

Smart Food Ordering System for Restaurants - Order Up

Ashwinikumar Sunil Jaiswal¹, Chinmay R. Kulkarni², Yashaswi Patil³, Shrihari Ponde⁴,
Prof. Renuka Bhokarkar Vaidya⁵

Students, Department of Computer Engineering^{1,2,3,4}

Faculty, Department of Computer Engineering⁵

Sinhgad College of Engineering, Pune, Maharashtra, India

Abstract: *The quality of a restaurant and its food in today's food industry is heavily influenced by customer feedback. As a result, restaurants pay close attention to customer satisfaction in order to maintain their reputation. A key factor in evaluating customer happiness is the ability to provide efficient services while maintaining a high level of quality. In traditional restaurant ordering systems, the waiter takes the order after the customer selects an item from the menu, which can be time-consuming and require a lot of staff to manage. To address these issues, a new ordering system has been developed that provides personalized menus based on the customer's preferences. The menu is displayed on the customer's device, eliminating the need to wait for the waiter to take the order. The order is sent directly to the chef's display via wireless connectivity, improving service effectiveness and efficiency. This approach makes the restaurant more appealing to a broad spectrum of customers and offers numerous benefits such as excellent usability, time savings, portability, a reduction in human error, adaptability, and customer feedback. The interactive ordering system, known as E-menu, provides new digital menus for customers. The goal of this project, called "ORDER UP," is to integrate all touch points, share information, speed up processes, and personalize experiences for customers.*

Keywords: Smart Food Ordering, Web Development, Restaurant Management, E-Menu

I. INTRODUCTION

Restaurants often struggle to satisfy guests during busy periods, which can lead to difficulties with table reservations and food orders. Poor service can result in lost customers, even if the food and ambiance are excellent. Additionally, preparing too many different dishes at the same time can slow down order processing, increase wait times, and decrease table turnover rates. Order Up is a solution designed to minimize these problems and maximize restaurant efficiency. By streamlining kitchen systems and allowing guests to order food through a mobile or web application, Order Up reduces the time needed to prepare orders and ensures that meals are ready for guests on time. The application also provides a detailed menu with information about food options, allowing guests to browse at their leisure. However, traditional solutions such as kiosks and POS systems have their drawbacks, such as high costs and frequent upgrades. Order Up handles reservations and orders, recommends menu items, provides printable menus, and performs sentiment analysis and reviews. By making it easier for guests to find nearby restaurants, make reservations, and order food online, Order Up improves the customer experience and reduces costs over time. This paper will describe the system and the results achieved through research and implementation.

Although there are solutions available to address the issues faced by restaurants in providing efficient customer service, they also come with certain drawbacks. Two such solutions are Kiosks and POS (Point of Sale) systems.

Kiosks are automated self-service stations that are often equipped with touchscreens. However, they can be quite expensive, especially for businesses operating on a tight budget. The costs associated with Kiosks extend beyond just the initial installation, and include ongoing maintenance and upkeep.

POS systems, on the other hand, are handheld devices such as tablets that are used to manage orders and payments. While these systems are convenient and can be upgraded to improve their functionality, the upgrades often come at a

cost. Business owners using POS systems need to pay for new licenses and software upgrades, which can be time-consuming.

The Smart Food Ordering System addresses these challenges and more. It comprises four key factors: efficient handling of reservations and orders, a recommendation system to suggest food options, an attractive print menu, and sentiment analysis and reporting. By using this system, restaurants can optimize their service and increase customer satisfaction.

The Smart food ordering system comprises four key components:

- Efficient handling of reservations and orders
- Recommendation operation system
- Appealing print menu
- Sentiment analysis and summarization

Order Up is a mobile/web application that facilitates guests to discover nearby restaurants, check table availability, reserve a table, order food online, read reviews, and view a print menu of each restaurant's food items. Guests can leave reviews for menu items, which are analysed by Order Up to assist restaurants in deciding whether to retain or replace menu items. The system's order handling component creates a queue of orders, ensuring prompt order processing, reduced costs, and improved customer service experience. Thus, Order Up functions as both an order management and business intelligence system. This paper will elaborate on the system's implementation and the outcomes achieved during the investigation.

II. LITERATURE SURVEY

FOODS is a system developed to assist people in making informed food choices by using an ontology-driven approach. The ontology used in FOODS is intended to capture information about various food categories and specific foods within those categories, including their nutritional content such as macronutrients and micronutrients. FOODS enables users to search for specific foods or food categories and provides personalized recommendations based on their dietary preferences and health goals. It also includes a feature that allows users to create meal plans based on their nutritional needs and preferences.[1]

FoodX is a technology-based system that aims to reduce food waste by streamlining the food donation process. The system comprises a mobile app for donors, a web-based platform for food banks, and an intelligent routing algorithm. The mobile app allows donors to report food that is available for donation easily and quickly, while the web-based platform helps food banks manage and track incoming donations, providing analytics and reporting tools to help them track their donation activity. The intelligent routing algorithm is used to optimize the donation process by finding the most efficient routes for pick-up and delivery.[2]

