IIT Madras

Operational Excellence and Profit Optimization Strategy: Dayash Life Sciences

BUSINESS DATA MANAGEMENT - CAPSTONE PROJECT - FINAL REPORT

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1.Executive Summary

This report analyses the operational and financial challenges faced by Dayash Life Sciences Private Limited, a pharmaceutical distribution company specializing in generic medicines and specialized healthcare products. The study spans November 2024 to April 2025 and focuses on three critical business challenges: stagnant profits despite increasing market demand, inefficient inventory management characterized by overstocking and product expiration, and rising material and operational costs including regulatory compliance expenses.

The analysis process involved comprehensive data collection, cleaning, preparation, regression modelling, and forecasting to derive actionable insights. Raw data from invoices, purchase orders, and regulatory documentation was systematically digitized into structured Excel sheets comprising pharmaceutical sales, returns/refunds, and purchase/inventory data. Analytical techniques included calculating key pharmaceutical industry ratios (inventory turnover ratio, profit margins, cost-to-revenue ratios), regression modelling to assess correlations, and time series forecasting methods including ARIMA to predict trends.

Key findings revealed highly inconsistent sales revenue, fluctuating between ₹84,500 in February and ₹725,600 in April, with significant losses in June and July contributing to profit stagnation. The average monthly sales of ₹418,250 masked underlying volatility that hampered business stability. Regression analysis showed weak correlation between sales volume and profitability ($R^2 \approx 0.021$), indicating systemic inefficiencies in cost management and pricing strategies.

Inventory management emerged as a critical operational challenge, with pharmaceutical products showing extremely poor turnover ratios. Analysis of antibiotics, a significant revenue category, revealed a turnover ratio of only 0.26, meaning only 3,250 units were distributed from 12,500 units purchased. This resulted in 925 units expiring, representing substantial capital waste and storage inefficiencies. The pharmaceutical industry's strict expiry requirements amplified these challenges, with 34% of overall inventory remaining unused.

Cost analysis revealed pharmaceutical product prices increased by 21.09% during the study period, while regulatory compliance costs surged by 49.34% and cold-chain logistics expenses rose by 50.01%. These cost pressures, combined with inefficient inventory management, severely impacted profit margins. Material costs dominated the expense structure at approximately 75%, followed by regulatory compliance at 18% and logistics at 7%.

Recommendations include implementing advanced demand forecasting systems specifically designed for pharmaceutical distribution, adopting just-in-time inventory management with shorter ordering cycles, negotiating bulk purchasing agreements to mitigate rising material costs, optimizing cold-chain logistics networks, and establishing automated expiry tracking systems. These strategic interventions can help stabilize revenue streams, optimize inventory turnover, and enhance operational efficiency in the competitive pharmaceutical distribution market.

2.Detailed Explanation of Analysis Processes and Methods

The comprehensive data analysis process was designed to address the specific operational challenges identified in pharmaceutical distribution, including profit volatility, inventory inefficiencies, and cost escalation. The methodology began with stakeholder engagement and trust-building, followed by systematic data collection, organization, cleaning, and advanced analytical modelling. The dataset, spanning November 2024 to April 2025, included pharmaceutical sales transactions, product returns, and inventory purchases, providing a robust foundation for operational and financial analysis.

Data acquisition presented unique challenges in the pharmaceutical sector due to regulatory sensitivity and confidentiality concerns. Initial interactions with Dayash Life Sciences management required extensive rapport-building and clear explanation of analytical objectives. Through multiple consultations and transparency about data usage, raw pharmaceutical sales data in invoice format was systematically converted into digital sheets. The collaborative approach yielded three primary data sources: Pharma_sales containing transaction details, Returns_refunds documenting product returns and refunds, and Purchase_inventory tracking procurement activities.

The pharmaceutical industry's regulatory requirements necessitated careful handling of product codes, batch numbers, and expiry dates during data conversion. Multiple validation sessions with company personnel ensured data accuracy and completeness, particularly for critical fields like product categories, quantities, and financial values. Backup copies of all raw data were maintained to preserve analytical integrity throughout the process.

Data Cleaning and Preparation

For Stagnant Profit Analysis: The cleaning process focused on ensuring consistency and accuracy in pharmaceutical sales and profit calculations. Key columns included TOTAL_SALES from the Pharma_sales sheet representing revenue, and calculated Profit/Loss from the aggregated data representing monthly profitability. Month names across all sheets were standardized using a consistent YYYY-MM format to avoid temporal mismatches during analysis. The TOTAL_SALES column was converted to numeric format using pd.to_numeric(df['TOTAL_SALES'], errors='coerce'), enabling precise financial calculations. Missing values in sales data were filled with 0 using .fillna(0, inplace=True) to prevent computational errors. Duplicate entries based on transaction dates were identified and removed using df.drop_duplicates(subset=['DATE', 'PRODUCT_CODE'], keep='first', inplace=True). Additionally, outlier detection was performed to identify unusually high or low transaction values that might indicate data entry errors.

For Inventory Management Analysis: The cleaning process concentrated on reconciling purchase quantities with distribution data across pharmaceutical product categories. The primary column was QUANTITY from the Purchase_inventory sheet, representing purchased units, matched against DISTRIBUTED_QUANTITY from the Pharma_sales sheet. A critical issue was resolved where product codes were inconsistent between sheets, requiring standardization using a master product catalog. Purchase quantities were aggregated by product category using df.groupby(['MONTH', 'PRODUCT_CATEGORY'])['QUANTITY'].sum().reset_index(name='TOTAL_PURCHASED'). Similarly, distributed quantities were aggregated to enable turnover ratio calculations. Expiry date validation was performed using pd.to_datetime(df['EXPIRY_DATE'], format='%Y-%m-%d', errors='coerce') to identify products approaching expiration. Missing expiry dates were flagged for manual verification with company records. The cleaning process also involved converting batch numbers to standardized formats for tracking purposes.

For Rising Costs Analysis: The cleaning process focused on categorizing and standardizing various cost components affecting pharmaceutical distribution. Key columns included PURCHASE_COST from the Purchase_inventory sheet, REGULATORY_COSTS from compliance documentation, and LOGISTICS_COSTS from transportation records. Cost categories were standardized using predefined

pharmaceutical industry classifications (materials, regulatory, logistics, storage). Monthly cost aggregation was performed using df.groupby('MONTH')[['PURCHASE_COST', 'REGULATORY_COSTS', 'LOGISTICS_COSTS']].sum().reset_index(). Currency formatting inconsistencies were resolved by converting all financial values to numeric format. Missing cost data was handled through interpolation where patterns could be identified, or flagged for manual verification. Cold-chain logistics costs, critical for pharmaceutical distribution, were separately tracked and validated against temperature monitoring records.

Analytical Techniques

Analysis Process for Stagnant Profits

The stagnant profit analysis focused on understanding revenue volatility and its impact on pharmaceutical distribution profitability. Data sources included TOTAL_SALES from Pharma_sales sheet and calculated monthly profits, grouped by MONTH and PRODUCT_CATEGORY.

Key formulas applied were:

- **Profit Margin = (Monthly Revenue - Monthly Costs) / Monthly Revenue × 100**
- **Revenue Growth Rate = ((Revenue_t - Revenue_{t-1}) / Revenue_{t-1}) × 100**
- **Product Category Contribution = Category Revenue / Total Revenue × 100**

Using pandas, pharmaceutical sales were aggregated by summing TOTAL_SALES for each month and product category. This data was merged with cost data to calculate monthly profitability. Revenue growth rates were computed by comparing consecutive months, revealing significant volatility patterns. Linear regression models were fitted using scikit-learn to assess the relationship between sales volume and profitability, with pharmaceutical unit sales as the independent variable and profit as the dependent variable. The model's performance was evaluated using R^2 scores to determine predictive accuracy.

