RESTAURANT AUTOMATION SYSTEM

Software Engineering | B.Tech 3rd Year, 1st Semester
Department of Computer Science and Engineering

- SUBMITTED BY
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RESTAURENT AUTOMATION SYSTEM

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~ Challengerzz

Problem Statement

Restaurant Automation System:

A restaurant owner wants to computerize his order processing, billi and accounting activities. He also expects the computer to generat statistical report about sales of different items. A major goal of this computerization is to make supply ordering more accurate so that t problem of excess inventory is avoided as well as the problem of no availability of ingredients required to satisfy orders for some popula items is minimized. The computer should maintain the prices of all items and also support changing the prices by the manager. Whene any item is sold, the sales clerk would enter the item code and the quantity sold. The computer should generate bills whenever food it are sold. Whenever ingredients are issued for preparation of food it the data is to be entered into the computer. Purchase orders are generated on a daily basis, whenever the stock for any ingredient fa below a threshold value. The computer should calculate the thresh value for each item based on the average consumption of this ingredient for the past three days and assuming that a minimum of days stock must be maintained for all ingredients. Whenever the or ingredients arrive, the invoice data regarding the quantity and price entered. If sufficient cash balance is available, the computer should print cheques immediately against invoice. Monthly sales receipt an expenses data should be generated whenever the manger would re to see them. The computer should be able to print a menu card containing the menu items and their prices.

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Introduction :

The Restaurant Automation System (RAS) is designed to streamline and optimize the various operational aspects of a restaurant, including order processing, billing, inventory management, and accounting.

Purpose :

The purpose of the Restaurant Automation System (RAS) is to streamline and enhance the efficiency of order processing, billing, and accounting activities within the restaurant. It aims to improve inventory management by ensuring accurate supply ordering and minimizing both excess inventory and shortages of ingredients. Additionally, the system provides valuable sales and financial reports, facilitating better decision-making and operational management for the restaurant owner.

Intended Audiience :

1**. Restaurant Owners/Managers:**

To oversee and manage all aspects of restaurant operations, including sales, veiw and update menu card, prints menu card,inventory, and financial reporting.

2**. Sales Clerks/Cashiers:**

- To efficiently process customer orders, generate bills, and handle transactions.

3. Inventory/Stock Managers:

To monitor and manage stock levels, ensure accurate inventory records, and handle reordering of ingredients.

4. Kitchen Staff:

To access updated inventory information and ensure ingredient availability for food preparation.

5. Accountants/Bookkeepers:

To manage financial transactions, process invoices, print cheques, and generate financial reports.

6. IT Support:

To maintain and update the system, provide technical support, and ensure data security and system reliability.

7. Customers:

To view menu card, Order placement, Order status, Payments, Rating and Feedback,Reservation Management.

Product Vision :

Vision Statement:

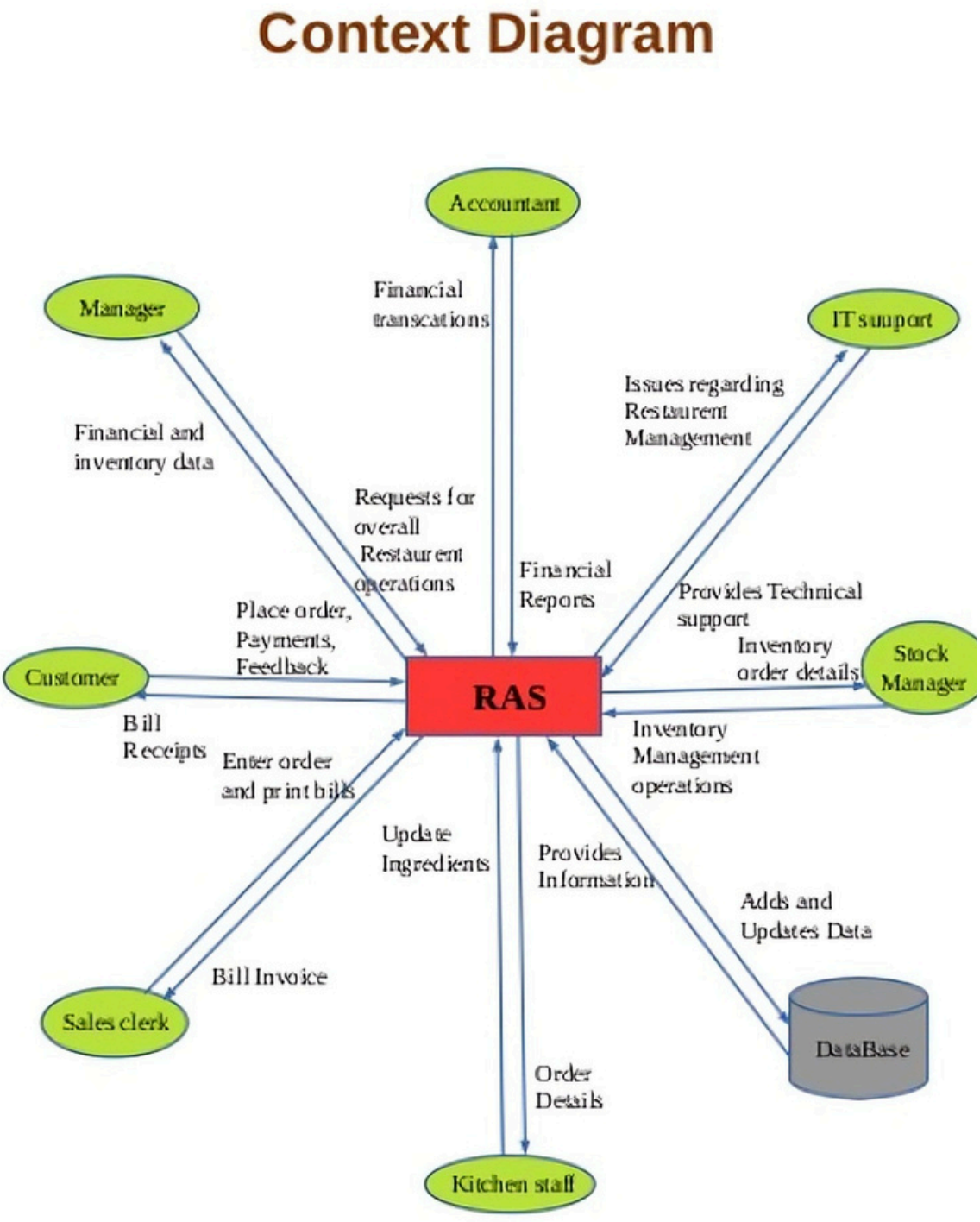
The product vision for the Restaurant Automation System (RAS) is to create a comprehensive, user-friendly platform that seamlessly integrates order processing, inventory management, billing, and accounting functions. This system will empower restaurant owners and staff to operate more efficiently, reduce errors, and enhance customer satisfaction. By leveraging real-time data and automation, the RAS will optimize inventory levels, ensure timely reordering of ingredients, and provide valuable insights through detailed sales and financial reports. Ultimately, the RAS aims to transformrestaurant operations into a streamlined, data-driven process that supports growth and improves the dining experience for customers.

Technologies :

HTML, CSS, JAVASCRIPT, JAVA, JDBC, SERVLETS, MYSQL

System in Context：

The Restaurant Automation System, acts as the backbone of restaurant operations, connecting various functions and ensuring that all processes run smoothly. It empowers staff, enhances customer satisfaction, and provides the owner/manager with the insights needed to drive business success.



User characteristics:

The users of the Restaurant Automation System (RAS) include restaurant owners/managers, sales clerks/cashiers, inventory/stock managers, kitchen staff, accountants/bookkeepers, IT support/administrators, and customers. Their technical expertise ranges from basic (kitchen staff) to advanced (IT support). Owners/managers focus on monitoring operations and making strategic decisions, while sales clerks require a fast, simple interface for processing orders. Inventory managers need tools for real-time stock tracking, and accountants focus on financial accuracy. The system must be user-friendly, efficient, and tailored to the specific needs of each role to ensure smooth operations and enhance the overall customer experience.

