Optimized Warehouse Management For Perishable Goods

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INTRODUCTION

This is a Software model on Demand Forecasting of perishable goods using machine learning solutions.

Hence a machine learning model with accurate demand forecasting ability can solve the perishable goods wastage and efficient and timely usage of goods.

OVERVIEW

A food storage warehouse service has to deal with a lot of perishable raw materials which makes it all, the most important factor for such a company is to accurately forecast daily and weekly demand.

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 replenishment of the majority of raw materials is done on a weekly basis and since the raw material is perishable, procurement planning is of utmost importance.

PROBLEM ANALYSIS

Wastage in the perishable fresh produce fruits and vegetables supply chain from harvesting stage till it reaches the consumer is very high in emerging markets like India.

There are several reasons why so much perishable food is lost, including the absence of modern food distribution chains, inaccurate demand prediction, too few cold-storage centers and refrigerated trucks, poor transportation facilities, erratic electricity supply, and the lack of incentives to invest in the sector.

PROPOSED SOLUTION

The machine learning Model solution has been prepared which should have the ability to predict accurately. In this model, the demand forecasting for vegetables is predicted.

DATA COLLECTION

The historical **data** of crop **prices** along with the arrival **quantity** in **different region**s has been collected for **training** the machine learning model for analyzing the **trend in demand**.

MACHINE LEARNING

Machine Learning model has been **trained from the collected data** From **Watson Studio**.

Multi Regression model for **Retail Price Estimation** and **Linear Regression** model for **Arrival Quantity Estimation** has been used.

ML Deployment models has been created using AutoAI in Watson studio

UI MODEL

Node-Red has been used in this project to create the UI model. The ML Model has been **integrated** with the node-red webapp to have an interactive smooth input/output interface with the Machine Learning model deployment. **Seasonal Fruits and Vegetable** arrivals is also integrated in the UI model.

App URL: click here

FEATURES

- It predicts **each day's arrival quantity** estimation accurately by using the ML model along with **Retail Price estimation**.
- **Seasonal effects** on demand are also considered while training the ML model.
- **Three years of data** is considered which can provide the ML model the high accuracy.
- **Seasonal Fruits and Vegetables** availability can also be known by the model.

DEPLOYMENTS

Future demand can be predicted in **Food Industries.**

Accurate demand forecast can be utilized in managing of **Local Warehouses**.

Can help customers and sellers in the estimation of the price in future.

ADVANTAGES

Compared to traditional demand forecasting methods, machine learning accelerates data processing speed.

No human intervention needed.

Quantity estimation of perishable food.

Accurate demand forecast.

DISADVANTAGES

Sudden changes affect demand forecasts.

Predictions may vary at times of Natural Calamities.

Change in people’s mindset can affect the demand.

FUTURE SCOPE

The growing demand of **Machine Learning (ML) and Artificial Intelligence (AI**) in almost every industry. Fortunately for demand planners, ML can now help further improve the forecast from **40% of actual to 70% of actual**.

Machine Learning can predict future weather patterns at the local level and identify how it connects to ***local demand patterns***.

Machine Learning can also determine if a lag exists between the weather changes and the demand of products on a **real-time basis**. The life cycle of a product plays a critical role in **demand forecasting**.

Thank You.