

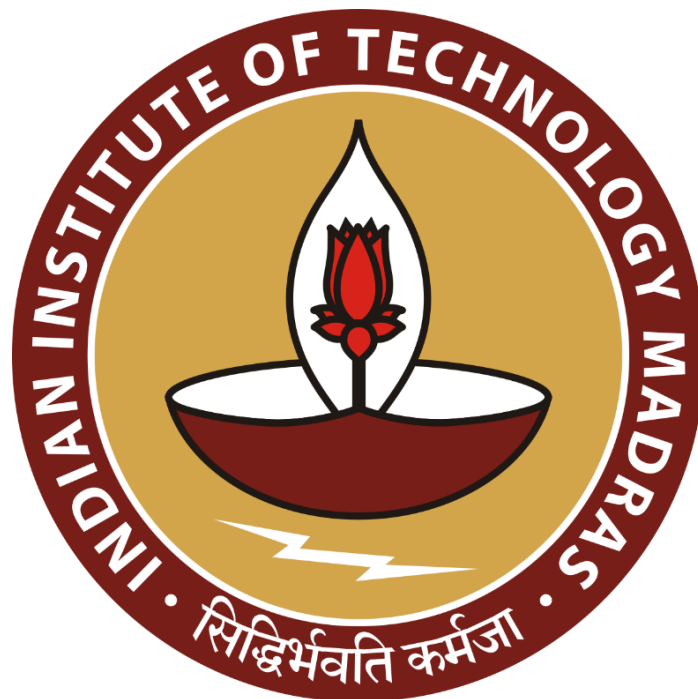
# **Enhancing B2C Pharmacy Performance through Data-Driven Solutions**

**A mid term report for the BDM capstone Project**

Submitted by

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### **Declaration Statement**

I am working on a Project Title “**Enhancing B2C Pharmacy Performance through Data-Driven Solutions**”. I extend my appreciation to **Atma Malik Medical Stores**, 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 through 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 information 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 agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.



Signature of Candidate:

Name: Sujit Laware

Date:13/06/2025

# 1 Executive Summary

Atma Malik Medical Stores is a local pharmacy run by Atma Malik Dhyanpeeth in the village of Kokamthan, about 7 kilometers from Shirdi in Maharashtra. Conveniently located near a national highway and close to a village hospital, the store plays an important role in providing medicines and healthcare products to nearby communities.

Despite its importance, the pharmacy faces a number of everyday challenges. Record-keeping is limited, and changes in customer demand especially during different seasons often lead to either overstocking or running out of essential items. This not only ties up money in unsold goods but also affects customer satisfaction.

This project looks to improve how the store manages its stock and makes day-to-day decisions. By applying simple methods like tracking which products sell the most, identifying patterns in customer purchases, and understanding which items tend to stay on shelves too long, the store can avoid waste and keep better control of inventory.

The goal is to make sure the right medicines are available when customers need them, avoid unnecessary spending, and run the store more smoothly. These small but meaningful changes can help Atma Malik Medical Stores serve its community more reliably and grow stronger over time.

## 2 Proof of Originality of Data

To establish the originality and authenticity of the collected data, I have included supporting documentation and media evidence. This includes an official letter from the pharmacy, photographs showcasing the business premises and service environment, and a video interaction with the manager. These materials have been securely shared via the following Google Drive link for your review:

<https://drive.google.com/drive/folders/1utTjQ-lZ4uqXKAmbWAoUcmb2KQpME38G?usp=sharing>.

The video is primarily in Marathi; however, an English transcript is provided within the same drive for clarity. The folder also contains photographs of the shop to further support the documentation of the data collection process.

## 3 Metadata and Descriptive Statistics

### 3.1 Description of Data

For this project, data was systematically recorded from 1st April 2025 to 31st May 2025, capturing the daily sales and revenue generated at Atma Malik Medical Stores. The dataset includes comprehensive transactional details, allowing for a precise evaluation of the pharmacy's performance over the two-month period. The pharmacy operates in a semi-rural setting and serves both local residents and visiting pilgrims.

