Ideation Phase
Literature Survey

Date	3 September 2022
Project Name	DemandEst - AI powered Food Demand Forecaster

Forecasting is crucial to supply chain management because of the increased amount of corporate competition, and a company's survival is frequently reliant on how well its projections are made. Demand projections are more important than all other strategic and planning choices in any retail firm since they have a direct impact on the profitability and market share of the enterprise. To assist analysts in predicting demand, a number of methodologies are available. Although these methods differ greatly from one another, they have the following traits:

● They often presume that the factors that have influenced demand in the past will continue to do so,

● Forecast accuracy declines as the forecasting horizon lengthens,

● And aggregated forecasts for product groupings are more accurate than predictions for individual products

Keywords:

· Restaurant sales forecasting

· Guest count prediction

· Forecasting survey

· Revenue management

· Yield management

Demand forecasting is one of the important inputs for a successful restaurant yield revenue management system. Sales forecasting is crucial for an independent restaurant and for restaurant chains as well. The sales transaction data collected by restaurant chains may be analyzed at both the store level and the corporate level. At the level of single store, exploring the large amounts of transaction data allows each restaurant to improve its operations management (e.g., labor scheduling) and product management (e.g., inventory replenishment, product preparation scheduling), and in consequence reducing restaurant operating costs and increasing quality of serving food. Whereas at the corporate level, extraction of relevant information across the restaurants can greatly facilitate corporate strategic planning. Management can assess the impact of promotional activities on sales and brand recognition.

PAPER TITLE: Food Quality Demand and Monitoring System.

AUTHOR: Atkare Prajwal (1), Patil Vaishali (2), zade payal (3), Dhapudkar Sumit(4)

Food plays a very important role in our day to day life. With an increase in globalization, the quality of food decreases day by day. Most of the time various food processing is done to keep the food fresh. Various preservatives or the ingredients are added in the food so that it looks fresh or tempting. Now most of the food is preserved with the chemicals which causes the

food contamination. This contamination leads to various diseases which results that the consumer want healthy food. The people wants organic food for healthy lifestyle. So to avoid the problems associated with the food without human interpretation we need such a device which helps to determine the quality of food. There is a requirement of such a device which guide us about the hygienic food. Hence to fulfill this consumer demand we made a device that checks whether the quality of food is good or bad. This paper represents the use of various sensors in the field of the food industry. The sensors like pH sensor, gas sensor, temperature sensor help in identifying the condition of food. This system makes an effective presence in restaurants, households, small scale industries.

Keywords: - Food quality, Contamination of food, pH sensor, Gas sensor, Temperature sensor

DRAWBACKS:

The Quality of a food is defined from two perspectives- scientific status and customer preferences. Scientific factors affecting the quality of food include composition,spoilage, colorants, contamination etc.

PAPER TITLE: Flexible Demand Forecasting in Intelligent Food Supply Chain Management.

AUTHOR: Srimathi Ravisankar,Kanimozhi Mahendran,Srilakshmi Arulmurugan M.R. Sumalatha

In the Food industry, Big data analytics concepts and techniques are being used in the food business for inventory optimization, which combines historical data with predictive techniques to improve supply chain management techniques. Demand forecasting, food tracing, and information exchange for suppliers, warehouses, and restaurants to connect with one another are the three modules covered in this paper that deal with managing the food supply chain. In this paper, a novel algorithm for the demand forecasting module is proposed. It combines an outlier detection method with the Light GBM Regressor, which manages the target, and the SARIMA Algorithm, which handles data seasonality. This paper also suggests a Food Tracing System (Find my Food) that employs the Nakamoto Consensus method for network participants to agree on issues such as traditional data invisibility, data manipulation, and sensitive information exposure, as well as an information sharing module between supply chain entities using a database where they can share about food quality issues, share information about stock and requirement details of the ingredients needed for pre-production.This method of incorporating an information sharing module into the supply chain.

PAPER TITLE: Daily Food Demand Forecast with Artificial Neural Networks: Kırıkkale University Case.

AUTHOR:

1.ZenepCentinkaya Department of Computer Engineering Kırıkkale University Kırıkkale, Turkey.
2.Erdal Department of Computer Engineering Kırıkkale University Kırıkkale, Turkey.

In food service organizations, demand estimation is very important in planning of production. When an accurate demand forecast is made, the resources are used more efficiently, and the production wants to be lost in some places. In the institutions where the number of people to make a request is not known clearly, the demand forecasts of the quantitative and qualitative targets are made. It has been proposed a model of artificial neural networks to estimate the daily meal demand. Artificial neural networks are a qualitative method that targets a predetermined target by using the previous example data using a predefined

demand estimate. Kırıkkale University cafeteria, where a selection should be made, the demand can affect your criteria. A MATLAB program was prepared, a suitable model was created and the data were analyzed in the meantime.

Keywords— Demand Forecast, Food Forecast, Artificial Neural Networks

DRAWBACKS:

1. This method is subjective and the forecast could be unfavorably influenced by persons with vested interests.
2. Results are based on mere hunch of one or more persons and not on scientific analysis.

PAPER TITLE: Demand forecasting in restaurants using machine learning and statistical analysis.

AUTHOR: Takashi Tanizaki,Tomohiro Hoshino ,Takeshi Shimmura,Takeshi Takenaka

In the paper, demand forecasting in restaurants using machine learning is proposed. Many researches have been proposed on demand forecasting innovation utilizing POS information. However,in order to make demand forecasts at a genuine store, it is important to lay out a store-explicit demand forecasting model in light of different factors, for example, the store area, the climate, occasions and so on .Thus, we developed an demand forecasting model that practically consolidates the previously mentioned information utilizing machine learning.

In this paper ,the interest determining model utilizing AI and the check consequence of the model utilizing genuine store information is examined. In this paper, demand forecasting techniques utilizing inner information, for example, POS information and outside information in the omnipresent climate like climate, occasions, and so on are proposed. We utilize Bayesian Straight Relapse, Helped Choice Tree Relapse, Choice Backwoods Relapse and Stepwise technique as the demand forecasting strategy. There was no huge distinction in the determining rate utilizing the strategy for Bayesian, Choice, and Stepwise, and the forecasting rate of Helped was somewhat low. The figure rate of any store surpassed around 85%.

PAPER TITLE: FOOD DEMAND PREDICTION USING MACHINE LEARNING

AUTHOR:

1.K Aishwarya, Dept. of Computer Science & Engineering, NIE College, Mysore, Karnataka,
2.N Rao, Dept. of Computer Science & Engineering, NIE College, Mysore, Karnataka, India
3.Akshit Mishra, Dept. of Computer Science & Engineering, NIE College, Mysore, Karnataka.
4. Nikita Kumari, Dept. of Computer Science & Engineering, NIE College, Mysore, Karnataka, India

Demand forecasting is the process in which historical data is used to estimate the quantity of product customer will purchase. This prediction activity is used in many fields like retailing, food industry etc. In Restaurants, prediction play a vital role as most of the basic ingredients have short-shelf life. The demands depend upon many explicit and hidden context such as season, region etc. In this paper, number of order is used to forecast stock of items, using machine learning with internal and external data. In this we provide an appropriate algorithm for demand forecasting which is capable of overpowering the wastage of short life items. Proposed algorithm like Bayesian Linear Regression, LASSO, XGBoost algorithm are used that considerably improves the forecasting performance.

DRAWBACKS:

1.It involves a lot of data gathering, data organizing, and coordination.

2.Companies typically employ a team of demand planners who are responsible for coming up with the forecast. But in order to do this well, demand planners need substantial input from the sales and marketing teams.