पुण्यश्लोक अहिल्यादेवी होळकर
सोलापूर विद्यापीठ
।। विद्यया संपन्नता ।।
NAAC Accredited-2022
'B++' Grade (CGPA-2.96)

Mini Project Report

On

"E-Menu : A Digital Food Ordering System"

Submitted By

Ms. Rutuja Prakash Kodag (Roll No - 38)

Ms. Siddhi Vinod Doiphode (Roll No - 16)

Ms. Sakshi Balasaheb Patil (Roll No - 60)

Under the Guidance of

Prof. M. S. Koli

For The Award of the Degree of

Third Year Bachelor of Technology

SPSPM
॥ ज्ञान दान पवित्र दान ॥

DEPARMENT OF COMPUTER SCIENCE AND ENGINEERING

S K N SINHGAD COLLEGE OF ENGINEERING

Korti, Pandharpur.

Punyashlok Ahilyadevi Holkar Solapur University Solapur.

2024-2025

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SKN SINHGAD COLLEGE OF ENGINEERING

Korti, Pandharpur

--(Accredited by NAAC 'A+' Grade)--

CERTIFICATE

This is to certify that, the mini project report entitled

"E-Menu A Digital Food Ordering System"

Submitted by

Ms. Rutuja Prakash Kodag (Roll No - 38)

Ms. Siddhi Vinod Doiphode (Roll No - 16)

Ms. Sakshi Balasaheb Patil (Roll No - 60)

In the fulfilment for the award of the Degree of

Third Year Bachelor of Technology

This Design work is a record of student's own work carried out by under my supervision and guidance during the academic year

2024-25

Project Guide
(Prof. M. S. Koli)

Mini-Project Co-Ordinator
(Prof. M. S. Koli)

Head of Department
(Dr. S. V. Pingale)

External Examiner

Acknowledgment

We have great pleasure in presenting this project report on **"E-MENU A DIGITAL FOOD ORDERING SYSTEM"** we take this opportunity to express sincere appreciation and deep sense of gratitude to our project guide **Prof. M. S. Koli** for his whole hearted cooperation, valuable guidance and perpetual encouragement, which had a great influence in bringing this project to success. We remain ever indebted to him for the keen interest shown and moral support offered all throughpursuance of this work.

We also express our sincere thanks to, **Dr. S. V. Pingale** Head, Dept. of Computer Science and Engineering for extending all the facilities required for thisproject work. We express our sincere thanks to principal **Dr. K. J. Karande** for extending all facilities required for this project work.

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Ms. Rutuja Prakash Kodag (Roll No - 38)

Ms. Siddhi Vinod Doiphode (Roll No - 16)

Ms. Sakshi Balasaheb Patil (Roll No - 60)

DECLARATION

We the undersigned hereby declare that the declaration entitled **"E-MENU A DIGITAL FOOD ORDERING SYSTEM"** submitted by us to SKN Sinhgad College of Engineering, Pandharpur for the award of the degree of Bachelor of Engineering in Computer Science and Engineering, under the guidance of **Prof. M. S. Koli** is our original work. We further declare that to the best of our knowledge and belief, this work has notbeen submitted to this or any other university.

Ms. Rutuja Prakash Kodag (Roll No - 38)

Ms. Siddhi Vinod Doiphode (Roll No - 16)

Ms. Sakshi Balasaheb Patil (Roll No - 60)

ABSTRACT

This project seeks to transform traditional restaurant service by leveraging technology to reduce human dependence, streamline operations, and enhance the overall dining experience. By placing QR codes on restaurant tables, customers can access a digital menu (e-menu) on their smartphones. This allows them to browse, customize, and place orders directly, bypassing the need for waitstaff, thereby reducing human errors and wait times. Orders are sent directly to the kitchen for faster processing, and billing is automated—updating dynamically as orders are made. Payments can be made through integrated gateways on smartphones, speeding up the checkout process.The project offers several benefits, including improved operational efficiency, reduced labor costs, and enhanced customer satisfaction by providing a seamless dining experience. It also aligns with the growing trend towards digital and contactless services in the hospitality industry. However, challenges such as potential technical issues, customer adaptation, and data security will be addressed through rigorous testing, user training, and implementing strong security protocols to ensure a smooth rollout and user experience.Overall, this project embraces cutting-edge technology to modernize restaurant operations, optimizing both front-end customer interaction and back-end processes for a more efficient and enjoyable dining experience.

Key Words: QR Code, e-menu, Efficiency, Automation, Digital Dining, Contactless Service.

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1.INTRODUCTION OF PROJECT

1.1) PROJECT INTRODUCTION:

In today's fast-paced world, restaurants are constantly seeking ways to improve customer service and streamline operations. The E-Menu system is designed to meet these demands by providing a contactless ordering solution that allows customers to place orders via a QR code at their table. This system eliminates the need for physical menus, reduces wait times, and ensures accurate order communication between customers and the kitchen.

The primary objective of this project is to develop and implement a digital ordering system that enhances the dining experience and improves operational efficiency in restaurants. By using technology to simplify the ordering process, the E-Menu system aims to benefit both customers and restaurant staff by making operations smoother and more efficient.

1.2) WHY WE CHOSE THIS PROJECT:

The decision to develop the E-Menu system stems from the increasing demand for contactless solutions in the hospitality industry, especially after the global pandemic. Many restaurants are looking for ways to offer seamless and efficient service while maintaining safety and reducing physical interaction.

By choosing this project, we also aimed to explore the digital transformation of restaurant operations, leveraging technology to provide quicker service and better customer satisfaction. This project not only fulfills a practical need but also allows us to innovate within the realm of digital solutions for the hospitality sector. The system's potential for scalability and adaptability in various restaurant environments made it an appealing project to work on.

1.3) BENEFITS OF PROJECT:

The E-Menu system offers several benefits, including:

- **Time-Saving**: Reduces waiting times for customers and staff by streamlining the order process.
- **Contactless Service**: Enhances safety by minimizing physical interaction between staff and customers.
- **Operational Efficiency**: Improves order accuracy and reduces the workload on restaurant staff.
- **Analytics and Insights**: Provides restaurant managers with data-driven insights to improve operations.
- **Scalable Solution**: Can be easily adapted to different types of restaurants or scaled for larger operations.

1.4) APPLICATIONS:

The E-Menu system can be applied in various settings such as:

- **Restaurants and Cafes**: For contactless and efficient order processing.
- **Hotels**: As part of room service systems, allowing guests to place orders from their rooms.
- **Canteens and Food Courts**: To speed up the process of ordering and reduce waiting times in high-traffic areas.
- **Event Venues**: For large-scale event catering where quick and accurate order processing is critical.

1.5) SCOPE OF THE PROJECT:

The scope of the E-Menu system project includes:

- **System Architecture**: Defining and developing the system's overall structure.
- **QR Code Integration**: Enabling contactless menu access and ordering via QR codes.
- **User Interface**: Creating a user-friendly interface for both customers and staff (including kitchen and admin).
- **Order Management**: Implementing real-time notifications and tracking for orders in the kitchen.
- **Payment Integration**: Automatically calculating bills and processing payments efficiently.
- **Future Enhancements**: Possibilities for integrating customer feedback, analytics, and scaling the system for larger operations.

