

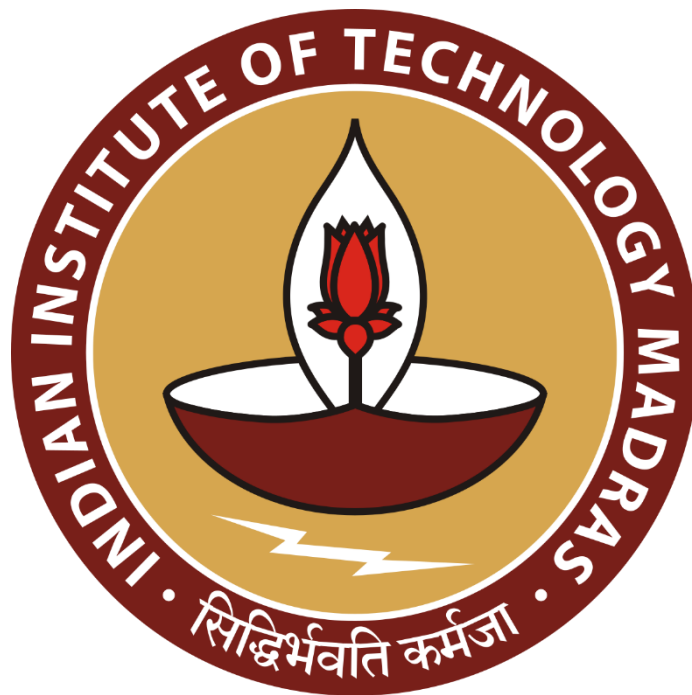
EFFECTIVE STOCK INVENTORY MANAGEMENT OF BABA BAKERS

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.

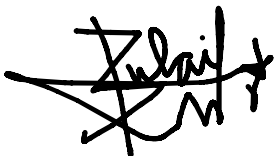
I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered from primary sources and carefully analysed to assure its reliability.

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: 14-3-2024

Executive summary

For this capstone project, I selected to choose and work with a small local bakery outlet in my city name "baba bakers". The bakery is a well-established firm and doing business since, with this the bakery has now established its unique place in the local market ad people's perspective.

The bakery deals with b2b and b2c mode of business as well. The focus of our project will be solely on its b2b sector business which is generally done on order basis. The bakery is situated in kat kat gate, hattisinghpura, Ch Sambhaji Nagar (Aurangabad), Maharashtra

The bakery is now facing new challenges after the lockdown period causing their business to make much less profit and even sometimes halt their production rate. The issue generally arisen due to increased rate of competition in the local market after lockdown period, the production cost of the bakery products significantly increased due to inflation in prices but the retail price remains the same due to competition significantly reducing the margin.

Moreover, the labours have started to demand a higher pay salary for work and are reluctant to work on less and competitive wages, this with the increase in production cost is subsequently affecting the business growth and is causing the firm to face a very less profitable business

For addressing these problems I opted a data analytical approach, with the analysis approach I implemented various different analysis such as product performance analysis, time series analysis, descriptive analysis, pareto analysis, percentage wise growth analysis, profit analysis

Moreover, with the help of graphs and table charts proper data visualization was done and different data patterns and data trends were studied accordingly. with the help of these approach, I aim to gain valuable insights from the trend and analysis to provide the business firm with ideas and solution to their problems.

As our business is considered a part of food industry, our main primary objectives will be inducing the products quality, quantity and taste, so that the products have a good sales demand.

With implementation of the knowledge, I gained in the course of "business data management" and with the help pf data analysis tools provide by Ms excel I intend to optimize the sales and products and ensure efficient business.

The main objectives of this projects revolve around by using theoretical knowledge of business knowledge into actually implementing it o a business firm to provide them effective data driven decisions leading to more profitable business growth.

DETAILED EXPLANATION OF ANALYSIS METHODS

The business firm I am working with deals in bakery eatable items so the most important aspects to be noted will be the products demand, consumers taste and choices about what they require and their buying patterns with respect to time and products. Understanding of the consumer behavior is the key element to this business group.

The data has been collected for a span of 12 weeks starting from the first week of September to the last week of November, which will be analysed for every product to identify the pattern of incoming orders.

1. Analysis on Performance of product:

With the help of the sales data, we can really assess and identify each of the products and how well they are performing, which products are most liked and which are least liked by the customers. This analysis plays an important key role in our analysis process as by analysing our products we can understand which products need more investment and which products should be worked on for better and effective sales and profit.

The analysis can be done by following step:

Product growth analysis:

With the help of the sales data of 12 weeks we can easily identify each of the product's growth with time, how well they are performing, whether the demand is decreasing or increasing by figuring out their sales going up or down. By analysis of product growth, we can identify products which need improvement and the products that will be more profitable, therefore allowing us to invest our effort and resources in an effective manner.

Analysis of product sales:

By analysing different product sales, we can identify the most demanded and the least demanded products out of all products. With analysis of their sales overtime it will give us proper understanding of behavioural pattern of consumer for each product type. The analysis will also provide us the market share of each product.

Product margin analysis:

The profit percentage a product is able to generate determines its value and worth. May be a product be having less sales but a good margin, products with good margins are considered more profitable while the products with less margin can be worked or improved optimally to increase their profit margin.

Product pricing and market share:

With analysing the demand in the local market and then comparing it with our products and their price of sales we can identify patterns and key insights on consumer's choices and price range. By

adjusting our product pricing range and type we Can achieve more sales and more profit in this business sector

2. Time series analysis:

This analysis helps us to identify the sales and revenue pattern after analysinf the data for over a period of time. with the help of understanding the trends according to the time periods we can refer many predictive approaches towards our firm for better profit results. Time series analysis is usually done on data sets that are constantly changing over time just like the sales data of our firm by analysing the data with time change we can understand the buying pattern and behaviour of customers and find out key selling weeks .by splitting data into time limits such as weeks, days , months and using graphs to compare different attributes and aspects' wanted to find out the pattern of orders that are placed each month to find which week has the most orders.

