Project Design Phase-I
Problem – Solution Fit

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Project Name	AI Powered - Food Demand Forecaster

PROBLEM STATEMENT:

While the food and beverage industry has to deal with a lot of perishable raw materials, it can be nearly impossible to have the right amount of stock on hand at any given time. Too much inventory in the warehouse could suggest a high risk of wastage, and not enough means running out of stock which could spur customers to seek solutions from the other competitors. The key problem is finding the balance between scarcity and surplus food.

1. CUSTOMER SEGMENT(S)

- Organizations that need to predict changes in consumer demand to provide higher customer satisfaction.
- Manufacturer of food products who uses demand forecasting for improved markdown/discount optimization.

6. CUSTOMER CONSTAINTS

- Seamless Internet connectivity.
- Power supply in case of usage of desktop system.
- Basic technical knowledge for performing efficient operations on the platform.

5. AVAILABLE SOLUTIONS

- Prediction using LSTM :Short-term memory neural networks (LSTMs) are suitable for demand forecasting but requires longer time and more memory.
- Prediction using Ensemble Learning: An ensemble can make better predictions and achieve better performance than any single contributing model but expensive.

2. JOBS-TO-BE-DONE / PROBLEMS `J&P`

Provide daily and weekly demand that needs to be precise and accurate.
- Eliminate wastage which would otherwise increase the operating cost.
- Having products always available which improves customer loyalty and brand perception
- To avoid cash-in-stock situation for retail companies, where products remain unsold for a longer period than expected.

9. PROBLEM ROOT CAUSE `RC`

- Lack of Adequate, Accurate and Timely Demand Data.
- Traditional demand forecasting falls short of this vital aspect as it stretches over a longer time period which can dilute the essence of real-time data tracking and near-term visibility
- Food retailers very often get misled by the slightest abnormal shift in demand, which if not explained can be treated as a signal for change in planning and forecasting models.

7. BEHAVIOUR

- Company might conduct client-intent surveys to ask what the customer is planning on buy in the future.
- Conjoint analysis is used to obtain consumer input about the most favorable attributes of their products. These surveys ask consumers how they would use and respond to certain product attributes.
- Traditional forecast model used to estimate future value – usually from historical records of business performance metrics.

3. TRIGGERS `TR`
- Social media advertisements.
- The cost-free, self intuitive simple nature of platform that favors interaction.
- Other food retailers gaining maximum profit using the AI platform.

4. EMOTIONS: BEFORE / AFTER `EM`
- Before : Doubt, ambiguous, stressed, disoriented.

10. YOUR SOLUTION

- To use simple linear regression model which is a quantitative way to predict future values `SL` with past values.
- Post applying feature engineering and data transformation.
- Feature engineering is the process of using domain knowledge of the data to create features

8. CHANNELS of BEHAVIOUR `CH`

8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7

- Cost free, simplistic prediction can be made online. User Interactive website that can be accessed by
- anyone anytime

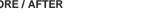**8.2 OFFLINE** What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

- After accurate prediction: Happiness,determined,explicit,calmness.

that improves the performance of the machine learning models.