
Fast food billing system

Software Requirements Specification

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Revision History

Name	Date	Reason For Changes	Version

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1. Introduction

This document includes specifications and features of the software in detail. It helps understand the target audience and user classes accordingly and internal and external interface requirements.

Purpose

The purpose of the fast food billing system software for customers is to streamline order processing, billing, and improve the overall dining experience. It focuses on reducing wait times, order customization and sorting options and facilitating easy digital payments for a convenient and satisfying customer interaction.

Document Conventions

This is the hand written document that follows specific rules to keep everything clear and organized. For example, we use capital letters for important words and bold for titles.

Intended Audience

This document is intended for developers, testers, project managers, and stakeholders involved in the development and implementation of the Fast Food Billing System.

additional information

1. ****User Support:**** *Clear instructions for users and troubleshooting steps will be provided in user manuals and help documentation to ensure smooth operation of the system.*

2. ****Accessibility Features:**** *The system will incorporate accessibility features such as screen reader compatibility and keyboard navigation to accommodate users with disabilities and ensure inclusivity.*

1.5 References

The following references were consulted during the development of this Software Requirements Specification (SRS):

ISO/IEC/IEEE 29148:2018, "Systems and software engineering -- Life cycle processes -- Requirements engineering."

2. Overall Description

The following section mentions overview of the system, its operating environment and dependencies.

Product Perspective

The fast food billing system is designed to seamlessly integrate with existing POS systems and payment gateways commonly used in fast food restaurants. It acts as an intermediary between these systems, handling order processing, billing, and payment functions efficiently.

Product Functions

Menu Management: Allows administrators to easily add, edit, and delete menu items, along with categorization and pricing.

Order Processing: Facilitates the creation, modification, and cancellation of orders, with features for adding/removing items and calculating total costs.

Billing: Generates bills/receipts for each order and provides options for printing or emailing them to customers.

Payment Processing: Supports various payment methods such as cash, credit/debit cards, and mobile payments, integrating with payment gateways for secure transactions.

User Management: Allows for the creation and management of user accounts with different access levels, catering to the needs of cashiers, managers, and other staff members.

User Classes and Characteristics

Chef: Typically operate in a fast-paced environment and may have limited technical expertise. They require a user-friendly interface for quick order processing.

Managers: Need access to detailed reports and administrative functions for overseeing operations and making informed decisions.

Customers: Non-technical users who expect clear and straightforward billing and payment processes to complete their transactions efficiently.

Operating Environment

The fast food billing system is platform-independent and can run on various operating systems, including Windows, macOS, and Linux distributions. It requires a modern web browser such as Google Chrome, Mozilla Firefox, or Microsoft Edge for accessing the web-based interface.

User environment

The fast food billing system is designed to operate on standard desktop computers running Windows 10 or later, with a minimum of 4GB RAM and a dual-core processor.

Additionally, the system relies on a stable internet connection for uninterrupted operation and data synchronization with central servers.

Design/Implementation Constraints

The fast food billing system must adhere to existing hardware infrastructure limitations, necessitating compatibility with barcode scanners, receipt printers, and cash drawers commonly used in fast food establishments. Testing will be crucial to make sure everything works together without any issues.

Assumptions and Dependencies

Internet Connectivity: The system relies on internet connectivity for real-time communication with payment gateways and other external services, assuming a stable and reliable internet connection is available.

Hardware Availability: The system assumes the availability of POS systems or tablets equipped with compatible hardware for installation and operation in fast food restaurant environments.

3. System Features

Personal Details

3.1.1 Description and Priority

The Personal Details feature enables the system to capture and securely store essential customer information, including name, contact details, and delivery preferences. This feature is of High Priority, as it is crucial for creating personalized and efficient customer experiences.

3.1.2 Stimulus/Response Sequences

1. Stimulus: Customer initiates the order process.

- Response: System prompts for personal details, including name, contact number, and delivery address.
- 2. Stimulus: Returning customer logs in.
 - Response: System retrieves stored personal details and presents them for confirmation.

3.1.3 Functional Requirements

- REQ-1: The system shall provide a form for customers to enter personal details.
- REQ-2: Personal details, including name and contact number, shall be mandatory fields.
- REQ-3: The system shall securely store personal details in the database.
- REQ-4: Returning customers shall have the option to log in and retrieve their stored details.
- REQ-5: The system shall validate the format of the contact number entered by the user.
- REQ-6: In case of incorrect or incomplete details, the system shall provide appropriate error messages.

3.2 Show Menu

3.2.1 Description and Priority

The Show Menu feature presents a visually appealing and detailed menu with item descriptions and prices. This feature is of High Priority, as it forms the foundation for customer interaction and order placement.

3.2.2 Stimulus/Response Sequences

1. Stimulus: Customer accesses the system.
 - Response: System displays the menu with categories and item details.
2. Stimulus: Customer selects a category.
 - Response: System filters and displays items within the selected category.

3.2.3 Functional Requirements

- REQ-1: The system shall display a categorized menu with clear item descriptions and prices.
- REQ-2: Customers shall be able to navigate through menu categories.
- REQ-3: Each menu item shall be accompanied by a high-quality image.
- REQ-4: The system shall allow customers to view details of an individual menu item.
- REQ-5: Prices displayed shall be updated in real-time based on any customizations.

3.3 Place Order

3.3.1 Description and Priority

The Place Order feature facilitates a user-friendly order placement process, ensuring ease of selection and submission. This feature is of High Priority, as it directly influences the customer's ability to complete a transaction.

3.3.2 Stimulus/Response Sequences

1. Stimulus: Customer selects items and proceeds to checkout.
 - Response: System presents a summary of selected items and prompts for customization.
2. Stimulus: Customer customizes items.
 - Response: System updates the order summary in real-time.