2.LITERATURE REVIEW

Author	Year	Objective	Pros	Cons	Platform Used
Vaidya R.B.	2023	Create a smart food ordering system for restaurants.	● Enhances efficiency and customer engagement.	● Accessibility issues for non-tech-savvy users.	YouTube, Vimeo
Kurniaw ,An,R	2020	Implement an online ordering system at Hover Cafe.	● Streamlines ordering; enhances customer engagement.	● Resistance from traditional customers.	Graph-based techniques
Aizen . I	1991	Modify the Theory of Planned Behavior (TPB).	● Effective in predicting consumer behavior.	● Oversimplifies real-world complexities.	YouTube, Dailymotion
Kumar & Smith	2017	Apply TPB to study food choices.	● Provides insights into consumer preferences.t	● Ignores cultural and health factors.	NLP, ML

3. PROPOSED WORK

3.1) PROBLEM STATEMENT:

Restaurants face challenges in delivering efficient service while ensuring accuracy in order processing. Traditional paper menus and manual order-taking lead to delays and errors. The goal is to develop a contactless digital ordering solution to streamline operations, reduce wait times, and enhance order accuracy.

3.2) OBJECTIVE:

- **Develop an eMenu System**: Create a seamless digital ordering solution for restaurants using QR code technology.
- **Utilize Modern Web Technologies**: Implement front-end development with HTML, CSS, and JavaScript, and back-end development using Flask server.
- **Enhance Customer Experience**: Reduce waiting times and improve order accuracy through a user-friendly interface.
- **Optimize Restaurant Operations**: Enable restaurant staff to manage orders efficiently with kitchen notifications and automatic bill generation.
- **Address Technical Challenges**: Ensure the system works effectively across various devices and network environments.
- **Scalability**: Design the system to be scalable and adaptable to various types of restaurants and dining environments.
- **Data-Driven Insights**: Integrate analytics for restaurant managers to track and optimize operations.

4. METHODOLOGY

This project focuses on developing an E-Menu system that offers a seamless digital ordering experience. The methodology involves a structured approach to design, development, and implementation.

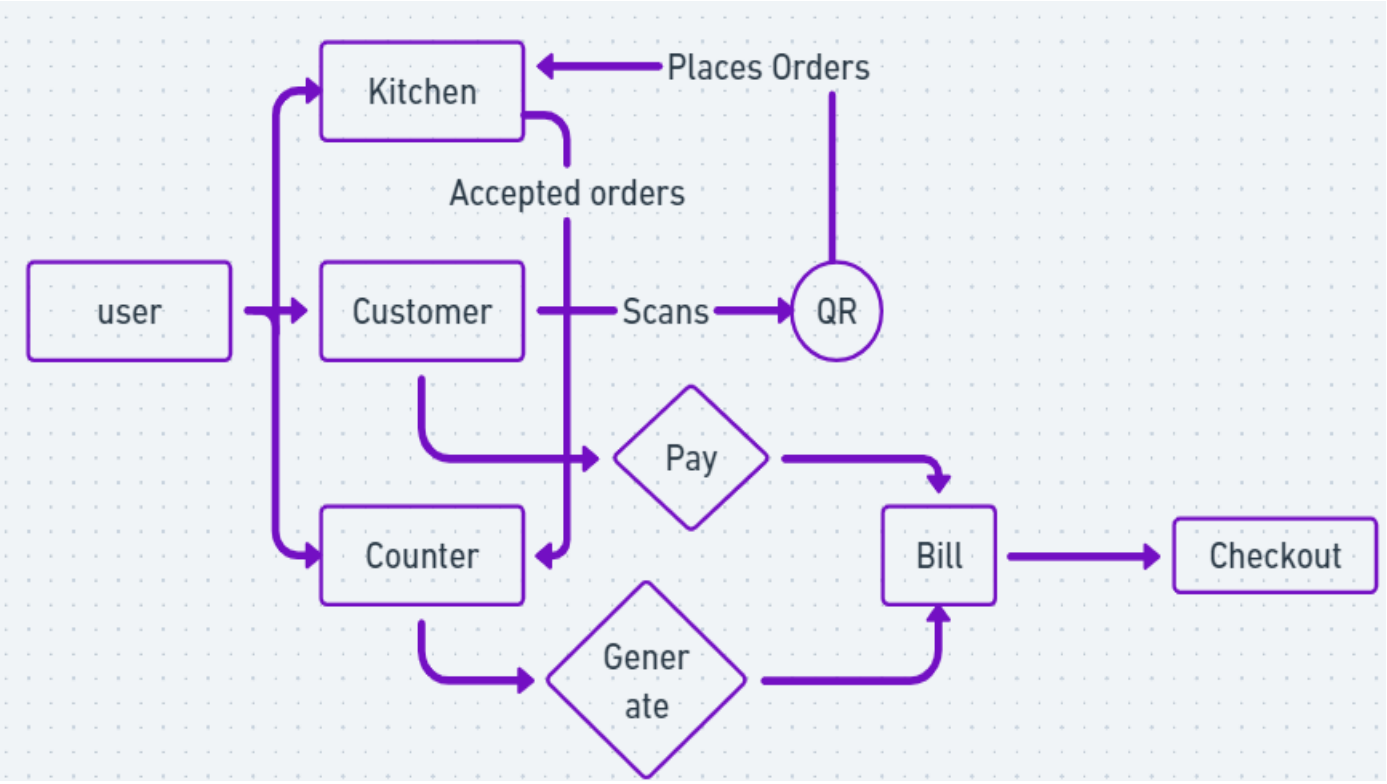


Fig. 4.1) Methodology

1. **System Design and Planning**:

Define the system architecture and user requirements.Plan the flow of the system, including customer interactions, order management, and billing.

1. **Back end Development**:

Implement the **server** for processing customer orders and managing the database. Create APIs to handle interactions between the frontend and backend systems.

2. **QR Code Integration**:

Generate **QR codes** that customers can scan at their tables to access the digital menu. Link the QR codes to the relevant table numbers for accurate order management.

3. **Order Management and Kitchen Display**:

Implement a notification system that instantly alerts the kitchen staff when a new order is placed, ensuring timely food preparation. Track the status of each order and update it accordingly.

4. **Automatic Billing System**:

Calculate the total bill automatically as orders are placed and display it at the payment counter. Provide a seamless and error-free checkout experience for the customers.

5. **Testing and Feedback**:

Conduct user testing to ensure that the system meets customer and restaurant staff needs. Gather feedback for further refinement of the system.

5.PROJECT DESIGN

5.1) Data Flow Diagram:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically.It can be manual, automated, or a combination of both.