Time series analysis can be done by the following methods:

Functional and trend analysis:

With help of this analysis, we can understand and find out patterns and relationships within data which can help us gain valuable insights and trends the data follows through specific period of time. there are generally two data movement one where we can find the actual cause of it commonly referred to as deterministic and the other that is stochastic which is random and generally unexplainable

Exploratory analysis and forecasting:

With analysis done the exploration of the different insights and trends we can highlight the main reasons behind the data variation and data movement. with help of charts and graphs tools provided by MS excel we can have a better visual representation on the analysed data. based on the result we can predict the possible trend or pattern that the products, sales will follow throughout a particular time period with this u may be able to forecast much more data driven decisions for other future time period such as off-season sales and seasoned sales.

3.Descriptive analysis:

Descriptive analysis means the descriptive statistics that is formed from our data set it helps us to understand data better by making it clean, simpler and easy to understand.

With the use of MS Excel and the various features it provides various formulas and functions can be used to get a summarized data statistics for our analysis.

For more better analysis of data, we used pictorial representation using charts and graphs like a pie chart was used to filter out top 3 best products with respect to sales and another pie chart for top 3 product with respect to revenue

We also used column (bar graph) representation for analysis data for comparison over different conditions and time period

Formulas provided by MS excel such as min, max, average, sum with the application of these formulas we were able to generate well summarised statistics of the data for providing us key insights on the data such as the maximum sales of each product and the maximum revenue they can generate in a week, total sales and revenue generated by products in each month and the average sales and revenue they do in each week.

4.Diagnostic analysis:

Diagnostic analysis refers to the afterwork or the time we spent on analysis the results we obtained from the descriptive analysis approach, in diagnostic approach we analyse as to why such trends or patterns are followed by the products. we do this by analysing the data over different time spans to analysis why such the product follows such changes and trends, discussion with the owner can also result in better understanding of such behavioural patterns

Diagnostic approach is used for the Finding the root cause of the problem, identifying and then solving that issue which in turn will help our organization by improving its processes by highlighting inefficiencies and problems through insights gained this will give an overall optimized performance by evaluation

5.Predictive approach:

Predictive analysis can be considered as the next step of analysis after diagnostic approach after understanding the reason for each data pattern and trend for the descriptive statistic data created, in predictive approach we can predict or forecast the future possibilities of that respective product or that dataset. with predictive approach we can understand and be aware of the possible situations our sales can get into by using past information.

6.Prescriptive approach:

prescriptive approach refers to the last step of analysis where we prescribe a possible strategy for future situations for sales and revenue pattern to be more efficient. this approach is the end result of the first three analysis approach, giving us the opportunity to make efficient and smart decisions by recommending ways for us to achieve better result in our business

7.Pareto analysis:

Pareto analysis works on the principle of idea that 80 percent of profit gained can be achieved by only 20 percent of the products or it can be stated that 80 percent of problems are traced to 20 percent of cause

With pareto analysis each of the products will be rated or given a percentage share based on there performance related to their sales and revenue. similarly, the problems that will be ruled out after the analysis can also be chart through Pareto analysis that will provide us the problems having most significant impact that will be top treated at top most priority

For implementing pareto analysis we need to understand and identify the problems first with diagnostic analysis, then each problem should be given a certain scope for comparison, the problems with high score will show that they have a huge impact on our business as not all problems will have high scores and will be worth pursuing.

With the help of pareto analysis we can achieve greater improvement in result by figuring out the main factors causing it, resulting in saving of time and efforts and unnecessary money. it states that disproportionate movement can be made by concentrating on solution for largest impacting problems

Profit margin analysis:

From the analysis of each product and comparing them with their margin of profit we can rule out which products have great profit margin and which products need to be worked on in terms of their rate of sales and production cost

We can infer two things from this data analysis:

1. Products with good sales but less profit margin needs to be worked on their production cost efficiency and rate
2. The products with good profit margin but less sales are need to be worked on their popularity in our scenario the product should be worked on their quality and popularity and marketing strategies

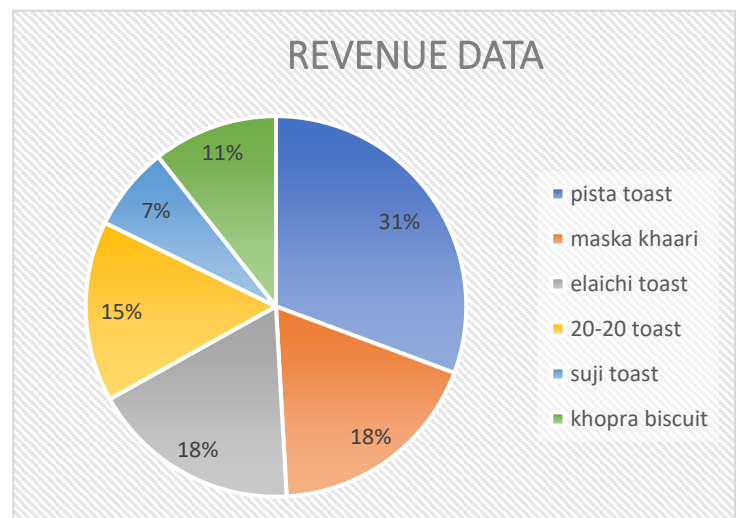
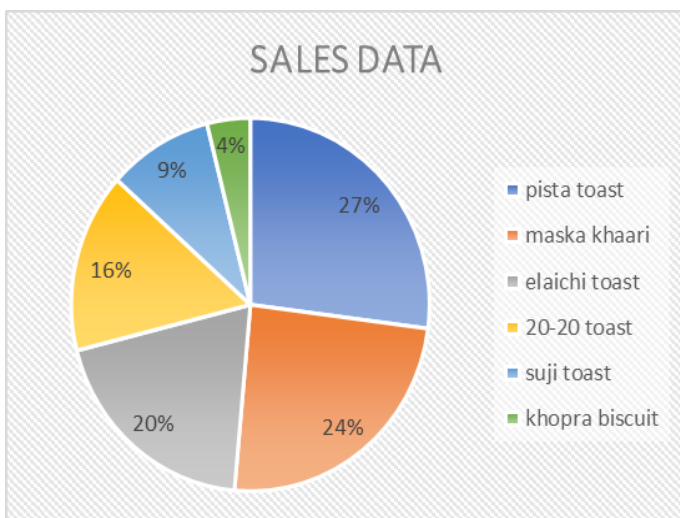
Analysis can be done on the profit margin of each product this will give us high profitable product of our firm.

