Efficient Inventory Management using Sales Data Analytics for a Kirana Store

A Proposal report for the BDM capstone Project

Submitted by

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Contents

Declaration Statement

I am working on a Project titled “Efficient Inventory Management using Sales Data Analytics for a Kirana Store”. I extend my appreciation to Bablu Kirana Store for providing the necessary resources that enabled me to conduct my project.

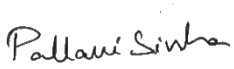
I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered from primary sources and carefully analyzed to assure its reliability.

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 fulfillment in the BS Degree Program offered by IIT Madras. The institution does not endorse any of the claims or comments.



Signature of Candidate:

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Date: 05/06/2024

EFFICIENT INVENTORY MANAGEMENT USING SALES DATA ANALYTICS FOR A KIRANA STORE

1 Executive Summary

For this Project, I am working with unorganized sector which is B2C, a small Kirana Store named “Bablu Kirana Store”. It has started its operation in 2012. It is located near Hospital Road, Masaurhi, Patna, Bihar. It serves the local communities with range of products like dairy products, Rice, Dals, Flour, Detergents, Soaps, Oils, Potato, Onion and other grocery products.

This Business is facing a lot of issues like stock out, Inefficient working capital management due to excess of slow-moving products in Inventory. Profit declining due to large number of stocks in Inventory, which also has a carrying cost. As the Kirana store is running on rented space. Also, the order placing date is not efficient as he used to order its product frequently which also has a Transportation Cost.

So, to address these issues, I am going to Collect and Analyze 5 weeks sales data of 100 SKUs along with Inventory data like current stock level. To forecast demand accurately with the help of different time series Analysis like exponential smoothing. And also, to optimize the Inventory with the help of Economic order Quantity model and calculating reorder point and safety stock.

This will help the Business to run, without the customer facing any stock out and minimize the excess Inventory. And optimize the order quantity that will minimize the total Inventory cost and will ensure the balanced Inventory level. And also, will improve the overall Operational Efficiency.

2 Organization Background

The Business I am working with is a Kirana Store named “Bablu Kirana store” run by Bablu Kumar who is a middle-aged man with age 40. He belongs to a farmer family background; he

came out of his village to a small town and started his business in 2012 on a small rented space and run his livelihood by selling just few categories of products. With time his store has grown up and now his inventory contains more than 150 SKUs. His store is located at Hospital Road, Masaurhi, Patna. This store serves the local people with products like dairy products, Rice, Dals, Flour, Detergents, Soaps, Oils, Potato, Onion and other grocery products.

As he is not much Educated, he doesn't understand the importance of data and also don't trust technology and data. With the growth of inventory, he is unable to manage his Inventory well, and facing a lot of issues.

3 Problem Statement

3.1 Need to minimize stock out as customers don't like stock out, as this will lead to customer dissatisfaction.

3.2 To minimize excess inventory and also minimize the slow-moving product, lead to increase the working capital and holding cost.

3.3 To determine Optimal Order Quantity and Re order point for various products. It will minimize the inventory cost.

3.4 To calculate the safety stock for the sudden surge in demand so that, at that time customer don't face any stockout.

3.5 Proper management of costs associated with inventory, holding and ordering costs.

4 Background of the Problem

This Kirana store manage their inventory manually, so with the growing SKUs he doesn't able to track all the SKUs, thus he forgets to order some of them at right time, which cause the stock out problem. Also, as he doesn't have any idea of the future demand, he orders some of products in excess quantity so that he doesn't face any stock out but that leads to increase in working capital and holding cost of its Inventory, which is also affecting his future growth. Now he doesn't left with enough capital to invest in the new SKUs.

As he keeps his inventory on a rented space, due to excess order of some SKUs whose demand is less, got accumulated in excess quantity which also occurring the holding cost of Inventory, and capture the space which can be utilized by new growing SKU's.

As he is the only earning member of his family, so with the increasing family expenses and the profit being constant, he doesn't able to maintain his working capital for his business and use this for his family expenses and thus his growth and profit is continuously declining. So, he needs to manage his inventory well and minimize his excess inventory and need to invest his money in future growth to increase his profit.

