**Project Design Phase-II**

**Technology Stack (Architecture & Stack)**

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| --- | --- |
| Date | 27 June 2025 |
| Team ID | LTVIP2025TMID30146 |
| Project Name | Garage management system |
| Maximum Marks | 4 Marks |

**1. Frontend Layer (User Interface)**

| **Technology** | **Purpose** |
| --- | --- |
| **Gradio** | Build browser-based AI chat interface for mechanics & customers. |
| **HTML5 / CSS3** | Base structure and styling of embedded UI in Salesforce LWC. |
| **JavaScript (ES6)** | Interactive elements, event handling in embedded components. |
| **Lightning Web Components (LWC)** | Salesforce-native frontend to embed AI assistant. |

**2. Backend Layer (Logic & Processing)**

| **Technology** | **Purpose** |
| --- | --- |
| **Python 3.10+** | Core application logic, AI model integration, API endpoints. |
| **Transformers (Hugging Face)** | Load and interact with IBM Granite model. |
| **Accelerate** | Optimize AI inference performance. |
| **Salesforce Apex** | Backend logic for Salesforce data updates and retrieval. |
| **Salesforce REST API** | Sync AI-generated outputs to Salesforce objects. |

**3. AI Model Layer**

| **Technology** | **Purpose** |
| --- | --- |
| **IBM Granite 3.3 2B Instruct** | Large Language Model for troubleshooting, booking, and service recommendations. |
| **Hugging Face Hub** | Model hosting and integration. |
| **Prompt Engineering Techniques** | Design effective prompts for accurate garage-specific outputs. |

**4. Database & Data Storage**

| **Technology** | **Purpose** |
| --- | --- |
| **Salesforce CRM Database** | Store customer details, service history, bookings. |
| **Local JSON / CSV Files** | Store prompt templates and offline part catalogs (optional). |

**5. Deployment & Hosting**

| **Technology** | **Purpose** |
| --- | --- |
| **Hugging Face Spaces** | Host public Gradio AI assistant. |
| **Streamlit Cloud (optional)** | Alternate deployment option for internal use. |
| **Salesforce Experience Cloud** | Publish customer-facing AI booking portal. |
| **Google Colab** | Quick testing and prototyping environment. |

**6. Security & Performance**

| **Technology** | **Purpose** |
| --- | --- |
| **Named Credentials (Salesforce)** | Secure API key management. |
| **HTTPS** | Encrypt all API requests and responses. |
| **Gradio Authentication** | Restrict access to internal staff when needed. |
| **Caching Layer** | Improve AI response times for repeated queries. |