The total profit can also be studied to identify the composition of the actual net profit earned and the extra other cost that is cost from the grossed profit we ca find out the actual profit earned and the rule out areas in where unnecessary money is spent

with the help of comparing the profit margin over different time period example each month wise we can keep track of our profit and loss of each month and identify factors and trends that are causing such changes

Results and findings

1. Product performance:



With the help of the filter functions, we were able to develop a table and the pie chart of that table that's shows us the percentage share of each product's sale for the span of twelve weeks. Pie charts are generally used to represent proportional data.

From the above chart it can be understood that the product with the highest sales is the 'Pista toast'. With the help of the chart, we were able to find out our star product and also the least selling product which is 'khopra biscuits'.

Comparing the above data with the new pie chart created to represent percentage share of the total revenue generated in the entire 3 months span. We can clearly find out that the most revenue is generated by the most sold product that is 'Pista toast'. and the least revenue is generated by suji toast.

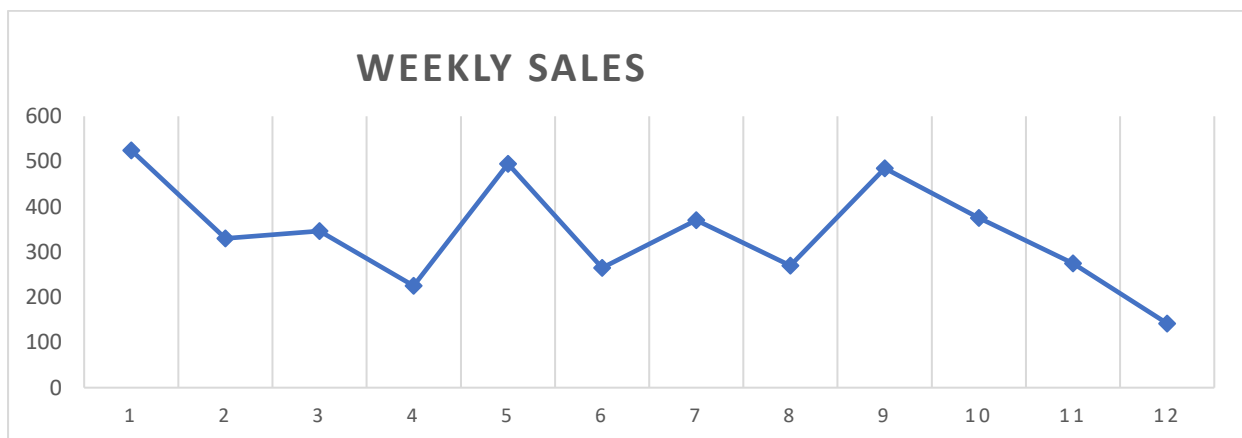
The product 'Pista toast' can be addressed as the star product of the bakery as it has the highest sales as well as the highest revenue that is generated with sales of 1110 units and revenue generated of Rs 3,33,000.

The product 'khopra biscuits', even though having the least sales it still generates a good amount of revenue.

The product suji toast can be considered to be the poorest performing product as it has very little sales and the least profit generated that is the sales of 388 unit and revenue generated about Rs 77,600

The product 'Maska Khari' can be considered the second most profitable product sharing 24 percent of total share of sales and ranking 2 at the most revenue generated.

2.time series analysis



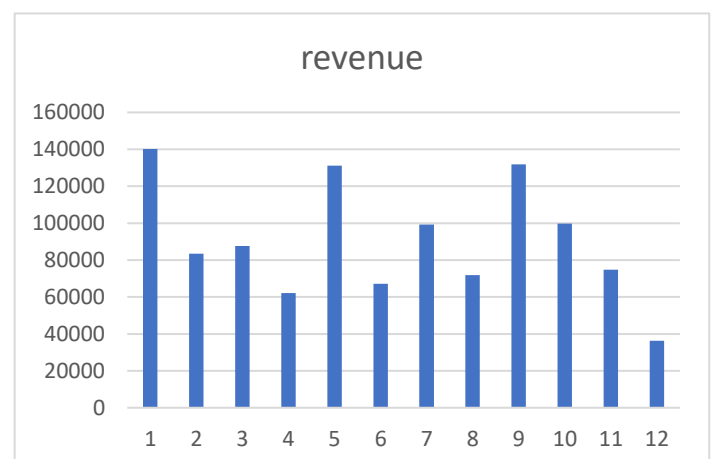
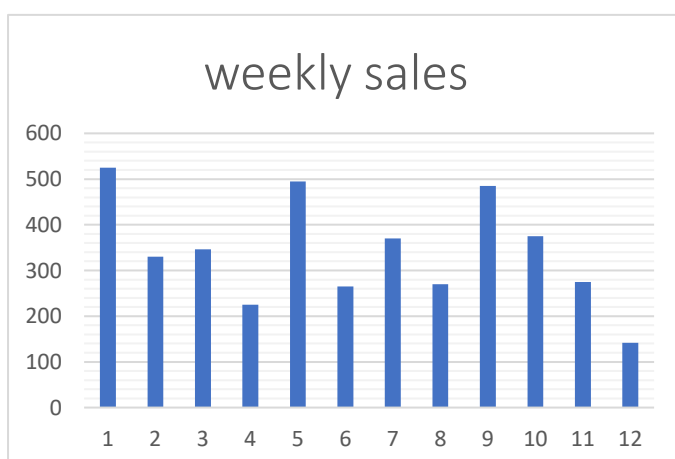
The chart represents total weekly sales of all products with the help of this scatter plot we are able to understand the pattern and trends the sales are following:

