

Data driven solution for Cost Estimation Accuracy for profit maximization

A Proposal report for BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project “Data-driven solution for Cost Estimation Accuracy for profit maximization”. I extend my appreciation to Pioneer Furnishers, for providing the necessary resources that enabled me to conduct my project.

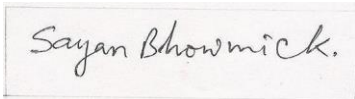
I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability.

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 information 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 agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

Signature of Candidate: 

Name: Sayan Bhowmick

Date: 04/02/2024

Executive Summary

The project focuses on a small interior decoration company Pioneer Furnishers, located at Bowbazar, Central Kolkata. The business is both B2B and B2C and deals in the segment of manufacturing furniture for bank branches (Business) as well as to consumers.

The major business issues that the organization is facing are related to nominal profits due to several seasons such as - labor rates, unpredictable fluctuations in raw material cost alongside price hike in fuel prices etc.

The issues will be addressed by analyzing the data via different analytical approaches to obtain a fruitful outcome. The approach will be to get at least 6 months of data from the business and have some in depth analysis such as doing a scatter plot to see if there is any correlation between the issues alongside histogram (if needed) & some other plots if needed.

Organization Background

The name of the company is Pioneer Furnishers; which is small business majorly deals with interior decoration and Manufacturing, based in Central Kolkata, West Bengal.



The company was established in 1985 by Rathin Bhowmick. He started his business inside a rented workshop and continued his business. After hard work & dedication to his work, he was able to buy the rented workshop as well as the whole premise where he lives with his family till date as well as runs his business. Till 2013, the business was B2B as well as B2C but after 2013, the Bank changed its policies (which is briefly explained in the later section), it became B2C. From 2013 onwards, the company is focusing on individual projects which are more focused on residential projects.

Problem Statement

This project aims at assessing reasons for the same. The objectives of this project are -

- ★ To collect data related to -
 - Project based combined production cost & sales
 - Separate project-based data on the basis of the size of the project
- ★ To analyze the data and identify possible solutions
- ★ To provide the insight of the analysis to the business

Background of the Problem

With an average yearly profit of 25-30%, Pioneer Furnishers had been a successful B2B interior decorator(majorly) alongside being a B2C business till the year 2013. In 2013, the Bank (For legal & security reasons the name of the bank is not disclosed) published a document for the employees where the bank employees will not get-well furnished accommodation when they get transferred to a new city. In spite of giving the employees fully furnished accommodations, they started to cap some amount of money which the employees could spend on the furniture they needed, which led to a complete shutdown of the repairing work.

Previously, the Bank used to repair the old or used furniture made by the contractors or listed companies to the bank and tender system was followed which was extremely profitable for the business owner due to top-notch product quality alongside the goodwill.

After 2013, the company became a B2C interior decoration business and started working on residential projects. Then in 2020 COVID-19 outbreak happened and people kind of started spending less on wooden furniture, which actually made the owner very conscious about running the business successfully and whoever are still giving projects to the business, the owner cannot make expected profits from those.

Problem Solving Approach

To identify possible reasons behind the less profitability situation and major factors that are causing the issue to the business, we got to do some analysis on the historical data of the company.

Now, Historical data consists of project-based combined production cost and sales amount.

Data Collection:

The project-wise data for past 6 to 8 months (whatever is available), which is available at the business owner's daily account book, will be collected for analysis of the sales trend. To understand the issues from manufacturing to delivery, to the consumer and wherever the project work was performed at the place of delivery, a period of 6 months of data will be collected and analyzed to observe any pattern which is understandable.

Methods of Analysis and Required tools:

Analysis got to be done by keeping in mind about project size, client preferences, location of the work and work complexity alongside breaking down costs into fixed & variable components. We got to categorize different costs such as labor, raw material, permit, subcontractors (if any) and miscellaneous expenses. Any kind of unforeseen expenses should not be overlooked during analysis. If the project work is done from beginning to end at the place of the client or the place where the client wanted the manufactured furniture to be delivered then the transportation cost for the delivery of the furniture is nullified but the travelling cost gets included if no accommodation is available. Also, if the work is complex, which could be design wise or implementation wise, then extra care is needed which might lead the business to spend some extra money to get the job done.

The collected data will be loaded into MS Excel. Since the data is collected project-wise the data cleaning process becomes very important, so for analysis, simple line chart will be constructed using the sales data and all the costs which come under production for trend analysis, a pie chart plot to understand which section of production is consuming the most amount of money which is getting invested for a particular project. Also, scatter plot for seeing if there are any correlation between the production cost variables prices.