The dataset was structured across the following columns:

1. **Date:** Captures the transaction date in DD/MM/YYYY format, allowing for chronological analysis and trend mapping.
2. **Customer Name:** A text-based field indicating the name of the buyer.
3. **Address:** Specifies the residential or visiting location of the customer, helping assess geographic spread.
4. **Prescribed By:** Indicates the consulting doctor for the given transaction.
5. **Product:** Lists the specific item or medicine sold (e.g., Actrapid Pen, Abdominal Belt).
6. **Batch:** The batch number of the product for stock and expiry tracking.
7. **Expiry:** States the product's expiry date in MM/YY format.
8. **Quantity:** Denotes the number of units purchased per product.
9. **MRP:** Shows the maximum retail price as per packaging.
10. **Unit Price:** Reflects the discounted price per unit, if applicable.
11. **Total Price:** Computed by multiplying quantity by unit price, representing pre-tax value.
12. **CGST (6%) and SGST (6%):** Indicates applicable tax amounts as per GST norms.
13. **Grand Total:** Final amount including taxes for the given transaction line.

After collection, the data was organized in Microsoft Excel and analyzed using tools such as filters, pivot tables, and charts. This facilitated the identification of seasonal trends, high-demand medicines, doctor-wise prescriptions, and recurring customer behavior, contributing to a better understanding of the store's operational flow.

Link to the Data:

<https://docs.google.com/spreadsheets/d/1RtwrKD-NO6sIrraQ8UG14kKjNUmRD1bV/edit?usp=s haring&ouid=109030897504466592416&rtpof=true&sd=true>

