

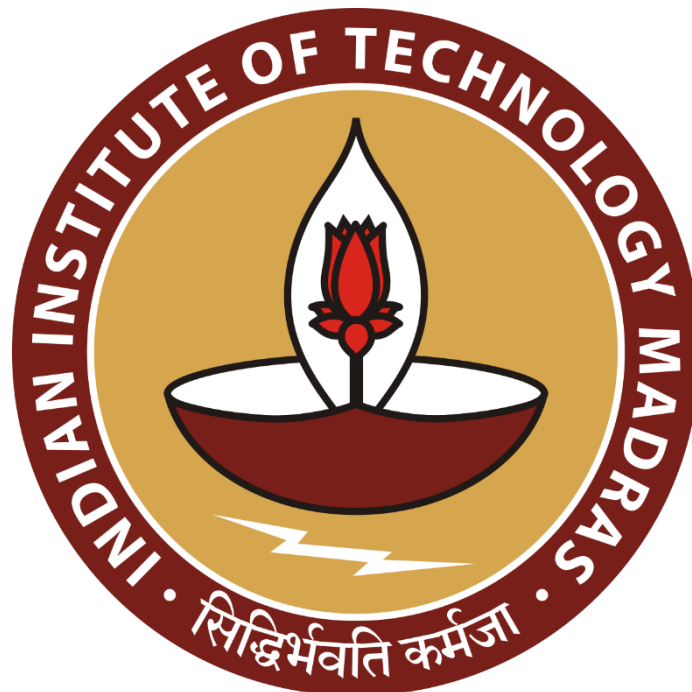
Optimizing Inventory and Pricing to Enhance Profitability and Reduce Impact of Currency Fluctuations in Wholesale Distribution

A Proposal report for the BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project titled "Optimizing Inventory and Pricing Strategies to Enhance Profitability and Reduce Impact of Currency Fluctuations in Wholesale Distribution". I extend my appreciation to **Kid Shopper Stop Limited**, 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 analysed 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 fulfilment in the BS Degree Program offered by IIT Madras. The institution does not endorse any of the claims or comments.

Signature of Candidate:

A handwritten signature in blue ink, appearing to read 'Deev', is shown on a light blue background.

Name: Deev Savla

Date: 27/09/2024

1 Executive Summary and Title

Kid Shopper Stop Limited, a B2B wholesaler located in Nairobi, Kenya, faces some challenges related to currency fluctuations and inventory management. The company, established in January 2023, imports products from India and sells them to small retail shops around Kenya. Currency fluctuations along with difficulties in predicting product demand, has led to reduction in profit margins and inefficiency in stock management.

This project aims to implement a data-driven approach using historical exchange rates, sales data, and inventory management techniques. By employing tools such as Excel, Python, and machine learning models, the proposed solution will help reduce the risks from currency fluctuations and optimize inventory handling. The expected outcomes include increased profit margins and efficient stock levels.

2 Organization Background

The company that I am working with is Kid Shopper Stop Limited was established on 5th January 2023 by Rajesh Haria. It is a wholesale business that sells large quantities of products such as pressure cookers, stainless steel hotpots, and aluminium cans to small retail shops.

The company imports the products from a supplier based in Bhayandar, Mumbai, India. The delivery of products from India to Kenya is conducted via cargo ships, taking approximately 21 days, with an additional one or two days required for transporting the consignment to the owner's warehouse.

Business Segments:

- **Wholesale (B2B):**
 - **Target Market:** Small retail shops.
 - **Services:** Bulk supply, flexible delivery schedules, and customized order handling.
 - **Logistics:** Efficient supply chain management ensuring timely deliveries.

One of its key challenges is dealing with factors such as currency fluctuations. These fluctuations reduce profit margins, especially since the company deals in high-volume, low-margin products.

3 Problem Statement

The business owner faces major problems in predicting the selling price of the products due to currency fluctuations and difficulty in managing inventory, which hamper the company's net profit.

3.1 Currency Fluctuation Impact on Profits: Kid Shopper Stop Limited purchases goods from India, with transactions conducted in US dollars (USD). The company faces difficulties in predicting appropriate pricing due to exchange rate fluctuations between USD and Kenyan Shillings (KES). Delays in payment leads to this situation where costs rise due to currency depreciation, reducing the profit margins.

