

Project Design Phase-I
Proposed Solution Template

Date	24 September 2022
Team ID	PNT2022TMID47942
Project Name	Project – DemandEst-AI powered Food Demand Forecaster
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Food Demand Forecaster is a key component to every growing online business. Without proper demand forecasting processes in place, it can be nearly impossible to have the right amount of stock on hand at any given time. Too much inventory in the warehouse means more risk of wastage, and not enough could lead to out-of-stocks - and push customers to seek solutions from your competitors. The task is to predict the demand for the next 10 weeks. In this challenge, get a taste of demand forecasting challenge using a real datasets.
2.	Idea / Solution description	Food Demand Forecaster website is a process by which an individual or entity predicts the how much the consumer or customer would be willing to buy the product or use the service. Different industry or company has different methods to predict the demands. So, the daily and weekly(10weeks once) demand needs to be precise to avoid wastage which would otherwise increase the operating cost.
3.	Novelty / Uniqueness	<ul style="list-style-type: none">▪ Extensive hyper parameter tuning and feature selection.▪ Create more features based on Categorical Encoding methods like mean encoding, frequency encoding, hash encoding etc.▪ Try more algorithms like xgboost, LightGBM, Linear Regression etc.▪ Try ARIMA , Prophet etc.▪ Ensemble of different models.
4.	Social Impact / Customer Satisfaction	This model provides our customer's with the product that they want in a timely manner will increase satisfaction and make them likely to purchase from our business again. Inventory optimization, decreased safety stock requirement , Improving prices and promotion, Cost reduction for expiring products.

5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> • With improvised feature engineering, built advanced models using Ensemble techniques and other Regressor algorithms. • CatBoost and LightGBM Regressors performed well on the model which gave much reduced RMSLE. • With proper hyper-parameter tuning, CatBoost Regressor performed well on the model and gave the least RMSLE of 0.5237
6.	Scalability of the Solution	Increasing the size of your food production. Scaling up can be relatively small: making 50 instead of 10 muffins, or big: making 10,000 instead of 10 muffins. Since you're making larger quantities of your product, you may run into 'scale up challenges'.