IIT MADRAS

Bachelor of Science
Programming and data science

FINAL TERM SUBMISSION

ADITYA KHURANA

21F1001241

21f1001241@ds.study.iitm.ac.in

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DECLARATION

I hereby declare that the project report entitled "Resolving issues being faced by a yarn sales and marketing company using data analytics" is submitted by me to IITM BSc in partial fulfillment for the project for the course Business Data management.
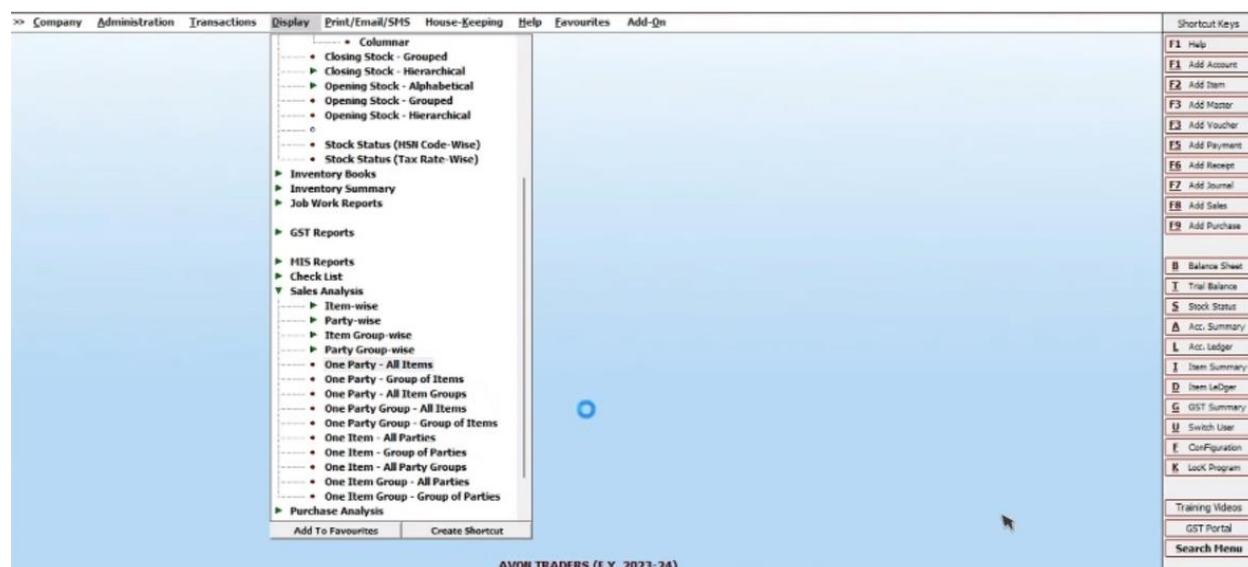

Aditya Khurana,

21f1001241

Date: 15/04/24

PROOF OF ORIGINALITY OF DATA

I had a talk with the owner Mr. Tushar Punhani over his data collection process. They record their data on a software. The name of the software is busy accounting software.

Here is a recording of me discussing with the owner about their data collection processes and the various nuances surrounding it:

[Recording and data collected](#)

LETTER AUTHENTICATED FROM THE ORGANIZATION

TO WHOMSOEVER IT MAY CONCERN

This is to certify that, I Tushar Punhani owner of Avon Traders, on request from Aditya Khurana, student of IIT Madras, I have provided data for sales, monthly expenditure details. I can confirm that Aditya sought my consent before collecting data and pictures from us and this can be used for academic project purposes.

We wish Aditya Khurana all the success in his project and welcome any suggestions he may have to improve our services.

Business shop Owner

TITLE

Resolving issues being faced by a yarn sales and marketing company using data analytics.

EXECUTIVE SUMMARY

Avon traders, a small yarn sales and marketing company based in Tronica City, Ghaziabad. They cater to the factories in and around Delhi mostly. They have got a single warehouse where different types of threads are transported, and kept until they are eventually sold. Most of their threads come from a factory owned by a partner company of theirs. Being in the business for 7+ years, they have expanded the type of threads they trade in exponentially. The company is owned by Mr. Tushar and his father, but is being operated primarily by Mr. Tushar. They store their data in a software (busy accounting software).

The problem that they are being faced with are inventory management and credit issues. As the number of threads and their types they deal in grew over the years, an obvious problem has made itself apparent. They are looking to decrease their expenses caused due to overstocking or understocking certain types of threads. This has led to on certain occasions, delays and sometimes them not being able to fulfill certain orders. Expenses due to this can be high, because they are also paying its transport and upkeep. Other than that, they rely on strong client relationships as a commitment to timely payments. This has sometimes led to the payments being delayed. They are looking to implement stricter credit policies and guarantees in place, without potentially harming the relationships.

I am going to look up their sales data and try to infer what and how much is being sold. Use different excel graphs and charts to help them pinpoint the problem threads. Expected outcome is that they are successfully able to minimize their expenses on such threads.

DETAILED EXPLANATION OF ANALYSIS PROCESS AND METHODS.

