**Project Overview:** The AI-Driven Guest Experience Personalization System is a cutting-edge solution to revolutionize how hotels enhance guest satisfaction and loyalty. This project incorporates advanced machine learning and AI techniques to deliver an unmatched personalized experience for each guest. The system is built on three core functionalities: dynamic profile management, real-time sentiment analysis of hotel reviews, and a personalized recommendation system.

**Product Owner:**

Anwesha Banerjee

**Team**

Anwesha Banerjee

**Stakeholders:**

Hotel

#### **Epic 1 - Setting up of Virtual Environment and CRM Data Collection**

* **User Story 1.1:** Task of setting up a local environment
  + **Acceptance Criteria:** Installed Python and local virtual environment
  + **Status:** Completed
    - **Subtask 1.1.1:** Install Python
* **User Story 1.2:** CRM Data Collection
  + **Acceptance Criteria:** Collected CRM Dataset and cleaned the null values
  + **Status:** Completed
    - **Subtask 1.2.1:** CRM Data collection and Data cleaning

#### **Epic 2 - Leveraging LLMs to Perform Sentiment Analysis**

* **User Story 2.1:** Implement a sentiment analysis engine using LLMs
  + **Acceptance Criteria:** Real-time sentiment analysis engine integrated with the system
  + **Status:** Completed
    - **Subtask 2.1.1:** Train sentiment analysis model
    - **Subtask 2.1.2:** Test model on mock CRM data
* **User Story 2.2:** Generate real-time alerts for detected sentiment changes
  + **Acceptance Criteria:** Alerts triggered and logged based on sentiment fluctuations
  + **Status:** Completed
    - **Subtask 2.2.1:** Integrate real-time notification logic

#### **Epic 3 - Developing Recommendation Engine and Dynamic Profile Management System**

* **User Story 3.1:** Create a personalized recommendation engine
  + **Acceptance Criteria:** Recommendation engine deployed and functional
  + **Status:** Completed
    - **Subtask 3.1.1:** Build recommendation algorithms
    - **Subtask 3.1.2:** Test recommendations based on guest profiles
* **User Story 3.2:** Implement dynamic profile management
  + **Acceptance Criteria:** Profiles update dynamically based on guest behavior analysis
  + **Status:** Completed
    - **Subtask 3.2.1:** Develop real-time profile update logic

#### **Epic 4 - Notification System Integration**

* **User Story 4.1:** Integrate staff notification system with Slack and Email
  + **Acceptance Criteria:** Staff receives automated alerts for service issues or opportunities
  + **Status:** Completed
    - **Subtask 4.1.1:** Set up Slack integration
    - **Subtask 4.1.2:** Configure email notification logic

## **Sprint Plan**

| **Sprint** | **Goal** | **Key Tasks** | **Deliverables** |
| --- | --- | --- | --- |
| Sprint 1 | Setting up of Virtual Environment and CRM Data Collection | 1. The task of setting up a local environment 2. CRM Data Collection | Data collected and cleaned |
| Sprint 2 | Leveraging LLMs to Perform Sentiment Analysis | 1. Implement a sentiment analysis engine using LLMs 2. Generate real-time alerts for detected sentiment changes | Sentiment analysis engine integrated |
| Sprint 3 | Developing a Recommendation Engine and Dynamic Profile Management System | 1. Create a personalized recommendation engine 2. Implement dynamic profile management | The recommendation engine and dynamic profile system completed |
| Sprint 4 | Notification System Integration | 1. Integrate staff notification system with Slack and Email | Alerts and notification systems integrated with the application |
|  |  |  |  |

## **Testing Plan**

**Unit Testing**: Test individual functionalities for accuracy, including sentiment analysis and recommendation algorithms.  
**Integration Testing**: Validate seamless integration of all modules, including profile management, alerts, and recommendation systems.  
**Performance Testing**: Assess the system’s ability to efficiently handle large datasets and real-time operations.  
**User Testing**: Gather feedback from stakeholders to refine personalization and notification workflows.

## **Key Metrics**

* **Recommendation Accuracy**: Precision, Recall.
* **Sentiment Classification Accuracy**: F1 Score
* **Profile Update Latency**: Average time to update profiles.
* **Feedback Processing Time**: Time taken to analyze feedback and trigger alerts.