By the chart we can clearly see that the most sales are generally done in the first weeks of each month with that the sales gradually decreases until the months end

We can also see spike in sales in the third week of each month, this is because of the product quality life which cause many retailers to place an order again after half a month

The last month (November) is showing a massive drop in sales, this is the result of the peak Diwali season as the most of the orders were placed pre-Diwali and post Diwali thew business placed a low sale.

Another key factor about this trend is the unavailability of workers post Diwali season causing very less production



The bar graph is used to generally compare data over a period of time we used the bar graph to represent total sales of the products week wise

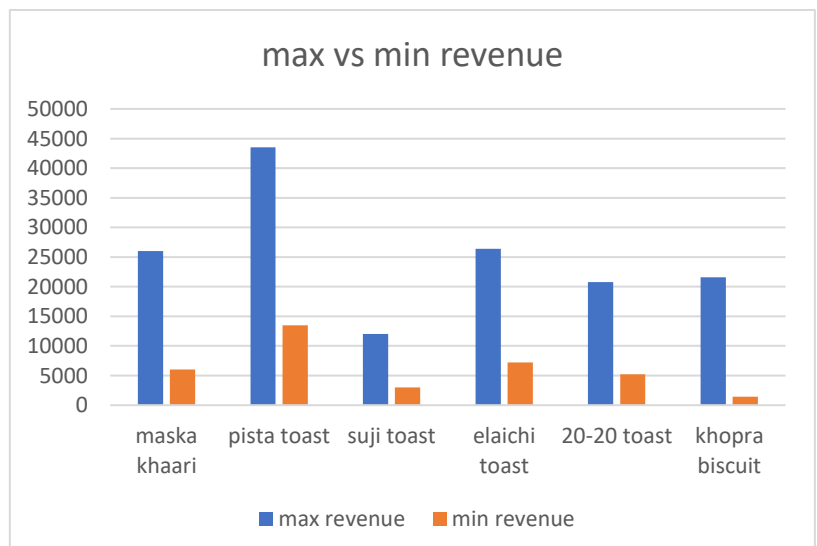
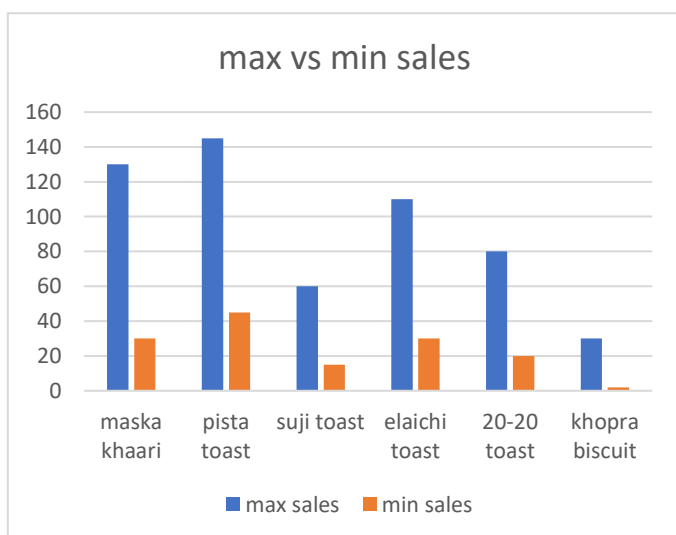
From these graphs we are able to figure out that the highest sales were done in week 1 followed by week 5 and then week 9. this indicates that the sales pattern is decreasing slowly each month and the business is slowly getting low sales. on further discussion with the owner, we were able to know that the business is undergoing some changes related to infrastructure and adding of new product types as competition is causing their sales to slowly decrease

The minimum sales were done in the last month due the post Diwali effect causing the least sales of followed by the least revenue generated

Though it's not generally defined that the sales define the revenue but in our case the business has continues sales of each products causing the revenue to be according to the sales pattern.

