

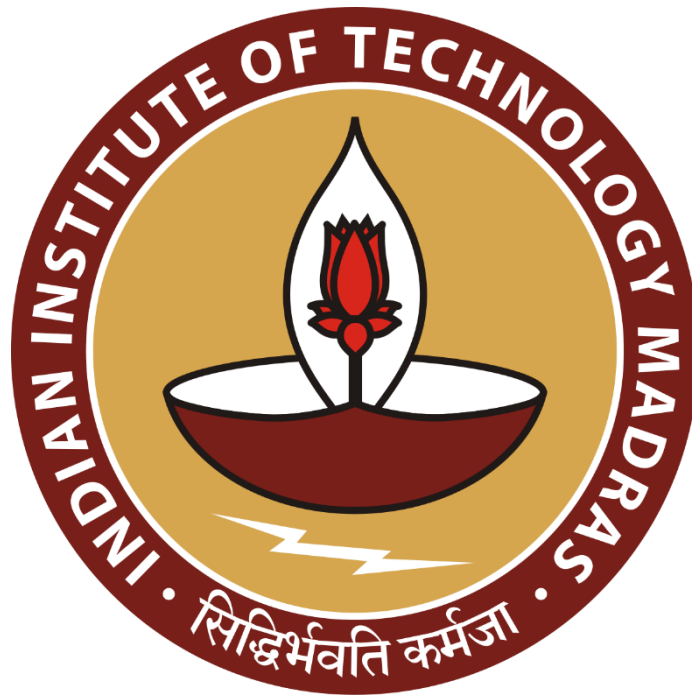
Data-Driven Strategies for Sales Improvement and Retail Expansion at Panchsheel Enterprises

A Final report for the BDM capstone Project

Submitted by

Name: Abhay Maurya

Roll number: 22f3001075



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

Contents

1	Executive Summary	4
2	Organization Background	5
3	Problem Statement	6
3.1	Sales Challenges	6
3.2	Need for Expansion Funds	6
4	Background of the Problem	6
5	Proof of originality of the Data	7
6	Descriptive Statistics	8
7	Detailed Explanation of Analysis Process/Method	8
8	Results and Findings	12
9	Interpretation of Results and Recommendation	19

Declaration Statement

I am working on a Project titled “**Data-Driven Strategies for Sales Improvement and Retail Expansion at Panchsheel Enterprises**”. I extend my appreciation to **Panchsheel Enterprises**, for providing the necessary resources that enabled me to conduct my project.

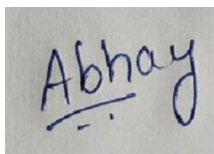
I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered from primary sources and carefully analyzed to assure its reliability.

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.

A handwritten signature in blue ink that reads "Abhay". The signature is written in a cursive style with a horizontal line underneath the name.

Signature of Candidate:

Name: Abhay Maurya

Date: December 3, 2024



IIT Madras
B.S. Degree

Coordinators

Prof. Andrew Thangaraj
Dept. of Electrical Engg.
IIT Madras

Prof. Vignesh Muthuvijayan
Dept. of Biotechnology
IIT Madras

Sep 27, 2024

To whomsoever it may concern

This is to certify that **ABHAY MAURYA(22F3001075)**, is a bonafide student of BS degree program, IIT Madras.

This letter is issued to support the student to reach out to Industry/Business establishments for their Capstone project in the Business Data Management course.

As part of the project, the students are required to collect and analyze data from the establishment. We kindly request you to support them in this regard. The data provided will not be shared with anyone else and will be used for academic purposes only.

We thank you for your support and cooperation.

M. Vignesh

Prof. Vignesh Muthuvijayan
Coordinator
IIT Madras B.S. Degree Program

I confirm that I will not share this data with anyone else and whatever is shared with me will be used purely for academic purposes.

**ABHAY
MAURYA**
Sign of Student

B.S. Degree Office, 3rd Floor, ICSR Building, Indian Institute of Technology Madras, Chennai - 600036

7850-999966 (Mon-Fri 9am-6pm)

support@onlinedegree.iitm.ac.in

1 Executive Summary

Panchsheel Enterprises, established on August 8, 2020, is a micro-manufacturing unit located in Rudrapur, Uttarakhand. It specializes in producing customized plastic articles for the B2B market. Operated by a small team with two machines, the company has built a reputation for reliability and quality. However, it faces significant challenges that limit its growth potential.

The primary issues identified are **low frequency and small order sizes**, coupled with the **need for expansion funds**. From January to August 2024, the company received only 14 irregular orders across three products: Handles, Colored Caps, and Digital Meter Boxes. This erratic demand causes underutilization of resources and raises per-unit costs. Additionally, delayed and partial payments from clients disrupt cash flow, making it challenging to secure external funding for retail expansion.

A comprehensive data analysis revealed that Handles, despite their volume, generate lower margins, while the Digital Meter Box, with a higher profit per unit, contributes significantly to revenue. Poor marketing efforts and a limited client network exacerbate the issues, resulting in inconsistent sales patterns.

To address these challenges, it is recommended that Panchsheel focus on **client retention**, particularly for high-volume clients, and prioritize high-margin products like the Digital Meter Box. Strengthening marketing and industry connections is essential to improve order frequency and size. Additionally, optimizing production resources and exploring external funding sources, such as banks or investors, will support retail market entry.

By stabilizing its B2B operations and leveraging internal revenue for expansion, Panchsheel Enterprises can achieve sustained growth. The proposed strategies will not only enhance operational efficiency but also position the company for future success in the competitive manufacturing landscape.

