

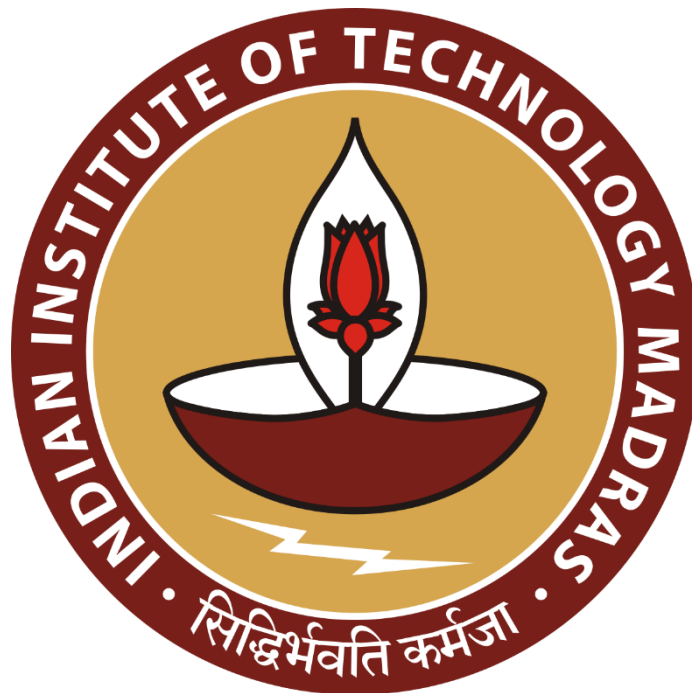
Optimizing inventory management for improving resource mobilization, growth and profitability of a retail pharmaceutical business

Final submission report for the BDM capstone Project

Submitted by

Name: BINAYAK BANERJEE

Roll number:21F2000510



IITM Online BS Degree Program,
Indian Institute of Technology, Madras, Chennai
Tamil Nadu, India, 600036

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1. Executive Summary:

New Medica, a retail pharmaceutical shop in Rishra, West Bengal, operates as a B2C business serving the local community. Despite being well-established, the shop faces challenges in managing its inventory effectively, resulting in issues such as stockouts, overstocking, and capital misallocation. Key problems such as capital blockage and poor inventory turnover have been identified through Inventory turnover ratio analysis. With the aim to improve inventory management system in achieving proper resource allocation and improving profitability of the business, further analysis has been undertaken.

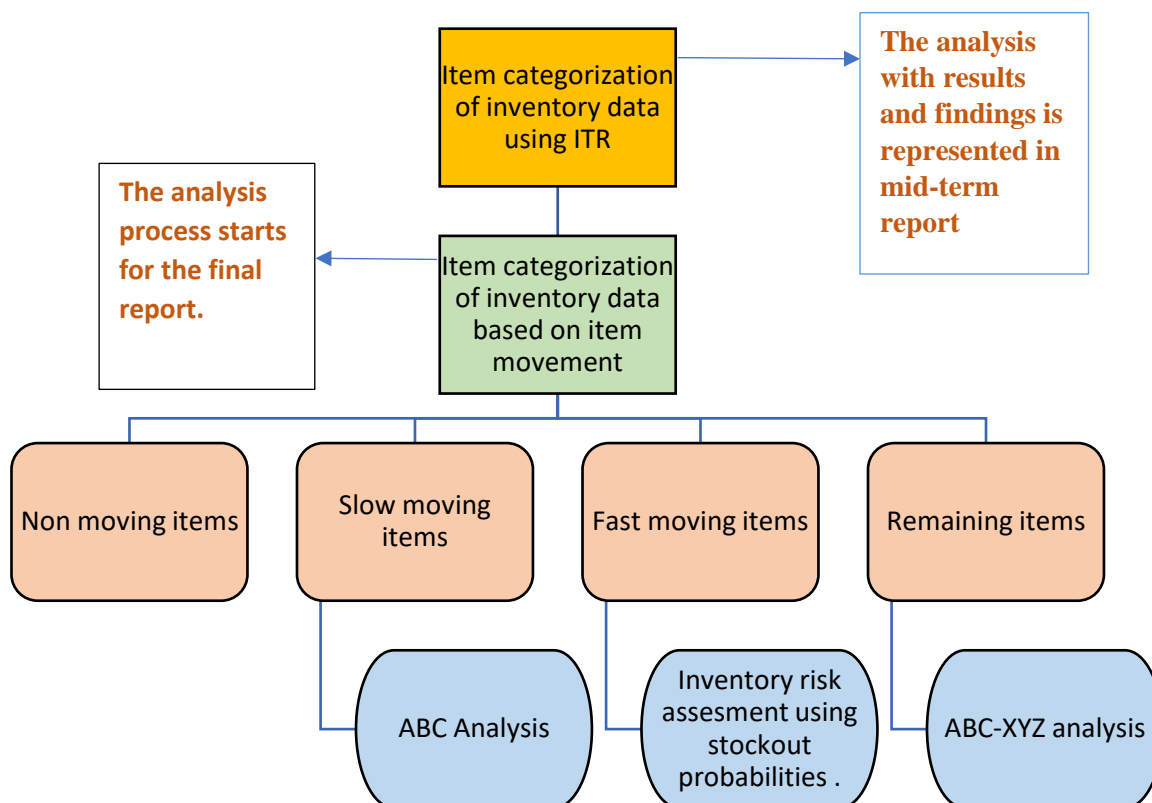
Inventory Movement Categorization Analysis is performed on total items in the inventory to segregate items into four different categories - **non-moving, slow-moving, fast-moving and remaining items**. **ABC analysis** is performed on slow-moving items to prioritize identification of items contributing to high capital blockage. **Inventory risk assessment analysis** is performed on fast-moving items to prioritize identification of item sub-categories with associated percentage stockout probabilities. **ABC-XYZ analysis** is performed for identification of sub-categories contributing high to low sales volume with associated demand variations.

Inventory Movement Categorization Analysis shows total **630** slow-moving items comprise **13%** of the inventory volume contributes **100%** capital blockage amounting to **Rs 449776**, **1283** slow-moving items comprise **27%** of the inventory volume contributes **49%** capital blockage amounting to **Rs 812906**, **141** slow-moving items comprise **3%** of the inventory volume contributes **0%** capital blockage and **2743** remaining items constitute **57%** of inventory volume contributes **45%** capital blockage amounting to **Rs 1019445**. ABC analysis on slow-moving items reveals **21%** items contribute **70%** of the net capital blockage **Rs 812906**. Inventory risk assessment on fast-moving items reveals that out of **141** items, there are **27 items** associated with high risk of stockout probabilities (**83%-100%**), **98 items** associated with moderate risk of stockout probabilities (**17%-67%**) and **16** items with no stockout risk. ABC-XYZ analysis on remaining items reveals that **7%** of the inventory comprising **197 items** shows very high sales volume of which **104 items** have stable demand variation. **89%** of the inventory comprising 2428 items shows very low sales volume of which **822 items** have very fluctuating demand variation indicating high uncertainty in sales.