5.1.1) Level 0 DFD:

The Level-0 DFD, also called context diagram of the result management system isshown in Fig.5.1

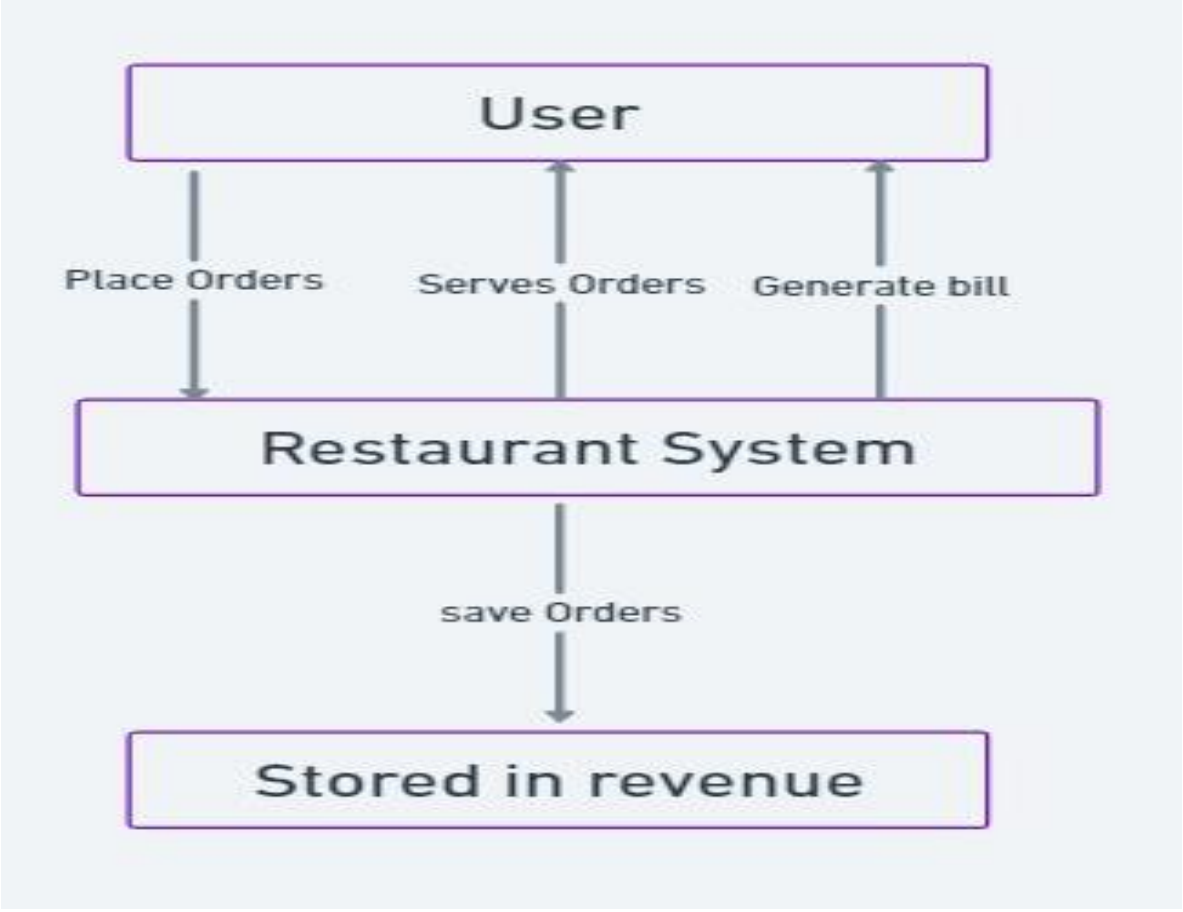


Fig.5.1. Level 0 DFD

6. SYSTEM REQUIREMENTS

6.1) SOFTWARE REQUIREMENTS:

- Operating System: Windows
- Front End: HTML, CSS, JavaScript
- Back End: Flask Server
- Web Browser
- Tool Used: VS code

6.2) HARDWARE REQUIREMENTS:

- Processor: Minimum dual core processor
- Hard Disk: 512GB Minimum
- RAM: 4GB Minimum
- Mouse
- Keyboard

7. IMPLEMENTATION DETAILS

Implementation is a crucial phase where the theoretical design of the E-Menu system is transformed into a functioning application. This process ensures that the system is efficient and effective for users. It involves detailed planning, examining the constraints of the current system, and selecting the most suitable method for a smooth changeover.

Key steps in the implementation process include:

- Careful planning and evaluation of the existing system to ensure a successful transition.
- Designing a method to ensure that the new system integrates seamlessly.
- Providing comprehensive education and training to users, ensuring they understand and are comfortable with the new system.
- An implementation coordination committee was established to oversee and manage the process, following organizational policies.

The implementation process begins with:

- Creating a detailed plan for system implementation, outlining activities and necessary discussions related to equipment and system deployment.
- Ensuring that the users are confident in using the system and that the system functions as expected.

7.1 Admin/User Interface Design:

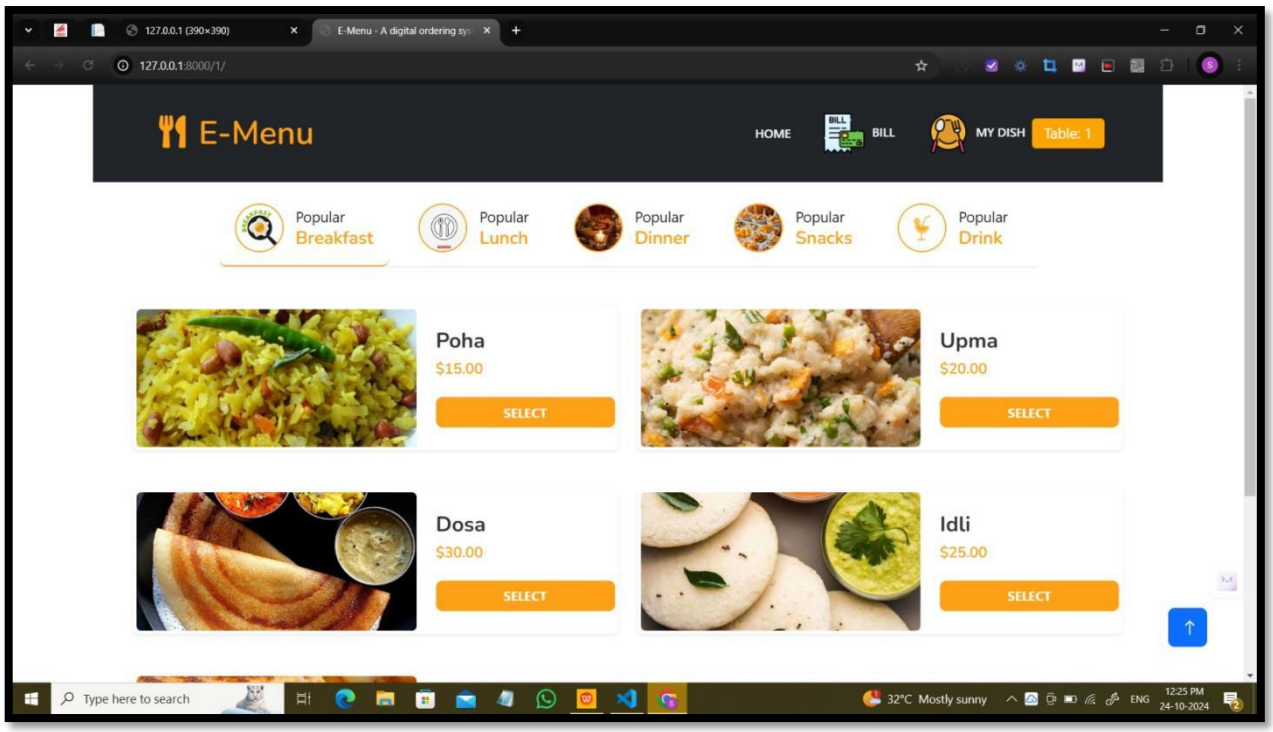
The Admin/User Interface Design focuses on facilitating smooth interaction between the user and the system. It is critical in guiding the user through the process of logging in, navigating the system, and achieving desired outcomes. The following are important guidelines adhered to in the design process:

- **Clarity of next steps**: The system always informs the admin or user about what to do next, ensuring ease of navigation.

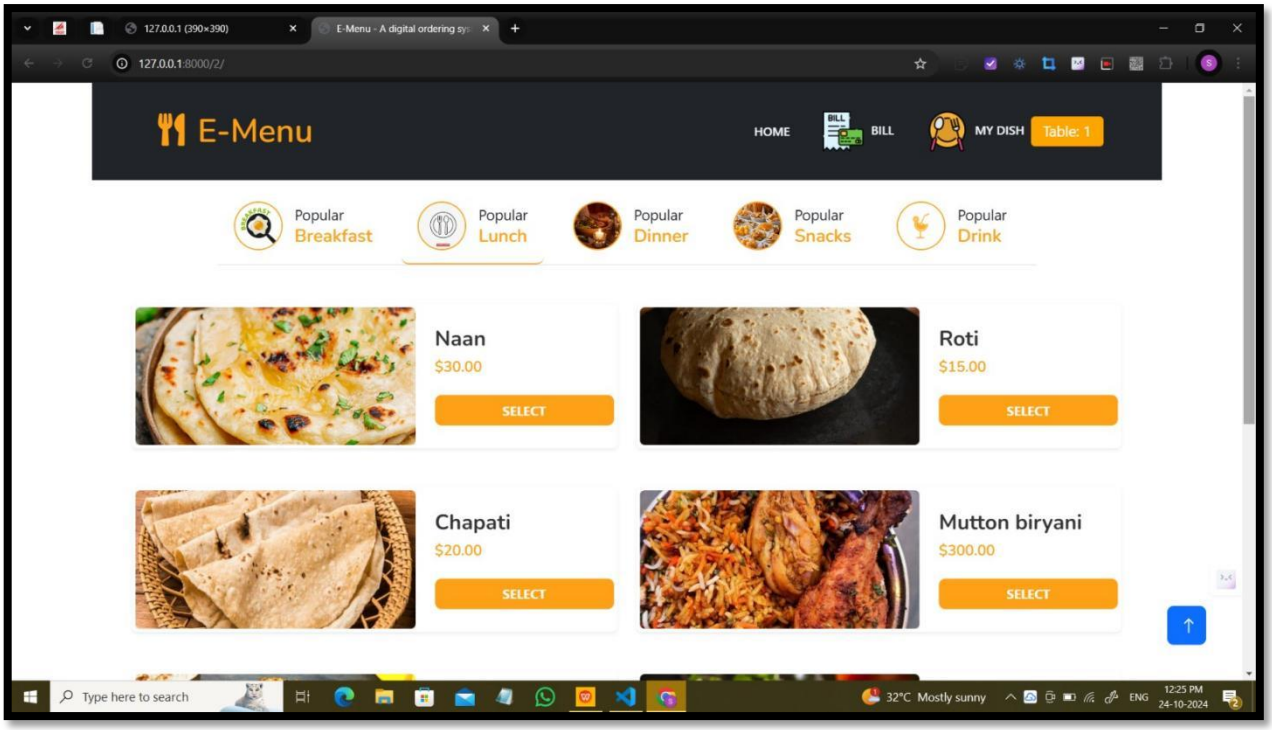
- **Consistent formatting**: Information, instructions, and messages are consistently displayed in the same area on the screen to avoid confusion.
- **Adequate display time**: Messages and instructions are displayed long enough for the admin or user to read them comfortably.
- **Use of display attributes**: Display attributes such as colors or highlights are used sparingly to avoid overwhelming the user.

7.1.1) INTERFACE DESIGN: (Important Screenshots of Front End)

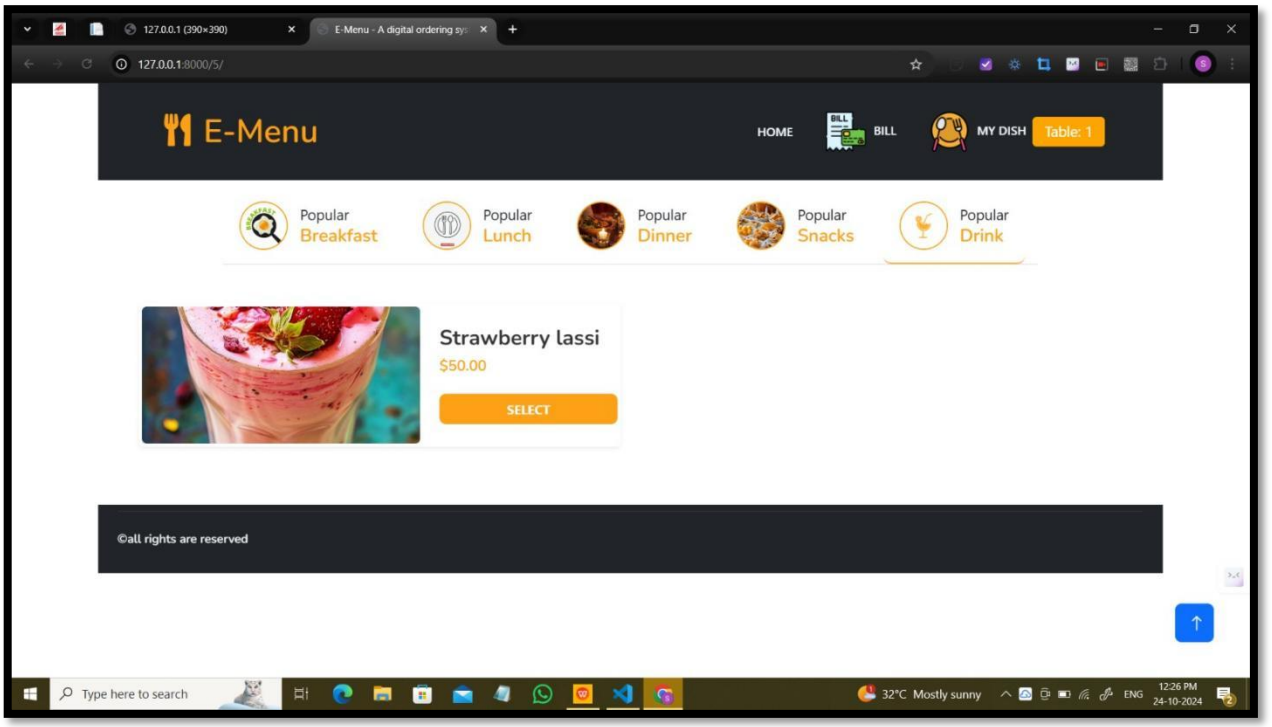
I) Fig.7.1. HOME PAGE(Sorted By Breakfast):