2 Organization Background

Panchsheel Enterprises is a micro-manufacturing company and was incorporated on 08th August, 2020, by its promoters Arun Maurya and Vikas Maurya. It is located in the industrial hub Rudrapur, Uttarakhand. It manufactures plastic articles of different sizes and shapes. It has set up an area measuring about 0.405 hectares of land. This tiny unit has a team of one skilled operator, one unskilled laborer and two machines. By focusing on customized manufacturing solutions, Panchsheel Enterprises has earned a reputation as a partner to reckon with for any company that would have its production reliably serviced. This is a strategic point for which, given the commitment, it finds a good position for future growth and expansion in this competitive manufacturing landscape.



Fig : Panchsheel Enterprise



Fig : Machines in factory

3 Problem Statement

3.1 Sales Challenges:

The business is struggling with a low frequency of orders and small order sizes, which significantly limits its growth potential.

3.2 Need for Expansion Funds:

The company requires additional capital to finance the further expansion into the retail markets.

4 Background of the Problem

The major problem with Panchsheel Enterprises is that the size of orders is not big enough and frequency is also very low. Only few orders were received from January 2024 to August 2024. This condition worsens because of a few small orders received at irregular periods. For every product that is made, there is a need to use an expensive mold. Hence, the lowly ordered quantity cannot justify the high costs of such molds. Inside, it can be viewed as underutilization of resources, both labor and machinery, which raises the per-unit cost. This irregular and thin issuance of big orders by the clients means that the company cannot maintain regular cash flow, which makes it very difficult to obtain those funds necessary for retail market expansion.

The cash flow problem has severely hit the retail market expansion of Panchsheel Enterprises. Payments by retailers are delayed sometimes up to a month or even more and at times partially. This delayed and partial payment culture has stretched the company's cash flow and instills a fear of availing of loan facilities from banks. This financial instability hurts the operational efficiency and inhibits growth. However, this unpredictability of the revenue makes the business not capable of accessing bank loans for investment in expansion and sustaining its operations.

5 Proof of originality of the Data

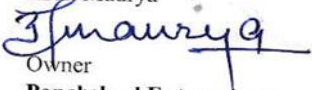
5.1 Letter from organization

Panchsheel Enterprises
Rudrapur, Uttarakhand
Date :
To Whom It May Concern,

This letter serves as authorization for Abhay Maurya, a student enrolled in the BS Degree Program at IIT Madras, to access business-related data from Panchsheel Enterprises for the purpose of conducting a Business Data Management project. The data provided will be used solely for academic purposes and is confidential.

Should you require any further information, please feel free to contact us.

Sincerely,

Arun Maurya

Owner
Panchsheel Enterprises
For Panchsheel Enterprises
arunmaurya1969@gmail.com
Partner

5.2 A short video 3-8 mins interacting with the founder

video link :

https://drive.google.com/drive/folders/12YXX95uXnRuIFOMkEngjrbrRJDyVVAUK?usp=s_haring

6 Descriptive Statistics

Order reported between January and August 2024 totaled 14 orders, with the major three products mostly responsible for aggregate orders. Colored Cap had total orders in four deliveries, at 1,950 kg; Digital Meter Box had four orders at 760 kg; and the biggest one was handles, at 2,575 kg from six orders. A large order size for Handles points to the importance the overall sales volumes accord Handles. It seems like Handles constitute a major source of revenues for the business.

It's very evident from the manufacturing time data that the Digital Meter Box takes the longest, 43 seconds per unit to be exact. Handles take only 15 and Colored Cap is 10 seconds per unit. The Digital Meter Box takes a little longer time in comparison to others because of the size of the box.

The total revenues from the three products amount to ₹191,981.2, split with the greatest number in Handles. The average revenue of all the products is ₹63,993.73, which means that the handles constitute the highest revenue for the total sales volume.

7 Detailed Explanation of Analysis Process/Method

7.1 Initialization:

After conducting extensive discussions with the owner and operator, I gained a complete understanding of the business model. The owner and operator found me invaluable and enlightened me on the plastic article market, which operates in very heavy competition between big and small companies. The business has no middlemen, because it services the clients directly. They take up the raw material according to the product from the client. This ensures the quality of product according to the client's needs. Their main clients are small businesses. They have only two employees, an operator and an unskilled laborer. The factory is equipped with two machines that operate according to production demand.

Images link:

<https://drive.google.com/drive/folders/1vXCYmvORFuCbxAcDJSVA45A6pm4KV7i5?usp=sharing>

7.2 Data collection and preparation:

The dataset was for the months of January to August 2024 and covered three SKUs: Handle, Colored Cap and Digital Meter Box. All the data was unstructured and taken on paper-based forms in reporting sales, revenue, profit and low sales costs (see figure1). For this dataset, per-unit product costs and profits have been a must in the overall financial performance of the company. The company produced products according to clients' order. This information formed the basis of the analysis done in respect of the challenges the company had in sales and where it could better its profitability and efficiency.

I have taken the data and processed it into digital format using MS Excel, thus converting unstructured, analog information into a neat digital form. The preprocessing effort had to be undertaken with utmost accuracy. Clean, structured data form good analysis (see table 1).

Dataset link:

https://drive.google.com/drive/folders/1Clqs7096DBlGIMSxwQqr13-tjgkf5haI?usp=drive_link

Raw Data link:

https://drive.google.com/drive/folders/19NLuAE2V_e7UWihSRw82I8Vr4fCQT4K4?usp=drive_link

M/s.	No.	Date	PARTICULARS	QTY	RATE	AMOUNT
	ABS					
		5/2/24		25		
		8/2		100		
		3/3		500		
		6/3		20		
		6/3		15		
		6/3		100		
				760		
			Job work - 12.50 pic. material from company.			

