Detailed Analysis on NN Traders
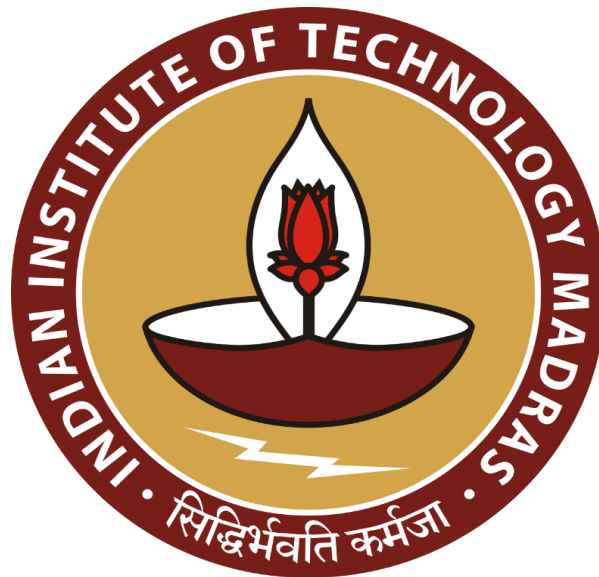
BDM Capstone Project

Final Submission

Submitted by

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Declaration Statement

I am working on a Project titled "Detailed Analysis on NN Traders". I extend my appreciation to NN Traders, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered from primary sources and carefully analyzed to assure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the principles of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I understand that all recommendations made in this project report are within the context of the academic project taken up towards course fulfillment in the BS Degree Program offered by IIT Madras. The institution does not endorse any of the claims or comments.

Signature of Candidate: Md Anas Alam

Name: Md Anas Alam

Date: 14-08-2024

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Executive Summary:

Customer footfall and deadstock is a major issue faced by the business in enhancing their profitability. In this case the business I am working with i.e NN traders is also facing the same problem of acquiring customers, enhancing their product sales and reducing the chances of deadstock. Before going forward let me give you a brief introduction of NN traders, NN traders in business to business (B2b) type of business which mostly deals and specializes in selling home textile products such as Bedsheets, curtains, blankets and more home textile products.

At a very early age the owner of the NN Traders "Mr. Noorain Shahid" along with his friend "Mr. Najish ahmad" started this business and subsequently acquired the market of Rourkela and its nearby region but then covid era the business went completely down as every other business in the world. But the post covid era was the actual phase of difficulty for the business as most of his customer went on starting another business, many new business with same segment come into the market with good capital and investment in hand and conversely NN Traders lost a good percentage of its capital by taking money from the business in the covid era and subsequently one of the major loss the business "NN Traders" and his owner "Mr Noorain Shahid" faced is the breakdown of the Business into two as his partner "Mr Najish Ahmed" has decided to take leave from the business and start his own new business with the same segment which also result in division of the product and category to avoid the conflict of sales and customer acquisition. Other major challenges faced by NN Traders was blocking of capital and customer acquisition. On taking to the owner of NN Traders Mr. Noorain Shahid told several times that he is facing major problem regarding the cash flow which means the customer ask for the for the products and item to be given on loan and they ensure of paying the value of the products once they sell the product and make profit which made business go low in capital and adversely Mr.Noorain has to take loans as he has also parties to pay, sometimes customer pay the amount in installments and sometime most of the customers take years to pay back to the business. So to solve this issue the business owner Mr. Noorian has started evaluating the credit score of the customers and took his decision of lending his items and products only to the customers with a standard credit score. This perhaps looks like a good approach to solve this problem but ultimately it has some major consequences that the business i.e "NN Traders" has to face.

The first and the foremost consequences is that the business has lost several of its customers which is obvious and ultimately had an impact on the reputation of the business in the market and the competitors in the market took advantage of this situation as most of the customers of NN Traders have shifted to its competitors. Mr Noorain shahid has also told that the business is also getting affected by the time and resource intrusive transportation as most of its goods and products come from Ahmedabad and because of the geographical distance between odisha and Ahmedabad the product take approximately 29 hours on average to reach to the destination and cost of transportation has to be beared by the NN Traders itself. This issue of time and resource intrusive transportation has not only impacted the business in the above mention way but one of the other major consequences that come to my knowledge that NN Traders has to face because of the resource intrusive transportation is "Missing of the opportunity to increase the sales" by claiming the above sentence it is intended to say that, adversely NN Traders has not any visualizations or graphs the identify and get ready for the trends and fluctuations in the market. Mr. Noorain Shahid doesn't has a standard level of stock of any particular product because of the limited capital, so if a particular item started performing well in market the business got stock-out and its has to place new orders for that particular stock at that time and because of the time and resource intrusive transportation NN Traders misses the opportunity to make more profit by recording a healthy increase in the sales.