Constraints:

When designing a restaurent automation system,initial cost for technology, software and hardware mustbe within budget constraints.In simple we can say that budget is main constraint.

System-Wide Requirements(Received):

Actors:

The System interacts with 6 kinds of users.Each user has own functions to access with the system.The functionalities of user are dependent on each other.

Events:

Order Placement : Customers place orders through various interfaces for example digital menus,tablets,mobiles
Order Transmission : Orders are transmitted to the kitchen staff
Order Preparation : Kitchen staff prepares the order,tracking its status and updating progress in the system
Payment Processing : Customers pay for their orders through integrated payment gateways.
Inventory Management : The main goal of this application is to manage inventory efficiently.The system tracks inventory levels and updates as items are used or restocked.

These Actors and Events work together to stream line restaurant operations,enhance customer service and optimise overall efficiency.

The below table provides a set of user visible events that define the functionalities that are in the RAS Tool

	Actor	Action	Object	Frequency	Arrival Pattern	Response
1.	Customer	opens	Webpage			Got a login page
2.	Customer	register	Registration page			Create a user and redirect to Home page
3.	Customer	login	Login page			Redirect to Home page
4.	Customer	contact	Helpline			Got a form which has the help request details
5.	Customer	view	Menu card			Available items will be displayed
6.	Customer	post	Place Order			Order is placed
7.	Customer	check	Order status			Displays order details
8.	Customer	enter	Feedback			Feedback to a particular item is taken
9.	Clerk	view	Pending orders			Displays Pending orders
10.	Clerk	approve	Pending orders			Approve specified pending order

11.	Clerk	send	Payment details			Payment details sent to the customer
12.	Clerk	enter	Place order by id			Order is placed
13.	Kitchen staff	view	Order details			Order details are viewed to prepare items
14.	Kitchen staff	update	Order status			Updates order status to the customer
15.	Manager	login	Login page			Home page with administration details
16.	Manager	view	Items			View all available items
17.	Manager	select	New item			A form is opened to create a new item
18.	Manager	post	Item details			New item is added
19.	Manager	update	update menu card			Menu card is updated
20.	Manager	select	Delete item			Specified item is deleted.

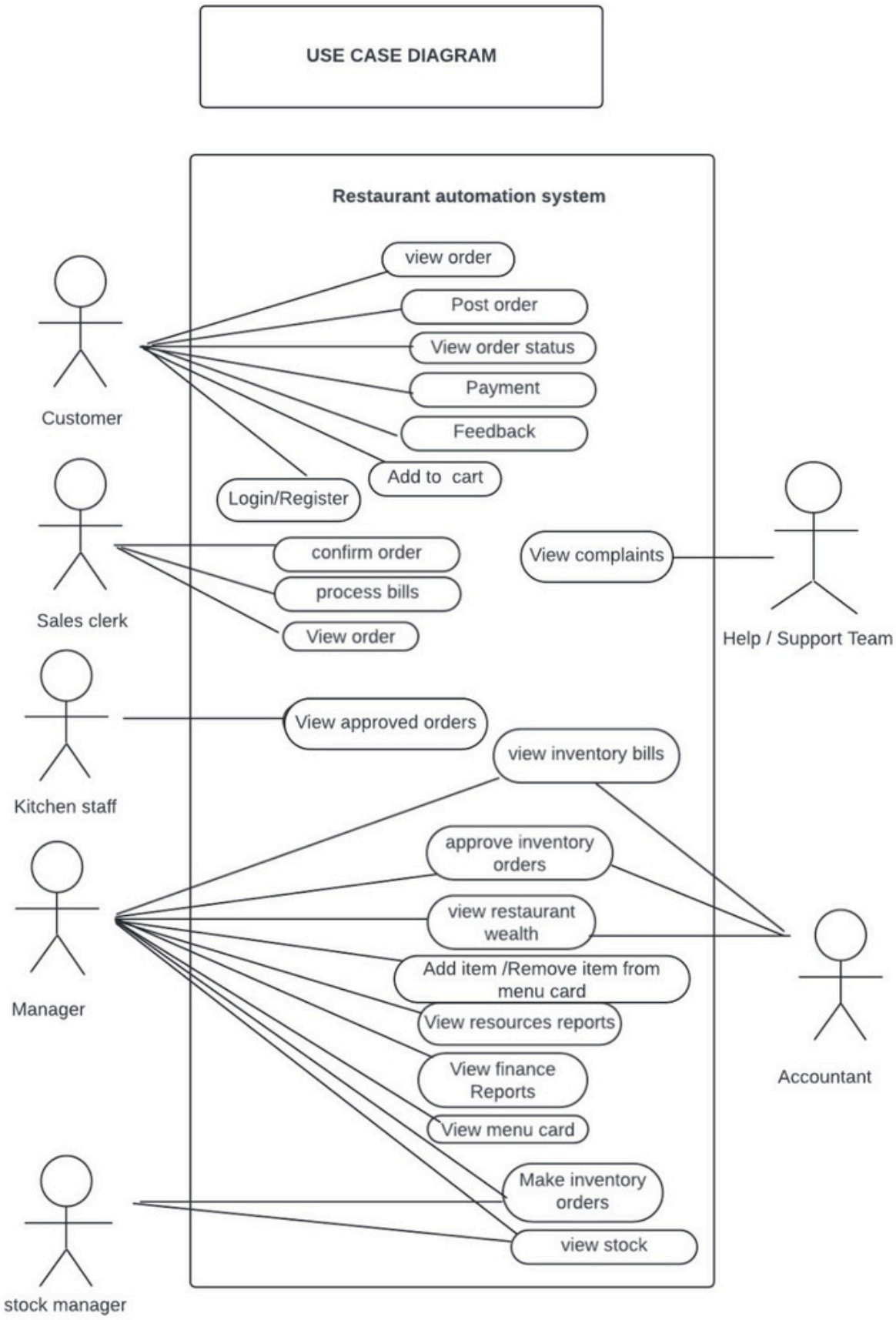
21	Manager	post	Inventory order			New inventory order is added
22.	Manager	view	Financial report			View Financial, income and statistics reports
23.	Manager	update	Update inventory order			Inventory order details are updated
24.	Manager	enter	Order types			Orders history of specified type is displays
25.	Stock Manager	check	Pending Inventory orders			Currently pending inventory orders are listed
26.	Stock Manager	post	Approving inventory order			Ordered Ingridents are updated
27.	Stock Manager	select	View ingridents			Ingridents present in Inventory listed
28.	Stock Manager	select	Generate Bills			Bills are generated for respective inventory order

Functional Requirements:

Usecase overview:

	Use-Case ID	Use-Case Name	Priority	Stability	Verifiability
1.	UC-RAS-CVO	Customer-view Order history	High	Stable	Verifiable
2.	UC-RAS-PO	Post Order	High	Stable	Verifiable
3.	UC-RAS-VOS	View order status	High	Stable	Verifiable
4.	UC-RAS-P	Make Payment	High	Stable	Verifiable
5.	UC-RAS-F	Give feedback	High	Stable	Verifiable
6.	UC-RAS-ATC	Add to cart	High	Stable	Verifiable
7.	UC-RAS-SU	Post cutomer details	High	Stable	Verifiable
8.	UC-RAS-L	User Login	High	Stable	Verifiable
9.	US-RAS-VPO	View pending orders	High	Stable	Verifiable
10.	UC-RAS-PB	Process Bills	High	Stable	Verifiable
11.	UC-RAS-VAO	Vlew approved orders	High	Stable	Verifiable
12.	UC-RAS-CO	Confirm order	High	Status	Verifiable
13.	UC-RAS-VPIO	View pending inventory orders	High	Status	Verifiable
14.	US-RAS-PIO	Place inventory orders	High	Status	Verifiable
15.	US-RAS-GB	Generate Bills	High	Status	Verifiable
16.	US-RAS-VI	Display ingredient details	High	Status	Verifiable