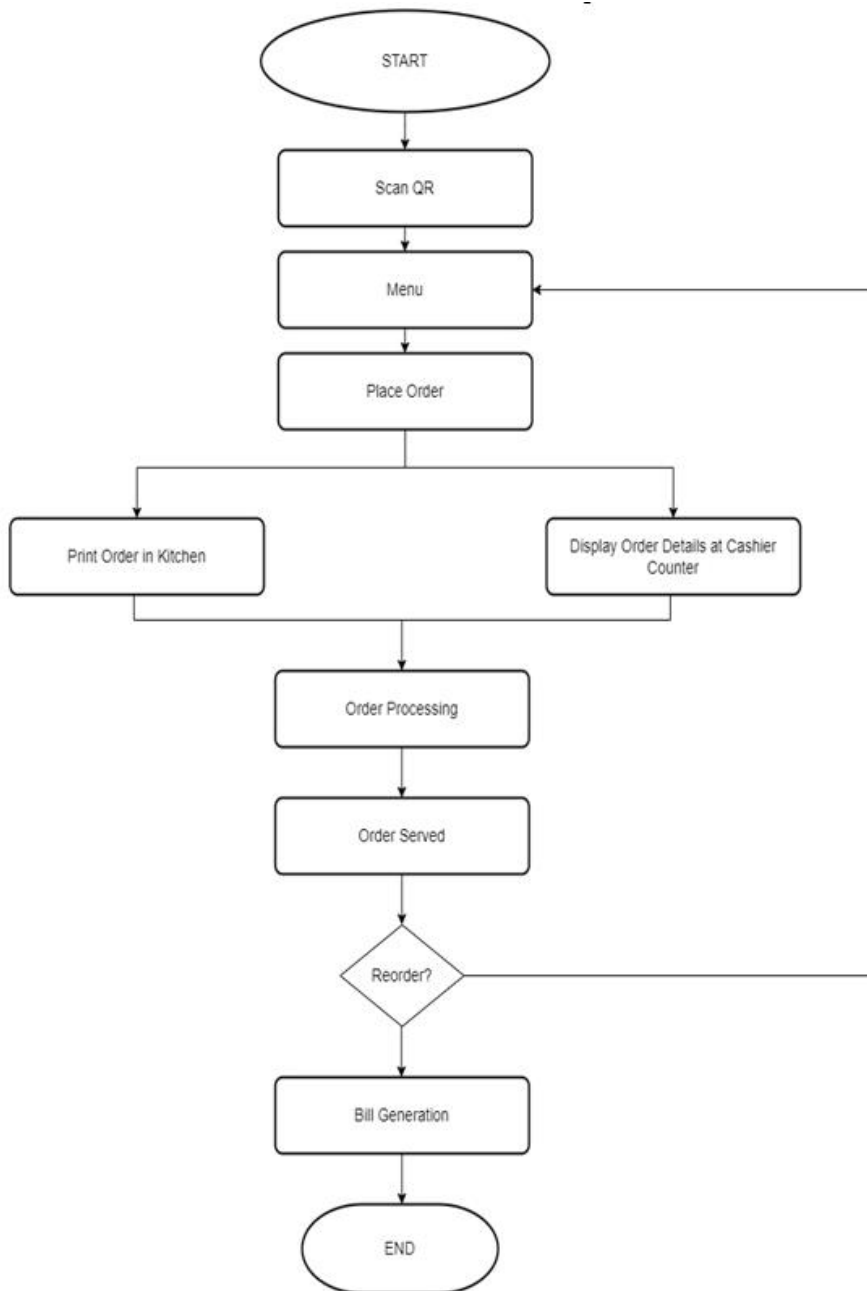
Foody is a smart restaurant management and ordering system that uses technology to enhance the customer experience and streamline the ordering process. The system includes a mobile app for customers and a web-based platform for restaurant managers. The app allows customers to browse menus, place orders, and make payments directly from their smartphones, while the platform provides real-time updates on order status and inventory levels, allowing managers to make adjustments to menus and pricing on the fly. Foody can also provide insights and analytics on customer behaviour and preferences, enabling restaurants to make data-driven decisions to improve their business.[3]

The Self-Ordering Concept Food Ordering System in restaurants is a technology-based solution that includes a self-ordering kiosk to streamline the food ordering process and improve the customer experience. The self-ordering kiosk features an intuitive interface that makes it easy for customers to browse menus, select items, and customize their orders. The system sends the order directly to the kitchen, eliminating the need for a server to manually enter the order. This can help reduce errors and improve order accuracy. The system also includes features such as payment processing and order tracking, allowing customers to pay for their orders and track their progress in real-time.[4]

The Smart Menu Card System is a technology-based solution that enhances the dining experience for customers in restaurants. The system replaces traditional paper menus with digital menus displayed on tablets or other devices. Customers can browse the menu, view pictures and descriptions of dishes, and customize their orders directly from the device. The system can also make recommendations based on the customer's previous orders or popular menu items. The Smart Menu Card System can also provide valuable data and analytics on customer behaviour and preferences, allowing restaurants to make data-driven decisions to improve their business.[5]

III. METHODOLOGY

1. Customers can access an ORDER UP MENU at the restaurant through a QR code system that can be scanned using their mobile devices.
2. Each table will have a unique QR code assigned to it, allowing the restaurant to manage and identify tables individually.
3. The menu will showcase all the currently available items in stock.
4. The system ensures that food is delivered accurately to the respective table, avoiding any confusion.
5. Prior reservations can be made by customers before arriving at the restaurant.
6. Furthermore, the system offers various online payment options.
7. Customers can opt to donate a specific order to provide food to those in need.
8. Customers can leave comments on individual food items to express their feedback



