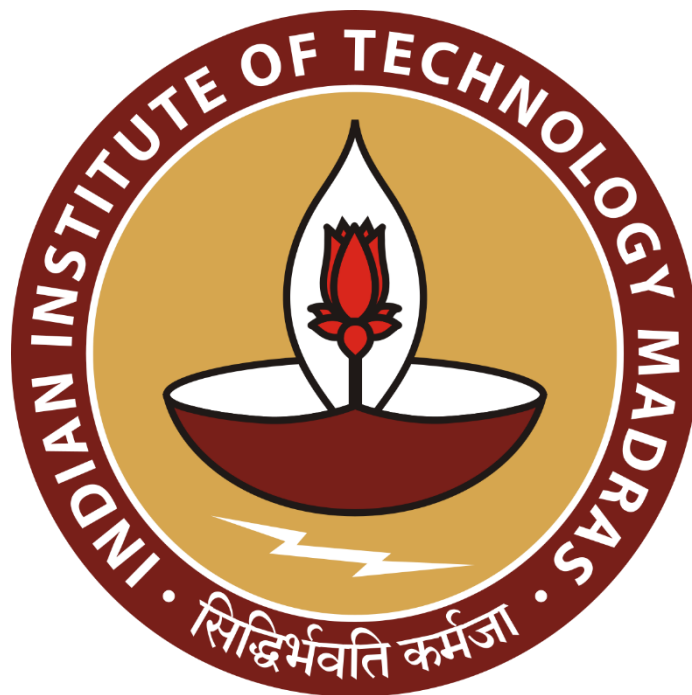# EFFECTIVE STOCK INVENTORY MANAGEMENT OF BABA BAKERS

A Proposal report for the BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project titled "effective stock inventory management of baba bakers". I extend my appreciation to 'BABA BAKERS', 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: (**Digital Signature**)

Name: RAZVI SYED SULAIM

Date: 10-1-2024

EXECUTIVE SUMMARY

The baba bakers is a bakery firm which operates in b2b supplies of bakery product and b2c business of bakery products with a bakery outlet. the bakery was found in 2007, 7th July by Mr. shaikh Amer. Mr Amer started the business on his own and now the business is run by him and his son Mr Sufiyan. The bakery is situated on kat kat gate road, hattisinghpura, Aurangabad Maharashtra. the bakery has been selling bakery products by there own brand name that mainly includes toast, khaari, biscuits

The bakery is facing business problems that were found out while discussing with the owner that are as follows:

- Low profit margins of products in product sales in the b2b business:
  The business is having a good sale due to the trust and connections they built but due to post covid inflations in prices their production cost has increased

- Labour reluctant to accept competitive and low wages:
  The gross profit they earned after the business is greatly used in maintenance and labour work with inflation in prices labours are not ready to work on less wages and demand higher salary rates

- Declining market demand due to intense competition and same product type offering:
  Due to emerging new bakeries the firm is facing competition in their business supply moreover as the trend is changing, they are in ned to also change their production type to produce such bakery items hat are currently in demand

The capstone project was done in various steps:

The first step was to locate and find a business firm offering their data for analysing the business firm baba bakery was selected for it

 the second step was to identify the problems the business was facing and the reasons and the cause of the problems the problems were found with the help of discussions with the bakery owner and his son and were listed

The next step was to collect the data, the data was collected about the weekly sales of the business with the help of the bills and handwritten records that the bakery firm had. The data was then properly updated in an excel sheet and was properly cleansed from errors and any improper irregular entries. the metadata and the explanation of the following data workbook is given below in the metadata section

With all these information and data sheets further study and analysis on data was done to provide and find out meaningful insights and pattern to find out solutions and justification to there to their problems

PROOF OF ORIGINALITY:

LINK TO: <u>INTERACTION WITH THE OWNER</u> (click the highlighted text)

BAKERY LOCATION

BAKERY GODOWN
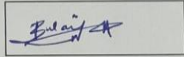
LETTER OF AUTHORIZATION

PHOTO WITH THE OWNER

METADATA:

I have collected data of the sales and the revenue generated over three months span period of (September, October, November) of the bakery. And created an excel workbook to store, analyse and study the data.