	Use-Case ID	Use-Case Name	Priority	Stability	Verifiability
17.	UC-RAS-AITM	Add item to menu card(updates the menu card)	High	Stable	Verifiable
18.	UC-RAS-RIFM	Remove item from menu card	High	Stable	Verifiable
19.	UC-RAS-VMC	View menu card	High	Stable	Verifiable
20.	UC-RAS-VIO	View inventory order history	High	Stable	Verifiable
21	UC-RAS-CIO	Create a intentory order	High	Stable	Verifiable
22.	UC-RAS-PIO	Post inventory order	High	Stable	Verifiable
23.	UC-RAS-RIO	Remove inventory order	High	Stable	Verifiable
24.	UC-RAS-MVO	Manager view all customer order history	High	Stable	Verifiable
25.	US-RAS-VRR	View resource reports	High	Stable	Verifiable
26.	UC-RAS-VRR	View restaurent resources	High	Stable	Verifiable
27.	UC-RAS-VI	Vlew ingredients available	High	Stable	Verifiable
28.	UC-RAS-VC	View complaints	Low	Stable	Verifiable
29.	UC-RAS-PC	Post complaint	Low	Stable	Verifiable


USE CASE DIAGRAM
Restaurant automation system
view order
Post order
View order status
Payment
Feedback
Add to cart
Login/Register
Customer
confirm order
process bills
View order
Sales clerk
View complaints
Help / Support Team
View approved orders
view inventory bills
Kitchen staff
approve inventory orders
view restaurant wealth
Add item /Remove item from menu card
View resources reports
View finance Reports
View menu card
Manager
Accountant
Make inventory orders
view stock
stock manager

Use case Specifications:

1 . UC-RAS-CVO

Use-case ID : UC-RAS-CVO	Use-case Name : Customer-View Order history
Description	Customer-view order history features allows customers review their past orders,providing them with an easy way to crack their dining preferences,reorder favorite dishes.
Pre-Conditions	1)The customer must have previously placed orders that are recorded in the system.
Success guarantee (Post-conditions)	1)The system retrieves and displays the customer's past orders.
Frequency of Use	High
Main success scenario (or Basic flow)	The customer logs in using their credentials (email/phone number and password, or through social media login). After successful login, the customer is redirected to the homepage or dashboard.
Extensions (or alternate flows)	1)If the customer has no previous orders, the system displays a message indicating that no orders have been placed yet.
Frequency of Occurence	As needed by customer

2. UC-RAS-PO

Use-case ID : UC-RAS-PO:	Use-case Name : Post Order
Description :	It refers to the process where an order, after being received from a customer, is sent to the kitchen or preparation area for fulfillment.
Pre-Conditions	The customer has successfully placed an order.The order has been reviewed and confirmed by the customer.
Success guarantee (Post-conditions)	1)The kitchen staff has received the order and it is queued for preparation.The system has updated the order status to 'In Preparation', both staff customers to track its progress.
Frequency of Use:	Very high
Main success scenario (or Basic flow):	1)When order is confirmed, it is automatically sent to the kitchen.The order is added to the kitchen's queue, where it waits for preparation based on the kitchen's workflow & priority rules.
Extensions (or alternate flows):	The system detects that an ordered item is unavailable when attempting to post the order.The system prompts the customer or server to select an alternative item or cancel the item.
Frequency of Occurnece	As needed by customer

3. UC-RAS-VDS

Use-case ID:UC-RAS-VDS	Use-case Name : View Order status
Description :	The View Order Status feature allows customers, staff, and kitchen to track the progress of an order in real-time.
Pre-Conditions	The customer has successfully placed an order through the restaurant's ordering platform.The order details, including items & special instructions, have been accurately recorded in the restaurant's system.
Success guarantee (Post-conditions)	1)Any changes to the order, such as modifications or cancellations, are reflected in the status updates.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The customer or staff accesses the order status via a mobile app, website.The system retrieves the current status of the order and displays it on the user interface. 1)Order Received: The order has been successfully placed 2)In Preparation: The kitchen has started preparation
Extensions (or alternate flows):	The system experiences a delay in updating the order status due to network issues or heavy traffic.The customer or staff attempts to view the order status but receives an outdated status.
Frequency of Occurnece	As needed by customer

4 . UC-RAS-P

Use-case ID : UC-RAS-P :	Use-case Name : Make Payment
Description :	The Make Payment feature streamlines the payment process for customers, making it quick, efficient.
Pre-Conditions	A bill has been generated, summarizing the items ordered and the total amount due.The customer has indicated their intent to pay.
Success guarantee (Post-conditions)	The payment has been successfully processed through the chosen method.A receipt has been generated and provided to the customer.
Frequency of Use:	High
Main success scenario (or Basic flow):	The customer indicates they are ready to pay, and the server or cashier retrieves the bill from the system.The customer reviews the bill to ensure accuracy.The customer selects their preferred payment method.
Extensions (or alternate flows):	The payment method is temporarily unavailable. 1)Server/cashier informs the customer of the issue. 2) Customer chooses an alternate payment method that does not rely on the system (e.g., cash).
Frequency of Occurnece	Every time order is approved

5. UC-RAS-F

Use-case ID : UC-RAS-F :	Use-case Name : Glve feedback
Description :	Feedback streamline the process of gathering and analyzing customer opinions,helping restaurants improve service, address issues,enhance overall customer satisfaction.
Pre-Conditions	The feedback system (including online platforms,apps) must be operational and accessible to the user.
Success guarantee (Post-conditions)	The system should confirm that the feedback has been successfully submitted. This may involve a confirmation message or email.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The user accesses the feedback form or survey via the provided channel.The user fills out the feedback form, rating various aspects of their experience and providing comments if desired.
Extensions (or alternate flows):	The system displays an error message indicating the issues with the submission.The user is prompted to correct the errors and resubmit the feedback.
Frequency of Occurnece	As needed by customer

6 . UC-RAS-ATC

Use-case ID : UC-RAS-ATC :	Use-case Name : Add to cart
Description :	In restaurant automation systems, the "Add to Cart" feature allows users to select and manage their meal choices before finalizing their order.
Pre-Conditions	The menu is loaded and available with current prices for the user. The cart is initialized and ready to accept new items.Any existing items in the cart are correctly displayed.
Success guarantee (Post-conditions)	The selected item(s) are added to the cart with the correct quantity.The user receives confirmation that the item has been successfully added to the cart.
Frequency of Use:	High
Main success scenario (or Basic flow):	The user browses items within the selected category and chooses a specific dish.The user specifies the quantity and clicks "Add to Cart."The system updates the cart with the selected item.
Extensions (or alternate flows):	The user tries to add more items than are allowed 1)The user specifies a quantity for an item. 2)The system checks the quantity limit.
Frequency of Occurnece	As needed by customer

7 . UC-RAS-SU

Use-case ID : UC-RAS-SU :	Use-case Name : Post Customer details
Description :	"Post customer details" typically refers to the process of capturing and storing information about customers during their interaction with the system. This information is used to enhance service, manage reservations, and track customer preferences.
Pre-Conditions	The customer has provided consent to collect and store their personal information, typically as part of the system's terms of service or privacy policy.
Success guarantee (Post-conditions)	Customer details are successfully stored in the system's database with accurate & complete information.Information captured should be correct and reflect the actual details provided by the customer.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The customer engages with the system.The system prompts the user to enter customer details such as name, contact information, reservation preferences, etc.
Extensions (or alternate flows):	The customer enters data that does not meet validation criteria 1)The system displays an error message indicating the issue. 2)The customer is prompted to correct the invalid data. 3)The customer re-enters the corrected information.
Frequency of Occurnece	Only once per user

