



SRM University AP

Department of Computer Science and Engineering

SOFTWARE ENGINEERING

“FAST FOOD BILLING SYSTEM”

Submitted by :

Deekshitha Chirumamilla- AP21110010304

Shreyan Dasari - AP21110010305

Sai Naren Polavarapu- AP21110010306

Sai Vasanth Komallapalli- AP21110010307

CSE-E

Table of contents:

1. Abstract.
2. Introduction.
3. Existing System/Literature review.
4. System Requirements.
5. Proposed System.
6. Results/Screenshots
7. Conclusion.
8. References.

1.Abstract

In the fast-paced environment of the fast food industry, efficient order processing and billing are crucial for customer satisfaction and operational success. This project presents a Fast Food Billing System that connects customers, managers, and chefs through a seamless platform, utilizing a SQL-based backend to ensure secure and reliable data management.

Customers interact with the system through a user-friendly interface, where they can create accounts with unique usernames and passwords. Once logged in, they can add items to their cart, view order details, and complete the payment process. This streamlined experience reduces wait times and improves customer satisfaction. Managers have access to a dashboard where they can monitor customer activities, including order histories and payment statuses. This oversight helps managers ensure accurate billing, track business performance, and generate reports for analysis and auditing.

Chefs use a real-time order display that provides detailed information on incoming orders, allowing them to prioritize tasks and coordinate kitchen operations efficiently. This feature helps reduce errors and ensures timely food preparation.

The system's SQL-based backend supports secure data storage and retrieval, while its flexible architecture allows for scalability, making it suitable for various restaurant sizes and complexities. Overall, the Fast Food Billing System provides a comprehensive solution for fast food businesses, enhancing operational efficiency, accuracy, and customer experience.

2.Introduction

Fast Food Billing Systems are central to maintaining efficiency and profitability in the fast food industry, where quick service and accuracy are paramount. These systems provide a streamlined process for order management, payment handling, and inventory tracking. By automating various tasks, Fast Food Billing Systems enable restaurants to reduce errors, minimize customer wait times, and ensure accurate billing. This, in turn, leads to improved customer satisfaction and smoother restaurant operations. In a typical fast food establishment, Fast Food Billing Systems facilitate quick order processing, allowing customers to select menu items, customize their orders, and complete transactions swiftly. The system's ability to calculate totals, apply taxes, and handle various payment methods contributes to a seamless customer experience. These features also minimize human errors, which can otherwise lead to billing discrepancies or over/undercharging customers. Additionally, the system's inventory tracking capabilities help managers maintain optimal stock levels, reducing waste and preventing shortages.

Another key aspect of Fast Food Billing Systems is the ability to provide detailed reports and data analytics. These tools give restaurant managers insights into sales trends, peak business hours, and customer preferences, allowing for more informed decision-making. Security is also a top priority, with robust measures such as user authentication, encrypted data storage, and secure payment gateways ensuring customer information is protected. These features make Fast Food Billing Systems a crucial component for fast food businesses looking to improve operational efficiency while maintaining a high level of customer satisfaction and security.

2.1 Definitions

- **Fast Food:** A type of food service characterized by quick preparation and service, often featuring pre-prepared or quickly prepared items. Fast food establishments typically have high customer traffic and require efficient operations.
- **Billing System:** A software application designed to manage transactions, including order processing, bill calculation, and payment processing. In a fast food context, billing systems need to be fast, accurate, and user-friendly.
- **Order Processing:** The process of taking customer orders, recording them in the system, and relaying them to the kitchen for preparation. This step often involves customer interaction through digital interfaces or direct communication with cashiers.
- **Payment Processing:** The process of calculating the total bill, and handling various payment methods. Fast food billing systems often support cash, credit cards, and digital wallets to facilitate quick transactions.
- **User Interface (UI):** The visual elements and design through which users interact with the billing system. In fast food billing systems, UIs are designed to be intuitive and user-friendly, allowing customers to place orders and staff to process transactions quickly.

