**Optimizing Inventory Management with Data Driven Stock Level Predictions**

User Approach

1. **Problem Statement:**
   * Recap the client's problem statement: "Can we accurately predict the stock levels of products based on sales data and sensor data on an hourly basis to intelligently procure products from suppliers?"
2. **Data Sources:**
   * Identify available data sources:
     + Sales data: Includes transactional data on product sales.
     + Sensor data: Measures temperature in storage facilities and stock levels in refrigerators and freezers.
3. **Data Selection:**
   * Choose relevant data for modelling:
     + Sales data: Use historical sales data to identify trends and patterns in product demand.
     + Sensor data: Utilize temperature data to assess storage conditions and correlate with stock levels to predict potential inventory issues.
4. **Data Integration:**
   * Integrate sales and sensor data to create a unified dataset for modelling:
     + Merge datasets based on timestamps to align sales and sensor readings on an hourly basis.
     + Apply data cleaning and pre-processing techniques to handle missing values and outliers.
5. **Modelling Approach:**
   * Select appropriate machine learning algorithms for prediction:
     + Time series forecasting: Use methods such as ARIMA or LSTM to predict future stock levels based on historical data.
     + Regression modelling: Develop regression models to estimate stock levels using sales and sensor data as features.
6. **Evaluation and Iteration:**
   * Evaluate model performance using appropriate metrics such as RMSE or MAE.
   * Iterate on the modelling process to refine algorithms and improve predictive accuracy.
   * Validate models using cross-validation techniques to ensure robustness and generalizability.
7. **Next Steps:**
   * Present potential next steps for implementation and deployment:
     + Develop a prototype model for testing and validation.
     + Collaborate with the Data Engineering team to integrate real-time sensor data into the modelling pipeline.
     + Conduct thorough testing and validation before full-scale deployment.

**Closing Remarks:**

* Conclude with a summary of the proposed strategy and its potential impact on improving inventory management and procurement decisions for the client.