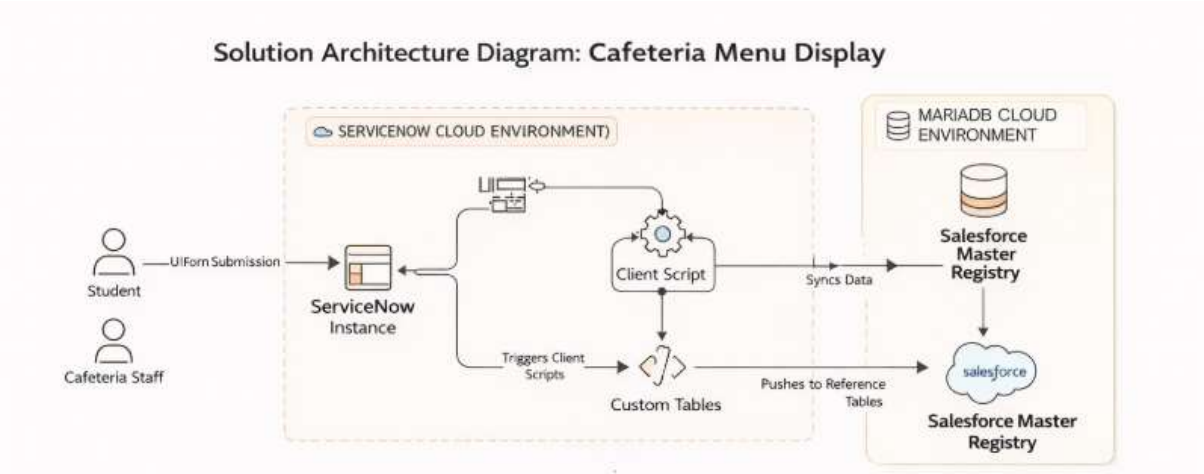
Project Design Phase
Solution Architecture

Date	15 February 2026
Team ID	LTVIP2026TMIDS79115
Project Name	Cafeteria Menu Display
Maximum Marks	4 Marks

Solution Architecture:

The Cafeteria Menu Display System follows a three-tier architecture with the frontend built using HTML, CSS, and JavaScript for the customer display and admin panel, the backend developed in Python Flask handling API requests, authentication, and business logic, and the MySQL database serving as the master registry for storing users, categories, and menu items. The admin panel communicates with the backend through RESTful APIs to update menu data, which is then stored in the database and automatically fetched by the customer display every five minutes through auto-refresh client scripts, ensuring real-time synchronization between staff updates and customer view.

Solution Architecture Diagram:



The architecture bridges the business problem of manual paper menus by using a 3-tier web structure. Data submitted via admin panel forms is processed by backend API endpoints and synchronized with a MySQL database for real-time display updates.

Component	Technical Role
Flask Backend	The core Python web framework hosting the application and handling API requests, authentication, and business logic
MySQL Database	The foundation of the system, consisting of Users, Categories, and Menu Items tables for persistent data storage
Client-Side JavaScript	Frontend logic that handles auto-refresh every 5 minutes, category filtering, and dynamic menu rendering on the customer display
Admin Panel UI	Custom digital interfaces designed with HTML/CSS for secure menu management by cafeteria staff

Customer Display	A visually optimized interface that presents categorized menu items with prices, dietary icons, and availability status
RESTful APIs	The communication architecture used to transfer JSON data between frontend display, admin panel, and backend database