# **Project: AI-Driven Guest Experience Personalization System for Hospitality**

### **Project Overview**

**Product Owner:** Annapurna  
**Team:**

* Annapurna

**Stakeholders:** Hotel

## **Epics**

### **Epic 1: Introduction & Initial Training**

**Objective:** Set up the project infrastructure, introduce team members to tools like LLMs (OpenAI GPT, Meta LLaMA), and gather initial data for training models.

**User Story 1.1: Task - Setup the environment for sentiment analysis  
Description:** Configure and integrate the environment for sentiment analysis with CRM systems.  
**Acceptance Criteria:**

* Environment successfully set up and integrated with CRM systems.
* Tools and software for sentiment analysis configured and tested.  
  **Status:** **Completed**

**User Story 1.2: Task - Train team members on using LLMs for guest feedback analysis  
Description:** Introduce team members to LLMs, create API keys, make API calls, and analyze feedback.  
**Acceptance Criteria:**

* API key for LLM created.
* Successful API calls made to LLMs.
* Team members understand LLM functionality and feedback analysis.  
  **Status:** **Completed**

**User Story 1.3: Task - Collect initial data from mock CRM interactions (guest profiles, feedback)  
Description:** Gather mock CRM data including Customer ID, name, email, feedback, preferences, etc. Ensure data is clean and relevant.  
**Acceptance Criteria:**

* Data includes all relevant attributes essential for project workflow.
* Data is clean, without redundancy or missing values.  
  **Status:** **Completed**

### **Epic 2: Sentiment Analysis & Service Alert Engine**

**Objective:** Build a system that analyzes real-time sentiment from guest interactions across various touchpoints.

**User Story 2.1: Task - Implement LLMs for real-time sentiment analysis  
Description:** Use OpenAI GPT and Meta LLaMA to analyze guest feedback in real time.  
**Acceptance Criteria:**

* LLMs integrated and functional for real-time sentiment analysis.
* Sentiment scores generated from guest feedback.  
  **Status:** **Completed**

**User Story 2.2: Task - Develop algorithms for alerts on negative sentiment/service issues  
Description:** Create algorithms to detect negative sentiment and generate service alerts.  
**Acceptance Criteria:**

* Alerts generated accurately based on negative sentiment.
* Alerts trigger in real-time during guest interactions.  
  **Status:** **Completed**

### **Epic 3: Personalized Recommendation System & Dynamic Guest Profile Management**

**Objective:** Provide personalized recommendations and update guest profiles continuously based on preferences.

**User Story 3.1: Task - Build a recommendation engine  
Description:** Develop a recommendation engine to suggest amenities, dining options, and activities based on real-time behavior analysis.  
**Acceptance Criteria:**

* Recommendations generated dynamically based on behavior and preferences.
* Recommendations tailored for individual guests.  
  **Status:** **Completed**

**User Story 3.2: Task - Implement dynamic guest profile management  
Description:** Aggregate data from multiple visits to ensure consistent personalization for guests.  
**Acceptance Criteria:**

* Guest profiles update automatically based on interaction history.
* Profiles reflect preferences from past visits and new behaviors.  
  **Status:** **Completed**

### **Epic 4: Staff Notification & Feedback Integration Hub Deployment**

**Objective:** Provide real-time notifications about guest needs or service issues via Slack and email.

**User Story 4.1: Task - Integrate system with Slack and email  
Description:** Set up integrations for automated notifications regarding service issues or personalization opportunities.  
**Acceptance Criteria:**

* Notifications sent to staff through Slack and email.
* Alerts triggered based on guest sentiment and preferences.  
  **Status:** **Completed**

**User Story 4.2: Task - Test notification system for real-time alerts  
Description:** Test the notification system by sending alerts based on detected sentiment or preference changes.  
**Acceptance Criteria:**

* Notifications tested and validated for accuracy and timeliness.
* Alerts address service issues or personalization opportunities effectively.  
  **Status:** **Completed**

## **Sprint Plan**

| Sprint | Goal | Key Tasks | Deliverables |
| --- | --- | --- | --- |
| Sprint 1 | Local environment setup and data collection | Install Python, Set up virtual environment | Data collected |
| Sprint 2 | Feedback Analyzer | Build sentiment analysis engine | Feedback analyzer module |
| Sprint 3 | Develop recommendation engine and dynamic profile management system | Build recommendation engine, Implement dynamic profile logic | Recommendation engine module, Profile management system |
| Sprint 4 | Add email and Slack alerts | Integrate sentiment analysis and notification logic | Alerts |

## **Testing Plan**

Unit Testing: Test individual modules for correctness.

Integration Testing: Ensure all modules work together seamlessly.

Performance Testing: Verify the system meets performance benchmarks.

User Testing: Collect feedback from end-users to ensure usability.

## **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.