

Restaurant Management System

Version 1.0

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1. Introduction

1.1 Background & Motivation

The restaurant industry has undergone significant changes over the years, due to evolving customer preferences, technological advancement, and increased competition customers expect quick and efficient services, convenience, and a personalized dining experience. To meet these expectations restaurants must adopt digital solutions that streamline operations, reduce errors, and improve customer engagement.

Many restaurants still rely on traditional management methods involving manual processes and disparate software tools for tasks such as reservations, order management, inventory tracking, and staff coordination. These methods often lead to various operational challenges.

- Manual order processing, inventory checks, and reservation management can be time-consuming and prone to errors, leading to service delays and customer dissatisfaction.
- When different functions, such as reservations and inventory management, are handled by separate systems, it can be difficult to get a holistic view of the restaurant's operations, affecting decision-making.
- Manually tracking orders and inventory increases the likelihood of mistakes, such as incorrect orders or running out of stock during busy hours.
- Without a centralized system to manage customer information and preferences, providing a consistent and personalized dining experience becomes challenging.

These challenges highlight the need for a comprehensive digital solution to integrate various restaurant management functions into a single platform. This is the motivation behind developing the Restaurant Management System (RMS). The goal is to create an all-in-one solution that streamlines processes, automates routine tasks, and centralizes data, enabling restaurant staff and managers to operate more efficiently.

RMS is designed to address key operational aspects Allowing customers to book tables online, view availability, and select their preferred seating options. This reduces the workload on staff and minimizes the likelihood of overbooking. Enabling real-time order tracking and communication between the kitchen and waiting staff, which helps in delivering prompt service and reducing the chance of order mix up. Tracking inventory levels in real-time, automatically alerting staff when stock is low, and facilitating timely reordering to ensure essential ingredients are always available. Collecting customer reviews and feedback to help the restaurant understand areas for improvement and maintain a high level of service quality.

By addressing these areas, the RMS aims to not only improve operational efficiency but also enhance the overall dining experience, leading to higher customer satisfaction and loyalty.

1.2 Aim

The primary aim of the Restaurant Management System (RMS) is to develop a comprehensive web-based platform that joins various restaurant operations into a single, user-friendly interface. The system seeks to automate tasks, reduce manual work, and streamline processes to improve the efficiency and quality of restaurant operations. By doing so, the RMS aims to transform how restaurants manage their daily activities, resulting in enhanced service delivery, reduced operational costs, and improved decision-making.

The key aspect of the aim includes streamlining workflows by automating repetitive tasks and reducing manual intervention. Providing a seamless and convenient way for customers to engage with the restaurant, from making reservations to giving feedback. Equipping managers with the tools to analyze operational data and make informed decisions that improve performance and profitability.

1.3 Objectives

To achieve the project's aim, the Restaurant Management System (RMS) has several specific objectives, each targeting different aspects of restaurant management.

- Integrate key functionalities such as reservations, order processing, inventory tracking, and staff management into a single system for easy access and management.
- Streamline tasks like order processing and inventory updates to reduce manual work, minimize errors, and speed up service.
- Offer a user-friendly interface for online reservations, order customization, and feedback to ensure a convenient and personalized dining experience.
- Use analytics to provide insights on customer preferences, peak times, and menu popularity, aiding in better decision-making.
- Incorporate features for shift scheduling, attendance tracking, and performance monitoring to optimize staff coordination and utilization.

These objectives aim to streamline restaurant operations, enhance service quality, and improve overall efficiency.

2. System Analysis and Design

2.1 ER diagram.

The below diagram illustrates an Entity Relationship Diagram (ERD), which is a visual representation used in database modelling to illustrate the logical structure of databases. It shows various entities such as Customer, Order, Employee, and Product, and the relationships between them.

Each entity is represented by an oval shape, and the connections between them are shown with lines that indicate the type of relationship (one-to-Many or Many-to-Many etc.). This diagram helps in understanding how data is interconnected within a system, which is crucial for database design and management.