The data provided by NN Traders has been loaded into Ms Excel and all the analysis has been done in Ms Excel itself. From the observation I have concluded some insights such as trend in seasonality and the performance of the product. I have also recommended business owner Mr. Noorain Shahid to look for better parties and options in the eastern part of India which will solve the problem of time constraints and resource intrusive transportation. There are also some suggestions and recommendations that the owner told by himself that he is planning to implement which obviously can be recognized and solved in the initial stage. One of such cases that will align with the above stated statement can be the activeness and effectiveness of the staff and helper.

As mentioned by the owner the staff of the business are not much effective and they initially come from a non educational background and don't even know the local language of the Odisha i.e Odia which is making it hard to communicate with the customers and eventually they end up losing the opportunity to sell. All the problems and their recommendations had been initially discussed with the owner of NN Traders and he also agreed to implement some of the recommendations mentioned in the below parts of the project to make the business run on its all four wheels.

Analysis Process Involved: [DATA](#)

Initially the data provided by the business has two sheets one consists of the sales data from April-2022 to April-2024 and the other one consists of the inventory or purchase data of the same period of the time. So, basically the business has given us the data for the two financial years i.e FY 2022-23 and FY 2023-24.

To identify the sales trends it is necessary to have clean and clear sales data. NN traders have provided the sales data but it was inaccurate and unfit to do the analysis as there are many faults and discrepancies in data. The data that has been provided consists of date, quantity, SGST, CGST, HSN code and total invoices. Same data has been exported in the ms excel as it was in csv form and analysis has been performed on the given data. Initially the data has been cleaned and all the empty cells have been removed and some has been directly deleted which doesn't make sense at all. For example: a column named "Address cus" has been totally deleted because it doesn't have any entries which do not make sense and perhaps making the data look complicated. Identifying and analyzing sales trends using sales data is an important strategy that a business should adapt to make informed data driven decisions and strategic growth in the business. By interpreting historical data and sales trends, most of the important patterns and trends such as seasonal trends and dips in the market come into our notice that might go unnoticed most of the time. These information and insights are very essential for a business for understanding sales cycles and identify hidden problems that the business is facing. They also play a vital role in making business stand out from others by making future predictions.

As for NN traders conducting sales trends analysis is very important to identify the performance of the product across different months and periods. I have created a pivot table from the sales sheet to perform a comprehensive analysis on sales made by NN traders every month across the period of two years. Moreover, interpreting and understanding sales trends from this analysis process allows NN Traders to focus on marketing and making more efforts to increase the sales during the most profitable period of the year and optimizing the return of the investment made by the business. Additionally the insights gained from the analysis will allow NN Traders to make data driven decisions for the future and be prepared for the fluctuation in market demands. By systematically studying these trends NN Traders can make sure that they are not just only reacting to the market needs but also collectively shaping their business strategies for long term success.

As mentioned earlier NN Traders is facing its major issue in optimizing inventory management and sales. To solve this problem I merged the sales and purchase data and performed a detailed analysis. I initially merged the two data in a new sheet termed it as "Sales vs purchase". The main motivation behind this was to produce a clear and understandable visualization of the stock levels and overstocking. To solve this issue I have performed **Reorder Point Calculations.** The main motivation behind Reorder point calculations is to ensure optimized inventory control reducing the case of avoiding excess deadstock while reducing the chase of stockouts. The Reorder points in the threshold point by which the business will decide to Reorder the stock to decrease the chance of replenishing of the stock and overstocking. The Reorder point depends upon three major parameters i.e Average daily sales, lead time and safety stock. The reorder point for any given product is given by:

Reorder Point (ROP) = (Average Daily Sales × Lead Time) + Safety Stock

Note:

1. *Lead Time: The time it takes from placing the order until receiving and ready to sell.*
2. *Safety stock: It is an additional inventory acting as a buffer held to account to variability in demand and lead time.*