The Excel workbook contains four work sheets that are named as:

Sales data: This sheet contains the data of weekly sales of all the bakery products with their respective rates and units
Production cost: This sheet contains the production cost of the different products the bakery sells and the cost of maintenance and labours.
Monthly data: This sheet contains the monthly data of the sales and the revenue generated (per month) of the various selling products
Revenue data: This sheet contains monthly analysis of the products their sales, the revenue they generated and the net and gross profit earned by the firm

1. SALES DATA

Name of the Item	Unit	quantity	Rate (INR)	Sale in Week-1	Sale in Week-2	Sale in Week-3

The sales data contains a table with the columns as:

Item name: This column contains the names of the bakery products sold by the business
Rate: This column indicates the rate at which the bakery sells the product
Unit: This column refers to the unit in which the product is sold (either in box, or in packet bundle)
Sales in week: these columns consist of the quantity of the items sold with respect to the units in that week

2. PRODUCTION COST

PISTA TOAST BOX		
ingredients	quantity	price

ELAICHI TOAST BOX		
ingredients	quantity	price

The production cost sheet consist of 7 tables each for a respective product's ingredients and there rates giving the cost of producing one box or bundle of that product

The column's metadata are as follows:
Ingredients: This column contains the ingredients required for baking the product
Quantity: This column indicates the quantity of ingredient used
Price: This column contains the price of the item

LABOUR AND MAINTAINENCE			
work	No of workers	salary daily (per day)	amount per month

A table that contains the data for the labour cost and maintenance required per month.

Work: The type of work that is required
No of workers: the number of workers required for it
daily salary: and their daily salary
amount: the final column contains the amount spent on each work per month for labours and maintenance

3. MONTHLY DATA

Monthly data contains two tables one that has monthly sales data and the other have monthly revenue generated. The tables have the following columns for different data entries

REVENUE DATA

item name	September revenue	October revenue	November revenue	total revenue

SALES DATA

item name	unit	sales in September	sales in October	sales in November	total sales

The metadata of the columns are as follows:

Item name: This column consists of the product name
Month-sales: This column contains the total sales of each of the products for that respective month
Month revenue: This column contains the total revenue generated by each product in that month
Total sales/revenue: This column contains the total sales or the total revenue generated by each product in the period of three months (September, October, November)

4. REVENUE DATA:

item name	september sales	production cost	revenue generated	profit

The revenue data sheet contains the month wise tables containing column headers as:

Each table shows and compare the total sales and revenue generated in that month and the gross profit generated by the firm
The metadata of each column is as follows:
Item name: This column contains the name of the items for sale
Monthly Total sales: This column contains the total sales of respective product of that month
Productions cost: This column contains cost required by the bakery to produce the products for the sales
Total revenue: This column contains the revenue generated by each product in that month
Gross profit- this column contains the gross profit of each product in that respective month

month	Gross profit	labour& maintenance	net profit	profit margin

There is another table which contains data of the gross profit and net profit per each month.the metadata is as follows

Month-name: This column contains name of the respective month
Gross profit: This column contains the total gross profit of that respective month generated
Labour and maintenance: This column has the monthly labour and maintenance charges the bakery firm has to pay
Net profit: This column shows the final amount of net profit that the firm is making er each month
Profit margin: This column contains the profit margin for each month they had on their total sales

BDM DATA LINK: https://1drv.ms/x/c/9a8ed347cf66b92f/ESif-oSnUC9Ek3oSi-1T4CoBLJ8xWl79UlaMAGFNxZCLCg?e=zFbRnV

DESCRIPTIVE STATISTICS:

item name	max sales	min sales	total sales	max revenue	min revenue	total revenue
Maska khaari	130	30	1000	26000	6000	200000
pista toast	145	45	1110	43500	13500	333000
suji toast	60	15	388	12000	3000	77600
elaichi toast	110	30	805	26400	7200	193200
20-20 toast	80	20	640	20800	5200	166400
khopra biscuit	30	2	160	21600	1440	115200

The descriptive statistics were calculated with the use of Microsoft excel and the various formula's that it provides to users such as the 'SUM' function to calculate total sales and revenue for every month and total 3 months. The 'MIN' and 'MAX' function to find minimum and maximum sales and revenue generated. With the help of these statistics, we can identify sales and revenue patterns and some insights like the following:

- The product 'Pista toast' is the most sold item having total sales of 1100 boxes and also generates the most revenue of 3,33,000(INR) over three months' time period
- the least sold item is 'khopra biscuit' with total sales of 180 boxes in three months also with the least maximum sales and minimum sales
- the least revenue share is generated by the product suji toast with revenue of 77,600 (INR) in three months.

item name	Average sales	Average revenue
Maska khaari	83	16666
pista toast	92	27750
suji toast	32	6466
elaichi toast	67	16100
20-20 toast	53	13866
khopra biscuit	13	9600

● the average weekly sales can be calculated by the formula of total sales/no of weeks. With this we are able to find out the average sales per week is.