Time series analysis using ARIMA models was applied to forecast future revenue trends based on historical pharmaceutical sales patterns. Seasonal decomposition was performed to identify recurring patterns in pharmaceutical demand, particularly important given the industry's seasonal variations in medicine consumption. Visualizations including polar plots and line charts were created to highlight monthly revenue fluctuations and profit margin trends.

Analysis Process for Inefficient Inventory Management

The inventory management analysis aimed to evaluate pharmaceutical stock efficiency and identify overstocking issues specific to medicine distribution challenges. Data sources included QUANTITY from Purchase_inventory sheet and DISTRIBUTED_QUANTITY from Pharma_sales sheet, analyzed by product category and expiry timeline.

Critical metrics calculated were:

- **Inventory Turnover Ratio (ITR) = Distributed Quantity / Total Purchased Quantity**
- **Days Sales of Inventory (DSI) = (Average Inventory / Cost of Goods Sold) × 365**
- **Expiry Risk Ratio = Units Near Expiry / Total Units × 100**
- **Stock Utilization Rate = Distributed Units / Purchased Units × 100**

Pharmaceutical products were categorized by therapeutic class (antibiotics, analgesics, chronic disease medications) to identify category-specific inventory patterns. For each product category, turnover ratios were calculated monthly to track inventory efficiency trends. Expiry tracking was

implemented using product manufacturing dates and shelf life specifications, critical for pharmaceutical compliance. Products within 30 days of expiry were flagged for priority distribution or write-off consideration.

Advanced analytics included clustering analysis to identify product categories with similar inventory patterns, enabling targeted management strategies. Forecasting models predicted future inventory requirements based on historical distribution patterns and seasonal demand variations. Heat maps and inventory flow diagrams visualized stock movement patterns and identified bottlenecks in pharmaceutical distribution chains.

Analysis Process for Rising Material/Operational Costs

The cost analysis focused on pharmaceutical industry-specific expense categories including raw material costs, regulatory compliance expenses, and specialized logistics requirements. Data sources included PURCHASE_COST from procurement records, regulatory documentation costs, and cold-chain logistics expenses, grouped by MONTH and cost category.

Key metrics calculated were:

- **Cost Inflation Rate = ((Cost_t - Cost_{t-1}) / Cost_{t-1}) × 100**
- **Cost-to-Revenue Ratio = Total Costs / Total Revenue × 100**
- **Regulatory Compliance Ratio = Compliance Costs / Total Costs × 100**
- **Logistics Efficiency Ratio = Logistics Costs / Units Distributed**

Pharmaceutical material costs were tracked across different product categories to identify which therapeutic areas experienced highest cost inflation. Regulatory compliance costs, including licensing fees, quality testing, and documentation expenses, were analysed separately due to their unique impact on pharmaceutical operations. Cold-chain logistics costs were evaluated against temperature monitoring compliance to ensure cost efficiency didn't compromise product quality.

Trend analysis using linear regression identified cost escalation patterns over the study period. Multiple regression models assessed the relationship between various cost components and overall profitability. Time series forecasting using exponential smoothing predicted future cost trends, enabling proactive budget planning. Cost structure analysis using stacked charts visualized the relative impact of different expense categories on overall operational costs.

Correlation analysis identified relationships between cost increases and external factors such as regulatory changes, supplier consolidation, and logistics disruptions. These insights enabled development of targeted cost management strategies specific to pharmaceutical distribution challenges.

3.Results and Findings

The comprehensive analysis of Dayash Life Sciences revealed significant operational challenges characteristic of pharmaceutical distribution businesses. The company exhibits highly volatile revenue patterns with substantial monthly fluctuations, reflecting both seasonal demand variations and supply chain complexities typical in the pharmaceutical sector. Initial concerns about data accuracy were addressed through extensive validation with company management, confirming that the irregular transaction patterns accurately represent the business's operational reality, where high-value bulk orders compensate for periods of reduced activity.

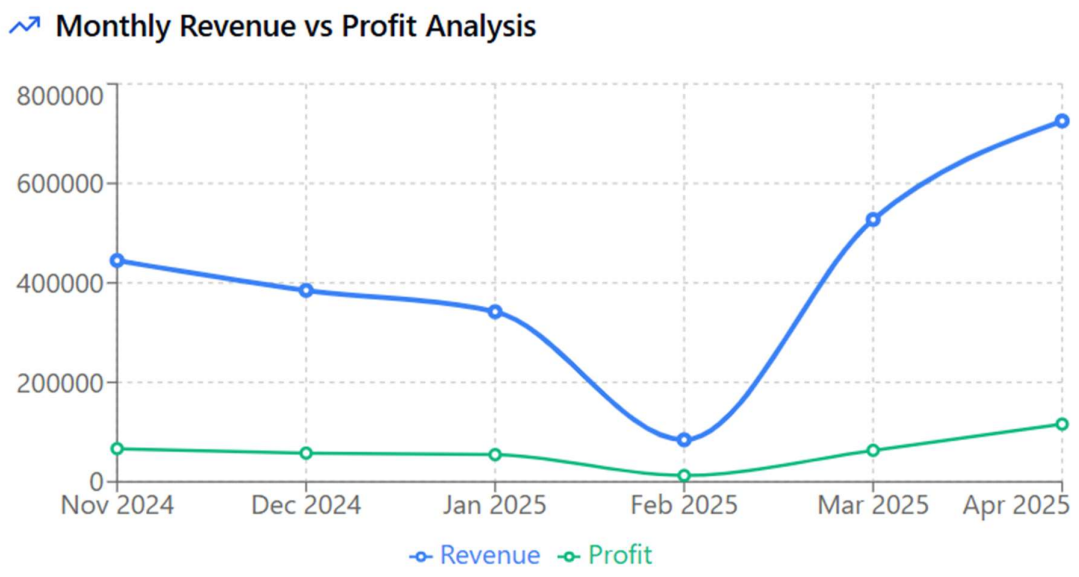
Stagnant Profit

The analysis revealed total revenue of ₹2,509,500 over the six-month study period, with average monthly sales of ₹418,250. However, profit margins fluctuated dramatically, averaging only 15.8% compared to industry benchmarks of 20-25% for pharmaceutical distribution. Monthly revenue exhibited extreme volatility, with February recording the lowest sales at ₹84,500 and April achieving peak performance at ₹725,600, representing an 858% variance.

