

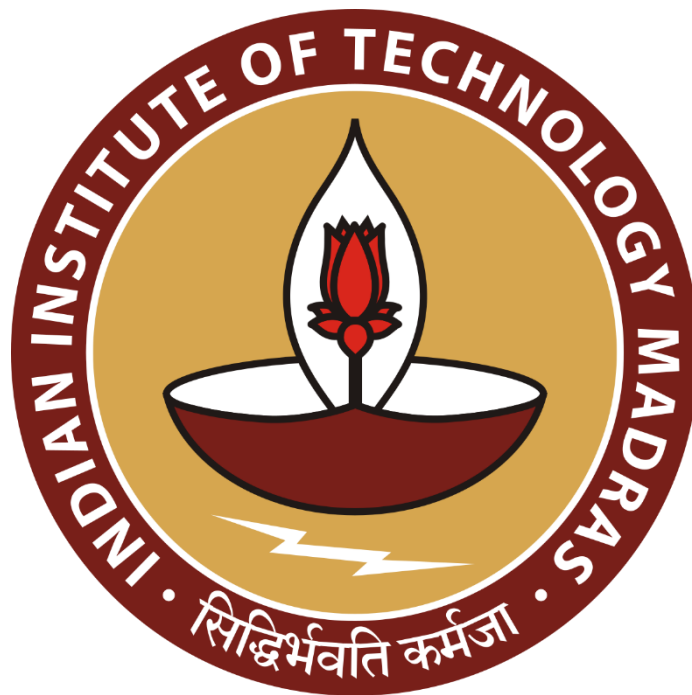
Enhancing Profitability and Inventory Management

Mid-term submission for the BDM capstone Project

Submitted by

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1 Executive Summary and Title

Title of this project is “Enhancing Profitability and Inventory Management”. The dataset I've selected for my project is from an electrical shop that sources various electrical products and supplies and sells them to local customers. The primary aim of this study is to gain insights into the sales data of the electrical shop and derive actionable insights that can enhance the business's profitability and resource efficiency. This analysis focuses on understanding the distribution of expenditures across different categories of electrical products and the corresponding revenues generated by these products.

The collected data spans over 6 months and will be examined from multiple angles to identify which electrical products contribute most significantly to the revenue. Additionally, the study will explore the impact of price fluctuations on the quantity sold, pricing dynamics, and the duration of the products' sales periods.

The proposed approach involves identifying the peak and nadir sales among various electrical product categories and juxtaposing these figures with the associated expenditures. To ensure a comprehensive understanding of the findings and to draw meaningful conclusions, visual aids such as bar charts, line charts, or combination charts will be employed. These graphical representations will facilitate a clear visualization of the situation, aiding in predicting the quantity of specific electrical products to be procured to maximize profits.

Ultimately, this analysis seeks to optimize the product mix, pricing strategies, and stocking decisions for the electrical shop, leading to improved profitability and efficient resource utilization.

2 Proof of originality



3 METADATA

METADATA	TYPE	DISCRIPTION
Item	String	Indicates the names of electrical items
Stock	Integer	Quantity of stock that is being bought
Sales	Integer	Quantity of stock that is being sold
Cost price	Integer	Price of stock per unit
Selling price	Integer	Price of sold items per unit
Total cost price	Integer	Sum of costs of stock when bought
Total selling price	Integer	Sum of selling prices when sold
m{1,...,6} stock	Integer	Quantity of stocks bought in months 1 to 6
m{1,...,6} cost price	Integer	Cost price of stock for 6 months
Expenditure{1,...,6}	Integer	Expenditure spent on buying stocks for 6 months
Average expenditure	Float	Average expenditure of 6 months for buying stock
m{1,...,6} sales	Integer	Quantity of sales for 6 months
m{1,...,6} selling price	Integer	Price of sales per unit for 6 months
Revenue{1,...,6}	Integer	Revenue generated by 6 months by sales
Average Revenue	Float	Average of 6 months revenue by sales
Profit{1,...,6}	Integer	Profits generates in 6 months
Average stock Quantity	Float	Average quantity of stock that is being bought
Average sales Quantity	Float	Average quantity of sales that is being sold
Left-over stock	Float	Quantity of leftover after sales
Total Profit	Float	Sum of 6 months profit