Key recommendations to address these issues include liquidating non-moving items to free up capital and reallocating in fast-moving and high sales driving items, tightening inventory control for slow-moving items by reducing purchase volumes, prioritizing high sales volume with stable demand to ensure better stock movement and continuous monitoring of fast-moving item inventory to prevent stockouts.

2. Detailed explanation of analysis process:

Flowchart of analysis process:



2.1 Inventory Movement Categorization Analysis: In order to perform a specific and result oriented analysis the items in the consolidated data have been segregated under following categories:

- **Non-moving items:** These are the items whose stock in hand are twice the average monthly purchases and total sales are **NIL**.
- **Slow-moving items:** These are the items whose stock in hand are twice the average monthly purchases and total sales are **not NIL**.
- **Fast-moving items:** These are the items whose **average monthly purchases** and **average monthly sales** are equal.
- **Remaining items:** Rest items in the total inventory not fulfilling the criteria of any one of the above three categories.

For detailed understanding of categories refer to table 3.1 in the results and finding section in page 7

2.2 ABC Analysis: ABC analysis is performed over the slow-moving items to further categorize items based on their capital blockage contributions.

Procedure: The items in the sheet has been arranged in descending order of capital blockage. A column for cumulative capital blockage has been generated containing the cumulative blockage contribution of the items in ascending manner. Consequently,

cumulative capital blockage contributions of the items have been represented percentage-wise, which forms basis of the items being categorized as A, B & C.

Please refer to the excel file sheet named “ABC slow moving items ” for the data of analysis process. Link: { [click here](#) }

Equation 2.1:

$$\begin{aligned} & \textbf{Cumulative Capital Blockage of}_{\{t+1\}th} \textbf{item} \\ &= \textbf{Cumulative Capital Blockage of}_{\{t\}items} \\ &+ \textbf{capital blockage of}_{\{t+1\}th} \textbf{item} \end{aligned}$$

Blockage contribution of the item categories have been described below:

Category A: Represents the top ‘x’ items contributing up to 70% of the capital blockage.

Category B: Represents the next ‘y’ items contributing up to next 20% of the capital blockage.

Category C: Represents the rest of the items contributing to remaining 10% of the capital blockage.

Interpretation of the ABC-Analysis: The analysis categorizes the slow-moving items further into three categories—A, B, and C. The categorization has been performed on the basis of their significance, typically measured by their contribution to overall capital blockage. The objective is to prioritize the management and control of inventory items by focusing on the most critical ones.

2.3 Inventory risk assessment using stockout probabilities:

The analysis allows to monitor categorized items based on risk associated for a stockout situation. Inventory risk assessment due to frequent stockout is performed on the fast-moving items. The analysis is used in further segmentation of fast moving items based on the percentage probabilities of stockout.

Procedure: Items have been categorized on the basis of monthly closing balance stockout cases i.e., the cases where monthly closing balance is zero. Probability of item stockout has been calculated from the monthly stockout cases. The counts and percentage- wise representation of items across the categories has been calculated.

Please refer to the excel file sheet named “ Stockout monitoring ” for the data of analysis process. Link: { [click here](#) }

Equation 2.2:

$$\begin{aligned} & \textbf{Probability(\%)of item stock out} \\ &= \frac{\textbf{Number of monthly stock out cases * 100}}{\textbf{Total number of months of review period}} \end{aligned}$$

For example,

No. of monthly closing balance stock out cases=4

Item category=D

Total number of months of review period=6

$$Probability(\%) of \text{ item stockout} = \frac{4 \times 100}{6} = 67\%$$

Interpretation of percentage probability of stockouts: Each of the item categorization has a definite value of monthly stockout case associated to it resulting into a particular percentage probability of item stockout. Increasing order of percentage probability of stockout represents item categories with high risk of facing stockout situation and vice-versa.

2.4 ABC-XYZ Analysis: The analysis categorizes items based on their importance in terms of value as well as demand stability, leading to improved item demand forecasting and inventory planning. The analysis process also helps in achieving efficient resource allocation.

The ABC-XYZ analysis is performed on the items of the category ‘remaining items’. As the name suggests the analysis comprises of two parts -ABC analysis and the XYZ analysis. ABC analysis classifies inventory into three categories based on their importance in terms of sales value generated. It helps businesses prioritize resources toward the most sales value generating items. XYZ analysis classifies inventory based on the variability of demand or consumption.

Please refer to the excel file sheet named “ **ABC XYZ** ” for the data of analysis process. Link: { [click here](#) }

Procedure: For categorizing items as A,B and C using ABC analysis items in the sheet has been arranged in descending order of sales value. A column for cumulative sales value has been generated containing the cumulative sales value of the items in ascending manner. Consequently, cumulative sales value contributions of the items have been represented percentagewise based on which the items have been categorized.

- **Category A:** Represents the top ‘x’ items contributing up to 70% of the overall sales value.
- **Category B:** Represents the next ‘y’ items contributing up to next 20% of the overall sales value.
- **Category C:** Represents the rest of the items contributing to remaining 10% of the overall sales value.

For categorizing items as X, Y and Z using XYZ analysis, standard deviation of the sales quantity over the review period has been calculated. The variability in sales demand of items has been calculated using coefficient of variation. The items have been categorized on the basis of coefficient of variation expressed percentage-wise which represents the uncertainty level of sales for the item.

- **Category X:** These have a consistent demand or consumption rate with minimal fluctuations, making them easier to forecast. For the category of items percentage coefficient of variation ranges from [0,25).
- **Category Y:** These have moderate fluctuations in demand or consumption, with some level of seasonality or trend-based changes. For the category of items percentage coefficient of variation ranges from [25,40).
- **Category Z:** These have irregular or unpredictable demand patterns, making forecasting difficult. For the category of items percentage coefficient of variation ranges from [40,224(max. value)).

Equation 2.3:

$$\text{Cumulative sales value of}_{\{t+1\}\text{th}} \text{item} = \text{Cumulative sales value of}_{\{t\}\text{th}} \text{item} + \text{sales value of}_{\{t+1\}\text{th}} \text{item}$$

Equation 2.4:

$$\text{Population standard deviation}(\sigma) = \frac{1}{N} \sqrt{\sum (x_i - \mu)^2}$$

Where, N=size of population

x_i =Sample value from the population

μ =Mean of the population

Equation 2.5:

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\mu}$$

Where, σ =population standard deviation

μ =Mean of the population

The items have been categorized into the following categories listed below:

- **Category AX:** High-value items with consistent demand.
- **Category AY:** High-value items with fluctuating demand.
- **Category AZ:** High-value items with unpredictable demand.
- **Category BX, BY, BZ:** Moderate-value items with different demand patterns.
- **Category CX, CY, CZ:** Low-value items with various demand patterns

For detailed understanding of categories refer to fig 3.6 in the results and finding section in page no:12.