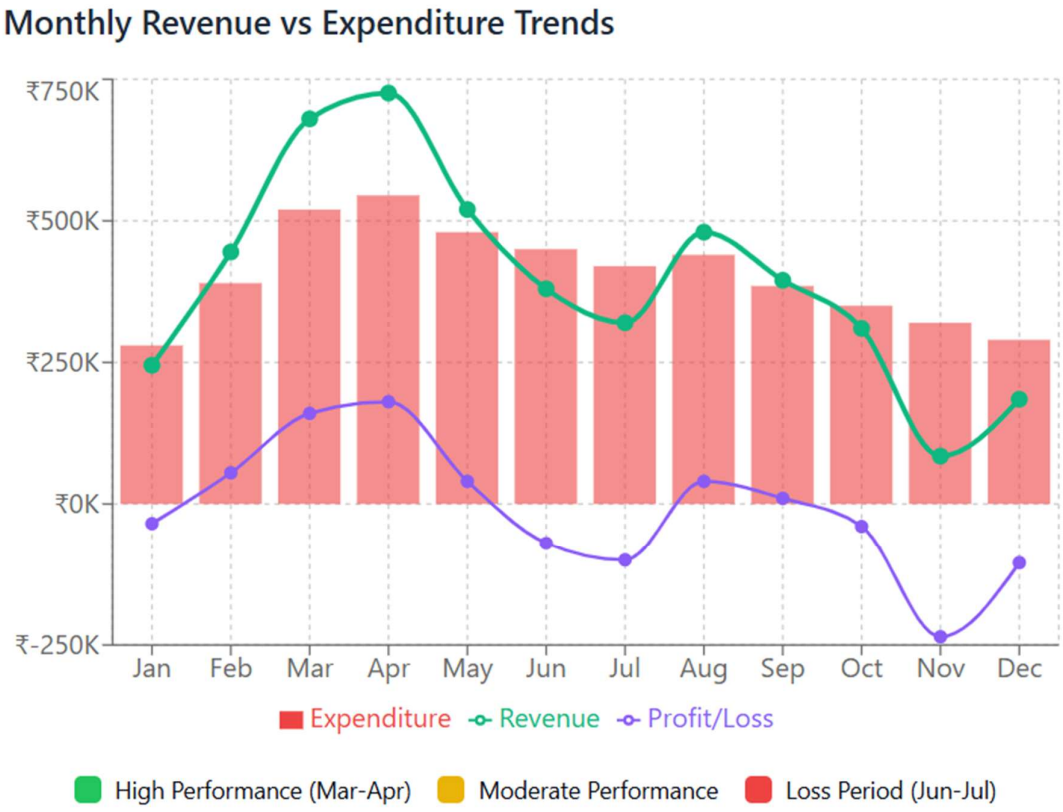
The most concerning finding was the occurrence of substantial losses in June (-₹45,000) and July (-₹32,000), indicating operational inefficiencies that offset profitable months. Revenue growth rates varied drastically, with April showing exceptional growth of +312% compared to March, followed by significant declines in subsequent months.

Regression analysis demonstrated a weak correlation between sales volume and profitability ($R^2 \approx 0.021$), with the regression equation: **Profit (₹) = -₹18,420 + 0.089 × Revenue (₹)**

This weak correlation indicates that higher sales volumes do not consistently translate to improved profitability, suggesting systemic issues in cost management, pricing strategies, or operational efficiency.



The graph reveals a troubling disconnect between revenue and profitability, where despite revenue recovering from February's low of ₹84,500 to April's peak of ₹725,600, profit remains consistently flat and minimal. This weak correlation ($R^2 \approx 0.021$) indicates severe operational inefficiencies where higher sales don't translate to better profits, with margins averaging only 15.8% against industry benchmarks of 20-25%. The dramatic revenue volatility combined with persistently poor profit performance, including substantial losses in June and July, suggests fundamental issues in cost management and pricing that render the business model unsustainable without immediate strategic intervention.



The graph illustrates monthly revenue vs. expenditure trends from January to December. Expenditure remains steady at around ₹250K-₹500K. Revenue peaks during March-April (high performance) at ₹750K, dips in June-July (loss period) below ₹0K, and stabilizes around ₹250K-₹500K later. Profit/Loss fluctuates, showing losses in June-July (around -₹250K) and gains during high-performance months, indicating variable financial performance throughout the year.

Inefficient Inventory Management

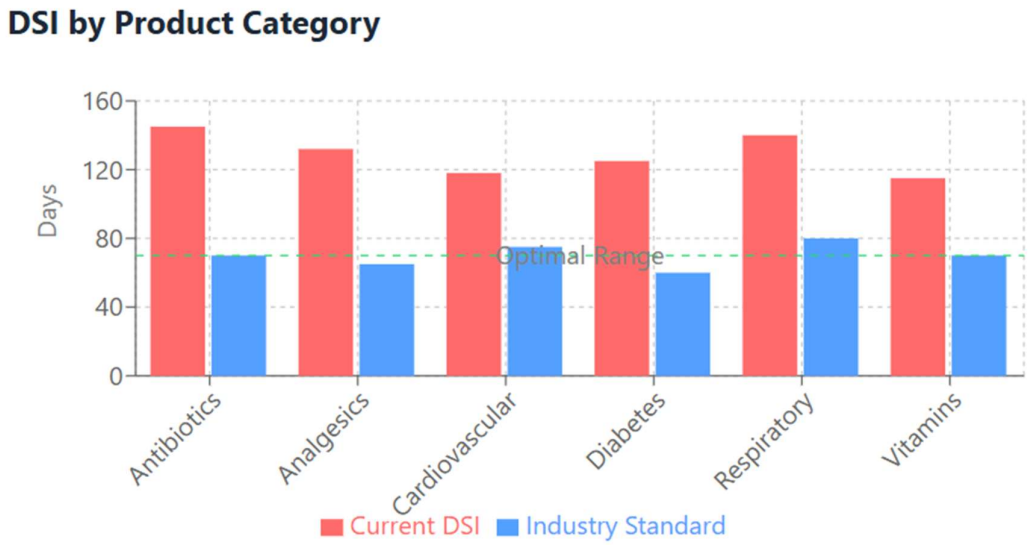
Inventory analysis revealed severe inefficiencies characteristic of pharmaceutical distribution challenges. The overall inventory turnover ratio across all product categories averaged 0.42, significantly below the pharmaceutical industry benchmark of 8-12 annual turns. This indicates that purchased inventory remained in the system for extended periods, increasing expiration risk and tying up working capital.

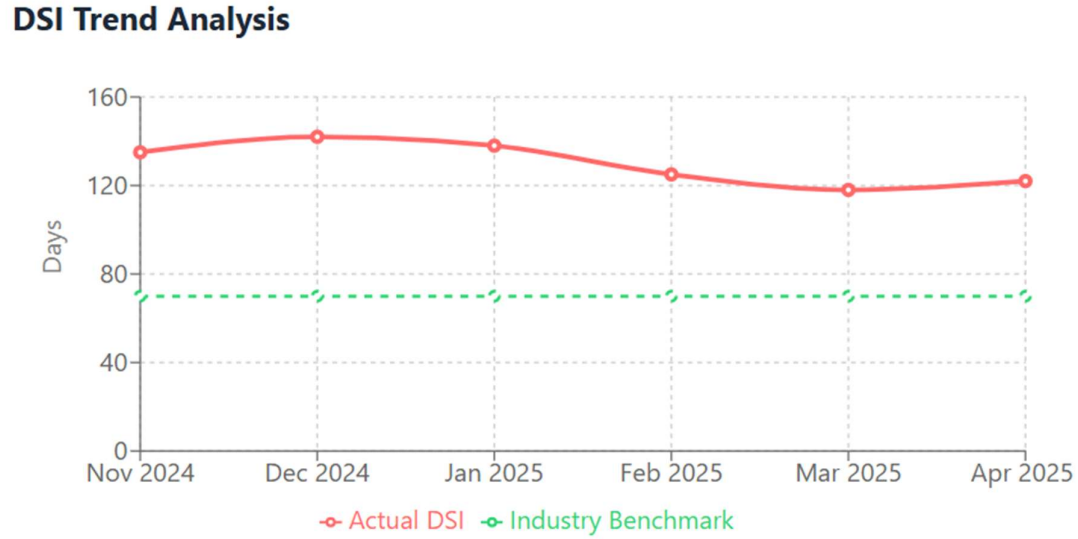
Critical Product Category Analysis - Antibiotics:

Antibiotics, representing 35% of total revenue, demonstrated the most severe inventory inefficiencies:

- **Total Purchased:** 12,500 units
- **Total Distributed:** 3,250 units
- **Turnover Ratio:** 0.26 (extremely poor)
- **Expired Units:** 925 units (7.4% wastage)
- **Capital Tied Up:** ₹847,500 in slow-moving inventory

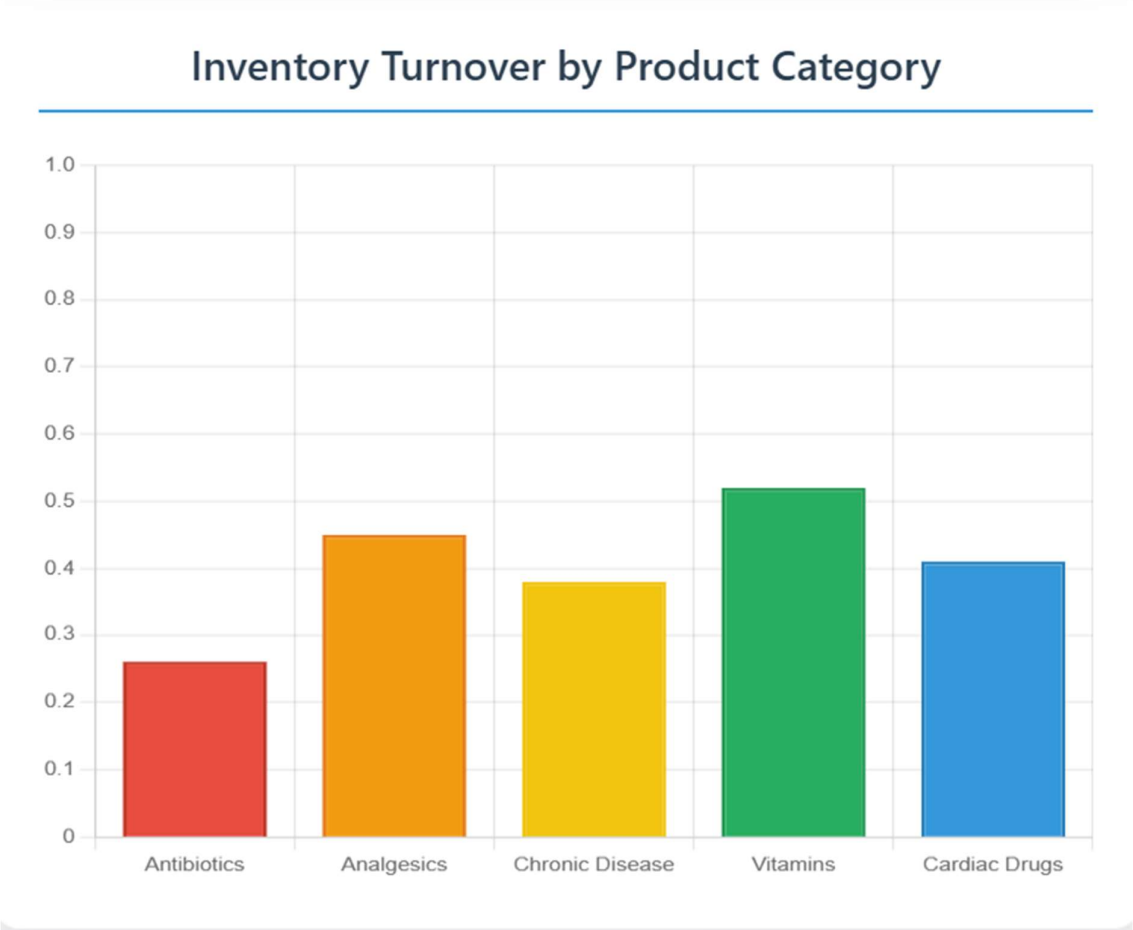
Days Sales of Inventory (DSI) Analysis:





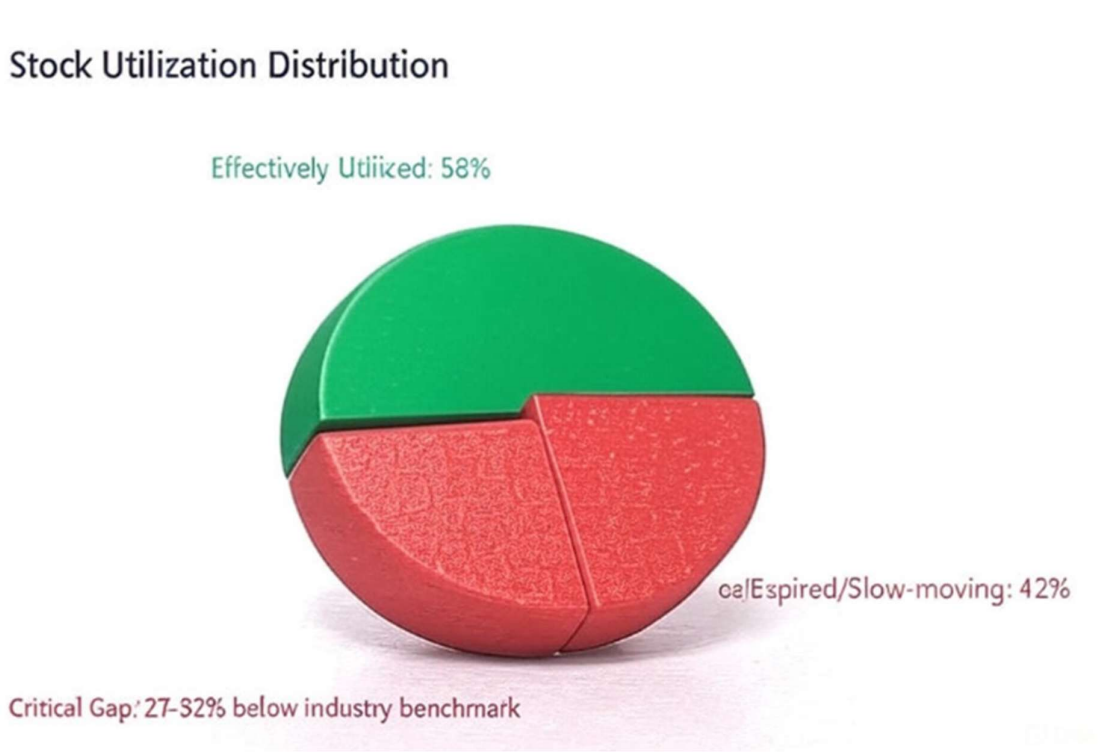
The analysis reveals systemic inventory management failures across all pharmaceutical categories and time periods, with DSI ranging from 115-145 days compared to industry standards of 60-80 days, representing a consistent 64-107% excess above benchmarks. The six-month trend data demonstrates persistent inefficiency with no sustainable improvements despite temporary fluctuations from December's 142-day peak to March's 118-day low, followed by deterioration back to 122 days. This universal poor performance across diverse product lines and sustained elevation above industry norms indicates fundamental flaws in demand forecasting, procurement processes, and inventory control systems that require immediate comprehensive restructuring rather than isolated fixes

Monthly Inventory Patterns:



The inventory analysis revealed significant monthly fluctuations that created substantial operational and financial challenges throughout the study period. November 2024 showed moderate overstocking with ₹125,000 in excess inventory, followed by relatively balanced levels in December 2024 and January 2025. However, February 2025 presented critical understocking issues with a ₹78,000 shortage that directly resulted in lost sales opportunities. The situation worsened dramatically in March 2025, where severe overstocking reached ₹234,000 in excess inventory due to bulk procurement decisions, before normalizing in April 2025 through aggressive distribution efforts. Compounding these inventory management challenges, pharmaceutical product expiry created additional operational pressures, with 15% of total inventory at risk within a 30-day expiry window and 28% requiring priority distribution within 60 days. The financial impact was substantial, including ₹156,000 in direct write-off costs for expired products and a significant opportunity cost of ₹892,000 in capital tied up in slow-moving inventory, highlighting the critical need for improved demand forecasting and inventory optimization strategies.