4 DISCRIPTIVE STATISTICS

Upon a thorough visit to the electrical shop and engaging in discussions with both the shop owner and employees, I obtained comprehensive sales data for 6 months from their books and bills. Collaborative conversations with the shop's staff provided invaluable insights into the day-to-day operational challenges faced by the business. Through these discussions, I've identified some key challenges that the business confronts:

- **Competition from Established electrical shops:** The electrical shop faces stiff competition from well-known brands like Philips, Havells, and Schneider Electric. These established brands in the electrical industry, along with the presence of other renowned outlets create a challenge for the shop's revenue generation. The allure of recognized brands often draws customers away from local options, impacting the shop's sales.
- **Monthly Sales Variation:** The collected data is segmented on a monthly basis to uncover any recurring patterns or seasonal trends in sales. Visualizing the data through line charts or bar graphs can highlight months of peak and low sales, assisting in understanding demand fluctuations.
- **Customer Purchase Behavior:** Exploration of customer buying patterns can provide insights into the types of products that are frequently purchased together.
- **Pricing Analysis:** Statistical summaries of product prices help assess the competitiveness of the shop's pricing strategy in comparison to competitors or online platforms.
- **Identifying Inventory Challenges:** Analyzing stock turnover rates and identifying slow-moving or excess inventory items can help optimize inventory management.
- **Sales Distribution Across Product Categories:** The dataset reveals the distribution of sales across different product categories offered by the electrical shop, such as lighting fixtures, wiring accessories, power tools, and appliances. Summary statistics, including mean, median, and standard deviation, help discern the typical sales volume within each category.
- **Product Performance Metrics:** Statistical measures such as average purchase frequency, average purchase value, and average customer spend offer a comprehensive view of each product's popularity and profitability.
- **Seasonal Impact on Sales:** The dataset allows for a thorough examination of how different seasons and festivities impact sales. Understanding seasonal demand fluctuations assists in inventory planning and enables the shop to capitalize on peak buying periods.
- **Inventory Turnover and Stock Management:** Calculating inventory turnover helps gauge the efficiency of stock management. A high turnover rate suggests effective inventory control, while a low rate may indicate overstocking or slow-moving items.

5 DETAILED EXPLANATION OF ANALYSIS PROCESS/METHOD

The cleaning of Raw data is a very crucial part before building any data model or for analyzing the problems on which we are focusing to optimize business revenue.

Firstly, I cleaned the data collected and formatted the data types and named the columns and arranged the data that is easy to understand and interpret. Few changes had to be made in the process to proceed for further step without any issue with data elements.

There was some unimportant data which were not useful for analyzing objectives like address, customer name, customer contact number, GSTIN/UIN etc. so I eliminated them to focus only on the main objective data.

The subsequent phase of the analysis involved categorizing the data into Cost Details and Sales Details to facilitate a more insightful exploration of the dataset.

Creating a new sheet dedicated to Cost Details, I computed the expenses associated with each type of electrical product for each month. By aggregating the weekly expenditures on different products, I then calculated the average expenditure per product using a pivot table. Subsequently, I visualized

this information by generating a bar chart, providing a clear overview of average expenditures across different product categories.

Transitioning to the Sales Details sheet, I quantified the revenue generated from the sales of each type of electrical product on a monthly basis. Through the aggregation of monthly revenue data, I determined the average revenue per product using a pivot table. Utilizing this averaged revenue data, I constructed a bar chart to visually depict the average revenue generated by various product categories.