Category wise sales analysis plays an important role in increasing the sales and profitability of the business. Category wise sales analysis gives us clear understanding about the performance of the product and categories within the business. To make 'NN Traders' more profitable and to have a monopoly in the market it is very important for the business to have a track of its key performance indicator (KPIs). The category wise sales analysis breaks the whole bunch of data into different smaller categories such as customer segment, SKUs, brand or region. In the case of NN Traders I have categorized the data into different SKUs by their HSN code and performed analysis for the same. The SKUs with code as "5407", "6005", "6301", "6303" and "6304" are the top five best performing SKUs by the NN Traders. By analyzing the each SKUs closely there are numerous valuable question that may emerge such as "what is the best selling period for a particular SKU", "why a particular SKUs performing in the given period" and "What is the reason for the good performance of the SKU in the given period ", we can only answer the above asked question by perform category wise analysis. The answers we get for the above questions will not only help in increasing the profitability generated by the particular category but it will also create the opportunity to add more products and SKUs aligning with the parameters of the identified SKUs. Thus, by closely monitoring the Key Performance Indicator (KPIs) of the business we identify the strengths and weaknesses of the business and eventually drive the business to a sustainable growth.

HSN CODE	PRODUCT
6304	Bedsheet and pillow cover
6005	Raw curtains
6303	Readymade Curtains
6301	Dohars and Doormats
5407	Blankets

Results And Findings:

From the line chart visualization of the overall sales trends it has been observed that there is a slight positive trend in the slope of the line chart despite many ups and downs in the period of two years i.e from April 2022 to April 2024. Also one can easily observe that there is a peak in the chart in the month of "March-2023" which says that business has made its highest sale in the month of March-2023.
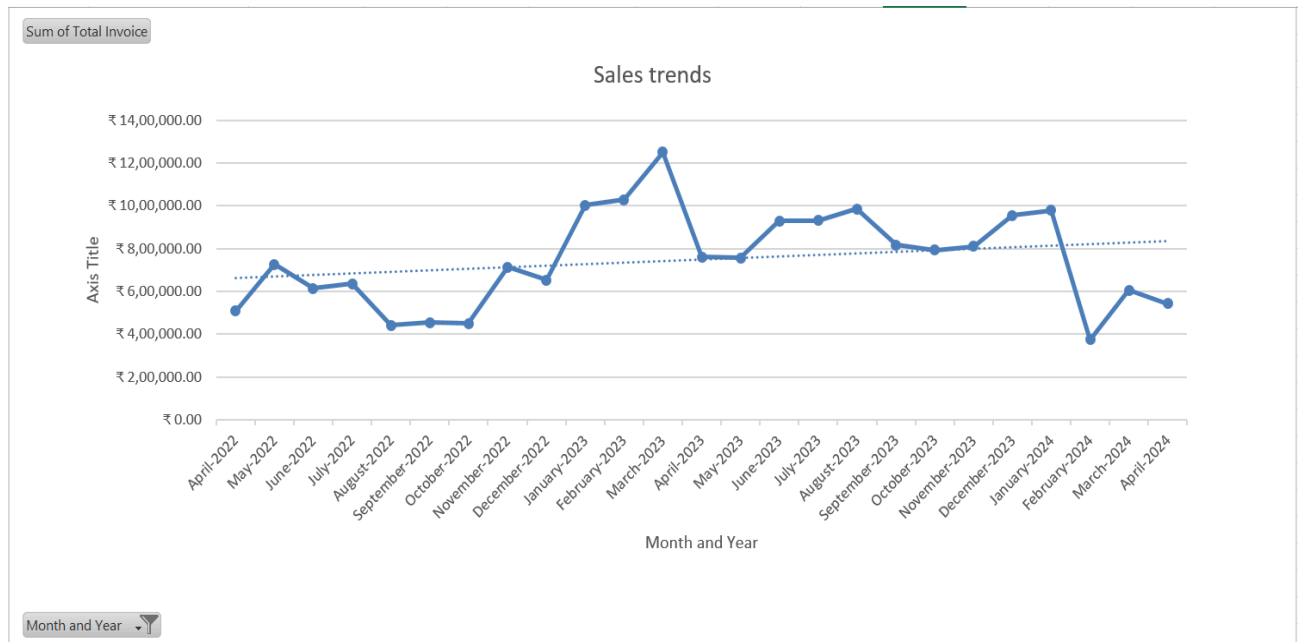

Fig 1. Overall sales trends.

