Stock Optimization to Increase Market Recognition and Expand Business

A Mid-Term report for the BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project Title "**Stock Optimization to Increase Market Recognition and Expand Business"**. I extend my appreciation to **TVS- Sneha E Auto Rickshaw Pvt Ltd**, 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: (**Digital Signature**)

Name: Aayush Krishna

Date : 01-11-2024

Stock Optimization to Increase Market Recognition and Expand Business

1. Executive Summary

The project, titled "**Stock Optimization to Increase Market Recognition and Expand Business,**" commenced with the acceptance of the proposal to streamline inventory management processes for Sneha Auto. In order to overcome these obstacles, the project suggests a data-driven strategy that emphasizes increasing brand awareness and stock level optimization.

The analysis was based on historical data on CNG rickshaw sales and purchases from May to October 2024, which were manually recorded and then digitized for accuracy. Using tools such as ABC analysis, demand forecasts, and turnover ratio evaluations, the initiative was to find relevant trends, prioritize inventory, and provide actionable growth strategies. These methodologies provided in-depth insights into the dealership's operations, indicating key areas for improvement.

One of the important conclusions was that the TVS King Zs+Fi-BsVI 4sCNG 30Ltr made a considerable impact to the dealership's revenue. With an 80.95% stock turnover ratio, this model has proven to be the most popular among consumers, indicating a growing preference for CNG-powered vehicles. In contrast, models such as the TVS King Zk G Yellow had no sales during the investigation period. Monthly sales increased steadily from 5 units in June to 25 units in October, supported by a significant association found by trendline analysis (R^2 = 0.9566).

The investigation found disparities between purchase and sales data for specific models, indicating inefficiencies in inventory management. Furthermore, dependence too heavily on a single high-performing model exposes the company to risk, underlining the importance of diversification and developing measures to improve the performance of underperforming models. Implementing automated inventory management systems, synchronizing purchasing habits with sales trends, and using targeted marketing efforts to increase demand for less popular models are among the recommendations.

The project will help Sneha Auto achieve operational excellence and enhance its market position. Addressing the identified deficiencies and executing the proposed solutions would allow the dealership to minimize costs, improve customer happiness, and position itself for long-term success in the competitive CNG rickshaw industry.

2. Proof of Originality of Data

2.1 Letter from Organization Head

Sneha Auto,
Bypass Rd, Indrapuri, Dasratha, Sipara,
Patna, Bihar 800002

Date: 23-11-2024

To Whom It May Concern,

This is to formally grant consent to Aayush Krishna, a student enrolled in the IIT Madras BS degree program, to use Sneha Auto's sales and purchase data for the purpose of completing their BDM (Business Data Management) project as required by the curriculum.

We understand that the data will only be used for academic reasons, and we trust that all sensitive information will be handled confidentially and securely.

If you have any additional requirements or would like to clarify something, please contact us.

We wish Aayush Krishna all the best in completing the project successfully.

Yours sincerely,

SUSHANT SHEKHAR
Director, Sneha Auto

Email: snehatvspatna@gmail.com

2.2 Video and Images

1. **Video with Owner:** *Sneha_auto_owner.mp4*
2. **Image with Owner:** *Sneha_auto_owner.jpg*
3. **Some more images:** *Sneha_auto_images.jpg*

3. Metadata and Descriptive Statistics

I collected data from May 1st to October 31th, 2024, with an emphasis on monthly CNG rickshaw sales and purchases. The data includes:

- 80 sales records
- 11 purchases records

The data was initially recorded manually in traditional ledgers before being inputted into Excel for detailed analysis. Since Sneha Auto uses traditional data recording methods, some figures may be approximate or slightly incorrect owing to manual entry errors.

3.1 Metadata

The Excel workbook contains 2 Sheets, named as:

Fig 1: Sample snapshot of sheets

SALES Sheet:

- This sheet records transaction details for the selling of CNG rickshaws. It contains information such as sales dates, client names, rickshaw models, quantities sold, unit prices, applied discounts, tax details, and gross totals for each transaction.

