Project Documentation
Title : Optimised Warehouse Management with Auto AI

1. INTRODUCTION
1.1 Overview

In this project we are going to deal with warehouse management.At present many food delivery companies are facing problems with management of perishable raw materials.Through our project we will predict the no.of orders and we will produce a list of predictions which helps the warehouse management easy and efficient.For this project we are using Machine Learning model.

1.2 Purpose

The purpose of this project is to establish the relation between the number of orders of food items for a food company and the required input features like number of the week,type of food,checkout price,base price,email promotions and the number of times the food item featured in the home page.To establish this relation,analysis of the past data is the most important.We made use of machine learning model to establish this relation.

2. LITERATURE SURVEY
2.1 Existing problem

A food delivery company has to face lot of problems with Perishable raw materials.Mainly not able to predict the sufficient future demands for the company.Due to this there will be more risk of wastage of materials or leads to out of stock.In both cases the company has to face economical loss.So,there is a need for accurate prediction of demands.Old statistical methods needs to be developed by using the current technology for accurate predictions.

2.2 Proposed solution

Machine learning is the most trending and useful technology for business predictions. It has several advantages like more accuracy,automates forecast updates based on recent data,high data processing speed etc when compared to the existing methods.So,we prefer machine learning model as a suitable solution for the given problem.

3. THEORETICAL ANALYSIS

3.1 Block diagram
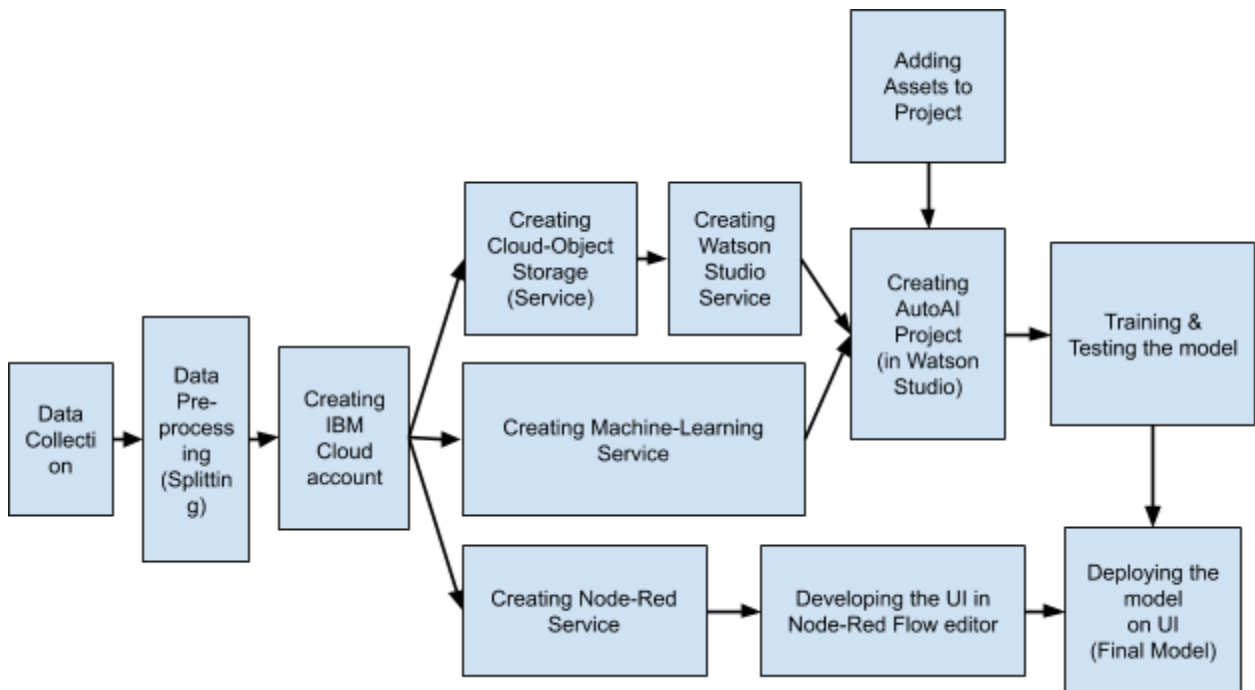
3.2 Hardware/Software designing

We used all the software and hardware requirements for our project from the IBM Cloud services.To build the machine learning model we made use of AutoAI service in IBM Watson Studio service with the association of machine learning and Cloud-Object Storage(for storage purpose).The designing part is very easy as we are using the AutoAI.It will select the appropriate ML algorithm based on the data we gave and train the model with all the tuning required automatically(It will be a big task if we do those with our hands).Deployment is done after training. We can use all the computations and storage required from the cloud services based on our requirement.

