

High Level Design (HLD)

Consignment Pricing Prediction

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Abstract

The market for logistics analytics is expected to develop at a CAGR OF 17.3 percent from 2019 to 2024, more than doubling in size. In this project we demonstrate how logistics organizations are understanding the advantages of being able to predict what will happen in the future with a decent degree of certainty. The main goal of this project is to predict the consignment pricing based on the available factors in the dataset. This may be useful for the Logistics leaders to address the supply chain difficulties, cut costs, and enhance service levels all the same time.

1. Introduction

1.1 Why this High-Level Design Document?

The purpose of this High-Level Design (HLD) Document is to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions prior to coding, and can be used as a reference manual for how the modules interact at a high level.

The HLD will:

- Present all of the design aspects and define them in detail.
- Describe the user interface being implemented.
- Describe the hardware and software interfaces.
- Describe the performance requirements.
- Include design features and the architecture of the project.
- List and describe the non-functional attributes like:
 - Security
 - Reliability
 - Maintainability
 - Portability
 - Reusability
 - Application compatibility
 - Resource utilization
 - Serviceability

1.2 Scope

The HLD documentation presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technical terms which should be understandable to the administrators of the system.

1.3 Definitions

Term	Description
Database	Collection of all the information monitored by this system
IDE	Integrated Development Environment
ML	Machine Learning

2. General Description

2.1 Problem Perspective

This is a machine learning based model which will help us to predict the consignment pricing.

2.2 Problem Statement

This data demonstrates how logistics organizations are understanding the advantages of being able to predict what will happen in the future with a decent degree of certainty. Logistics leaders may use this data to address supply chain difficulties, cut costs, and enhance service levels all at the same time. The main goal is to predict the consignment pricing based on the available factors in the dataset.

2.3 Proposed Solution

The solution proposed here is a ML model which can predict the consignment price. The user should manually enter certain values and the model will predict the price of the consignment on the basis of the feature value given by the user.

2.4 Data Requirements

Data requirement completely depend on the problem statement.

- The features should be given by the user manually.
- The given features should be normalised accordingly.
- The user has to make sure that he/she gives the correct feature value In the corresponding feature columns.

2.5 Tools Used

Python programming language and frameworks such as NumPy, Pandas, Scikit-learn, Flask, Random Forest Regressor are used to build the whole model.



- PyCharm is used as IDE.
- For visualization of the plots, Matplotlib, Seaborn and Plotly are used.

- Front end development is done using HTML.
- Python Flask is used for backend development.
- Local deployment is used for the deployment of the model.

2.6 Constraints

The Consignment Pricing model should be user friendly and user should manually provide input features, but it is not necessary to know the working of the model.

2.7 Assumptions

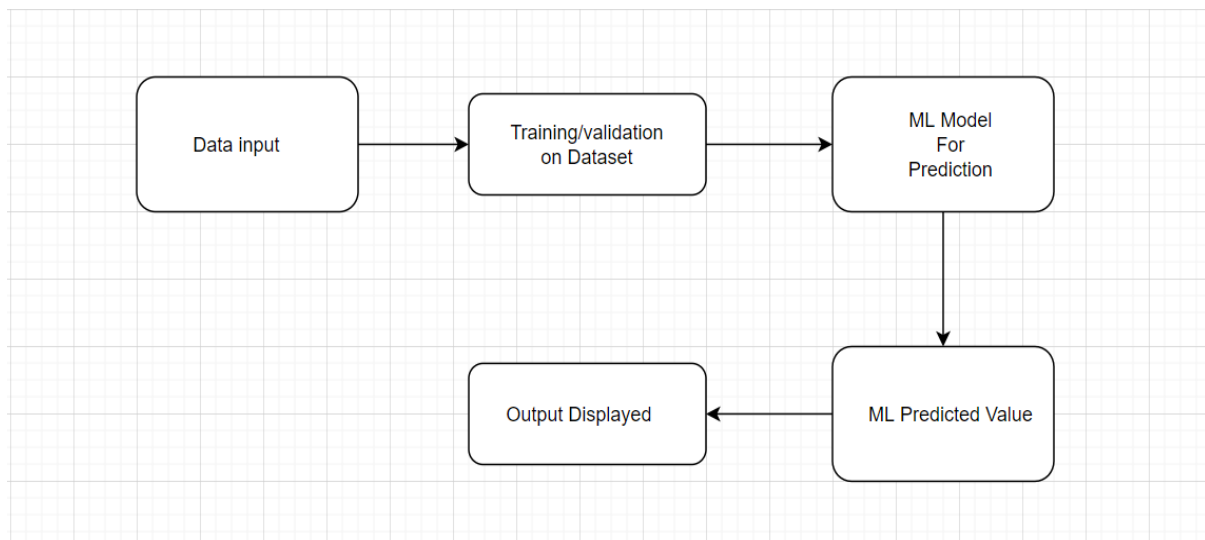
The main objective of the project is to predict the consignment price based on the input features provided by the user. Random Forest Regressor is used for predicting the above-mentioned use case based on the input data. It is also assumed that all aspects of this project have the ability to work together in the way that the designer is expecting.