8. UC-RAS-CO

Use-case ID : UC-RAS-CO :	Use-case Name : Confirm Order
Description :	In a restaurant automation system, confirming an order typically involves verifying the details of a customer's order before it is processed for preparation.
Pre-Conditions	The customer has selected all desired menu items, quantities, and any special instructions.The system has identified or authenticated the customer.
Success guarantee (Post-conditions)	The order is confirmed and locked in the system, meaning no further changes can be made by the customer.
Frequency of Use:	High
Main success scenario (or Basic flow):	The system generates an order number.The system displays an order confirmation message with the order number, summary, and estimated delivery date.
Extensions (or alternate flows):	After the user places the order, the system checks inventory. 1)If an item is out of stock: 2)The system notifies the user that the item is unavailable.
Frequency of Occurnece	After the verification of each posted order

9. UC-RAS-L

Use-case ID : UC-RAS-L :	Use-case Name : Login
Description :	A sales clerk's role is often streamlined through technology to enhance efficiency and customer service.
Pre-Conditions	The sales clerk must be trained to use the automation system, including handling transactions, processing payments, and managing customer orders.
Success guarantee (Post-conditions)	All transactions should be processed correctly, with accurate amounts charged and receipts issued to customers.
Frequency of Use:	High
Main success scenario (or Basic flow):	The sales clerk greets the customer and prepares to take their order.The sales clerk inputs the customer's order into the restaurant automation system.
Extensions (or alternate flows):	The system encounters an error during order entry or payment processing. 1)The sales clerk reports the issue to the technical support team if necessary. 2)The sales clerk may use a backup manual system or alternative procedures to complete the transaction.
Frequency of Occurence	Each time when the website is started

10 . UC-RAS-VPO

Use-case ID : UC-RAS-VPO :	Use-case Name : View Pending Order
Description :	In a restaurant automation system, viewing pending orders is a crucial feature for managing and tracking customer orders in real time.
Pre-Conditions	The restaurant automation system is operational and accessible to staff.The staff member has the necessary permissions to view orders.
Success guarantee (Post-conditions)	The staff can take appropriate actions on the orders, such as updating the status to "In Progress" or "Completed."Any errors or issues encountered during the process are handled or logged by the system for further review.
Frequency of Use:	High
Main success scenario (or Basic flow)	The system displays a list of orders categorized by their status.The staff selects the "Pending Orders" tab. The system displays a list of all pending orders, showing details such as: • Order number • Customer name (if applicable) • Table number (for dine-in orders)
Extensions (or alternate flows):	The system encounters an issue retrieving the pending orders.The system displays an error message indicating the problem.
Frequency of Occurnece	As needed by Sales Clerk

11 . UC-RAS-PB

Use-case ID : UC-RAS-PB :	Use-case Name : Process Bills
Description :	"Processing Bills" involves managing the entire lifecycle of a customer's bill, from the moment they place their order until they complete the payment.
Pre-Conditions	This system must have access to the latest menu data, including prices, available items, taxes, and any applicable discount.
Success guarantee (Post-conditions)	The customer's payment has been processed successfully through the chosen payment method, and the transaction is approved.
Frequency of Use:	High
Main success scenario (or Basic flow):	The kitchen completes the customer's order, and the status is updated in the system.The server or the system automatically generates an itemized bill using the order details stored in the system.The bill includes item costs, taxes, and any additional charges.
Extensions (or alternate flows):	The customer notices an error on the bill (e.g., incorrect item, wrong price). 1)The customer informs the server of the discrepancy. 2)The server reviews the bill and corrects the error in the POS system.
Frequency of Occurnece	After the approvement of each posted order

12. UC-RAS-VAO

Use-case ID : UC-RAS-VAO :	Use-case Name : View Approved Orders
Description :	"View approved orders" refers to a feature or functionality within a restaurant's management system that allows staff to see orders that have been reviewed and authorized for preparation or fulfillment.
Pre-Conditions	There must be at least one order placed by a customer or staff that is pending approval.The order must have gone through an approval process where it has been reviewed for accuracy and completeness.
Success guarantee (Post-conditions)	Approved orders should be visible to authorized users in the approved orders section of the system.Each approved order should display relevant details such as item names, quantities, special instructions, and timestamps.
Frequency of Use:	medium
Main success scenario (or Basic flow):	The user navigates to the section of the system where approved orders are displayed.The system retrieves the list of orders that have been marked as approved from the database.
Extensions (or alternate flows):	The user navigates to the approved orders section. The system retrieves the list of approved orders. If there are no approved orders, the system displays a message indicating that there are no orders to view at this time.
Frequency of Occurnece	As needed by Sales Clerk

13. UC-RAS-VPIO

Use-case ID : UC-RAS-VPIO :	Use-case Name : View pending inventory orders
Description :	“View pending inventory orders” refers to a feature within the restaurant's management system that allows staff, typically those in charge of inventory management.
Pre-Conditions	There should be inventory items marked as pending in the system. This could include items that are ordered but not yet delivered, items that require restocking, or items flagged for review..
Success guarantee (Post-conditions)	The system displays a list of all inventory items that are pending, including details like item names, quantities, statuses, and expected delivery dates.
Frequency of Use:	High
Main success scenario (or Basic flow):	The system retrieves and displays a list of all pending inventory orders.The user can click on any specific order to view more detailed information.The system displays item-level details, including quantities ordered, unit prices, total cost, and any special instructions..
Extensions (or alternate flows):	The user attempts to access the “Pending Orders” section without proper permissions.The system denies access and shows a message indicating that the user does not have the necessary permissions.
Frequency of Occurnece	As needed by Stock manager

14 . UC-RAS-PIO

Use-case ID : UC-RAS-PIO :	Use-case Name : Place inventory orders
Description :	Place inventory orders is a critical function that ensures the kitchen is always stocked with necessary ingredients and supplies. Automation can streamline this process by using software to track inventory levels.
Pre-Conditions	The restaurant must have an automated inventory tracking system in place that monitors stock levels in real-time.The system should be integrated with the system to accurately track ingredient usage as orders are processed.
Success guarantee (Post-conditions)	The order should include all necessary details such as quantities, prices, delivery date, and any special instructions.The system updates projected inventory levels based on the order placed, considering the expected delivery date.
Frequency of Use:	High
Main success scenario (or Basic flow):	The system continuously tracks inventory levels in real-time. As items are used in the kitchen, inventory counts are automatically updated.The system identifies when the quantity of an item falls below the predefined reorder threshold.
Extensions (or alternate flows):	The system is configured to require managerial approval for certain orders.
Frequency of Occurnece	If there is shortage of stock or monthly

15 . UC-RAS-GB

Use-case ID : UC-RAS-GB :	Use-case Name : Generate Bills
Description :	Generating bills is an essential process that ensures accurate, efficient, and seamless transactions between the restaurant and its customers.
Pre-Conditions	The restaurant's menu, including all items, prices, taxes, and service charges, must be set up in the billing system.Any discounts, promotions, or loyalty rewards applicable must be configured.
Success guarantee (Post-conditions)	A detailed and accurate bill is generated, reflecting all items ordered, taxes, service charges, and any discounts applied.The bill should be available for review by the customer before payment.
Frequency of Use:	High
Main success scenario (or Basic flow):	The customer is ready to pay or requests the bill.The system calculates the total amount, including taxes, service charges, and any applicable discounts or promotions.
Extensions (or alternate flows):	Order Modification After Initial Entry: The customer requests changes to the order after it has been entered into the system.
Frequency of Occurence	After approvement of each inventory order