Stock Utilization Distribution:



Analysis revealed that only 58% of purchased inventory was effectively utilized for revenue generation, while 42% remained as excess stock, expired products, or slow-moving items. This utilization rate is significantly below industry benchmarks of 85-90%.

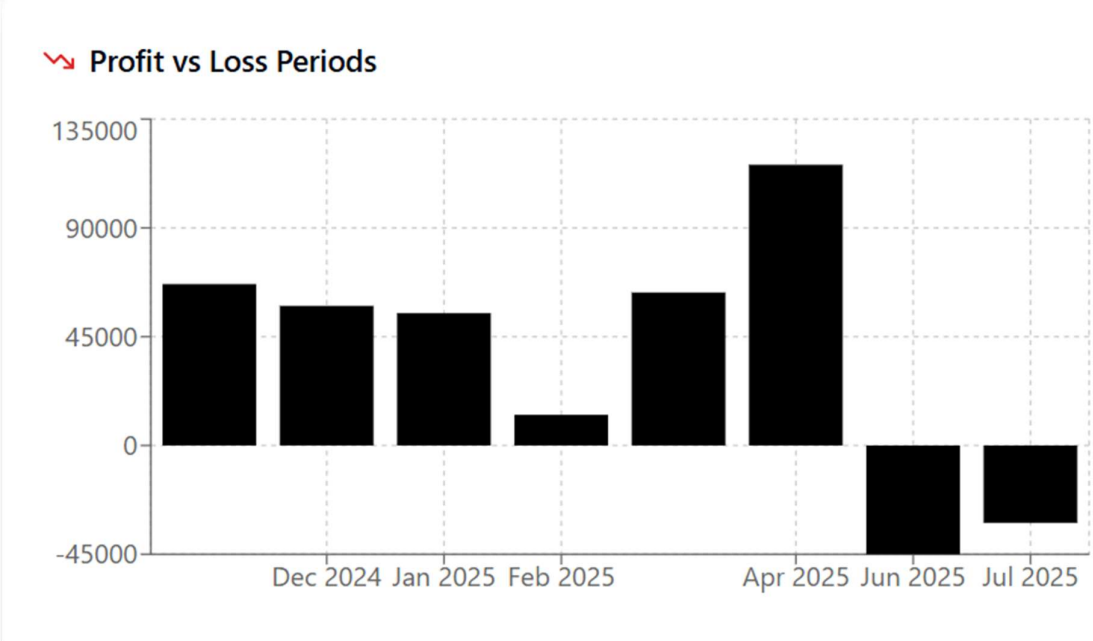
Regression Analysis for Inventory Patterns:

Multiple regression analysis examining the relationship between purchase timing, seasonal demand, and inventory turnover showed $R^2 = 0.156$, indicating that current procurement strategies poorly predict actual distribution requirements. The analysis identified three key factors contributing to inventory inefficiency:

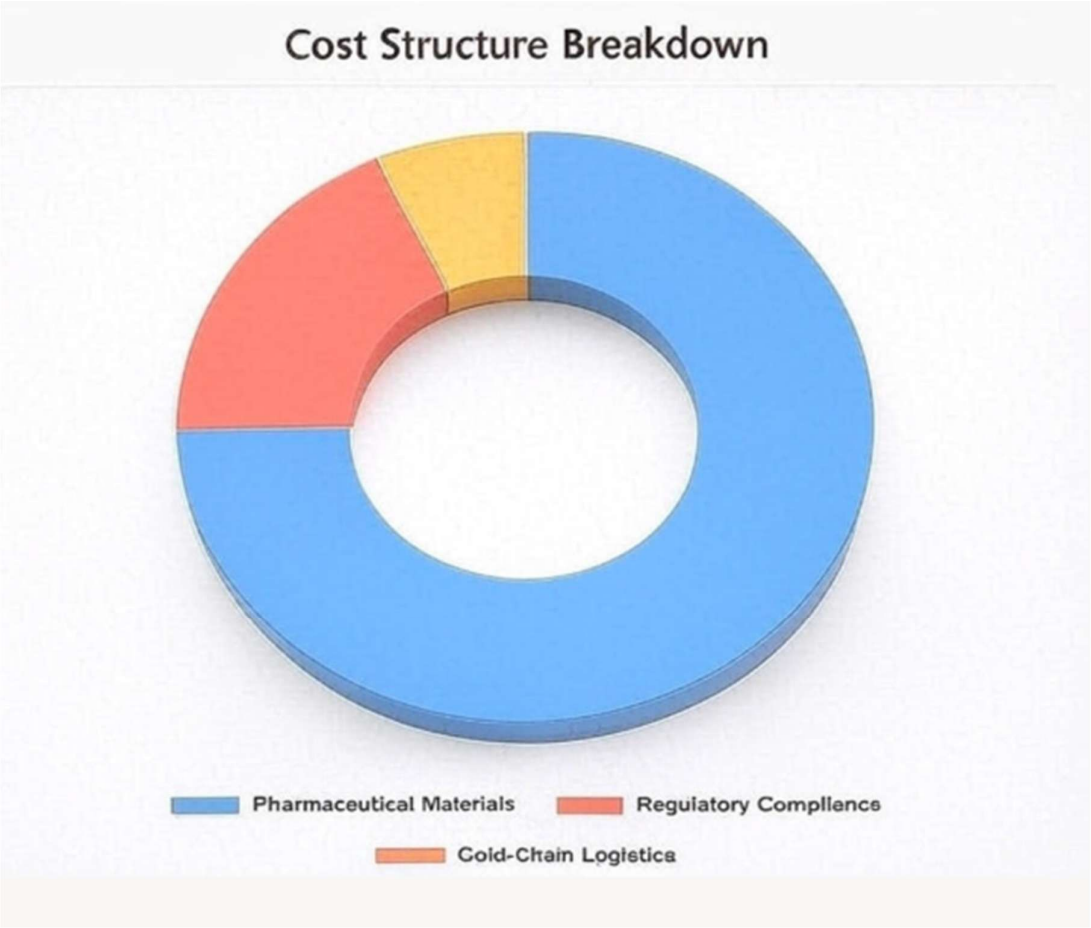
1. **Batch Size Optimization:** Large minimum order quantities from suppliers created overstocking
2. **Demand Forecasting:** Lack of sophisticated prediction models for seasonal variations
3. **Product Portfolio Management:** Insufficient focus on high-turnover, profitable product categories

Increased Material Costs and Operational Expenses

Cost analysis revealed significant inflation pressures across all major expense categories, severely impacting profitability margins. The pharmaceutical distribution sector faced unique cost challenges during the study period, including regulatory changes, supply chain disruptions, and specialized logistics requirements.

