

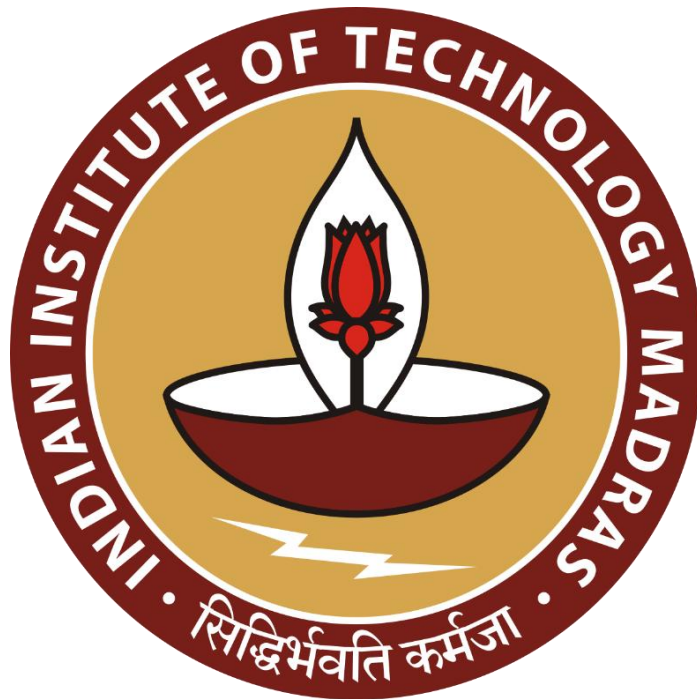
Optimizing Sales, Inventory management and analyzing the shopping trends of a general store.

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

Submitted by

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1.Executive summary and title

The project on “*Optimizing sales, Inventory management and analyzing the shopping trends of a general store*” outlines a strategic initiative to address the operational challenges faced by a small general store located at N5, Satyam Nagar, Chhatrapati Sambhaji nagar 431001, Maharashtra, India. The business operates in the B2C sector, specializing in daily essentials and snacks and cold drinks for the past 4 years. Needs Corner owner actively participated and provided the support that is much needed for doing this project in every aspect.

Despite the general store's current success, there are areas where performance can be elevated. The project identifies key areas of focus, including refining inventory management processes, reducing competition from neighboring stores, adapting to fluctuating pricing trends, overcoming transportation hurdles, and optimizing overall store management practices.

The primary goal of this project is to overcome the identified challenges through a comprehensive analysis of sales data, resulting in increased profitability and more efficient store management. Descriptive statistics will be used to get preliminary insights on sales trends and other important characteristics.

The project will leverage analytic tools and methodologies to analyze sales data, identify market trends, and implement data-driven strategies. The data includes information about products, sales volumes, profit margin and categories. Analyzing this data will help us uncover valuable insights that can help in optimizing its operations and be more efficient and effective.

The report explains these observed trends and patterns visually through graphs and charts offering insights to improve their business performance.

2. Proof of Originality

2.1 Photograph of the organization - This is a photograph of Needs Corner general store and it opens at 6 am and closes at 10 pm.





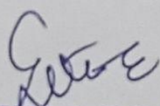
2.2 Letter from the organization - Letter to collect data from the shop owner.

To whom it may concern,

I Ajinkya Atre, the owner and manager of Needs Corner General Stores, have chosen to provide Atharva Garajkar, a student of IITM (BS in Data Science & Applications), access to sales data for 4 months from our store for his project.

The data provided is true to my knowledge and can be used for the aforesaid academic course only.

Signature


NEEDS CORNER

2.3 Photograph of general store and owner - He is the owner of the general store who takes care of everything regarding the shop.