An overview
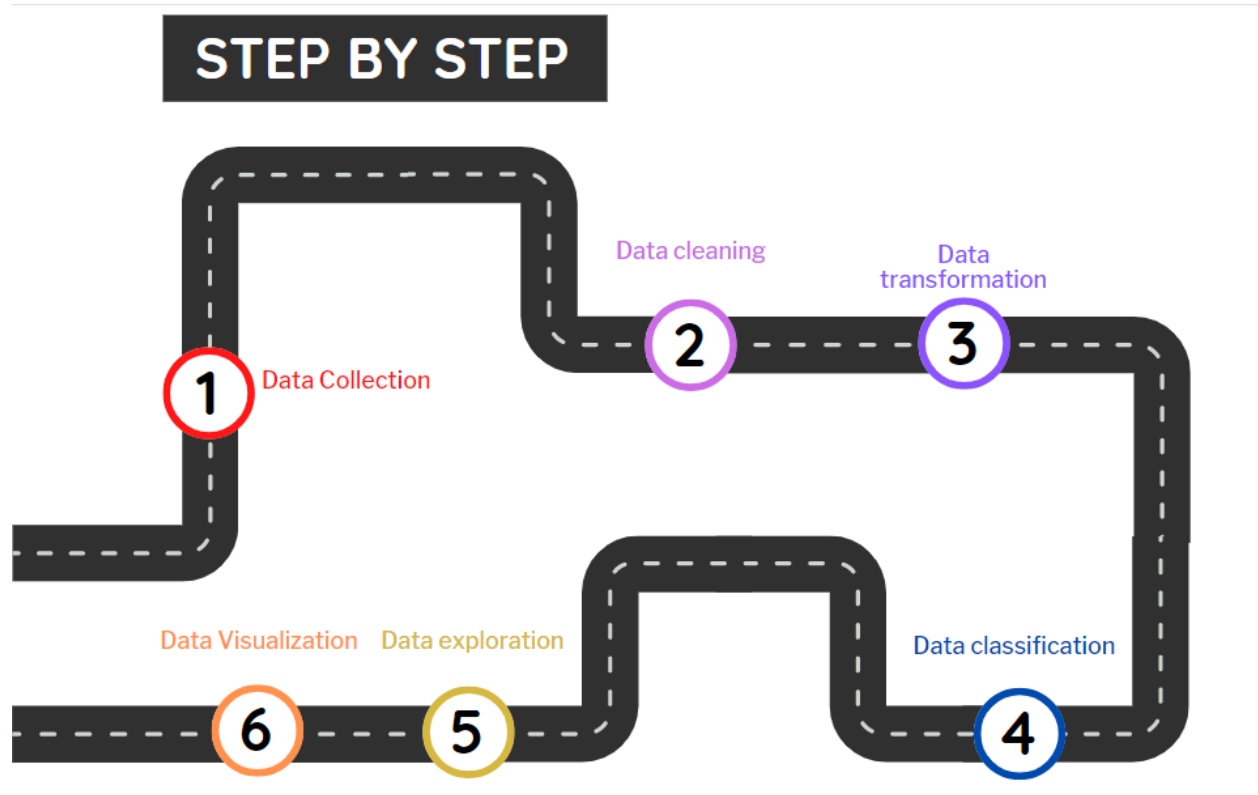
Data collection:

The data I collected was given by them to me in excel format. They record their data in a software which goes by the name of busy accounting software. It contained Sales Analysis (party-wise, item-wise,), stock (as of 8th May '23).
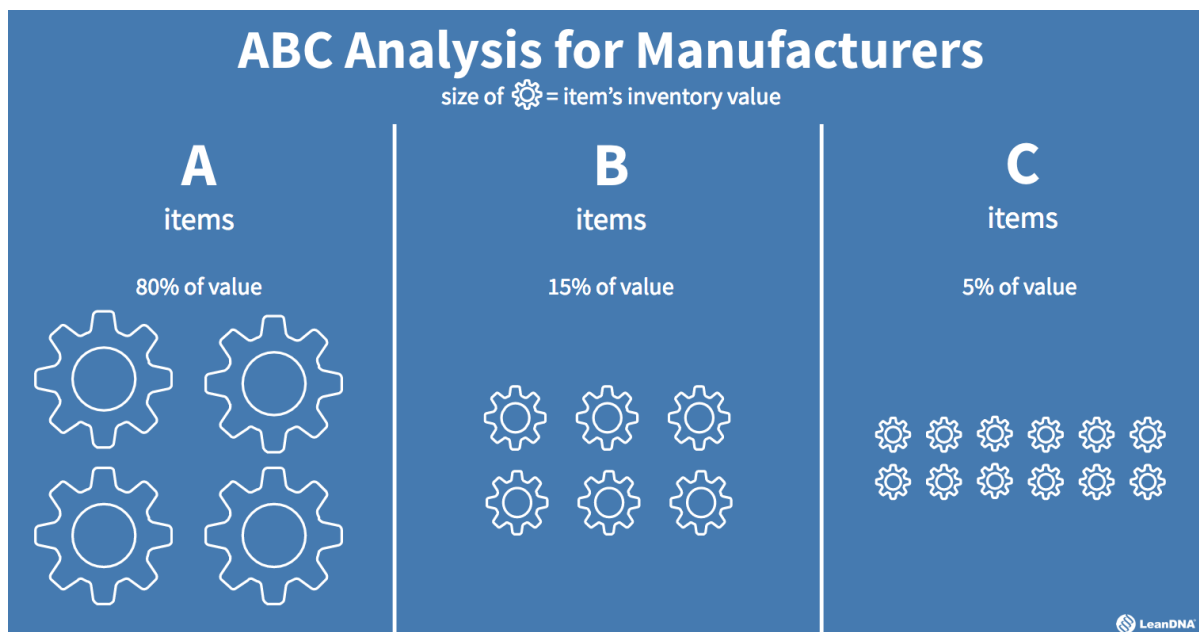
Data cleaning:

I cleaned their stock data so that it becomes easier for me to work on it, and derive inferences.