2.2 Terminologies:

- **Customer:** The individual who places an order at a fast food establishment. Customers typically interact with the billing system through user interfaces.
- **Manager:** The person responsible for overseeing the fast food establishment's operations. Managers use the billing system to monitor transactions, view reports, and ensure the business runs smoothly.
- **Chef:** The individual or team responsible for preparing food based on customer orders. Chefs use the billing system to view order details and track order status to ensure efficient kitchen operations.
- **Cart:** A virtual representation of a customer's order, where they can add, remove, or adjust items before finalizing their purchase.
- **Order Record:** A stored data representation of an order in the system. Order records typically contain information like customer ID, items ordered, quantities, prices, order status, and timestamps.
- **Menu:** A digital list of available food and drink items from which customers can choose. In a Fast Food Billing System, the menu is usually dynamic, allowing for updates and customization.

3.Existing System/ Literature Survey

3.1 Existing Fast Food Billing Systems

Fast Food Billing Systems have evolved to meet the changing needs of the fast food industry. These systems are designed to process large volumes of orders quickly and accurately, supporting various payment methods and providing real-time order tracking. The following are some examples of existing systems used in fast food establishments:

Point-of-Sale (POS) Systems:Point-of-Sale (POS) systems are a common component of fast food billing systems, providing the hardware and software necessary to process transactions. Companies like Square, Toast, and Lightspeed offer POS systems designed specifically for the food service industry. These systems typically include features like:

- **Order Processing:** POS systems allow for quick order entry and management, often using touchscreen interfaces for ease of use.
- **Payment Processing:** POS systems support various payment methods, including cash, credit/debit cards, and mobile payments.
- **Reporting and Analytics:** POS systems often include reporting tools that provide insights into sales trends, employee performance, and more.

Advantages: POS systems are widely used and generally reliable. They offer a range of features designed to improve efficiency and accuracy in fast food establishments. Their integration with other systems, such as kitchen display systems (KDS), enhances order fulfillment efficiency.

Limitations: POS systems can be expensive, especially for small businesses. Customization may be limited, and some systems require specific hardware. Additionally, POS systems may face security risks if not properly maintained or secured.

Online Ordering Platforms: Online ordering platforms have become increasingly popular in the fast food industry, allowing customers to place orders through websites or mobile apps. Companies like DoorDash, Uber Eats, and Grubhub offer platforms that connect customers with fast food restaurants. These platforms typically feature:

- **User Interfaces:** Online platforms provide intuitive interfaces for customers to place orders and make payments.
- **Order Management:** Restaurants can manage incoming orders from online platforms, often integrating with POS systems.
- **Delivery and Pickup:** Online platforms often support delivery and pickup options, expanding a restaurant's reach.

Advantages: Online ordering platforms increase customer convenience and expand a restaurant's customer base. They can boost sales by offering delivery and pickup services.

Limitations: These platforms often charge fees, which can reduce profit margins. Integration with existing systems can be challenging, and customer data may be shared with third-party providers.

3.2 Existing Works by the Researchers

The field of Fast Food Billing Systems is also influenced by ongoing research and emerging technologies. Artificial intelligence (AI) and machine learning (ML) are increasingly being used to optimize order processing, personalize customer experiences, and improve inventory management. Notable research areas include:

AI-Based Order Processing: AI-based systems can streamline order processing by recognizing patterns in customer behavior and predicting popular items. For example, AI-driven chatbots can take orders via messaging platforms, reducing the need for human intervention.

Advantages: AI-based order processing can increase efficiency and reduce staffing needs. It also offers opportunities for personalized customer experiences and targeted marketing.

Limitations: AI systems require significant data and computing resources. Implementing AI solutions can be costly, and there may be concerns about data privacy and security.

4. System Requirements

4.1 Software Requirements

A Fast Food Billing System requires a combination of frontend and backend technologies to ensure a seamless user experience and efficient data management. The following describes the key software components and technologies used in the development of such system.