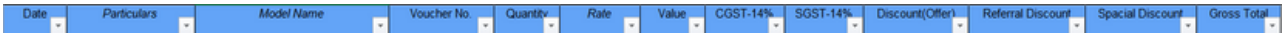

Fig 2: Sample snapshot of column names of Sales sheets

PURCHASE Sheet:

- This sheet records purchasing actions, including suppliers, purchase date, buy amounts, unit costs, and total values.

Fig 3: Sample snapshot of column names of Purchases sheets

3.1.1 Sales sheet Metadata

- *Date:* The date of the sale.
- *Particulars:* The name of the customer or client.
- *Model Name:* The specific model sold.
- *Voucher number:* A unique identification for the transaction.
- *Quantity:* The number of units sold.
- *Rate:* The price per unit of the goods sold.
- *Value*: The total sale price before taxes and discounts.
- *Taxes:* Includes CGST and SGST rates (14% each in the data).
- *Discounts:* There are several varieties, including offer discounts, referral discounts, and special discounts.
- *Gross Total:* The final sales amount after taxes and discounts.

3.1.2 Purchase sheet Metadata

- *Date:* The date when the purchase was made.
- *Particulars:* Purchase description.
- *Buyer/Supplier:* Name of the supplier.
- *Consignee/Party:* The party to whom the goods were delivered.
- *Quantity:* Number of units purchased.
- *Rate:* Price per unit for the purchased product.
- *Value:* Total purchase value before taxes.
- *Taxes:* Involves CGST, SGST, and IGST rates (28% in some cases).
- *Gross Total:* Final purchase amount after taxes.
- *TCS Charges:* Additional charges related to Tax Collected at Source (TCS).

- *Link to the Data*

3.2 Descriptive Statistics

For Sales Sheet

- *Quantity:*
  - Mean: 1 unit per transaction
  - Min/Max: 1 (indicating each transaction involved exactly one unit)
- *Rate and Value (in ₹):*
  - Mean: ₹204,606
  - Range: ₹176,735 to ₹215,725
- *Taxes (CGST & SGST):*
  - *Mean:* ₹26,544
  - *Range:* ₹23,714 to ₹29,402
- *Discounts:*
  - Offer Discount: ₹13,399 (only 2 entries recorded)
  - Referral Discount: ₹5,000 (only 2 entries recorded)
- *Special Discount:*
  - Mean of ₹2,645,
  - Range: ₹1,394–₹3,895 (2 entries)
- *Gross Total:*
  - Mean: ₹258,993
  - Range: ₹226,221 to ₹296,709

For Purchases Sheet

- *Quantity:*
  - Mean: ~10.36 units per transaction
  - Range: 2–12 units
- *Rate and Value (in ₹):*
  - Mean Rate: ₹168,696

- Mean Value: ₹1,743,628
- Value Range: ₹351,562–₹2,062,072

- *Taxes (IGST):*
  - Mean: ₹527,194
  - Range: ₹278,105–₹577,380
- *TCS Charges:*
  - Mean: ₹2,410
  - Range: ₹1,271–₹2,639
- *Gross Total:*
  - Mean: ₹2,234,034
  - Range: ₹450,000–₹2,642,091

4. Detailed Explanation of Analysis Process/Method

Covering a time span of over six months, comprehensive data from Sneha Auto was meticulously gathered and entered into Excel. In order to extract valuable insights, this data required considerable amount of organizing and cleansing as well, to use the descriptive statistical technique.