Figure 1 sample of data collected on paper

Date	Product	Quantity(kg)
16-01-2024	Handles	475
05-02-2024	Digital Meter box	25
08-02-2024	Digital Meter box	100
03-03-2024	Digital Meter box	500
06-03-2024	Digital Meter box	135
10-04-2024	Colored Cap	850
26-04-2024	Colored Cap	100
06-05-2024	Colored Cap	300
19-05-2024	Handles	500
31-05-2024	Colored Cap	700
05-06-2024	Handles	500
12-07-2024	Handles	300
22-07-2024	Handles	400
05-08-2024	Handles	400

Table 1 Digitalized sales dataset

For the second challenge, there was no formal data available, only discussions with retail shopkeepers were shared. A lack of funds has hindered their business expansion. They require financial support to invest in new machinery, additional manpower and in-depth market research to identify suitable retail products for growth.

7.3 Tools used:

Through the operator's interaction, I learned vital calculations on unit production for the product, margin, usage of raw materials and weight. MS Excel's features, such as graphical analysis, pivot tables and mathematical formulas, really made it easy for me to find some meaningful patterns in the dataset. These tools enabled me to derive strong insights on operational dynamics for the company, hence pinpointing key areas of improvement.

Column charts were used in the analysis of orders and their sizes, as well as the frequency of usage, while pie charts helped differentiate sales distribution within products, thereby giving an identification about which products are being ordered more frequently by whom. Revenue distribution to products is also given via the pie chart. Bar charts have been used to unbundle pricing per unit for products, hence yielding cost structure. Other usages made were pivot table to sum up the quantity of products. These graphic tools enhanced my understanding of it, hence informing decisions.

Using all sorts of mathematical tools through MS Excel, the numerous numerical analyses ran on this data. All these tools are being used for the sales problem and we get some insights from the analysis. Although the set is quite limited, pertinent insights were found to emanate from this set.

7.4 Approach:

An EDA approach is followed in order to highlight the trends and patterns in the sales data to address the sales issues Panchsheel Enterprises was facing. Subtle underlying causes like not so balanced order frequency with products were brought out by EDA. Bar graphs were used to understand which of the factors of competition, pricing, product quality and finally client relationship is actually influencing the sales trend. The analysis shows that the company has done little in terms of marketing and its network of customers is weak, thus barring it from receiving high-value, regular orders. Constructing a stable client base coupled with improving sales performance is the strategic plan needed to take it to future growth prospects. Building long-term relationships with major clients is also important for order volumes to stabilize and encourage further business growth.

To address the funding issue for entering the retail market. Panchsheel Enterprises should conduct an in-depth analysis of the retail product supply chain, from raw materials up to manufacturing costs and the pricing to mitigate the funding problem. This will help figure out how much needed capital will be accessed and position the business to turn out successful with the effective brand value and competitive pricing. On calculation of capital, they should seek investors from friends, families, banks, or small investment groups, among many others. After getting the desired funding, the company is sure to go forward with product development and launch in the retail market without any glitches.

8 Results and Findings

8.1 Orders Analysis:

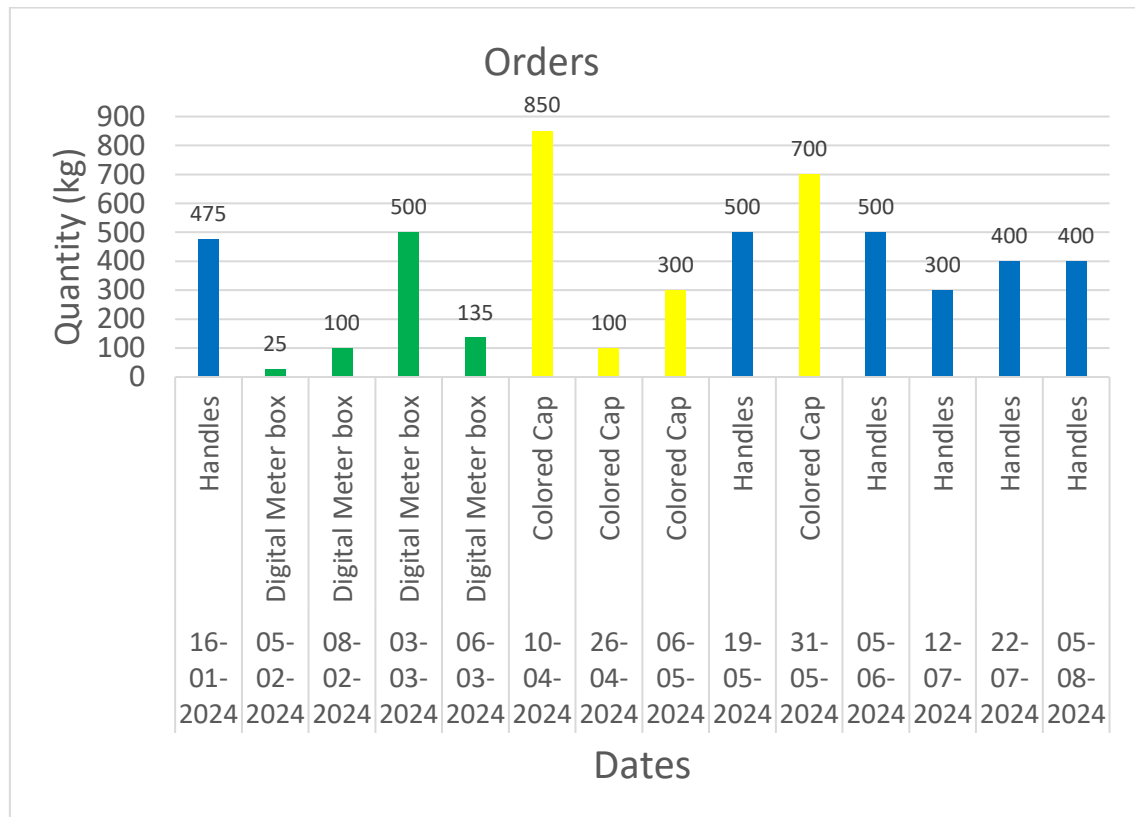


Figure 2 Column chart of sales dataset showing frequency and size of orders

In the analysis of sales data in figure 2, there exists variation in terms of order size and frequency between the products. Handles experienced the highest number of orders because of constant replenishment to a hand saw manufacturer and orders for the Digital Meter Box ceased in March 2024. Regular clients mostly of Handles and Colored Caps. Figure 2 also shows that the Digital Meter Box was procured in the last financial year from February 5, 2024 to March 6, 2024. Moreover, it reveals that the supplier had altered the supplier. However, the Handles customer had been retained since the past financial year. The Colored Cap customer has been joined in this financial year.

