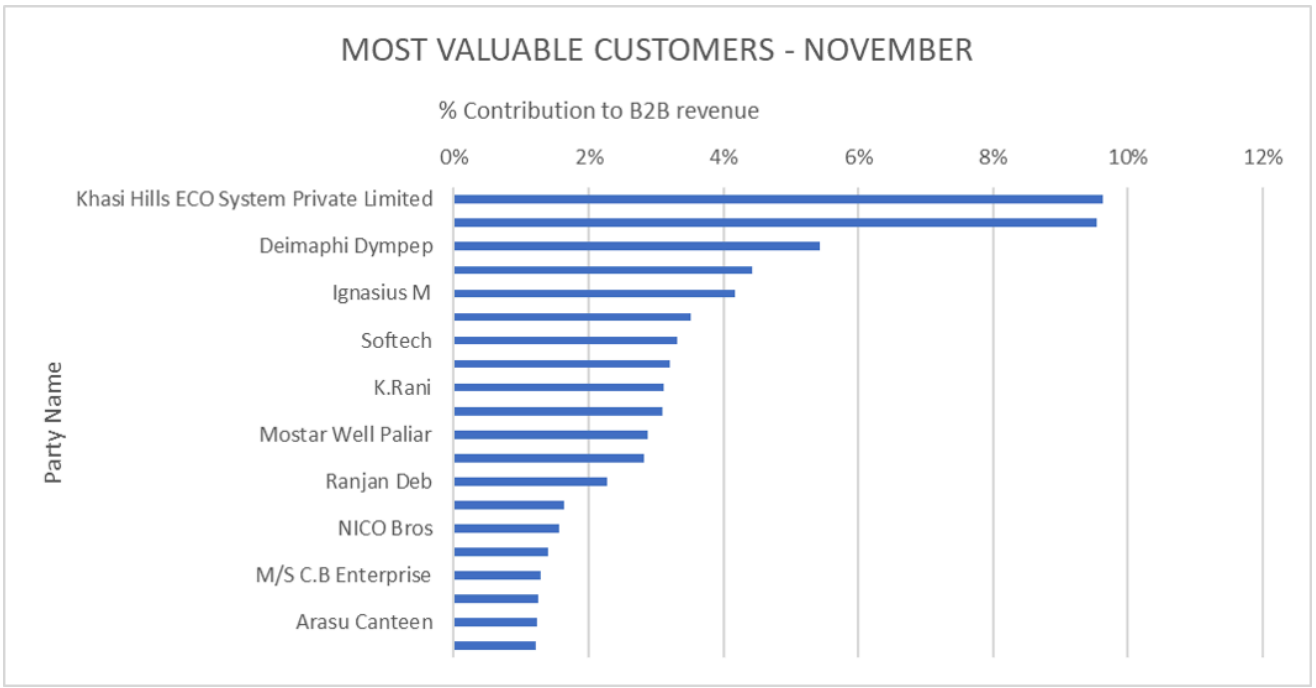

Figure 11: Valuable Customers - November

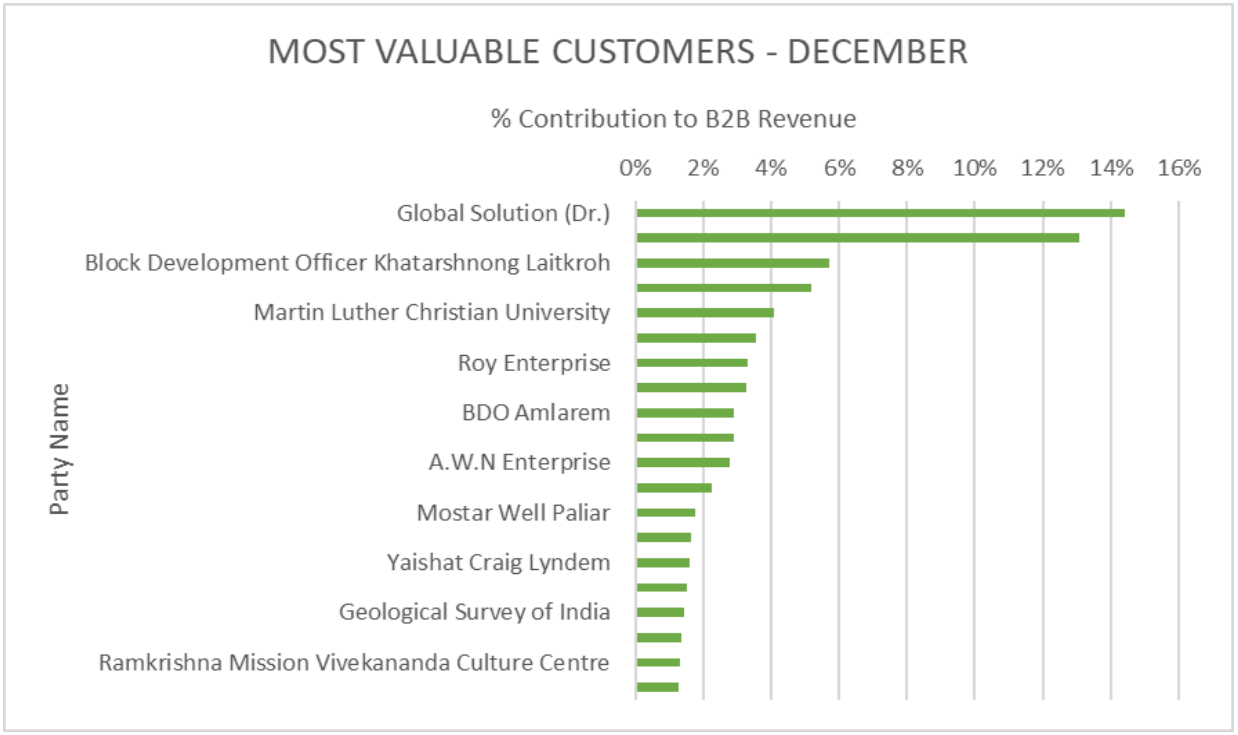

Figure 12: Valuable Customers - December

Across the months, the top 20 most valuable customers contributed 65% (October), 67% (November), and 75% (December) to the B2B revenue generated during that month. There were 48 unique most valuable customers.

On the whole, the stationary shop interacted with 238 unique enterprises, though a majority of them were for low