16. UC-RAS-VI

Use-case ID : UC-RAS-VI :	Use-case Name : Display ingredient details
Description :	Displaying ingredient details is a critical feature that helps kitchen staff, management, and sometimes even customers access vital information about the ingredients used in dishes.
Pre-Conditions	The database should include detailed information such as ingredient names, nutritional content, allergens, supplier details, expiration dates, and storage requirements.
Success guarantee (Post-conditions)	The system displays accurate and up-to-date ingredient details whenever requested by staff.
Frequency of Use:	High
Main success scenario (or Basic flow):	The staff member uses a device connected to the restaurant's automation system (e.g., a kitchen display system,management dashboard to search for .
Extensions (or alternate flows):	A system error occurs while retrieving ingredient details (e.g., network issue, system crash). The system displays an error message, and staff are prompted to try again later or use an alternative method (e.g., manual records).
Frequency of Occurnece	As needed by Sales Clerk

17. UC-RAS-AITM

Use-case ID : UC-RAS-AITM :	Use-case Name : Add item menu card
Description :	Adding an item to the menu card is a crucial feature that enables the restaurant to manage its offerings efficiently and keep the menu up-to-date.
Pre-conditions	The user must have appropriate permissions to add or update menu items in the restaurant's automation system.
Success guarantee (Post-conditions)	The new item is correctly added to the menu card and is visible in all relevant interfaces, including digital menus, printed menus, and systems.All information related to the new item is accurate and up-to-date, including name, description, price, and any other relevant details.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The system displays a form where the staff can enter details such as item name, description, price, category, and any special attributes (e.g., spicy, vegetarian).The staff can upload an image of the menu item.
Extensions (or alternate flows):	The staff does not have the necessary permissions to add a new menu item. The system displays a message indicating insufficient permissions and may redirect the staff to contact an administrator
Frequency of Occurnece	As needed by manager

18. UC-RAS-RIFM

Use-case ID : UC-RAS-RIFM :	Use-case Name : Remove item from menu card
Description :	Remove item from menu card is a also a cruical to remove a item from menu card as their is shortage of ingredients or respective chef is not available or else as the item is not getting good response from the customers.
Pre-Conditions	The item intended for removal must exist in the current menu. The system should be able to locate the item based on its identifier or name.
Success guarantee (Post-conditions)	The menu should be updated to reflect the removal of the item. The item should no longer appear in the menu or be available to customers.The user should receive confirmation that the item has been successfully removed from the menu.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The system prompts the staff to confirm the removal of the item, usually with a confirmation dialog or popup (e.g., "Are you sure you want to remove this item?").
Extensions (or alternate flows):	The item being removed is currently associated with active orders or reservations.Then system alerts the staff about the associations and may require additional steps to resolve them before the item can be removed.
Frequency of Occurnece	As needed by the manager

19 . UC-RAS-VMC

Use-case ID : UC-RAS-VMC:	Use-case Name : View Menu Card
Description :	View menu Card purpose is to display the food your guests will be enjoying Menu cards are often displayed at each place setting or one at the center of each table.
Pre-Conditions	The user must be logged into the system with the appropriate access rights.The user must have access to the menu management or viewing section of the system.
Success guarantee (Post-conditions)	The system successfully displays the current menu card description for the user to review.The system remains in a stable state, allowing the user to perform further actions if needed (e.g., editing, closing).
Frequency of Use:	High
Main success scenario (or Basic flow):	The user navigates to the menu management section of the system.The user selects the option to view the menu card or its description.The user reviews the menu card description to ensure that all information is accurate and up-to-date.
Extensions (or alternate flows):	Its purpose is to display the food your guests will be enjoying at your wedding reception. Menu cards are often displayed at each place setting or one at the center of each table.
Frequency of Occurnece	As needed by manager

20 . UC-RAS-VIO

Use-case ID : UC-RAS-VIO :	Use-case Name : View inventory order history
Description :	Restaurant inventory management is the process of tracking and managing the food and beverage supplies within a commercial kitchen.
Pre-Conditions	The user must be logged into the system with appropriate access rights.The user must have access to the inventory management or order history section.
Success guarantee (Post-conditions)	The system successfully displays the requested order inventory history for the user to review.The system remains stable, allowing the user to perform additional actions (e.g., exporting, printing)
Frequency of Use:	High
Main success scenario (or Basic flow):	The user may be prompted to specify a date range, filters, or other criteria to narrow down the history view.The system retrieves the relevant data based on the specified criteria and displays the inventory history.
Extensions (or alternate flows):	The inventory history is extensive, causing performance issues or delays.The system may display a loading message or progress indicator. It may also provide options to view data in chunks or pages
Frequency of Occurnece	As needed by manager

21 . UC-RAS-CIO

Use-case ID : UC-RAS-CIO :	Use-case Name : Creates a inventory Order
Description :	An inventory management system is the combination of technology and processes and procedures that oversee the monitoring and maintenance of stocked products, whether those products are company assets, raw materials and supplies, or finished products ready to be sent to vendors or end consumers.
Pre-Conditions	The user must be logged into the system with the appropriate access rights.The user must have access to the inventory management section of the system.
Success guarantee (Post-conditions)	The system updates the inventory status to reflect the pending order. This may include adjusting expected stock levels based on the incoming order.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The user selects items to include in the order. This can be done by browsing a list of inventory items or by searching for specific items. For each item, the user specifies the quantity to order.
Extensions (or alternate flows):	The user tries to order an item that is currently out of stock with the supplier.
Frequency of Occurnece	As needed by manager

22 . UC-RAS-PIO

Use-case ID : UC-RAS-PIO :	Use-case Name : Post inventory Order
Description :	Posting or completing an inventory order in a restaurant automation system typically involves finalizing the process after the order has been received.
Pre-Conditions	The user must be logged into the system with the appropriate access rights.The user must have access to the inventory management section of the system.
Success guarantee (Post-conditions)	The system updates the inventory levels based on the received items and quantities, ensuring accurate stock records.Any discrepancies between the ordered and received items are recorded and resolved. The system may adjust the inventory levels or keep the order open if necessary.
Frequency of Use:	High
Main success scenario (or Basic flow):	The system displays the order details, including items, quantities ordered, quantities received, and any discrepancies. The user verifies that all received items match the order.If there are discrepancies between the ordered and received quantities,the user records these discrepancies.
Extensions (or alternate flows):	The order needs to be canceled after being received (e.g., due to significant discrepancies). The system allows the user to cancel the order.
Frequency of Occurnece	As needed by manager or if there is shortage of stock

23 . UC-RAS-RIO

Use-case ID : UC-RAS-RIO :	Use-case Name : Remove inventory order
Description :	Removing an inventory order in a restaurant automation system involves deleting or canceling an existing order that is no longer needed.
Pre-Conditions	The user must be logged into the system with the appropriate access rights.The user must have access to the inventory management section of the system.
Success guarantee (Post-conditions)	The inventory order is successfully removed from the system. It is either deleted entirely or marked as canceled, depending on the system's configuration.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The user selects the specific inventory order that needs to be removed or canceled.The system displays the details of he selected order, including items, quantities, supplier, and order status
Extensions (or alternate flows):	The user attempts to remove an order that has already been processed or posted.
Frequency of Occurnece	As needed by manager

24. UC-RAS-MVO

Use-case ID : UC-RAS-MVO :	Use-case Name : Manager-view all customers order history
Description :	Manager-view all customers' order history in a restaurant automation system is a critical feature for managing customer relationships, analyzing sales trends, and addressing customer inquiries.
Pre-Conditions	The manager must be logged into the system with the appropriate access rights.The manager must have access to the customer management or sales reports section of the system..
Success guarantee (Post-conditions)	The system remains stable, allowing the manager to perform additional actions (e.g., exporting, printing, closing).The system may log the viewing action for auditing purposes, noting who accessed the order history and when
Frequency of Use:	Low
Main success scenario (or Basic flow):	The manager selects the option to view customer order history. This might be available under a menu labeled "Order History".The system may prompt the manager to filter the history by customer, date range, order type, or other criteria.
Extensions (or alternate flows):	The manager needs to view the order history for a specific customer in response to a customer inquiry or issue.The system allows the manager to search for the customer by name, phone number, or email.
Frequency of Occurnece	As needed by manager