3. Results and findings:

3.1. Results and findings from inventory movement categorization analysis (ref: section 2.1): Please refer to the excel file sheet named “**Tables and charts**” for finding tables and fig attached below. Link: { [Click here](#) }

Table 3.1: Criteria for item categorization of consolidated inventory data

Item category	Criteria for categorization	Conditions used
Non moving	Stock in hand is twice the monthly purchase but total sales is NIL.	1. Purchase quantity-Sales Quantity>2* Average monthly purchase Quantity 2.Total sales quantity=0
Slow moving	Stock in hand is twice the monthly purchase but total sales is not NIL.	1. Purchase quantity-Sales Quantity>2* Average monthly purchase Quantity 2.Total sales quantity>0
Fast moving	The average monthly purchase and sales quantities are equal	1.Average monthly purchase quantity=Average monthly sales quantity
Remaining items	Rest items of the inventory not fulfilling any of the criteria for non-moving,slow-moving and fast-moving items.	

Table:3.2 Category-wise item distribution and value analysis

Item category	item count (No.)	item volume(%)	Purchase value (Rs.)	Sales value(Rs.)	Profit (Rs.)	Capital blockage (Rs.)
Non moving	630	13%	390844	0	0	449776
Slow moving	1283	27%	1654671	1254792	291489	812906
Fast moving	141	3%	410870	545728	126544	0
Remaining items	2743	57%	2278792	1535476	348674	1019445