3.3.3 Functional Requirements

- REQ-1: The system shall allow customers to add items to the order cart.
- REQ-2: Customers shall have the option to customize selected items.
- REQ-3: The system shall display a summary of selected items before finalizing the order.
- REQ-4: Customers shall be able to review and modify their order before confirming.
- REQ-5: The system shall calculate and display the final order total.
- REQ-6: Customers shall have the option to proceed with the payment process or continue shopping.

3.4 Customization

3.4.1 Description and Priority

The Customization feature empowers customers to personalize their orders through flexible customization options. This feature is of High Priority, as it enhances the customer experience by allowing tailored food selections.

3.4.2 Stimulus/Response Sequences

1. Stimulus: Customer selects a customizable item.
 - Response: System presents customization options, such as toppings, ingredients, and portion size.
2. Stimulus: Customer makes customization choices.
 - Response: System updates the order summary to reflect chosen customizations.

3.4.3 Functional Requirements

- REQ-1: The system shall identify customizable items on the menu.

- REQ-2: Customers shall be prompted with customization options upon selecting a customizable item.
- REQ-3: The system shall accurately update the order summary based on customer customization choices.
- REQ-4: Customization options shall include, but not be limited to, toppings, ingredients, and portion size.

3.5 Sorting

3.5.1 Description and Priority

The Sorting feature implements intuitive sorting options for the menu, catering to various customer preferences. This feature is of Medium Priority, enhancing the ease of navigation through the menu.

3.5.2 Stimulus/Response Sequences

1. Stimulus: Customer views a menu category.
 - Response: System provides sorting options, such as alphabetical, price, and popularity.
2. Stimulus: Customer selects a sorting criterion.
 - Response: System reorganizes the menu items based on the chosen criterion.

3.5.3 Functional Requirements

- REQ-1: The system shall provide sorting options for menu categories.
- REQ-2: Sorting options shall include alphabetical order, price, and popularity.
- REQ-3: Customers shall be able to easily switch between sorting criteria.
- REQ-4: The system shall display a visually clear indication of the currently applied sorting criterion.

3.6 Track Time

3.6.1 Description and Priority

The Track Time feature provides real-time updates on the status and estimated time of delivery for customer orders. This feature is of Medium Priority, offering transparency and convenience in monitoring order progress.

3.6.2 Stimulus/Response Sequences

1. Stimulus: Customer confirms the order.

- Response: System initiates real-time tracking and provides an estimated delivery time.
- 2. Stimulus: Customer checks order status.
 - Response: System displays the current status (e.g., preparing, out for delivery) and updates the estimated time dynamically.

3.6.3 Functional Requirements

- REQ-1: The system shall track the status of each order in real-time.
- REQ-2: Customers shall have access to a live, dynamic estimate of the time remaining until order delivery.
- REQ-3: The system shall update the order status based on the different stages of order processing.

3.7 Billing

3.7.1 Description and Priority

The Billing feature automates the billing process, ensuring accuracy and transparency in the final cost calculation. This feature is of High Priority, as it directly impacts the completion of the customer transaction.

3.7.2 Stimulus/Response Sequences

1. Stimulus: Customer confirms the order.
 - Response: System calculates the final cost based on selected items, customizations, and applicable discounts.
2. Stimulus: Customer reviews the final cost.
 - Response: System displays a detailed breakdown of the bill, including item costs, taxes, and discounts.

3.7.3 Functional Requirements

- REQ-1: The system shall automatically calculate the final cost of the order.
- REQ-2: The final bill shall include a detailed breakdown of individual item costs, taxes, and any applied discounts.
- REQ-3: Customers shall have the option to view the final bill before confirming the order.
- REQ-4: The system shall apply any relevant promotional discounts or coupon codes.

3.8 Coupon Code

3.8.1 Description and Priority

The Coupon Code feature allows customers to input coupon codes for applicable discounts, enhancing promotional offerings. This feature is of Medium Priority, contributing to customer satisfaction and loyalty.

3.8.2 Stimulus/Response Sequences

1. Stimulus: Customer proceeds to checkout.
 - Response: System prompts for the entry of a coupon code.
2. Stimulus: Customer applies a valid coupon code.
 - Response: System validates the code, applies the discount, and updates the final cost.

3.8.3 Functional Requirements

- REQ-1: The system shall provide a field for customers to input coupon codes during the checkout process.
- REQ-2: Coupon codes shall be validated for authenticity and applicability.
- REQ-3: The system shall apply the relevant discount to the final order total.
- REQ-4: In case of an invalid coupon code, the system shall display an appropriate error message.

3.9 Choice of Payment

3.9.1 Description and Priority

The Choice of Payment feature offers customers a diverse range of payment options, including cash, credit cards, and digital wallets. This feature is of High Priority, as it directly impacts the completion of the transaction and customer satisfaction.

3.9.2 Stimulus/Response Sequences

1. Stimulus: Customer confirms the order.
 - Response: System presents various payment options.
2. Stimulus: Customer selects a payment method.
 - Response: System processes the payment and confirms the order.

3.9.3 Functional Requirements

- REQ-1: The system shall provide multiple payment options, including cash, credit cards, and digital wallets.
- REQ-2: Customers shall be able to select their preferred payment method during the checkout process.
- REQ-3: The system shall securely process payments and provide confirmation upon successful transaction.

- REQ-4: In case of payment failure, the system shall display an appropriate error message.

3.10 Payment Link to Phone or QR

3.10.1 Description and Priority

The Payment Link to Phone or QR feature generates secure payment links or QR codes for efficient and convenient transactions. This feature is of Medium Priority, offering an alternative and modern payment method.

3.10.2 Stimulus/Response Sequences

1. Stimulus: Customer selects the payment link or QR code option.
 - Response: System generates a unique link or QR code for the specific order.
2. Stimulus: Customer initiates payment via link or QR code.
 - Response: System verifies and processes the payment, updating the order status.