DESCRIPTIVE STATISTICS	
Mean Sales (In Rupee)	₹ 7,48,507.72
Max Sales (In Rupee)	₹ 12,50,214.00
Min Sales (In Rupee)	₹ 3,74,297.70
Standard Devaition	₹ 2,18,716.78
Below Average (In Month count)	12 Months
Above Average (In Month count)	13 Months
1st Quartile(Q1)	₹ 5,73,402.90
2nd Quartile(Q2)	₹ 7,55,780.00
3rd Quartile(Q3)	₹ 9,43,066.50
IQR	₹ 3,69,663.60

Fig 2. Descriptive statistics on overall Sales.

Based on the above data we have performed descriptive statistics and observed the insight from the results. We initially calculated statistical measures like Mean, variance, standard deviation, quartiles and interquartile range. The importance and the purpose of calculating each statistical measure has been provided below:

1. Mean provides the measure of central tendency of the data. The value provided by the mean provides us with the idea of average value in the overall dataset. The calculator of mean is important because it will give us a single value representing the entire sales data. Oftentimes it is used as a reference point that will be used to compare individual data points and identify trends in data and understand overall performance.
2. Variance provides us with an identification of the overall variability of the dataset. The variance measures how far the data points are spread out from the central tendency. Understanding variance is crucial for accessing predictability and reliability of the data. High variance suggests that the data are spread out over a wide range whereas low variance means that the data clustered closely towards the central mean. Similarly, standard deviation provides the measure of the average distance from the mean. The standard deviation is the square root of variance.
3. Quartiles divide the data into four different parts and each part is named as Q1, Q2 and Q3. Each part contains 25% of the data which means Q1 contains 25% of the data, Q2 contains the median i.e 50% of the data and Q3 contains 75% of the data. Quartiles help us in understanding the distribution of the data which means it will help us in identifying where the most of the data lies. Interquartile range on the other hand is just the difference between the third quartile (Q3) and first quartile (Q1). Interquartile range (IQR) gives us a clear picture of where the bulk of the data is located.

Key Observation:

1. **Sales Trends Analysis**: Initially the business saw an increase in sales from April-2022 to May-2022. The business recorded the sale of rupees 5.7 lakhs approximately in the month of April-2022 and approximately 7.27 lakhs of sales in the month of May-2022, on account the business has approximately recorded a hike of 27% in the sales of the two consecutive months.

Followed by the inconsistencies, the business has recorded its lowest sales for the year 2022 in the month of August-2022 by making a sale of approximately 4.42. This sale in the month of August-2022 recorded a dip of around 29%. The business recorded its record highest sales in the month of March-2023 by selling almost 12.5 lakhs worth of SKUs and recording almost 182% of hike in sales from the month of August-2022 to March 2023, Then the sales rapidly dropped to 7.59 lakhs. The sales remain notably increasing for the next 9 months but the business has recorded its lowest ever sales in the span of two years in the month of February-2024 with only 3.74 lakhs of sales in the given month. Hence the business has almost recorded a 70% dip in sales to go from its best performing month to its worst performing month.

2. **Mean and Central Tendency:** The mean for the sales made by the business has come out to be 7.48 lakhs for overall two years. The average sales made by the business in the Financial year 2022-23 and Financial year 2023-24 are 7.6 and 6.04 lakhs respectively. In simpler terms the average sales made by the business in the two financial years are 7.6 and 6.04 which suggest that there is a decrease in the sales in FY 2023-24 as compared to FY 2022-23.