Fig-3.1: Category-wise item count

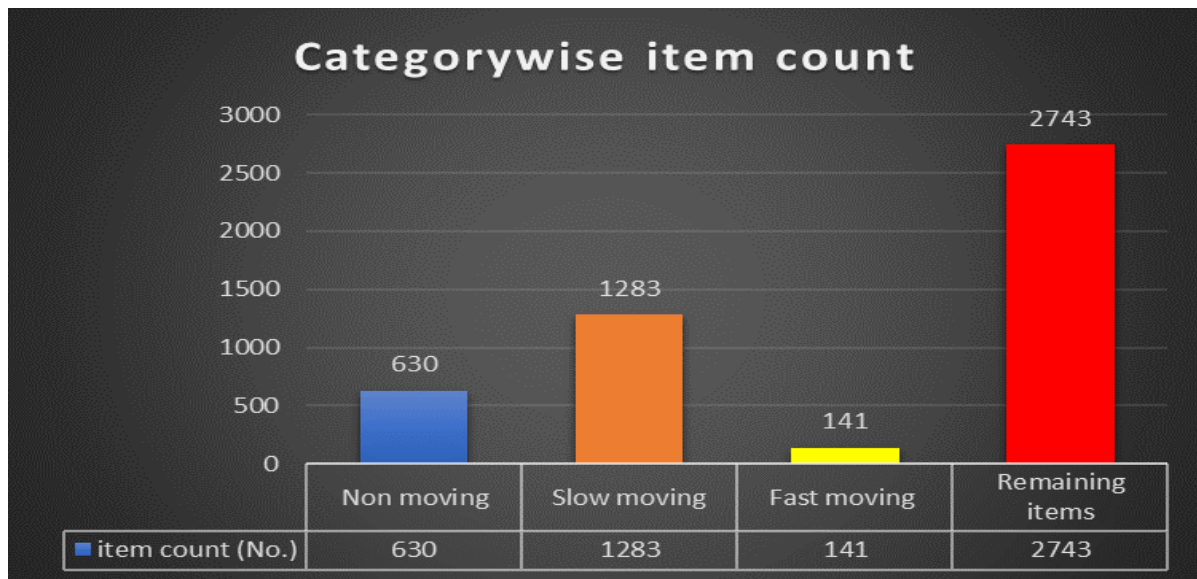


Fig-3.2 : Percentage wise representation of items across categories

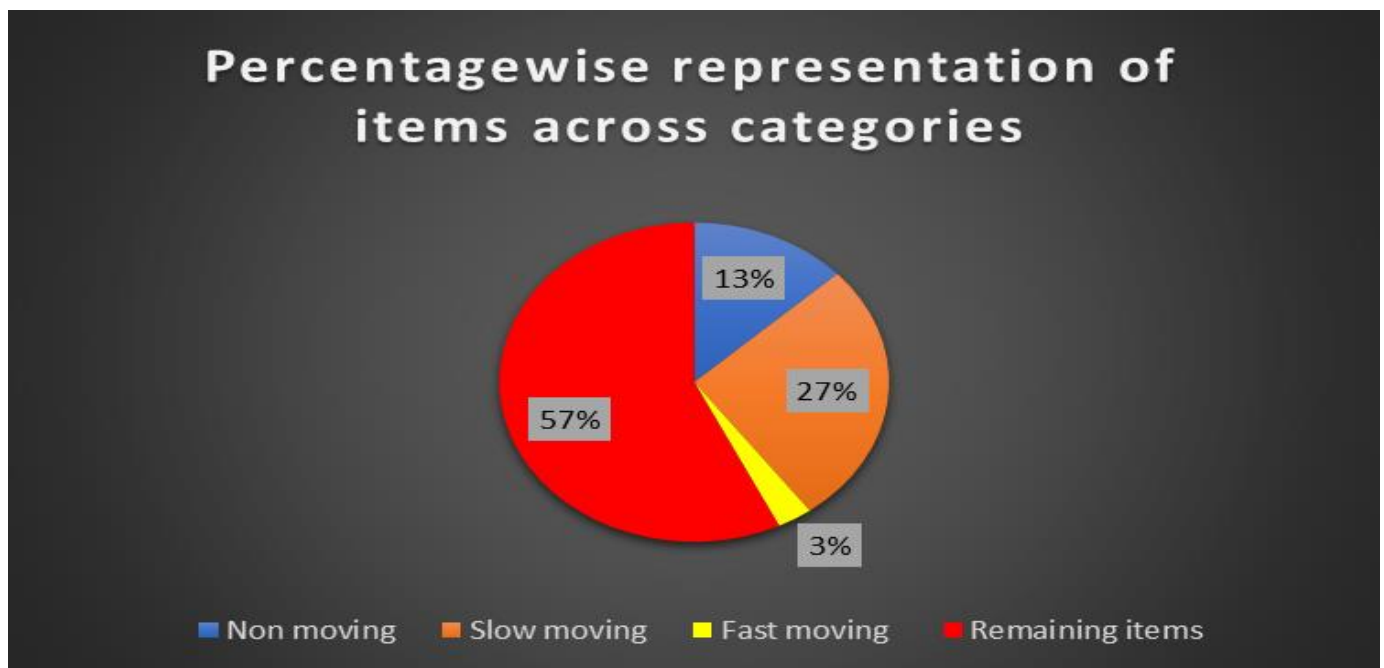


Fig-3.3: Value analysis of categorized items

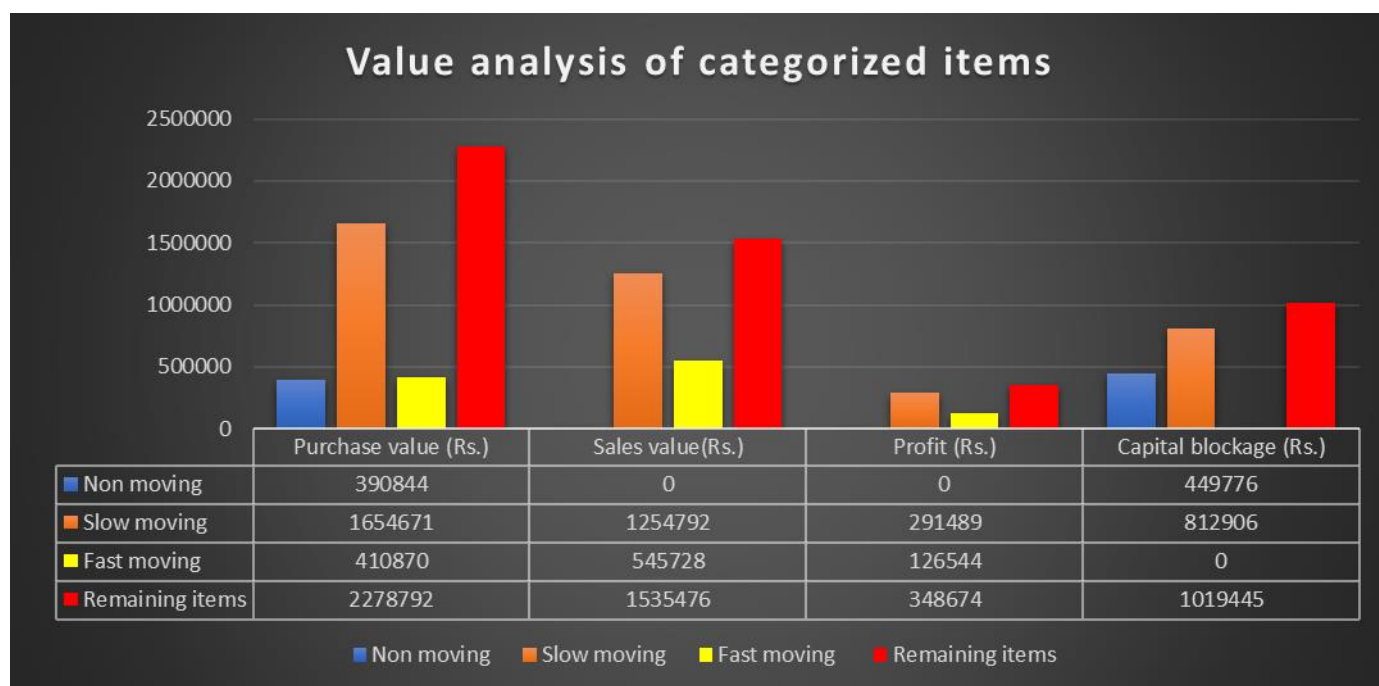


Table 3.3: Capital flow analysis across item categories

Item category	Item count (No.)	Capital blockage (Rs.)	Capital blockage contribution per item (Rs.)	Capital blockage (%)	Rolling Capital (Rs.)	Rolling Capital (%)	Net Capital usage (Rs.)
Non moving	630	449776	714	100%	0	0%	449776
Slow moving	1283	812906	634	49%	841765	51%	1654671
Fast moving	141	0	0	0%	410870	100%	410870
Remaining items	2743	1019445	372	45%	1259347	55%	2278792

Fig-3.4: Capital usage analysis across item categories

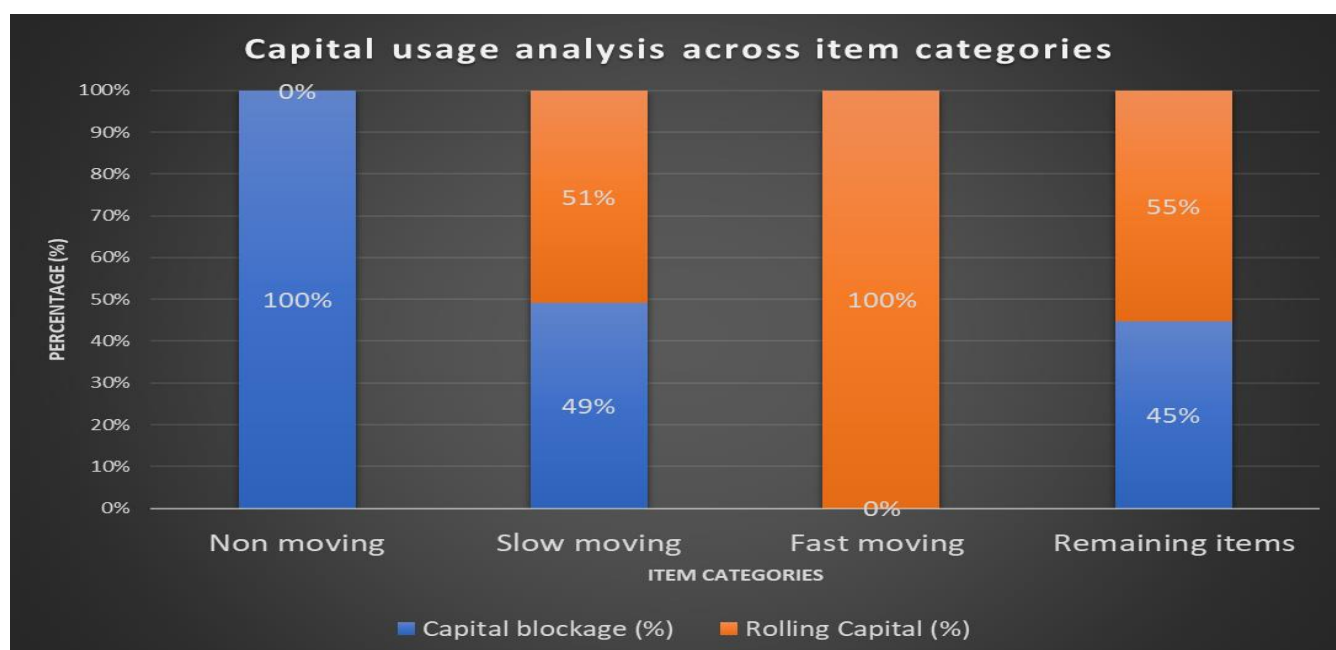
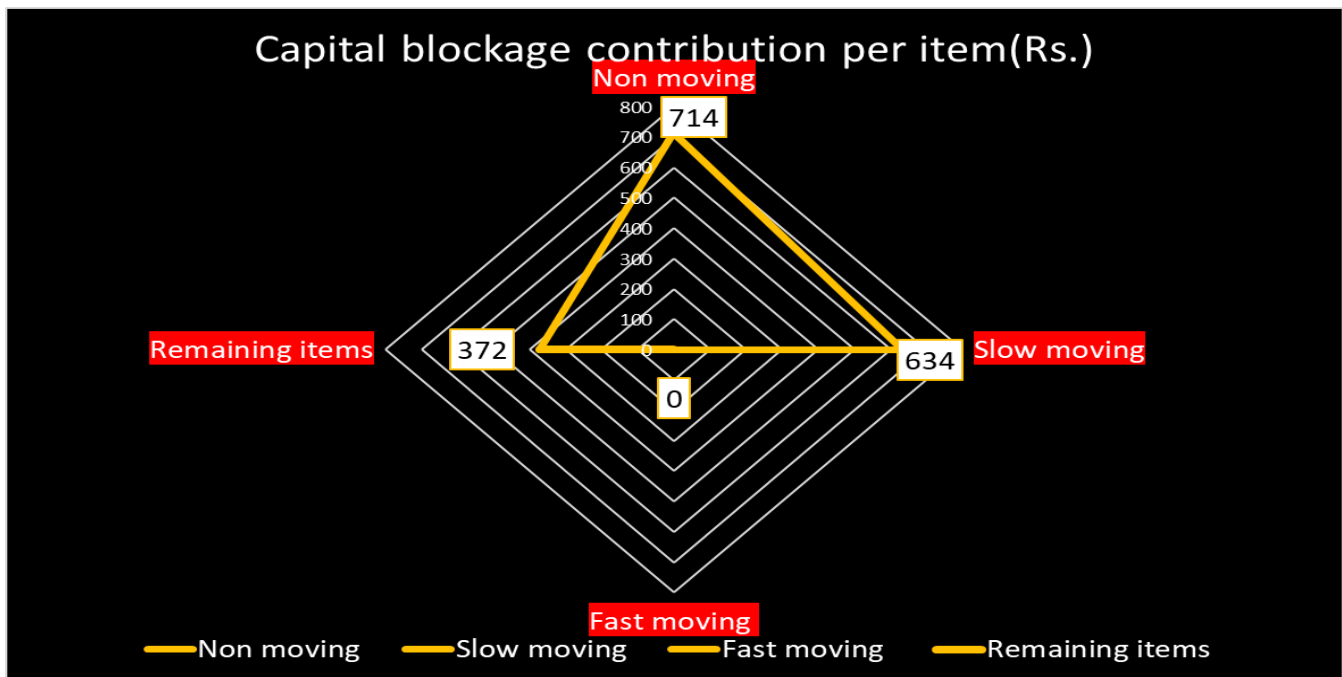


