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Lumière-Café-Management

Atharva Deshmukh[1], Anirudh Madiwal[2], Shruti Ayare[3], Purva Devrukhkar[4]
[1]Student, [2]Student, [3]Student, [4]Student
[1]Department of Computer Science and Engineering (DS),
[1]Bharat College of Engineering, Badlapur, India.
[1]Asst.Prof. Shital Gujar – Assistant Professor, Department of Computer Science and Engineering (DS),
[1]Bharat College of Engineering, Badlapur, India.

Abstract: The rapid growth of the food and beverage industry has increased the need for efficient and automated management systems. Traditional café management methods often rely on manual processes, leading to inefficiencies, errors, and reduced customer satisfaction. This research paper presents the design and development of the Lumière Café Management System, a full-stack web-based application aimed at streamlining café operations including order processing, inventory tracking, staff management, and reporting. The system leverages modern web technologies such as React for the frontend, Node.js with Express for backend services, and SQL-based databases for persistent data storage. The application provides role-based access for administrators and staff, enabling efficient task allocation and monitoring. The results demonstrate improved operational efficiency, reduced human errors, and enhanced decision-making capabilities through real-time data insights.

Keywords - Café Management System, Web Application, React, Node.js, Inventory Management, Automation, Full-Stack Development.

I. INTRODUCTION

The café industry is highly dynamic and customer-centric, requiring efficient management of multiple operations such as order handling, staff coordination, and inventory control. Traditional manual systems are prone to delays, inaccuracies, and lack of scalability.

With advancements in web technologies, digital solutions have become essential for automating business processes. The Lumière Café Management System is designed to address these challenges by providing a centralized platform for managing all café-related activities.

The primary objectives of this system include:

- Automating order management
- Tracking inventory in real time
- Managing staff roles and sessions
- Generating analytical reports
- Improving operational efficiency

This system is particularly beneficial for small to medium-sized cafés aiming to transition into digital management systems.

II. METHODOLOGY

The development of the Lumière Café Management System follows a structured software engineering approach involving requirement analysis, system design, implementation, and testing.

A. System Architecture

The system adopts a client-server architecture consisting of:

Frontend Layer: Built using React and TypeScript

Backend Layer: Developed using Node.js and Express

Database Layer: SQL-based relational database

B. Frontend Design

The frontend is implemented using:

- React for component-based UI development
- Tailwind CSS for responsive design
- React Router for navigation

Key modules include:

- Login Page
- Admin Dashboard
- Staff Dashboard
- Menu Management Interface
- Inventory Management Panel

C. Backend Design

The backend handles:

- API routing using Express
- Authentication and session handling
- CRUD operations for menu, staff, orders, and inventory

Important backend features:

- RESTful API endpoints (/api/login, /api/menu, etc.)
- Session tracking for staff activities
- Data validation and error handling

Database Design

The database schema includes:

- Users table (staff/admin data)
- Menu items table
- Orders table
- Inventory table

SQL queries are used for:

- Data insertion
- Retrieval
- Updates and deletions

Implementation Tools

- Frontend: React, TypeScript, Tailwind CSS
- Backend: Node.js, Express
- Database: MySQL (or compatible SQL DB)
- Development Tools: Vite, npm

III. RESULTS AND DISCUSSION

The system was successfully implemented and tested in a simulated café environment.

Functional Outcomes

- Users can log in with role-based access
- Admins can manage menu, staff, and inventory
- Staff can handle orders efficiently
- Real-time updates improve operational awareness

Performance Analysis

- Reduced order processing time
- Improved inventory tracking accuracy
- Faster decision-making through reports

Advantages

- User-friendly interface
- Scalable architecture
- Secure authentication system
- Efficient data handling

Limitations

- Requires internet connectivity
- Initial setup complexity
- Limited offline functionality

IV. CONCLUSION

The Lumière Café Management System provides a comprehensive solution for automating café operations. By integrating modern web technologies, the system enhances efficiency, accuracy, and user experience.

The application successfully demonstrates how digital transformation can improve traditional business models. Future enhancements may include mobile app integration, AI-based demand prediction, and cloud deployment for scalability.

REFERENCES

1. M. Fowler, Patterns of Enterprise Application Architecture, Addison-Wesley, 2002.
2. Node.js Documentation. [Online]. Available: https://nodejs.org
3. React Documentation. [Online]. Available: https://react.dev
4. Express.js Guide. [Online]. Available: https://expressjs.com
5. MySQL Documentation. [Online]. Available: https://dev.mysql.com
6. Tailwind CSS Documentation. [Online]. Available: https://tailwindcss.com