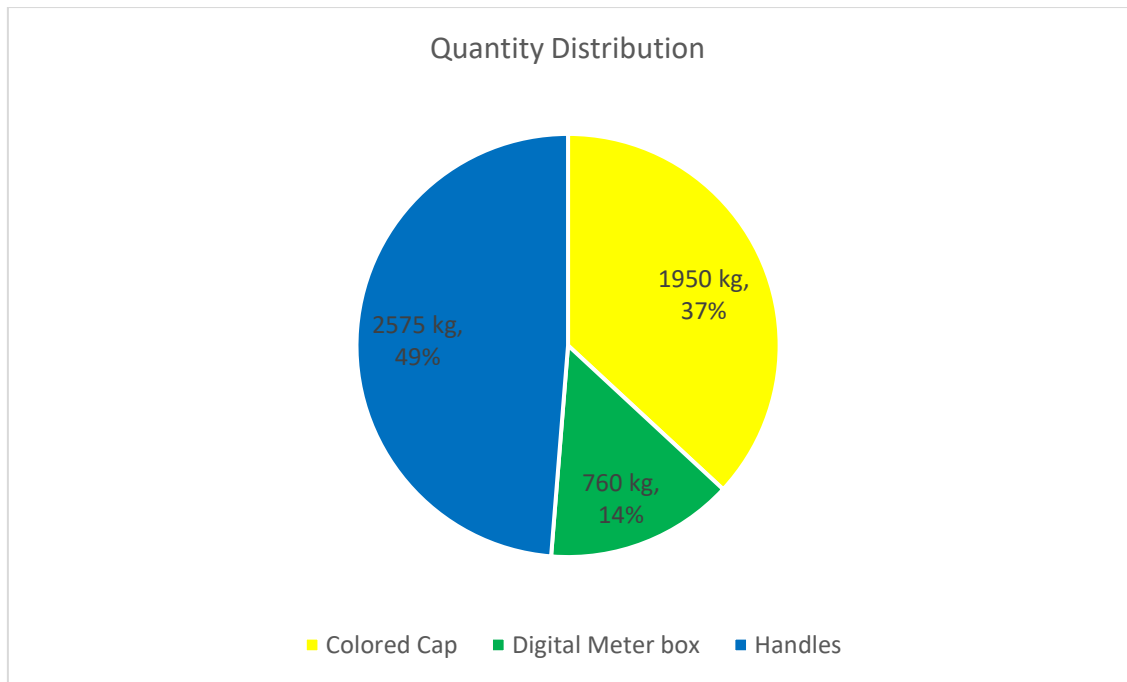


Figure 3 Pie chart of sales dataset showing distribution of SKUs in kgs

The overall order quantity for the handles was 2575 kg, which was more than the Colored Cap (1950 kg) and Digital Meter Box (760 kg) shown in figure 3. Larger and more frequent orders from the Handles client helped boost sales right from the beginning of the year. This draws attention to the company's poor sales, which mostly depend on the volume and amount of orders.

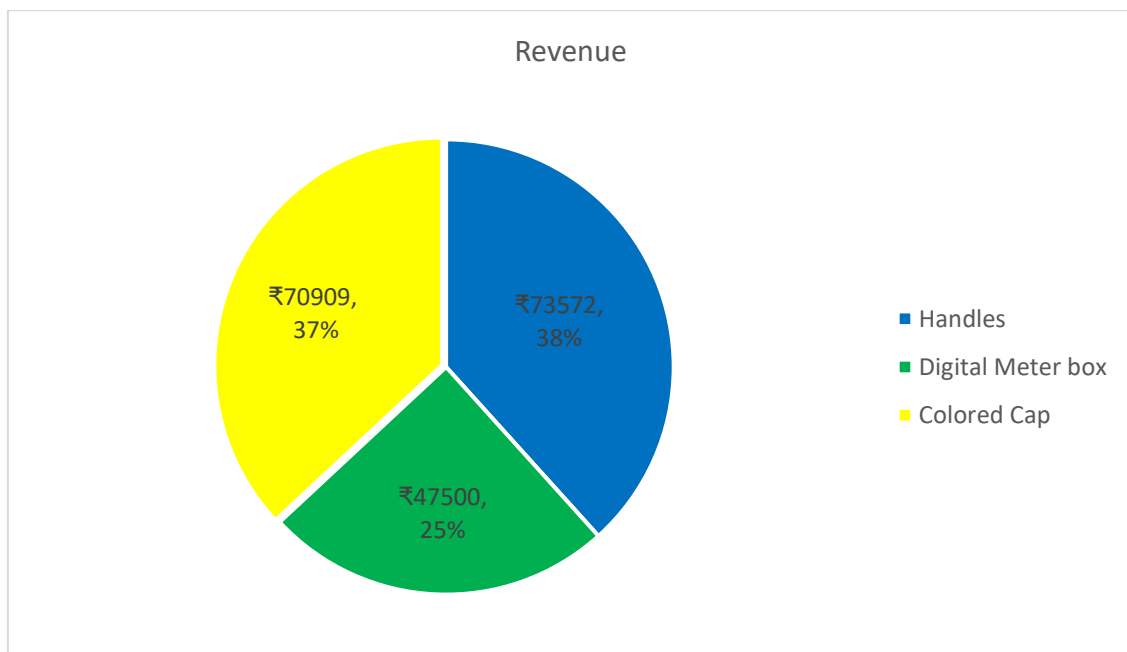


Figure 4 Revenue distribution of all SKUs

Exploratory data analysis (EDA) was utilized to find trends in order to resolve irregular sales patterns. These findings suggest that Panchsheel Enterprises should put a higher priority on client retention by getting back in touch with important customers who place regular, sizable orders. Both the volume and frequency of sales will rise with this tactic. In order to stabilize sales of all goods, study should also be done to determine why demand for the Digital Meter Box is declining. Maintaining steady business growth also requires attention to order size.