The Customer Modules:

This module provides all necessary features for restaurant visitors, such as accessing the digital menu and placing orders. These modules include:

- **Scanning module:** Customers can scan the QR code on their table to be redirected to the restaurant's website. The QR code contains a unique table ID on top of a URL, which is saved for later use.
- **Menu display module:** This module shows the current restaurant menu, including popular and recommended dishes, along with images, names, prices, and descriptions.
- **Cart module:** Customers' carts update automatically when they add items, and they can modify their cart at any time before ordering. They can also view previous orders in detail.
- **Payment module:** Customers can see their final bill and complete payment by clicking the 'PAY' button. Receipts are sent to their registered email address.
- **Feedback module:** Customers can rate each dish, comment on the ordering process, and suggest ways to improve the restaurant's service.
- **Notification module:** Customers receive WhatsApp notifications with order details, and after successful payment, they receive notifications with the amount received and payment receipts.

The Manager Modules:

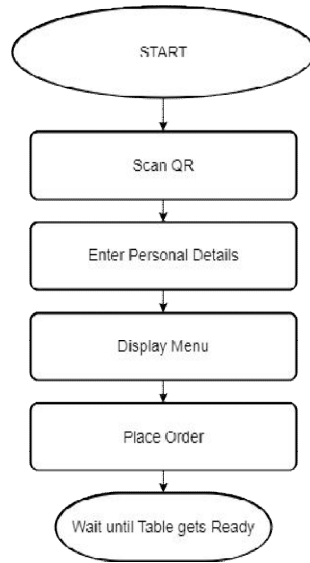
Include order analysis, product management, and order and sales management, with the following modules:

- **Analysis module:** This module offers a range of data visualizations, such as customer and product statistics, order information, and daily and monthly revenue estimates.
- **Product management module:** Managers can add and update products based on categories and manage the current date's menu.
- **Sales module:** Managers can see detailed sales information, including customer IDs, order IDs, and order dates.
- **Bill history module:** Managers can view all billing information, including past orders, and delete them.
- **Report module:** This module allows managers to download sales, order, and customer reports in various formats.

The Pre-Order Modules:

This module provides customers to order food while waiting in the queue when tables are occupied. The process consists of the following modules:

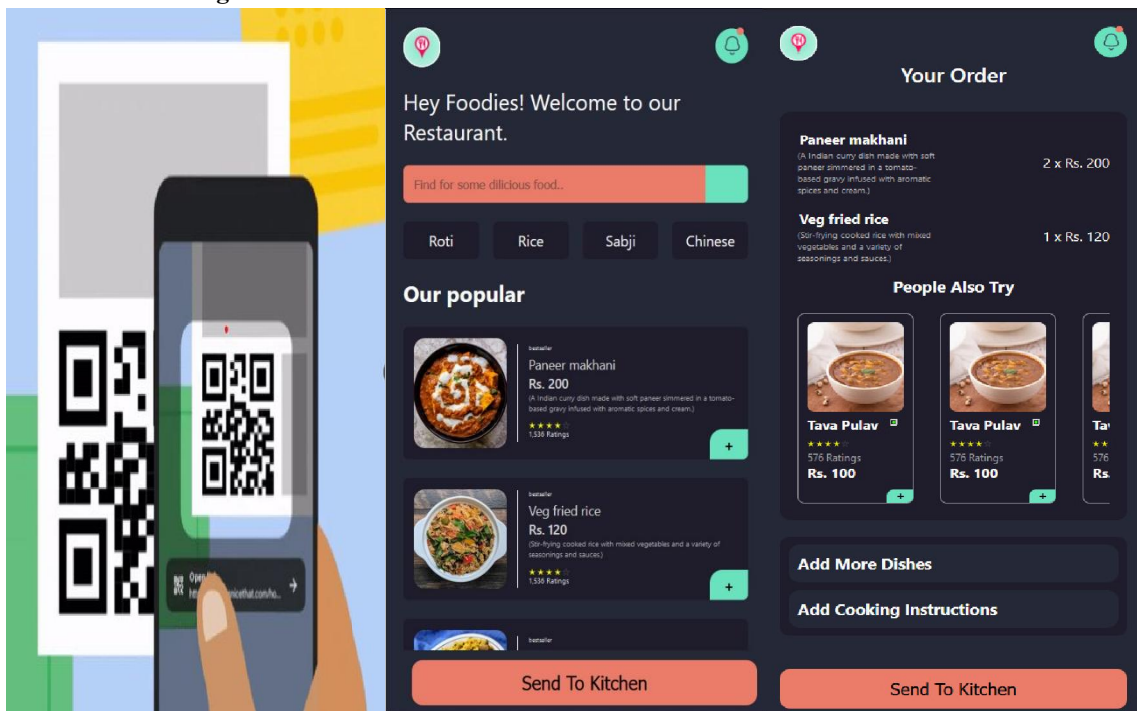
- **Scanning module:** Customers scan the QR code on their table to be redirected to the restaurant's website. The QR code contains a unique table ID on top of a URL, which is saved for later use.
- **Login/ Registration module:** Returning customers can log in using their unique username, while new customers must complete the registration process before proceeding. After logging in, customers select the number of people in their party.
- **Menu display module:** This module displays the current restaurant menu, including popular and recommended dishes, along with images, names, prices, and descriptions.
- **Ordering module:** This module shows the items ordered by customers and the time required for the table to become free.