Frontend Development

- **HTML (HyperText Markup Language):** HTML is the foundational markup language used to create the structure of the web interface. It defines the layout of the user interface for customers, cashiers, managers, and other users interacting with the system.
- **CSS (Cascading Style Sheets):** CSS is used to style and design the appearance of the user interface. It controls elements such as fonts, colors, spacing, and overall layout, enhancing the visual appeal and usability of the system.
- **JavaScript:** JavaScript is the primary language for adding interactivity and dynamic behavior to the frontend. It enables real-time updates, responsive design, and client-side logic, allowing for features like interactive menus, order carts, and live order status tracking.

Backend Development

- **Python:** Python is a versatile programming language used for server-side development in this system. It provides a robust framework for handling business logic, data processing, and backend operations.
- **Flask:** Flask is a lightweight web framework for Python, designed to build scalable and flexible web applications. It serves as the backend server, managing requests, routing, and communication between the frontend and backend. Flask's modularity allows for easy integration of various components and extensions.
- **MySQL:** MySQL is a popular relational database management system used to store and manage data. It provides the backend infrastructure to store order records, customer information, payment data, inventory levels, and other essential information. MySQL's stability and scalability make it suitable for fast food billing systems.

Development and Testing Tools

- **Integrated Development Environment (IDE):** Tools like Visual Studio Code, PyCharm, or Sublime Text for development and debugging.

4.2 Hardware Requirements

Server

- **Processor:** A multi-core processor (such as Intel Core i5 or equivalent) is necessary to handle multiple concurrent requests and manage backend database operations efficiently.
- **RAM:** A minimum of 4GB of RAM is required, but higher capacities (8GB or more) are recommended for improved performance and smoother operation under heavy load.
- **Storage:** Solid-state drives (SSDs) are recommended for their faster data access and retrieval, contributing to quicker response times in the billing system.
- **Operating System:** Linux-based operating systems (such as Ubuntu Server or CentOS) are commonly used due to their stability and performance, and they work well with Python and Flask-based applications.

Client Devices

- **Desktop/Laptop Computers:** Any modern desktop or laptop computer that can run web browsers such as Google Chrome, Mozilla Firefox, or Microsoft Edge. These devices are typically used by managers for overseeing operations, viewing reports, and managing inventory.

Networking

- **Internet Connection:** A stable internet connection with adequate bandwidth is essential for accessing online resources, integrating with payment gateways, and ensuring smooth communication with external services.

5. Proposed System

The proposed Fast Food Billing System aims to streamline the ordering and payment process for customers while providing essential tools for management and kitchen staff. The system features a single login page with role-based access, allowing customers, managers, and chefs to log in using unique identifiers. Customers can view the menu, add items to their cart, and proceed with payment. Managers can monitor users and their payment status, while chefs can view order details and update order statuses.

5.1 User Roles and Features

Customer Role: Customers log in with a unique identifier in the format **username@customer**. After login, they can:

- View the menu and select items to add to their cart.
- Adjust item quantities in the cart.
- View the total bill and choose from multiple payment options (cash, UPI, credit/debit card).
- After successful payment, a thank-you page appears, confirming the completion of the order.

Manager Role: Managers log in with a unique identifier in the format **username@manager**. After login, they can:

- View all user accounts, including customers and chefs.
- Monitor the payment status of customers to ensure accurate billing.
- Access additional reports and insights for business analysis.

Chef Role: Chefs log in with a unique identifier in the format **username@chef**. After login, they can:

- View the details of orders placed by customers, including item descriptions and quantities.
- Update the status of orders to indicate whether they have been delivered.