Descriptive analysis:

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



I created a table for the descriptive analysis of the data by creating a descriptive statistic table

From this table we can learn that the 'Pista toast' had the maximum sales with a sale of 145 units and the minimum sales of 30 units

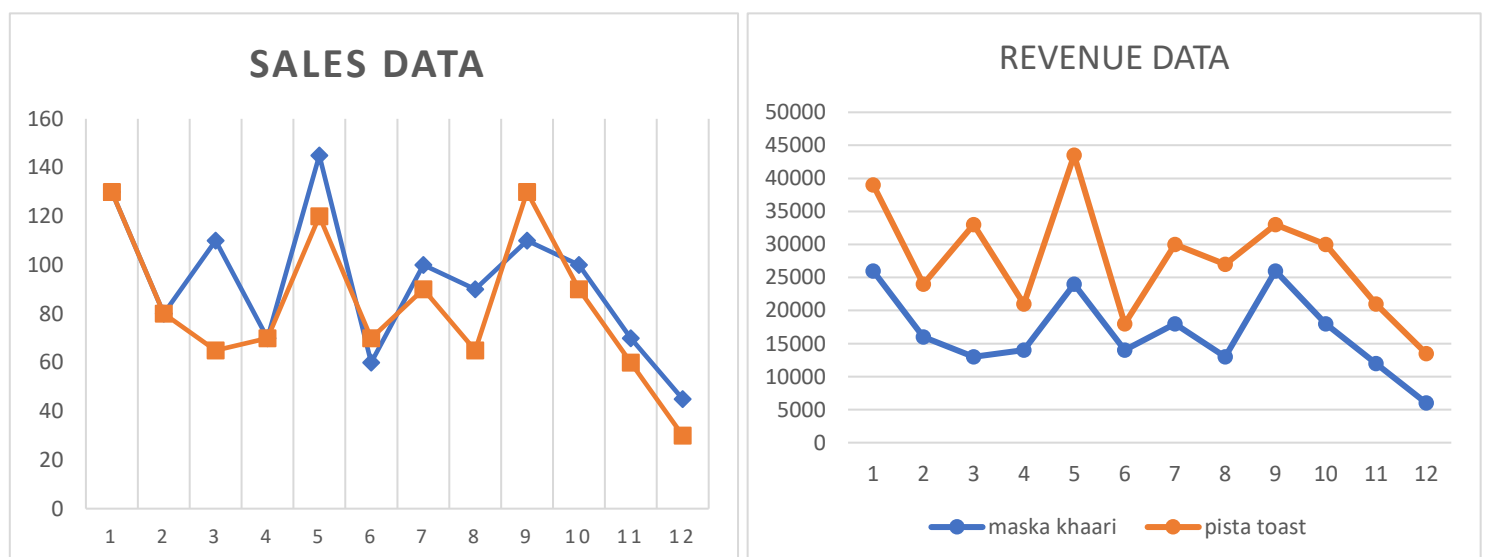
The revenue generated by the star product was of maximum 43,500 in a week and minimum of 13,500 rupees

The khopra biscuits with the least overall sales having maximum sales of 30 units and minimum sales of up to 2 units but still generating max revenue of 21,000 for a week

The Suji toast has the least maximum revenue generated for a week of 12,000 rupees.

Diagnostic approach:

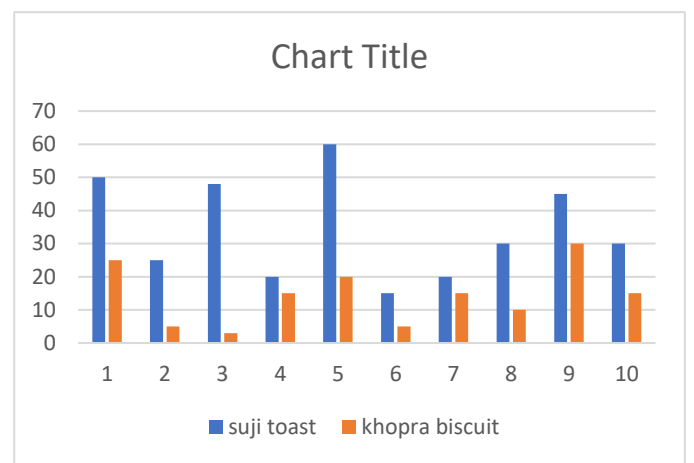
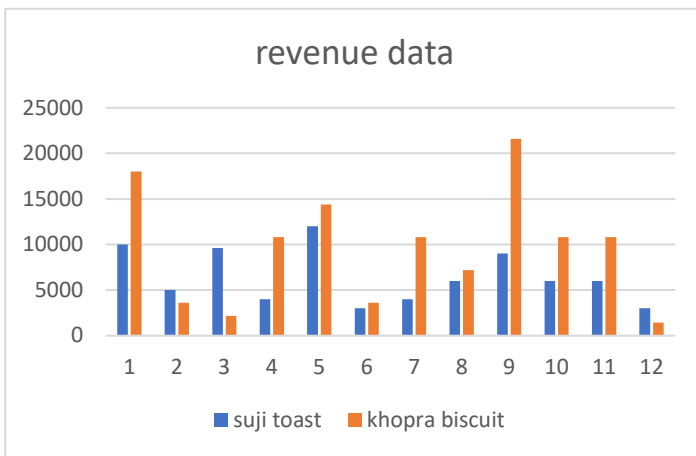
For further understanding this trends and pattern I used scatter plot to compare the top 2 products



Based on the above chart we can confirm that from sales point of view the two products have a pretty close competition and the product 'Maska Khari' (orange) can also be said as a potential star product for the business firm. There were several weeks where the sales of Maska Khari were greater than 'Pista toast'.

On the other hand, when the same analysis is done with respect to the revenue generated by each of them, we can clearly see that the product 'Pista toast' has a greatly higher performance than the Maska Khari. This is due to the rate difference between both of the products the product 'Pista toast' has a very good profit margin compared to Maska Khari which is why the revenue generated by it is far greater.

A similar strategy can be used to determine the least performing products by comparing their sales and revenue. We can conclude that though the product khopra biscuits have very less sales due to its high



price it generated a healthy amount of revenue compared too Suji toast which produces les revenue because of the less sales and less rate of sales

By this data we infer that even tough Suji toast has great sales compare to khopra biscuits it still is behind in the revenue generation making it the least profitable product.