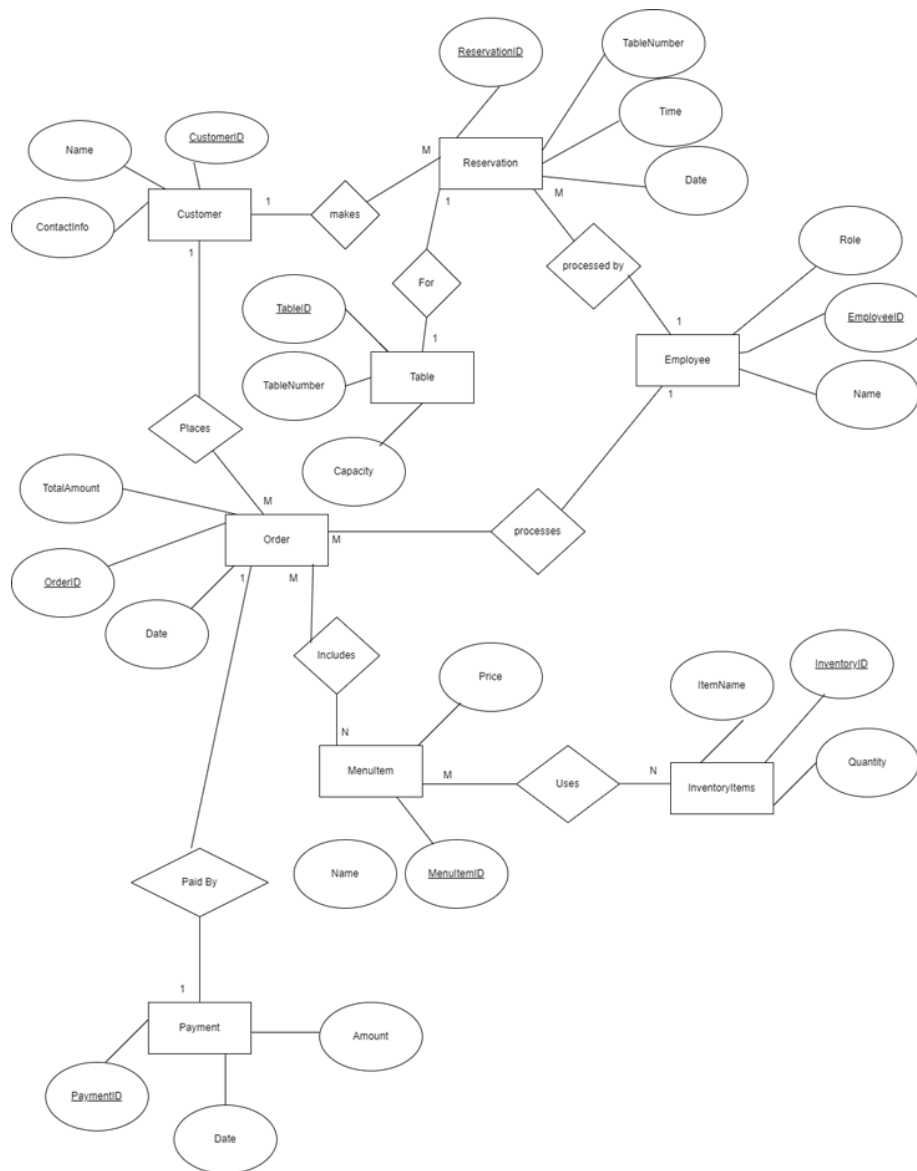


Figure 1 RMS ER Diagram.

2.2 Class Diagram

Restaurant Management System (RMS) class diagram describes the structure of the RMS classes, their attributes, methods, and the relationships among other objects. The main classes of the RMS are Restaurant, Customer, Employees, Reservation, Order, and Menu.