While coming to the User Interface(UI).Node-red service a flow based service in IBM Cloud for developing web applications.We made use of the Node-Red service to develop an User Interface web page and deployed the developed model in UI.Designing part will be done after deployment of model on developed UI on Node-Red.

4. EXPERIMENTAL INVESTIGATIONS

This model is developed using an automatic Machine Learning model development service called AutoAI provided in IBM cloud.We collected the data of 135 weeks including the details number of the week,center id,meal id,checkout price,base price,number of email used for promotions,number of times the food items featured in homepage as independent variables and the orders in that week as dependent variables.By developing the relationship between the all features and number of orders we developed the model to make estimation of orders for upcoming weeks .

The Auto AI selected the Random Forest Regressor algorithm as a suitable learning algorithm to learn the relationship between dependent and independent variables.We trained model with the Random Process Regressor along with feature engineering(generating new features from the available features to make best fit).Our model showed an Explained Variance of 0.796 on test data after all required tunings.

5.FLOW CHART
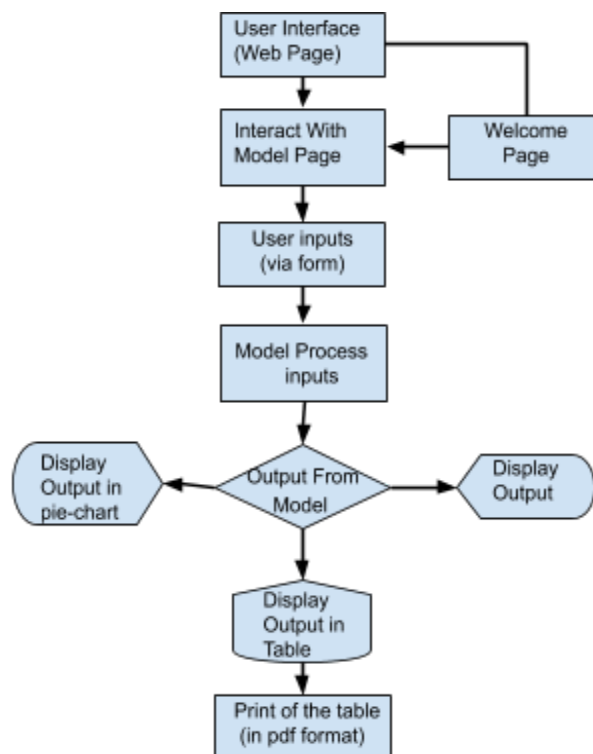
6.RESULT

Expected number of orders for food items will be delivered from the model with required inputs.Along with the visualisation in pie chart,ability to add required predictions to the table to take summary as print out(in pdf format) at last.

7. ADVANTAGES AND DISADVANTAGES

Advantages:

1. Easy to use
2. Decreases economical loss by reducing the wastage of perishable raw materials.
3. Increases profits by predicting the required quantity of demanded raw materials.
4. Less human effort for prediction of demand.
5. Helps in business expansion

Disadvantages:

1. Cannot do prediction for all food items at once
2. Cannot do appropriate predictions in uncertain situations.

8.APPLICATIONS

This model used as a tool for estimating the demand for the food items(in the form of number of orders) for optimised management in the warehouse of a food delivery company,helps in buying the required amount of raw materials for upcoming week(not more,not less).Results in the reduction of wastage and improves the availability of food items for customers(by preventing out of stock).

9.CONCLUSION

It is clear that every food delivery company has a problem of wastage of perishable raw materials or lack of materials.To avoid that we developed a Machine Learning model to predict the no.of orders for next ten weeks based on the previous data availability.By that we can solve the problem facing by the food delivery

companies.And the accuracy of our model is 79.6%.So we believe that our model can predict the no.of orders more accurately.

10.FUTURE SCOPE

The present model is not adaptable to the uncertain conditions.We are expecting the adaptable model for the any situation with inputs,which can explain the model about the situation in future.Ability to take all the required inputs at a time and do process to make the user feels easy by avoiding the recurring work to all the food items.And the model can update itself by comparing the predicted orders and the actual number of orders for the last week.These are the expected modifications for our model to perform better in future.

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