Pareto analysis:

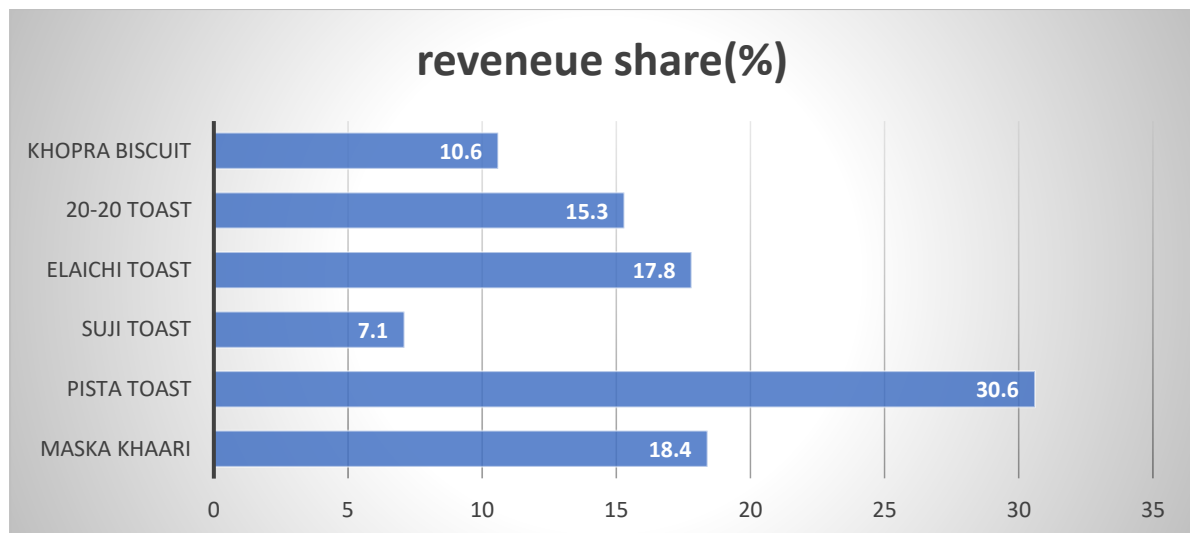
Pareto analysis refers to the 80,20 rules of the business analysis. with the help of excel I plotted a pareto analysis graph for the revenue generated by the products to determine their share in it

The following table and the chart contain revenue pareto data showing shares of revenue generated by each of the product.

item name	total sales	revenue share(%)
maska khaari	1000	18.4
pista toast	1110	30.6
suji toast	388	7.1
elaichi toast	805	17.8
20-20 toast	640	15.3
khopra biscuit	160	10.6
total	4103	100

With the help of the following data chart and table we were able to find out that the top 3 products which are pista toast, Maska Khari, Elaichi toast contribute to roughly about 70 percent of the total revenue generated

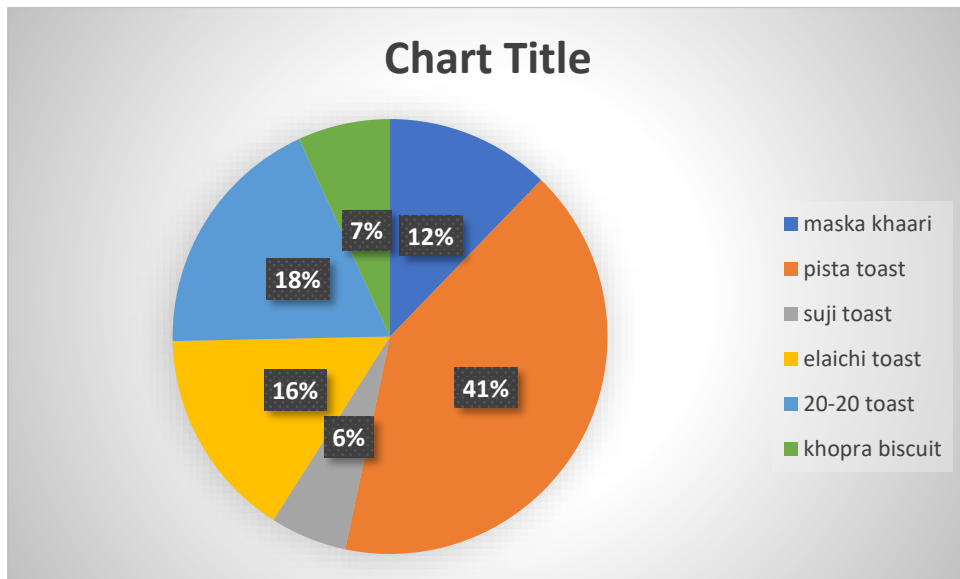
Meanwhile the rest of the product contribute about remaining 30 percent in the total revenue generated. This allows us to identify our best products and work on them to make them more efficient



Profit margin analysis:

From the following chart we are able to rule out the different profit margins of each product and their sales and revenue data

item name	total revenue	production cost	profit
Maska Khari	200000	161000	39000
pista toast	333000	202020	130980
suji toast	77600	59364	18236
elaichi toast	193200	143290	49910
20-20 toast	166400	107520	58880
khopra biscuit	115200	93280	21920
total	1085400	766474	318926