3.2 Difficulty in inventory management: The company struggles with determining the right quantity of goods to order, resulting in overstocking or understocking. Overstocking forces the company to sell products at reduced prices, while damaged or poor-quality products from shipments further complicate matters. With limited warehouse space and intense competition in the locality, efficient inventory management is essential for survival.

4 Background of the Problem

Hamper in profits due to currency fluctuations:

Kid Shopper Stop Limited purchases products or consignments from suppliers in US dollars. The owner sets the selling price for retail shops based on the current exchange rate between US dollars and Kenyan Shillings (KES). The supplier does not require any upfront payment or advance, instead, the owner is given a 3-month period before payment is due. However, by the time the payment is due, inflation and other factors often cause the exchange rate to rise, forcing the owner to pay at a higher rate. This situation negatively impacts the business, significantly reducing profit margins, as the owner has been losing money instead of generating profits from sales.

Difficulty in inventory management:

Kid Shopper Stop Limited also faces challenges in managing its inventory. Sometimes, the products sent by the supplier are of poor quality or damaged during shipment, leading to overstocking in the warehouse. The owner is unable to order and store new consignments until the current stock is sold. This forces the owner to sell the goods at a very low price, resulting in losses instead of profits. The combination of currency fluctuations and inventory issues makes it difficult for the owner to compete in the market, while also limiting the ability to rent additional warehouse space due to budget constraints.

5 Problem Solving Approach

To address the challenges faced by Kid Shopper Stop Limited, a data-driven approach will be implemented.

Data Collection

- **Sales Data:** Includes product categories, quantity of products sold and net sales. Analysing sales data will allow us to identify the best-selling and worst-performing products, helping in inventory optimization. Patterns in the data will help prioritize which products to reorder from the supplier.
- **Exchange Rate Data:** Historical exchange rate data between USD and KES will be used to predict future fluctuations, helping the business adjust pricing strategies accordingly.

Currency Risk Management Strategies

1. **Exchange Rate Forecasting:** Utilize historical exchange rates and data to predict future exchange rates. Implement machine learning models such as ARIMA to improve accuracy in forecasting. ARIMA is an effective model for time-series analysis and will be used to predict future currency movements, reducing the impact of currency fluctuations.
2. **Scenario Planning:** Develop various pricing strategies based on different seasonal forecasts and exchange rate predictions.

Inventory Management Strategies

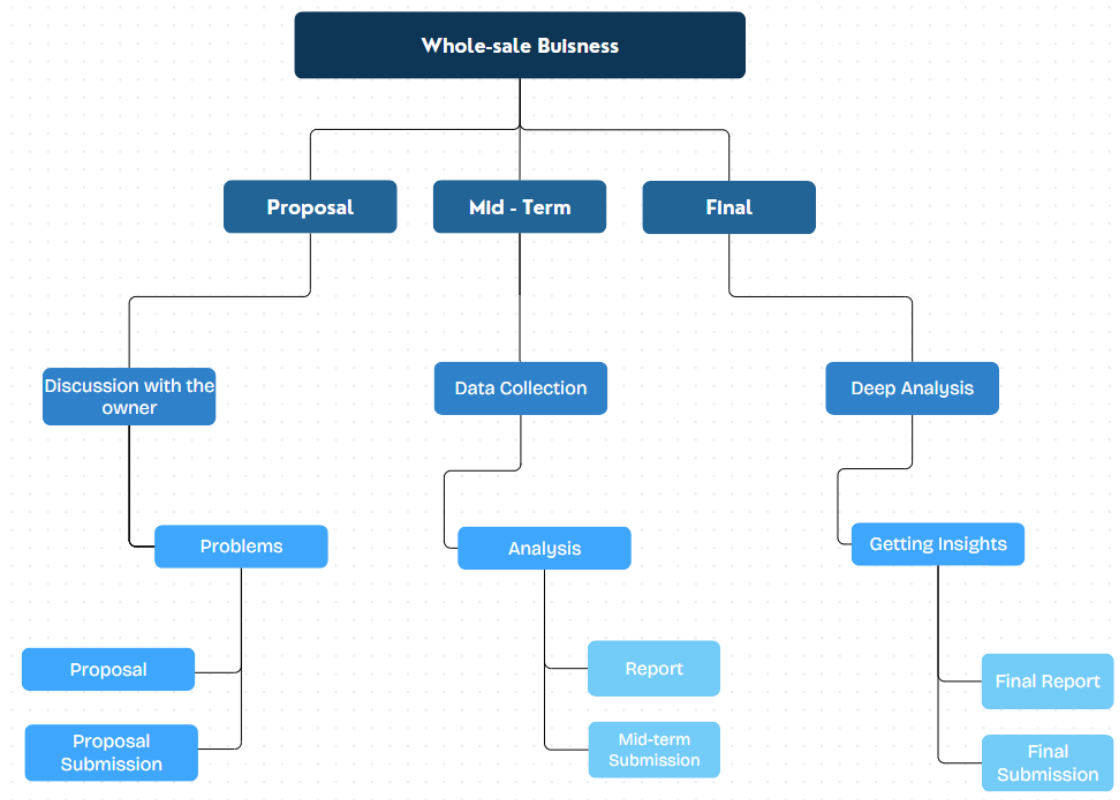
1. **Reorder Point (ROP):** Calculate the precise point at which new orders should be placed to avoid stockouts by analysing the data. The owner has mentioned that an ideal time of re-ordering is about 3 months but this has not been the case for a few consignments.
2. **Economic Order Quantity (EOQ):** EOQ will help to determine the optimal quantity of stock to order, minimizing both ordering and holding costs.
3. **Targeted Marketing:** Use machine learning algorithms to analyse sales data and identify trends. This will help create targeted marketing strategies that highlight unique selling points and products in demand.