5.2 Backend Structure

The backend is built on an SQL database with six key tables that manage the following aspects of the system:

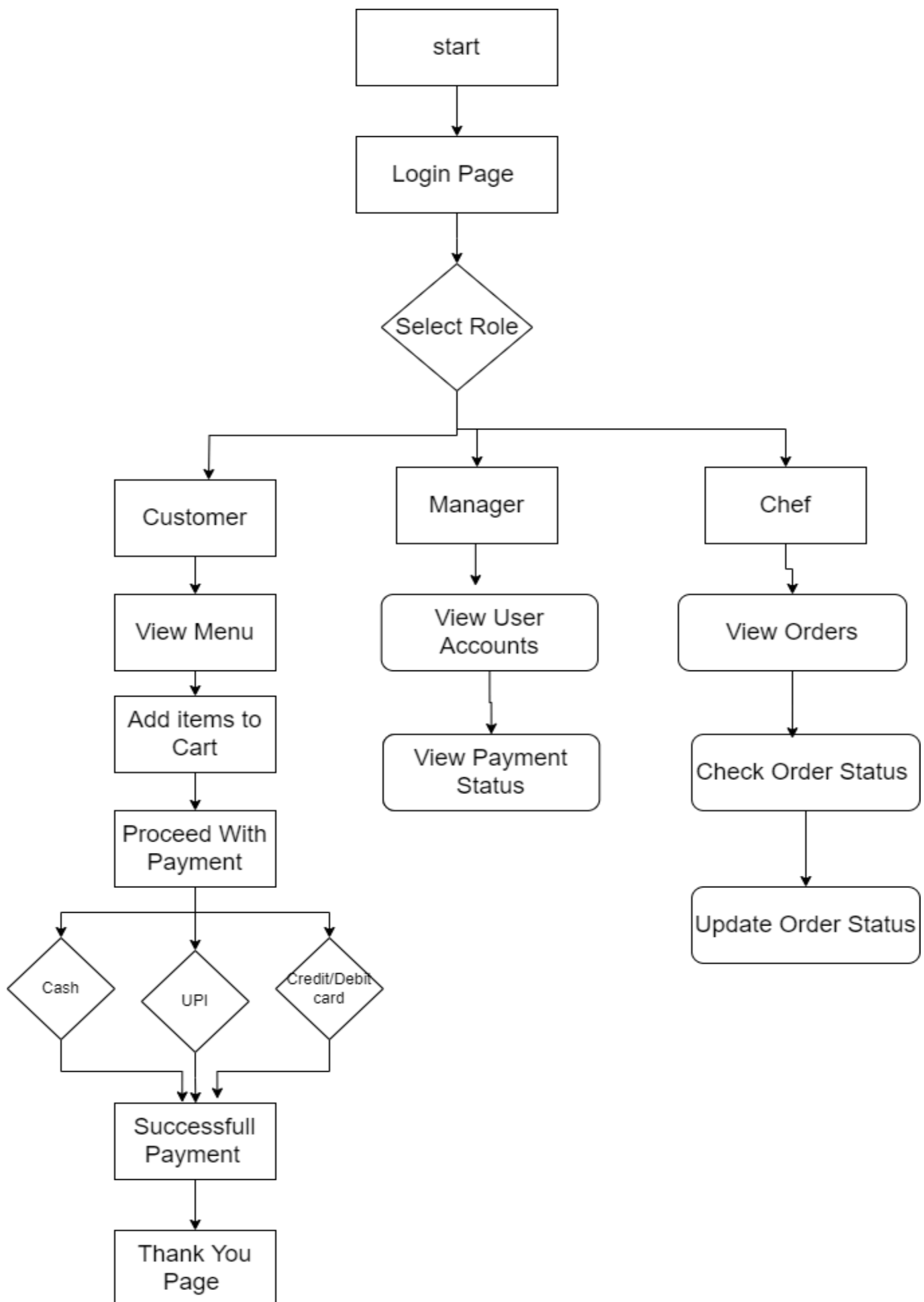
- **Records:** Stores all transaction records, including order details, payment methods, and timestamps.
- **Orders:** Contains information about individual orders, such as customer ID, item descriptions, quantities, and order status.
- **Price:** Stores pricing information for all menu items.