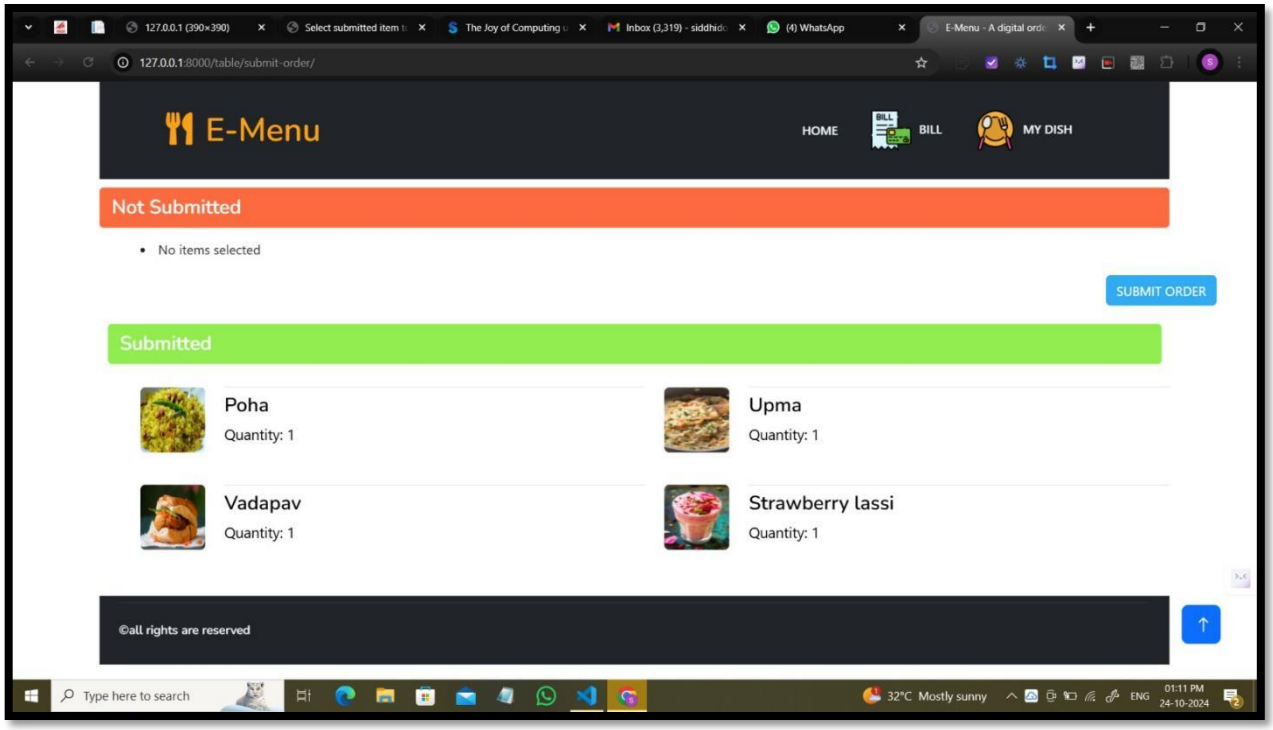
II) Fig.7.2. HOME PAGE(Sorted By Lunch):



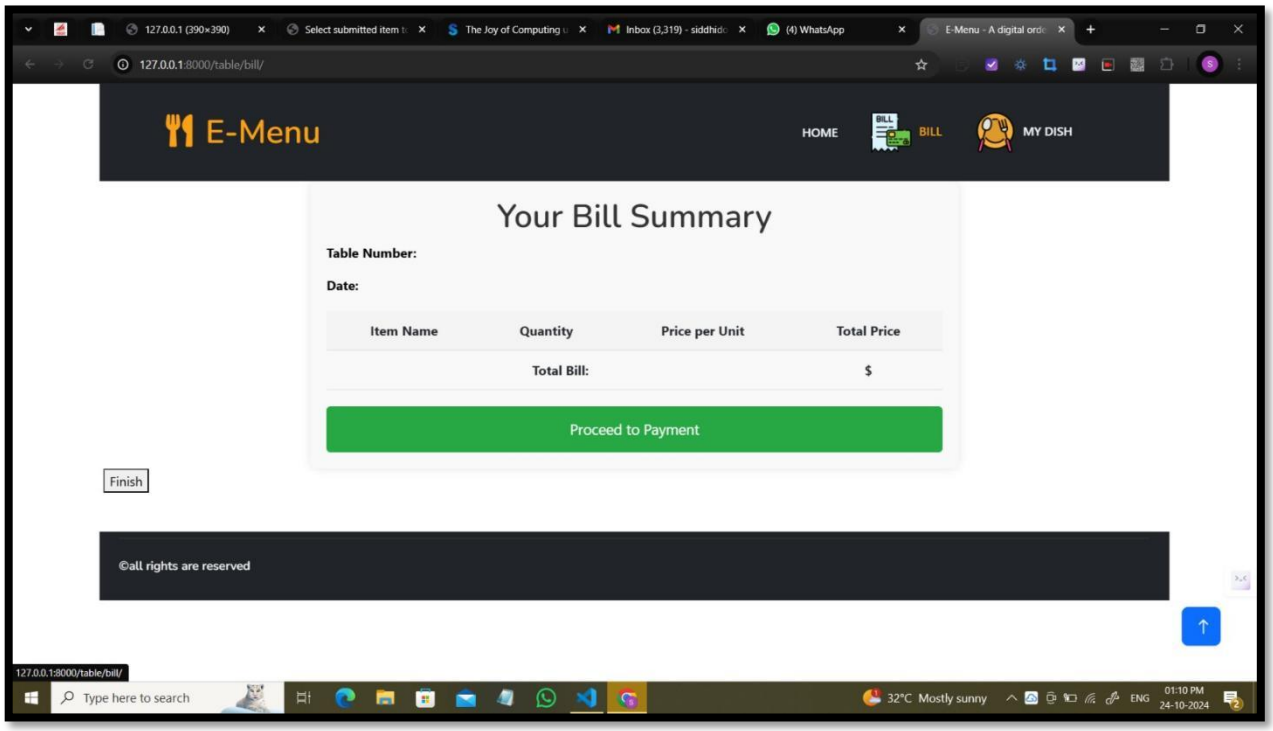
III) Fig.7.3. HOME PAGE(Sorted By Drink):