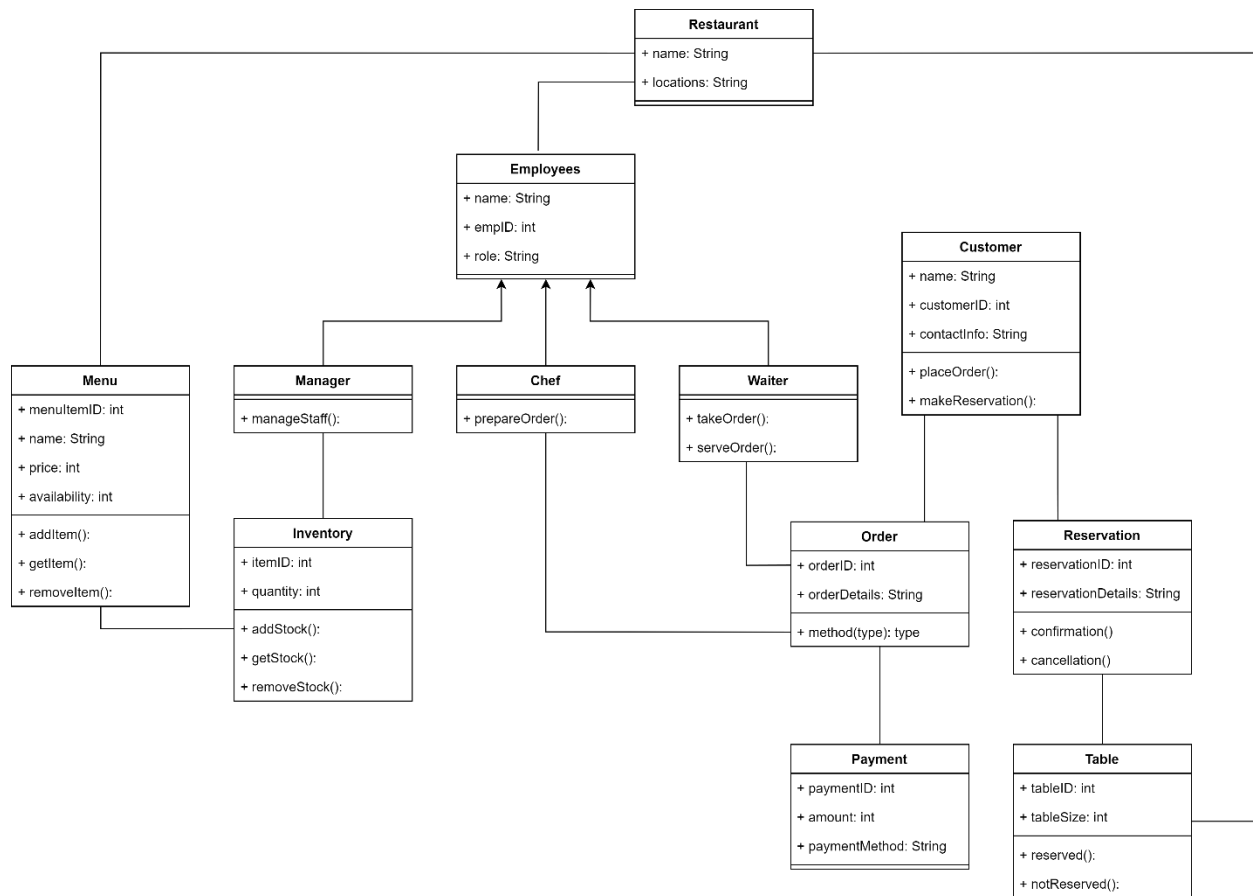


Figure 2 RMS Class Diagram.

2.3 Component Diagram

Restaurant Management System (RMS) component diagram showcases the components of the RMS, required interfaces, ports, and relationships between the Customer, Employees, Reservation, Order, Payment, and Inventory. These components are connected to a central database and interact with each other.