2.4 [Link to the video](#) - [BDM Project Video](#)

3. Metadata

- ❖ **Data Collection** - The month wise sales of a general store has been collected . The data was written in books and folders which I converted into excel sheets for the duration of 4 months to analyze in this project. The sales data is a part of the general store's daily business operations.
- ❖ **Contents of the data** - The data contents are as following :
 - Type - Category of the item
 - Item Name - Name of the item
 - Inward Item Price - Price at which the item was bought
 - Inward Quantity -Quantity of the item that was bought
 - Value - The total value of Inward stock of a particular item
 - Outward quantity - Quantity of an item that has been sold
 - Outward Item price - Price at which the item was sold
 - Revenue - Revenue generated after selling an item in x quantity
 - Profit - Profit generated by selling an item

Sample of sales data

MONTH - MAY															
Type	Item	Opening Balance			Inward Stock				Outward Stock			Closing balance			
	Item	Quantity	unit price	Value	Quantity	Margine	Unit Price	Value	Sales	unit Price	Revenue	quantity	unit price	Value	Profit
Namkeen	Balaji(40)	43	₹40.00	₹1,720.00	144	15	₹34.00	₹4,896.00	101	₹40.00	₹4,040.00	86	₹40.00	₹3,440.00	₹806.00
Namkeen	Balaji(10)	345	₹10.00	₹3,450.00	1,153	15	₹8.50	₹9,800.50	807	₹10.00	₹8,070.00	691	₹10.00	₹6,910.00	₹1,210.50
Namkeen	Balaji(5)	691	₹5.00	₹3,455.00	2,306	15	₹4.25	₹9,800.50	1,614	₹5.00	₹8,070.00	1,383	₹5.00	₹6,915.00	₹1,210.50
Namkeen	Haldiram(10)	296	₹10.00	₹2,960.00	988	15	₹8.50	₹8,398.00	692	₹10.00	₹6,920.00	592	₹10.00	₹5,920.00	₹1,038.00
Namkeen	Haldiram(50)	47	₹50.00	₹2,350.00	158	15	₹42.50	₹6,715.00	111	₹50.00	₹5,550.00	94	₹50.00	₹4,700.00	₹832.50
Namkeen	Haldiram(sweet-130)	4	₹130.00	₹520.00	15	15	₹110.50	₹1,657.50	11	₹130.00	₹1,430.00	8	₹130.00	₹1,040.00	₹214.50
Namkeen	Bingo(5)	98	₹5.00	₹490.00	327	10	₹4.50	₹1,471.50	229	₹5.00	₹1,145.00	196	₹5.00	₹980.00	₹114.50
Namkeen	Bingo(10)	114	₹10.00	₹1,140.00	381	16	₹9.00	₹3,429.00	267	₹10.00	₹2,670.00	228	₹10.00	₹2,280.00	₹267.00
Namkeen	Moti(10)	60	₹10.00	₹600.00	200	16	₹8.40	₹1,680.00	140	₹10.00	₹1,400.00	120	₹10.00	₹1,200.00	₹224.00
Namkeen	Moti(45)	31	₹45.00	₹1,395.00	104	16	₹37.80	₹3,931.20	73	₹45.00	₹3,285.00	62	₹45.00	₹2,790.00	₹525.60
Namkeen	Lays	123	₹20.00	₹2,460.00	412	15	₹17.00	₹7,004.00	288	₹20.00	₹5,760.00	247	₹20.00	₹4,940.00	₹864.00
Namkeen	Chedda	78	₹10.00	₹780.00	263	20	₹8.00	₹2,104.00	184	₹10.00	₹1,840.00	157	₹10.00	₹1,570.00	₹368.00
Namkeen	Chikki	16	₹80.00	₹1,280.00	55	20	₹64.00	₹3,520.00	38	₹80.00	₹3,040.00	33	₹80.00	₹2,640.00	₹608.00
Namkeen	Rajgira Ladu	14	₹44.00	₹616.00	48	33	₹29.48	₹1,415.04	33	₹44.00	₹1,452.00	29	₹44.00	₹1,276.00	₹479.16
Namkeen	khajoor ladu	5	₹80.00	₹400.00	19	30	₹56.00	₹1,064.00	13	₹80.00	₹1,040.00	11	₹80.00	₹880.00	₹312.00
												0			
Cold drinks	Pepsi(20)	115	₹20.00	₹2,300.00	384	18	₹16.40	₹6,297.60	365	₹20.00	₹7,300.00	134	₹20.00	₹2,680.00	₹1,314.00
Cold drinks	Pepsi(40)	24	₹40.00	₹960.00	83	18	₹32.80	₹2,722.40	78	₹40.00	₹3,120.00	29	₹40.00	₹1,160.00	₹561.60
Cold drinks	Parle agro(10)	506	₹10.00	₹5,060.00	1,688	20	₹8.00	₹13,504.00	1,603	₹10.00	₹16,030.00	591	₹10.00	₹5,910.00	₹3,206.00
Cold drinks	Parle agro(20)	84	₹20.00	₹1,680.00	282	20	₹16.00	₹4,512.00	268	₹20.00	₹5,360.00	98	₹20.00	₹1,960.00	₹1,072.00
Cold drinks	Parle agro(40)	21	₹40.00	₹840.00	71	20	₹32.00	₹2,272.00	67	₹40.00	₹2,680.00	25	₹40.00	₹1,000.00	₹536.00
Cold drinks	Parle agro(100)	8	₹100.00	₹800.00	29	20	₹80.00	₹2,320.00	27	₹100.00	₹2,700.00	10	₹100.00	₹1,000.00	₹540.00
Cold drinks	Paperboats(10)	381	₹10.00	₹3,810.00	1,271	15	₹8.50	₹10,803.50	1,207	₹10.00	₹12,070.00	445	₹10.00	₹4,450.00	₹1,810.50