values. [There were 161 enterprises which contributed less than Rs. 10,000 individually to the shop's revenue over the entire 3-month period].

Item Analysis

a) Pareto Analysis

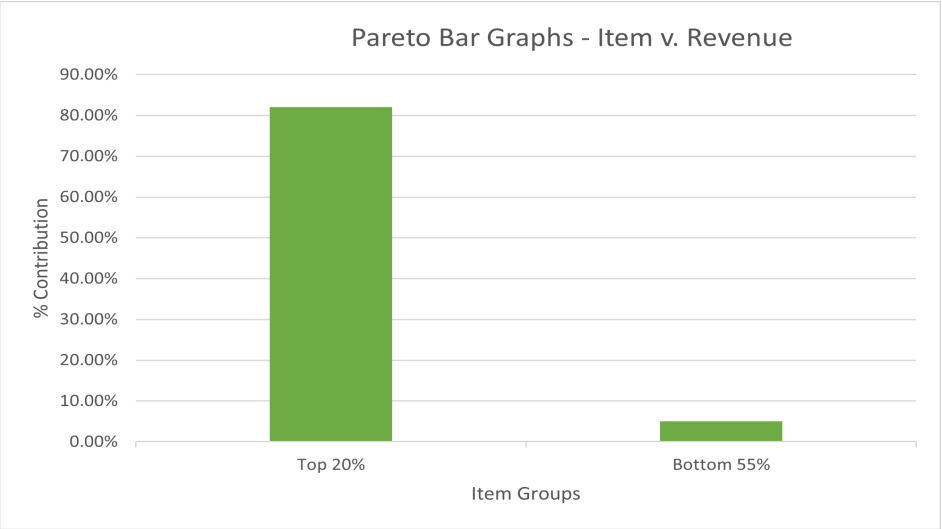

Figure 13: Pareto Analysis

The shop stores 945 unique items. Out of this, 170 items contribute 80% to the overall revenue. In contrast, the bottom 55% of items contributed less than 5% to the overall revenue, which almost all of them being sold only once over the 3 months.