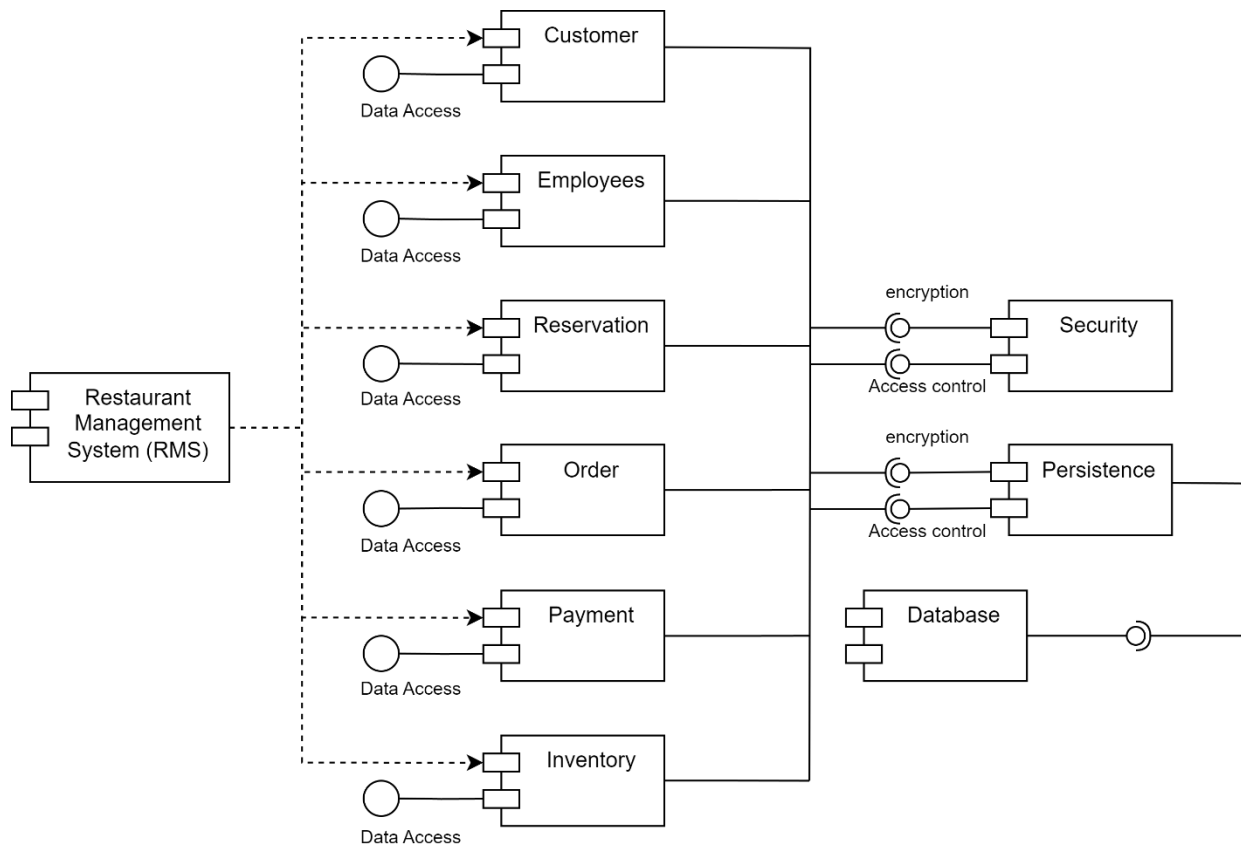


Figure 3 RMS Component Diagram.

2.4 Use Case Diagram

Restaurant Management System (RMS) use case diagram showcases a graphical depiction of users' potential interactions with the RMS. The main actors of RMS are Customers, Managers, Waiters, and Chef.