5 Problem Solving Approach

To Solve this problem, firstly I will collect the sales data for 5 weeks of all the SKU's and will also collect the inventory data like current stock level. The method I will use here to collect data is, first day I will talk with the business owner and note all the SKUs and its current stock level in the inventory, for which I am going to collect sales data, for the next 5 weeks. Then I will visit the shop daily in the evening and will note the sales for the different SKUs on each day. And will continue this process for the next 5 weeks. After that I will put the data on excel sheet and then data cleaning will be done. And after that Analysis will be done.

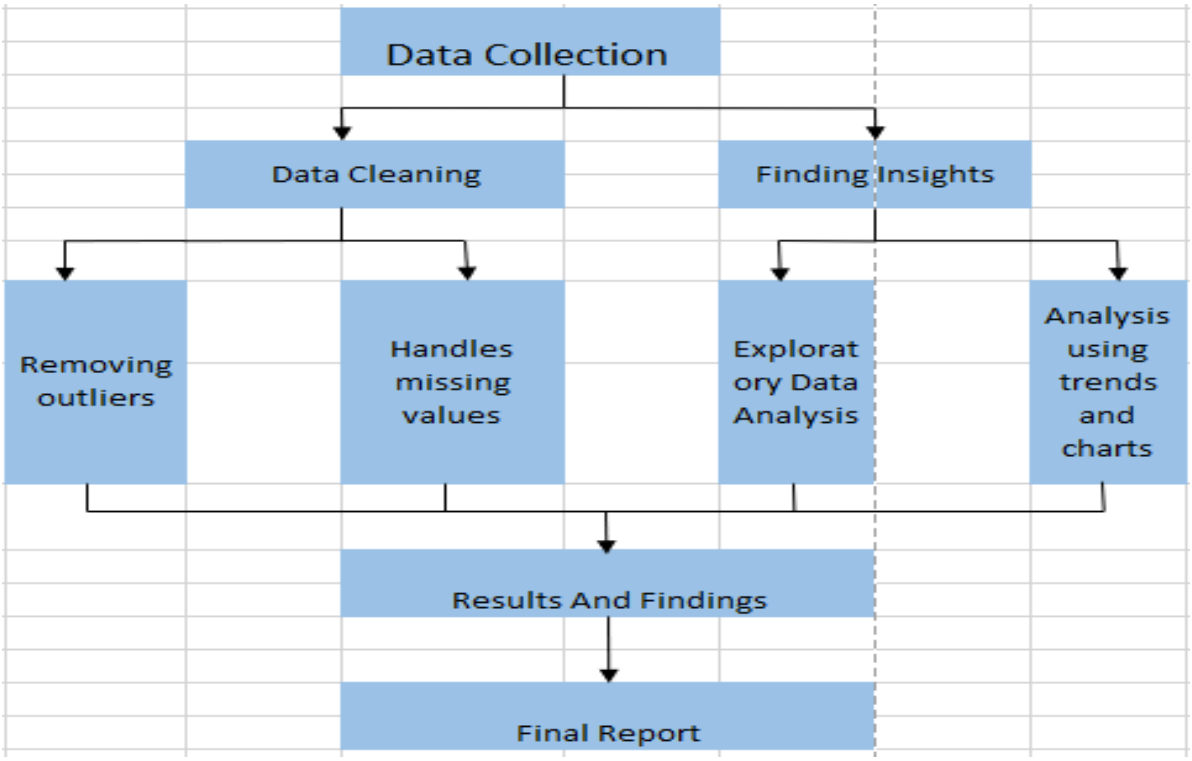
The different approaches that will be implemented to solve the problem on the collected data are, first I will do the pareto analysis of revenue and volume pareto, to know about the top selling SKU's, which are contributing more in revenue. After that will do ABC Analysis to categorize the item into three Categories A, B and C, on the basis of revenue and volume, so that we can prioritize the class A item over class B and C, when doing inventory management, to ensure that it never get stock out and also maintain the safety stock of these products.

