



Smart Restaurant Management System Using QR Code Technology

¹P.R. Patil, ²Nikita Mali, ³Anuradha Dhane, ⁴Sakshi Kurade, ⁵Shravani Rode, ⁶Akshata Salunkhe

^{1,2,3,4,5,6} Department of Information Technology, Dr. J. J. Magdum College of Engineering, Jaysingpur, Shivaji University Kolhapur, Maharashtra, India.

Peer Review Information	Abstract
<p><i>Submission: 18 April 2026</i></p> <p><i>Revision: 09 May 2026</i></p> <p><i>Acceptance: 26 May 2026</i></p> <p>Keywords</p> <p><i>Smart Restaurant Management System, Android Application, QR Code, MySQL Database, UPI Payments, Digital Menu, Restaurant Automation, Contactless Ordering</i></p>	<p>This study proposes a Smart Restaurant Management System that transforms traditional restaurant operations in rural and semi-urban areas by replacing manual processes with digital solutions. Conventional paper-based menus and order-taking methods often cause delays, errors, and hygiene concerns, particularly in the post-pandemic environment. The system utilizes a QR code-based Android application developed in Java, allowing customers to access menus, place orders, make UPI payments, and provide feedback efficiently. The backend, powered by a MySQL database, supports real-time order tracking, user management, and dynamic menu updates. Additionally, kitchen staff receive instant order notifications, while administrators can monitor sales and manage operations through a dashboard. By reducing physical contact and automating workflows, the system improves efficiency, accuracy, and customer experience, contributing to the digital advancement of restaurant services.</p>

Introduction

In several rural and semi-urban regions, restaurants and food service establishments continue to face challenges such as increased service latency, order inaccuracies, and operational inefficiencies due to reliance on manual management systems. With the rising demand for faster, safer, and hygienic dining experiences—particularly in the post-pandemic era - the adoption of digital solutions has become imperative.

The Smart Restaurant Management System (SRMS) proposed in this study provides an automated framework to address these challenges. The system is implemented as a QR code-based Android application that enables customers to access digital menus, place orders,

and perform secure UPI-based transactions seamlessly. Concurrently, restaurant staff are provided with functionalities to manage menu items, monitor real-time order status, and analyze sales data through an integrated administrative dashboard.

By minimizing manual intervention and reducing human-induced errors, the proposed system enhances operational efficiency and improves overall service quality. Furthermore, it offers a cost-effective and scalable solution tailored for small- and medium-scale restaurants, facilitating their transition toward a fully digitized management infrastructure.

Methodology

The Smart Restaurant Management System is

developed using a modular and systematic approach to ensure efficient interaction and seamless data flow among customers, kitchen staff, and administrators. The development process includes requirement analysis, system design, implementation, and testing to ensure reliability and performance. The system architecture integrates an Android-based frontend developed in Java with a MySQL-supported backend for efficient data management and real-time synchronization. The customer interface allows users to scan a QR code to access the digital menu, place orders, make secure UPI payments, and track order status. Once an order is placed, it is instantly transmitted to the kitchen module, where chefs receive detailed notifications for accurate and timely food preparation. The backend database manages user authentication, menu details, order records, and transaction data. An administrative dashboard is also implemented to enable menu management, order monitoring, and sales analysis, supporting better decision-making. Additionally, a feedback system is included to gather customer reviews and improve service quality. The overall methodology focuses on automation, reduced human intervention, and contactless interaction to enhance efficiency, accuracy, and hygiene.

Key Modules

- Customer Module: Enables users to access digital menus, place orders,

make UPI payments, and track order status.

- Order Management Module: Handles real-time synchronization of orders between customers and the kitchen.
- Chef/Kitchen Module: Displays incoming orders with details to streamline food preparation and reduce errors.
- Admin Module: Allows administrators to manage menu items, monitor orders, and analyze sales performance.
- Payment Module: Facilitates secure UPI-based transactions and maintains billing records.
- Feedback Module: Collects customer reviews and ratings to improve service quality.

Modeling And Analysis

The proposed Smart Restaurant Management System (SRMS) integrates customers, chefs, and administrators through a centralized digital platform, enabling real-time order processing and management.

Technology Stack:

- Frontend: Java (application logic) and XML (UI design)
- Backend: MySQL for database
- Chatbot: Dialogflow/Rasa for automated customer interactions

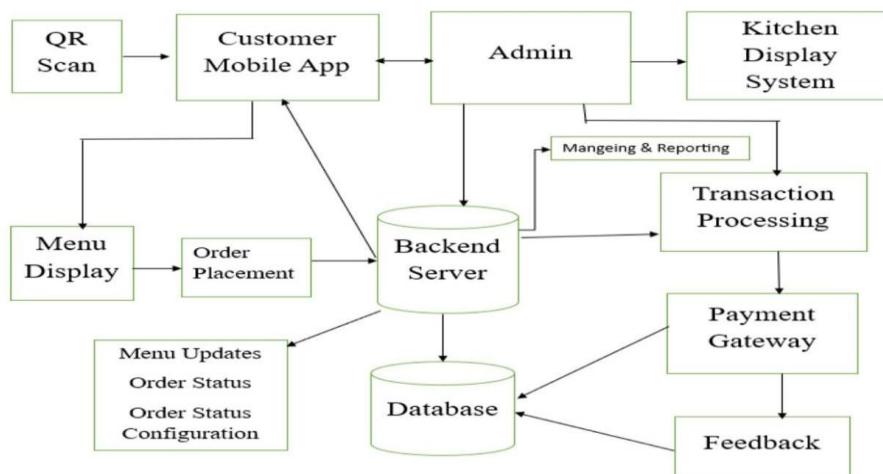


Fig. 1: QR-Based Food Ordering System Architecture

Results And Discussion

The application interface is designed to be simple, interactive, and user-friendly for both customers and restaurant staff.

