

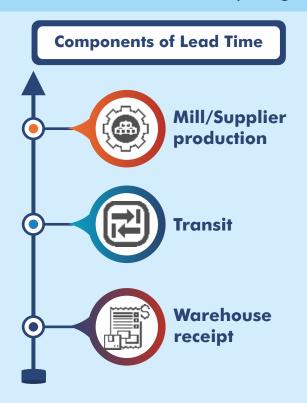
# A Practical Handbook-Predicting Lead Time for Steel Distribution



# **Understanding Lead Time in Steel Distribution**

## **Key Concepts**

**Definition:** Time taken from placing an order to receiving steel.





**Chapter 2** 

# **Data Requirements for Lead Time Prediction**

## **What Data to Collect**

#### **Order Data:**

1

- Order placement date and time.
- Delivery date.
- Order quantities.

## Transit Data:

2

- Shipping methods
- Days to delivery per shipper

#### **Supplier Data:**

3

- Average delivery time per supplier
- Delivery times across suppliers

## **Reality Check**

- Do you track days from order to delivery for all suppliers?
- Is your customer order, supplier order and shipment data connected?
- Are you recording the cause of delays (e.g., shipper vs. supplier)?

Chapter 3

# **How to Predict and Optimize Lead Time**

## **Approach**





Usinge AI algorithms to predict supplier lead times based on historical and real-time data.

2



Implement continuous feedback loops to refine predictions.

## **Key Models for Lead Time Prediction**

## 1. Linear Regression:

• Best to use when 1-2 suppliers/mills and few independent factors involved such as transit time to ship steel

#### 2. Time Series Analysis (ARIMA):

Best to use when repeating patterns in lead time
Example: Delays experienced during high-demand months

#### 3. Random Forest/Gradient Boosting:

• Best to use when multiple suppliers and complexity involved such as weather disruptions

#### 4. Monte Carlo Simulation:

Best to quantify multiple scenarios such as worst case vs best-case lead time scenarios and impact on business



Chapter 4

# **Tools for Lead Time Prediction**

## **Data Collection Tools**



Steel ERP system, QuickBooks tailored for small steel distributors.

Warehouse Management Systems

## **Analytics and Modeling Tools**

1. Excel for Basic Modeling:



- Ideal for small businesses starting out.
- Add-ins: Solver for optimization and trend analysis.

2. Python/R for Advanced Predictive Models:



- Libraries:
  - Statsmodels for ARIMA /time series.

3. Cloud-Based AI Tools:



 Google AutoML, AWS Forecaster

Chapter5

# **Steps for Implementation**

Gather and aggregate order, supply, and transit data.

Select the best-fit predictive model for your business. Choose a tool based on available expertise.

Develop, train, and test the model for lead time prediction. Compare results to real-world data and refine the model.



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