To visualize these insights, a variety of analysis methods can be employed:

- **ABC Analysis:** Finding the most profitable CNG rickshaw models that make a substantial contribution to revenue requires the use of ABC analysis. Inventory can be categorized into A, B, and C groups to help focus on high-profit items, optimize stock control, and prioritize management activities. Despite other approaches that treat all inventory identically, this strategy is effective because it identifies important areas that require attention.
- **Demand Forecasting:** Forecasting future trends in CNG rickshaw sales, optimizing inventory levels, and anticipating client demand all depend on demand forecasting. By facilitating data-driven decision-making, it helps prevent overstocking or shortages in inventory. By using past data to produce precise forecasts, improving strategic planning, and reducing financial risks through proactive management, this approach performs better than others.
- **Real-Time Inventory Analysis**: To track CNG rickshaw supply levels promptly and lower the chance of overstocking or stockouts, real-time inventory analysis is essential. It facilitates prompt decision-making and guarantees that the appropriate items are accessible when required. By offering current insights, enabling quick inventory modifications, maximizing cash flow, and raising customer happiness, this approach outperforms periodic analysis.
- **Clustered Column Chart:** When comparing CNG rickshaw sales and purchases across many categories (such as months, vehicle models, or suppliers), a clustered column chart is necessary. It highlights patterns and trends by visually grouping comparable data for simple comparison.

Together, these analytical methods and charts offered a comprehensive perspective of the automobile business performance, including revenue, profit margins, service distribution, and cost control.

5. Results and Finding

The results and insights drawn from the analysis of the data using various analytical methods such as ABC Analysis, Real Time Inventory Analysis and Demand Forecasting are mentioned here:

