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**Assignment 5**

**PART I: Conversational AI System Analysis Report**

**1. Introduction**

* **Overview**:

*"This project focuses on designing a Conversational AI System, Dining Dialogue Assistant, to streamline restaurant customer interactions. The system leverages natural language processing (NLP) to provide real-time assistance for menu inquiries, table bookings, and special requests."*

**2. Problem Statement**

* **What problem is being solved?**  
  *"Restaurants face challenges in promptly responding to customer inquiries, especially during peak hours. This can lead to poor customer satisfaction and lost business opportunities. The proposed Conversational AI System aims to automate responses, improve efficiency, and enhance customer experience."*

**3. System Requirements Analysis (from HW 4)**

**a. Business Requirements**

* + Improve customer engagement by 20%.
  + Automate 80% of routine queries to reduce employee workload.
  + Enable a personalized dining experience through tailored recommendations.

**b. Technical Requirements**

* + Cloud-based NLP model for scalability.
  + Integration with restaurant CRM and reservation systems.

**c. Data Requirements**

* + Input: Customer queries (text, voice).
  + Output: Relevant responses, booking confirmations.
  + Training Data: Restaurant menus, FAQs, customer feedback logs.

**4. Feasibility Analysis**

**a. Technical Feasibility**

* **Can the project be done?**  
  *Yes, leveraging existing NLP frameworks like OpenAI GPT models.*
* **Risks**:
  + Complexity in training the model with domain-specific data.
  + Potential issues with real-time response performance.

**b. Business Feasibility**

* **Business Value**:
  + Increased revenue from better customer service.
  + Cost savings from reduced human labor.
* **Risks**:
  + Initial setup costs may exceed budget.
  + Risk of insufficient ROI if adoption is low.

**c. Operational Feasibility**

* **Adoption**:
  + High likelihood if user-friendly.
* **Risks**:
  + Resistance from staff to adopt new systems.
  + Maintenance costs post-deployment.

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**5. Project Management**

**a. Timeline**

* **Major Tasks**:
  + Requirement gathering (2 weeks).
  + Model design and training (4 weeks).
  + System testing (3 weeks).
  + Deployment and user feedback (2 weeks).

**b. Human Resources**

* **Team Structure**:
  + Total team: 5 members.
  + Phases:
    - Research: 2 members.
    - Development: 2members.
    - Testing: 1 QA specialist.
  + Responsibilities:
    - Data Scientist: Model training.
    - Developer: Backend and integration.

**6. Conclusion**

*"While the project involves complexities such as data preprocessing and real-time performance optimization, it is expected to deliver significant value through automated customer service. With a skilled team and focused effort, the system will successfully enhance restaurant operations."*