25 . UC-RAS-VRR

Use-case ID : UC-RAS-VRR :	Use-case Name : View resource reports
Description :	Viewing resource reports in a restaurant automation system is essential for tracking and managing various resources, such as inventory, staff schedules, or equipment usage.
Pre-Conditions	The user must be logged into the system with the appropriate access rights.The user must have access to the reports or resource management section of the system.
Success guarantee (Post-conditions)	The system successfully generates and displays the requested resource report for the user to review.The system remains stable, allowing the user to perform additional actions, such as exporting, printing, or closing the report.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The user navigates to the reports section of the system, often labeled as “Reports,” “Analytics,” or “Resource Management.” The user selects the option to view resource reports. This may include various types of reports, such as inventory usage, staff scheduling, equipment maintenance, or utility consumption.
Extensions (or alternate flows):	The user attempts to generate a report, but there is no data available for the selected parameters (e.g., no inventory transactions within the specified date range).
Frequency of Occurnece	As needed by manager

26 . UC-RAS-VRR

Use-case ID : UC-RAS-VRR :	Use-case Name : View restaurent resources
Description :	Viewing restaurant resources in a restaurant automation system involves accessing detailed information about various assets or components necessary for the restaurant's daily operations.
Pre-Conditions	The user must be logged into the system with the appropriate access rights.The user must have access to the resource management section of the system.
Success guarantee (Post-conditions)	The system successfully retrieves and displays the requested resource information for the user to review.The system remains stable, allowing the user to perform additional actions or navigate to other areas without issues.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The user, such as a manager or staff member, logs into the restaurant management system with the necessary credentials.The user navigates to the resource management section of the system.The user selects the type of resource they want to view.
Extensions (or alternate flows):	The resource the user is trying to view is currently unavailable or marked as inactive (e.g., an out-of-service equipment).
Frequency of Occurnece	As needed by manager

27. UC-RAS-VI

Use-case ID : UC-RAS-VI :	Use-case Name : View Ingredients available
Description :	Viewing the available ingredients in a restaurant automation system is a crucial function for managing kitchen operations and ensuring that the restaurant is prepared to meet customer orders. This feature allows kitchen staff and managers to check current inventory levels of ingredients, helping to prevent stock-outs, manage orders, and plan menus effectively.
Pre-Conditions	The user must be logged into the system with the appropriate access rights.The user must have access to the inventory management or ingredient tracking section of the system.
Success guarantee (Post-conditions)	
Frequency of Use:	Low
Main success scenario (or Basic flow):	The kitchen staff, manager, or other authorized user logs into the restaurant management system with the necessary credentials.The user navigates to the inventory management section of the system, often labeled as “Inventory,” “Stock Management,” or “Ingredients.” he user selects the option to view available ingredients. This may be directly accessible from the inventory dashboard or through a menu option specifically for ingredient tracking.The system may allow the user to apply filters, such as by ingredient category, supplier, or location.The user reviews the available ingredients to ensure that there are sufficient supplies for upcoming orders and menu items.
Extensions (or alternate flows):	The user does not have the necessary permissions to view certain inventory information.The system displays a message indicating insufficient permissions and may prompt the user to contact an administrator or request additional access rights.
Frequency of Occurnece	As needed by manager

28. UC-RAS-VC

Use-case ID : UC-RAS-VC :	Use-case Name : View Complaints
Description :	The "View Complaints" use case allows restaurant managers to access and review complaints lodged by customers.
Pre-Conditions	There must be existing data on the ingredients in the system, including quantities and locations.
Success guarantee (Post-conditions)	• The user can see a list of complaints. • The system logs the viewing action for future reference.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The user navigates to the "Complaints" section in the restaurant automation system.
Extensions (or alternate flows):	No complaints are found
Frequency of Occurnece	As needed by manager

29. UC-RAS-PC

Use-case ID : UC-RAS-PC :	Use-case Name : Post complaints
Description :	The "Post Complaints" use case allows customers to lodge complaints directly through the restaurant's online system. This ensures that customer feedback is captured and can be addressed in a timely manner.
Pre-Conditions	The customer must have access to the restaurant's complaint submission platform through a website. The customer must be logged in.
Success guarantee (Post-conditions)	The complaint is successfully submitted and stored in the system. The customer receives a confirmation that their complaint has been received.
Frequency of Use:	Low
Main success scenario (or Basic flow):	The customer logs into the restaurant's online platform. The customer navigates to the "Complaints" section. The system presents a form for the customer to fill out.
Extensions (or alternate flows):	The customer leaves mandatory fields blank: The customer submits a complaint with invalid data , the system fails to store the complaint due to a database error
Frequency of Occurnece	As needed by customer

Non-Functional Requirements:

1. Performance

- **Response Time:**

- System should respond to user inputs within 2 seconds.

- **Scalability:**

-Handle increased transaction volumes during peak hours withou performance degradation.

2. Reliability

- **Uptime:**

- Ensure system availability 99.9% of the time.

- **Data Integrity:**

- Maintain accurate and consistent data storage and retrieval.

3. Usability

- **User Interface:**

- Design intuitive and easy-to-use interfaces for all user roles.

- **Accessibility:**

- Ensure accessibility for users with varying levels of technical expertise.

4. Security

- **Data Security:**

- Protect sensitive data (e.g., financial records, customer information) from unauthorized access.

- **Access Control:**

- Implement role-based access control to restrict functionalities based on user roles.

- **Backup and Recovery:**

- Perform regular backups and ensure the ability to recover data in case of system failure.

5. Maintainability

- **Modular Design:**

- Design the system in a modular way to facilitate easy updates and maintenance.

- **Documentation:**

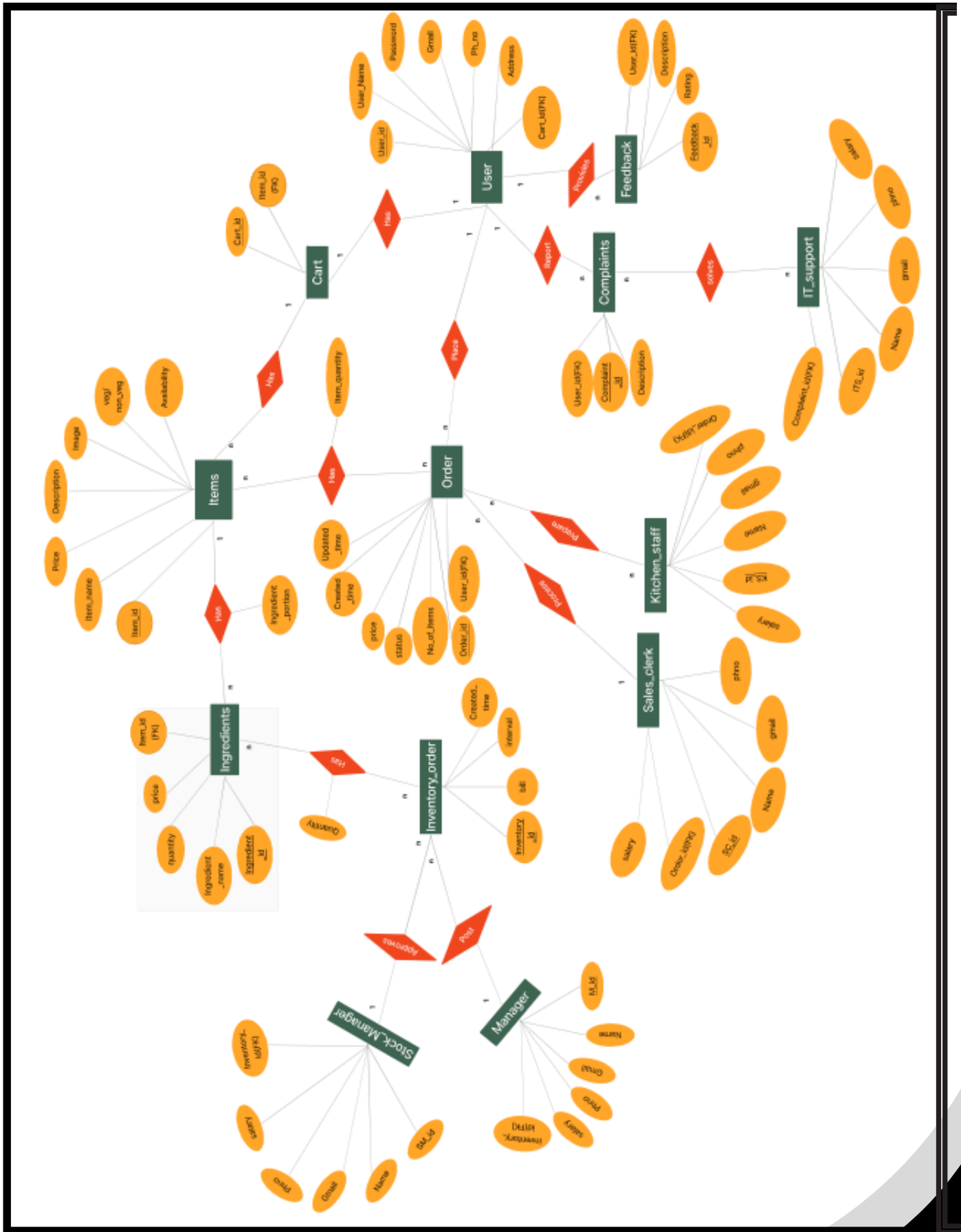
- Provide comprehensive documentation for users and administrators.