Analysis Tool used: *Microsoft Excel*

1) *ABC CLASSIFICATION METHOD.*

I am going to try to rank the threads into three classes. A, B and C. These are decreasing order of how useful they are for achieving business goals. This is linked to the 80-20 rule, that is, 80% of the outcomes are determined by 20% of the inputs. This can help us identify the products that need immediate attention, and the products that aren't in a need of fixing currently. This, again, can help us reduce expenses on the threads and its upkeep.

ABC Analysis for Manufacturers
size of ⚙ = item's inventory value

A	B	C
items	items	items
80% of value	15% of value	5% of value

LeanDNA

In rank A, I am going to keep items that are fast-moving. The products that are most demanded and in need of constant stock check. These items are also the items that the company is going to be spending most of their expenses on. Keeping the stocks always filled, ensuring its maintenance and safe transport is going to be the key. Therefore, frequently ordered ones are going to be kept here.

In rank B, we are going to keep the items that aren't in as much demand as the ones in A, but still are moving fast enough to significantly impact the expenses.

In rank C, we are going to keep items aren't in demand, or the products that are niche. They are not frequently ordered and are only there to fulfill special orders. Although they are not going to impact the expenses much, as they are not sold enough, they should be taken in point because there can be some threads that are expensive under these items. Bulk orders of these can also potentially affect the expenses.

Initially, I was leaning towards keeping the more expensive items in the A bracket, but after having a talk about the prices of these threads over with the owner, I decided not to, because the prices that they trade or sell these for are not fixed. Although I was able to get a round estimate prices of most of the threads that are being sold.

Now if we try to deduce from the stock data: *(Top 15 items: ~89%)*

Totals	0.00
Nice 50No Spun Polyester 2000Mtr	16915.00
X Speed (50 No.)	5888.00
Nice 25No Spun Polyester 1500Mtr	5572.00
Nice 20No CF Poly 1000Mtr	5357.00
20No CF Poly	3594.00
Nice 60No Spun Polyester 10000Mtr	3078.00
Nice 80No Spun Polyester 200gms	2391.00
X Speed (30 No. C.F.)	2337.00
Nice 25No CF Poly 1000Mtr	2100.00
Nice 30No CF Poly 1500Mtr	1721.00
Nice 40No CF Poly 1500Mtr	1524.00
50No Spun Polyester	1052.00
X Speed (25 No.)	979.00
X Speed (20 No. C.F.)	844.00
Nice 20No Spun Polyester 1500Mtr	828.00

Total: 60,846

These are the inventory ratios:

Nice 50No Spun Poly 2KMtr: ~27.8%

X Speed (50 No.): ~9.68%

Nice 25No Spun Poly 1.5KMtr: ~9.16%

Nice 20No CF Poly 1KMtr: ~8.83%

These constitute more than **50%** of the inventory. (~55.47%)

And the rest 41 items constitute around 44.53%

Its also reflected more or less in the sales data (analyzed later), with the Nice 50No Spun Poly 2KMtr being the most in demand item (A)

And the rest 3 from above also contributing significantly (B).

While there are some items that may not seem very significant from the rest (C), I will try to analyze them so that we can find any relevant information.

2) _Sales Trend Analysis_

I am going to try to analyze items from each class and get a rough idea of when and how much are the items are being sold.

I also have the data for different types of color for each thread, but for the scope of this project, I will try to analyze the 34 types of threads I have the sales data for.

We can already notice something here.

That is, in the stock, there were 45 types of different threads.

But in the sales data, I was sent by the company, **we only have 34 types of thread, from those 45 available** in the inventory.

Now, for context, the sales data I have is for a whole year, with a month wise sale of each type of thread.

That means there are 11 types of threads available in stock which didn't see light of the day for a whole year.

These were the threads that I identified as the ones in stock (that are not empty), but not sold in a whole year, with how much space they take in the inventory:

- Nice 30No Cotton 2000Mtr (390)
- Nice 30No Cotton 1500Mtr (220)
- Nice 15No Silky 750Mtr (80)
- Nice 30 No 3000Mtr (70)
- Fabric 5208 (70)

- Yorker 50No Spun Pokyester 2000Mtr (30)
- Nice 08 No. CF (9)
- Nice 20No Cotton 3000Mtr (7)