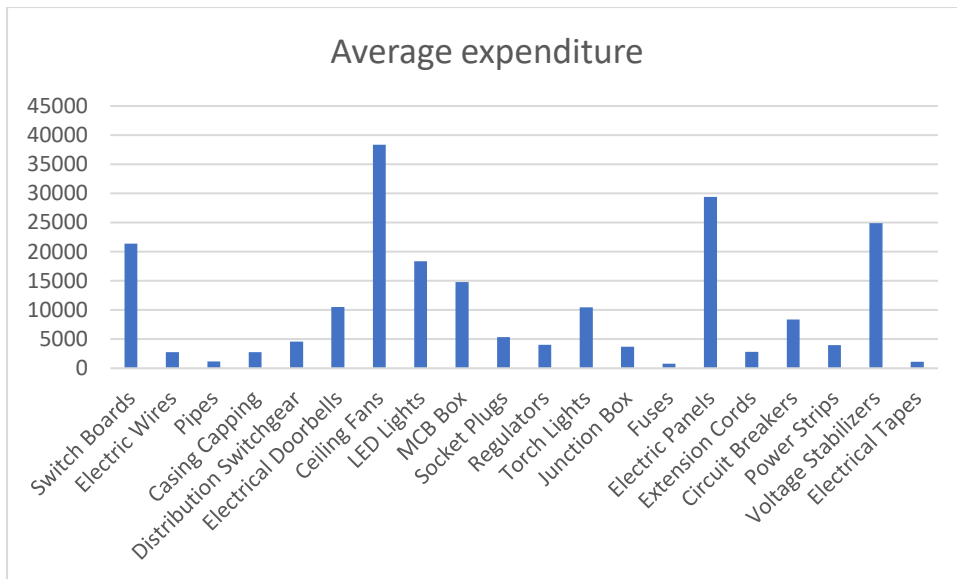
An integral aspect of the analysis was the comparison between the expenditure and revenue figures for each specific electrical product. This comparison provided valuable insights into the profit margins and potential areas for cost optimization within the business.

Moreover, to gauge the efficiency of stock management, I delved into the question of surplus or leftover stock after sales. To address this, I examined the average quantity of products purchased versus the average quantity sold, shedding light on the extent of waste or unsold inventory. This assessment aids in optimizing inventory levels and reducing wastage.

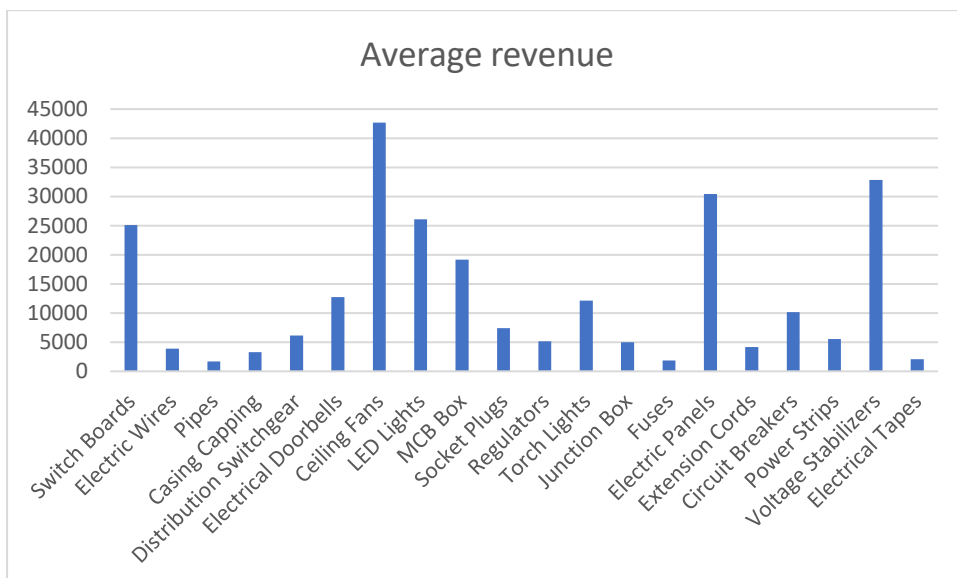
In a subsequent analysis, I proceeded to contrast the average cost price and selling price of different electrical products. By comparing these prices, I gained insights into the shop's pricing strategy, profit margins, and potential opportunities for pricing adjustments.