8.2 Product Analysis:

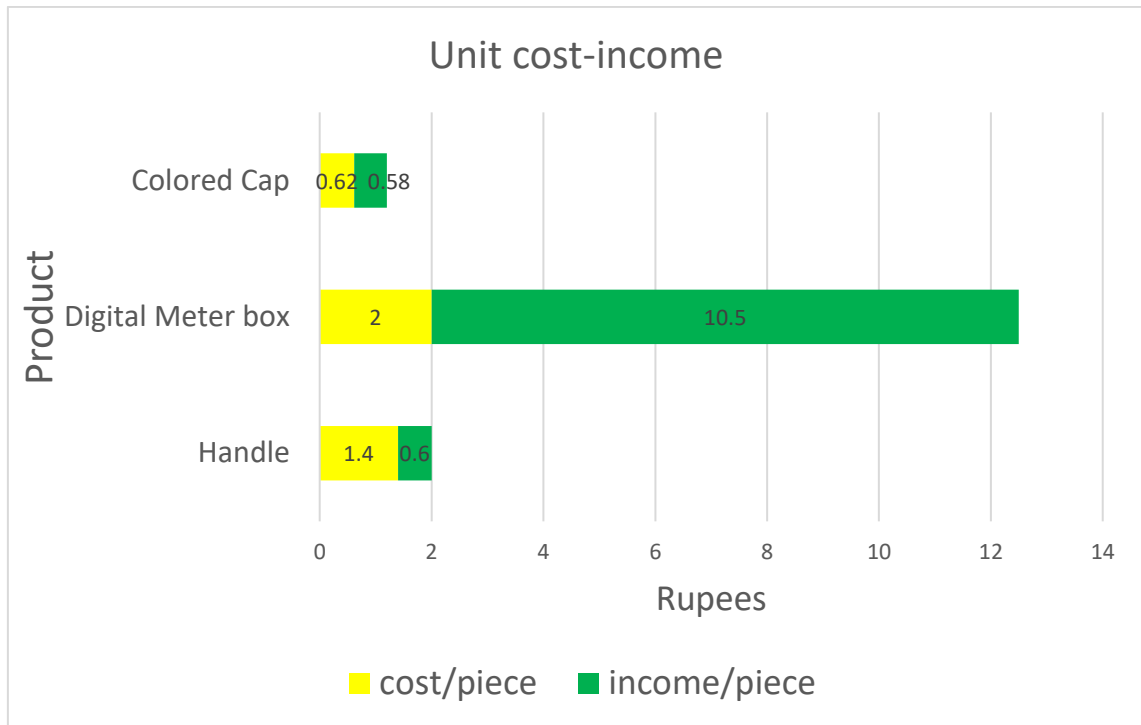


Figure 5 Bar chart showing the cost and income of a unit product of all SKUs

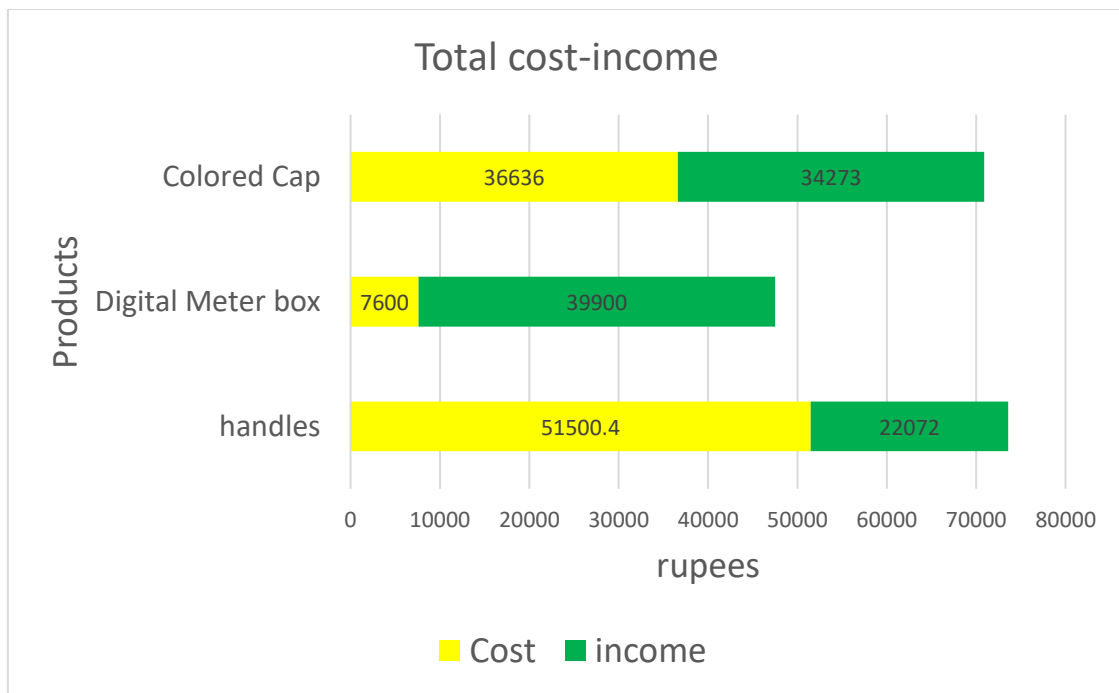


Figure 6 Bar chart shows total cost of products and their total income

The Digital Meter Box, which costs ₹10.50, is the product with the biggest profit margin, according to the product analysis. As seen in figure 5, the profit margins for colored caps and handles were significantly lower at ₹0.58 and ₹0.6, respectively.