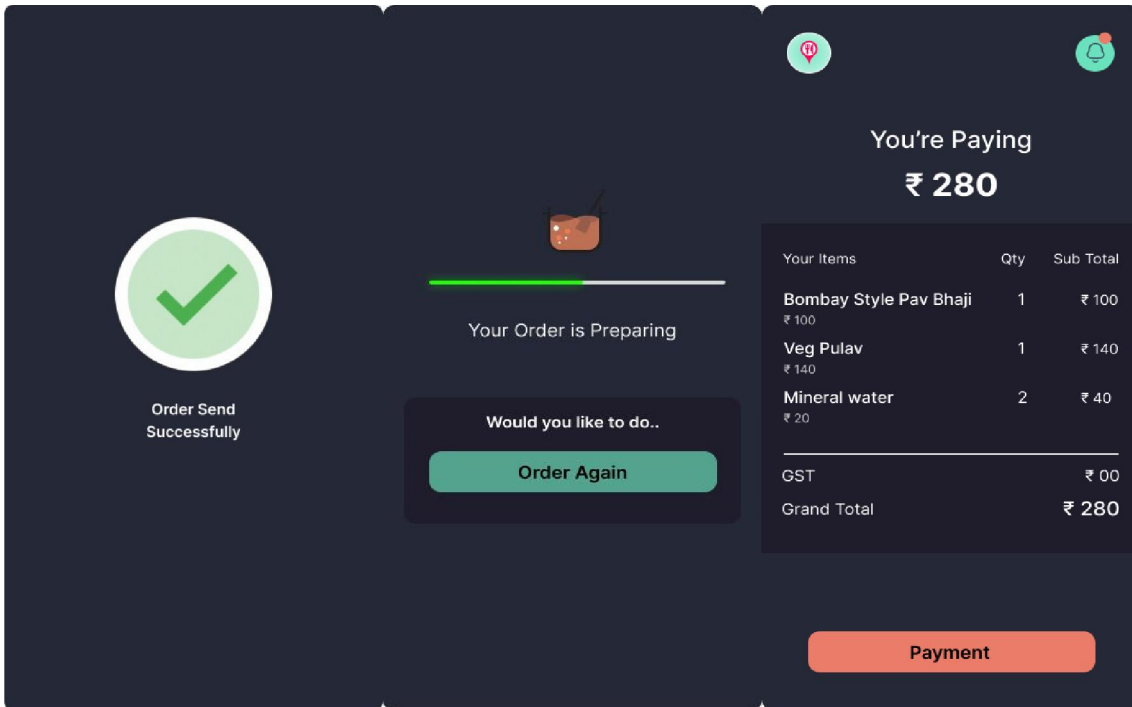


IV. RESULTS AND OUTPUTS

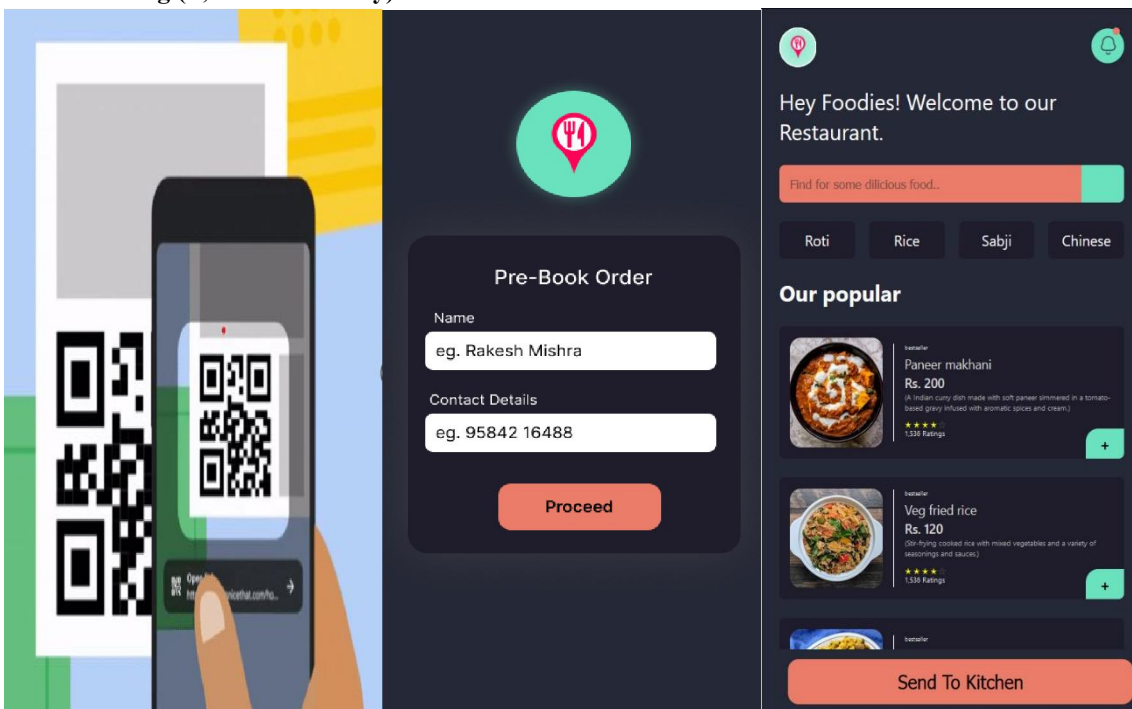
4.1 Customer Side

