

**Shipment Pricing Prediction**

High Level Design

Domain: Machine Learning

Author: Vaibhav Joshi

Date: 02-01-2024

Belgaum, India

+91 9742083119

vaibhavgjoshi95@gmail.com

**Document Version Control**

|  |  |  |  |
| --- | --- | --- | --- |
| Date issued | Version | Description | Author |
| January 2nd 2024 | 1.1 | First Draft | Vaibhav Joshi |

Contents

[**Abstract** 3](#_Toc146538265)

[**Introduction** 3](#_Toc146538266)

[What is High-Level Design Document? 3](#_Toc146538267)

[Scope 4](#_Toc146538268)

[**General Description** 4](#_Toc146538269)

[Definitions 4](#_Toc146538270)

[Product Description 4](#_Toc146538271)

[Problem Statement 4](#_Toc146538272)

[Proposed solution 4](#_Toc146538273)

[Data requirements 4](#_Toc146538274)

[Tools used 5](#_Toc146538275)

[Hardware Requirements 5](#_Toc146538276)

[Assumptions 5](#_Toc146538277)

[**Design Details** 6](#_Toc146538278)

[Process Flow 6](#_Toc146538279)

[**Performance** 6](#_Toc146538280)

[Reusability 6](#_Toc146538281)

[Application Compatibility 6](#_Toc146538282)

[Resource Utilization 7](#_Toc146538283)

[KPIs (Key Performance Indicators) 7](#_Toc146538284)

[**Conclusion** 7](#_Toc146538285)

## **Abstract**

The Shipment Pricing Prediction project aims to revolutionize the logistics and supply chain industry by leveraging advanced machine learning techniques to predict shipment prices accurately. In an era where efficient and cost-effective transportation is crucial, this project seeks to provide a robust solution that optimizes pricing strategies, enhances decision-making processes, and ultimately contributes to improved operational efficiency.

## **Introduction**

### What is High-Level Design Document?

The goal of this HLD or a high-level design 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 design aspects and define them in detail.
* Describe all user interfaces being implemented.
* Describe the hardware and software interfaces.
* Describe the performance requirements.
* Include design features and architecture of the project.
* List and describe the non-functional attributes such as security, reliability, maintainability, portability, reusability, application compatibility, resource utilization, serviceability.

### 

### Scope

The HLD documentation presents the structure of the system, such as 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.

## **General Description**

### Definitions

|  |  |
| --- | --- |
| **Term** | **Description** |
| SPP | Shipment Pricing Prediction |
| Database | Collection of the Information. |
| IDE | Integrated Development Environment. |

### Product Description

SPP is a Machine Learning based regression model which helps us to predict Shipment prices.

### Problem Statement

The goal of this project is to predict the shipment price based on which a company can take business decisions.

### Proposed solution

Using all the standard techniques used in the life cycle of a Data Science project starting from Data Exploration, Data Cleaning, Feature Engineering, Model Selection, Model Building and Model Testing were done.

### Data requirements

Data requirement completely depend on our problem statement. We need the dataset from Shipment Company. Required dataset should contain the following features:

* Country
* Shipment Mode
* Quantity in pack
* Price of Pack
* Weight of Pack
* Insurance of Product in USD

These are the required parameters to feed into model.

### Tools used

Python programming language and frameworks such as NumPy, Pandas and a few other libraries were used to build the whole model.



* For visualization tasks, Matplotlib is used.
* GitHub is used as version control system.
* NumPy and Pandas were used to clean and interpret data.

### Hardware Requirements

* Windows Server, Linux, or any operating system that can run as a webserver, capable of delivering HTML content.
* Minimum 1.10 GHz processor or equivalent.
* Between 1-2 GB of free storage.
* Minimum 512 MB of RAM.
* 3 GB of hard-disk space.

### Assumptions

The main objective of this project is to implement the use case as previously mentioned (2.3 problem statement) for new dataset that comes through the form. It is assumed that all aspects of this project have the ability to work together as the designer is expecting and also the data on which our model is trained is as correct as possible.

## **Design Details**

### Process Flow

For accomplishment of the task, we will use a trained Machine Learning model. The process flow

Data Preparation

Model

Development

Deployment

Deployment

## **Performance**

The SPP tool is used to predict the forecasted value of Petrol Price.

### Reusability

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

### Application Compatibility

The different components for this project will be using Python as an interface between them, each component will have its own task to perform, and it is the job of Python to ensure proper transfer of information.

### Resource Utilization

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

### KPIs (Key Performance Indicators)

* Key Performance Indicators of SPP
* Latency or the amount of time the application takes to display results for some specific input.
* The processing power our application takes to run
* The memory and RAM our application takes to run on a web server.

## **Conclusion**

*All in all, overall project architecture, design details, used technologies and performance were explained in detail. The SPP will give the people the idea of the expenses they have to make on their health insurance premium.*