Analysis Tools

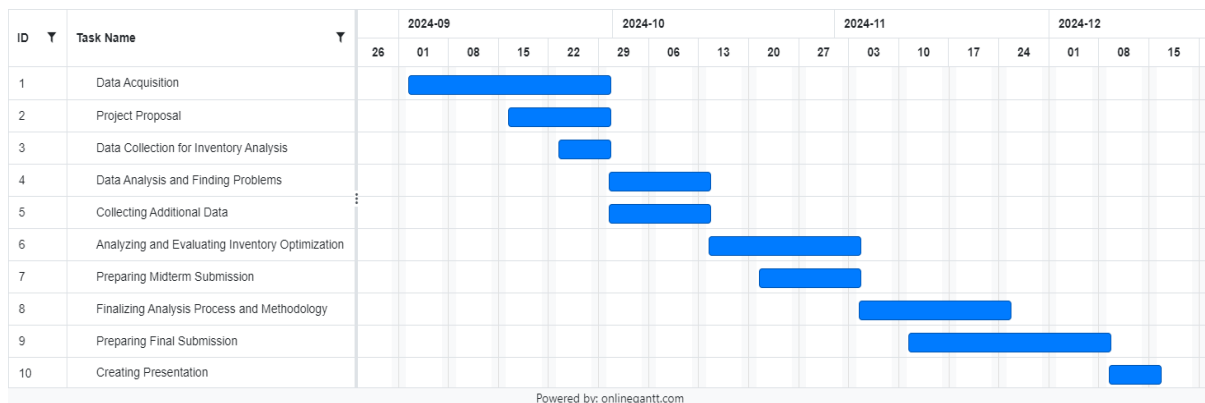
1. **Microsoft Excel:** Excel will be used for preliminary data analysis, including generating pivot tables, charts, and graphs to visualize sales and inventory data. Along with data cleaning, it will also be used to calculate reorder points and economic order quantities.
2. **Python and Machine Learning:** Python will be used for more advanced data analysis, including implementing the ARIMA model for exchange rate forecasting. Libraries such as NumPy, pandas, and matplotlib will be used to perform complex calculations for Economic Order Quantity (EOQ), Reorder Point (ROP) and safety stock levels as well as to create visualizations for decision-making.

6 Expected Timeline

6.1 Work Breakdown Structure:



6.2 Gantt Chart:



7 Expected Outcome

The data-driven approach is expected to improve operational efficiency by minimizing human errors and reducing the risks associated with stock shortages or overstocking. By integrating machine learning models, Kid Shopper Stop Limited will gain the ability to predict exchange rates and adjust prices in real-time, thereby reducing the impact of currency fluctuations. Inventory management strategies such as reorder point, economic order quantity, and safety stock calculations will ensure optimal stock levels, preventing costly excess or insufficient inventory.

APPENDIX A



Picture of the warehouse



Stainless Steel Hotpots



Aluminium Cans