3.10.3 Functional Requirements

- REQ-1: The system shall generate a unique payment link or QR code for each order.
- REQ-2: Customers shall have the option to use the provided link or scan the QR code for payment.
- REQ-3: The system shall validate the payment and update the order status accordingly.
- REQ-4: Payment links or QR codes shall expire or become invalid after successful use.

4. External Interface Requirements

User Interfaces

System Feature A enables customers to personalize their food orders by customizing menu items with specific toppings, condiments, and portion preferences. This feature is considered a high priority as it directly contributes to customer satisfaction and a tailored dining experience.

- **Enhanced User Experience:** The interfaces aim to enhance the overall user experience by providing a seamless and intuitive platform for customers to interact with.
- **Streamlined Order Processing:** The interfaces facilitate efficient order processing, allowing customers to place and customize their orders quickly and easily.
- **Intuitive Platform:** The interfaces are designed to be user-friendly and intuitive, ensuring that customers can navigate through the system with ease.
- **Visual Appeal:** Emphasis is placed on visual aesthetics to create visually appealing interfaces that engage users and enhance their perception of the system.
- **Cross-Platform Consistency:** The interfaces are designed to maintain consistency across various devices and platforms, ensuring a cohesive user experience regardless of the device used.

Hardware Interfaces

4.2.1 Description

The fast food billing system interacts with various hardware components to facilitate order processing, data storage, and communication. The hardware interfaces enable seamless integration between the software product and the underlying physical infrastructure.

4.2.2 Characteristics

- *Supported Device Types:* The software product is designed to run on standard computing devices such as desktop computers, laptops, tablets, and mobile devices.
- *Data and Control Interactions:* The software communicates with hardware components, including printers, scanners, card readers, and cash registers, to process orders, print receipts, and handle payment transactions.
- *Communication Protocols:* The system utilizes industry-standard communication protocols such as USB, Ethernet, and Bluetooth to establish connections with peripheral devices.
- *Physical Connectivity:* Hardware interfaces include ports and connectors for establishing physical connections with external devices, ensuring reliable data transfer and communication.

4.2.3 Integration Requirements

- *Compatibility:* The software product must be compatible with a wide range of hardware devices commonly used in fast food establishments.
- *Driver Support:* Compatibility with device drivers for printers, scanners, and other peripheral devices is essential to ensure seamless integration and functionality.
- *Scalability:* The system should be scalable to accommodate additional hardware components and devices as needed to meet the evolving requirements of the business.

Software Interfaces

4.3.1 Description

The fast food billing system interacts with various software components to support its functionality, including databases, operating systems, and external libraries. These software interfaces facilitate data exchange, system integration, and seamless operation within the software ecosystem.

4.3.2 Connections

- *Database Interface: The system interacts with a relational database management system (RDBMS) to store and retrieve data related to menu items, customer orders, and transaction records. The database software used is [specify name and version].*
- *Operating System Compatibility: The software product is compatible with major operating systems such as Windows, macOS, and Linux, ensuring broad accessibility across different computing platforms.*
- *Tools and Libraries: The system may utilize third-party tools and libraries for functionalities such as user interface design, payment processing, and data analytics. Examples include [specify names and versions of relevant tools and libraries].*

4.3.3 Data Exchange

- *Incoming Data: The system receives incoming data items such as customer orders, payment information, and inventory updates from external sources or user inputs.*
- *Outgoing Data: Outgoing data includes order confirmations, receipts, and transaction records generated by the system for communication with customers and internal record-keeping.*

Communications Interfaces

- *Services Needed: The system requires access to specific services such as internet connectivity for online ordering, database connectivity for data storage, and external API integration for third-party services.*
- *Communication Protocols: Communication between software components may utilize standard protocols such as HTTP/HTTPS for web-based interactions, JDBC/ODBC for database connectivity, and SOAP/REST for API communication.*
- *Data Sharing: Data sharing between software components is facilitated through structured messages or data formats, ensuring interoperability and consistency across the system.*

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- **Response Time:** The system should respond to user interactions within a maximum of 2 seconds under normal load conditions. This ensures a responsive and seamless user experience.
- **Throughput:** The system should be capable of processing a minimum of 100 orders per hour during peak hours of operation. This ensures efficient order processing and minimizes customer wait times
- **Memory Usage:** The system should consume no more than 500 MB of memory on average per concurrent user session. This ensures optimal utilization of system resources and prevents excessive memory usage that could affect overall system performance.
- **CPU Usage:** The system should utilize no more than 50% of the CPU capacity on the server hardware under normal operating conditions. This ensures that sufficient processing power is available for other system tasks and prevents performance bottlenecks.

5.2 Safety Requirements

- **Data Security:** The system must employ robust security measures to prevent unauthorized access to sensitive customer information, including personal data and payment details. This includes encryption of data transmission and storage, secure authentication mechanisms, and regular security audits.
- **Payment Security:** All payment transactions must comply with Payment Card Industry Data Security Standard (PCI DSS) requirements to ensure the safe handling of credit/debit card information. This involves using PCI-compliant payment gateways, implementing secure encryption protocols, and adhering to strict data handling practices.
- **Error Handling:** The system must incorporate robust error handling mechanisms to mitigate the impact of software bugs, system failures, or user errors.

5.3 Security Requirements

- **Data Encryption:** All sensitive data, including customer information, payment details, and order data, must be encrypted both in transit and at rest using strong encryption algorithms (e.g., AES-256) to prevent unauthorized access or interception.
- **Access Control:** The system must implement role-based access control (RBAC) to restrict access to sensitive functionalities and data based on user roles and privileges. This includes assigning appropriate permissions to users and enforcing least privilege principles.
- **User Authentication:** Users accessing the system, including customers and administrative staff, must be authenticated using strong authentication mechanisms,

such as passwords, biometrics, or multi-factor authentication (MFA), to verify their identities and prevent unauthorized access.