● The table also shows average sales for each of the product. with the highest selling product "Maska Khaari" has an average sale of 83 boxes per week

● The lowest selling product "khopra biscuit "has an average sale of 13 boxes per week.

● The revenue data its shown that the 'Pista Khaari' has an average revenue collection of 1,66,666(INR) per week

● The lowest selling product Khopra Biscuit has revenue collection of 9,600(INR) per week

DATA CLEANSING:

The organization and cleansing of data were done by creating tables containing each products weekly sales. the data was converted from manual diary records into excel worksheet during this process duplicate and improper records bills were eliminated so that a well-defined data table is constructed allowing ease in

analysis process. Some of the inconsistent entries were fixed while outliners where also removed to create a streamlined dataset

● The dataset consists of information about 7 different types of products offered by the bakery
● the data set is organised in a consistent manner providing a proper analysis and with the help of the metadata provided resulting in ease of finding insights and pattern.
● The weekly sales data will provide insights of each particular week's pattern and trends
● The data has been analysed using many different approaches such as the weekly sales information, weekly revenue generated and the net and gross profit earned by the firm monthly. with the help of this we are able to understand customer buying pattern and weekly trends.
● The data used is directly taken from the bakery's billing and sales records and is authentic providing transparency in the process of data collection cleansing and analysis done using formulas and statistical calculations and techniques

DETAILED EXPLAINATION OF ANALYSIS PROCESS/METHOD:

The analysis is done on the data collected over span of 3 months collected weekly from September first week to end of November. I used the most generalized data analysis method which involves of 4 different types of analysis approach that is done on the collected data

Descriptive approach:

Descriptive approach is a type of data analysis approach which includes summarizing the data and sorting them up. The first step is to collect relevant data needed for the analysis the data is then summarized into tables this approach allows us to have a clear view about the data and helps us in analysing it more efficiently

The descriptive approach is used to identify trends and patterns based on the summarized data. with the help of application of different various methods, we can get to finding out meaningful insights and results and then summarizing the statistics and visualizing the data through different representations

I used MS excel and its tools and functions to get a summarised statistic of the data for better analysis process. I created multiple pie charts based on the total sales and this helped me rule out the most selling item and the least selling item

 I was able to find out the most profitable product and the least profitable product based on the pie chart of there revenue generation. In addition, I also created column charts for comparison of monthly sales and revenue over the three months that help me understand monthly pattern and overview.

The descriptive analytic data was calculated using Ms Excel basic formulas like in, max, sum, average. and by using the help of the charts provide by Ms excel. These formulas aided me with the calculation and providing a streamlined output result

By analysing the star product with the help of this approach we can really understand which products need improvement and more attention to work on this approach describes our sales into a proper format by allowing us to gain insights and observe different trends in different product sales and the revenue they are generating

Predictive approach:

The predictive approach is a type of analysis that predicts about what and how the data patterns and trends will behave. these predictions are really crucial for finding out results as they are used as an input data for the prescriptive analysis that can prove the predictions about products their trends and patterns

Based on the data pattern and trends it can be predicted that the products like Pista toast, Maska khaari, were the most customer favourite and had a good demand. Meanwhile items like Suji toast and khopra biscuit were in less demand and were least liked by the customers.