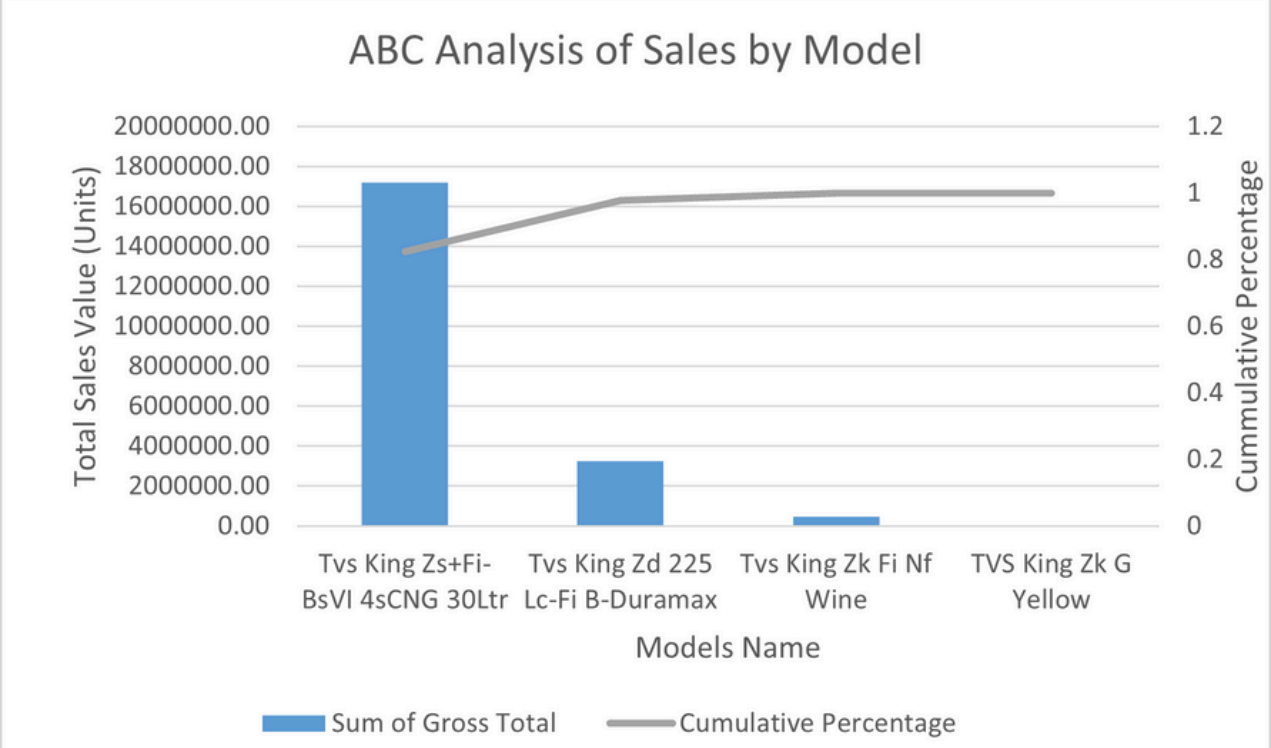

Fig 4: ABC categorization of products

- TVS King Zs+Fi-BsVI 4sCNG 30Ltr dominates overall revenue and contributes the highest total sales value by a wide margin.
- This model alone accounts for more than 80% of total sales, according to the Cumulative Percentage Curve, indicating that it falls into the "A" category (high-priority model for sales focus).
- The second highest revenue generator, since its sales value is significantly lower than the top model. It falls into the "B" category.
- While TVS King Zk Fi Nf Wine and TVS King Zk G Yellow contribute less to overall sales, they fall into "C" category.

Key Insight:

- A single model (TVS King Zs+Fi-BsVI 4sCNG 30Ltr) accounts for about 80% of total revenue, emphasizing the importance of maintaining position in the marketplace while broadening dependency by growing into new product lines.