6 RESULTS AND FINDINGS

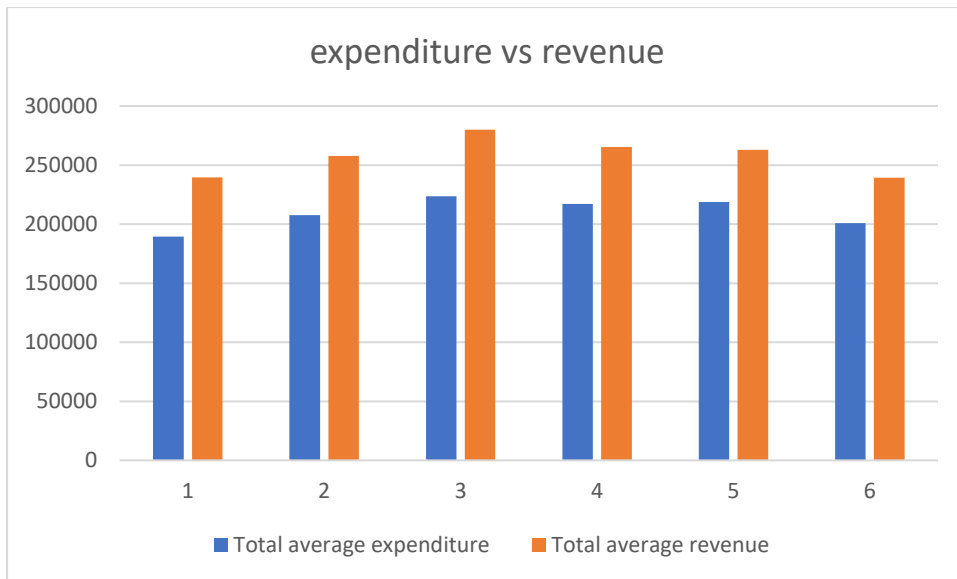
From the sales data of the shop I calculated the below mentioned descriptive statistics using Microsoft excel software and created pivot tables and graphs to descriptive the objective problems.



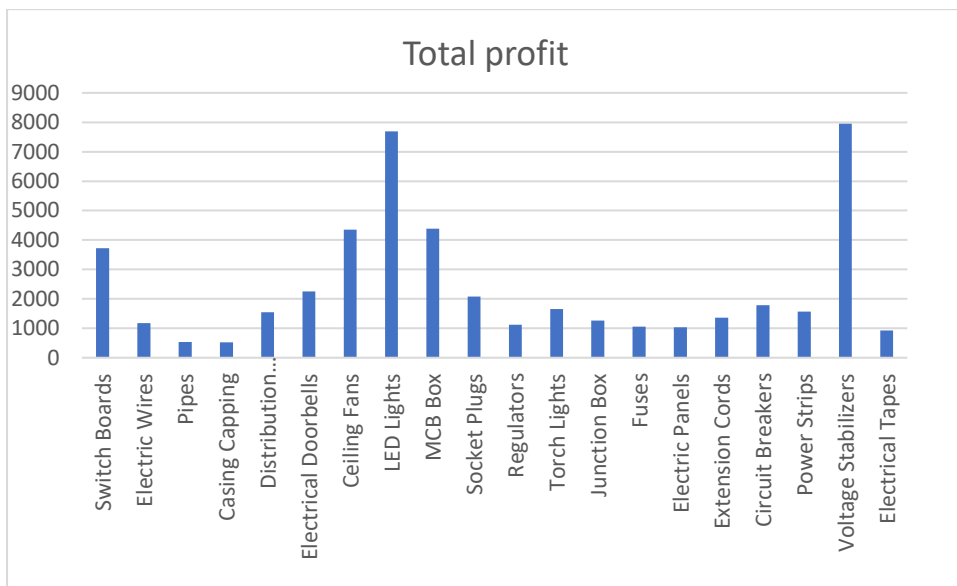
From above average expenditure graph it is clear that maximum expenditure is spent on ceiling fans and minimum expenditure on fuses.