- ❖ The dataset used in this analysis is derived from sales data recorded over the past three months, spanning from 1-May-24 to 31-August-24.
- ❖ The primary objective of utilizing this dataset is to analyze monthly sales trends and assess profitability. The insights obtained from this analysis are crucial for informed decision-making aimed at optimizing both sales and profits.
- ❖ This metadata paragraph provides a comprehensive overview of key details associated with the sales data used in this project. This clarity facilitates better understanding, accessibility, and efficient utilization of the dataset by stakeholders.

Description about Sales Data

Columns	Data Type
Item Name	Alphanumeric
Category	String
Item Price	Numerical
Quantity	Numerical
Item Amount	Numerical
Profit	Numerical

4. Descriptive statistics

Presented is a descriptive statistics table including various financial metrics. The tabulation comprises 15 rows and 5 columns, namely, “Statistic”, “Item price”, “Quantity”, “Revenue” and “Profit.” Within these rows, various statistical measures such as mean, median, mode, Quartile 1, Quartile 3, IQR, Sample Variance, Standard Deviation, kurtosis, Skewness, Minimum, Maximum, Sum, and Count are meticulously documented. This structured arrangement provides a comprehensive overview of key financial indicators, facilitating a detailed analysis of the dataset.

To get comprehensive understanding of the dataset's characteristics, the initial phase involved conducting descriptive statistics. Important statistical measures were calculated, and pie charts as well as bar charts were generated to explore data distributions and patterns on a monthly basis for an item's category. Exploratory Data Analysis (EDA) was done to identify anomalies, pinpoint outliers, and establish a foundation for subsequent analyses.

The inherent nature of the dataset, coupled with the specific objectives of the project, justified the utilization of EDA. Given that EDA aligns directly with the project's aim of figuring out the drivers of the business and their impact on gross revenue, it serves as an initial step in gaining a thorough comprehension of the data, bringing to light trends and potential outliers.

Descriptive Statistics of Sales Data

STATISTICS	ITEM PRICE	QUANTITY	REVENUE	PROFIT
COUNT	139	139	139	139
MEAN	302.7693694	₹60.45	₹6,034.61	₹1,219.90
STANDARD DEVIATION	674.4514665	₹67.33	₹11,148.09	₹2,769.19
MINIMUM	1	₹5.00	₹150.00	₹22.00
QUARTILE 1	22.5	₹15.00	₹1,120.00	₹187.50
MEDIAN	84	₹40.00	₹2,535.00	₹430.63
QUARTILE 3	253.25	₹80.00	₹6,107.50	₹1,058.40
MAXIMUM	6072	₹485.00	₹107,350.00	₹23,760.00
MODE	7	₹10.00	₹500.00	₹420.00
IQR	230.75	₹65.00	₹4,987.50	₹638.40
SUM	168037	₹33,912.00	₹3,385,416.00	₹678,262.77
SAMPLE VARIANCE	674.4514665	₹67.33	₹11,148.09	₹11,148.09
SKEWNESS	4.558281935	3.087551782	4.864483019	5.270254916
KURTOSIS	25.13388555	14.22280796	31.28448963	32.71535275

5. Analysis Process/Method

a. Collection

I have used an Excel sheet for the analysis part in order to analyze sales data by representing pivot tables and graphs. I collected sales data of a general store from May1, 2023 to August 31, 2023. The business manager was formally notified, both personally and in writing, about the project's objectives and methodology. Formal authorization, along with their explicit consent, was obtained.