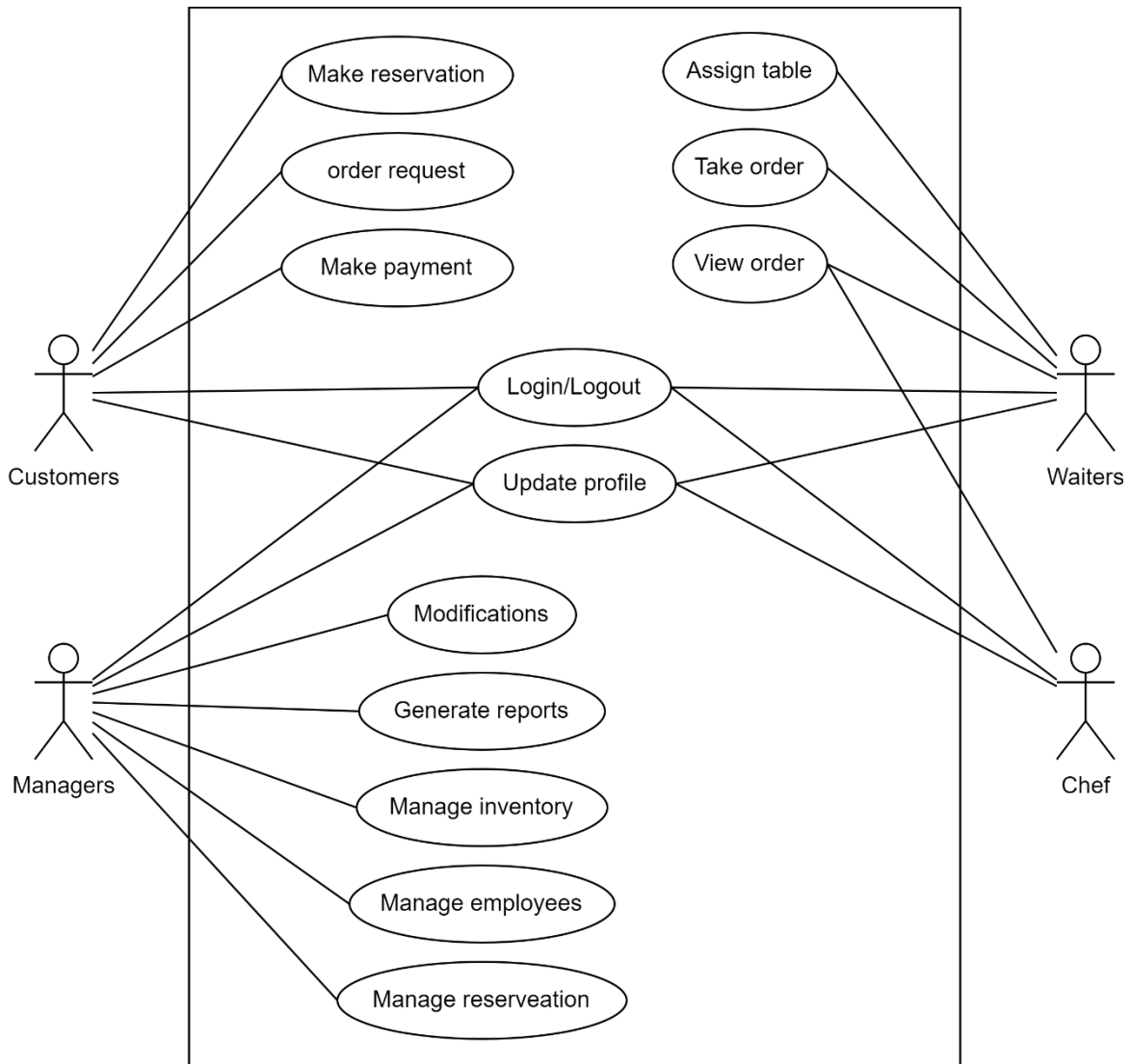


Figure 4 RMS Use Case Diagram.

2.5 Activity Diagram

2.5.1 Reservation Activity Diagram

The reservation activity diagram showcases the workflow for making a reservation via through the restaurant management system (RMS). It begins with a customer login to the website and navigating to the reservation page, where the customer check for availability of tables for the day they would like to dine in. If the table is available, the customer will select the date, time, and party number to reserve the table. Once the reservation is confirmed, the system will record the details regarding the reservation and send the confirmation information to the customer.