3. **Variation and Distribution Analysis:** The standard deviation recorded by the business is 2.18 lakhs for the span of two years which means that the data typically deviates from the central mean by 2.18. In simpler words we can say that the business has made sales in the range of 2.18 lakhs greater than the average sales and 2.18 lakhs less than the average sales. The low standard deviation of 2.28 also suggests that the data is clustered around the central mean. The values of Q1, Q2 and Q3 are 5.7, 7.5 and 9.4 lakhs respectively. This means 25% of the total month has sales below 5.7 lakhs and 50% of the total month has sales below 7.5 lakh or 50% of the total month has sales above 7.5 lakh and by saying that Q3 is 9.4 ultimately means 75% of the total month has sales below 9.4 lakhs. The Interquartile range (IQR) is rupees 3,69,663.60 which means 50% of the overall data is spread out over the range of 3,69,663.60.
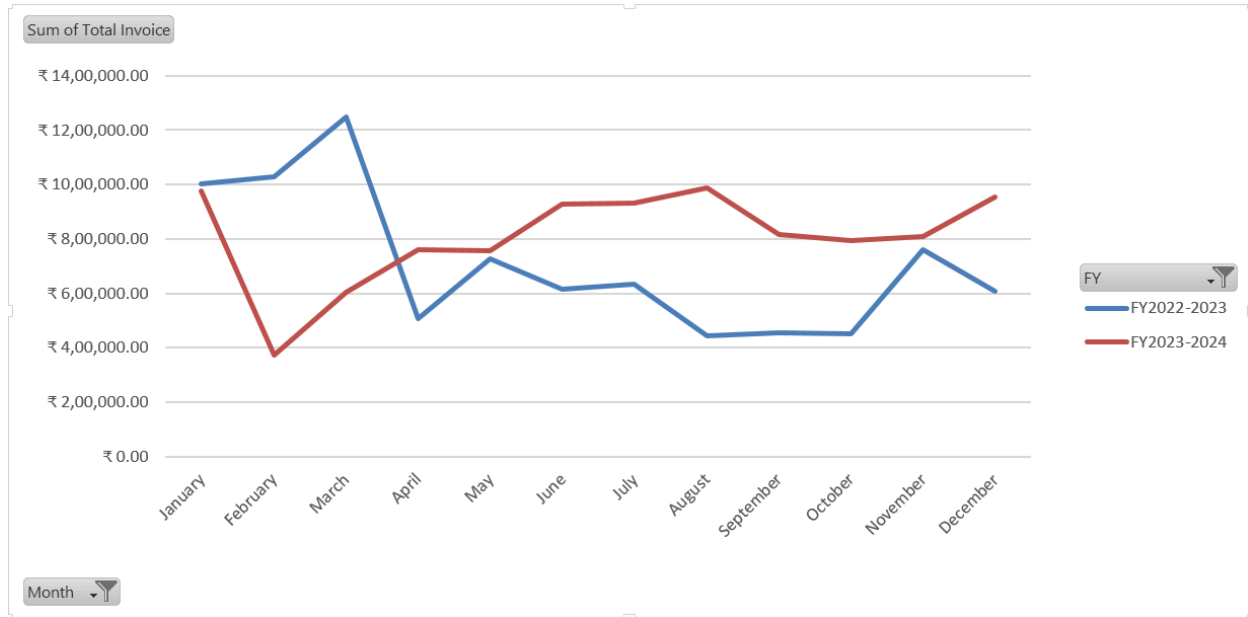
Fig 3. Year-wise sales trends.

By categorizing both the financials we can visualize the performance of the business in a more clear and better way. We can clearly see that FY2023-24 clearly outperformed the previous financial year for the business. Although FY2023 there is a major dip in the first four months, we can also see that the business has performed very efficiently in the covid era as well. This suggests the overall sales performance in the year and the next year.
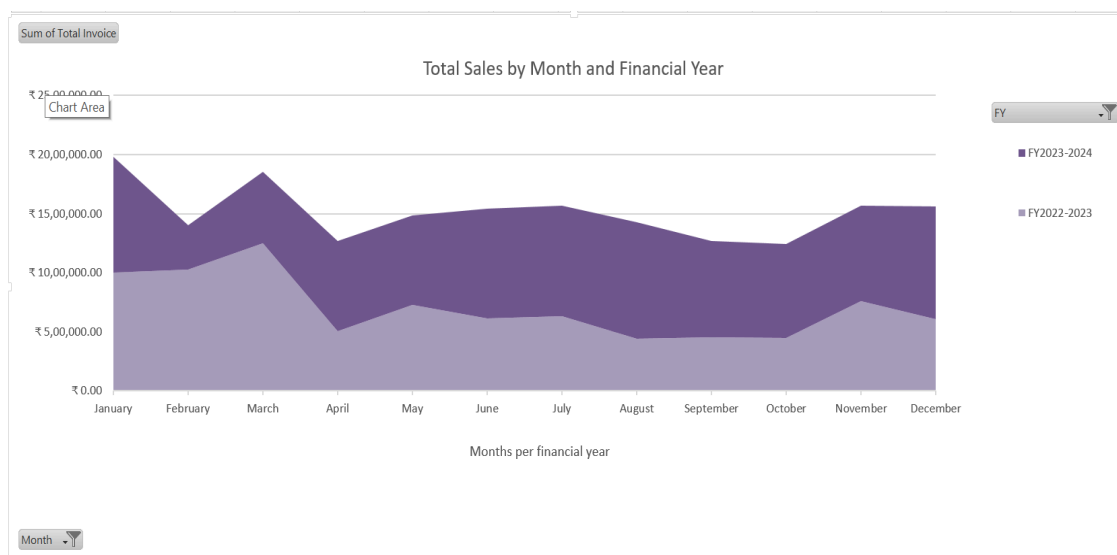

Fig 4. Year-wise Stacked Area Chart.