d) Fluctuations in the Prices of Useful Goods

Figure 14: Price Fluctuations – I

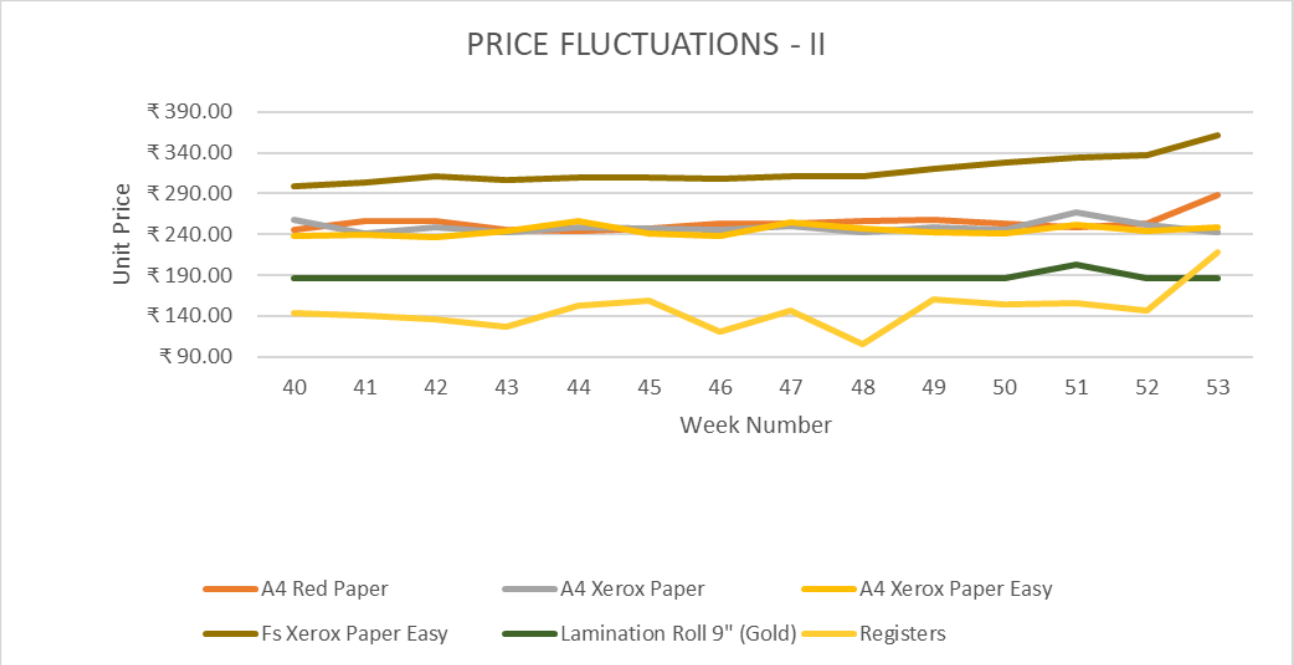

Figure 15: Price Fluctuations - II

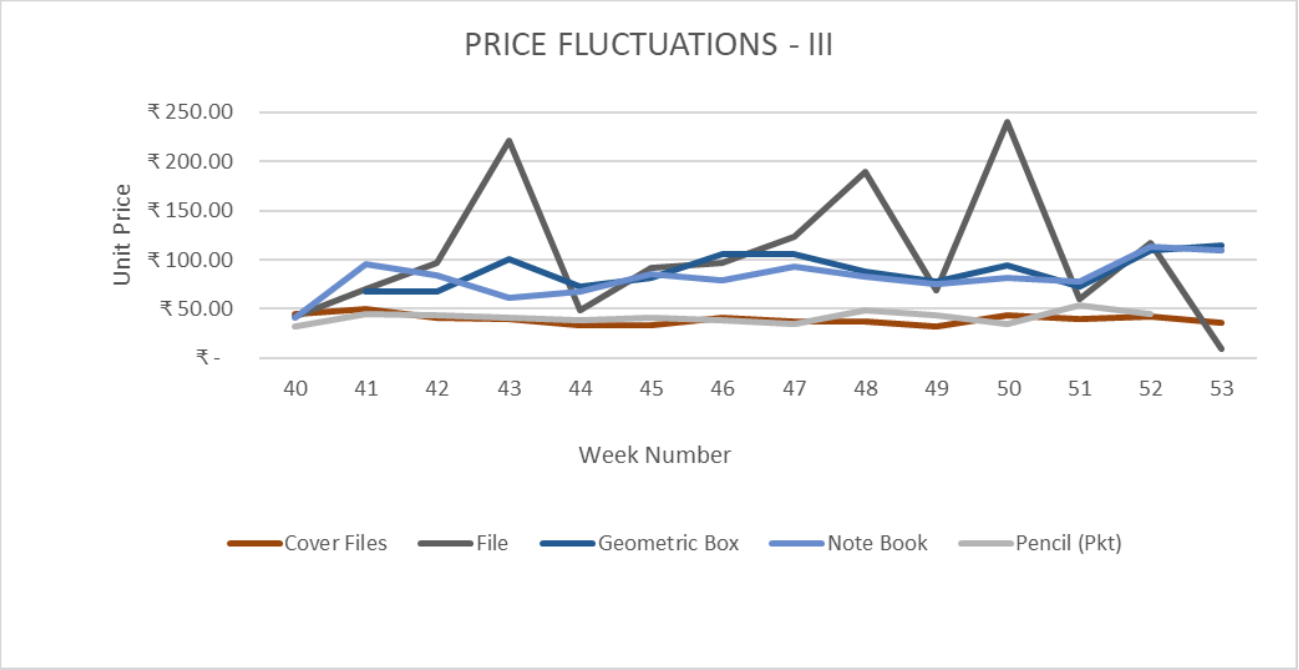

Figure 16: Price Fluctuations - III

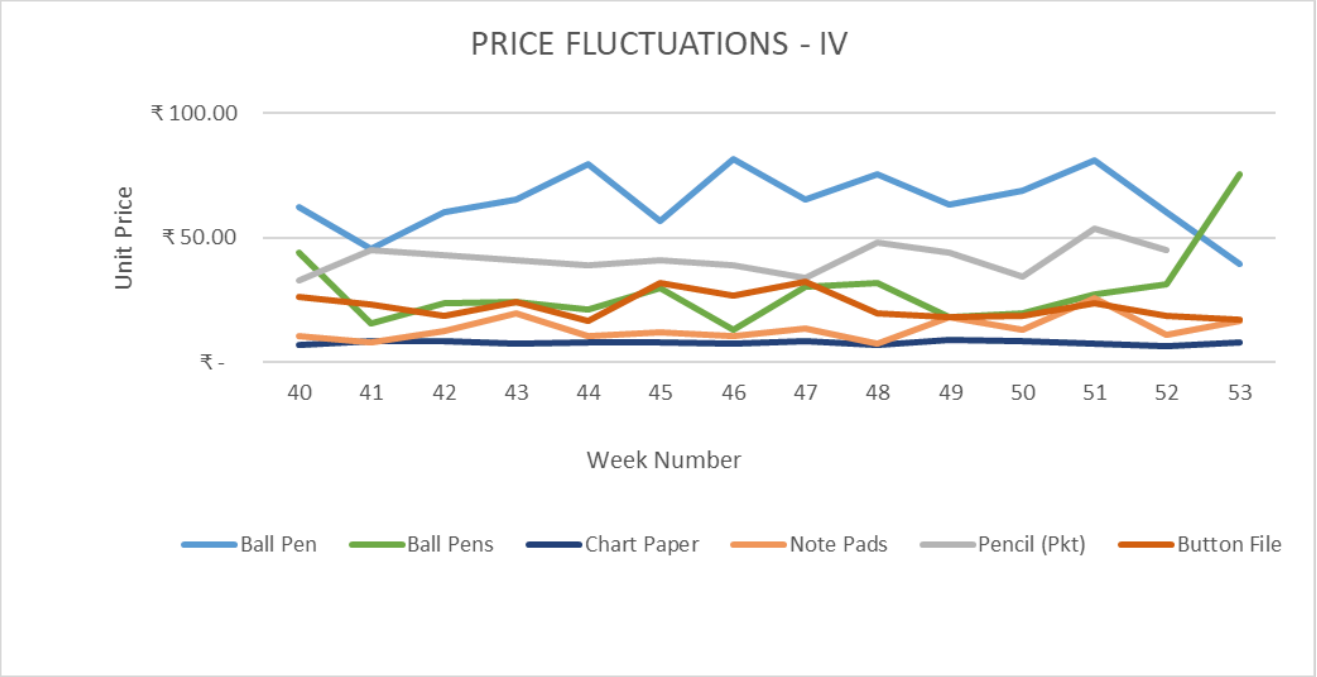

Figure 17: Price Fluctuations - IV

The items were divided into different charts to ensure their prices are on a similar scale. We will now discuss the price fluctuation for some of these items.

- **88A Toner:** The price for this good fluctuated wildly across the weeks. These toners are available for both inkjets as well as laser printers, which retail at vastly different prices. This lack of information is likely the cause of these fluctuations.
- **Paper goods:** Paper products such as A4 paper, FS paper, and Registers all saw some variation in their prices. This is a reflection of their cost prices as they constantly fluctuate across the weeks, and are also dependent on which supplier the business is sourcing these goods from.
- **Pens and Pencils:** Lack of information regarding the brand of these products is the primary reason for the fluctuations.
- **Files:** This is the product which saw the maximum fluctuations in prices. However, again the likely reason is that all these refer to different kinds of files (stick file v. cobra file v. box file).

INTERPRETATION OF RESULTS AND RECOMMENDATION:

Interpretation of Results:

a) Revenue Analysis:

October being the worst performing month shows the importance of B2B transactions for the business. The correlation between the number of orders and revenue generated shows that the business has a healthy number of customers that contribute to the revenue, instead of having to rely on a small number of high-value customers.

b) B2B v. B2C Analysis:

At first glance, it seems that B2C transactions are more important to the business. However, the large prevalence of LVTs indicates that this is likely a recording error and that a great part of these transactions are B2B. Most of the surrounding businesses being unorganized are likely the cause for this error.

Furthermore, the most valuable customer section indicates that over 60% of B2B revenue is driven by 30% of B2B customers.

c) Item Analysis:

This section shows that the business has a lot of redundant inventory, with over 50% of the items contributing negligible amounts to the revenue. Price fluctuations in most goods are likely caused by a lack of product information and not by fluctuations in cost prices. Though paper goods seem to be an exception to this.

Recommendation:

Data Recording:

1) **Provide Unique ID to Items:** The items are stored in their Tally database only by their names. There is no unique id for any of the items. This leads to fuzzy data down the line due to the same item being recorded under different names. Further, there is also ambiguity regarding the units in which the items are sold (1 individual pen vs 1 packet of pens).
   The store should record the SKU (Stock Keeping Unit) or the UPC (Universal Product Code) code for each item it sells.

2) **Use of Computer Software:** Currently the store uses paper records to store sales data. These records are then entered into Tally by an employee. Thus, the data is not stored in a standard format, plus there is a greater chance of human error. Further analysis also becomes difficult without technical know-how as the data would first have to be exported from Tally in the form of large XML files.
   The store should instead use a barcode scanner and Excel at the point of sale. It could also invest in inventory management software such as Zoho Inventory.

Inventory Pruning:

1) **Reduce the number of items:** As most of the items do not contribute to revenue generation, the store can safely reduce the number of items it keeps in stock. Though this will not directly increase sales, the lowered cost of obtaining as well as maintaining inventory will be beneficial in the long run.
2) **Make contracts with other businesses for frequently sold goods**: Goods such as A4 Paper, Notebooks, and Registers are bought by other businesses consistently. The store could form contracts with these businesses where it would supply a fixed quantity of these goods to them at a predetermined rate. This would help everyone avoid fluctuations in the prices of these goods.

Good Relations with customers:

1) **Role of the owner:** The owner of the shop sits at the register and personally interacts with all of the customers that come into the shop. This creates rapport with customers, which in turn is reflected in consistent retail sales. This business should continue doing this and also encourage its other employees to interact with the customers.