- **Registration:** Users can sign up as customers or staff with minimal input.
- **Login:** Customer can log in with phone number and password.

• **Customer Dashboard:** Allows menu browsing, order placement, payment processing, and feedback submission.

• **Chef/Staff Dashboard:** Enables order monitoring, status updates, and efficient management of kitchen operations.

• **Order Notifications:** Instant alerts improve communication and reduce service delays.

- **Hygiene and Efficiency:** Digital ordering and payments reduce manual errors and

physical contact, enhancing safety and operational efficiency.

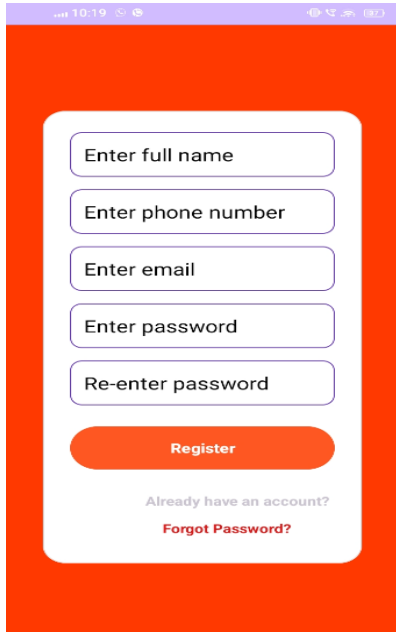


Fig 2: Sign Up

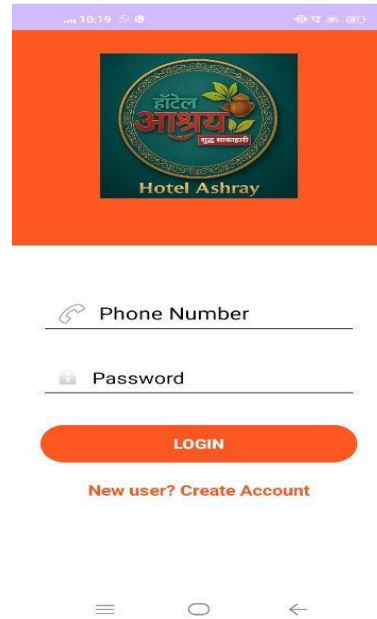


Fig 3: Log In

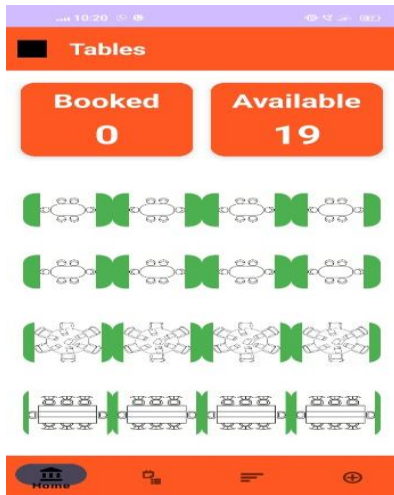


Fig 4: Table Design



Fig 5: Menu



Fig 6: Menu Management



Fig 7: Order Management

Conclusion

The Smart Restaurant Management System (SRMS) offers an effective digital solution to overcome the limitations of manual order-taking in rural and semi-urban restaurants. By integrating a QR code-enabled Android application, a MySQL backend, and secure UPI payment functionality, the system enables customers to browse menus, place orders, make payments, and provide feedback seamlessly. Real-time synchronization between customers and restaurant staff reduces delays, minimizes errors, and enhances overall operational efficiency. The platform provides a cost-effective and scalable solution, supporting small- and medium-sized food businesses in their transition toward digital operations. Future improvements, such as AI-based order suggestions, voice command features, and cloud analytics, have the potential to further enhance automation, personalization, and customer satisfaction.

References

- A. Kumar, R. Sharma, and P. Singh, "Transforming Dining with Real-time Innovation in Quick-service Restaurant Experience," *IEEE Xplore Digital Library*, vol. 12, no. 4, pp. 45-52, (2023).
- S. Lee, M. Tanaka, and J. Wong, "Developing a Restaurant Management Platform for Entrepreneurs based on the concept 'NEW NORMAL'," *IEEE Xplore Digital Library*, vol. 10, no. 2, pp. 77-85, (2022).
- R. Patel, V. Desai, and K. Rao, "Smart Restaurant Ordering System Using QR Code and Cloud Technology," *International Journal of Computer Applications*, vol. 175, no. 7, pp. 15-20, (2021).
- M. Chen, L. Zhang, and H. Liu, "Intelligent Food Ordering and Table Management System," *International Conference on IoT Applications*, pp. 120-127, (2020).
- P. Gupta, S. Mehta, and D. Kumar, "Design and Implementation of an IoT-Based Smart Restaurant System Using Cloud Computing," *IEEE Access*, vol. 9, no. 8, pp. 1123-1131, (2023).
- T. Reddy, A. Verma, and S. Das, "A Contactless Food Ordering and Payment Application for the Post COVID Era," *International Journal of Advanced Computer Science and Applications (IJACSA)*, vol. 13, no. 5, pp. 210-217, (2022).
- N. Choudhary, K. Joshi, and R. Malhotra, "Enhancing Restaurant Operations through

Mobile-Based Digital Menu and Real-Time Analytics," *International Research Journal of Engineering and Technology (IRJET)*, vol. 8, no. 11, pp. 870-875, (2021).