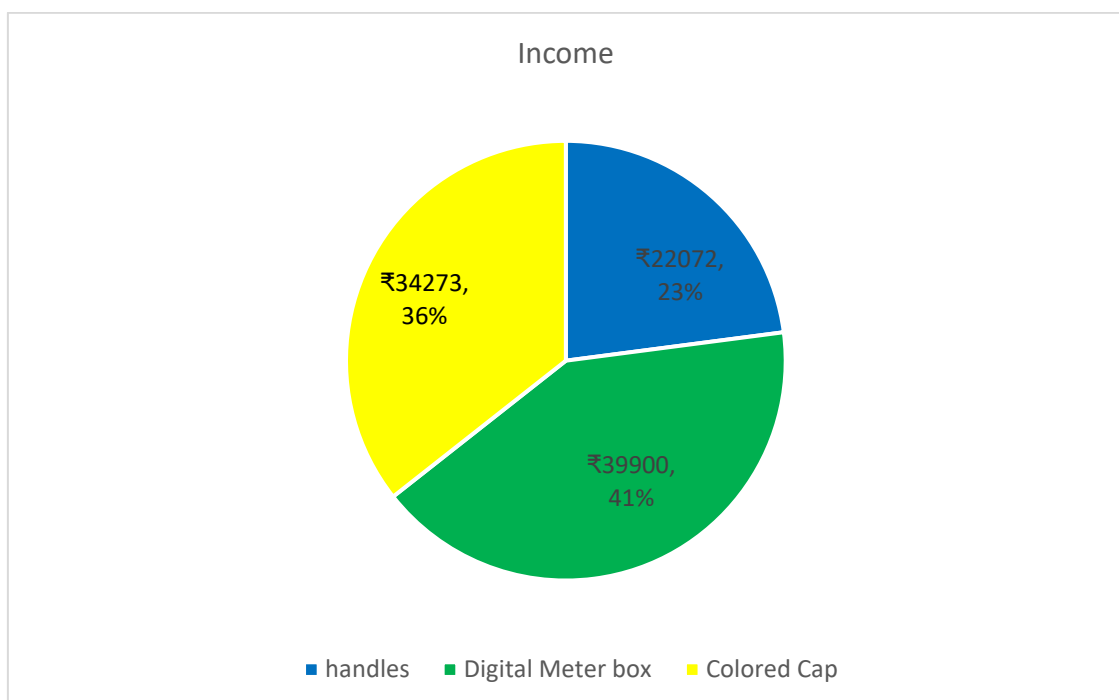


Figure 7 Income distribution of SKUs

The total production expenses and income from all orders are shown in Figure 6. While Handles and Colored Caps provide consistent, auxiliary revenue streams, the Digital Meter Box is the primary revenue generator (figure4), greatly increasing revenue. Although Handles and Colored Caps made about the same amount of money, their earnings differed slightly. With handles and colored caps helping to maintain a steady total income, this combination emphasizes the Digital Meter Box as the major source of money. See the figure 7 that shows the income distribution of SKUs from January 2024 to August 2024. Handles have the lowest income share with ₹22072 and highest share of Digital Meter Box with ₹39900 and Colored Cap with ₹34273.

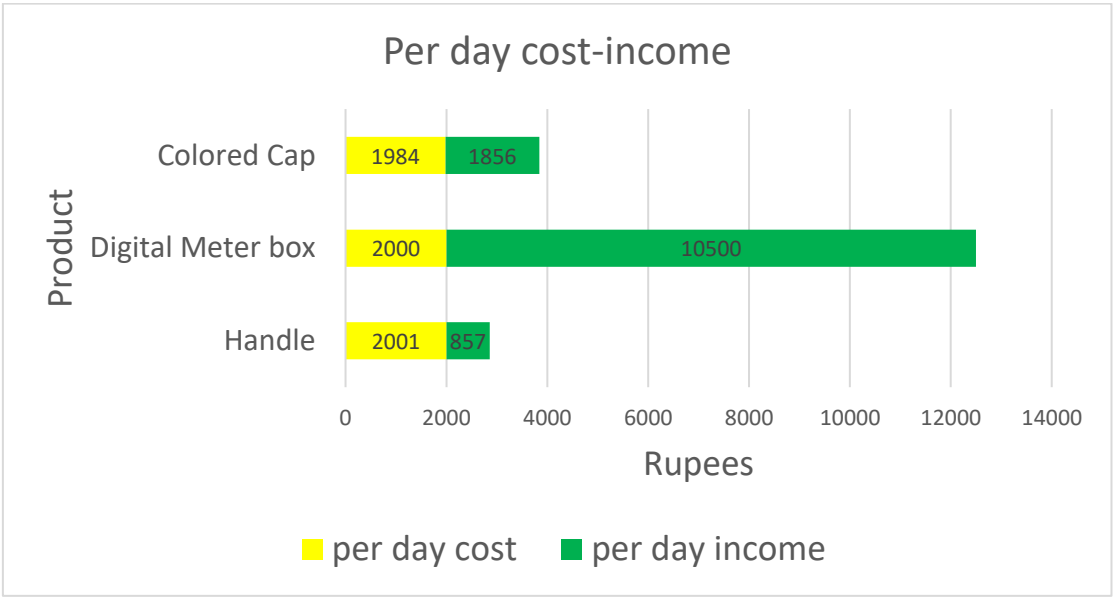


Figure 8 showing the per day cost and income of SKUs

It is clear from figure 8 that out of all the items, the Digital Meter Box makes the most money each day. As shown in figure 8, the approximate cost of production for all items in a day is ₹2000. The business may suffer losses if manufacturing does not reach the necessary volume, highlighting the necessity of efficient time management and resource optimization. The size and weight of the product determine how many pieces are produced each day, although these variables are not always related to profit. This implies that in order to maximize profitability, greater attention should be paid to high-income items with reduced labor costs. The owner added that a large company had ordered the Digital Meter Box and as big businesses usually have better profit margins, this product is a crucial area of focus for the company's financial expansion.

