

# **Optimizing Inventory and Marketing Strategies of an Electric Power Generation Company**

**A Proposal report for the BDM capstone Project**

Submitted by

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## **Declaration Statement**

I am working on a Project titled “Optimizing Inventory and Marketing Strategies of an Electric Power Generation Company”. I extend my appreciation to Gainwell Commosales Private Limited 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.

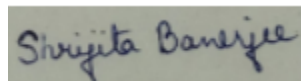
Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

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:

A rectangular box containing a handwritten signature in blue ink that reads "Shrijita Banerjee".

Name: Shrijita Banerjee

Date: 04/09/2024

## **1. Executive Summary**

The project focuses on a Multinational company, with their headquarters in India. The business is B2B and the segment I am working on deals with Electric Power Generation. Established in 1944, there are a total of 50+ branches of the company.

The major business issues that the organization is facing are related to imbalanced supply and demand of RECD (Retrofit Emission Control Device), a product used to control Air Pollution resulting from harmful carbon emission. Company is unable to solve supply and demand issues, which in turn is raising inventory jams. Also, they are unable to meet the sales target of batteries required to operate generator sets.

The issues will be addressed by analyzing the data via different analytical approaches to obtain a fruitful outcome, like competitor analysis, product pricing analysis, inventory and supply and demand analysis and other methods.

The expected outcome helps the organization to be able to minimize inventory jams, have a better supply and demand chain, and increase in sales rate.

## **2. Organization Background**

Gainwell Commosales Private Limited (GCPL), formerly Tractors India Private Limited, was founded in 1944 in Kolkata as a Track chain maker as well as service centre. The organization was better known in the name of TIL LTD. In the Mid Sixties Company started the business of manufacturing various types of Cranes as well as Sales and Service dealer of CATERPILLAR, USA for Earth Moving Equipment in Northern and Eastern part of India. In the Nineties started the business of Electric Power Generation. This Organization is ISO 9001:2015 certified. Gainwell gradually became a multinational company. More than 2000 permanent employees are working in this company. Now there are 80 branch offices and two workshops situated in various parts of India. At present Mr. Sunil Chaturvedi is Managing Director and Mrs. Meena Chaturvedi is Joint Managing Director of the Company. The main branch is in Salt Lake, Kolkata. The annual turnover of the company is over 500 crore INR, approximately.

### 3. Problem Statement

**3.1. Inventory Management:** GCPL has trouble keeping track of RECD inventory, which leads to excess inventory and makes it harder to balance supply and demand.

Objectives:

- 1) To find ways to reduce surplus inventory and increase inventory turnover.
- 2) To investigate supply and demand fields and determine the cause of the problem.

**3.2. Demand variability:** GCPL is having a problem for Generator battery demand volatility, which disrupts the supply chain and results in inventory imbalances.

Objectives:

- 1) To determine effective ways to stabilize battery supply.
- 2) To find effective measures to minimize inventory imbalances.

### 4. Background of the Problem

**4.1. Inventory Management:** Reducing unburned carbon emissions from fossil fuel cars is the goal of RECD (Residual Emission Control Device) technology, however Gainwell Commosales Private Limited (GCPL) is having trouble managing its inventory and supply chain. By the middle of 2024, RECD inventory had grown to be a major problem, and GCPL was having trouble keeping supply and demand under check. In addition to producing surplus stock, this mismanagement is making the entire supply chain process more difficult. To avoid more disruptions and inefficiencies, the main task is to optimize inventory management procedures and streamline the supply chain.

**4.2. Demand variability:** Gainwell Commosales Private Limited (GCPL), a vital part of backup power solutions, is having trouble controlling the demand variability for generator batteries. Demand fluctuations have made it extremely difficult to maintain ideal inventory levels, which has led to a lot of stockouts or surplus inventory. The supply chain is disrupted by these imbalances, which raises operating expenses and makes it more difficult to satisfy client demands. Stabilizing demand forecasts and enhancing inventory management techniques are the main challenges in this case.

## **5. Problem Solving Approach**

### **5.1. Methods used with justification**

#### **a. SWOT Analysis**

- Justification: This will help identify GCPL's strengths, weaknesses, opportunities, and threats related to inventory management and demand variability. This analysis will provide insights into internal capabilities and external market conditions.

#### **b. ABC Analysis**

- Justification: Implementing ABC analysis will categorize inventory based on value and consumption rates. This prioritization ensures that critical items are managed effectively.

#### **c. Five Whys Technique**

- Justification: This technique will help uncover the root causes of demand variability and inventory management issues by asking "Why?" multiple times. It encourages deeper exploration of problems beyond surface-level symptoms.

#### **d. Gemba Walk**

- Justification: Conducting Gemba walks allows management to observe operations firsthand, identifying inefficiencies and areas for improvement in the inventory management process.

### **5.2. Intended data collection with justification**

#### **a. Sales Data**

- Description and justification: Collect historical sales data for generator batteries and RECD inventory items, including quantities sold and seasonal variations. This data will enable accurate demand forecasting and help identify consumption patterns, essential for optimizing inventory levels.