5.4 Software Quality Attributes

- **Usability:** The system should be intuitive and easy to use, with a maximum new user order placement time of 3 minutes.
- **Reliability:** The system should maintain at least 99.9% uptime and provide informative error messages.
- **Maintainability:** The codebase should achieve a minimum code maintainability index (CMI) score of 70%, with comprehensive documentation provided.
- **Performance Efficiency:** The system should respond to user interactions within 1 second and scale horizontally to accommodate increased user load.
- **Security:** The system should implement robust security measures, including data encryption, secure authentication, and vulnerability management.

5.5 Project Documentation

SRS: Defines system requirements.

SDD: Details system design and architecture.

Test Plan: Outlines testing strategy.

User Manual: Guides users on system usage.

Maintenance Manual: Details system maintenance procedures.

5.6 User Documentation

User Manual: Guides users on system operation.

Quick Start Guide: Provides a brief overview for quick setup.

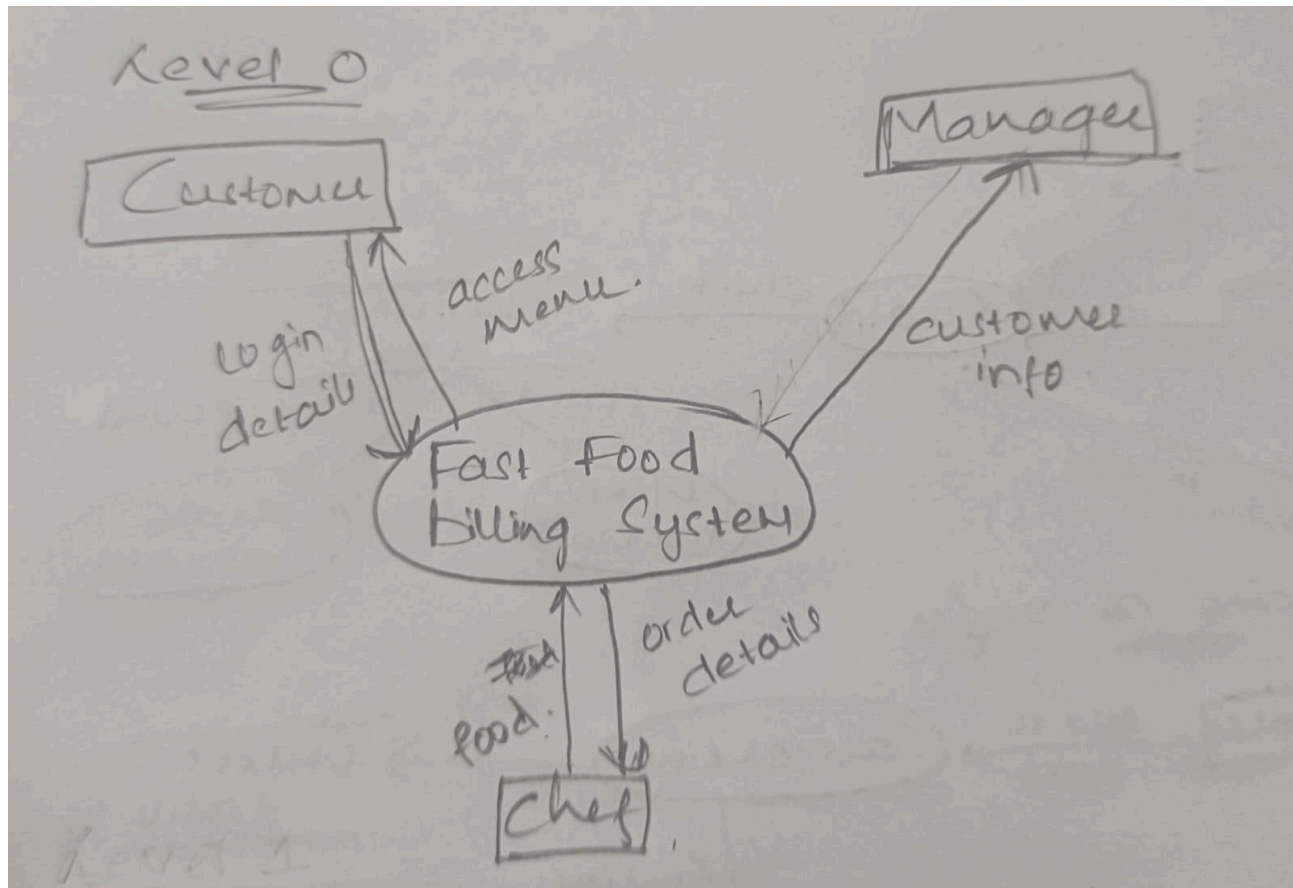
FAQs: Addresses common user queries.

Online Help Resources: Additional support materials.