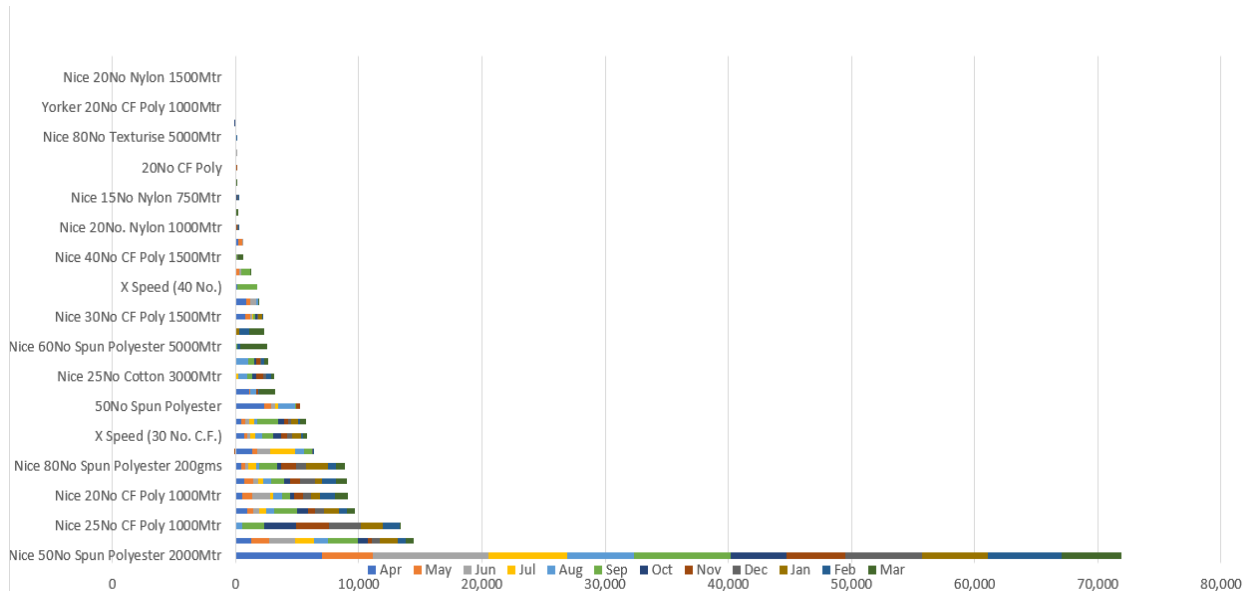After calculations, they take about ~1.43% of the inventory.

Charts of inventory and sales respectively:
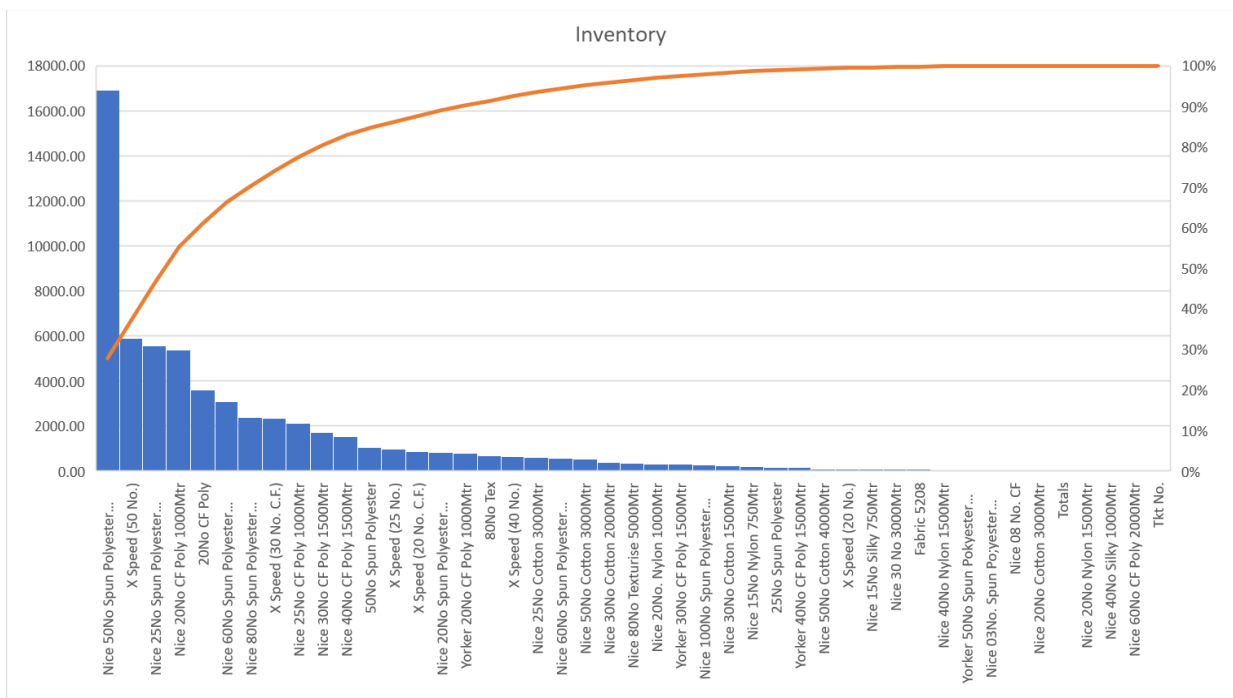
As expected in the below graph, we can see a reflection of the inventory. That means the company has been mindful in maintaining their inventory.
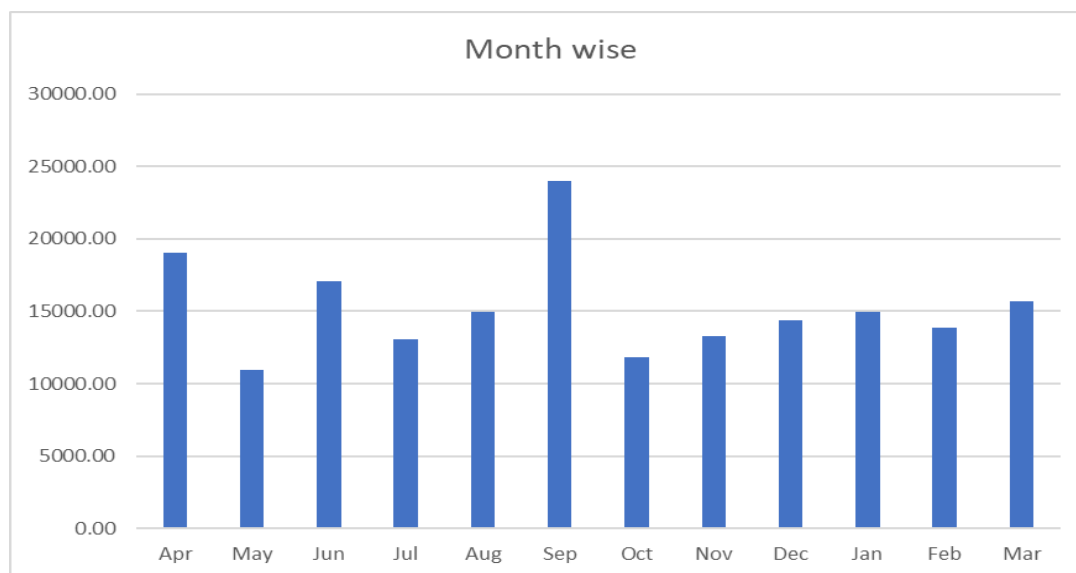
Now after the following graph we can analyze month wise data.