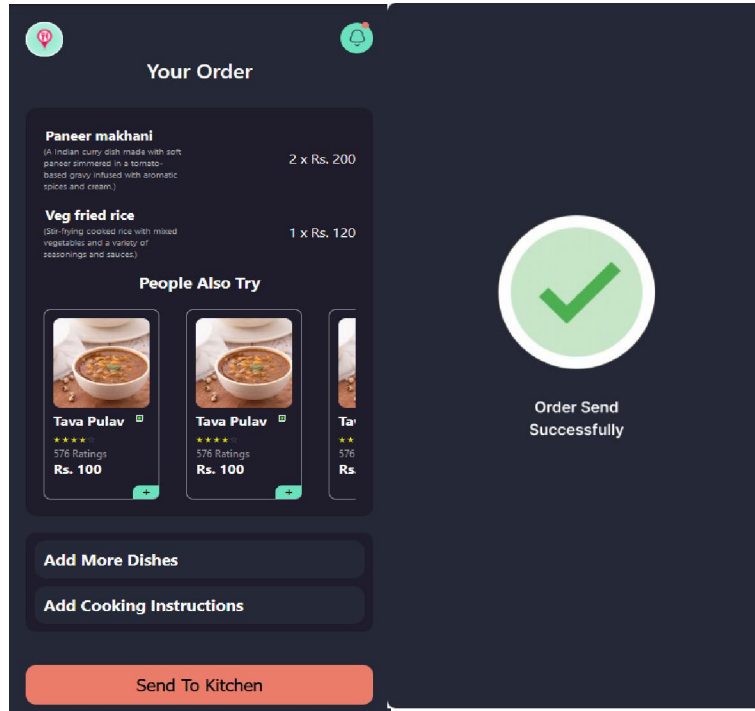
4.1.1 For Normal Booking





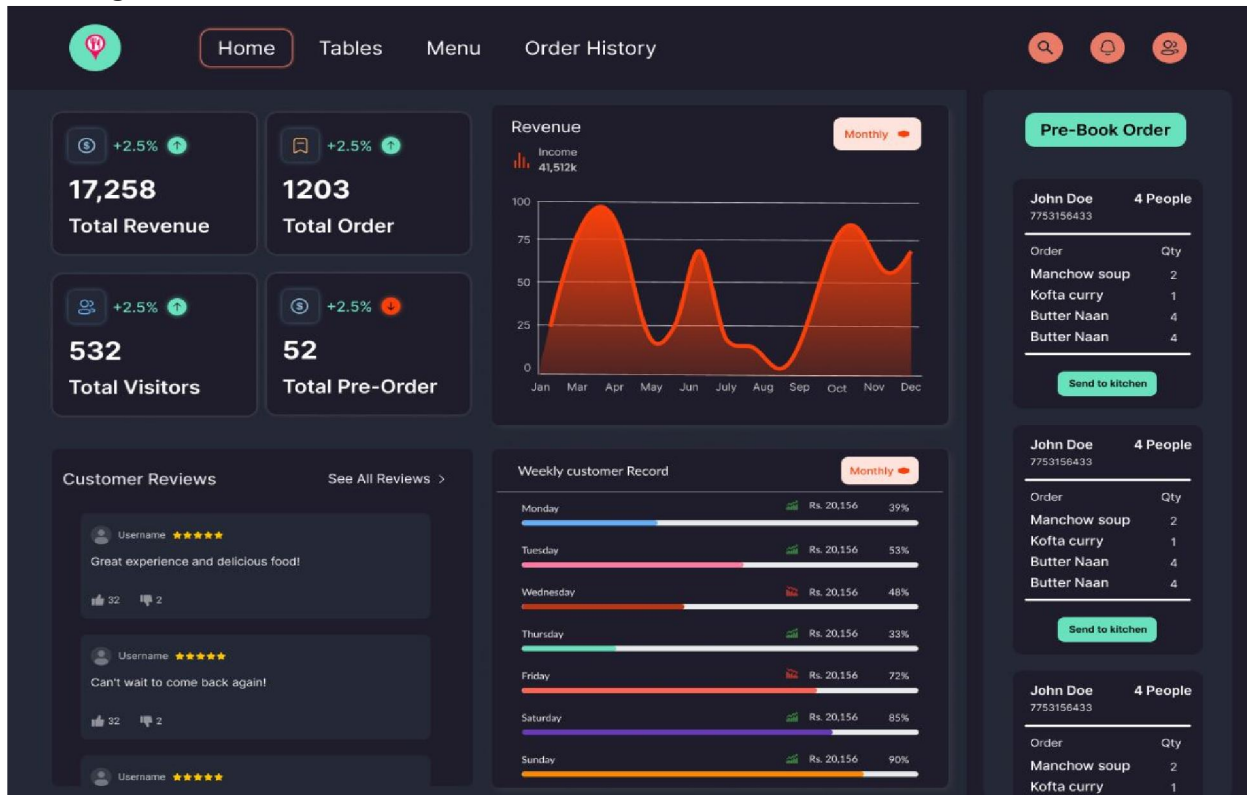
4.1.2 For Prebooking (if, tables are busy):