Sales vs Purchase Analysis:

To solve the problem of inefficient inventory management it is important to analyze the sales and the purchase data thoroughly. The sales and inventory data has been merged to a single sheet and a thorough analysis has been performed to visualize the inefficiency and the performance of the business. A clear visualization has been provided below. In this figure the red lines correspond to the purchase amount while the blue bars correspond to the total sales amount for the given month of the year.
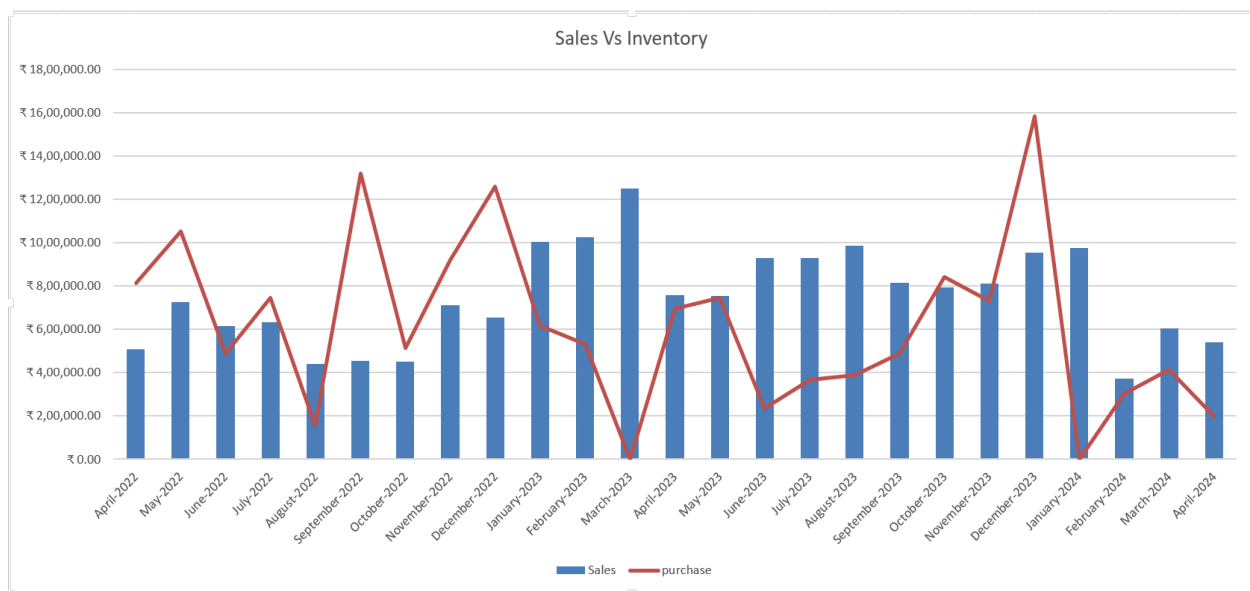

Fig 5. Sales Vs Purchase Graph.

Key Observations:

1. **Initial Trend (April 2022 - August 2022):**
   - A steady increase in sales from April 2022 to July 2022 touching sales around 6.34 lakhs and then sudden drop to august, reaching around 4.42 lakhs.
   - Fluctuation shown in purchase line, spending around 10.54 lakhs in inventory in May 2022 but then dropping in June and August 2022.
   - There's a significant dip in purchases graph in August 2022, In contrast to stable sales and restoring inventory to its value.

2. **Mid-Year Analysis (September 2022 - December 2022):**
   - A slight increase in sales from September 2022 to December 2022 touching the sales level of almost 7 lakhs.
   - After a low purchase made in August 2022 a sharp hike in purchase can be seen in September and December 2022.
   - Low inconsistencies can be seen in sales as compared to purchase, purchase lines appear to be more fluctuating.
3. **Start of New Year (January 2023 - March 2023):**
   - Sales reached its highest peak overall in two years in the month of march recording almost 12.50 lakhs.
   - On the other hand, purchases drop to exactly zero meaning that no purchase has been made in March 2023.
   - This divergence suggests a strategic approach where earlier inventory stocks are used to possibly free the stuck money.
4. **Post-Peak Period (April 2023 - August 2023):**
   - Sales dropped sharply from record highs of 12.50 to 7.50. After that a slight recovery has been made upto august 2023.
   - Purchase also rose as all the earlier inventory has been used up to increases in the sales in march. So, a purchase of 6.95 and 7.45 lakhs has been made in April 2023 and May 2023.
   - A balanced relationship has been displayed by both sales and purchase, showing a stable operation.
5. **Stable period (September 2023 - January 2024)**
   - Stability in sales has been noticed and slight hike in sales has been noticed in December 2023 and January 2023.
   - The business has made its record highest purchase in the month of December 2023 perhaps it is a preparation for end year sales.
6. **Final Period (February 2024 - April 2024):**
   - A record lost sales has been observed in the period of time dropping to almost 3.74 lakhs in the month of february.
   - A sharp decrease in purchase has been accounted for in the month of february 2024, as earlier a record highest purchase has been made by the business in december 2023.