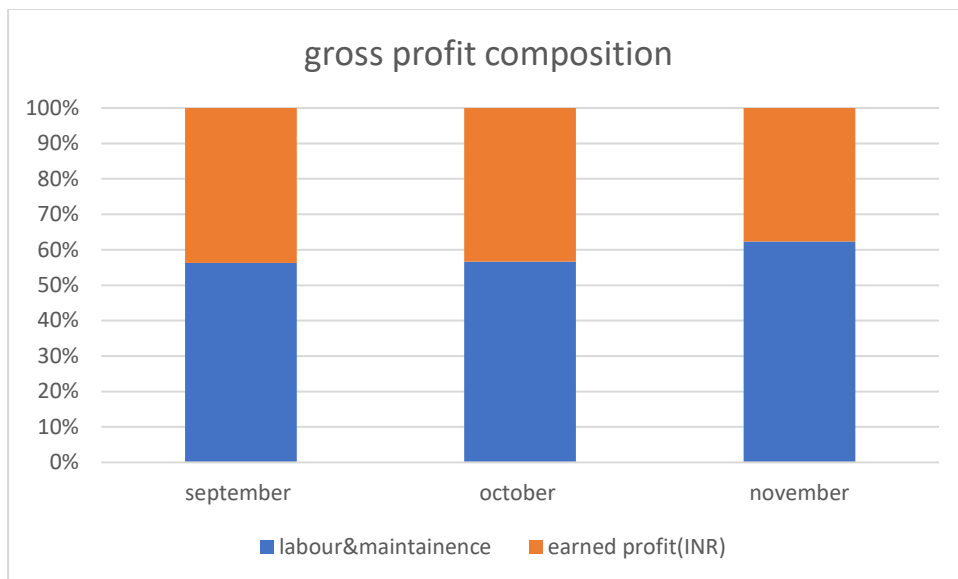


The product Pista toast has the highest profit generated of about 41 percent of the total profit earned. though having a less profit margin it has a good sale to rank as the best product

The least profit is generated by the suji toast and khopra biscuits both these products have good profit margin but lacks in the sales of the products

Profit analysis:

month	gross profit (INR)	Labour & maintenance	earned profit (INR)	profit margin (%)
September	110078	62000	48078	12.87711592
October	109460	62000	47460	12.85134037
November	99394	62000	37394	10.91031102
total	318932	186000	132932	12.24728211

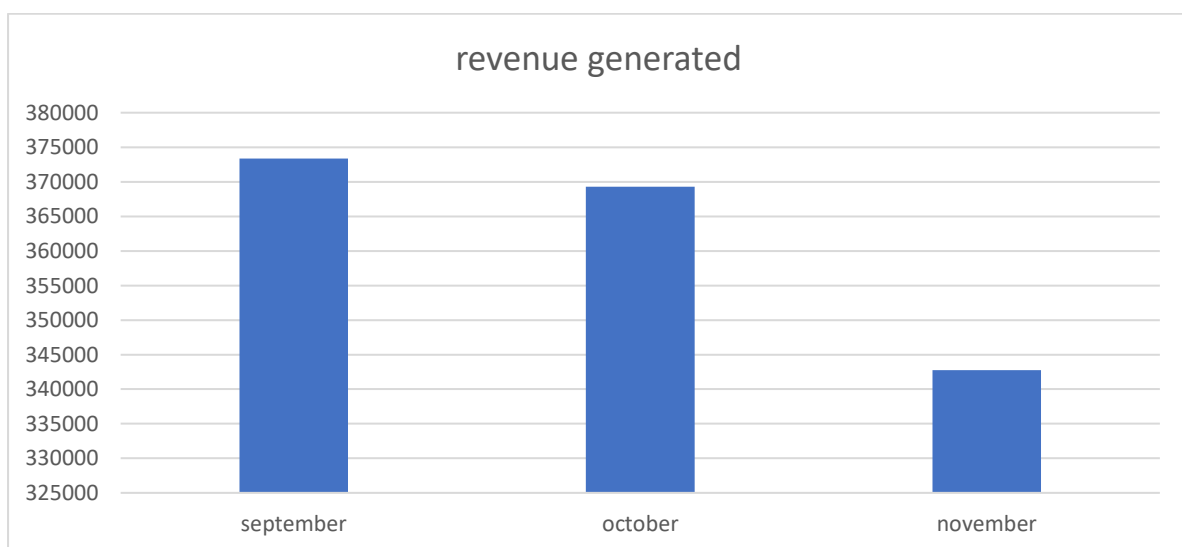


With the help of this chart, we are able to figure out that a majority portion of the gross profit earned by the firms being used in labour charges and maintenance about 50 to 60 percent.

This is a major cause of the business firm's less profitable business as 50 percent of there profit is being used in maintenance and labour. this is cause due to high labour charges and reluctancy of accepting low wages by the labours

November month had the most profit share used in revenue this because of the Diwali bonus salary and less production due to leave that was found out after discussion with the owner.

I also did a analysis of revenue generated of each month and the profit margin by which it changed for that I used a bar graph for better representation and Better interpretation of results



month	sales	revenue	percentage change
September	1426	373360	
October	1400	369300	1.09%
November	1277	342740	7.10%

From the following data we can infer that from September to October there is a loss of approximately 1 percent meanwhile,