Fig- 3.5: Capital blockage contribution per item



3.1.1. Item Category Distribution:

- **Non-Moving Items:** There are **630 non-moving items**, representing **13%** of the total inventory volume. These items have a purchase value of **₹3,90,844** and currently generate no sales or profit. The capital blockage tied to these items is **₹4,49,776**, indicating a significant resource allocation issue.
- **Slow-Moving Items:** There are **1,283 slow-moving items**, which make up **27%** of the total volume. This category shows a purchase value of **₹1,654,671** and sales value of **₹1,254,792**, generating a profit of **₹291,489**. However, the capital blockage is high, amounting to **₹8,12,906**.
- **Fast-Moving Items:** A total of **141 fast-moving items** account for only **3%** of the total inventory volume. These items have a purchase value of **₹4,10,870**, a sales value of **₹5,45,728**, and have generated a profit of **₹1,26,544**. No capital blockage is observed for this category.
- **Remaining Items:** This is the largest category, comprising **2,743 items** (approximately **57%** of the total volume). These items have a purchase value of **₹2,278,792** and have contributed to sales worth **₹1,535,476**, yielding a profit of **₹348,674**. However, the capital blockage remains significant at **₹1,019,445**.

3.1.2. Capital Blockage Contribution per Item:

- The **radar chart** shows that non-moving items have the **highest capital blockage per item (₹714)**, followed by slow-moving items (**₹634**). **Fast-moving items** contribute nothing to capital blockage, while remaining items have the lowest blockage contribution per item at **₹372**. The **non-moving and slow-moving categories** clearly have more capital tied up per item, which indicates inefficiency in managing inventory for these items.

3.1.3. Rolling Capital Efficiency:

- **Non-moving items** represent the most inefficient category, with **100% capital blockage** and no rolling capital, reflecting poor return on investment for this group.
- **Slow-moving items** have a balanced distribution between capital blockage (**49%**) and rolling capital (**51%**). However, the high blockage portion shows that there's room to improve inventory turnover.
- **Fast-moving items** have **100% rolling capital**, meaning that the capital tied to these items is being effectively utilized to generate revenue.
- The **remaining items** have a similar situation to slow-moving items, with **45% capital blockage** and **55% rolling capital**, indicating moderate efficiency.

3.1.4. Net Capital Usage:

- **Slow-moving items** have a net capital usage of **₹1,654,671**, with a mix of rolling and blocked capital. This signifies the need for measures to increase inventory movement and reduce blockage.
- **Remaining items** have the highest net capital usage at **₹2,278,792**, but nearly half of this is locked up in non-performing inventory.
- **Fast-moving items** demonstrate the most efficient net capital usage with **₹410,870** in rolling capital.

3.1.5. Sales and Profit Analysis:

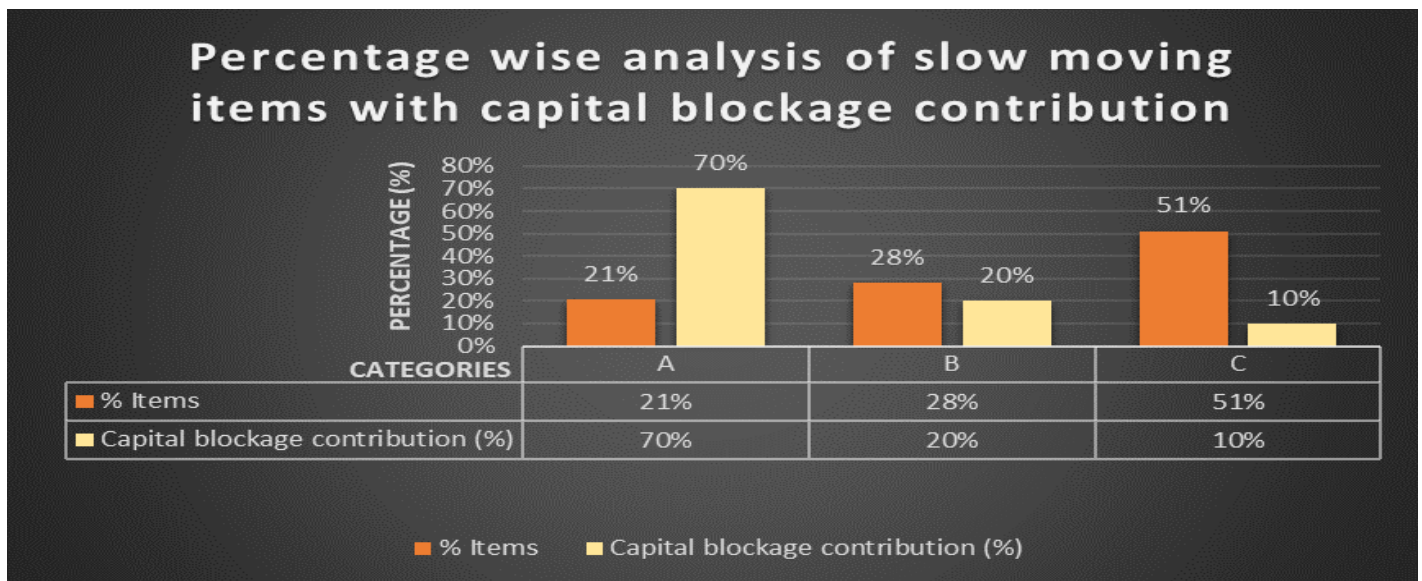
- **Non-Moving Category:** No sales have been recorded in this category, leading to **zero profit** and the largest capital blockage.
- **Slow-Moving Category:** This category, though contributing to sales and profit, has a considerable gap between the purchase value and sales, leading to moderate profit margins and high capital blockage.
- **Fast-Moving Category:** This is the most efficient category, with higher sales relative to the purchase value and no capital blockage. The profit percentage here is substantial, indicating good demand and high turnover.
- **Remaining Items:** Items for the category generate profit, the high capital blockage and needs to be managed better by focusing on efficient stock management.

