Project Overview:
This project enhances guest experiences in hotels and resorts using AI-driven sentiment analysis and recommendation systems. It optimizes guest satisfaction, operational efficiency, and real-time response management.

Product Owner:
Sathwik Kokkonda

Team:
Sathwik Kokkonda

Stakeholders:
Hotel Guests – End-users who interact with the AI system for a personalized experience.
Hotel Management – Decision-makers who implement and oversee the AI-driven solution.
Front Desk & Customer Support – Staff who assist guests and monitor AI performance.

Epic 1: Environment Setup

- **User Story 1.1** - Task of setting up local environment
    - **Acceptance Criteria**: Installed Python and local virtual environment
    - **Status**: Completed
    - **Subtask 1.1.1** - Install Python
    - **Subtask 1.1.2** - Set up a virtual environment

Epic 2: AI Model Development

- **User Story 2.1** - Implement AI-based recommendation system
    - **Acceptance Criteria**: AI model recommends personalized experiences based on user preferences
    - **Status**: Completed
    - **Subtask 2.1.1** - Collect and preprocess guest preference data
    - **Subtask 2.1.2** - Train and test AI model

Epic 3: System Integration

- **User Story 3.1** - Integrate AI with hotel management system
    - **Acceptance Criteria**: AI successfully interacts with booking, customer support, and feedback systems
    - **Status**: Completed
    - **Subtask 3.1.1** - Connect AI with the hotel booking API
    - **Subtask 3.1.2** - Implement chatbot for customer queries

Epic 4: Testing & Deployment

- **User Story 4.1** - Conduct user testing and deploy the system
  - **Acceptance Criteria**: Successful testing with minimal bugs and smooth guest interaction
  - **Status**: Completed
  - **Subtask 4.1.1** - Perform user acceptance testing (UAT)
  - **Subtask 4.1.2** - Deploy the system on cloud servers

Sprint Plan:

Sprint	Goal	Key Tasks	Deliverables
Sprint 1	Local environment setup and data collection	- Install Python locally and set up a virtual environment. - Figure out data collection methods and explore synthetic data generation capabilities.	- Data for feedback analysis. - Virtual environment setup.
Sprint 2	Develop a sentiment analysis system using LLMs	- Implement a feedback analysis system using Large Language Models (LLMs). - Train the model on guest reviews and feedback.	- Functional feedback analyzer for guest experience insights.
Sprint 3	Develop a recommendation engine and dynamic profile recommendation system	- Build a recommendation engine to suggest personalized services. - Implement a dynamic profile system that updates guest preferences based on interactions.	- Fully developed recommendation engine. - Profile management system for personalized guest experiences.
Sprint 4	Add email and Slack alerts	- Integrate sentiment analysis results with an automated alert system. - Implement email and Slack notifications for staff based on guest sentiment insights.	- Real-time alerts system for staff. - Seamless integration of notifications with communication channels.

Testing Plan

Unit Testing:

- Validate individual AI model components, such as recommendation algorithms.
- Ensure chatbot responses are accurate and context-aware.

Integration Testing:

- Verify seamless communication between AI, booking system, and customer support.
- Ensure data flow consistency between different modules (e.g., guest preferences, feedback).

Performance Testing:

- Measure AI response time under high user traffic.
- Test system scalability for handling multiple guest interactions simultaneously.

User Testing:

- Gather feedback from hotel staff and guests on AI-generated recommendations.
- Test user interface (UI) and overall guest experience for intuitiveness and efficiency.

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.