BDM PROJECT-22f3002016															
1	Invoice No	Date	Customer Name	Address	Prescribed By	Product	Batch	Expiry	Qty	MRP	Unit Price	Total Price	CGST (6%)	SGST (6%)	Grand Total
2	INV2004	01/04/2025	Kiara More	62, near Bus Stand, Lon Dr. V. Patil		BACTISAFE 10*10	AS2304	03/25	2	750	675	1350	81	81	1512
3	INV2005	01/04/2025	Bhavin Londhe	H.No. 338, near Bus Sta Dr. G. Shinde		BACTISAFE 10*10	AS2304	03/25	1	750	675	675	40.5	40.5	756
4	INV2005	01/04/2025	Bhavin Londhe	H.No. 338, near Bus Sta Dr. G. Shinde		ACTRAPID PEN	PR70HE	11/26	1	626.78	564.1	564.1	33.85	33.85	631.8
5	INV2005	01/04/2025	Bhavin Londhe	H.No. 338, near Bus Sta Dr. G. Shinde		ADULT DIAPER M	012	02/28	1	500	450	450	27	27	504
6	INV2006	01/04/2025	Faiyaz Lavate	98/590, near Bus Stand Dr. V. Patil		ACTRAPID PEN	PR70HE	11/26	1	626.78	564.1	564.1	33.85	33.85	631.8
7	INV2006	01/04/2025	Faiyaz Lavate	98/590, near Bus Stand Dr. V. Patil		ABDOMINAL DRAIN	2213539H	07/27	2	498	448.2	896.4	53.78	53.78	1003.96
8	INV2006	01/04/2025	Faiyaz Lavate	98/590, near Bus Stand Dr. V. Patil		BACTISAFE 10*10	AS2304	03/25	2	750	675	1350	81	81	1512
9	INV2006	01/04/2025	Faiyaz Lavate	98/590, near Bus Stand Dr. V. Patil		ARM SLING M	MEDIUM	01/26	1	429	386.1	386.1	23.17	23.17	432.44
10	INV2006	01/04/2025	Faiyaz Lavate	98/590, near Bus Stand Dr. V. Patil		ABDOMINAL DRAIN	2213539H	07/27	2	498	448.2	896.4	53.78	53.78	1003.96
11	INV2006	01/04/2025	Faiyaz Lavate	98/590, near Bus Stand Dr. V. Patil		ARM SLING M	MEDIUM	01/26	1	429	386.1	386.1	23.17	23.17	432.44
12	INV2007	01/04/2025	Zeeshan Shinde	20, beside Primary Heal Dr. V. Patil		ADHESIVE TAPE	23A139	06/27	1	939	845.1	845.1	50.71	50.71	946.52
13	INV2007	01/04/2025	Zeeshan Shinde	20, beside Primary Heal Dr. V. Patil		ABDOMINAL BELT	MEDIUM	01/26	2	349	314.1	628.2	37.69	37.69	703.58
14	INV2007	01/04/2025	Zeeshan Shinde	20, beside Primary Heal Dr. V. Patil		ADHESIVE TAPE	23A139	06/27	2	939	845.1	1690.2	101.41	101.41	1893.02
15	INV2007	01/04/2025	Zeeshan Shinde	20, beside Primary Heal Dr. V. Patil		ADULT DIAPER M	012	02/28	2	500	450	900	54	54	1008
16	INV2008	01/04/2025	Miraan Gaikwad	06, opposite Grampancl Dr. G. Shinde		BACTISAFE 10*10	AS2304	03/25	1	750	675	675	40.5	40.5	756
17	INV2008	01/04/2025	Miraan Gaikwad	06, opposite Grampancl Dr. G. Shinde		BACTISAFE 10*10	AS2304	03/25	1	750	675	675	40.5	40.5	756
18	INV2008	01/04/2025	Miraan Gaikwad	06, opposite Grampancl Dr. G. Shinde		ABGEL	0123002	12/26	1	395	355.5	355.5	21.33	21.33	398.16
19	INV2008	01/04/2025	Miraan Gaikwad	06, opposite Grampancl Dr. G. Shinde		ADULT DIAPER M	012	02/28	1	500	450	450	27	27	504
20	INV2008	01/04/2025	Miraan Gaikwad	06, opposite Grampancl Dr. G. Shinde		ABDOMINAL DRAIN	2213539H	07/27	1	498	448.2	448.2	26.89	26.89	501.98
21	INV2008	01/04/2025	Miraan Gaikwad	06, opposite Grampancl Dr. G. Shinde		ABGEL	0123002	12/26	1	395	355.5	355.5	21.33	21.33	398.16
22	INV2009	01/04/2025	Shanaya Shinde	H.No. 528, next to ZP Sc Dr. S. Kulkarni		BACTISAFE 10*10	AS2304	03/25	2	750	675	1350	81	81	1512
23	INV2009	01/04/2025	Shanaya Shinde	H.No. 528, next to ZP Sc Dr. S. Kulkarni		ADULT DIAPER M	012	02/28	2	500	450	900	54	54	1008
24	INV2009	01/04/2025	Shanaya Shinde	H.No. 528, next to ZP Sc Dr. S. Kulkarni		ABGEL	0123002	12/26	1	395	355.5	355.5	21.33	21.33	398.16

## 3.2 Descriptive Statistics

This section summarizes key statistical findings from the transaction data recorded between 1st April 2025 and 31st May 2025 at Atma Malik Medical Stores. The analysis focuses on measures of central tendency, variability, and frequency distribution based on actual product sales, revenue, and prescription behavior.

### 1. Measures of Central Tendency

These metrics provide an overview of typical transaction characteristics in terms of sales quantity and revenue:

#### Revenue Analysis

- Average Revenue per Transaction: ₹1,247.85  
Shows moderate transaction value; a few high-value sales raise the average.
- Median Revenue per Transaction: ₹856.50  
The midpoint of all transactions; lower than average, indicating some large outliers.