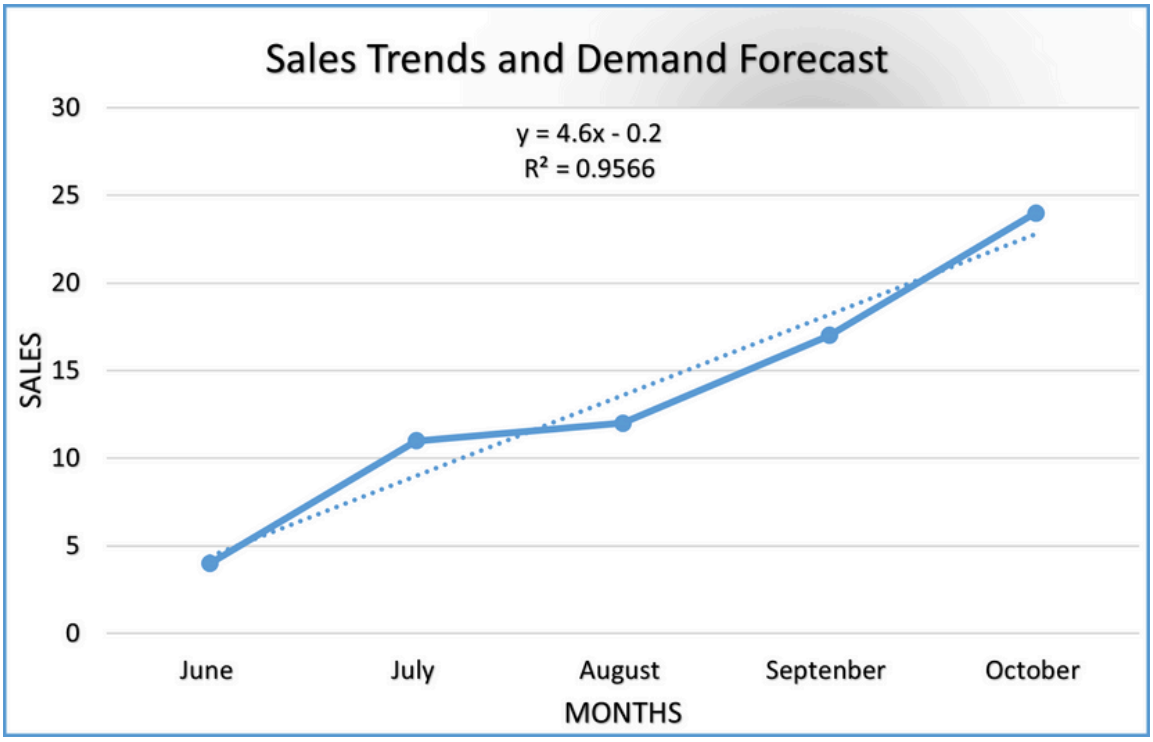

Fig 5: Monthly Sales Trends and Growth Forecast

- The figure indicates a clear growth trend from June to October, with sales rising from around 5 units in June to 25 units in October. This growth shows that demand will improve consistently over time.
- The trend line equation y = 4.6x - 0.2 shows a consistent monthly sales growth rate of around 4.6 units. The R^2 value of 0.9566 indicates a highly accurate trendline, providing an accurate forecast for inventory and sales targets.

Key Insights:

- The demand growth signals opportunities to scale operations, increase production capacity, and invest in distribution channels to meet rising customer needs.

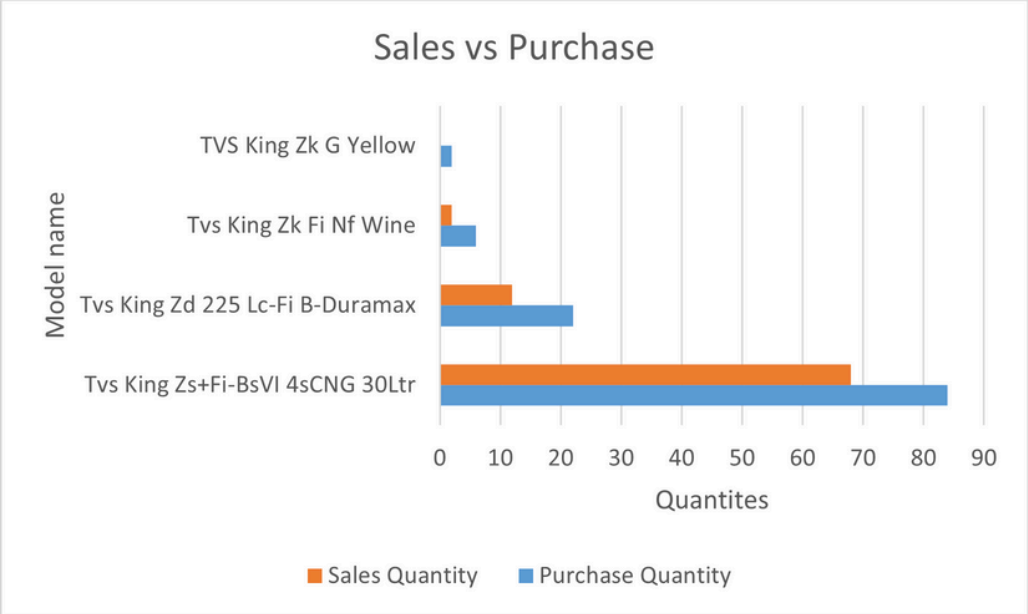

Fig 6: Inventory Purchase vs. Sales Flow Analysis

- High buy quantities for the TVS King Zs+Fi-BsVI 4sCNG 30Ltr correspond to its sales supremacy; nevertheless, sales quantities are marginally less than purchases, suggesting excess inventory.
- Purchase quantities for TVS King Zd 225 Lc-Fi B-Duramax are comparatively greater than sales, which could indicate overstocking or lower-than-anticipated demand.
- Low purchase and sales numbers for models such as TVS King Zk Fi Nf Wine and TVS King Zk G Yellow shows that there is little demand for these models or that they are only available in certain niche areas.

Key Insights:

- Effectively stocking the best-selling models appears to be the company's top priority. However, in certain situations, an imbalance between purchase and sales amounts indicates the need for improved inventory optimization and demand forecasts.