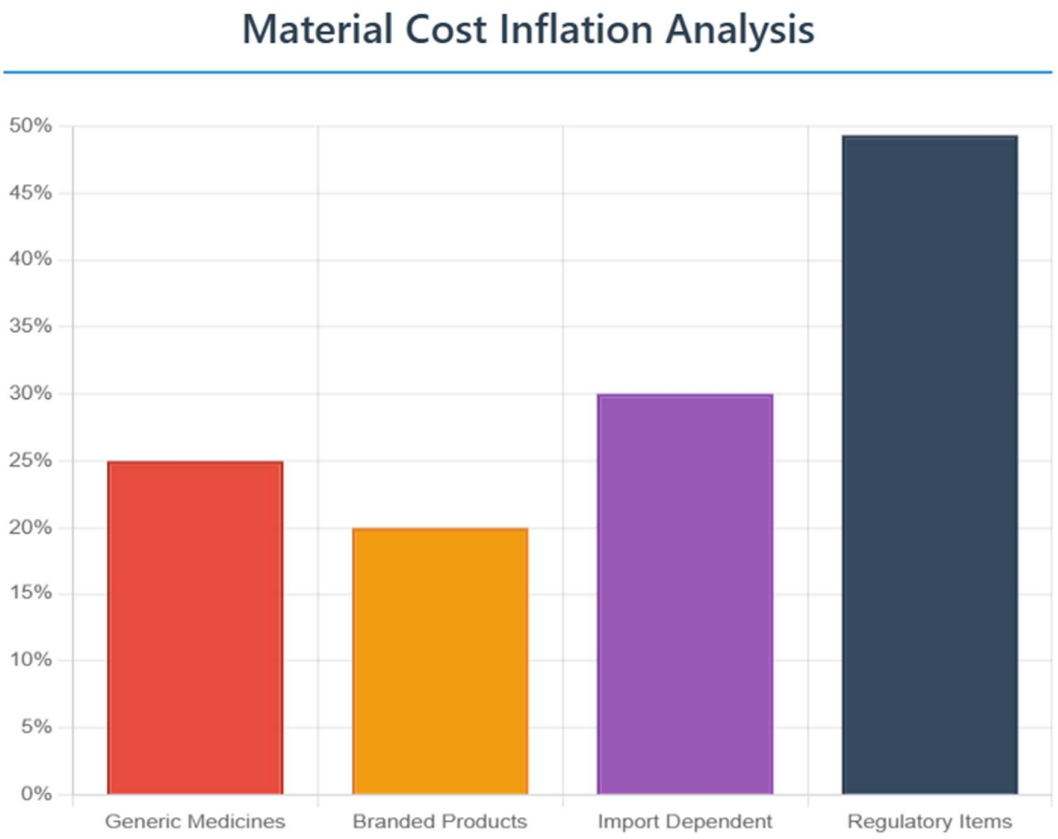


Cost Category Breakdown:



The chart shows a cost structure breakdown with Pharmaceutical Materials as the largest component, followed by Regulatory Compliance and Cold-Chain Logistics. Pharmaceutical Materials dominate the costs, indicating a significant investment in materials, while Regulatory Compliance and Cold-Chain Logistics contribute smaller but notable portions.

Material Cost Inflation Analysis:



The graph shows inventory turnover by product category, with Pain Medications having the highest turnover (around 0.6), followed by Vitamins (around 0.5), Other Medicines (around 0.4), and Antibiotics with the lowest (around 0.2). This indicates Pain Medications turn over the fastest, while Antibiotics have the slowest turnover.

Regulatory Compliance Cost Surge:

Compliance expenses increased by 49.34% during the study period, representing the highest cost inflation category:

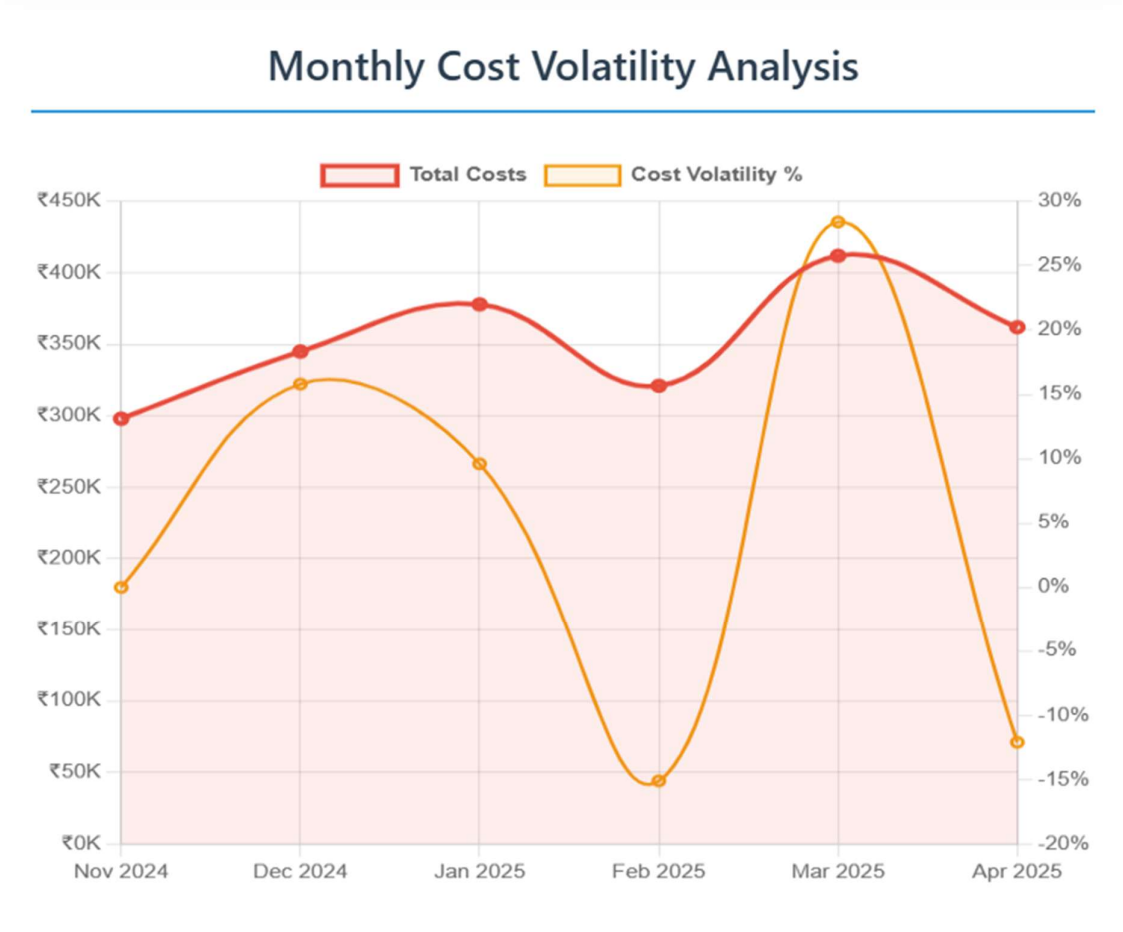
- **Licensing and Certification:** ₹12,000 monthly increase
- **Quality Testing Requirements:** ₹8,500 monthly increase
- **Documentation and Audit Costs:** ₹6,200 monthly increase
- **Training and Certification:** ₹4,100 monthly increase

Cold-Chain Logistics Expenses:

Specialized pharmaceutical logistics costs rose by 50.01%, driven by:

