Web Design and Programming Final Project Report (CEN301)

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GitHub Repository: https://github.com/mehmetzahitavci/qrmenu.git

PROJECT TITLE: QR MENU & ORDERING SYSTEM

1. Project Summary This project is a modern, web-based QR Menu and Order Management System developed for restaurants and cafes. Customers can access the menu via their smartphones by scanning QR codes located at their tables, filter products by category, and place orders without waiting for a waiter. The project aims to increase operational efficiency with its user-friendly interface and fast data flow.

2. Technologies Used A "Full-Stack" architecture complying with modern web standards was followed in the development of the project:

> **Frontend:** Developed as a Single Page Application (SPA) using the **React** library. A responsive (mobile-compatible) and stylish appearance was achieved using the **Material UI (MUI)** component library for the user interface design.
>
> **Backend:** A RESTful API architecture was established using the Java-based **Spring Boot** framework. A layered architecture (Controller, Service, Repository) was implemented for data security and fast response times.
>
> **Database:** Product and category data are stored in a relational database (**PostgreSQL**).

3. Key Features Distinguishing the Project The fundamental features that distinguish this project from standard e-commerce sites are:

> **Dynamic Category Filtering:** Users can filter via URL (e.g., /menu/coffee) while browsing the menu, allowing instant access to relevant products without reloading the page.
>
> **Global Cart Management (Context API):** By using the React Context API, when a product is added to the cart from any page of the application, the cart status and total price across the entire interface are updated instantly.
>
> **Smart Search Function:** Users can perform instant searches based on product names or descriptions. The search engine is optimized to support both Turkish and English characters.

Responsive Design: The category structure, which functions as a "Sidebar" on desktop computers, automatically transforms into a "Tab" structure on mobile devices, offering an excellent user experience.

5. Conclusion and Future Improvements The developed QR Menu system successfully performs basic ordering and product listing functions. Since the primary focus of this project was on **Frontend architecture and User Experience (UX)**, the **"Admin Dashboard"** and **"Order Preparation/Status"** screens currently utilize **mock data** to demonstrate functionality.

In future development phases, these modules will be fully integrated with backend services. Additionally, the project's modular structure allows for the easy implementation of features such as "Online Payment Integration" and "Multi-Language Support." The database and backend services have been optimized to handle high traffic efficiently.