3.2. Results and findings from ABC analysis (ref: section 2.2): Please refer to the excel file sheet named “ABC slow moving items” for finding tables and fig attached below.
Link: {{ [Click here](#) }}

Table-3.4: Calculation of capital blockage contribution of slow-moving items

Calculation of capital blockage contribution of slow-moving items					
Item categories based on capital blockage	% range of capital blockage for categorization	Item counts (No.)	% Items	Capital blockage contribution (%)	Capital blockage contribution (Rs.)
A	[0,70)	267	21%	70%	569033.85
B	[70,90)	360	28%	20%	162581.1
C	[90,100]	656	51%	10%	81290.55

Fig-3.6: Percentage wise analysis of slow-moving items with capital blockage contribution



3.2.1. Item Categories and Capital Blockage Contribution:

- **Category A:** Items in this category account for **21%** of the total slow-moving items, with **267 items**. However, they contribute **70% of the capital blockage**, amounting to a massive **₹5,69,033.85**. Items within the category should be the **top priority** for inventory optimization. The high capital blockage in this category, despite the smaller number of items, suggests that there is a significant amount of capital tied up in these items, potentially resulting in reduced liquidity and profitability. These items likely have a high individual cost and low turnover rate..
- **Category B:** Category B represents **28% of the total slow-moving items** (360 items), contributing **20% of the capital blockage**. The capital blockage contribution in this category is **₹1,62,581.1**. Items in Category B have a moderate capital blockage impact, but they still hold significant value that could be freed up through appropriate measures.
- **Category C:** This category contains the largest number of items, representing **51% of the slow-moving inventory** (656 items). However, they contribute only **10% of the capital blockage**, amounting to **₹81,290.55**. Despite having the most items, the capital blockage contribution per item is the lowest, indicating that this category is less critical in terms of capital inefficiency.

3.3. Results and findings from inventory risk assessment analysis using stockout probabilities (ref: section 2.3): Please refer to the excel file sheet named “Stock out monitoring” for finding tables and fig attached below. Link: { [Click here](#) }

Table-3.5: Calculation of stock out probabilities across fast-moving items

Monthly closing balance stockout cases	Item categories based on stockouts	Probability of item stock out (%)	No. of items	% of items
0	A	0%	16	11%
1	B	17%	37	26%
2	C	33%	21	15%
3	D	50%	27	19%
4	E	67%	13	9%
5	F	83%	18	13%
6	G	100%	9	6%

Fig-3.7: Fast moving item distribution based on percentage probability of stockout

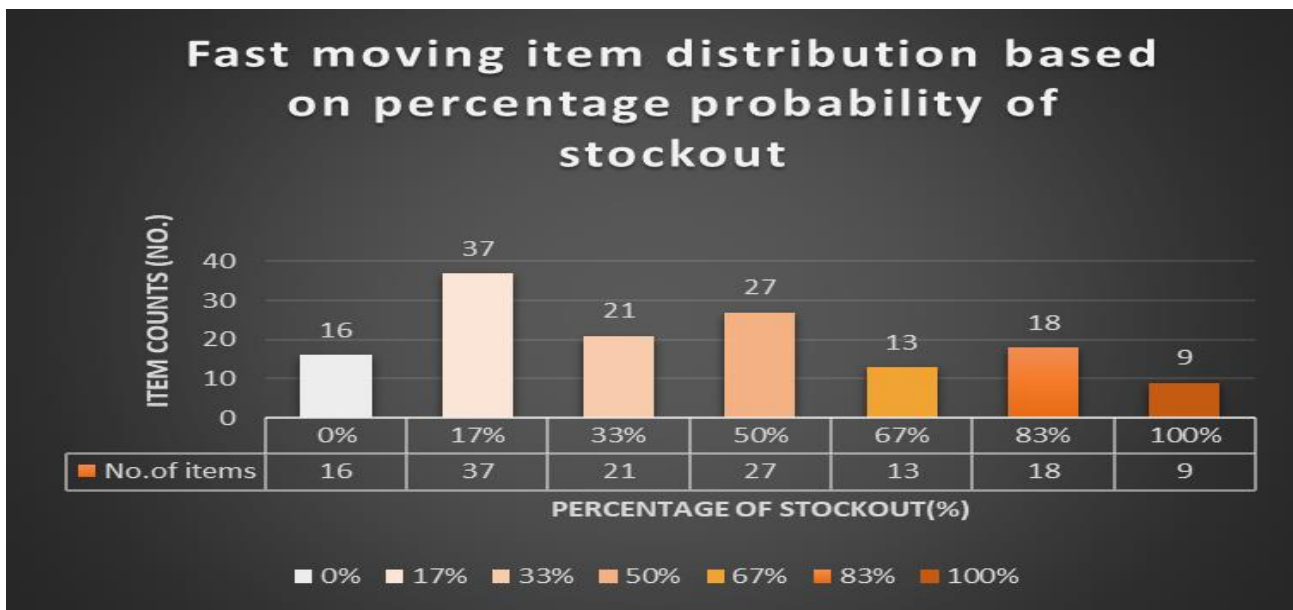
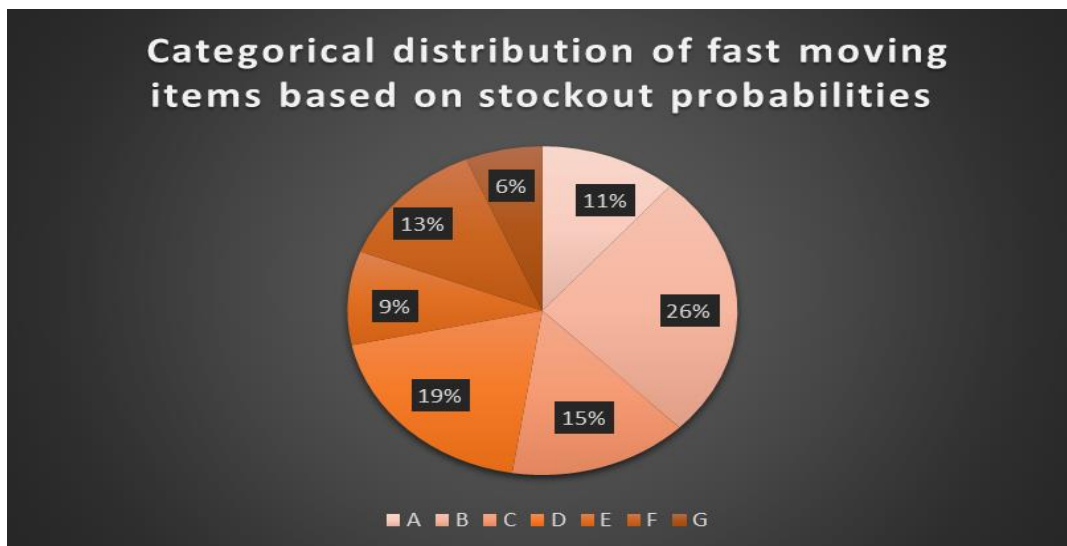