For the analysis phase, the data underwent a meticulous cleansing and organization process. Trends and insights were discovered through the application of descriptive statistics, measures of central tendency, and graphical representations.

To ensure the accuracy and reliability of the data, the data gathering procedure was executed with precise attention to detail. A comprehensive examination was conducted, leading to insightful advice that will be beneficial to the business.

b. Analysis

The analysis was designed to provide a comprehensive understanding of revenue, with a specific focus on the dynamics of sales categorized by different product categories and their corresponding sales patterns. A key aspect of the analysis involved breaking down the dataset into distinct time periods, The dataset was divided into 4 time period, each with duration of one month. Within these segments, a detailed examination and comparison were conducted, calculating sales trends and the other financial outcomes.

One significant element was the utilization of the "Inward - Outward" columns, which served as a pivotal tool for gaining a broader perspective on monthly sales trends. This facilitated meaningful comparisons and offered insights into the fluctuations and variations in sales over time. The examination of important performance metrics, including "Item Price", "Category", "Item Amount", and "Profit" was carried out with accuracy to find insightful conclusions.

The analysis process extended to the creation of visual representations such as charts and graphs. These visual aids played a crucial role in effectively communicating complex patterns and trends within the data. The objective was not just to present data but to make it accessible and understandable, aiding in the identification of key insights.

This detailed exploration aimed to uncover detailed insights into the various financial elements of the business. It laid the groundwork for strategic decision-making by providing a clear understanding of

how different factors, such as product categories and time periods, influenced revenue and profit. The ultimate goal was to empower decision-makers with the knowledge needed to guide the business towards sustainable growth.

In summary, the analysis examined deeply into the connection of various factors, including categories and quantities, revealing complex patterns in revenue and profit. The combination examining the data meticulously and effective visual communication formed an excellent basis for strategic decision-making, ensuring a overall well-informed approach to the development of the business.

6. Results and Findings

I. Categorical contribution towards the Total Shop Revenue

TYPE	SUM of Total Revenue
Bakery	₹157,745.00
Biscuits	₹142,150.00
Chocolates	₹118,730.00
Coffee	₹24,034.00
Cold drinks	₹306,770.00
Dairy	₹441,586.00
Electronics	₹25,848.00
Home care	₹111,765.00
Ice cream	₹1,029,935.00
Kirana	₹270,401.00
Masale	₹29,090.00
Namkeen	₹397,278.00
Personal Care	₹203,573.00
Ready mix	₹49,886.00
Stationary	₹31,240.00
Tea	₹42,385.00
Grand Total	₹3,382,416.00