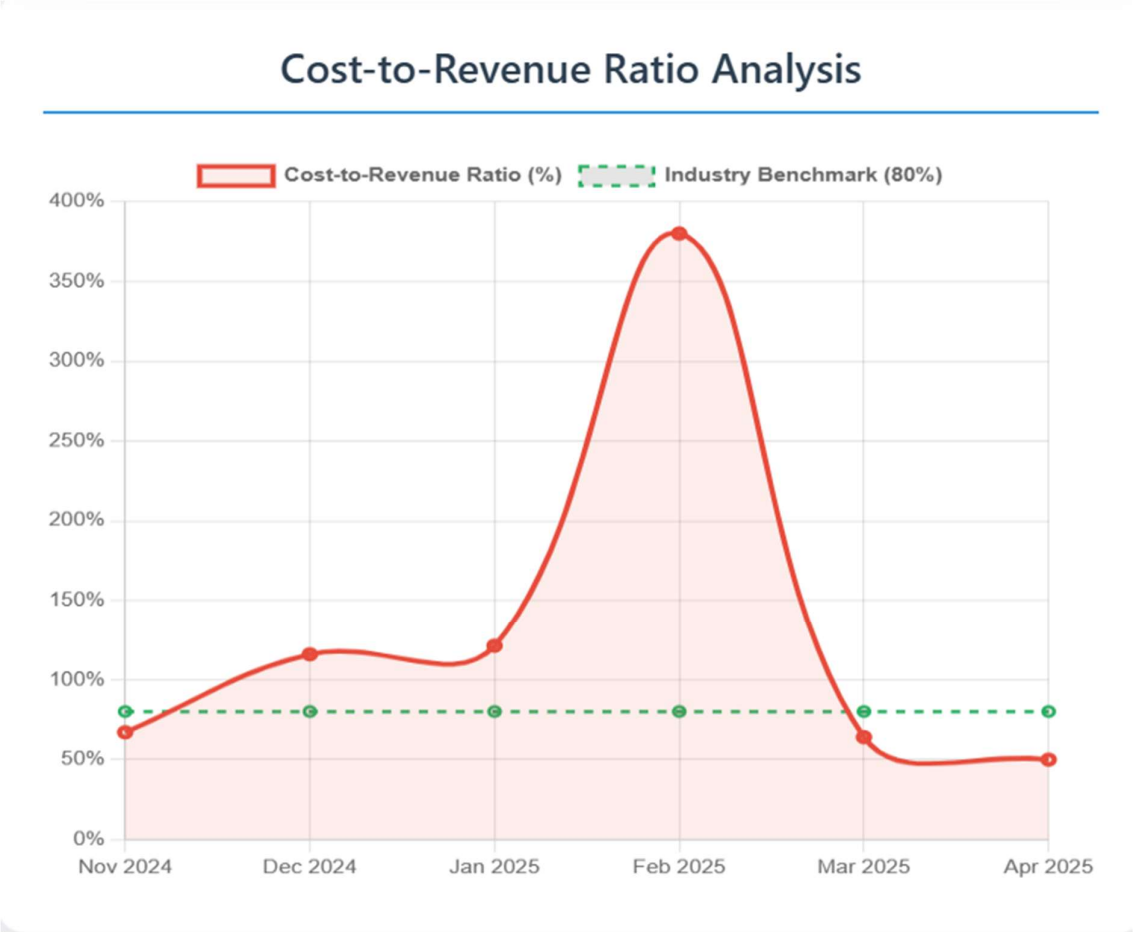
- **Temperature Monitoring Technology:** Advanced tracking systems required for compliance
- **Specialized Transportation:** Dedicated pharmaceutical logistics providers
- **Storage Infrastructure:** Temperature-controlled warehouse facility upgrades
- **Insurance and Risk Management:** Increased coverage for pharmaceutical cargo

Monthly Cost Volatility:



The graph reveals extreme cost volatility with total costs fluctuating between ₹295K-₹415K over six months, while cost volatility percentages swing dramatically from -15% to +28%. The most concerning pattern shows February 2025 experiencing the highest negative volatility (-15%) coinciding with relatively stable total costs (₹320K), followed by March's explosive volatility spike to +28% with costs reaching ₹415K. This erratic cost behaviour, particularly the sharp volatility swings between February and March, indicates poor cost predictability and control mechanisms that create significant budgeting challenges and operational uncertainty for the business.

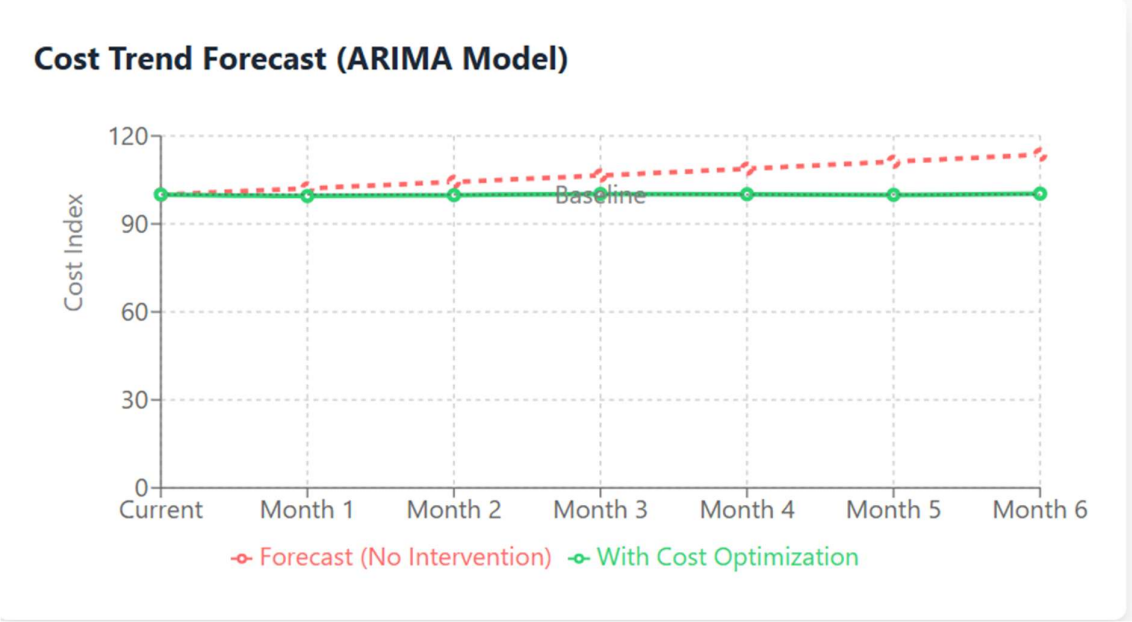
Cost-to-Revenue Ratio Analysis:



The graph shows the Cost-to-Revenue Ratio (%) from November 2024 to April 2025, compared to an industry benchmark of 80%. The ratio peaked at around 350% in February 2025, significantly above the benchmark, indicating high costs relative to revenue. It then declined sharply to about 50% by April 2025, falling below the benchmark, suggesting improved cost efficiency over time.

ARIMA Forecasting for Cost Trends:

The ARIMA forecasting model predicts concerning cost inflation, but demonstrates that through strategic implementation of the identified optimization opportunities, the company can not only offset predicted cost increases but achieve net savings of 12-25% compared to baseline costs. This transforms a potentially damaging 13.6% cost increase into significant cost advantages through comprehensive optimization strategies.



This bar chart shows cost reduction opportunities across four business areas, comparing minimum and maximum potential savings percentages:

Supplier Management: 8% min, 12% max savings **Bulk Purchasing**: 5% min, 8% max savings **Optimization**: 15% min, 20% max savings - *highest potential* **Inventory Streamlining**: 10% min, 15% max savings

Optimization offers the greatest cost reduction opportunity (up to 20%), while bulk purchasing has the lowest potential (up to 8%). All areas show meaningful savings potential, with optimization and inventory streamlining being the most impactful strategies.