After that will do time series Analysis to predict the future demand accurately with the help of different forecasting techniques like exponential smoothing. With the help of this, can maintain the inventory at right level without over stocking it and will also minimize the excess slow-moving SKUs from the inventory.

After that will calculate the Economic Order Quantity, Reorder point and Safety stock for the inventory to maintain the working capital and the Inventory, efficiently for smooth running of the business and minimize the cost associated with inventory holding and carrying cost. This will give lead us to have enough capital to invest for the future growth of the business by adding new SKUs which is having good opportunity for the growth.

6 Expected Timeline

6.1 Work Breakdown Structure



6.2 Gantt chart

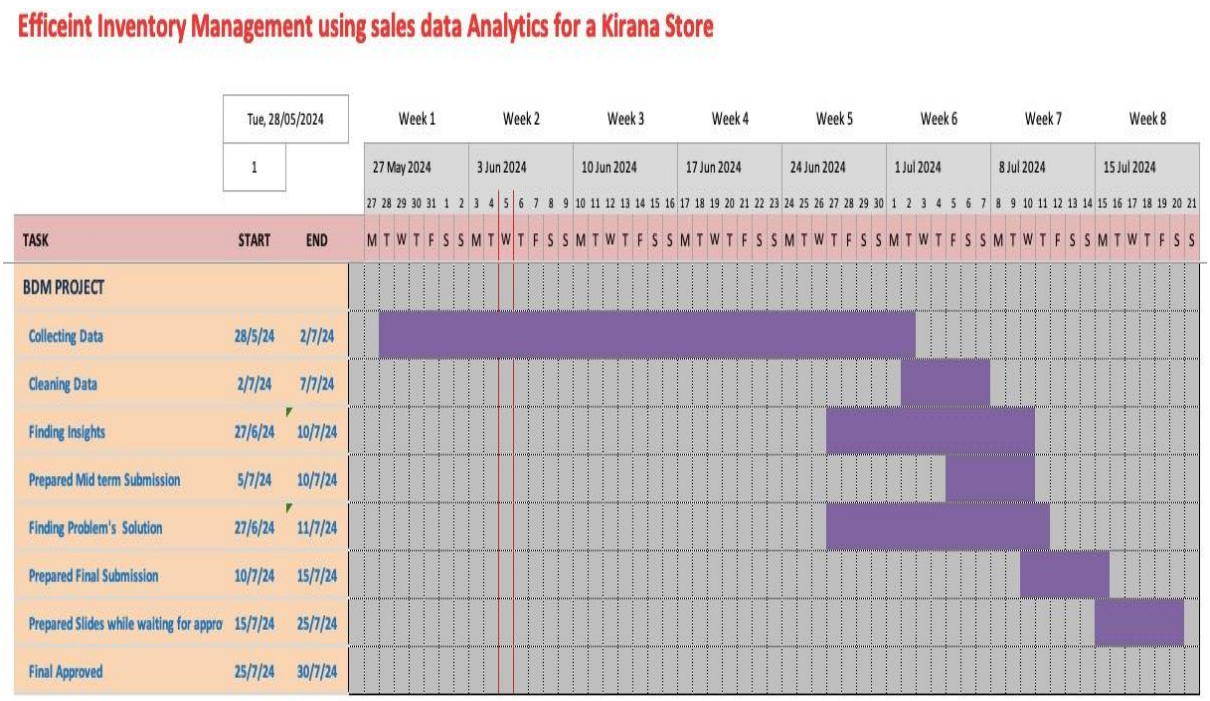


Figure 1 Expected timeline for completion of project.

7 Expected Outcome

7.1 Better understanding of all the products in inventory, like which are having high revenue and which is slow moving product with less revenue.

7.2 Better working capital management by maintaining stocks at right level without facing stock out and placing economic order quantity for the product.

7.3 Maximizing profit by investing money in new SKUs and removing excess inventory, having holding cost which reduce the expenses.