3 Design Details

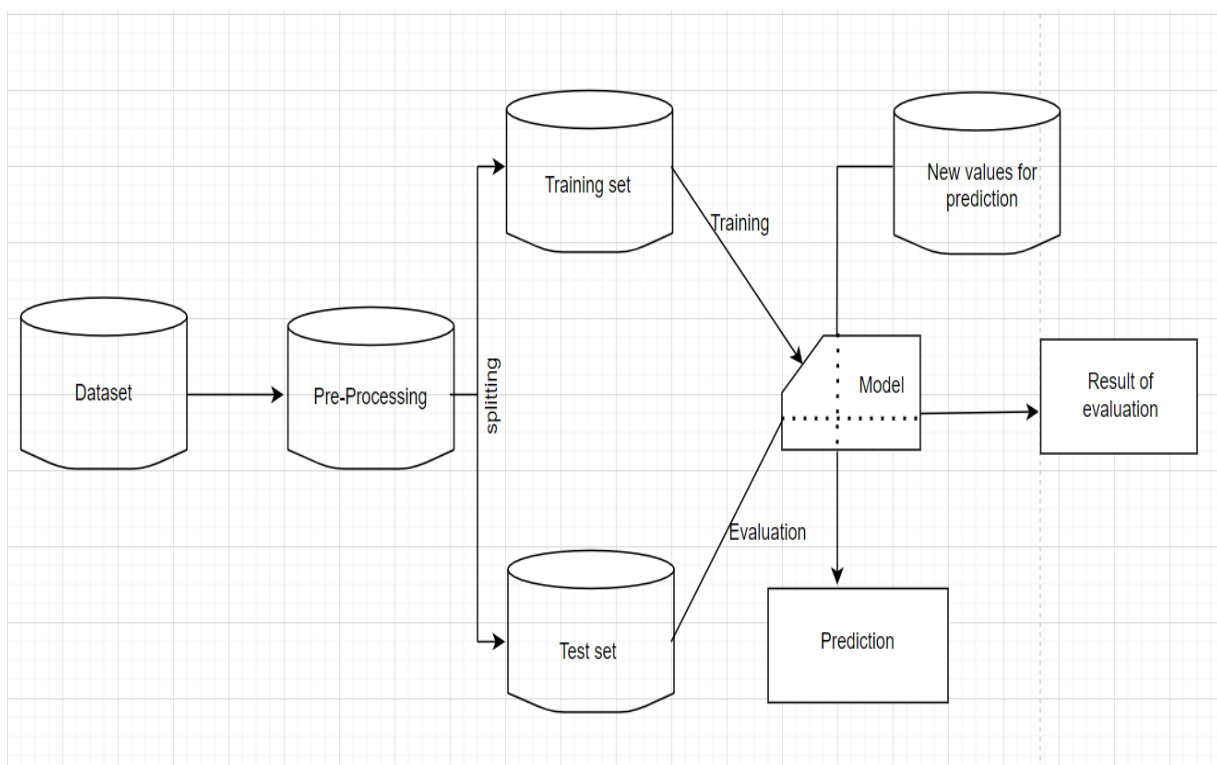
3.1 Process Flow

For identifying the different types of anomalies, we will use a Machine Learning model. Below is the process flow diagram as shown below.