IV) Fig.7.4 . MY DISH(Ordered Dishes):



V) Fig.7.5. Bill(Total Bill Calculation):

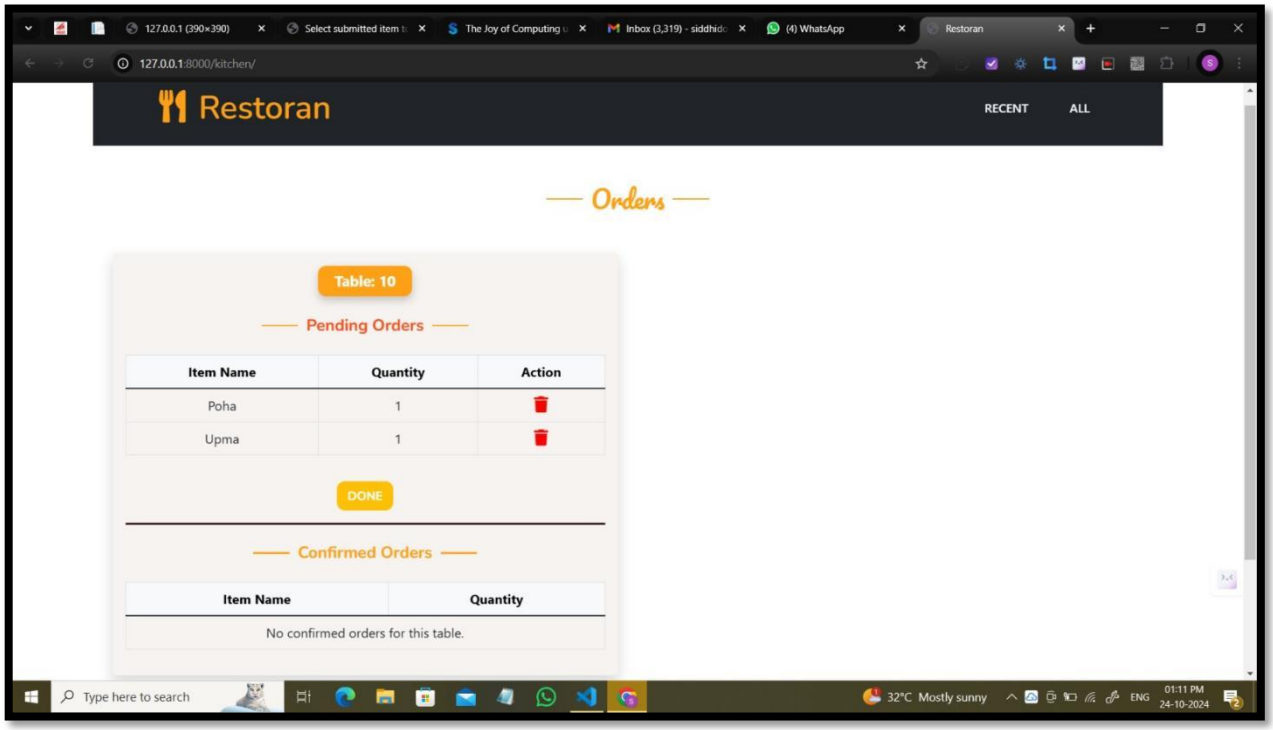


8. RESULT

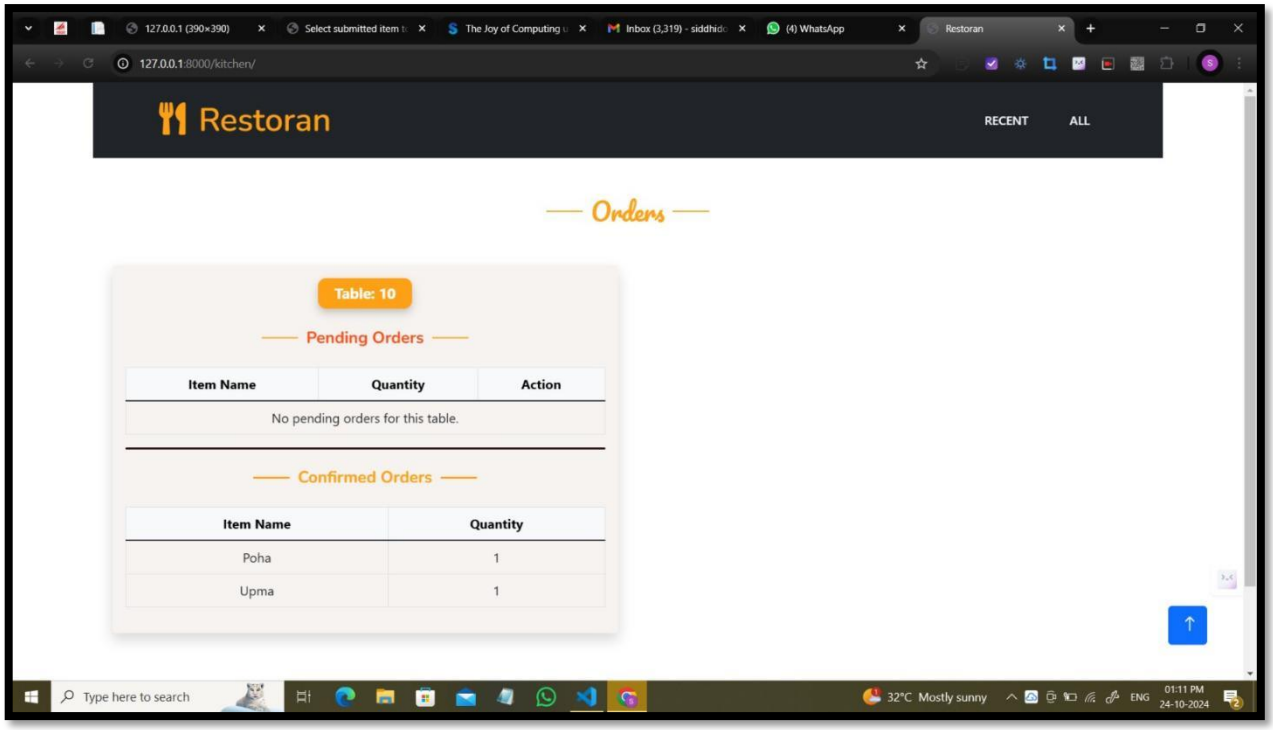
We successfully developed an E-Menu system that integrates modern technology to streamline restaurant operations and improve the dining experience.