This analytical approach helps us to study about the consumer buying behaviour and there likes and dislikes based on it we can improve our products and product type for maximizing the profit. By working on the products, the customer like we can enhance our profit in our business firm

The predictive approach allows us to give valuable and meaningful insights and data driven opinion based on the trends of data. These predictions are based on the data that helps the business grow and avoid mistakes and find out their shortcomings

Prescriptive approach:

The prescriptive approach is a statistical analytical approach which provides a forward way or the the method and the way the business should continue their work based on the data analytics the prescriptive analysis uses descriptive and predictive approach the predictive analysis output is the input of prescriptive analysis the prediction made are prescribed based on data and findings

For the problem of competition and expansion that the bakery is facing by analysing the best product that is "pista toast" that is the most profitable product with the most sales and revenue generation and the products with least sales and revenue generation. This can help me prescribe the business owner about the products on which they should invest and the products in which they should work more

By analysing the profit margin of different products, we can identify products with good profit margin and work on them also inclusion of new products that are more in demand and are profitable to produce for the bakery The advantage of prescriptive approach is that it helps business understand the consumers psychology what they want to buy and why is the reason. It also offers business intelligence on the current situation and data, it shows possible future outcomes and trends leading to revenue growth, gross margin management and cost reduction

Diagnostic approach:

With the diagnostic approach I want to understand the trend and the pattern the sales data follows for this purpose I created a scatter plot for total weekly sales. with the help of the chart, I was able to diagnose that the business company has the most sales during first week of the month and then the sales gradually decrease, I also found out that the sales subsequently dropped in the month of November

WEEKLY SALES
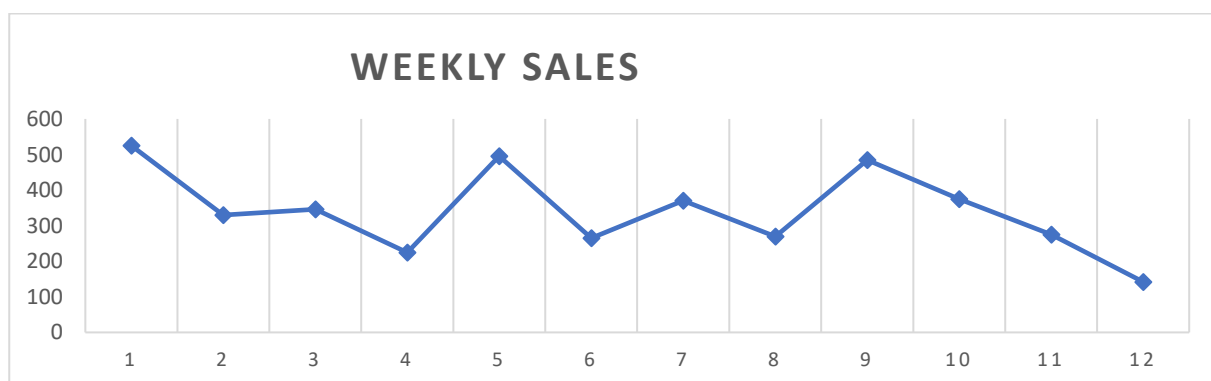
The project's objective was to analyse the sales data over a period of time to understand the pattern and trend followed by the sales. Other than data collection I was also able to rule out the fact that the customer had different preferences thus the products were mostly depended on the taste and the likability of customer

With the analysis approach I used, I was able to find out the top selling and least selling products. the trend and pattern each product follow that gave me insight on the consumer buying behaviour about their likes and preferences that can be predicted. from these insights and information

I will try to prescribing a better business marketing strategy that will lead to business growth. the diagnostic analysis of weekly sales and revenue will help me rule of the most profitable weeks of the months In any business one of the most important aspects is understanding the customers need and the consumer buying behaviour by analysing this behaviour we aim to provide the customers the things they want resulting in satisfactory feedback to our business and maximizing business sales.

RESULTS AND FINDINGS:

The results and findings by analysis of the bakery sales data were as follows:

The top selling product and least selling product was found based on the data of weekly sales of 12 weeks. I also visualized the data table as by visual representation we can gain more insights on the data thus I created a pie chart. The pie chart contains percentage share of the products in overall sales

ITEM NAME	SALES (box/packets)	REVENUE(INR)
Pista Toast	1110	333000
Maska Khaari	1000	200000
Elaichi Toast	805	193200
20-20 Toast	640	166400
Suji Toast	388	77600
Khopra Biscuit	160	115200