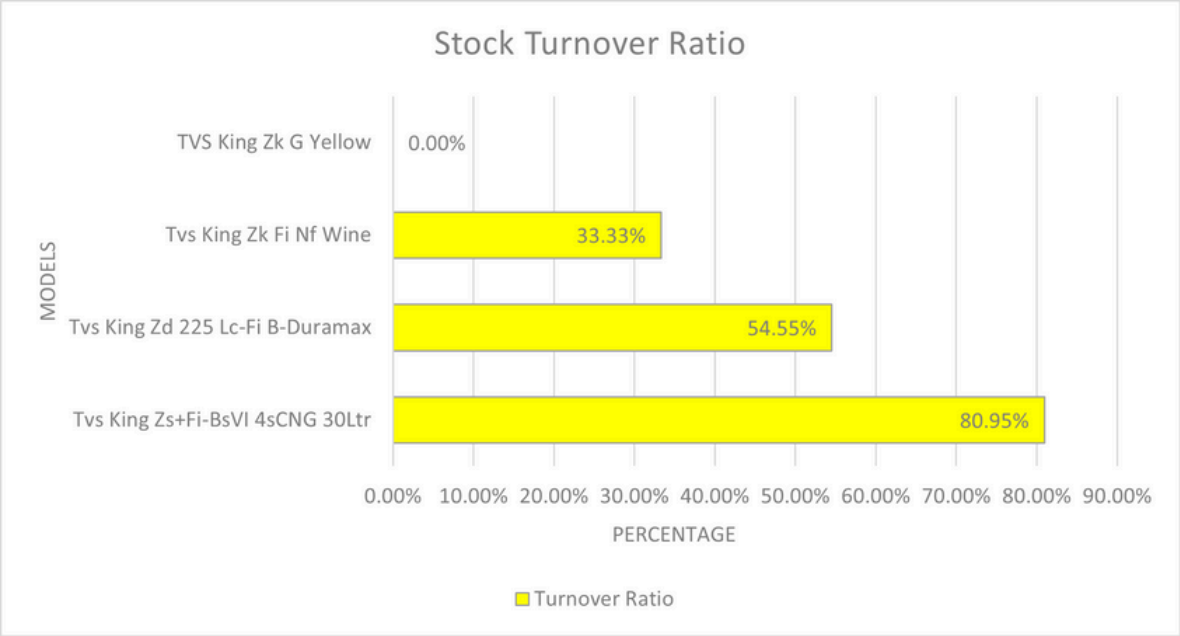

Fig 7: Stock Turnover Ratio of CNG Rickshaw Models

- The TVS King Zs+Fi-BsVI 4sCNG 30Ltr has the highest stock turnover ratio (80.95%), indicating strong customer preference for CNG-based models.
- Models like the TVS King Zk Fi Nf Wine with 33.33% share and Zd 225 Lc-Fi B-Duramax with 54.55% share show moderate demand. So, these models need targeted marketing strategies to improve their turnover.
- The TVS King Zk G Yellow has a turnover ratio of 0.00%, reflecting no sales. This suggests very low demand, requiring a reassessment of its inventory and marketing approach.

Key Insights:

- Resource efficiency and overall profitability can be enhanced by prioritizing high-demand models and reducing stock or discontinuing low-performing models.

Conclusion

The overall conclusion underlines Sneha Auto Pvt. Ltd.'s strategic concentration on high-performing models, notably those in the A-category, such as the TVS King Zs+Fi-BsVI 4sCNG 30Ltr. To capitalize on their demand, these models require significant investment in marketing, production, and inventory management. To adapt with growing market trends, the company must improve procurement for popular models while guaranteeing a strong supply chain to avoid stockouts. Regular inventory monitoring and alignment with sales patterns will help to reduce overstocking and increase cost efficiency. Furthermore, the steady demand increase indicates an opportunity for Sneha Auto to expand operations, either by increasing its present product offers or exploring new markets and product lines to ensure long-term commercial success.