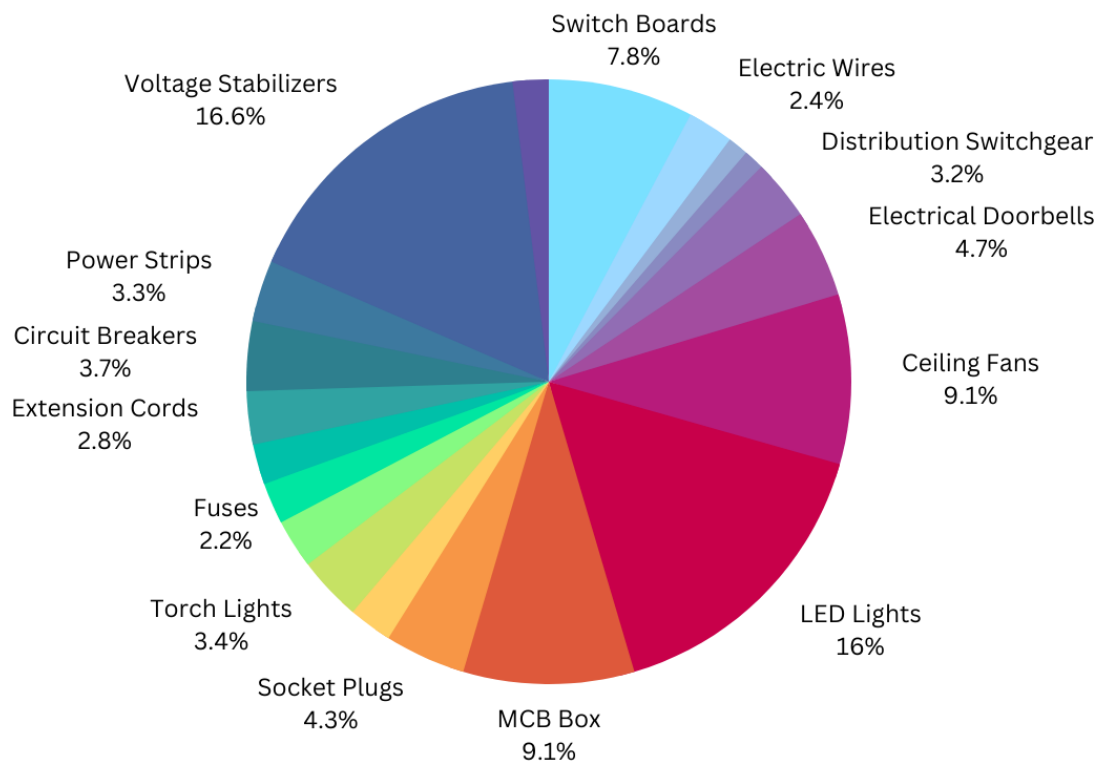
From above average revenue graph, the revenue generated by ceiling fans is maximum and the revenue generated by pipes is minimum.