- The system enables customers to view the menu, place orders, and receive bills via a QR code, reducing wait times and eliminating the need for physical menus.
- Key functionalities, including automatic bill calculation, order notification to kitchen staff, and seamless payment processing, worked efficiently as intended.
- User feedback indicated a positive reception, with significant improvements in order processing times and overall restaurant management.
- The project demonstrated the scalability and practicality of the eMenu system, making it a versatile solution for restaurants looking to adopt digital innovations

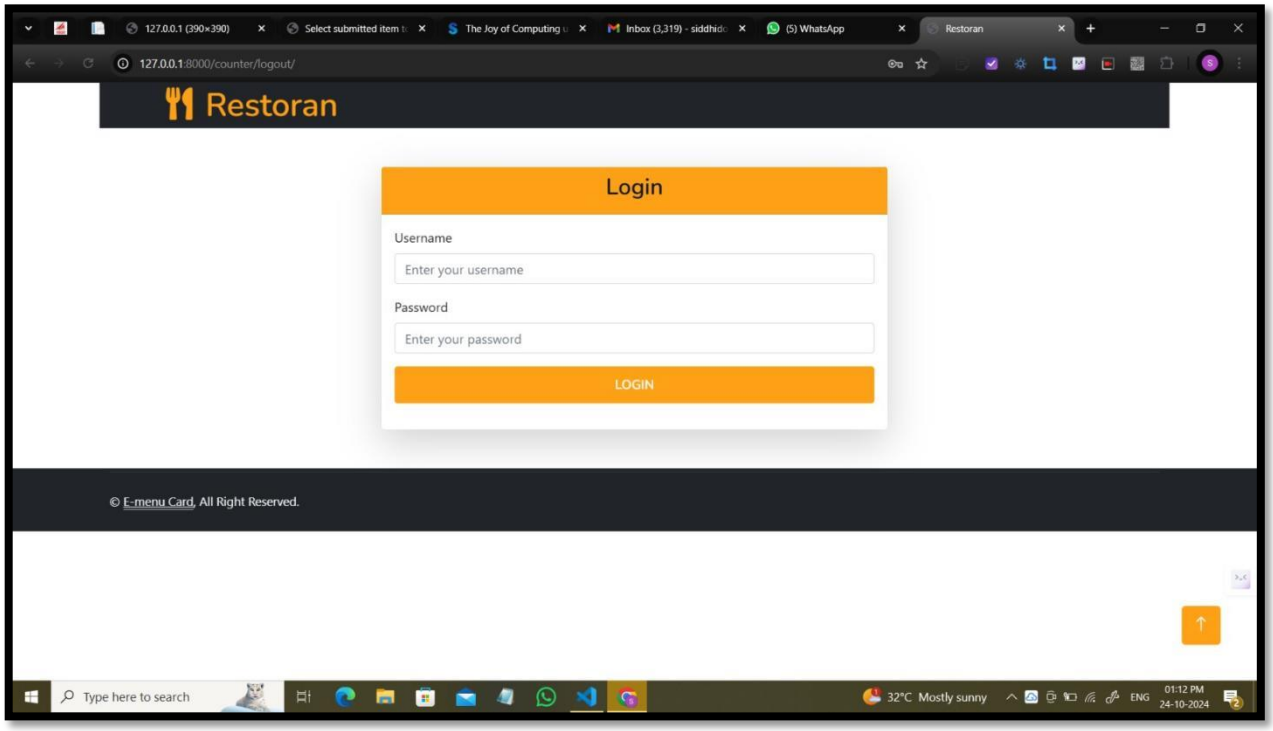
I)Fig. 8.1. Orders(Pending Orders At Kitchen):



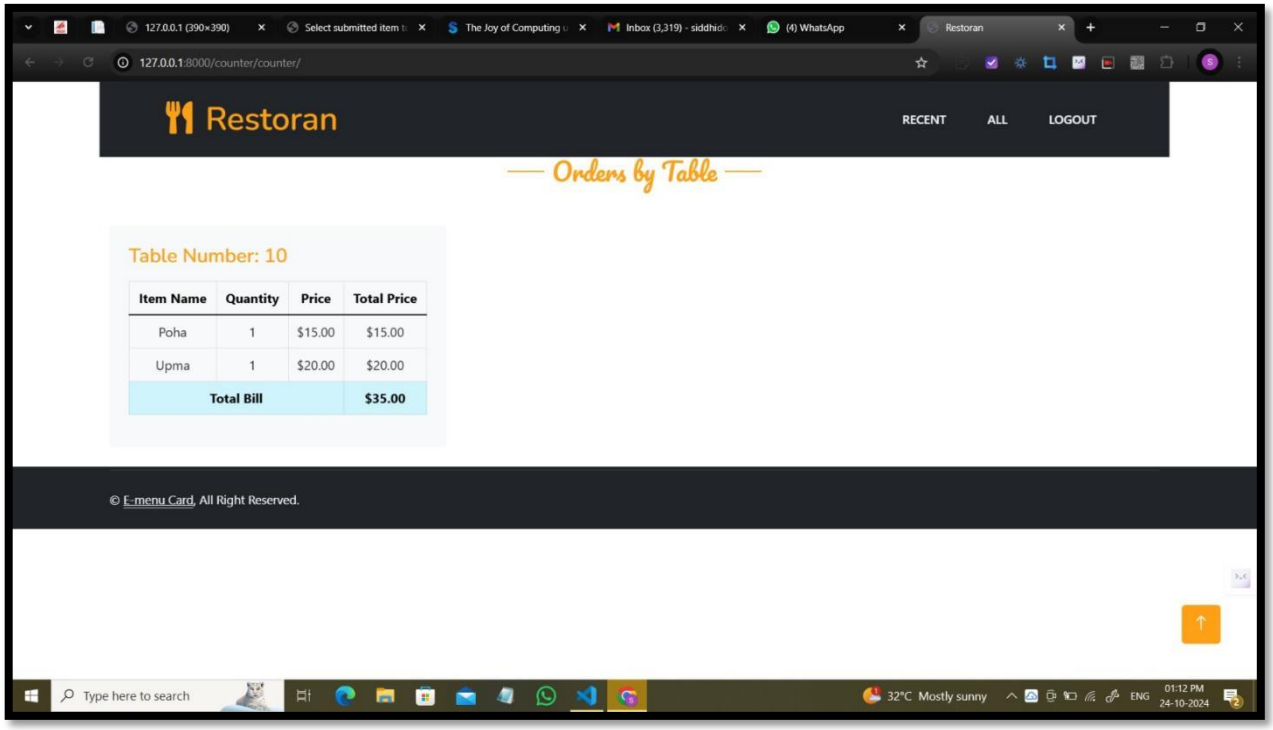
II)Fig. 8.2. Orders(Completed Orders At Kitchen):



