**Project Overview: AI DRIVEN GUEST EXPERIENCE PERSONALIZATION SYSTEM FOR HOSPITALITY**

**Product Owner: P.S. JAYASURYA**

**Team: P.S. JAYASURYA**

**Stakeholders: Hotel**

**Epic 1: Successful setup of project environment**

**User Story 1.1: Setting up a local environment in Python**

* + **Acceptance Criteria: Python installed, virtual environment configured, and required libraries installed**
  + **Status: Completed** 
    - **Subtask 1.1.1: Install Python in your device**
    - **Subtask 1.1.2: Set up a virtual environment for developing the project**
    - **Subtask 1.1.3: Install the required libraries and packages for the project in the virtual environment.**
* **User Story 1.2: Initialize the CRM dataset**
  + **Acceptance Criteria: Successfully imported CRM dataset for further analysis**
  + **Status: Completed** 
    - **Subtask 1.2.1: Generate and import the CRM data**
    - **Subtask 1.2.2: Clean and preprocess dataset**
    - **Subtask 1.2.3: Store the pre-processed dataset for future use**

**Epic 2: Sentiment Analysis**

* **User Story 2.1: Implement sentiment analysis** 
  + **Acceptance Criteria: Real-time sentiment classification is done**
  + **Status: Completed** 
    - **Subtask 2.1.1: Integrate LLM using API**
    - **Subtask 2.1.2: Basics of Prompt Engineering**
    - **Subtask 2.1.3: Select and integrate sentiment analysis model**
    - **Subtask 2.1.4: Train and validate model with existing data**

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

* **User Story 3.1: Develop personalized recommendation system** 
  + **Acceptance Criteria: Guests receive recommendations based on data and sentiment analysis**
  + **Status: Completed** 
    - **Subtask 3.1.1: Identify key guest preferences and behaviours**
    - **Subtask 3.1.2: Working with Cosine Similarity**
    - **Subtask 3.1.3: Getting similar users**
    - **Subtask 3.1.4: Develop recommendation algorithm**
* **User Story 3.2: Implement dynamic profile management**
  + **Acceptance Criteria: Guest profiles update dynamically based on real-time interactions**
  + **Status: Completed**
    - **Subtask 3.2.1: Define the dynamic user profiles**
    - **Subtask 3.2.2: Implement real-time data updates to profiles using**
    - **Subtask 3.2.3: Test and validate profile integration.**

**Epic 4: Alert Notification System**

* **User Story 4.1: Integrate Slack and Email notification system**
  + **Acceptance Criteria: Automated alerts sent to staff for service improvements and personalization opportunities**
  + **Status: Completed**
    - **Subtask 4.1.1: Set up Slack integration notifications with python**
    - **Subtask 4.1.2: Implement email notification using python**

**Sprint Plan :**

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| --- | --- | --- | --- |
| **Sprint** | **Goal** | **Key Tasks** | **Deliverables** |
| **Sprint 1** | **Local environment setup and data collection** | **Setup environment, import CRM data** | **Data Preparation Completed** |
| **Sprint 2** | **Implement Sentiment Analysis** | **Develop and test sentiment analysis model** | **Feedback Analyzer** |
| **Sprint 3** | **Develop recommendation engine and dynamic profile management system** | **Implement personalized recommendations, dynamic profile updates** | **Recommendation engine module, profile management system** |
| **Sprint 4** | **Add email and Slack alerts** | **Integrate alert notifications** | **Alerts System** |

**Testing Plan :**

* **Unit Testing: Verify individual components function correctly**
* **Integration Testing: Ensure seamless interaction between components**
* **Performance Testing: Evaluate system response time and accuracy**
* **User Testing: Collect user feedback and improve 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 send alerts**