System Design Document – Restaurant Reservation Management System

1. Introduction

1.1 Purpose

This document outlines the system architecture, data design, and key components for the Restaurant Reservation System. The system aims to streamline restaurant bookings, manage reservations, and enhance customer experience by integrating table management, online reservations and transportation services.

1.2 Scope

The system will provide:

- Customer functionalities: Account creation, table reservations, reservation modificiations, transportation requests

- Staff functionalities: Table and reservation management, real-time table updates, walk-in customer handling.

- Adminstrator functionalities: User account managements, ssytem monitoring, security management.

1.3 Target Audience

- Software developers
- System architects
- Database administrators
- Quality assurance engineers
- Product managers

2. System Overview

2.1 High-Level Architecture

The system follows a three-tier architecture:

- **Presentation Layer**: Web and mobil applications for customers, staff and admins.
- **Business Logic Layer**: Hadnles reservations and database interactions.

- **Data Layer**: Stores user data, reservation, restaurant details, and logs. Relational Database (MySQL)

Technology Stack:

- Frontend: React.js / Vue.js (Web), React Native (Mobile)
- Backend: Node.js / Express.js or Django / Flask
- Database: MySQL
- Authentication: OAuth 2.0 / JWT
- Cloud Deployment: AWS / Google Cloud / Azure

3. System Components

3.1 User Management Module

- Users (customers, staff, admins) can sign up, log in and manage accounts.
- Admins can modify user roles and permissions
- Role-based functionality.
- Customers update their profiles and preferences.

3.2 Reservation Management Module

- Customers make, modify, and cancel reservations
- Real-time availability of tables should be displayed.
- Automated notifications remind customers about reservations.

3.3 Table & Seating Management Module

- Proper distribution of reserved tables among waiters to avoid mismanagement
- Customers without reservations accomodated dynamically.

3.4 Pick-Up Service Module

- Pick-Up request system
- Vehicle Assignment
- Driver & Vehicle Tracking
- Notifications System

3.5 Ordering & Menu Management Module

- Digital Menu Interface
- Self-Ordering System

- Order Queue System
- Order Status Tracking

3.6 Staff Management Module

- Role-based Access to manage reservations and orders
- Staff dashboard
- Task Assignment System
- Communications between staff members should be streamlined.

3.7 Admin & Security Management Module

- User Account Management
- System Logs & Monitoring
- Data Security & Compliance
- Performance Tracking

4. Database Design

The system will have the following key tables:

Customers Table

Column	Type	Description
Id	INT	Unique user identifier
Name	VARCHAR(200)	Full Name
Email	VARCHAR(100)	Unique email address
Password	VARCHAR(250)	Hashed password
Number	VARCHAR(50)	Customer phone number

5. Conclusion

This document provides a comprehensive system design for the Restaurant Reservation Management System, covering architecture, database, API structure, security, and scalability considerations. The system will be developed iteratively following Agile methodologies.