**Phase 1**:

**Problem Definition and Design Thinking Document:**

**Problem statement:**

PRODUCT DEMAND PREDICTION WITH MACHINE LEARNING

**Problem Definition:** The problem is to create a machine learning model that forecasts product demand based on historical sales data and external factors. The goal is to help businesses optimize inventory management and production planning to efficiently meet customer needs. This project involves data collection, data preprocessing, feature engineering, model selection, training, and evaluation.

**Data Collection:**

1. First we are planed to take the required data collection / sets from the provided link [**https://www.kaggle.com/datasets/chakradharmattapalli/product-demand-prediction-with-machine-learning**](https://www.kaggle.com/datasets/chakradharmattapalli/product-demand-prediction-with-machine-learning)

**Data Preprocessing:**

1. Thisprocess may include theCleaning and preprocess the data, handle missing values, and convert categorical features into numerical representations.

**Feature Engineering:**

1. We are planning to Create additional features that capture seasonal patterns, trends, and external influences on product demand in this phase.

**Model Selection:**

1. We have opted some of the regression algorithms like Linear Regression, Random Forest, XGBoost for demand forecasting.

**Model Training:**

1. In this phase we planned to train the model with the data we have collected earlier.

**Evaluation:**

1. We have planned to Evaluate the model's performance using appropriate regression metrics like Mean Absolute Error, Root Mean Squared Error etc….