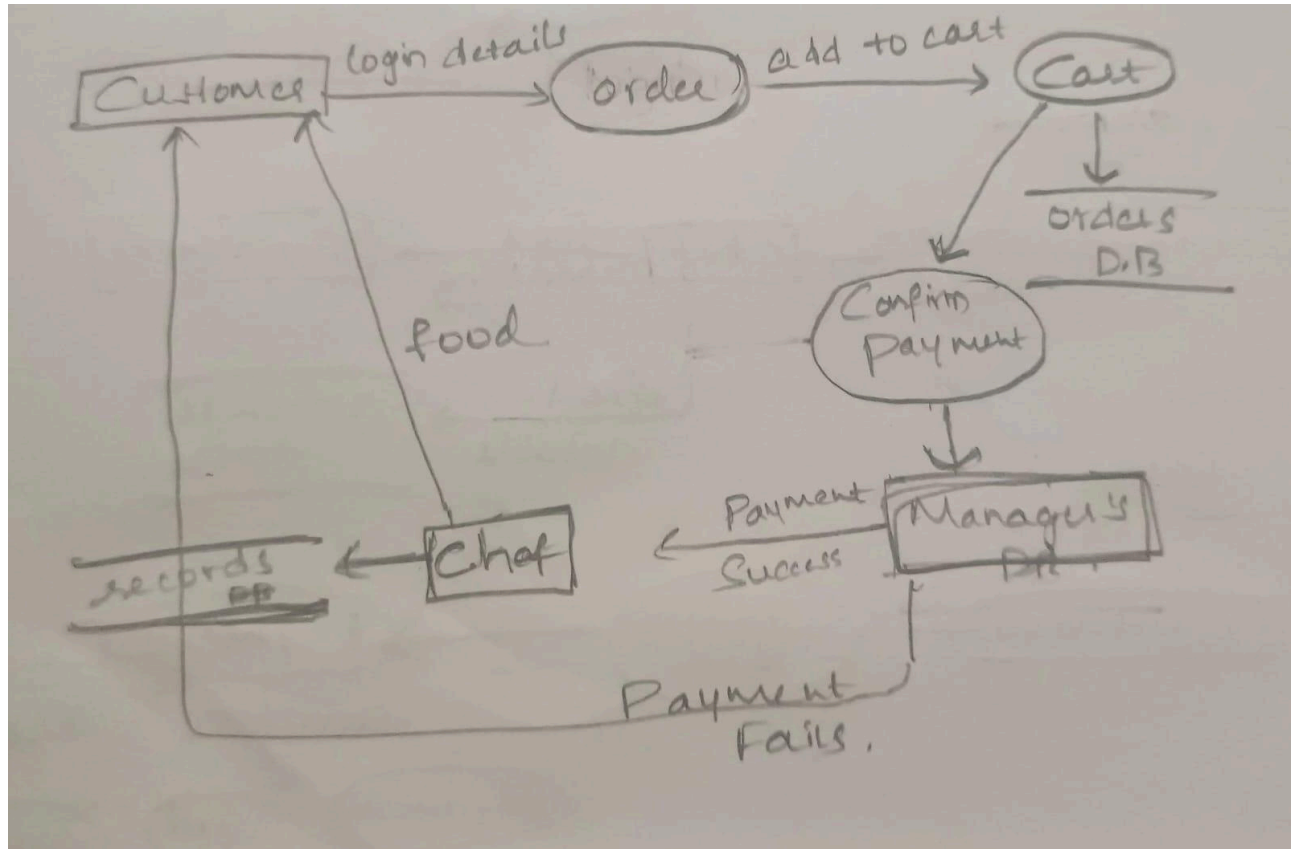
Feedback Mechanism: Allows users to provide input.