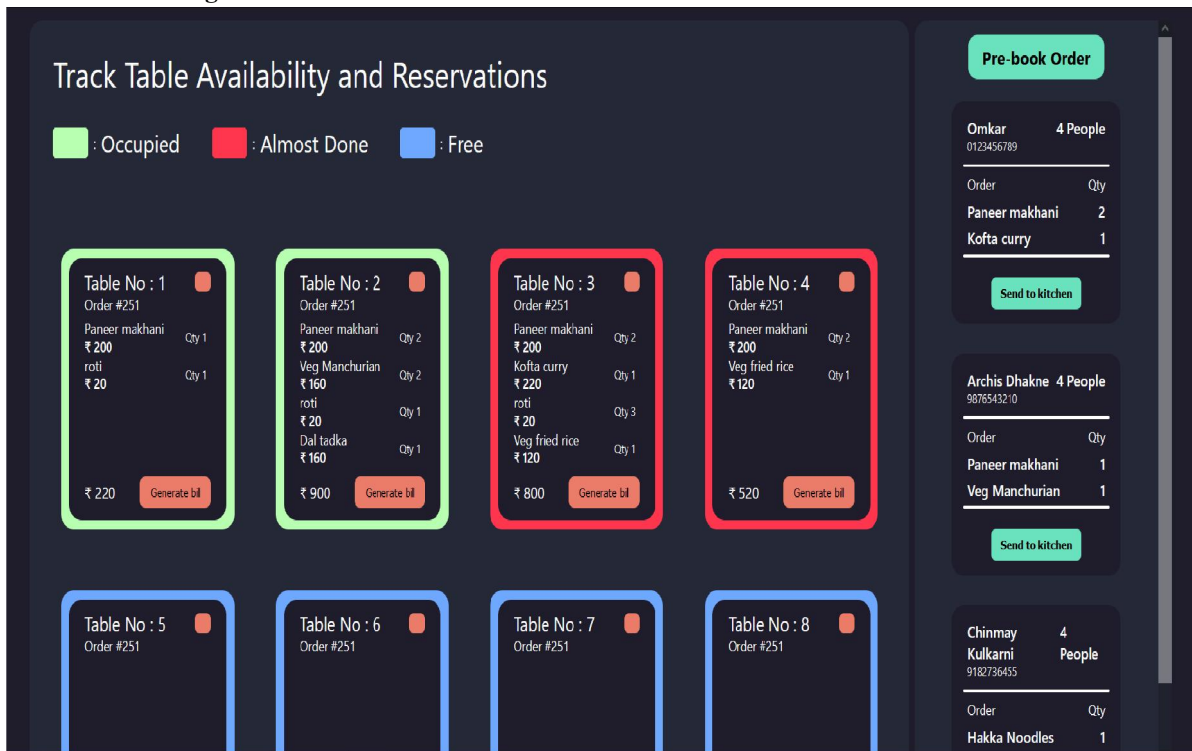


4.2 Restaurant Side:

4.2.1 Manager's Dashboard



4.2.2 Table Monitoring



Track Table Availability and Reservations

Legend: ■ : Occupied ■ : Almost Done ■ : Free

| Table No | Order # | Status | Items | Total Price | Action |
|--------------|------------|-------------|--|-------------|---------------|
| Table No : 1 | Order #251 | Occupied | Paneer makhani ₹ 200, roti ₹ 20 | ₹ 220 | Generate bill |
| Table No : 2 | Order #251 | Occupied | Paneer makhani ₹ 200, Veg Manchurian ₹ 160, roti ₹ 20, Dal tadka ₹ 160 | ₹ 900 | Generate bill |
| Table No : 3 | Order #251 | Almost Done | Paneer makhani ₹ 200, Kofta curry ₹ 220, roti ₹ 20, Veg fried rice ₹ 120 | ₹ 800 | Generate bill |
| Table No : 4 | Order #251 | Almost Done | Paneer makhani ₹ 200, Veg fried rice ₹ 120 | ₹ 520 | Generate bill |
| Table No : 5 | Order #251 | Free | | | |
| Table No : 6 | Order #251 | Free | | | |
| Table No : 7 | Order #251 | Free | | | |
| Table No : 8 | Order #251 | Free | | | |

Pre-book Order

Omkar 4 People
0123456789

| Order | Qty |
|----------------|-----|
| Paneer makhani | 2 |
| Kofta curry | 1 |