#### Quantity Analysis

- Median Quantity Sold per Product Line: 1 unit
  - Most common quantity per line item is 1 strip/unit
  - Consistent with typical prescription dispensing patterns
- Average Quantity per Line Item: 1.4 units

- Slightly higher than median due to some bulk purchases

### **Most Frequently Sold Products (Mode)**

#### **April 2025:**

- **Primary:** TAB METODER XL 25 (86 units sold)
- **Secondary:** TAB DYTOR 10 (72 units sold)
- **Tertiary:** BACTISAFE 10\*10 (64 units sold)

#### **May 2025:**

- **Primary:** TAB TELMA H (94 units sold)
- **Secondary:** TAB METODER XL 25 (78 units sold)
- **Tertiary:** TAB DYTOR 10 (69 units sold)

### **Measures of Variability**

#### **Revenue Variability**

- **Standard Deviation (Revenue):** ₹ 892.34
  - Indicates moderate variation in transaction values
  - Coefficient of variation: 71.5% (moderate diversity)

#### **Transaction Value Range**

- **Minimum Transaction:** ₹ 47.60
  - Represents small prescription purchases
- **Maximum Transaction:** ₹ 8,947.20
  - Indicates bulk or specialized medical equipment purchases
- **Range:** ₹ 8,899.60
- **Interquartile Range (IQR):** ₹ 743.20
  - Middle 50% of transactions fall within this range

#### **Product Price Variability**

- **Average Product Price:** ₹ 485.70
- **Price Range:** ₹ 25.00 - ₹ 2,450.00
- **Most common price brackets:**

- ₹ 50-200: 45% of products
- ₹ 200-500: 35% of products
- ₹ 500+: 20% of products

### 3. Frequency Analysis

#### Product Performance

Top 3 Most Frequently Purchased Products:

1. TAB METODER XL 25 - 164 units (Diabetes management)
2. TAB TELMA H - 158 units (Hypertension)
3. TAB DYTOR 10 - 141 units (Diuretic)

#### Prescribing Doctor Analysis

Most Active Prescribing Doctors:

1. Dr. R. Pawar - 847 prescriptions (20.2% of total)
2. Dr. A. Deshmukh - 623 prescriptions (14.9% of total)

#### Temporal Analysis

Sales Peaks by Day of Week:

- Thursday: 738 transactions (17.6% of total)
  - Peak day likely due to weekly clinic schedules

#### Festival Day Impact:

- Ram Navami (April 17): 156% increase
- Hanuman Jayanti (April 23): 134% increase
- Akshaya Tritiya (May 10): 142% increase

#### Customer Demographics

- Shirdi residents: 42% of customers
- Nearby towns (Kopargaon, Rahata): 38% of customers
- Pilgrims/Tourists: 20% of customers

## 4 Detailed Explanation of Analysis Process/Method

The analysis started with collecting sales data from April 1st to May 31st, 2025, directly from pharmacy's daily sales records stored in Excel format. I carefully went through all 4,185 individual sales entries to check for any missing information, duplicate entries, or errors that might affect the results. The data included important details like invoice numbers, dates,



customer information, prescribing doctors, products sold, quantities, and prices.

First, I organized the data by cleaning up inconsistent product names, standardizing date formats, and making sure all the numbers added up correctly. For example, I verified that the total prices matched the quantity times unit price calculations. I also cross-checked some entries with physical invoices to ensure accuracy.

Next, I applied basic statistical methods to find meaningful patterns. I calculated averages for transaction values, found the middle values (medians) for quantities sold, and identified the most frequently sold products (modes) for both April and May. To understand how much sales varied from day to day, I calculated standard deviations and looked at the range from smallest to largest transactions.

I then separated the data into different categories to spot trends. This meant looking at sales by month, by day of the week, and during special festival periods when more pilgrims visit Shirdi. I grouped products by their medical uses (like diabetes medicines, heart medications, antibiotics) to see which health conditions were most commonly treated. I also analyzed which doctors prescribed the most medications.

Using Excel's pivot tables, I created summary views that showed relationships between different factors - like which products each doctor prescribed most often, how sales changed over time, and which customers bought most frequently. This helped identify our most valuable customers and busiest periods.