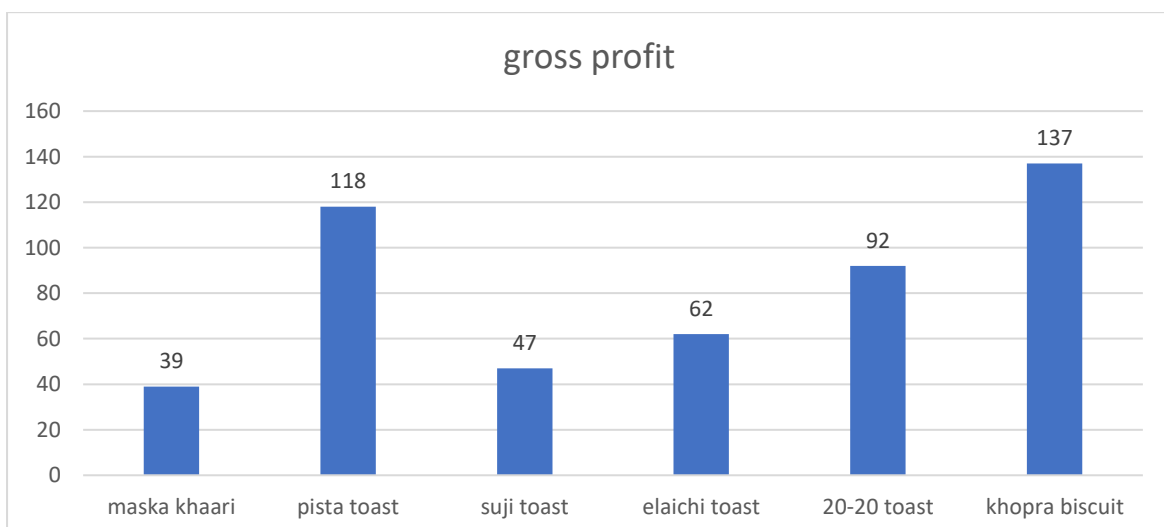
from the month October to November the revenue and sales significantly dropped by 7 percent

the subsequent loss of 7 percent in the revenue is due to the fact that there was less production in the month of November compared two the other two months

the basic trend is showing a bad sign of loss as the company is facing loss each month by a certain percentage

item name	production cost(INR)	selling price(INR)	gross profit
maska khaari	161	200	39
pista toast	182	300	118
suji toast	153	200	47
elaichi toast	178	240	62
20-20 toast	168	260	92
khopra biscuit	583	720	137

The above table shows the gross profit margin each of the product have with the help of a bar graph I depicted the following table to compare each product separately.



The following were the findings:

The khopra biscuits has the highest of the profit margin scale of around Rs 137 per product but due to its less sales performs very poor

The product Maska Khari even though having the least of the profit margin of around Rs 39 per unit among all products rank as the number 2 product in the business firm.

The product Elaichi toast can be considered as well stable product with a good amount of sales and a good profit margin.

The suji toast have the second lowest margin scale and with the low sales factor considered the most poor performing product

Interpretation of the results:

With summarizing of all the analysis process done and the results obtained from these approaches the final interpretation of all the data can be collected into summarized points

The interpretations are as follows:

The “Pista toast” is the most sold bakery product with total sales of 1110 units

- 1 The product “khopra biscuits “has the least sales of about 160 units.
2. The product “pista toast” has the highest amount of revenue generated in three months of Rs 3,33,000.
3. The product “Suji toast” has the least amount of revenue generated of about Rs 77,600 in over three months
4. The maximum sales were in week 1 followed by week 5.
5. The minimum sales were recorder in week 12.
6. The first week of months generally recorder the highest sales and revenue generated
7. The months end last week of month recorder least sales and revenue generation
8. September generated the most revenue while November generated the least revenue
9. the product “khopra biscuits recorded the highest profit margin but had the least sales
10. the product Maska Khari had the least profit margin but had the second highest sales
11. the general pattern of the revenue trend is shown as loss

12. the top 3 selling product are capable of generating about 70 percent revenue
13. the star product "pista toast" generates 41 percent of the total profit generated
14. the regular customers show quite the, liking to the product pista toast and Maska Khari with almost equivalent sales
15. the product Suji toast is the least liked mainly due to its taste and as its healthy and less flavoury compared to other items
16. there was a loss of 1 percent in revenue generated from the month of September to October.
17. there was a significant loss of 7 percent in the generation of revenue between November and October
18. the least sales were in the month of November because of the post Diwali season and business internal changes

Recommendations:

After summarizing all the interpretations made the recommendations to business firm are as follows:

introduction of new product type in their retail market according to the consumers need and demand to have more demanded product with a high rate of sales. The business was well known for their biscuits sales in the early times as one of the best providers of biscuits. readding the old products in the business can definitely help the business grow once again.

Addition of pastries and cakes can definitely be a game changer as most of the consumers love to eat cakes and pastries these product types can easily enhance the profit margin.

Since the product "pista toast" has the highest revenue and sales, there can be increased in production of it and addition of new flavours to include variety in that product type.

The product khopra biscuits has the highest profit margin but also the least sales, this product can be worked on the product promotion, fancy discounts and creating a sense of taste and quality among consumers to attract more sales and profit

Same treatment can be done for the product Suji toast, either we need to enhance the products taste and quality or else we need to create a different replacement for the product

Introduction of automated machines to reduce labour manpower can help the business firm in great way as the labours are generally consume a major amount of the gross profit earned use of machines and less labour can help business to save some money

The business has a very poor inventory management and generally works on order-based type, using proper inventory management and proper marketing skills can boost the business efficiency in making a profitable business

Since the firm is looking to expand .re-establishing the bakeries b2c business channel which has halted due to poor performance should be initiated with new bakery items and offers. the business is

situated at a very good location and has no or very less competition in his area in the b2c sector. with the growth of the b2c sector the business will have a new mode of profit open to it and can generate a decent amount of profit.

the business is also in range of many function halls, marketing their products on order basis can highly promote their business on a larger scale by providing bakery products in the respective function halls.

transport also plays a vital role in maintenance and total net profit reduction, for solving this problem the owner should establish the retail Gow downs in a common nearby area so that minimum transportation cost can be paid.

the business we are working with is a bakery so the most of the sales is determined by the consumers choice of taste and quality preference. the most important thing in this business industry is gain the customers trust with our product

with such key point to be paid attention to its also important to monitor each products sale and pattern and strategies new business strategies accordingly.