We also created a pie chart for finding the product generating highest revenue and the least revenue based on the revenue data of 12 weeks. with the help of pie chart, we found each product's contribution in overall revenue generation.
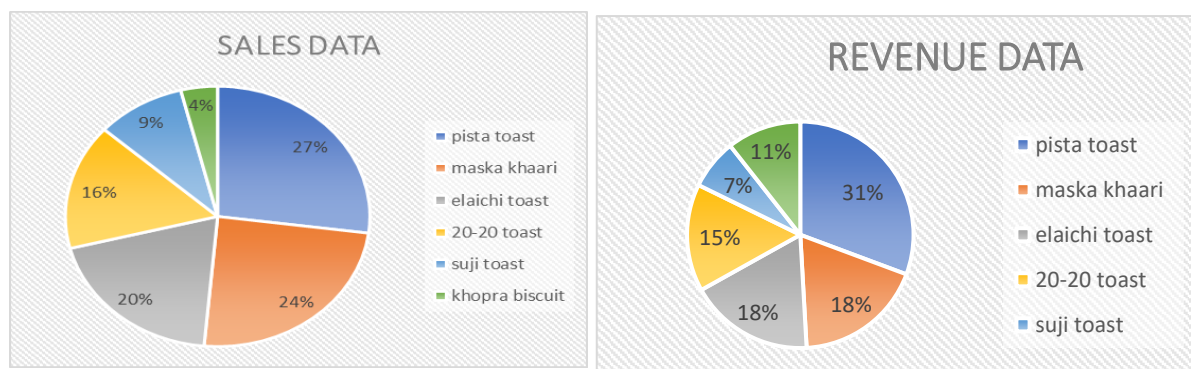
From the above chart and table data we can clearly see that the bakery product "pista toast" has the highest demand and sale as well as the highest revenue generation. Almost one third of their revenue is generated by this product. followed by Maska khaari which also hold a major percentage of their revenue generation.

The products elaichi toast and 20 20 toast shares a median percent of revenue generation meanwhile items like suji toast and khopra biscuits are in very less demand and the least revenue making product is suji toast

We can also sea that though the sales of khopra biscuits are less it still makes higher revenue than suji toast. The reason behind this is that the selling price of khopra biscuits is quite high causing less sales but it still has a good profit margin resulting in more revenue generation.

This data helped in identifying the most profitable product of the bakery firm that is the "pista toast" and least profitable product that is suji toast.

● Monthly revenue generation:

I used a bar chart (column) to depict the revenue generation for the three months as column charts are generally used for depicting the differences between data entries and comparing them

month	revenue generated
September	373360
October	369300
November	342740
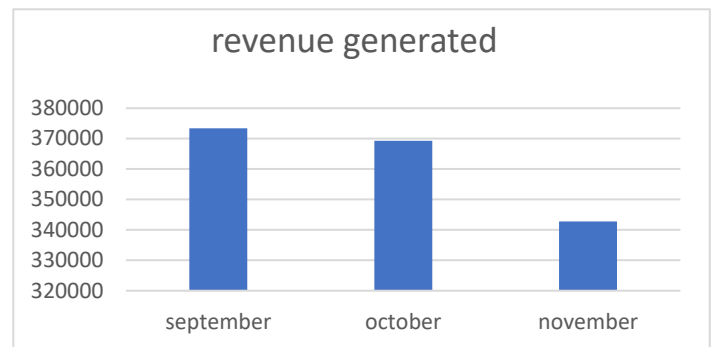
The chart contains three bars representing the total revenue generated at each month

From this column chart we can see that the business generated almost equivalent revenue amount for two months in September and October but generated the least amount of revenue in November. The reason for that is the post Diwali season fall in production and demands etc that lead to this situation. The situation has also another reason that came into finding after talking with the owner that the owner is planning on expanding there b2c outlet that is resulting in less sales for the following month too moreover the workers are at holiday leave so production is also less

● gross profit share percentage

month	profit	Labour & maintenance	earned profit	profit margin
September	110078	62000	48078	12.8771159
October	109460	62000	47460	12.8513404
November	99394	62000	37394	10.910311

With the help of this pie chart of three months span we found out about the share of the net profit. Pie charts are great tools for comparing different quantities and finding out share and percentage hold of each of the different data entities that they each holds.

By analysing this chart, we can clearly see that the problem the business is facing about the high maintenance and labour charges that are subsequently holding a major percentage of the revenue generated causing less net profit earned by the business firm.

Almost 55 to 65 percentage of the gross profit is being used in the maintenance and the labours and workers salary. this is resulting in a very crucial problem for the bakery as more than half of there profit is being used in labour and maintenance