(FY 2023)

Sales:

Looking through the month wise data, the least sales were done in July (10947) and the most sales were done in September (24000):

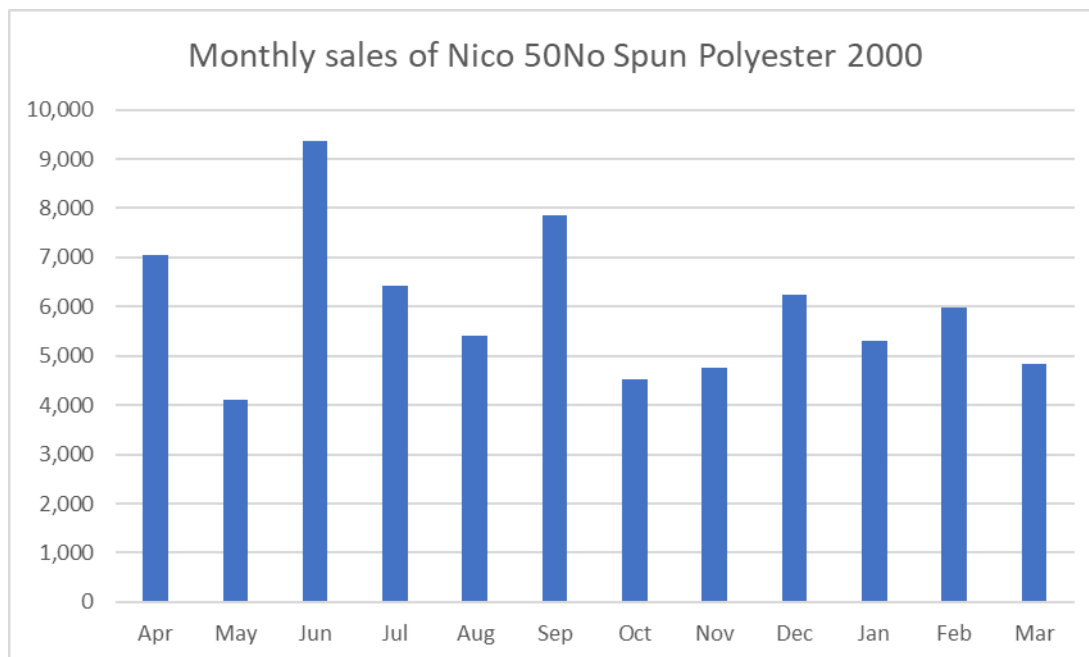April to March

RESULTS AND FINDINGS.

(1)I wanted to focus on the thread Nice 50No Spun Poly 2KMtr (~27.8%)

Because it constitutes more than a quarter of the inventory.

Let's focus on the sales on this thread in the year:

There were 71,881 units sold, out of 183,075 in the year, which basically constitutes ~39.62% of sales, just with this type of thread alone.

Here's the monthly chart:

Most sales were done in June (9365) and the least done in May (4115). I wanted to see if the patterns were any consistent with the overall monthly data we had previously:

Month wise
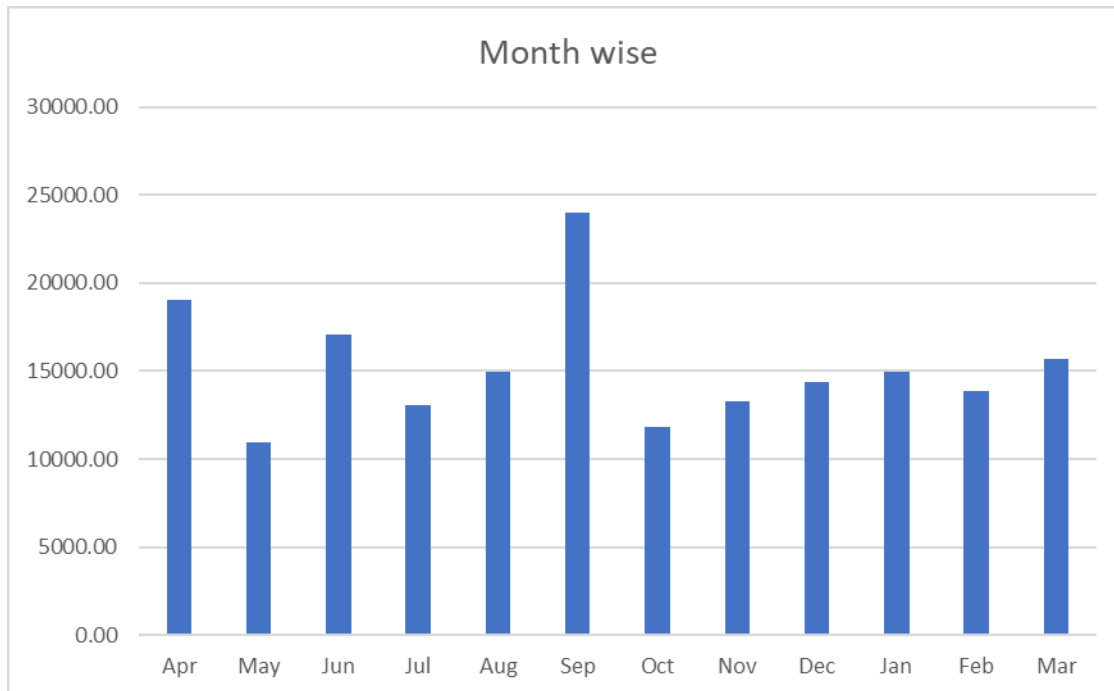
Overall, September seems to be the month where they made most of their sales. But, May being the worst month is consistent with our previous data.

Previously we calculated the amount of inventory we had, and these threads amounted for more than 50% (~55.47%) of the inventory:

    Nice 50No Spun Poly 2KMtr: ~27.8%

    X Speed (50 No.): ~9.68%

    Nice 25No Spun Poly 1.5KMtr: ~9.16%

    Nice 20No CF Poly 1KMtr: ~8.83%

For the first one, we have already calculated, ~39.62% sales.

(2) Now for, X Speed (50 No.):

Amount: 9667

Percentage: ~5.28% of total sales.

Most sales were made in September (1810)

(2) For, Nice 25No Spun Poly 1.5K Mtr:

Amount: 14455

Percentage: ~7.89%

Most sales were made in Sep (2459), followed by June (2103).

(3) For, Nice 20No CF Poly 1KMtr:

Amount: 13412

Percentage: ~7.32%

Most sales were made in November and December (2604) followed by October (2589). Also, there were 0 sales made of this thread during 4 months (Apr to July).

This is a very interesting pattern that I have noticed. Some months just don't have any sales for certain threads. This pattern sometimes may also continue over a period of months. For example, for Yorker 30No CF Poly 1500Mtr, there were 0 sales made from Apr to December. Only sales were made in the last 3 months.

If calculate, overall sales, by these threads will come out to be:

~60.11%

So, this is a pattern within an expected range. The inventory held by the threads which are responsible for ~60.11% sales is ~55.47%.

About the pattern where certain sales were being absolutely none in certain months, I tried talking about these patterns with the owner, and they said that this was because some factories they cater to don't run around the year. This was an important point.