6. Compliance

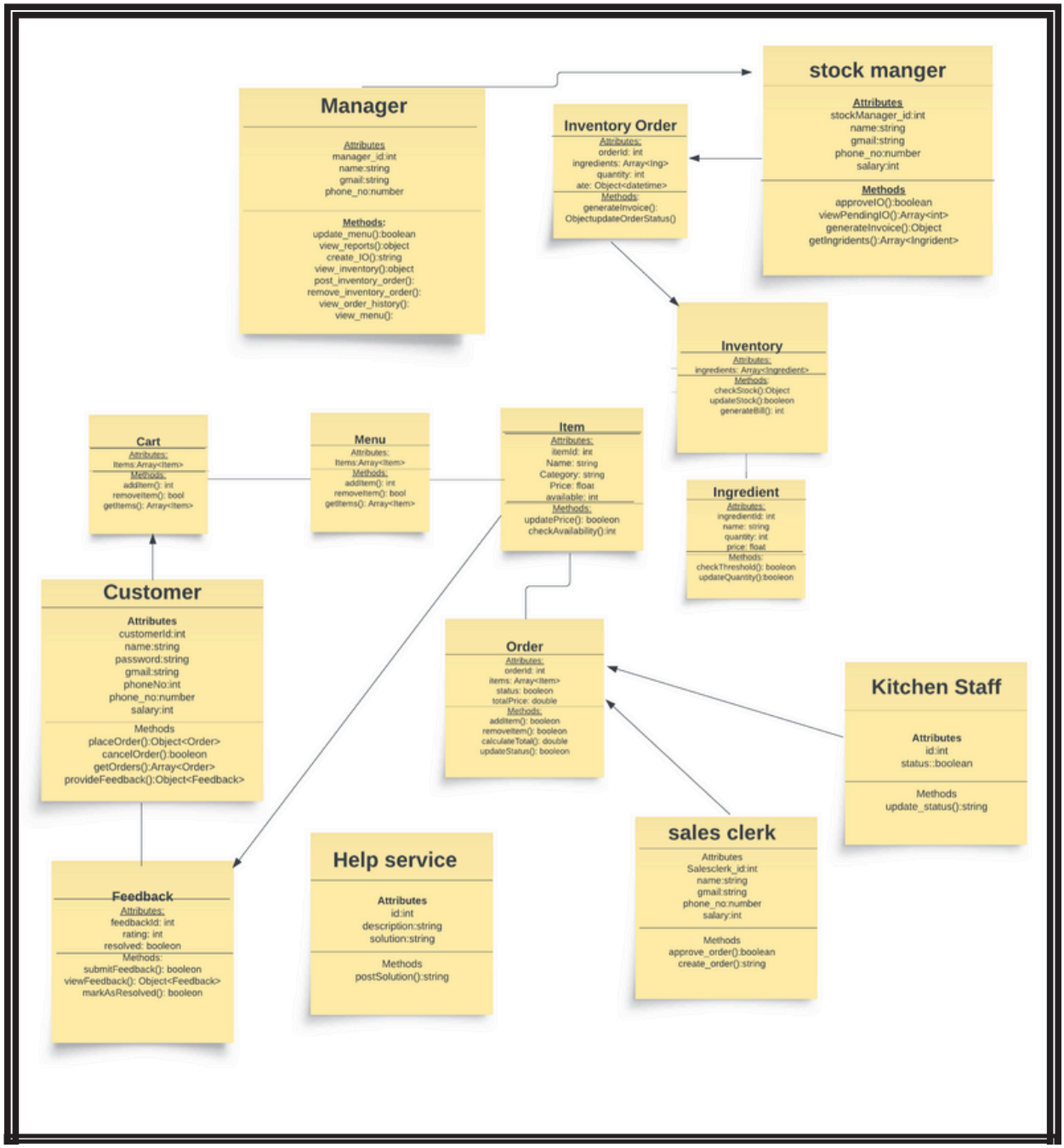
- **Regulatory Compliance:**

- Ensure the system complies with relevant industry regulations and standards (e.g., data protection laws).

ER Diagram:

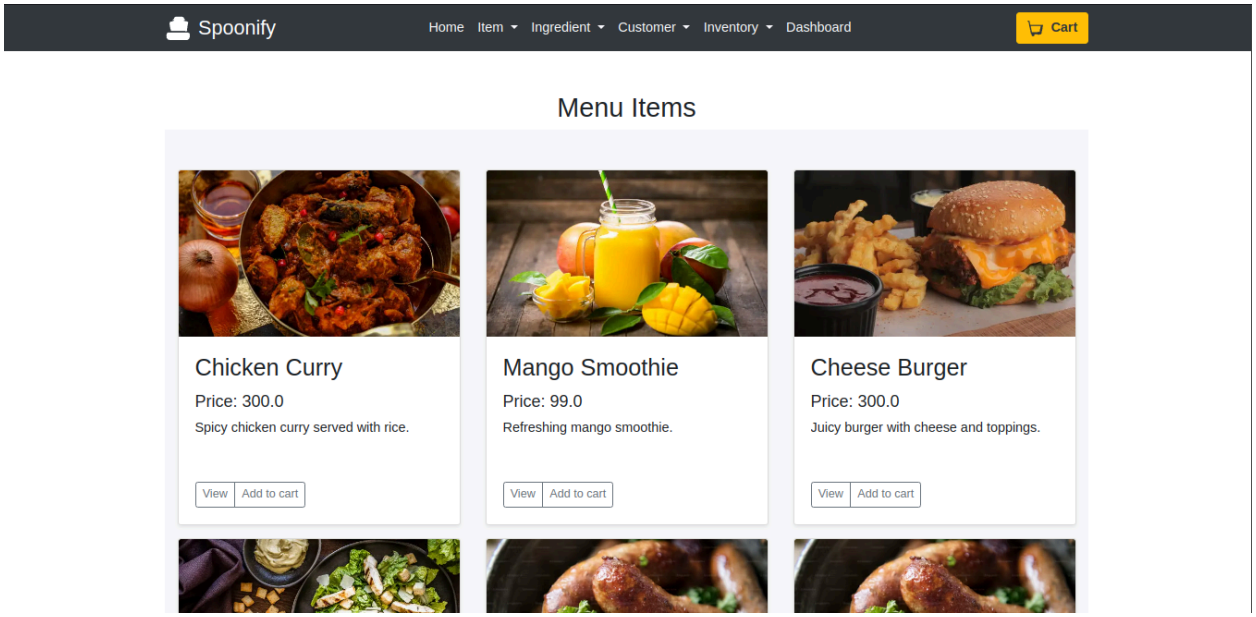

User
Cart
Items
Order
Feedback
Complaints
IT_support
Kitchen_staff
Sales_clerk
Ingredients
Inventory_order
Stock_Manager
Manager
Has
Places
Provides
Report
Solves
Prepare
Process
Approves
Post
Manages