II. Column chart showing each category's contribution towards Total Revenue

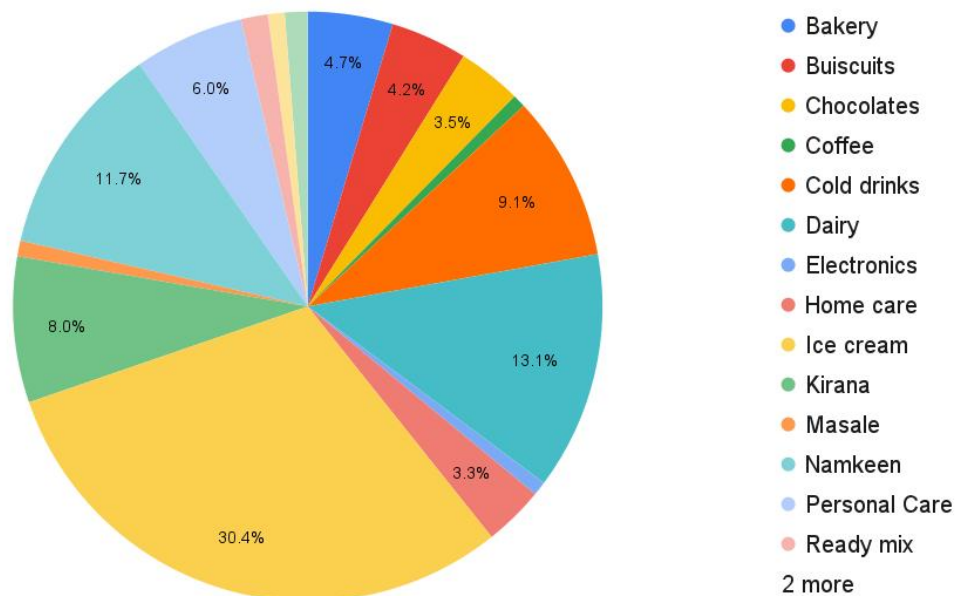
SUM of Total Revenue vs. TYPE



The column chart displays the sales distribution across sixteen categories over four months, highlighting their contributions to the shop's total revenue. This breakdown helps in identifying sales trends, informing inventory management decisions, and strategizing marketing to optimize overall profitability and growth of the business.

III. Pie chart representing Sales% of each category

SUM of Total Revenue

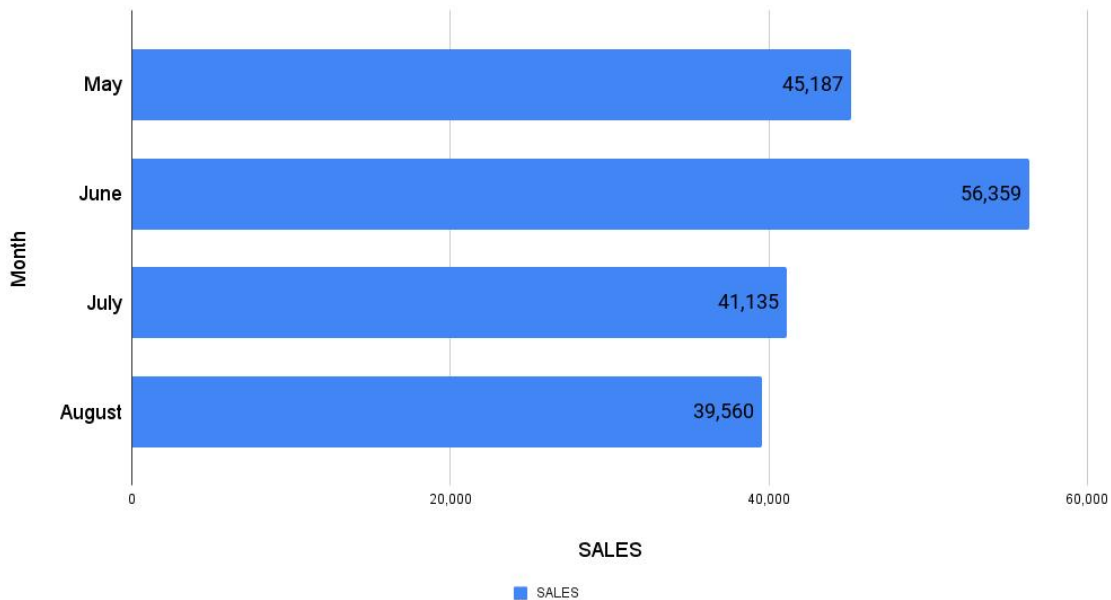


The pie chart depicts the sales share of each category in relation to the total general store's revenue. Notably, "Ice-cream" emerges as the top performer, generating Rs 10,29,935.00, constituting 30.4% of the total general shop's revenue. Conversely, "Coffee" lags behind with the lowest revenue of Rs 24,034.00, representing a mere 0.7% of the total shop's revenue. This analysis is specifically focused on comparing the performance of each category based on revenue. Once identified the category, We

can take actions to enhance the sales of that individual category hence optimizing overall revenue.

IV. Sale across the months in a bar graph

SALES (Units) Vs. MONTH



Revenue vs. Month



The bar chart portrays the variation in the total sales across the observed months. Notably, there's a rise in sales in June, with revenue totaling approximately Rs. 1,071,484. However, there's a subsequent dip in July, with revenue reaching around Rs. 797,629, as the season of the mostly sold items was over. Also, August exhibited even more dip in sales, amounting to Rs. 690,569, as evident from the bar chart.