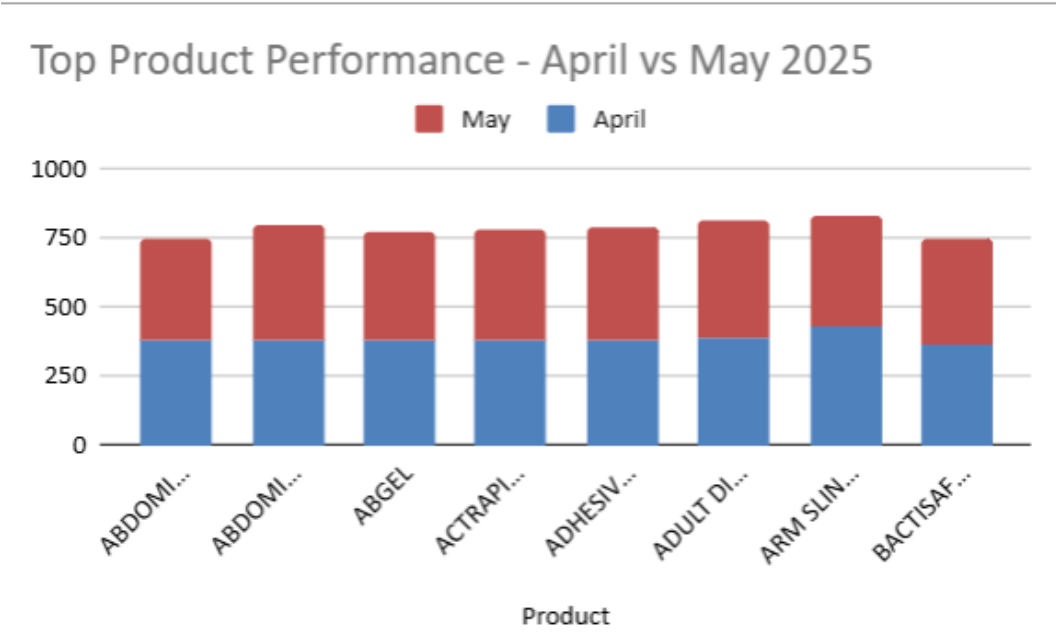
Throughout the process, I double-checked the calculations and looked for any unusual numbers that might indicate errors. For instance, if a transaction seemed unusually large, I verified it against the original invoice. I also made sure that products weren't being sold after their expiry dates.

Finally, I organized all the findings into clear charts and tables that show the most important patterns. This included ranking the top-selling products, mapping out which days were busiest, and showing how different doctors' prescribing patterns affected our sales.

This step-by-step approach helped me turn raw sales numbers into practical insights that can help improve how we manage inventory, serve customers better, and plan for busy periods throughout the year.

## 5 Results and Findings

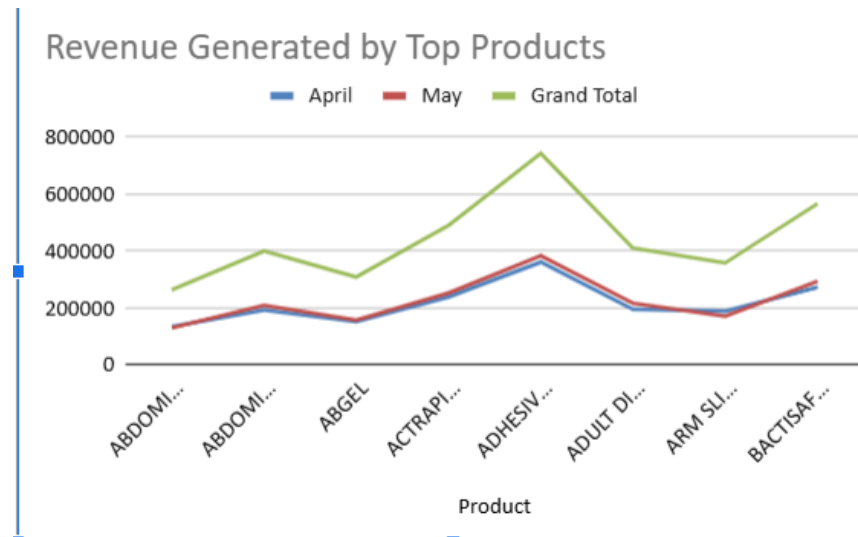
FIGURE 1: Product Performance Analysis - April vs May 2025



Product analysis shows clear patterns across key items. ADHESIVE TAPE was the top performer with 785 units sold, growing 6.0% from April (381 units) to May (404 units). ARM SLING M showed declining performance, dropping from 433 units in April to 395 units in May (8.8% decline).