- **Accounts:** Contains user account information, including login credentials and role identifiers (customer, manager, chef).
- **Chef:** Stores data related to chef activities, such as orders fulfilled and statuses updated.
- **Manager:** Contains information related to managerial activities, such as viewing user accounts and payment status.

5.3 System Workflow

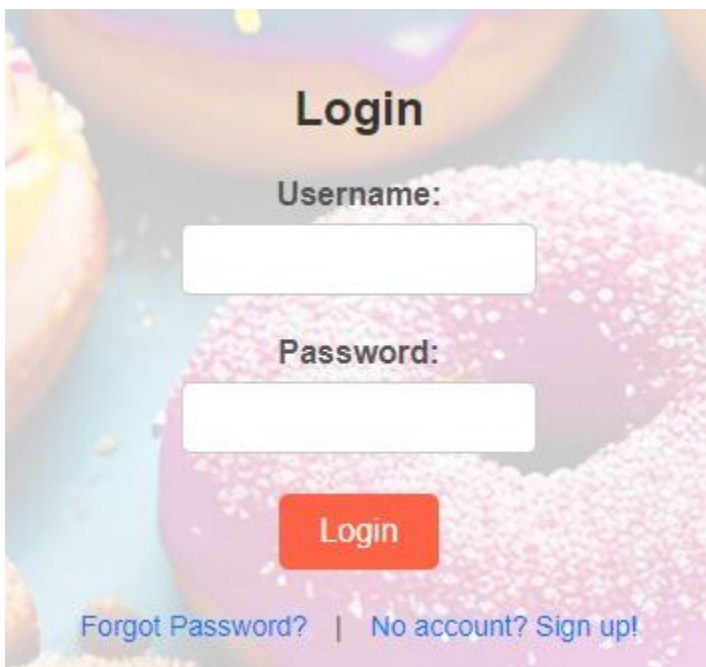
In the proposed system, the single login page allows users to sign in with their unique role-based identifiers. Customers can view the menu, add items to their cart, and proceed with payment. After successful payment, they are redirected to a thank-you page. Managers can view all user accounts and monitor payment statuses. Chefs have access to order details and can update the order status upon delivering the food.

This system structure provides a comprehensive solution for fast food billing, offering flexibility and role-based access to meet the needs of customers, managers, and chefs.



6.Results

HOME PAGE



The login form is centered on the page with a background of colorful donuts. It features a title, two input fields, a button, and two links at the bottom.

Login

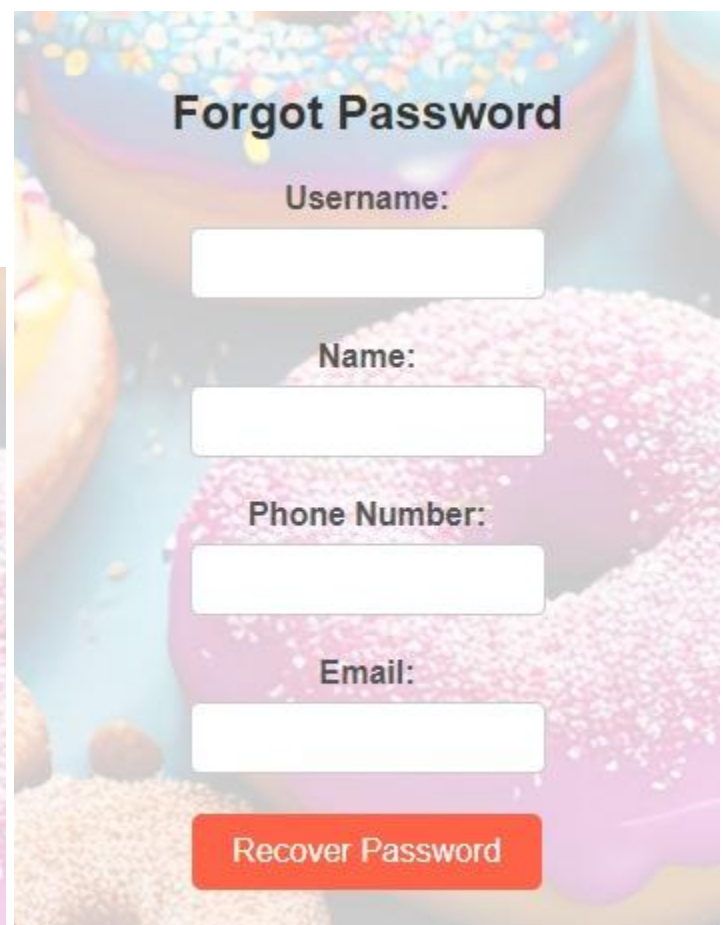
Username:

Password:

Login

[Forgot Password?](#) | [No account? Sign up!](#)

FORGOT PASSWORD



The forgot password form is centered on the page with a background of colorful donuts. It features a title, four input fields, a button, and a link at the bottom.

Forgot Password

Username:

Name:

Phone Number:

Email:

Recover Password

[Back to Home](#)

MANAGER DASHBOARD

Manager Dashboard

Username	Payment Status
deekshita@customer	Yes
mahita@customer	Yes
naren@customer	Yes

CHEF DASHBOARD

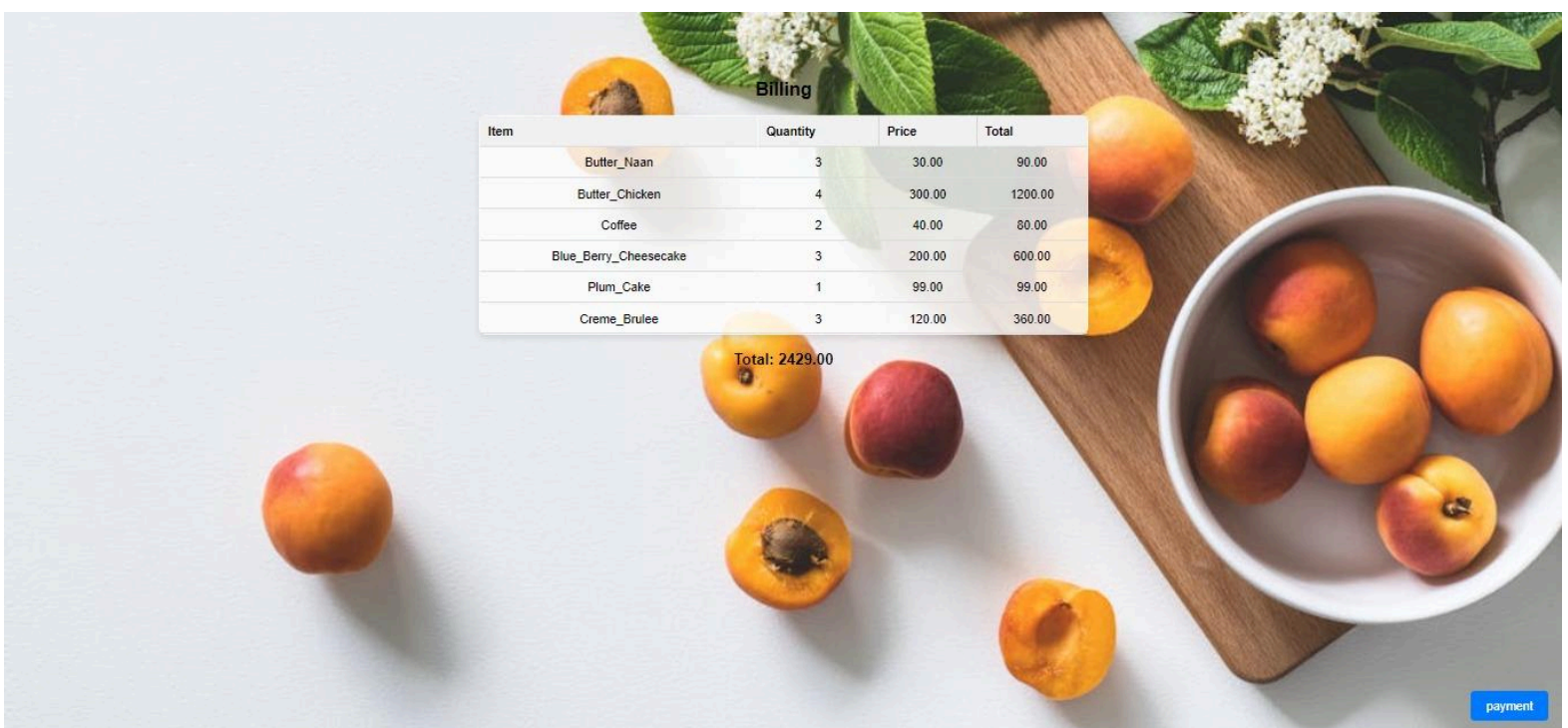
naren@customer

Item	Quantity	Status
username	3	<input checked="" type="checkbox"/>
Mixed_Vegetable	4	<input checked="" type="checkbox"/>
Tea	2	<input type="checkbox"/>
Spring_Rolls	3	<input type="checkbox"/>
Brownie_With_Ice_Cream	1	<input type="checkbox"/>
Apple_Pie	3	<input type="checkbox"/>

mahita@customer

Item	Quantity	Status
username	4	<input type="checkbox"/>
Mixed_Vegetable	2	<input type="checkbox"/>

CUSTOMER DASHBOARD

The background of the dashboard is a high-quality photograph of fresh peaches. Some are whole, some are sliced open to show the pit, and they are arranged on a light-colored wooden cutting board. A small white bowl filled with more peaches sits on the right side of the board. In the top right corner, there is a small blue button with the word "payment" in white text.

Billing

Item	Quantity	Price	Total
Butter_Naan	3	30.00	90.00
Butter_Chicken	4	300.00	1200.00
Coffee	2	40.00	80.00
Blue_Berry_Cheesecake	3	200.00	600.00
Plum_Cake	1	99.00	99.00
Creme_Brulle	3	120.00	360.00

Total: 2429.00

Payment Methods

UPI

Credit/Debit Card

Cash

Thank You for Your Order! Your order has been placed successfully.

7. Conclusion and Future Work