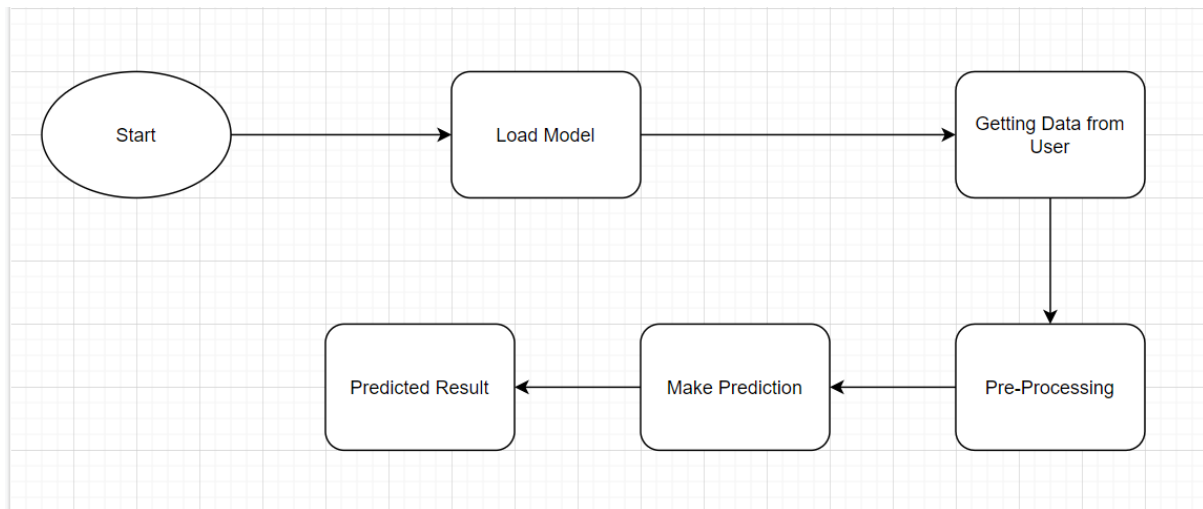
Proposed methodology



3.1.1 Model Training and Evaluation



3.1.2 Deployment Process



3.2 Event log

The system should log every event so that the user will know what process is running internally.

Initial Step-By-Step Description:

1. The system identifies at what step logging required.
2. The system should be able to log each and every system flow.
3. Developer can choose logging method. You can choose database logging/ File logging as well.
4. System should not hand after using so many loggings. Logging just because we can easily debug issues so logging is mandatory to do.

3.3 Error Handling

An error will be defined as anything that falls outside the normal and intended usage.

3.4 Performance

The consignment prediction is used to predict the logistics cost for the transportation of an item, so it should be as accurate as possible. So, it will not mislead the user. Also, model retraining is very important to improve the performance.

3.5 Reusability

The code written and the components used should have the ability to be reused with no problem.

3.6 Application Compatibility

It is the job of the python is to ensure proper transfer of information without any failure.

3.7 Resource Utilization

When any task is performed, it will likely use all the processing power available until that function is finished.

3.8 Deployment



4 Conclusion

The consignment prediction model will predict the logistics cost for the transportation of an item with pretty descent accuracy. This may be useful for the Logistics leaders to address the supply chain difficulties, cut costs, and enhance service levels all the same time.

5 References

1. <https://en.wikipedia.org/wiki/Logistics>
2. https://github.com/tichmangono/capstone_project