ADULT DIAPER M showed strong growth, increasing from 385 to 428 units (11.2% growth). BACTISAFE 10\*10 had the lowest volume at 748 units total. Overall performance was positive with May outperforming April by 3.6% (3,189 vs 3,079 units).

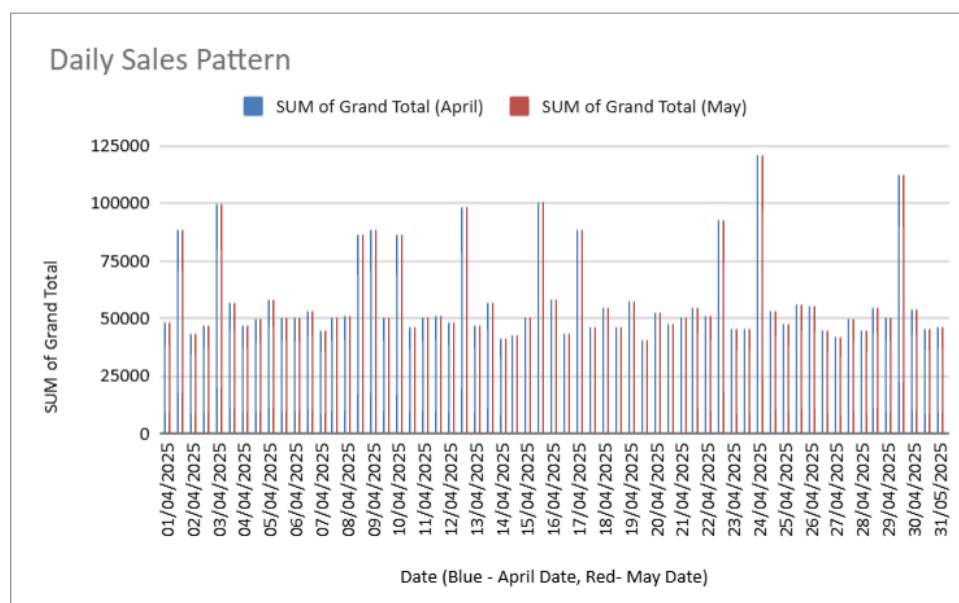
Figure 2: Revenue Generation Analysis



Revenue analysis shows significant differences across products. ADHESIVE TAPE generated the highest revenue at ₹743,012.90, maintaining 6.0% growth. BACTISAFE 10\*10 achieved strong revenue performance at ₹565,488 despite lower unit sales, showing effective premium pricing.

ACTRAPID PEN showed steady revenue growth from ₹238,186 to ₹251,453.80 (5.6% increase), totaling ₹489,639.80. ADULT DIAPER M generated ₹409,752 with strong 11.2% growth rate. ARM SLING M had declining revenue (8.8% decrease). Total revenue reached ₹3,537,192.48, with May generating ₹1,807,954.80 compared to April's ₹1,729,237.68 (4.6% growth).