DATA FLOW DIAGRAMS

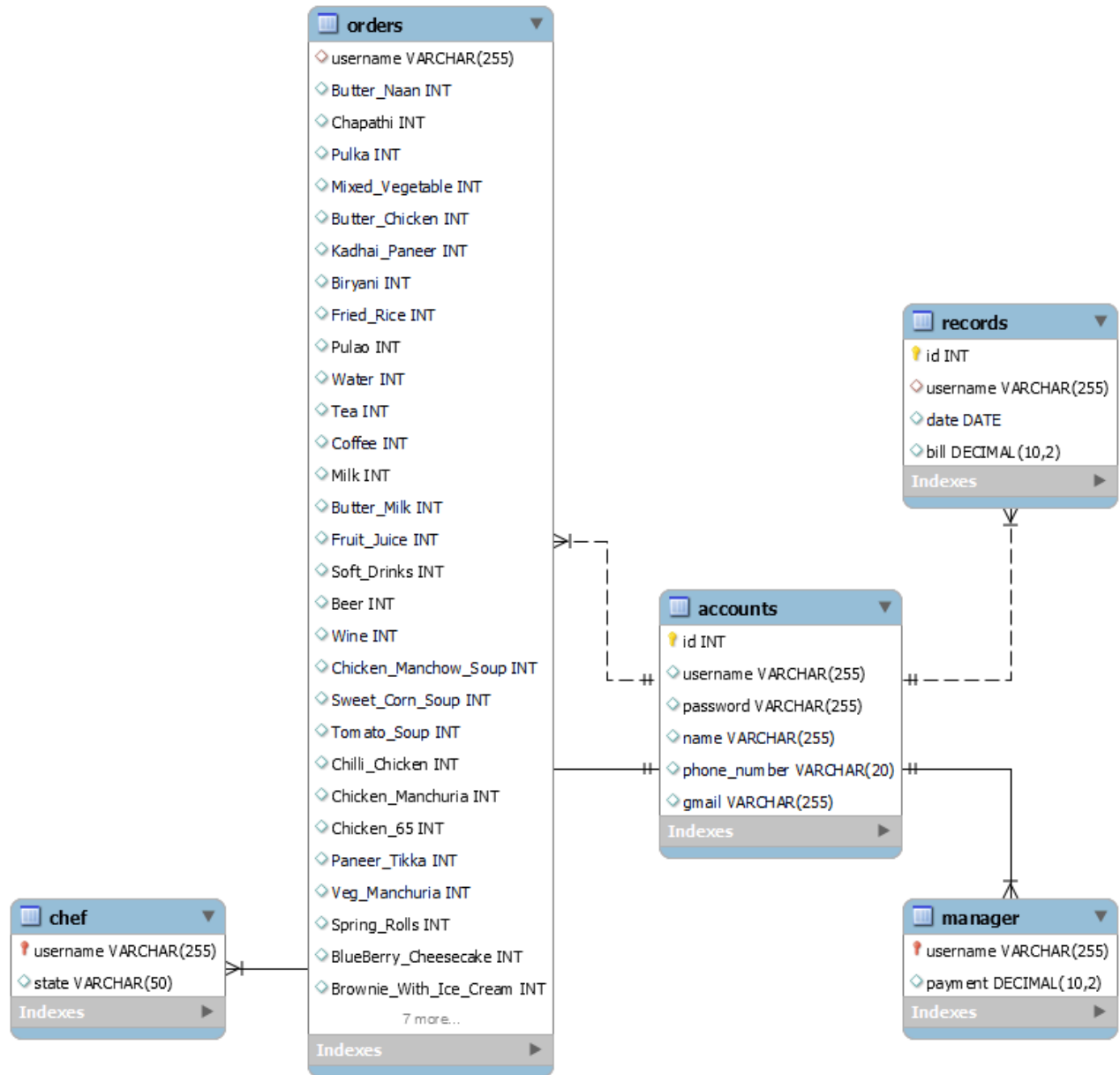
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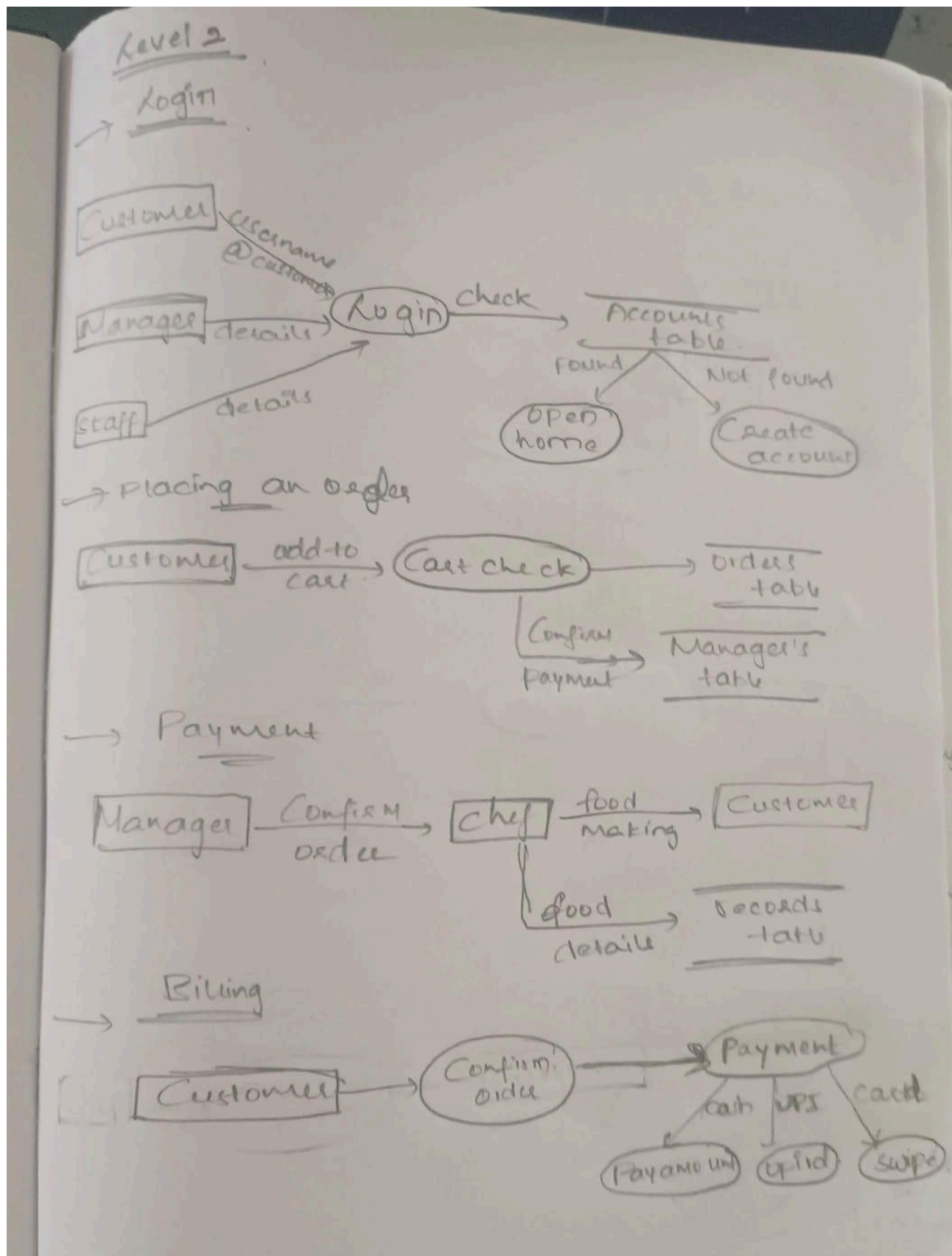