Class Diagram:

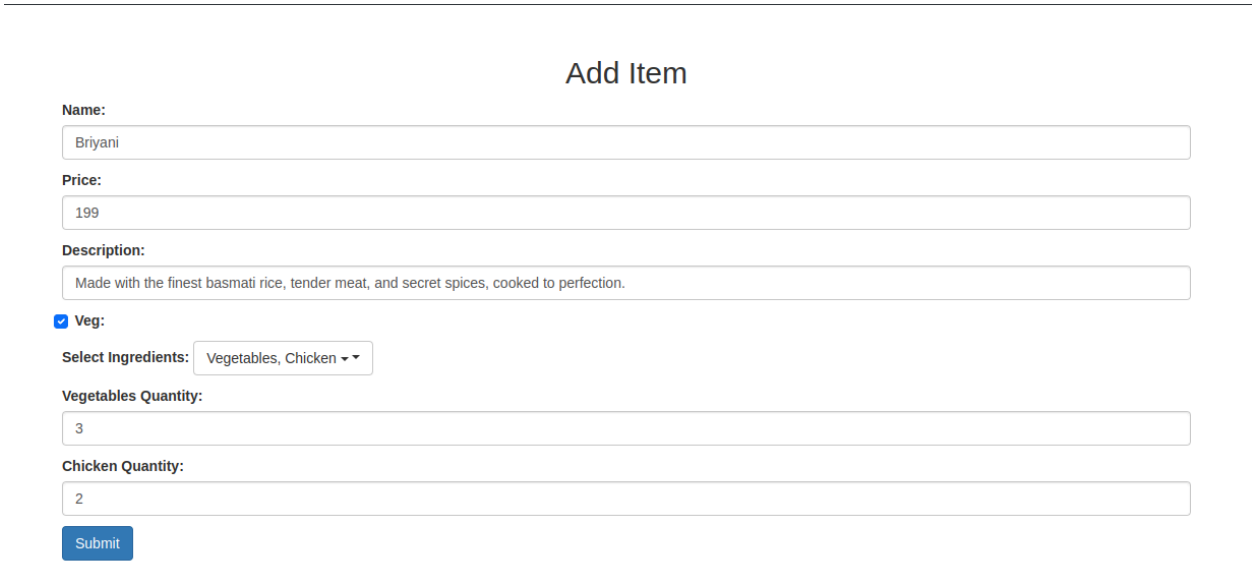


SAMPLE UI PAGES

Home Page:



Add item:

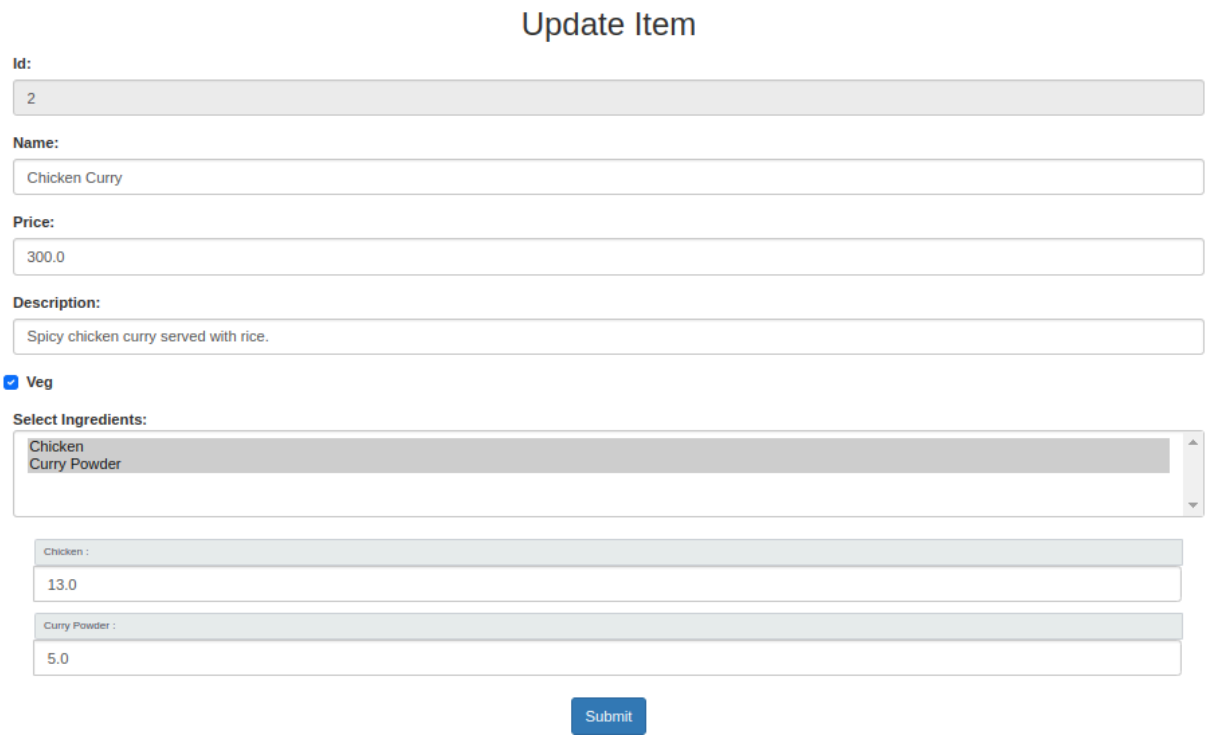


View & Delete item:

All Items

Item Name	Price	Is Vegetarian	Availability	Actions
Chicken Curry	₹300.0	Yes	Update Unavailable	Edit Delete
Mango Smoothie	₹99.0	Yes	Update Unavailable	Edit Delete
Cheese Burger	₹300.0	No	Update Unavailable	Edit Delete
Caesar Salad	₹120.0	Yes	Update Unavailable	Edit Delete
paneer	₹32.0	Yes	Update Available	Edit Delete
Rasam chicken annam	₹59.0	Yes	Update Available	Edit Delete
idly	₹40.0	No	Update Unavailable	Edit Delete
dosa	₹60.0	Yes	Update Available	Edit Delete
chapati	₹23.0	Yes	Update Available	Edit Delete

Edit Item details:



Conclusion:

The Restaurant Automation System (RAS) successfully integrates order processing, inventory management, billing, and accounting into a single cohesive platform. By leveraging automation and real-time data tracking, the system enhances operational efficiency, reduces errors, and improves customer satisfaction. Key features such as inventory management, automatic reordering, detailed reporting, and role-based functionalities streamline day-to-day operations for all stakeholders, including restaurant owners, managers, clerks, and customers. Overall, RAS serves as a powerful tool to modernize restaurant operations, support data-driven decision-making, and provide a superior dining experience.

Future Enhancements:

1. **AI-Powered Analytics:**
    - Implement AI for predictive analytics to forecast sales trends, ingredient demands, and customer preferences.
    - Enable automated suggestions for menu optimization based on past sales and customer feedback.
2. **Integration with Delivery Platforms:**
    - Connect RAS with third-party delivery platforms for seamless online order management and real-time tracking.
3. **Mobile App Development:**
    - Develop dedicated mobile applications for customers and staff to improve accessibility and ease of use.