Send to kitchen

Archis Dhakne 4 People
9876543210

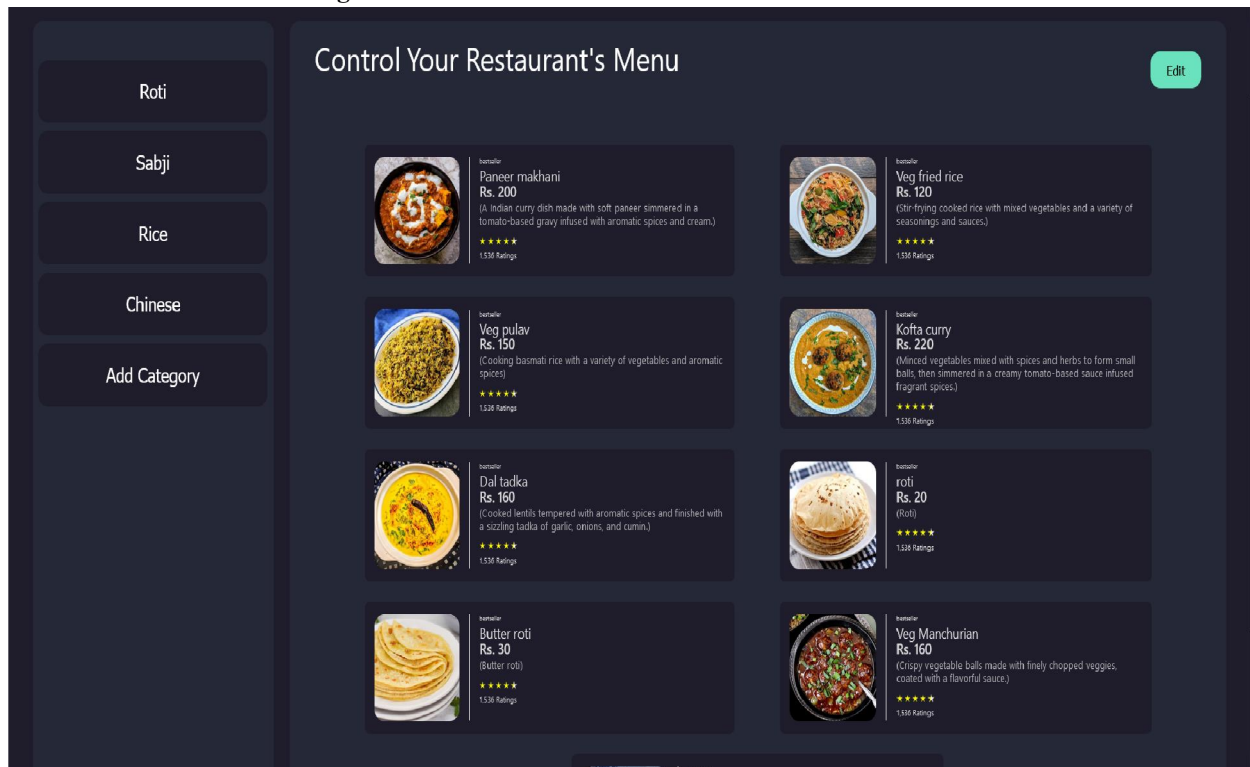
| Order | Qty |
|----------------|-----|
| Paneer makhani | 1 |
| Veg Manchurian | 1 |

Send to kitchen

Chinmay Kulkarni 4 People
9182736455









| Order | Qty |
|---------------|-----|
| Hakka Noodles | 1 |

4.2.3 Restaurant's Menu Editing



Control Your Restaurant's Menu Edit

- Roti
- Sabji
- Rice
- Chinese
- Add Category

| | |
|---|---|
|  <p>Paneer makhani Rs. 200 (A Indian curry dish made with soft paneer simmered in a tomato-based gravy infused with aromatic spices and cream.) ★★★★★ 1,538 Ratings</p> |  <p>Veg fried rice Rs. 120 (Stir-frying cooked rice with mixed vegetables and a variety of seasonings and sauces.) ★★★★★ 1,538 Ratings</p> |
|  <p>Veg pulav Rs. 150 (Cooking basmati rice with a variety of vegetables and aromatic spices.) ★★★★★ 1,538 Ratings</p> |  <p>Kofta curry Rs. 220 (Mixed vegetables mixed with spices and herbs to form small balls, then simmered in a creamy tomato-based sauce infused with fragrant spices.) ★★★★★ 1,538 Ratings</p> |
|  <p>Dal tadka Rs. 160 (Cooked lentils tempered with aromatic spices and finished with a sizzling tadka of garlic, onions, and cumin.) ★★★★★ 1,538 Ratings</p> |  <p>roti Rs. 20 (Roti) ★★★★★ 1,538 Ratings</p> |
|  <p>Butter roti Rs. 30 (Butter roti) ★★★★★ 1,538 Ratings</p> |  <p>Veg Manchurian Rs. 160 (Crispy vegetable balls made with finely chopped veggies, coated with a flavorful sauce.) ★★★★★ 1,538 Ratings</p> |

