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**

    o **Given** a new customer review is submitted,

    o **When** the AI model processes it,

    o **Then** it assigns a sentiment score and categorizes it.

2. **Sales Forecasting**

    o **Given** historical sales data and market conditions,

    o **When** the forecasting model is executed,

    o **Then** it predicts future demand with an accuracy score.

3. **Dynamic Pricing Adjustment**

    o **Given** a change in competitor pricing trends,

    o **When** the system detects the fluctuation,

    o **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.