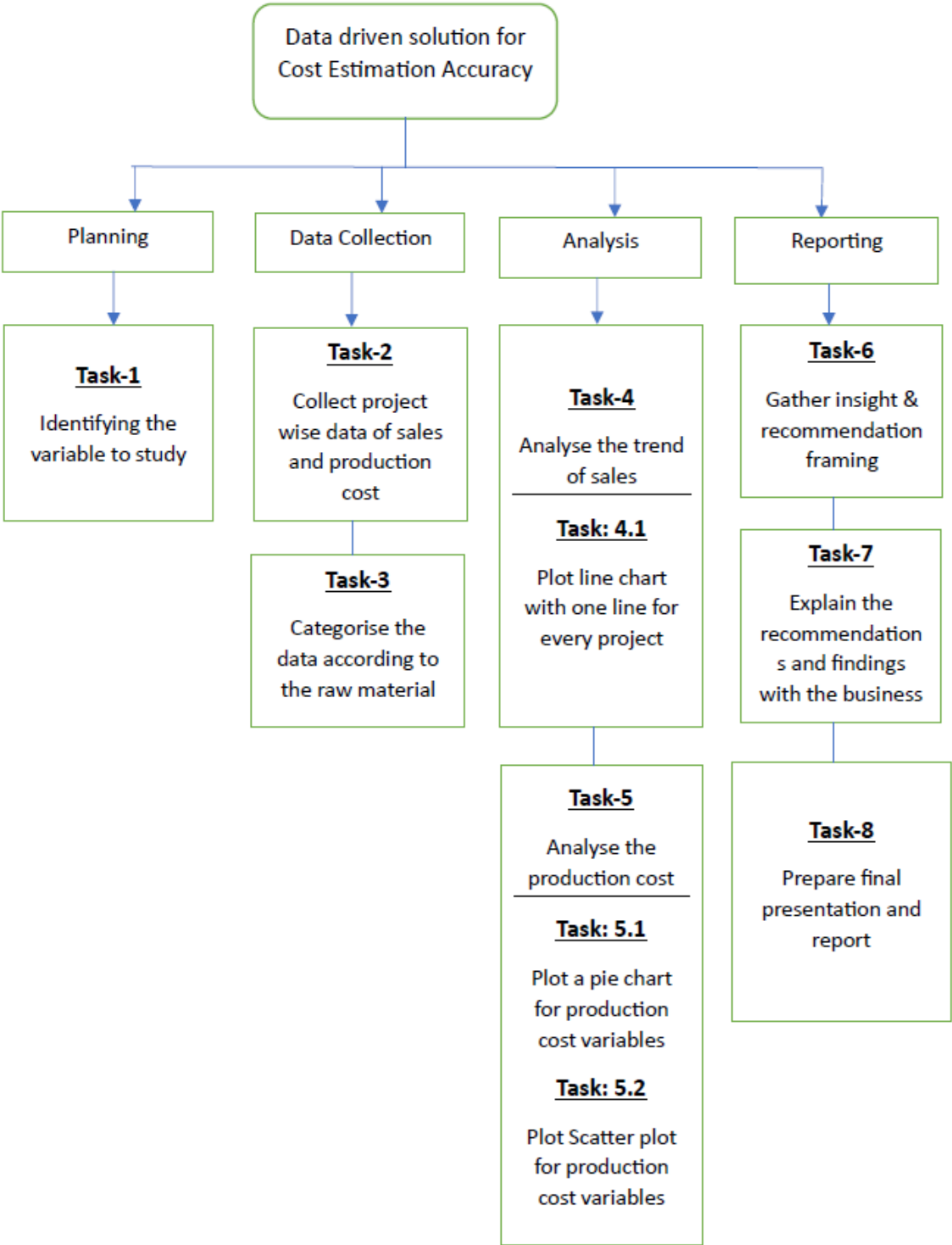
Expected Timeline

The project will be split into 4 segments, such as: 1) Planning, 2) Data Collection, 3) Analysis and 4) Reporting.