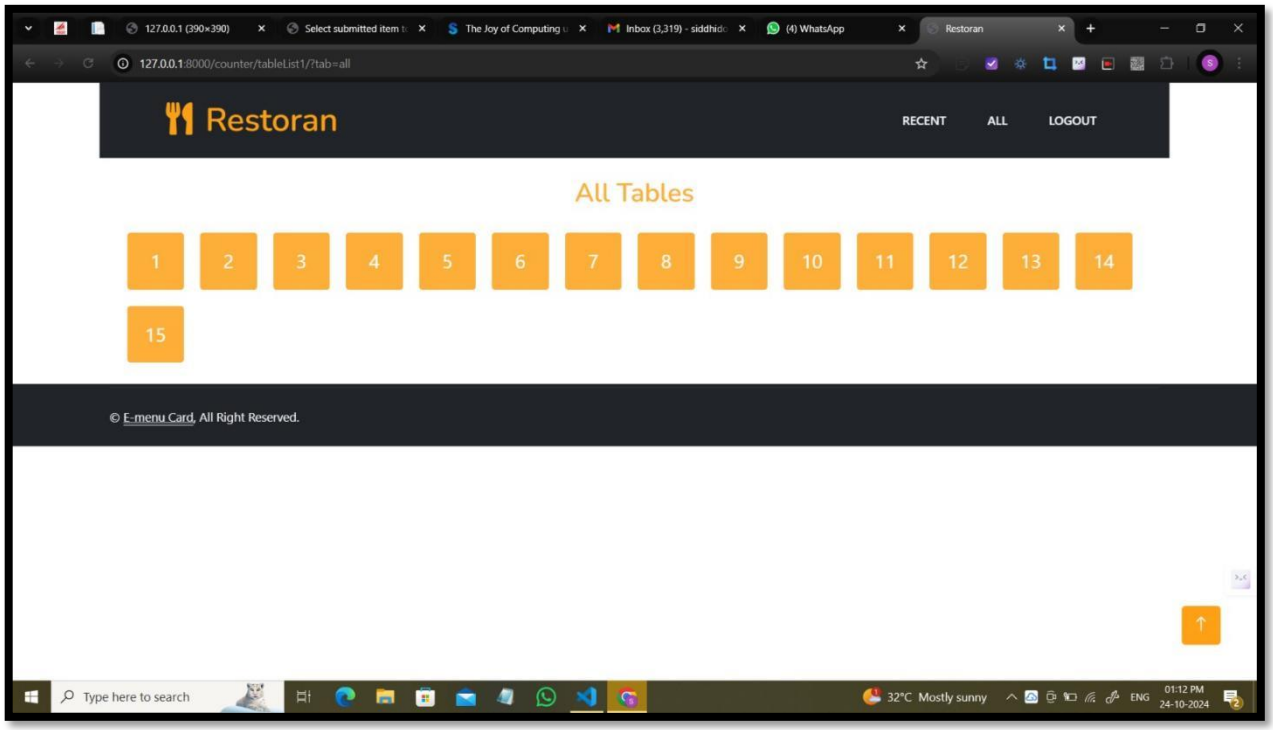
III)Fig. 8.3. Login (Login Page At Counter):



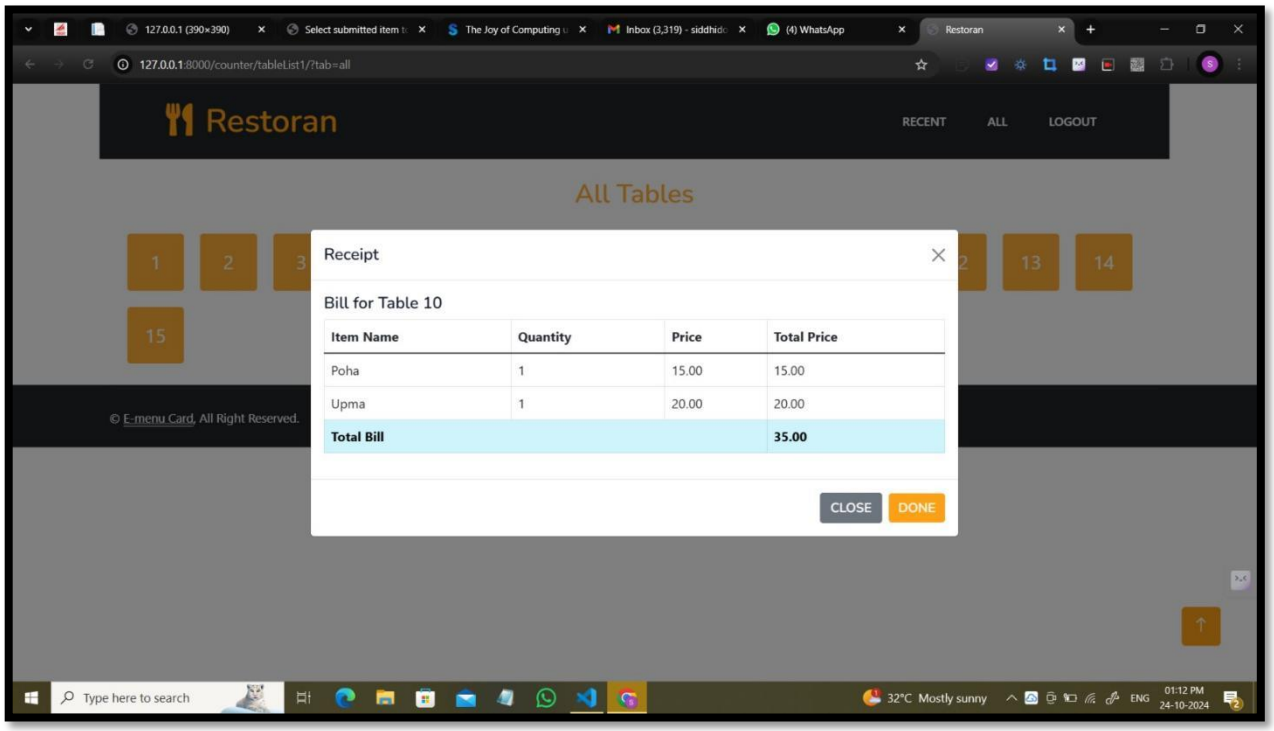
IV)Fig. 8.4. RECENT (Table Wise Bill Calculation):



V)Fig. 8.5. ALL (Pending Bills):



VI)Fig. 8.6. Receipt (Receipt Generation According To Table):



9. CONCLUSION

The E-Menu system effectively demonstrates how digital solutions can transform restaurant operations. By implementing a contactless and efficient ordering process through QR codes, it enhances both customer experience and operational efficiency. The system's scalability and adaptability make it suitable for various restaurant environments. Additionally, the project highlights the potential for further improvements, such as integrating more advanced features like customer analytics and real-time updates, proving to be a valuable asset in the hospitality industry.

10. REFERENCES

1. Rasheed, S., & Priya, P. (2017). An Automated E-menu Ordering System using IoT. In International Journal of Scientific Engineering and Technology Research, Volume 6

2. Vaidya, R. B. (2023). Smart Food Ordering System for Restaurants. In International Journal of Innovative Science and Research Technology, Volume 8

3. Kurniawan, R. (2020). Information System Ordering Online Restaurant Menu at Hover Cafe. In ATM, Volume 4

4. Kurniawan, R. (2020). Information System Ordering Online Restaurant Menu at Hover Cafe. In mini research paper 4

5. Ajzen, I. (1991). Modified model of Theory of Planned Behaviour. In International Journal of Academic Research in Business and Social Sciences, 13(6)

6. Amoah, J., Nadi, A., & Inyang, J. (2021). Consumer Acceptance Towards E-Menu. In International Journal of Academic Research in Business and Social Sciences, 13(6)