Reorder Point and Average Daily Sales:

To know the performance of the business in the long term it is important to do the analysis on a monthly and daily basis. As NN Traders as major facing the issue of deadstock and overstocking, we intend to perform analysis that will give NN Traders an idea about how their product is performing on the given period of time and on a daily basis. To know the product performance on a daily basis I calculated average daily sales of the product. The major issue of overstocking and dead stock can be resolved by knowing the reorders point of the business, so to calculate the reorder point we have calculated the <u>Average Daily Sales</u> that which will give us the performance of the product, <u>Lead time</u> it is the time in day days that takes from ordering the stock to receiving it and <u>Safety Stock</u> it is a buffer stock that is kept in inventory to reduce the chance of stockouts. I have calculated the Reorder Point for the top five product of NN Traders listed with their HSN code.

PRODUCTS WITH HSN CODE	TOTAL SALES	RE-ORDER POINT(ROP)
6304	38008	220
6005	31581	173
6303	12512	68
6301	8057	48
5407	7655	45

Fig 6. Reorder point calculation.

Key Insight:

　　Product 6304 has the highest sales in total i.e 38008 units and ultimately it will have the highest ROP (220 Units). This means the business has to palace order for **6304** whenever the inventory stock level of 6303 becomes equivalent to 220 units. Similarly the Reorder point (ROP) for products with HSN code **(6005, 6303, 6301, 5407)** is 173, 68, 48, 45 units respectively which means that NN Traders has to place order for the given product if the current stock level of the product become equivalent to their respective ROP in units.

Categorical Analysis:

It is crucial to perform categorical analysis as it helps to interpret the result of the data that is grouped into different categories such as segments, product types, region and customer. Business can identify patterns, relationships and the performance of each product that might not be visualized and identified in the numerical data. Overall categorical analysis can provide valuable insights that will help the business to future make strategies and apparently make the operation efficient. For this business the data is broken down into different SKUs with HSN code and performance of each product has been analyzed.
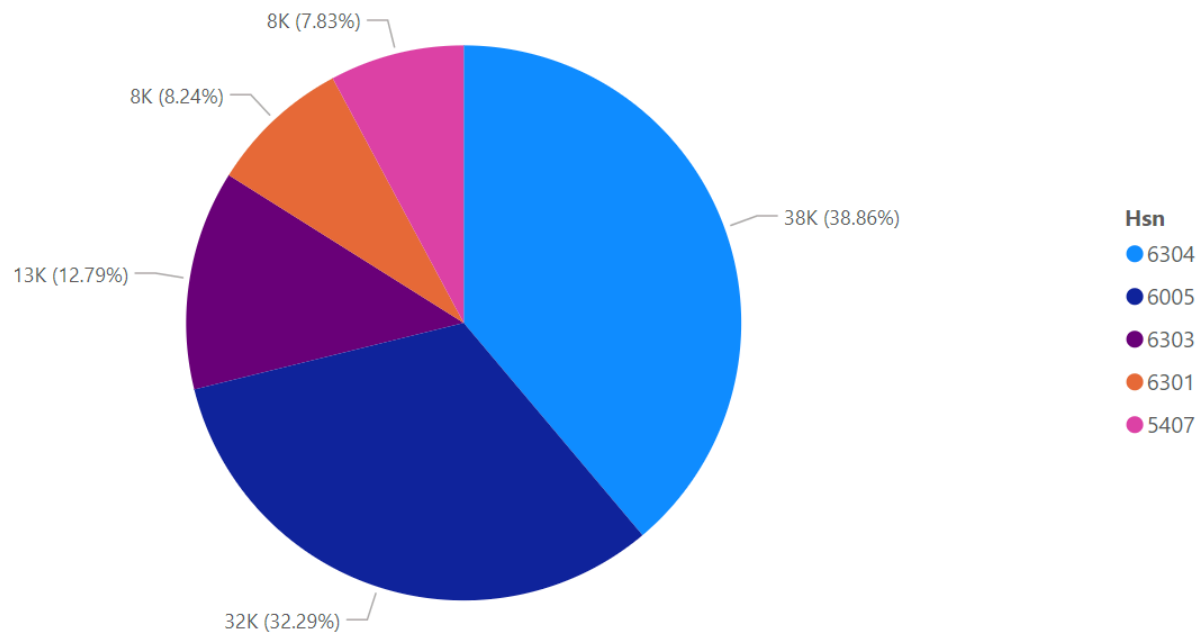