According to the data given in chart, revenue is greatly impacted by profit per unit. High-income items should be given priority by Panchsheel Enterprises in order to maximize daily productivity and profitability. Paying attention to these things will increase productivity and income. Furthermore, establishing manufacturing alliances with businesses that are similar to the ones placing the Digital Meter Box order can increase production consistency and guarantee on-time delivery. This approach will boost total sales and establish the organization as a more dependable provider.

8.3 Working Days Analysis

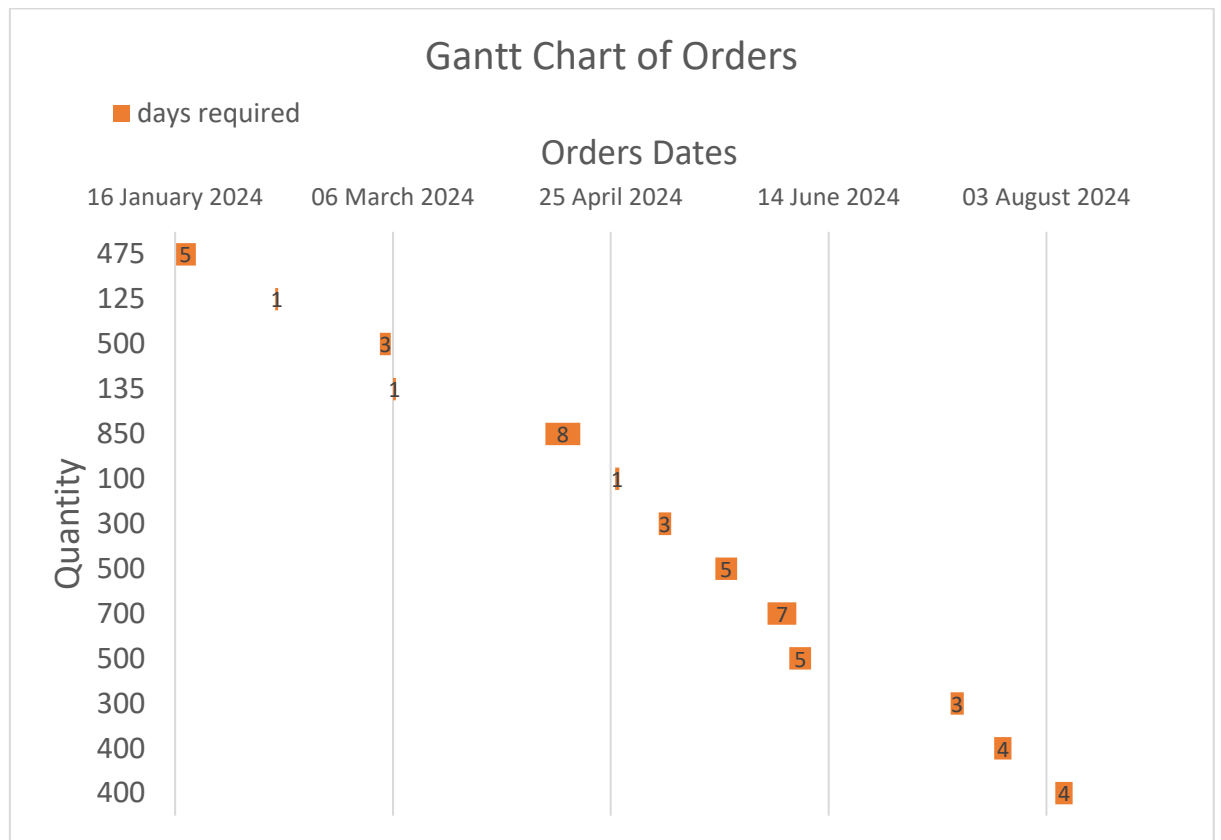


Figure 9 Gantt chart showing working days of business

Start Date	End date	Product	Quantity(kg)	Days required
16 January 2024	21 January 2024	Handles	475	5
08 February 2024	09 February 2024	Digital Meter box	125	1
03 March 2024	06 March 2024	Digital Meter box	500	3
06 March 2024	07 March 2024	Digital Meter box	135	1
10 April 2024	18 April 2024	Colored Cap	850	8
26 April 2024	27 April 2024	Colored Cap	100	1
06 May 2024	09 May 2024	Colored Cap	300	3
19 May 2024	24 May 2024	Handles	500	5
31 May 2024	07 June 2024	Colored Cap	700	7
05 June 2024	10 June 2024	Handles	500	5
12 July 2024	15 July 2024	Handles	300	3
22 July 2024	26 July 2024	Handles	400	4
05 August 2024	09 August 2024	Handles	400	4

Table 2 showing the days required for fulfilling of orders

Significant order gaps are shown in Figure 9 and table 2, emphasizing irregular order quantities. These anomalies point to a deficiency in marketing and a frail industrial network, which affects total sales and causes production halts. Panchsheel Enterprises should concentrate on fortifying their industry ties in order to obtain steady orders in order to remedy this. Better time management will also be essential since it will enable the business to devote time to investigating possible new retail products, which might increase revenue diversification and stabilize production flow.