Now onto the clients, I also have the party wise sales data for this company, which can be visualized:
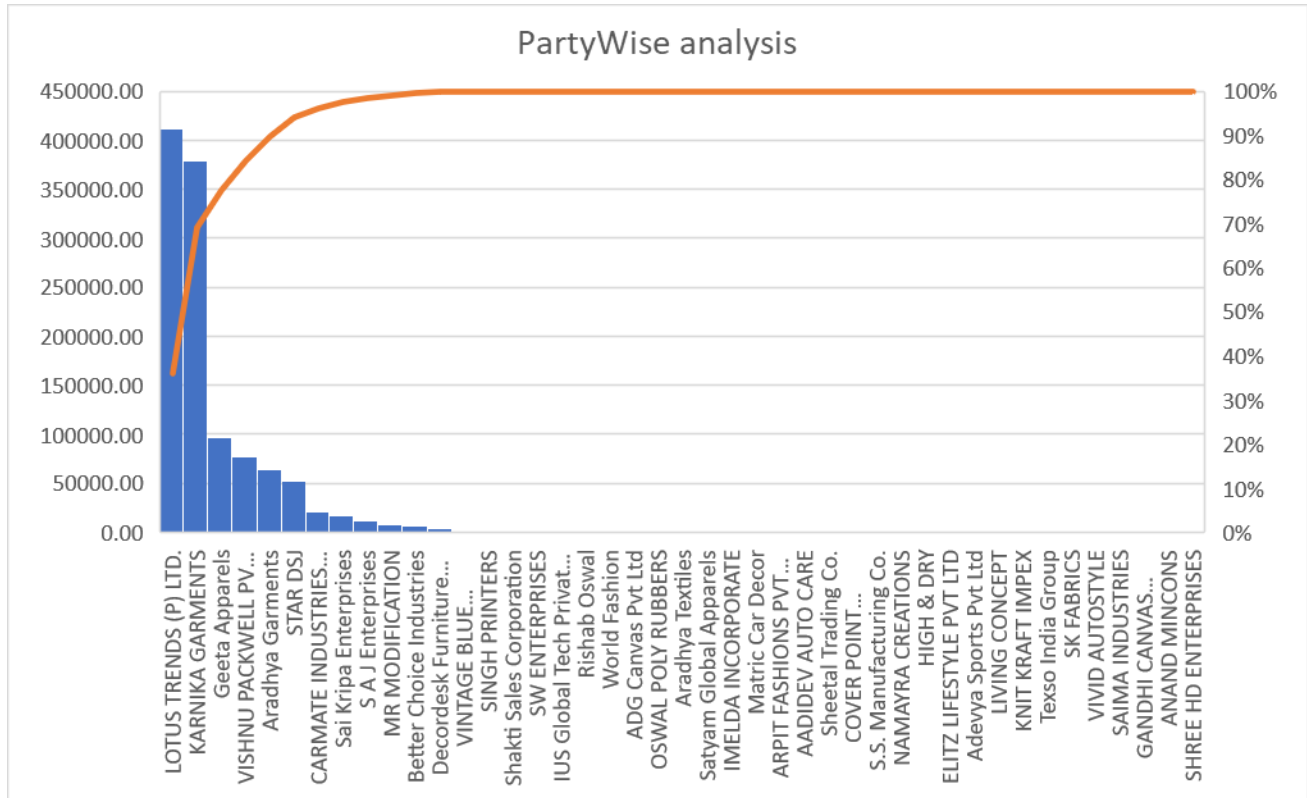
Month wise (party analysis)
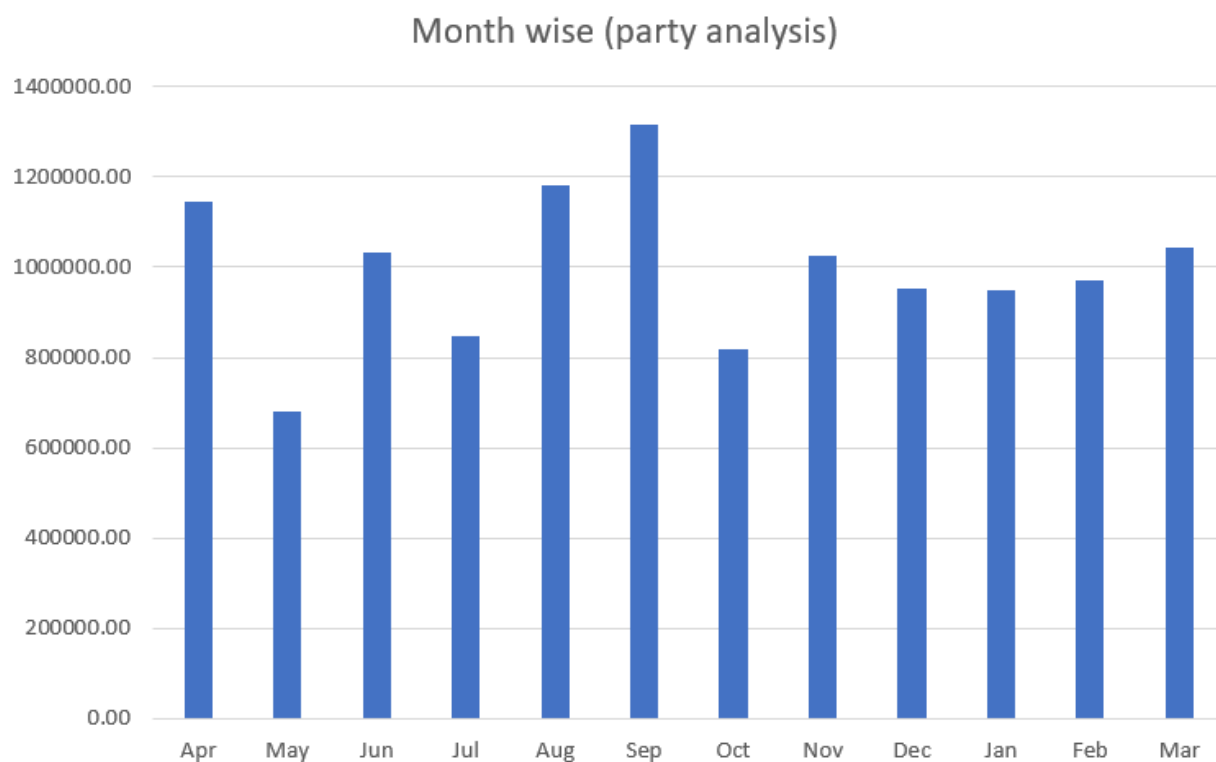
This is very much a reflection of the sales graph as expected.

Numbers and scale here is different, because this one was counted in cones. But the percentage more or less remains the same.

For example, for both data, sales made in September remain close to 12%.

Now let's plot a graph:

Here, we can clearly see that only 2 companies are responsible for most of their sales, i.e they fulfill bulk orders for these companies.