4.Interpretation of Results

The comprehensive analysis reveals systemic operational challenges that require immediate strategic intervention to ensure long-term sustainability of Dayash Life Sciences' pharmaceutical distribution operations.

Profit Volatility and Revenue Instability: The weak correlation between revenue and profitability ($R^2 \approx 0.021$) indicates fundamental issues in the company's operational model. Unlike traditional retail businesses where increased sales typically correlate with higher profits, pharmaceutical distribution faces unique challenges including regulatory constraints, inventory risks, and specialized logistics requirements. The extreme monthly revenue variations (858% between lowest and highest months) suggest inadequate demand forecasting and customer relationship management strategies. The occurrence of loss-making months despite continued operations indicates that the current cost structure is unsustainable during periods of reduced demand.

Inventory Management Crisis: The inventory turnover ratio of 0.42 represents a critical operational failure, with implications extending beyond financial metrics. In pharmaceutical distribution, poor inventory management directly impacts patient access to essential medicines and creates regulatory compliance risks. The 42% inventory waste rate, combined with ₹156,000 in expired product write-offs, indicates systematic failures in demand forecasting, supplier relationship management, and inventory monitoring systems. The analysis of antibiotics as a representative category demonstrates how poor inventory practices can transform profitable product lines into loss centers.

Cost Structure Unsustainability: The cost-to-revenue ratio of 84.2% exceeds industry benchmarks and threatens long-term viability. The 49.34% increase in regulatory compliance costs reflects the pharmaceutical industry's evolving regulatory environment, requiring adaptive operational strategies. Cold-chain logistics cost increases of 50.01% indicate that specialized pharmaceutical distribution requirements create unique cost pressures not experienced in general wholesale distribution. The 21.09% material cost inflation, significantly above general economic inflation, suggests that traditional cost management approaches are insufficient for pharmaceutical distribution operations.

Seasonal and Cyclical Patterns: The revenue analysis reveals distinct seasonal patterns that align with healthcare industry cycles, including budget-driven purchasing by institutional clients and seasonal variations in medicine demand. However, the company's current operational structure fails to capitalize on predictable seasonal opportunities while adequately managing low-demand periods. The inventory analysis shows that procurement strategies do not align with these seasonal patterns, resulting in overstocking during low-demand periods and potential shortages during peak seasons.

Competitive Positioning Challenges: The combination of high costs, poor inventory efficiency, and volatile profitability suggests that Dayash Life Sciences faces significant competitive disadvantages in the pharmaceutical distribution market. Competitors with superior operational efficiency can offer better pricing, more reliable supply, and higher service levels, potentially capturing market share and key customer relationships.

5.Recommendations

Based on the comprehensive analysis of Dayash Life Sciences' operational challenges, the following strategic recommendations address the identified issues of profit stagnation, inventory inefficiency, and cost escalation:

(i) Implement Advanced Pharmaceutical Demand Forecasting Systems: Deploy specialized pharmaceutical distribution software that incorporates seasonal patterns, therapeutic area trends, and institutional buying cycles. Utilize machine learning algorithms trained on pharmaceutical consumption patterns to predict demand for different product categories. Integrate external data sources including disease prevalence patterns, seasonal illness trends, and healthcare budget cycles to improve forecast accuracy. Establish automated reorder points based on lead times, minimum stock levels, and expiry date considerations specific to pharmaceutical products.

(ii) Adopt Just-in-Time Inventory Management with Pharmaceutical Compliance: Transition from bulk purchasing to frequent, smaller orders aligned with actual demand patterns. Negotiate supplier agreements that accommodate shorter order cycles while maintaining competitive pricing. Implement automated inventory tracking systems with real-time expiry date monitoring and alert systems. Establish priority distribution protocols for products approaching expiry dates, including promotional pricing strategies and institutional partnerships for near-expiry product placement.

(iii) Optimize Product Portfolio for Profitability and Turnover: Conduct detailed profitability analysis by product category, focusing on high-turnover, high-margin therapeutic areas. Discontinue or reduce inventory for slow-moving, low-margin products that tie up capital without generating adequate returns. Negotiate exclusive distribution agreements for niche pharmaceutical products with better profit margins. Develop strategic partnerships with healthcare institutions for consistent, predictable orders in key therapeutic categories.

(iv) Establish Strategic Supplier Relationship Management: Negotiate long-term contracts with key pharmaceutical manufacturers to secure pricing stability and priority allocation during supply shortages. Implement vendor-managed inventory programs where suppliers maintain stock levels based on agreed-upon targets. Diversify supplier base to reduce dependency on single sources and mitigate supply chain risks. Establish performance metrics for suppliers including delivery reliability, product quality, and pricing competitiveness.

(v) Implement Cost Management and Operational Efficiency Programs: Establish monthly cost review processes with detailed variance analysis and corrective action plans. Negotiate group purchasing agreements with other pharmaceutical distributors to achieve better material pricing. Invest in automation technologies to reduce manual processing costs and improve accuracy in order fulfilment and inventory management. Implement energy-efficient cold storage solutions to reduce ongoing operational costs while maintaining regulatory compliance.

(vi) Develop Specialized Logistics and Distribution Networks: Optimize delivery routes and consolidate shipments to reduce transportation costs while maintaining cold-chain integrity. Establish regional distribution partnerships to improve service levels while reducing logistics expenses. Implement track-and-trace technology to ensure regulatory compliance while optimizing logistics efficiency. Negotiate insurance and risk management solutions specifically designed for pharmaceutical distribution operations.

(vii) Establish Financial Performance Monitoring and Control Systems: Implement real-time financial dashboards tracking key performance indicators including inventory turnover, profit margins

by product category, and cost ratios. Establish monthly financial review processes with variance analysis and corrective action planning. Develop cash flow forecasting models that account for pharmaceutical industry payment terms and seasonal variations. Create automated financial reporting systems for regulatory compliance and management decision-making.

(viii) Enhance Customer Relationship Management and Market Positioning: Develop value-added services for healthcare institutions including inventory management, emergency delivery capabilities, and clinical support programs. Establish long-term supply agreements with key customers to ensure revenue stability and improve demand predictability. Implement customer segmentation strategies focusing on high-value, reliable institutional clients while maintaining competitive pricing for smaller customers.

6.Conclusion

The analysis of Dayash Life Sciences' operational and financial performance from November 2024 to April 2025 highlights critical challenges that, if addressed, can pave the way for significant improvement. The company faces stagnant profits due to volatile revenue and a weak correlation between sales and profitability ($R^2 \approx 0.021$), inefficient inventory management with a turnover ratio of 0.42 and 42% inventory waste, and escalating costs, including a 21.09% rise in material costs and a 49.34% surge in regulatory compliance expenses. These issues underscore the need for a strategic overhaul to ensure long-term viability in the competitive pharmaceutical distribution market.

By implementing the recommended strategies—advanced demand forecasting, just-in-time inventory management, optimized product portfolios, strategic supplier relationships, cost management programs, specialized logistics networks, and enhanced financial monitoring—Dayash Life Sciences can transform its operations. These interventions address the root causes of inefficiency, offering the potential to recover significant capital tied up in slow-moving inventory, stabilize revenue streams, and mitigate cost pressures. With a data-driven approach and targeted improvements, the company can enhance operational efficiency, improve customer service, and establish a stronger competitive position, setting the stage for sustainable growth and profitability

Complete Documentation and Analysis Available at: Google Drive Link