Fig-3.8: Categorical distribution of fast-moving items based on stock out probabilities



3.3.1. Stockout Probability Distribution:

- **A category (0% probability):** Out of the **141** fast-moving items, **16** items (**11%**) have **zero probability** of stockout. These items are well-managed in terms of inventory, with sufficient stock to meet demand without risk of shortage.
- **B category (17% probability):** **37** items (**26%**) have a moderate risk of stockout. This category represents items that may experience occasional shortages, requiring moderate attention.
- **C category (33% probability):** **21** items (**15%**) fall into a higher risk of stockout, necessitating tighter inventory management practices to avoid lost sales.
- **D category (50% probability):** **27** items (**19%**) have a 50% chance of stockout, representing a critical point for intervention to prevent frequent shortages.
- **E category (67% probability):** **13** items (**9%**) have a higher likelihood of stockout, posing a significant risk to maintaining customer satisfaction and sales continuity.
- **F category (83% probability):** **18** items (**13%**) are at a very high risk of stockout, signaling an urgent need for better inventory replenishment processes.

- **G category (100% probability):** 9 items (6%) have a certain risk of stockout. These items will always face shortages unless immediate corrective actions are taken.

3.3.2. Key insights:

- More than half of the items (55%) fall within the moderate to high-risk categories (B to D), indicating a need for stronger inventory management and restocking procedures.
- A small portion of items (6%) in **G category** has a guaranteed stockout issue, requiring immediate intervention to prevent customer dissatisfaction and lost sales.
- **Low-risk items (A and B)** represent 37% of the total fast-moving items. These could be examples of well-maintained inventory practices, but they should still be monitored to avoid slipping into higher-risk categories.

3.4. Results and findings from ABC-XYZ analysis (ref: section 2.4): Please refer to the excel file sheet named “ABC-XYZ” for finding tables and fig attached below.

Link: {{[Click here](#)}}

Table-3.6: Significance of item categories in ABC-XYZ analysis

Item sales volume increasing ->	Categorization	X	Y	Z
	A	High volume sales and stable	High volume sales and fluctuating	High volume sales and very fluctuating
	B	Average volume and stable	Average volume and fluctuating	Low volume and very fluctuating
	C	Low volume and stable	Low volume and fluctuating	Average volume and very fluctuating
Item sales uncertainty level increasing->				

Table-3.7: Distribution of items across categories

Item sales volume increasing ->	Categorization	X	Y	Z
	A	42	62	93
	B	19	35	64
	C	1605	1	822
Item sales uncertainty level increasing->				

Table-3.8: Percentage wise distribution of items across categories

Item sales volume increasing ->	Categorization	X	Y	Z
	A	2%	2%	3%
	B	1%	1%	2%
	C	59%	0%	30%
	Item sales uncertainty level increasing->			

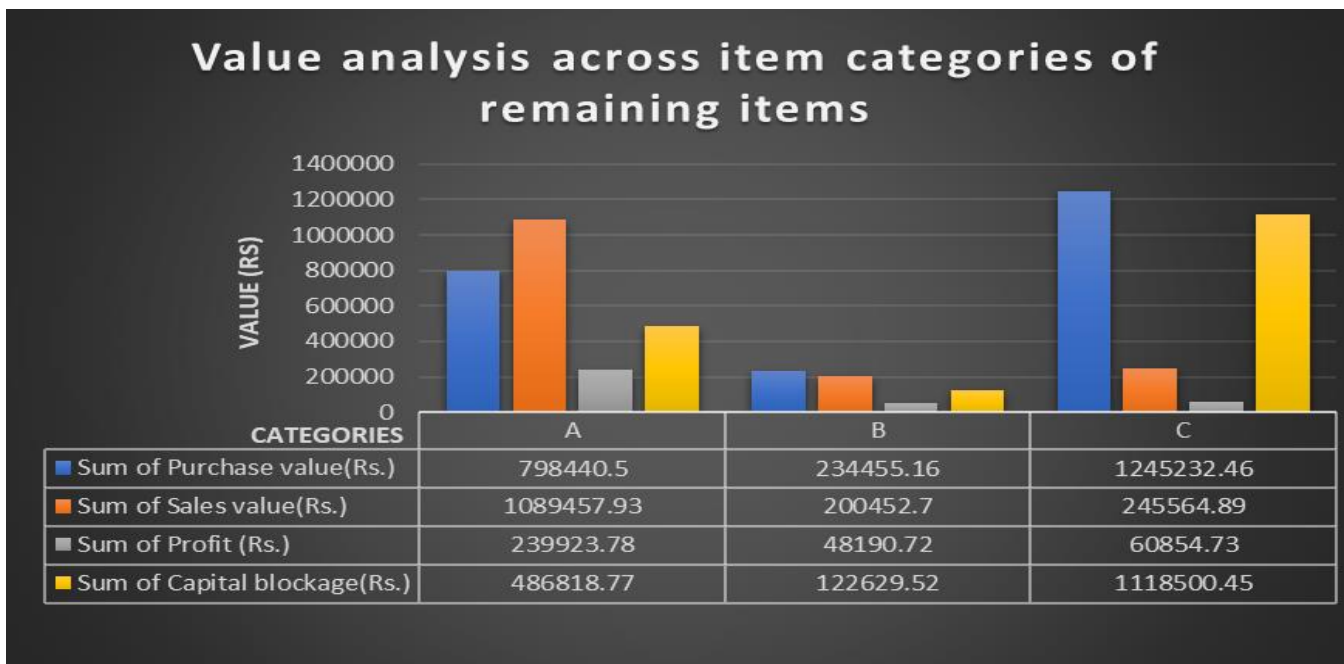
Table-3.9: Inventory Management Strategy Matrix Based on ABC-XYZ Analysis

Item sales volume increasing ->	Categorization	X	Y	Z
	A	Automate replenishment,keep safety stock,frequent monitoring required	Keep low safety stock,frequent monitoring required	Keep low safety stock,frequent monitoring required
	B	Automate replenishment,keep safety stock	Keep low safety stock	Monitor closing balance quantity before further purchase,Avoid keeping safety stocks
	C	Monitor closing balance quantity before further purchase,Keep low safety stock	Monitor closing balance quantity before further purchase,avoid keeping safety stock	Monitor closing balance quantity before further purchase,No safety stock required
	Item sales uncertainty level increasing->			