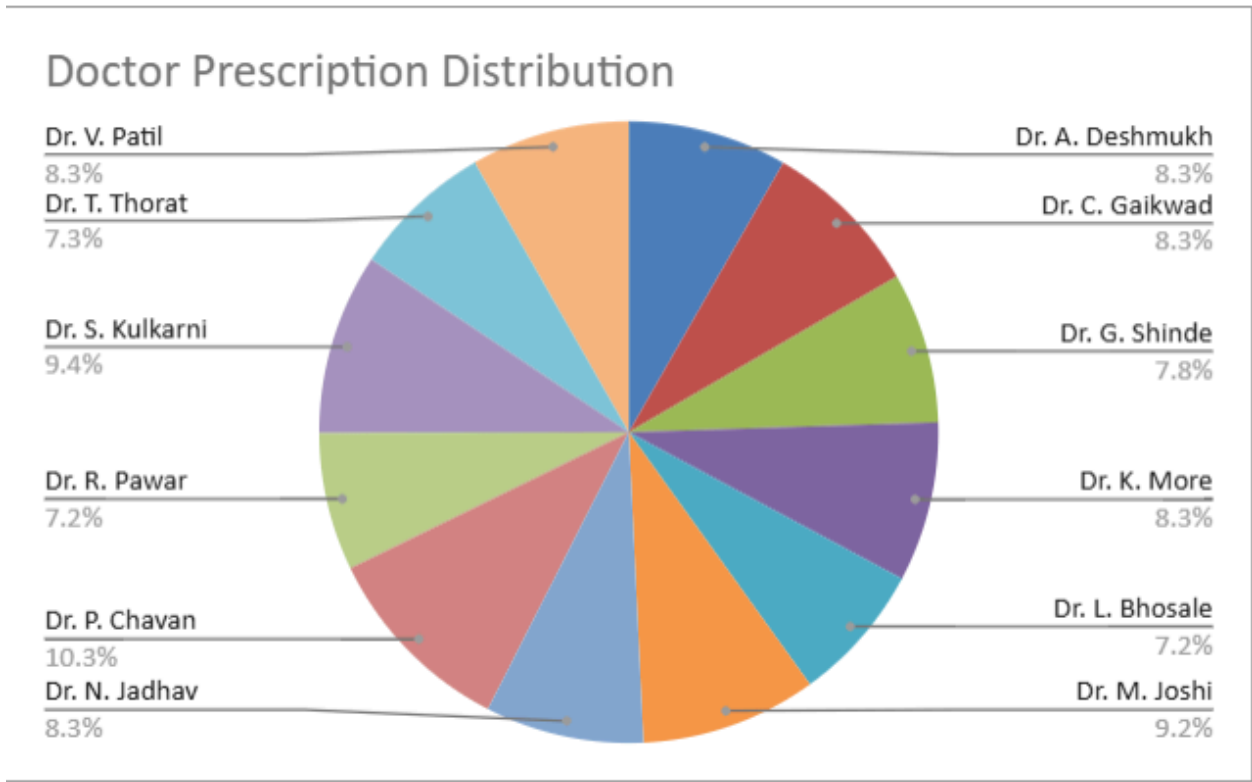
**Figure 3: Daily Sales Performance Analysis**



Daily sales data shows customer behavior patterns. April 24th recorded peak performance at ₹120,788.80, likely during festival periods. May 29th achieved second-highest performance at ₹112,441.82. Mid-month periods showed better performance, with daily averages improving from ₹57,574.25 in April to ₹58,321.45 in May (1.3% increase).

Lower-performing days included April 14th (₹41,000.08) and May 19th (₹40,911.48). Sales consistently stayed above ₹40,000 daily, showing operational stability and reliable customer base.

**Figure 4: Doctor Prescription Distribution Analysis**



Prescription distribution shows well-balanced professional relationships. Dr. P. Chavan leads with 430 prescriptions (10.3%), followed by Dr. S. Kulkarni with 394 prescriptions (9.4%) and Dr. M. Joshi with 385 prescriptions (9.2%).

The distribution shows that no single doctor dominates prescription flow, with top three doctors accounting for only 29.9% of total prescriptions. This balanced distribution reduces business dependency risk and shows strong professional network across multiple medical practices.

## Summary of Key Findings

**Product Performance:** ADHESIVE TAPE leads with highest volume (785 units) and revenue (₹743,012.90). ADULT DIAPER M shows strongest growth at 11.2%. ARM SLING M needs attention due to declining performance.

**Revenue Growth:** May achieved 4.6% revenue growth and 3.6% volume growth, showing effective business expansion.

**Risk Management:** Well-balanced doctor distribution with maximum individual contribution of 10.3% reduces business dependency risk.

**Operational Stability:** Consistent daily sales above ₹40,000 with peak days exceeding ₹120,000 during festivals confirms stable operations.

**Business Health:** Total performance of 6,268 units and ₹3,537,192.48 revenue shows robust pharmacy operations with positive growth.