**User Stories & Use Cases**

To define how users interact with the system, the following techniques and methodologies are applied:

**User Stories (Agile-Based Approach using INVEST Principle)**

1. **As a Sales Manager**, I want to receive accurate demand predictions so that I can optimize stock levels and prevent overstocking.
2. **As a Marketing Analyst**, I want to analyze sentiment trends from customer reviews so that I can adjust campaign strategies accordingly.
3. **As a Business Owner**, I want to forecast price fluctuations based on market conditions so that I can set competitive prices.
4. **As a Data Scientist**, I want to access structured historical sales data so that I can refine machine learning models.
5. **As a Retail Customer**, I want product recommendations based on real-time sales trends so that I can make informed purchase decisions.

Each story follows the **INVEST Principle**:

* **I**ndependent: Each story is self-contained.
* **N**egotiable: Can be modified based on feedback.
* **V**aluable: Provides clear business value.
* **E**stimable: Scope can be measured.
* **S**mall: Can be completed in a sprint.
* **T**estable: Criteria for acceptance are clear.

**Use Cases (UML-Based Approach with Use Case Diagrams)**

**Use Case 1: Sales Forecasting System**

**Actors:** Sales Manager, Business Owner, AI Model **Scenario:**

* **Precondition:** Historical data is available.
* **Steps:**
  1. Sales Manager inputs past sales data.
  2. AI Model analyzes trends and external factors.
  3. System generates a sales forecast report.
  4. Business Owner adjusts pricing strategies accordingly.
* **Outcome:** Improved pricing and demand forecasting.

**Use Case 2: Sentiment Analysis on Product Reviews**

**Actors:** Marketing Analyst, AI Model **Scenario:**

* **Precondition:** Customer reviews are collected.
* **Steps:**
  1. Marketing Analyst uploads reviews.
  2. AI Model performs sentiment analysis.
  3. System classifies reviews as positive, neutral, or negative.
  4. Analyst refines marketing strategy.
* **Outcome:** Data-driven marketing decisions.

**Use Case 3: Predictive Demand Analysis**

**Actors:** Retailer, Sales Manager, AI Model **Scenario:**

* **Precondition:** Product demand history is available.
* **Steps:**
  1. Sales Manager accesses demand forecasts.
  2. AI Model predicts seasonal demand.
  3. Retailer adjusts inventory orders.
* **Outcome:** Minimized stock shortages and surpluses.

**Behavior-Driven Development (BDD) Scenarios (Given-When-Then Format)**

1. **Sentiment Analysis**
   * **Given** a new customer review is submitted,
   * **When** the AI model processes it,
   * **Then** it assigns a sentiment score and categorizes it.
2. **Sales Forecasting**
   * **Given** historical sales data and market conditions,
   * **When** the forecasting model is executed,
   * **Then** it predicts future demand with an accuracy score.
3. **Dynamic Pricing Adjustment**
   * **Given** a change in competitor pricing trends,
   * **When** the system detects the fluctuation,
   * **Then** it suggests an optimized price point.

**User Journey Mapping (End-to-End Flow of Interaction)**

**Example: Retailer Using the Forecasting System**

1. **Discover:** Retailer learns about AI-driven sales forecasting.
2. **Onboard:** Registers and uploads historical sales data.
3. **Analyze:** System processes trends and generates insights.
4. **Decide:** Retailer adjusts inventory based on predictions.
5. **Monitor:** Tracks real-time demand and refines strategy.

This structured approach ensures that every stakeholder benefits from well-defined interactions, improving system usability and efficiency.