Fig 7. Pie chart of Total Sales Share in Quantity by HSN Code.

Key Observation:
- Products with HSN code 6304 and 6005 have the majority of the data share in sales which together account for over 70% of the total share of all the products.
- The dominant category of all is HSN 6304 with over 38% of the sales share, making it the most significant and valuable category.
- HSN 6301 and HSN 5407 come from smaller segments that contribute nearly equally to the total sales share in quantity.

Recommendation to the Business

NN Traders typically face issues regarding inefficient inventory management and customer acquisition. Customer acquisition is an important factor for a business to grow. Eventually the business lost most of its customers in covid era which can only be achieved by acquiring the market and gaining the trust of the customer again.

Sales Trends and Monthly Revenue Analysis:

Here are some of the recommendations for the business to make the business through data driven strategies:

> ➢ The main aim of the business should be to stabilize monthly revenue . The fluctuation in the sales data especially in FY 2022-23 show that the business needs better consistency which can only be achieved by introducing promotional strategies and campaigns during low performing and weaker months.
> ➢ In both the Fiscal year there is a weak performing month majorly August 2022 and February 2024. In these low performance months especially focus on efficient marketing or try adding new product aligning to the market and attract customers.
> ➢ Identify the reasons behind the best performing month such as February 2023 and March 2023 and try Replicating the strategies used during these months.
> ➢ Closely monitoring what strategies and implementation competitors have taken during the period where the business shows decline might provide insights about how to grow market share and increase customer acquisition.

Sales and purchase analysis:

Sales and purchase analysis mainly help in efficient inventory management and reducing the chances of deadstock and overstocking. Here are some of the recommendations for the business from sales and purchase analysis:

➢ It is advised to the business to keep track of the average daily sales of the product and average monthly sales of the product. NN Traders need to keep track of the average monthly sales of their product to identify how fast their specific product is selling and what is the overall performance of the product. On keeping track of the monthly sales we can also identify the performance of the individual product.

➢ The business must adhere to the " Fig 5" as it reduces the chance of business getting stockouts and overstock. The Reorder points for every individual product for NN Traders has been calculated and populated as a table in Figure 5. By strictly following the Reorder points (ROP) NN Traders will be able to identify the point where the business has to make the order of a particular product which will eventually make the inventory management efficient and reduce the chance of overstock and stockouts.

➢ NN Traders are advised small size godowns so that they can do cost cutting by reducing the rent for the godowns as businesses don't have to rent a big because they now know the outflow of their stock.

Categorical analysis and general instruction:

➢ The business must focus on adding more styles of bedsheet and pillow cover as products under HSN 6304 contribute to the majority of the sales share.

➢ NN Traders should also focus on making its own raw curtains as a result it helps in cost cutting. The raw curtains contribute to almost 32% of the total sales share.

➢ NN Traders is advised to hire sales persons who are comfortable in speaking the local language in that way they can communicate to local customers and preferably increase the profit of the business.

➢ A leniency in calculation must be implemented to calculate the credit score of the customer who is willing to buy the product on the basis of paying later. In that way they can regain their customers.

Conclusion

Through the comprehensive analysis on sales and inventory data and use of advanced analytical method and procedure, valuable insights have been trailed to NN Traders. This project clearly identifies the trends and uncover hidden patterns that will help the business in making data driven decisions. The issue that the business is facing such as efficient inventory management and problems in identifying sales trends is expected to be solved and NN traders are expected to enhance its overall efficiency and improve the cash flow by unlocking the Capital tied in deadstock.

 Special Thanks to Mr. Noorain Shahid, the owner of the "NN Traders" for their thorough contribution and help from the initial talking stage to data collection. I strongly believe that this project will definitely add value to the business and help the business in making more valuable profit.

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