**Project - Historical Product Demand**

**Problem definition**:

* As stated in the notes for this dataset - the problem is that this customer has many warehouses across the globe across many product IDs.
* It takes one month to ship product to a warehouse location.

**Goal:**

* To create accurate forecasting across warehouses and product ID so inventory can be optimized - resulting in no loss in sales and/or no excess production.

**How is it being solved today:**

* Since we dont have access to the original stakeholders, the assumption is a manual/instinctive forecasting being applied which may be resulting in inefficiencies(Gaps).

**Metrics for success:**

* By hypothesis testing we will confirm a 95% confidence interval between the distributions of the actual test values (lets say 10% of the tail end of the data) and our predicted results.
* We will also compare the results to a Simple Moving Average and/or Exponential Weighted Moving Average
* We will also report the Mean Absolute Error, Mean Squared Error and Root Mean Squared Error in context of the mean of the distribution.

**Actions to be taken based on this work:**

* Optimize inventory at each location using forecasts.
* Any further actions that become evident during Exploratory Data Analysis or other steps.

**Scope of the project:**

* + Data Collection - Not Required
  + Analysis - Required
  + Observation and Reporting - Required
  + Prediction - Required
  + Actionalable insights - Required. Aim to identify seasonal trends, demand spikes and underperforming products.
  + Deployment - Not Required
  + Retraining Pipelines - Required
  + Visualisations - Required

**Timelines:**

* + High Level Timeline estimate - Not Required for Sample project
  + Granular Task and Timelines breakdown - Not Required for Sample project

**Ethical & Regulatory considerations for this project : None**

**Data Collection: Not required for Sample project**

* + Integration of different data sources
  + Data Privacy and Compliance
  + Data Storage and Security
  + Data Accessibility

**Project Steps**

* + Data Exploration, Cleaning and Preparation
  + Feature Engineering
  + Feature Selection
  + Model Building
  + Model Evaluation

**Deployment: Not Required for Sample project**

* + Model Deployment
  + Version Control
  + Model Monitoring and Maintenance Plan
  + Scalability Considerations
  + Automated Testing

**Communicate and Reporting**

* + Report Findings - Required
  + Stakeholder Presentations - Not required for Sample project
  + Create Dashboards for interactive reporting - Not required for Sample project
  + User Training - Not required for Sample project

**Documentation**

* + Project steps and methodologies, parameters, deployment details - In Notebook, during project development
  + Code Documentation during development - In Notebook, during project development
  + Data Lineage Documentation - Not Required
  + Model Explanation and Interpretability - In Notebook, during project development

**Review**

* + Review Metrics of project - Via confirmation of Hypothesis testing, vs baseline SMA and EWMA and common error metrics MAE, MSE and RMSE
  + Lessons learned - In Notebook, after project development
  + Feedback Collection - Currently not required.
  + Follow up actions - Currently not required
  + Model Decommissioning Plan - Currently not required