Team Name: ByteEat

Project Title: AI-Driven Restaurant Web Application

Abstract

This project proposes the development of a modern restaurant web application designed to enhance customer experience, streamline staff operations, and support sustainability through descriptive AI. The system supports digital ordering, table reservations, real-time waiter alerts, subscription-based meals, valet parking coordination, and smart bill splitting. It provides role-based access for staff such as manager, waiters, delivery personnel, valet, and admins, with dashboards tailored to each role. The integration of descriptive AI allows stakeholders to view insights related to sales, food waste, and customer behaviour, enabling smarter business decisions and minimizing operational inefficiencies.

Problem Statement

Restaurants today face operational challenges such as inefficient communication between staff and customers, unmanaged food waste, lack of personalized service, and outdated billing/reservation systems. Traditional systems rarely include data analytics or customer-centric features like real-time waiter requests or per-person bill splitting at shared tables. There is also limited tech integration for services like valet parking or sustainability tracking.

Objectives

- Build a web application that offers digital ordering, billing, and reservations.
- Support multiple user roles with distinct dashboards (Customer, Admin, Chef, Waiter, Delivery Staff, Valet).
- Implement descriptive AI to generate insights on food waste, ordering trends, and customer preferences.
- Enable sustainable practices through waste tracking and food donation modules.
- Add features such as smart billing, silent waiter calls, valet coordination, and event mode for special occasions.

Existing System & Limitations

Traditional restaurant systems typically rely on disconnected tools for ordering, inventory, and feedback. They lack intelligent automation, data-driven insights, real-time service enhancements, and sustainability features. Manual billing and service requests lead to delays, inefficiencies, and a subpar customer experience.

Modules Overview

1. **Authentication & Roles**: Role-based login for customers, admin, waiter, chef, manager, delivery staff.
2. **Menu & Ordering**: Dynamic menu, cart, smart suggestions, favorites.
3. **Reservations**: Table booking with preferences and event mode.
4. **Subscriptions**: Weekly/monthly meal plans with delivery tracking.
5. **Silent Waiter Call**: Discreet service requests via app.
6. **Descriptive AI Insights**: Admin dashboard for sales, waste, and customer trends.
7. **Inventory & Waste Tracking**: Logs, alerts, and donation system.
8. **Chat Support**: In-app communication between user and staff.
9. **Delivery Panel**: View, update delivery status (for delivery staff).
10. **Smart Billing & Bill Splitter** – Individual orders and separate payments for shared tables via QR code.
11. **Valet Parking Coordination** – Logs vehicle info at entry and auto-notifies valet after billing is complete.

Conclusion

This project delivers a comprehensive and intelligent restaurant management solution that addresses real-world challenges like food waste, staff coordination, and service efficiency. By combining role-based access, real-time updates, customer-first features, and descriptive analytics, it bridges the gap between traditional hospitality and smart digital transformation. With potential for further expansion into mobile platforms or IoT integration, the system can scale beyond academic research into real-world application and commercial deployment.

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