4.2.4 Bill Generation

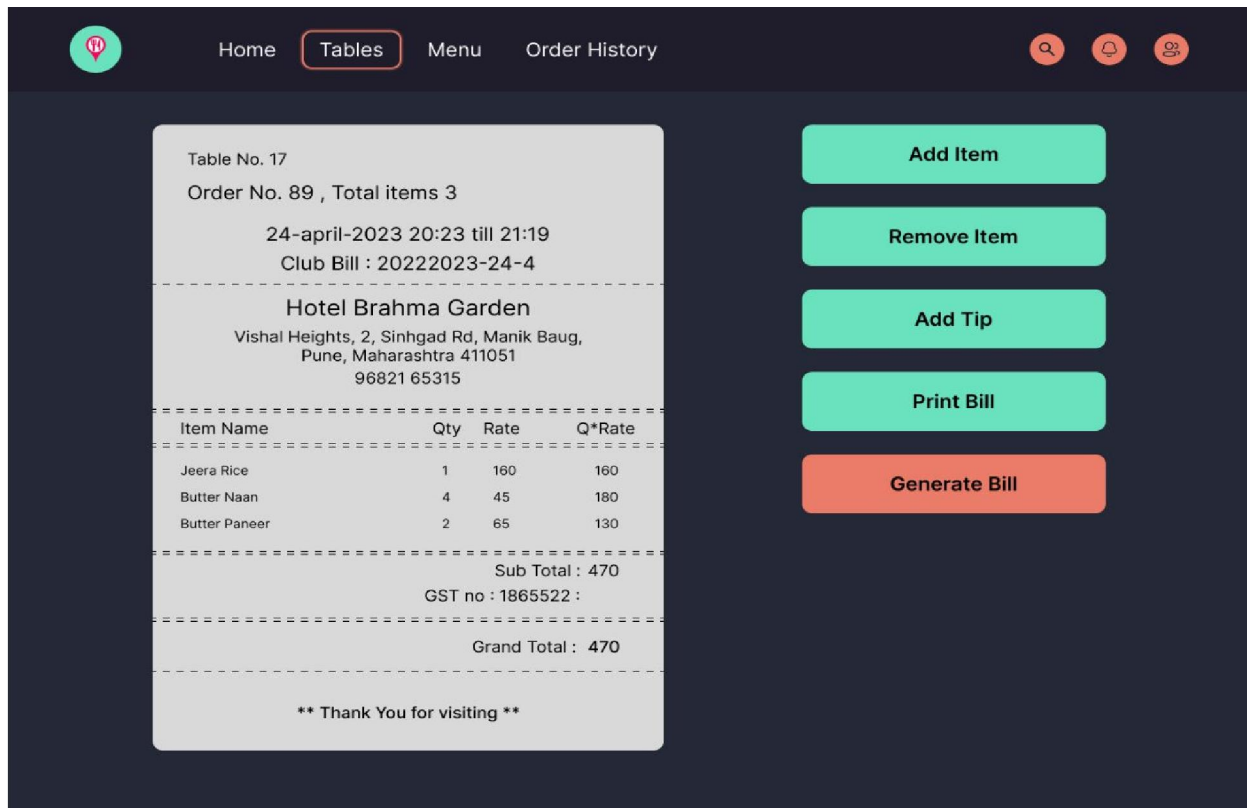


Table No. 17
Order No. 89 , Total items 3
24-april-2023 20:23 till 21:19
Club Bill : 20222023-24-4

Hotel Brahma Garden
Vishal Heights, 2, Sinhgad Rd, Manik Baug,
Pune, Maharashtra 411051
96821 65315

| Item Name | Qty | Rate | Q*Rate |
|---------------|-----|------|--------|
| Jeera Rice | 1 | 160 | 160 |
| Butter Naan | 4 | 45 | 180 |
| Butter Paneer | 2 | 65 | 130 |

Sub Total : 470
GST no : 1865522 :
Grand Total : 470

** Thank You for visiting **

Buttons: Add Item, Remove Item, Add Tip, Print Bill, Generate Bill

V. CONCLUSION

A digital touch-based system for restaurants is proposed as a replacement for the traditional pen-and-paper method of taking orders. This system automates the food ordering process, reducing the need for manual labor and lowering costs. Installing the devices is a one-time investment, and the system eliminates errors caused by human mistakes and saves time by streamlining the ordering process. It is efficient and fast, reducing the formation of queues. Additionally, this system simplifies the entire food ordering process and provides real-time feedback from customers, making it more dynamic. Restaurants can use this self-ordering system to manage customer orders easily by installing it at each table. Customers can effortlessly place their orders, which helps restaurants manage their inventory of raw materials.

VI. ACKNOWLEDGMENT

Every work is source which requires support from many people and areas. It gives us proud privilege to complete the Project on “Order Up” under valuable guidance and encouragement of our guide Prof. R. S. Vaidya. We are also extremely grateful to our respected H.O.D. (IT Dept.)-Dr. S. R. Ganorkar for providing all facilities and every help for smooth progress of our project. We would also like to thank all the Staff Members of IT Engineering Department for timely help and inspiration for completion of the project. At last, we would like to thank all the unseen authors of various articles on the Internet, helping us become aware of the research currently ongoing in this field and all our colleagues for providing help and support in our work.

REFERENCES

- [1]. Snae, C., & Bruckner, M. (2008, February). FOODS: a food-oriented ontology-driven system. In 2008 2nd IEEE International Conference on Digital Ecosystems and Technologies (pp. 168-176). IEEE.
- [2]. Oktaviana, R. S., Febriani, D. A., Yoshana, I., & Payanta, L. R. (2020, September). FoodX, a System to Reduce Food Waste. In 2020 3rd International Conference on Computer and Informatics Engineering (IC2IE) (pp. 361-365). IEEE.

- [3]. Liyanage, V., Ekanayake, A., Premasiri, H., Munasinghe, P., &Thelijjagoda, S. (2018, December). Foody-Smart restaurant management and ordering system. In 2018 IEEE Region 10 Humanitarian Technology Conference (R10-HTC) (pp. 1-6). IEEE.
- [4]. Alfaren, C., &Arijanto, R. (2021). Self-Ordering Concept Food Ordering System in Restaurants. bit-Tech, 4(1), 1-6.
- [5]. El Fiorenza, J. C., Chakraborty, A., Rishi, R., &Baghel, K. (2018, October). Smart Menu Card System. In 2018 3rd International Conference on Communication and Electronics Systems (ICCES) (pp. 847-849).IEEE.