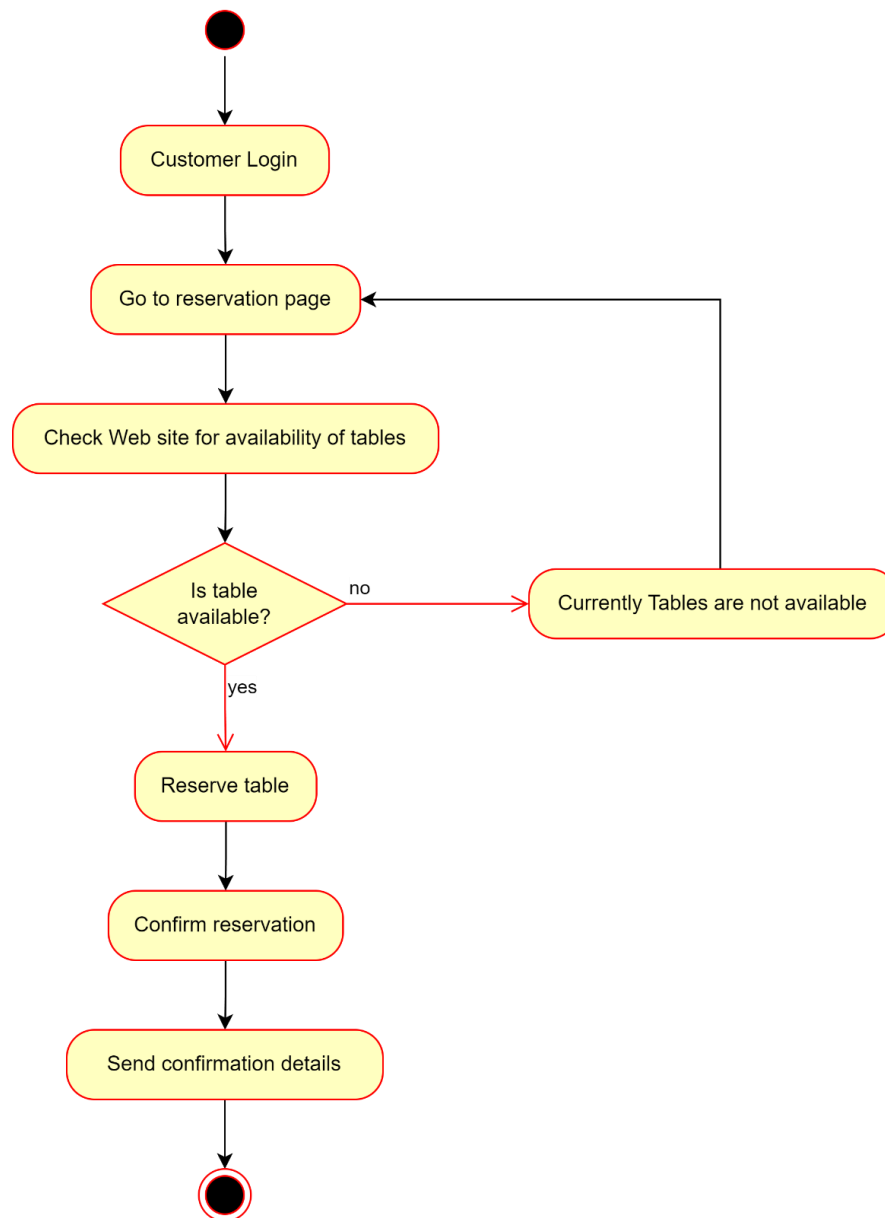


Figure 5 RMS Reservation Activity Diagram.

2.5.2 Ordering Activity Diagram

The ordering activity diagram showcases the process of placing an order in the restaurant management system (RMS). It begins with a customer login to the website and navigating to the menu page, where the customer will select the items, he would like to order. The order is validated to verify whether there were any errors, if not the order will be placed. The customer will receive the confirmation details and details regarding the order will be sent to the chef.