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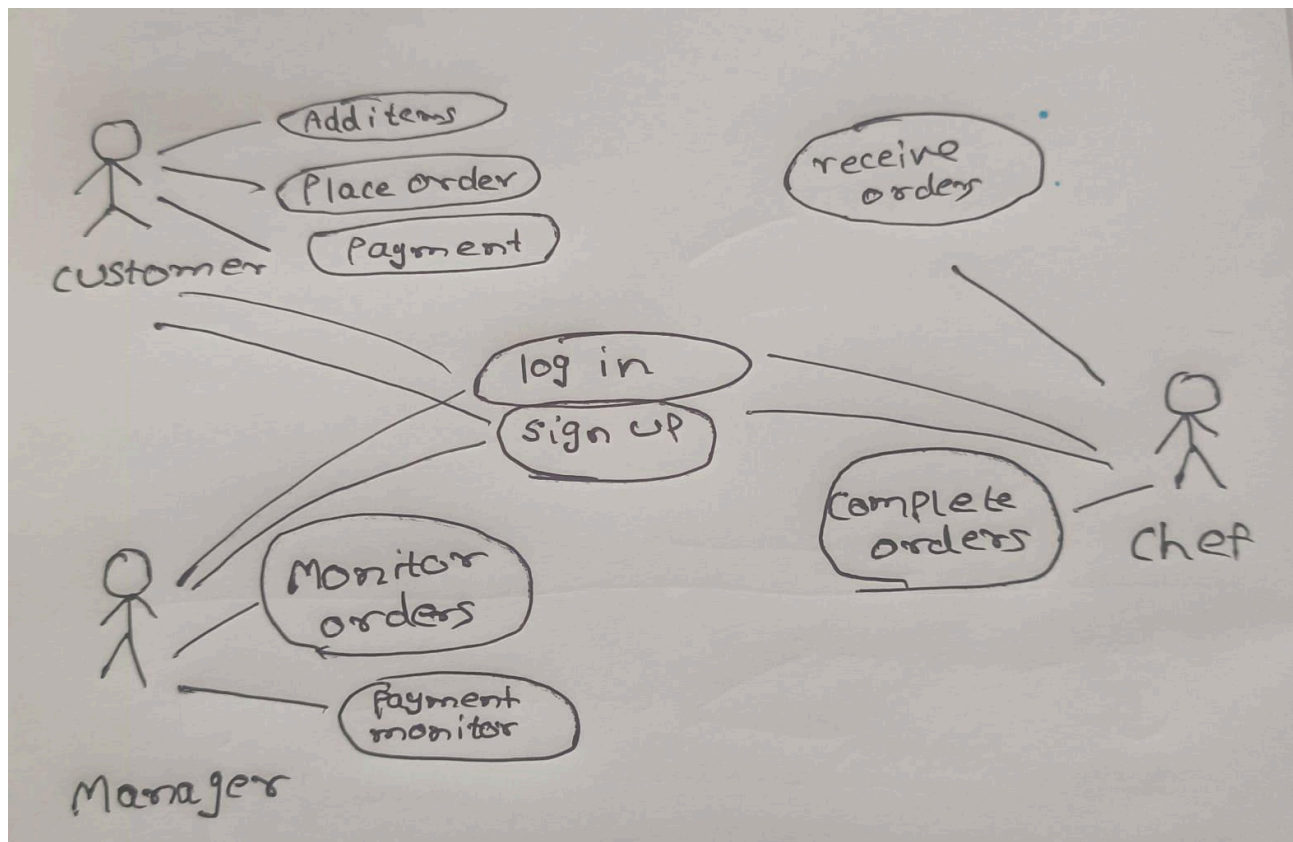
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ER Diagram

Use Case Diagram



Use Case Scenario

Use Case: Place Order and Make Payment

Description: This use case describes the process of a customer placing an order for food items and making payment directly with the Chef at the counter.

Actors: Customer, Chef

Precondition: The customer is inside the fast food restaurant and has decided on the items they want to order.

Flow of Events:

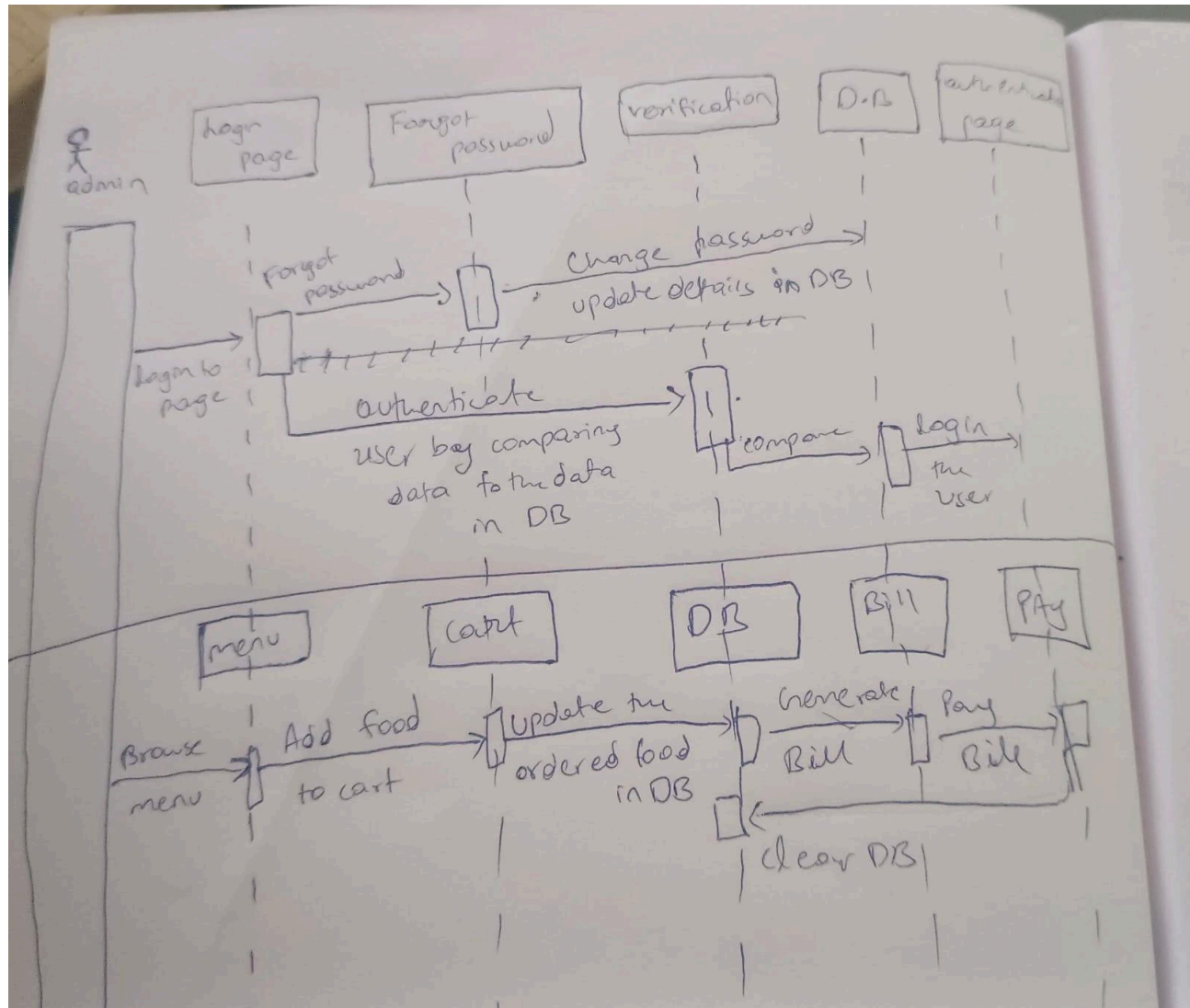
- 1. Customer enters the fast food restaurant.*
- 2. Customer approaches the ordering counter.*
- 3. Customer browses the menu and selects food items.*
- 4. Customer customizes the order (if applicable).*
- 5. Chef takes the order.*
- 6. Chef verifies the order details.*
- 7. Chef enters the order into the system.*
- 8. Chef calculates the total bill amount.*
- 9. Chef presents the bill to the customer.*
- 10. Customer selects a payment method.*
- 11. Customer makes the payment.*
- 12. Chef processes the payment.*
- 13. System updates the order status to "Paid."*
- 14. Chef provides a receipt to the customer.*
- 15. Chef initiates the preparation of the order.*