Let's see,

For Lotus trends,

3374593 cones, out of 11959572 cones

i.e ~28.21%
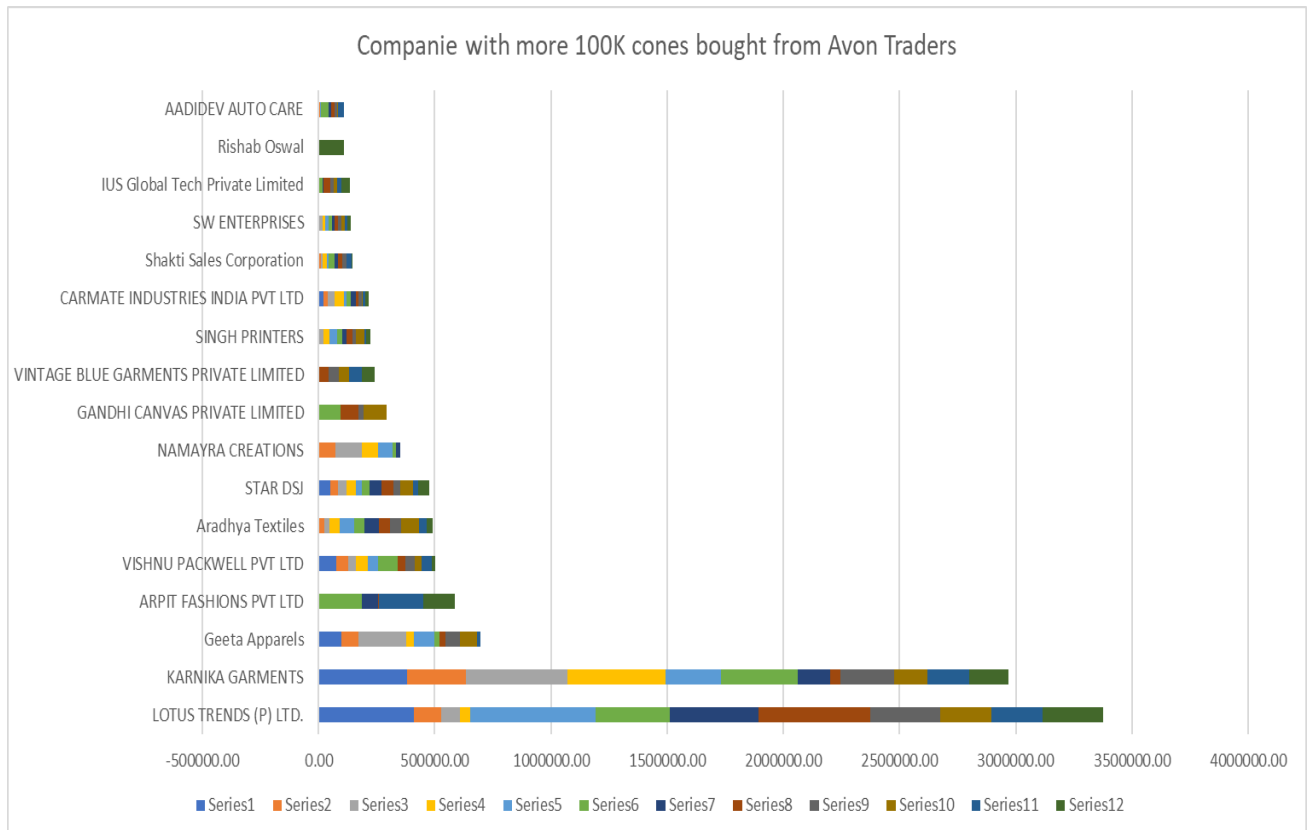
and for Karnika Garments,

2969096 cones out of 11959572 cones

i.e ~24.82%

Which is again, in total, ~53.03%.

That means, more than half of the companies' output is being sold to these two companies!

For the other companies more relevant companies, we have got:

Companie with more 100K cones bought from Avon Traders

All of these companies, have bought more than 100,000 cones from Avon traders in FY2023.

To calculate, we can see, that all of these constitute:

More than 90% of the sales! (~92.47%)

For perspective, 17 out of 43 companies are responsible for ~92.47% of sales. That is, sales are not even evenly distributed, neither among companies, nor among threads.

Interpretation of Results and Recommendation.

Interpretation:

Approximately 4 or 5 threads have more than 50% of the inventory, indicating potential overstocking.

These threads also have sales close to 60%, suggesting that inventory levels may need to be adjusted to align with sales demand.

Some threads show a pattern of zero sales over certain months, indicating either low demand or ineffective sales strategies.

Two parties account for more than 50% of total sales, indicating a high dependency on these customers.

A total of 17 parties contribute to around 92% of sales, highlighting a concentration of sales among a few key customers.

Certain threads with no sales throughout the year occupy around 1.5% of total inventory space, suggesting potential deadstock.

Adjusting inventory levels for threads with high inventory-to-sales ratios can help optimize space utilization and reduce carrying costs.

Implementing inventory tracking systems and regular reviews can help identify slow-moving items and prevent overstocking.

Recommendations:

Diversifying the customer base and reducing dependency on a few key customers can mitigate risks associated with credit issues or delayed payments.

Implementing stricter credit policies or providing incentives for timely payments can help improve cash flow and reduce financial risks.

Implement strategies such as inventory liquidation, promotions, or bundling to reduce excess inventory of slow-moving items. Regularly monitor sales trends and adjust inventory levels accordingly to meet demand while minimizing carrying costs.

Develop a strategy to attract new customers and expand the customer base to reduce dependency on a few key customers. Offer incentives or discounts to encourage repeat purchases from existing customers and attract new customers.

Also, strengthening relationships with the dependent customers can help with credit issues or delayed payments.

Investigate the reasons behind zero sales for certain threads and develop targeted marketing or sales campaigns to increase demand. Analyze customer feedback and market trends to identify opportunities for product improvement or new product development.