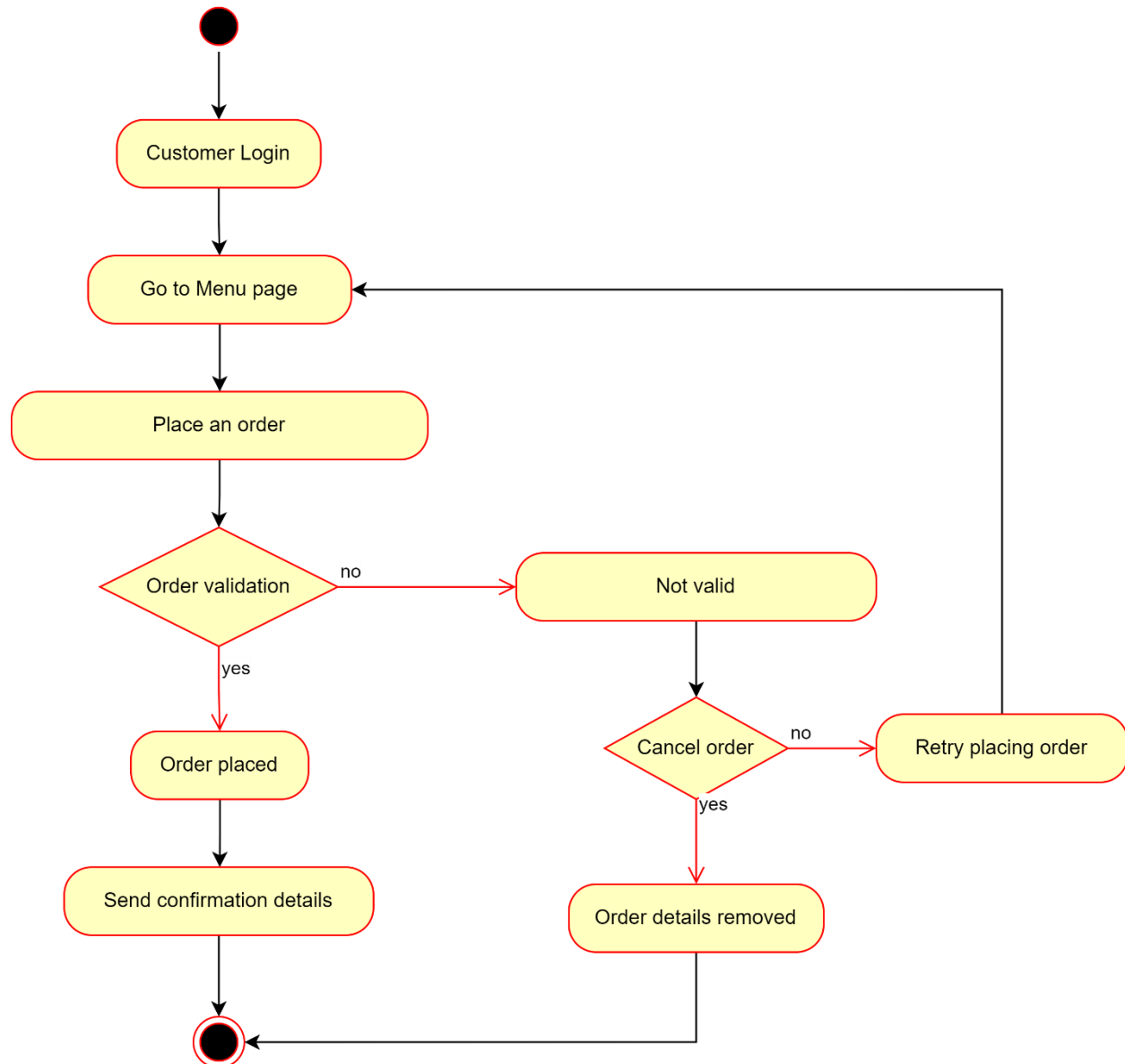


Figure 6 RMS Ordering Activity Diagram.