Postcondition: The order is successfully placed, and payment is made. The Chef begins preparing the order.

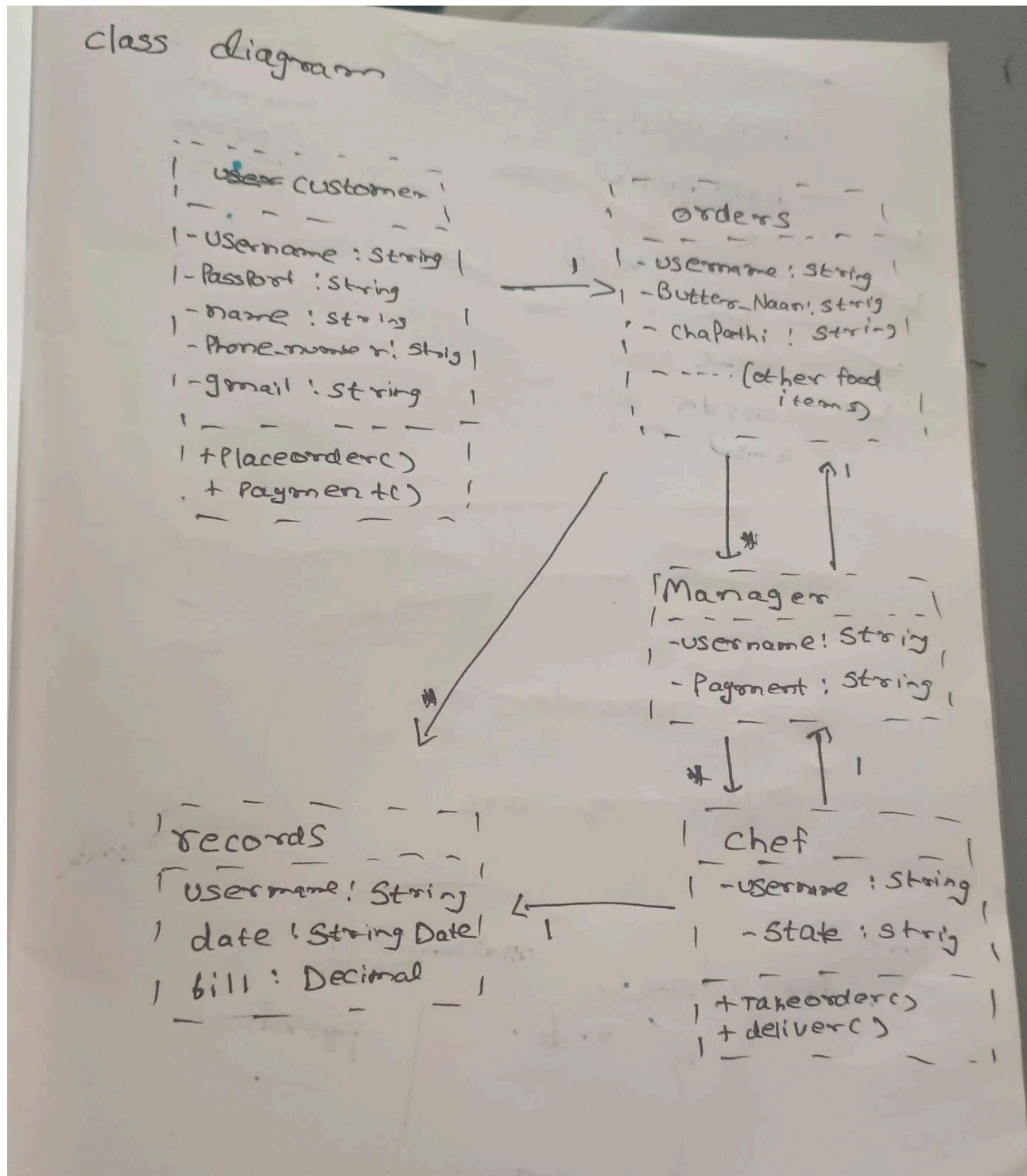
Alternative Flow:

- If the customer changes their order before making payment:*
 - 1. Customer modifies the order.*
 - 2. Chef updates the order details.*
 - 3. Chef recalculates the bill.*

Sequence Diagram



Class Diagram

**Component Diagram**

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