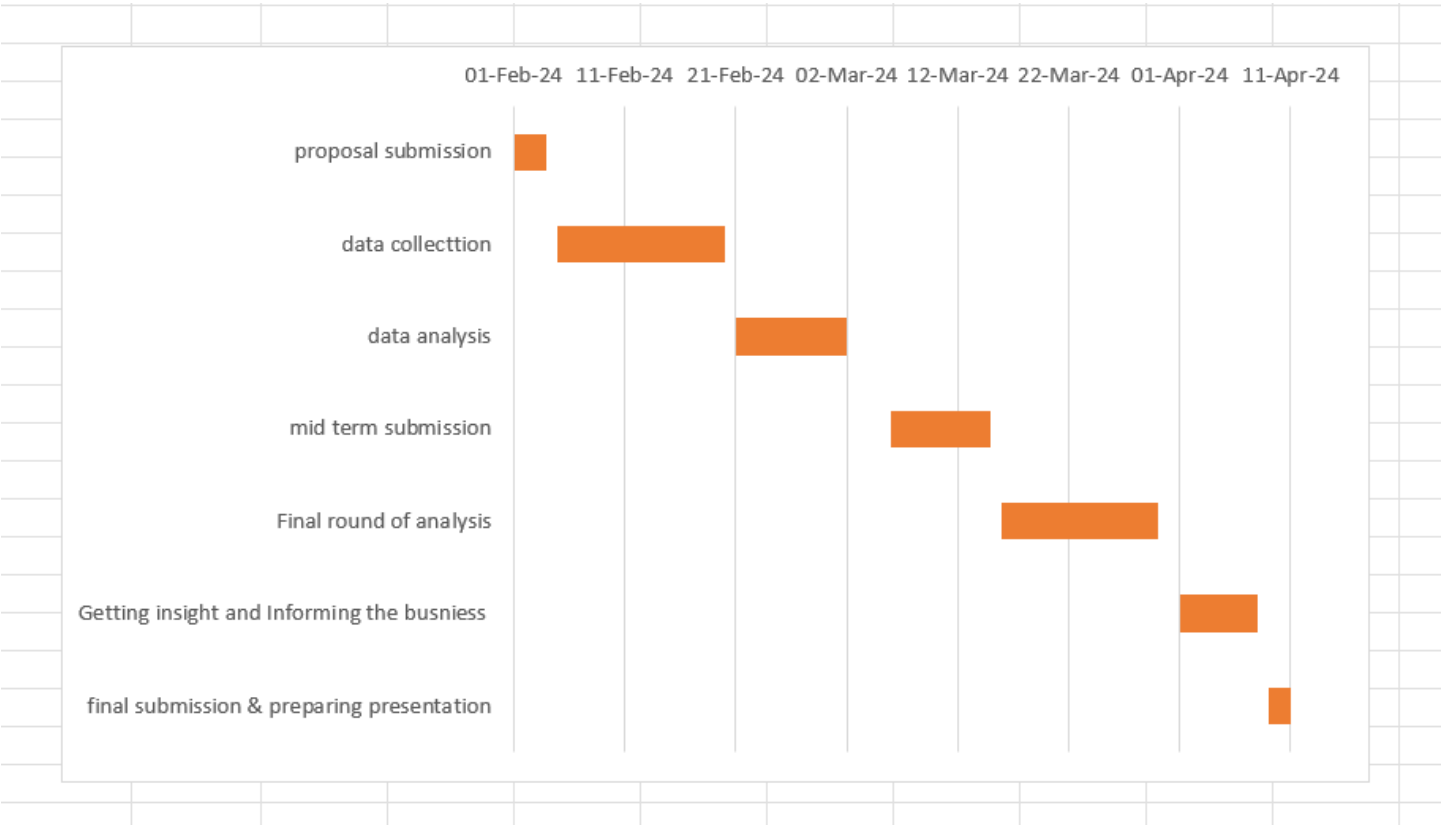
In planning phase, the task will be identifying the variables to be studied. Data Collection & Analysis, these two phases will be the major phases, where project wise data are collected which will consist of raw material price, labor charges, transportation cost, final sale price etc. Analysis phase includes data cleaning and data analysis to get the required insights, such as if there is any correlation between any of the variable of interests which impacts the overall manufacturing cost and how can those be controlled such that the profit margin will increase. In the final phase, Reporting, the observations and required recommendations will be shared with the business. Also, a final report for submission alongside presentation will be prepared.

All the tasks under each category alongside their subordinate tasks (if any) are all listed in the next section.

Work Breakdown Structure:



Gantt Chart:



Expected Outcome

The expected outcome is to get important insights after the required analysis and help the business to increase the profit margin by helping the business to estimate the cost of overall production process. Also, by analysis of the historical data of the business, the various variable cost amount is to be reduced since fixed cost can not be reduced or changed. There are several positive outcomes for the interior decoration business. The first outcome is the accuracy of cost predictions for projects which is anticipated to improve significantly, resulting in minimized budget overruns and increased financial predictability.

There are some specific products such as wooden cot, dressing table, shoe cabinet, study table etc. which standalone projects apart from some complete interior decoration project including full-fledged furnishing of a flat or an apartment, so this should also be taken into account during analysis cause even if the profit margin is low the owner can increase his sales which in turn will increase the profit in long run.