8.4 Funding Analysis:

Funding is a barrier for Panchsheel Enterprises' retail market expansion, and it's hard to provide an accurate mathematical analysis without data. But as figure 9 demonstrates, their B2B sales are currently minimal and there are large order gaps. Increased B2B revenues could provide the internal funding required to enable expansion. Furthermore, figure 5 shows that their profit margins are positive for all items, indicating room for expansion without suffering product losses. I advise them to start by strengthening their industry ties in order to stabilize and expand their B2B network. Increased B2B sales might generate a consistent flow of revenue to finance upcoming retail endeavors.

They might think about contacting banks, investors or even friends and family for more money. A robust product lineup, efficient marketing and a strong distribution network are also necessary for a successful retail market entry. They may make sure they are ready and gain a better understanding of retail dynamics by conducting market research. A structured and significant start in the retail industry will be possible with proper administration of any outside funding, reducing risks and maximizing profits. They can position themselves for long-term success by concentrating on increasing B2B sales first and then cautiously entering the retail market for sustainable growth of business.

9 Interpretation of Results and Recommendation

9.1 Order Patterns and Client Retention

According to the order data, which also shows anomalies in the frequency and size of goods orders, handles have the most consistent demand while others do not. Nonetheless, the stability of overall sales is impacted by drops in demand for other products, including the Digital Meter Box. To counter this, Panchsheel Enterprises should focus on retaining key clients, particularly those who put larger, more frequent orders. Restoring these relationships and placing a strong emphasis on customer loyalty may boost sales volume and frequency, leading to more consistent revenue.

9.2 Product Profitability Focus

The profit research indicates that the Digital Meter Box is the most profitable product, with a larger profit per unit than Colored Caps and Handles. Despite producing fewer pieces each day, this product generates the highest daily revenue. Prioritizing high-margin products like the Digital Meter Box in marketing and production, along with strengthening ties with customers who place orders, will stabilize revenue and cash flow. By compensating for lower margins on other products, optimizing for high-profit items can enhance overall financial health.

9.3 Marketing and Network Building

A small market reach and weak industry linkages are indicators of large order timing differences, which obstruct consistent manufacturing and sales. Through targeted marketing and client outreach, Panchsheel should grow its industry network in order to receive more regular orders. The business will be able to create a consistent order flow, cut down on production delays and investigate new opportunities, such potential retail product development, by addressing these gaps.

9.4 Funding and Expansion Strategy

In order to generate internal funds for its retail expansion, Panchsheel should stabilize its business-to-business sales. Expanding this industry will provide a strong financial foundation for retail market entry, especially considering the relatively low present B2B sales volumes. If the company chooses to look for outside funding, like from banks or investors, it must also continue to follow a rigorous plan to manage these funds. Building a solid retail network backed by in-depth market research will guarantee a smooth and profitable market debut.

9.5 Strategic Recommendations

The following strategic measures are suggested for Panchsheel Enterprises based on the analysis above:

1) Focus on Client Retention and Network Building

Prioritize retaining clients who place sizable, frequent orders in order to increase order volume and frequency. Strengthen industry links through targeted marketing to guarantee a consistent order flow and minimize production gaps.

2) Emphasize High-Income Products

Focus manufacturing resources on high-profit items that bring in a sizable sum of money every day, like the Digital Meter Box. Keeping up relationships with companies who order these products often will increase revenue and promote consistency in production.

3) Optimize Time and Resource Management

Two advantages of efficiently managing production time and resources include meeting required order volumes and reducing the likelihood of financial losses. Time management should enable the research of new retail products, which will assist diversify revenue streams.

4) Develop a Strong Foundation for Retail Expansion

Once B2B sales are stable, consider breaking into the retail market by securing the necessary funding from outside sources, such banks or investors. A solid marketing strategy, a robust distribution network and thorough market research are necessary for a retail launch to be successful.

5) Hiring

To increase customer acquisition, strengthen relationships and increase Panchsheel's sales and profitability in the plastics business, hire a man with B2B sales expertise, industry connections and good negotiating abilities.

9.6 Conclusion

The Panchsheel Enterprises operations and sales research identifies key areas for strategic growth and improvement. An examination of order trends indicates that while Handles continue to see steady demand, sales of other products, such as the Digital Meter Box, occasionally fall. Panchsheel must prioritize client retention, particularly with high-frequency and high-volume clients, in order to combat this and encourage consistent income and sales stability. Improving client loyalty through targeted relationship management may increase demand consistency and predict revenue.

According to a product profitability analysis, the Digital Meter Box has the largest profit margin and generates a substantial amount of revenue each day despite having smaller manufacturing numbers. Focusing on these high-profit products while maintaining relationships with industrial clients who place frequent orders will result in a balanced cash flow. This strategy can protect lower-margin products and improve financial stability. Improved marketing and network expansion efforts can also expand the company's reach, helping to overcome the poor market exposure that now results in unpredictable cycles in production and sales. Panchsheel might create a consistent flow of orders and position itself to capitalize on opportunities such as retail development by expanding its industry network.

Panchsheel's growth funding approach should focus on internal revenue from consistent B2B sales before seeking retail development. Any upcoming retail initiatives will be built upon achieving consistent B2B sales. If additional capital is required, external sources like banks or investors can assist a methodical retail entrance strategy based on in-depth market research, effective marketing and a strong distribution network.

To sum up, Panchsheel Enterprises should put a high priority on keeping customers, emphasize high-profit items, make the most of time and resources, lay the groundwork for future retail expansion and employ skilled salesmen. By using these strategies, Panchsheel can stabilize current operations and achieve additional growth potential.

Ppt link:

<https://drive.google.com/file/d/1IRfMc64GVcRWJQyIvj6L8wDY7EAnUweE/view?usp=sharing>

Drive link:

https://drive.google.com/drive/folders/11UqjxAaKDCxyS-Xp6Bm93CrBzZKwKyRr?usp=drive_link