

OPTIMIZING CASH FLOW AND STAGGERED CREDIT SALES SYSTEM FOR A B2B TEXTILE COMPANY

NAME : SHRIRAM G

ROLL NO. : 21f2000668

EXECUTIVE SUMMARY:

The R.G. Nagappa Mudaliar & Sons business firm is a B2B company that specializes in the purchase, processing, and sale of Poplin cloth to textile businesses in Tamil Nadu, India. The firm is facing challenges in their operations, such as advanced procurement of material and reservation of weaving and dyeing resources by competitors, bad debt arising from cloth sold on credit and delayed return on investment. To address the above issues, the business data management project has several objectives which include developing a yarn price forecasting system, bad debt recovery, establishing a staggered credit sales system for bad debtors and optimizing cash flow management.

The purpose of the project is to analyze data such as yarn pricing data, sales data and records of bad debtors. Insights from such data will be used to make informed decisions and improve the firm's operations by engineering decision trees and a control system design. Python will be used as a tool for analysis and running algorithms on the data and Tableau for dashboarding and presenting the results of the analysis. The aim is to improve the efficiency and profitability of their firm by utilizing data-driven analysis.



R.G. NAGAPPA MUDALIAR & SONS

ORGANIZATION BACKGROUND:

The business firm R.G. Nagappa Mudaliar & Sons is located at 75A, ground floor, Thillai Nagar, Erode, Tamil Nadu, India. The firm is primarily a family owned and managed B2B business that focuses on purchase, process and sale of Poplin cloth to various textile businesses in the state.

The business was founded half a century ago which was initially a wholesale and retail cloth merchant firm which has gradually transitioned into a purely Poplin wholesale business over the past few decades. They have an average turnover of one-to-three crore rupees per annum. To this day they primarily employ an outsourcing strategy. The firm only manages procurement of raw material and outsources the weaving, dyeing and transportation services. Only storage and packaging of the finished product, i.e., Poplin cloth is handled by the firm's own workforce on their premises.

PROBLEM BACKGROUND:

As the firm purchases yarn from yarn suppliers and promptly sends them for weaving and subsequently, for dyeing. Depending on the demand for weaving and dyeing services, it can take from days to months for the business to receive the finished product. The price variation of yarn is the primary factor in determining the retail price for the end product.

Firms that make advanced purchases and reservations can outcompete the firm by promptly meeting high demand during festive seasons when the price of yarn is high. This is done on a first come-first served basis. Buying and processing of yarn is always done in bulk, in orders of 1-2 tonnes. The business model of similar firms is such that there is no advance on payment or payment at the time of purchase of cloth by retail store.

Payment is usually received after the sale of cloth in retail stores which takes around two to four months. Thus, cloth is sold on credit. Bad debt arises when the retail store does not generate a profit due to unforeseen circumstances which may arise in such a business. Such circumstances involve situations where the cloth is sold for a loss or when the material is not sold at all and is returned to the supplier.

Since the cloth is sold on credit, for a profit to be made, the retail store needs to sell the cloth for a profit, otherwise the loss incurred cannot be recovered. If the cloth is returned to the seller due to no sales, it causes a delay in return on investment.

PROBLEM STATEMENT - OBJECTIVES:

1. Yarn Price Forecasting :

To predict dips in price well in time before peak demand seasons in order to be competitive in the market.

2. Bad Debt Recovery :

Estimate the occurrence of bad debt before each sales cycle for advanced recoupment of cloth.

3. Staggered Credit :

Develop a staggered credit sales and payment system based on history of default on payments by bad debtors.

4. Cash flow management :

Create a structured cash flow management model that is resistant to the delay in return on investment and losses occurring due to bad debts in advanced procurement cycles.

Note: Due to the delayed payment model where cloth is sold on credit, few short intervals (e.g. New Year - Pongal) of increased demand for material makes cash flow management arduous. This calls for an advanced cash flow management model.

PROBLEM SOLVING APPROACH:

DATA COLLECTION:

1. Yarn price across different yarn suppliers for a period of 1 year or more to analyze yarn pricing and supply availability is necessary. This includes the date the

material is procured and the date it is sent for weaving and dyeing to serve objective one.

2. Cloth sales data to each retail store across a period of 1 year or more to quantify the correlation between yarn pricing, purchase date and sales to analyze cash flow to and from retail stores.
3. History of bad debtors for a period of 1 year or more to analyze correlation between debt delays, recovery patterns and the time of the year. This serves objective three.
4. Data of delay in time in payments received/losses to serve objective two.

METHOD OF ANALYSIS:

Yarn price forecasting will be done either through linear, logistic or clustered regression analysis. Bad debt recovery and staggered credit system may be implemented via constructing decision trees and designing a feedback control system to work in tandem.

A decision tree gives a clear cut pathway to visualize and take action for the business owner. On the other hand, a feedback control system designed via state-space analysis may help in dynamically updating the bad debtor's record and update recommendations accordingly.

A simple K-Nearest-Neighbours algorithm may be implemented to form a portfolio of retail business partners that are safe versus the ones that are in danger of becoming bad debt once we have the above analysis by simply feeding in the final data into the algorithm.