#### **b. Inventory Levels**

- Description and justification: Gather data on current inventory levels, including stock on hand and turnover rates. Understanding inventory levels will facilitate the identification of surplus stock and inform decisions on reorder points.

#### c. Supplier Lead Times

- Description and justification: Collect information on lead times from suppliers for RECD components and batteries. Analyzing lead times will help in planning inventory replenishment and minimizing stockouts.

#### d. Customer Feedback

- Description and justification: Gather qualitative insights from customers regarding their purchasing behavior and preferences. Customer feedback will provide valuable context for demand fluctuations and help align inventory strategies with market needs.

### 5.3 Analysis tools with justification

#### a. Microsoft Excel

- Justification: Excel provides a user-friendly interface for data manipulation, calculations, and generating visualizations, making it suitable for initial analysis.

#### b. Python with Pandas and Matplotlib

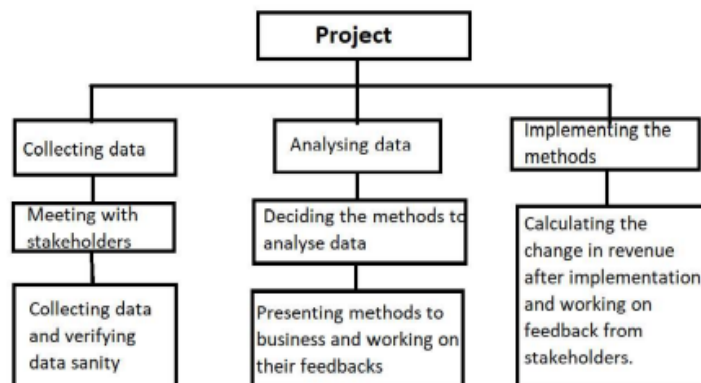
- Justification: Python's libraries, especially Matplotlib, offer robust capabilities for handling large datasets, performing complex calculations, and creating sophisticated visualizations.

#### c. Business Intelligence Tools

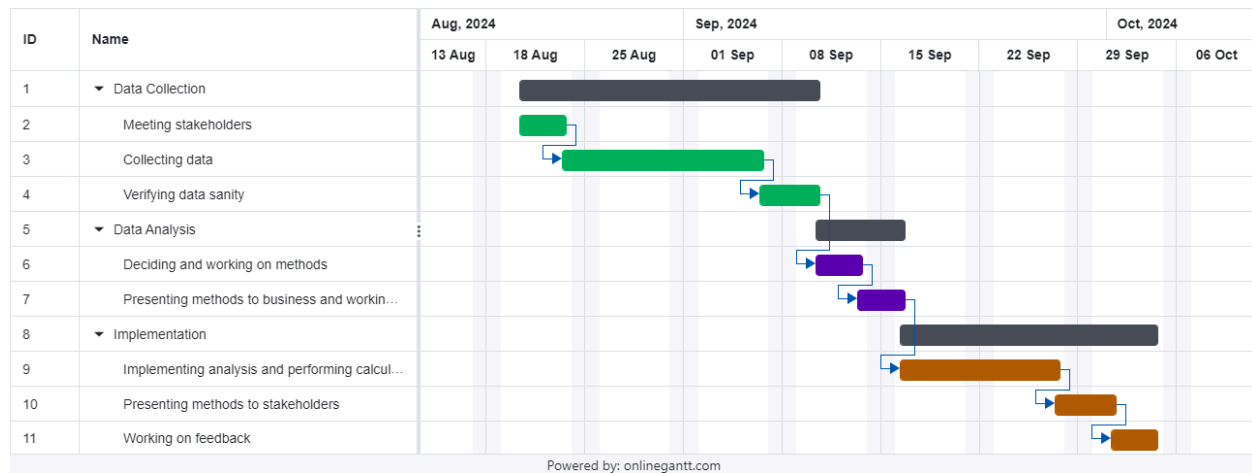
- Justification: These tools will facilitate the visualization of trends and patterns in the data, enabling stakeholders to make informed decisions based on real-time insights.

## 6. Expected Timeline

### 6.1. Work Breakdown Structure:



## 6.2. Gantt chart:



## 7. Expected Outcome

- 1. Optimized Inventory Levels:** Achieve a balanced inventory of RECD and generator batteries, reducing excess stock and minimizing stockouts.
- 2. Improved Demand Forecasting Accuracy:** Enhance forecasting accuracy for generator battery demand, leading to reduction in supply chain disruptions and better alignment with market demand.
- 3. Increased Supply Chain Efficiency:** Streamline supply chain operations, resulting in reduction in lead times and improved coordination between suppliers and distributors.
- 4. Reduced Operational Costs:** Lower inventory holding and related operational costs through better inventory management practices and efficient procurement strategies.
- 5. Increased Customer Satisfaction:** By maintaining optimal inventory levels and reducing supply chain disruptions, improve customer satisfaction through timely availability of RECD and generator batteries.