2.6 Sequence Diagram

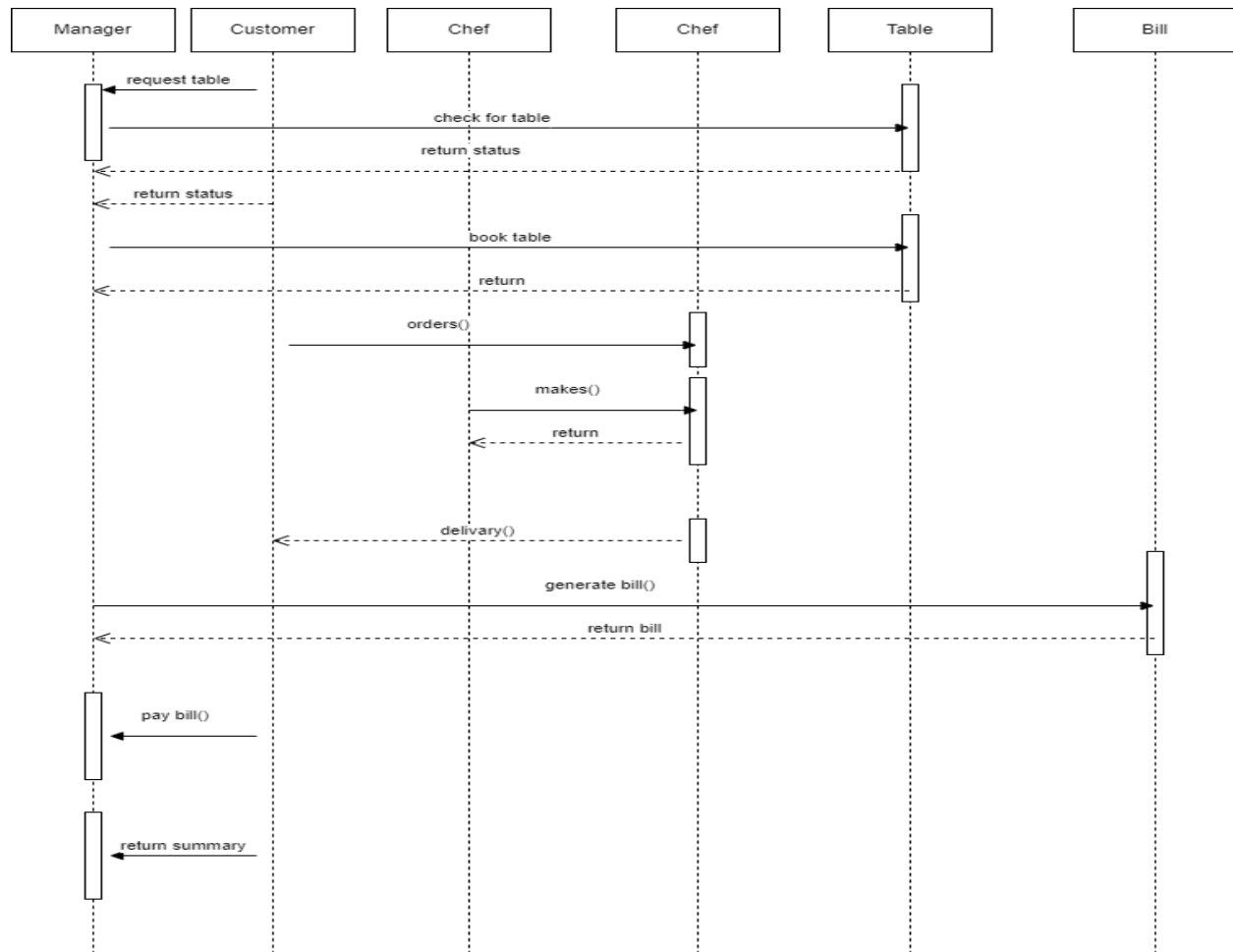


Figure 7 RMS Sequence Diagram

This sequence diagram outlines the process of managing a restaurant experience, from requesting a table to paying the bill, providing a clear view of the system's workflow and interactions.

The above diagram is a UML (Unified Modeling Language) sequence diagram. This type of diagram is used in software engineering to show how objects or components in a system interact with each other over time.

In this particular sequence diagram, the process of managing a restaurant table booking and order system is depicted. It includes interactions between a manager, customer, chef, and the table itself. The steps shown include checking for table availability, booking a table, ordering food, preparing food, delivering orders, generating, and paying bills, and returning summaries.