IDEATION PHASE

LITERATURE SURVEY

Date	29 September 2022
Team ID	PNT2022TMID45520
Project Name	Project – AI Powered Food Demand Forecasting
Maximum Marks	4 Marks

DemandEst - AI powered Food Demand Forecaster

LITERATURE SURVEY

TITLE: Enhanced Demand Forecasting System For Food and Raw Materials Using Ensemble Learning

AUTHOR: K. Harshini, Padmini Kousalya Madhira, Sutari Chaitra, G. Pradeep Reddy

YEAR: 2021

Human needs have been evolving along with time. There has been a constant change in the way people eat food and their taste pallets, with cuisines varying from continent to continent.In the older days,people used to cook with the ingredients they found around them and ended up with a new dish. Food wastage and raw materials deterioration are the most noteworthy predicaments faced by any food selling business.

To avoid wastage, the restaurants should have prior knowledge of the amount of foodrequired. Several solutions with the help of AI have been compounded to solve thisproblem of food wastage. Nevertheless, much of this research concentrates on theprediction of sales and its accuracy. It is important to note that sales prediction alonewon't be enough to decrease food wastage. Predicting the number of raw materials required also plays a crucial role in reducing food wastage. Therefore, in this paper, a demand forecasting system is proposed that predicts the number ofcustomers, sales for particular dishes, and the amount of raw materials required.

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

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

YEAR: 2018

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%.

TITLE: Food demand prediction using machine learning.

AUTHOR: K.Aishwarya, Aishwarya.N.Rao, Nikita Kumari, Akshit Mishra, Mrs.Rashmi MR

YEAR: 2020

Demand forecasting is the cycle where authentic information is utilized to assess the amount of item client will buy. This forecast movement is utilized in many fields like retailing, food industry and so on. In restaurants, prediction assume a crucial part as a large portion of the essential fixings have short-time span of usability. The demand rely on numerous unequivocal and secret setting, for example, season, region and so on. In this paper, number of request is utilized to estimate supply of things, utilizing AI with internal and external data.In this paper, involving outside and inward information for the expectation comprising of various variables like district ID, week and so on. Food demand prediction is a significant and testing issue.

As we go through various calculation for expectation the exactness rate continues to move along. There was not enormous distinction other than accuracy pace of estimating. XGboost is a decision based helping calculation which is utilized for expanding the exactness rate. This assessment is utilized basically for restaurants. Besides, in future more refined expectation should be possible in view of numerous different variables like social propensities, strict occasion, customer inclinations and so on. In future, this technique can be utilized for predicting work force requirements, robotized food requesting in view of forecasting results.

TITLE: Demand Forecasting For Production Planning In a Food Company.

AUTHOR: N. de P. Barbosa, E.da S.Christo, and K. A. Costa

YEAR: 2015

The food and beverage industry is one of the main areas of the Brazilian economy, with a huge cooperation in Gross domestic product list. The Brazilian economy has been showing an overall solidness somewhat recently, which takes the business interest to be more unsurprising. Because of this situation of monetary solidness, the organizations has been stressed over putting resources into arranging their activities, making use, principally, of forecasting techniques to turn out to be more serious on the lookout. On account of food industry, the occasional and the short perishability factors are a constraint to the upkeep of stocks, requiring a forecasts with a high exactness level. The current work comprises in applying techniques to estimate the interest for results of a food industry, which guides its deals to the food administration market, to base the short to medium term creation arranging. Posteriorly, the forecast will be assessed utilizing the blunder measure MAPE and contrasted with the interest presently thought to be by the organization. The proposed techniques highlight a decrease of the mistake roughly 5%. The technique applied in this work showed its straightforwardness and openness because of the minimal expense and effortlessness of use. By having these attributes, this strategy can be utilized by little and medium-sized organizations, where is preposterous to expect to make immense interests in arranging their tasks. The food items have a component that restricts the support of stocks, the short perishability. These items have a period wherein they keep their qualities and ought to be consumed prior to being viewed as unacceptable for consuming. Hence, it is recommended for future works that the short perishability of items should be considered while assessing the outcomes got by the quantitative techniques. To make conceivable not well thought out plan the creation to fulfill the anticipated interest, yet additionally add to limit the deficiency of items because of its short perishability and subsequently, working on the benefit of the organization.

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

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

YEAR: 2022

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 aids in information sharing and the smooth operation of the supply chain.

TITLE: Food demand prediction using the Nonlinear Autoregressive Exogenous Neural Network.

AUTHOR: K.Lutosławski ,M.Hernes, J.Radomska, M.Hajdas, E.Walaszczyk1, A. Kozina

YEAR: 2020

Predicting food demand is a critical problem for both sustainable development and corporate process optimization. Artificial intelligence techniques as well as data science techniques are frequently employed for this. The goal of this study is to create nonlinear autoregressive exogenous neural network-based models for predicting food demand. The research is concentrated on processed foods like bread and butter. Architectures of developed models with varying numbers of hidden layers and neurons, as well as with various diameters of the delay-line, were evaluated for a particular product. The study's findings indicate that the performance of prediction varied slightly based on the type of product.
The R2 metric yielded scores between 96,2399 and 99,6477.

depending on particular products. The suggested models can be incorporated into an organization's intelligent management system to control stocks and food production in a sensible manner. Additionally, it may result in less food waste. A useful method for creating time series prediction models is the hybrid concept of Nonlinear Autoregressive Exogenous with the Neural Network (NARXNN). In order to predict the demand for particular foods with accuracy, this paper has introduced a novel use of NARXNN. The suggested method can actually be used as a part of an organization's intelligent management system.