The Fast Food Billing System project aimed to create an efficient, user-friendly, and scalable solution for managing customer orders, processing payments, and supporting fast food restaurant operations. By implementing a unified login system with role-based access, the project provided a flexible platform for customers, managers, and chefs to interact with the system according to their specific needs.

Our Fast Food Billing System's success is attributed to the combined use of incremental and iterative development models. These approaches allowed for rapid progress, flexibility in adapting to changing requirements, and the delivery of a robust system that enhances operational efficiency and customer satisfaction.

The proposed system's architecture, based on a Flask backend with a SQL database, offered reliability and scalability, accommodating the varying demands of fast food establishments. The use of modern web technologies like HTML, CSS, and JavaScript provided a responsive and interactive frontend, enhancing usability for both customers and staff. Additionally, the system's integration with multiple payment methods allowed for flexibility and convenience during transactions.

Future work for the Fast Food Billing System can focus on enhancing security with multi-factor authentication, expanding reporting with advanced analytics for better business insights, and integrating with third-party delivery platforms to broaden service options. Additionally, developing dedicated mobile applications for a seamless customer experience and applying machine learning for more accurate inventory management could further improve efficiency and customer satisfaction. These enhancements will help the system adapt to evolving industry trends and user expectations.

8.References

- 1.Text Book - Object-Oriented Modeling and Design with UML- Michael Blaha, James Rumbaugh
- 2.Text Book-Fundamentals of Software Engineering, Fourth Edition, Rajib Mall
- 3.M .W. B. M. NASIR, N. S. A. B. ISMAIL, and R. B. A. RAHIM, "Restaurant billing system project," Tech. Rep., 2022.