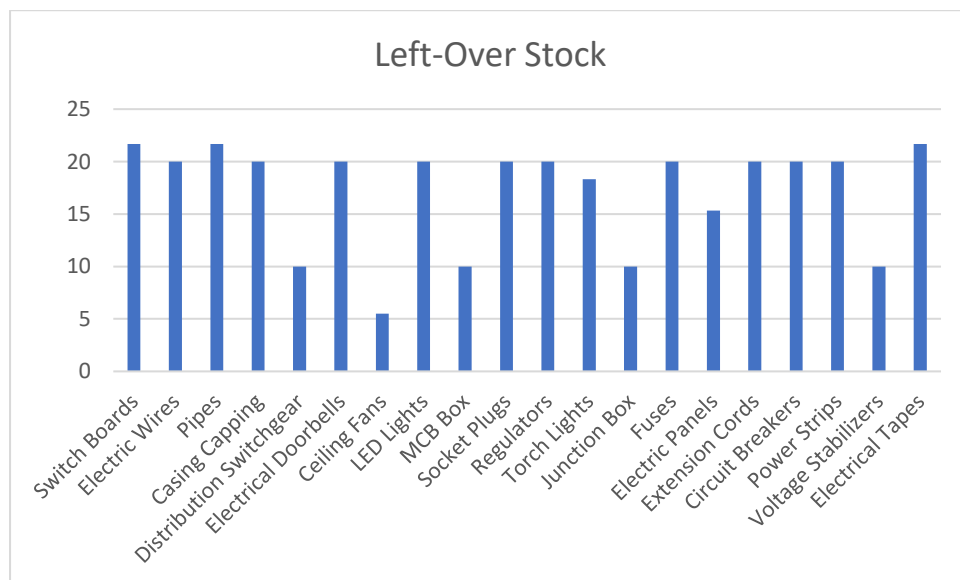
The above expenditure vs revenue graph reveals that the revenue generated by shop is always greater than expenditure. In month 3 both expenditure and revenue seems maximum.



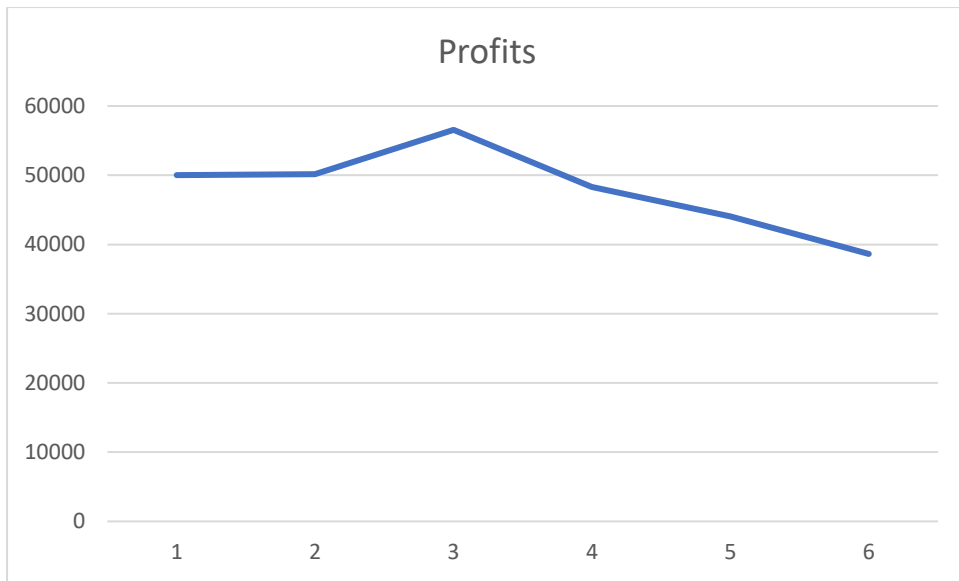
Above total profit graph shows us that both LED lights and voltage stabilizers generated maximum profits and both pipes and casing capping generated minimum profits.



The above pie chart shows the contribution of different items in profits. It is the same representation of above profits bar graph.



The above bar graph represents the quantity of left over stock. Almost quantities are same for most of the items. The leftover quantity of ceiling fans is less, it means, it is the most selling product.



The above trend line represents monthly profits of the shop. It has maximum profits at 3rd month and after that profits have been declining. In 6th month it experienced less profits comparing to other months.