Table-3.10: Summary of value analysis of A, B & C categories

Item categories	Sum of Purchase value(Rs.)	Sum of Sales value(Rs.)	Sum of Profit (Rs.)	Sum of Capital blockage(Rs.)
A	798440.5	1089457.93	239923.78	486818.77
B	234455.16	200452.7	48190.72	122629.52
C	1245232.46	245564.89	60854.73	1118500.45

Fig-3.9: Value analysis across item categories of remaining items



3.4.1. Volume and Stability Insights:

- **Category A:** This category (High-value items) has **197 items** (42 in X, 62 in Y, and 93 in Z). A majority of these are high sales volume items but they differ in their demand stability.
- **Category AX:** Comprises of (**42 items**) which has high volume and stable sales, ideal for automated replenishment with regular safety stock management.
- **Category AZ:** Comprises of (**93 items**) which has high volume but very fluctuating demand, requiring close monitoring and frequent adjustments to inventory levels.
- **Category B:** (Medium-value items) includes **118 items** (19 in X, 35 in Y, 64 in Z). While B category items have lower volumes, **Z (64 items)** shows significant demand fluctuation, so these items require careful monitoring and stock control to avoid excess.
- **Category C:** (Low-value items) dominates the remaining inventory with 2,428 items (**1605 in X, 1 in Y, and 822 in Z**).
- **Category CX:** **1605 items** are in this category (**low volume and stable**), showing little fluctuation but contributing significantly to overall stock count.
- **Category CZ:** (**822 items**) in this category is concerning, as these items have high fluctuation, requiring careful analysis to avoid excess inventory.

3.4.2. Value Contribution by Categories:

- **Total Purchase Value** across all categories: **Rs.2,278,128.12**.
- **Category A** has a net purchase value of **Rs 798,440.5** and items of this category generate the most profit (**Rs.2,39,923.78**) despite having fewer items (**197**).
- **Category C** has the highest purchase (**Rs.12,45,232.46**) and sales value (**Rs.2,45,564.89**) but a much lower profit contribution (**Rs.60,854.73**), suggesting lower profitability per item compared to Category A. It has the highest capital blockage (**Rs.11,18,500.45**), indicating that a large amount of capital is tied up in these low-volume, fluctuating items.

3.4.3. Percentage of Items by Volume and Uncertainty (Heatmap Analysis):

- **Category A:** Represents **1%-2%** of the total items and requires similar care but not as aggressive inventory management compared to Category A. Since this category consists of high-value, high-profit items, it should be prioritized for automation and frequent monitoring to ensure supply meets demand.
- **Category B:** Represents **1%-2%** of the total items and requires similar care but not as aggressive inventory management compared to Category A.
- **Category C:** Constitutes the largest percentage (**59%** in **X** and **30%** in **Z**), meaning a significant amount of stock consists of low-value, fluctuating items. Since these items tie up large amounts of capital but offer lower returns, inventory should be minimized through better forecasting and frequent stock monitoring to reduce wastage and excess holding costs

4. Interpretation of results and recommendations:

4.1 Recommendations based on item categories:

4.1.1 Non-Moving Items (13% of total volume):

- **Immediate Action:** Focus on liquidating non-moving items to free up capital (**₹4,49,776**) currently blocked. Implement strategies like deep discounts, promotional sales, or return policies to move these items quickly.
- **Supplier Negotiation:** Explore possibilities for returning non-moving items to suppliers or exchanging them for more fast-moving inventory.

4.1.2 Slow-Moving Items (27% of total volume):

- **Targeted Promotions:** Use targeted marketing campaigns (discounts, bundle offers) to improve turnover and reduce stockholding costs. These items generate some profit (**₹2,91,489**) but suffer from high capital blockage (**₹8,12,906**).
- **Capital Reduction:** Prioritize reducing stock levels in Category A slow-moving items (**21%** of items contributing **70%** of capital blockage). Implement aggressive promotional strategies and explore liquidation options where necessary.

4.1.3 Fast-Moving Items (3% of total volume):

- **Monitor Stockout Risks:** Focus on categories **D, E, F, and G** (high to critical stockout risk) for continuous inventory replenishment to avoid lost sales. Strengthen predictive demand analytics to ensure uninterrupted stock availability.
- **Automated Replenishment:** Use automated replenishment systems for fast-moving items with a low probability of stockouts (Categories **A** and **B**) to maintain stock levels efficiently.

4.1.4 Remaining Items (57% of total volume):

- **Inventory Optimization:** Streamline stock management for remaining items, which show high capital blockage (**₹1,019,445**). These items generate moderate profit but need more efficient resource allocation to improve profitability and liquidity.

- **Sales Promotion:** Implement moderate promotions for items in this category to reduce overstocking and improve turnover.

4.2 Capital Blockage Reduction:

- 4.2.1 **Priority Action:** Category A of slow-moving items and Category C of remaining items contribute to significant capital blockage. Immediate attention should be given to freeing up capital by reducing stock levels in these categories through targeted promotional activities, supplier negotiations, or stock liquidation.
- 4.2.2 **Minimize Overstocking:** Focus on minimizing overstocking in Category C (low-value, high-fluctuation items) and redistributing resources towards more profitable, high-sales volume items in Category A of remaining items.

4.3 Inventory Risk Management for Fast-Moving Items:

- 4.3.1 **Critical Stockout Prevention:** Address the high risk of stockouts in categories D, E, F, and G. Replenishment planning, supplier negotiations, and predictive analytics should be employed to prevent stockouts and ensure customer satisfaction.
- 4.3.2 **Monitor Low-Risk Items:** Although categories A and B (37% of items) have a low risk of stockouts, they should still be monitored regularly to prevent any potential shortages.

4.4 ABC-XYZ Analysis-Based Strategies:

- 4.4.1 **Automate Replenishment for High-Value Items (Category A, X):** Automate replenishment processes for items with high value and stable demand to ensure optimal inventory levels.
- 4.4.2 **Reduce Overstocking in Low-Value, Fluctuating Items (Category C, Z):** Closely monitor items in Category C with fluctuating demand. Reduce stock levels of these items and optimize inventory to prevent unnecessary capital blockage.
- 4.4.3 **Dynamic Pricing for Fluctuating Demand (Category B, Z):** Implement dynamic pricing and promotional campaigns for Category B items with fluctuating demand to boost sales without excessive discounting.

4.5 Overall Strategy:

- 4.5.1 **Inventory Efficiency:** Focus on reducing stock in non-moving and slow-moving items to free up capital and improve liquidity. Promote efficient inventory turnover in fast-moving and remaining items through better demand forecasting and stock replenishment.
- 4.5.2 **Resource Mobilization:** Redistribute capital from non-moving and low-profit items to fast-moving, high-profit items to boost profitability.

4.5.3 Growth and Profitability: By improving stock rotation, reducing stockouts, and managing inventory effectively, New Medica can enhance profitability, customer satisfaction, and overall business growth.