ANALYSIS TOOLS:

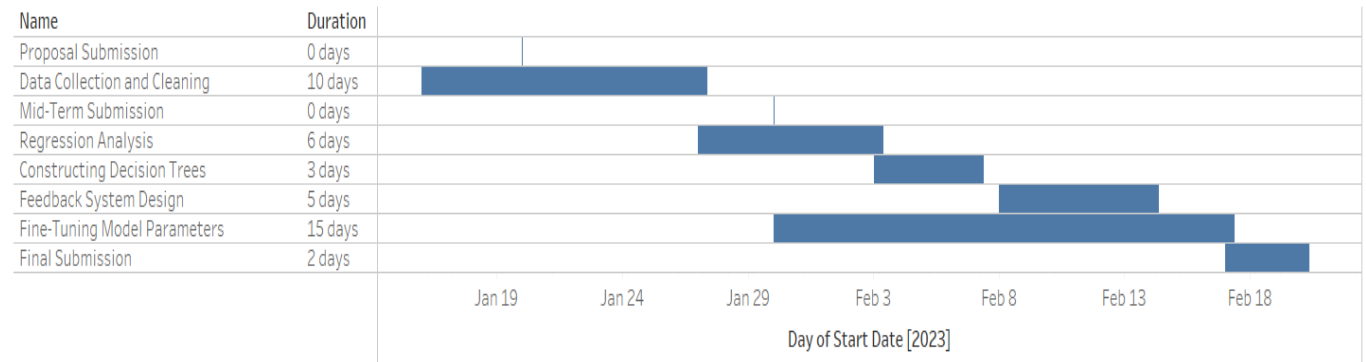
Python and its essential library packages such as numpy, pandas, matplotlib, scikit-learn etc. will be used for implementing all algorithms for analysis. Dashboarding will be done by generating Tableau Workbook visualizations and the relevant figures will be adopted for presentation purposes.

Google Colaboratory will be used to run python programs to generate outputs which will then be transferred to Tableau for dashboarding.

EXPECTED TIMELINE:

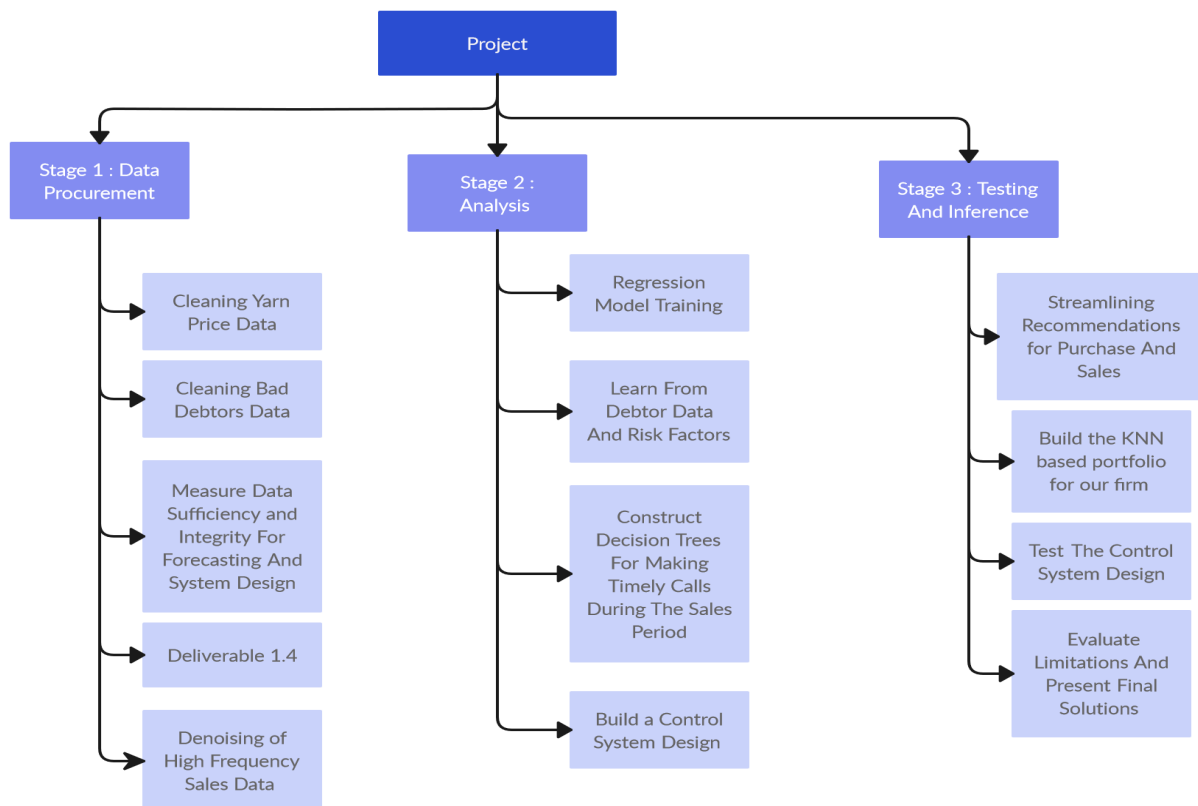
The expected timeline is illustrated via a Gantt Chart here with a breakdown of the work structure.

Timeline Gantt Chart



The Above chart was made with the use of Tableau. An access to gantt chart view is also linked below : [My Tableau Timeline Gantt Chart](#)

WORK BREAKDOWN:



EXPECTED OUTCOME:

With the conclusions of our analysis, the aim is to help the firm:

1. Efficiently manage bad debt recovery operations well before in time.
2. Improve cash flow management in the occurrence of bad debt.
3. Utilize price forecasting to make advance procurement and processing
4. Implement a staggered credit sales system with retail stores of bad debt history to minimize losses.
5. Finally, streamline the operations with retail owners to ensure a smooth flow of business and ensure earliest return on investment.