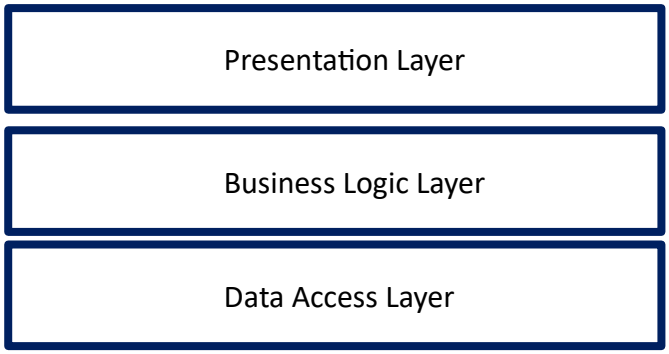
Design structure

The design structure of the ReserveWell Application is organized in a layered architecture, ensuring modularity, scalability, and maintainability. Each layer serves a specific purpose and collaborates seamlessly to achieve the overall goal of efficiently managing restaurant reservations.



Layered Architecture

Subsystems

The application has no subsystems.

Patterns

Overview

The Optimized Reservation Workflow pattern is tailored to streamline the reservation process within the ReserveWell Application, specifically targeting the "Make Reservation" use case. With a focus on enhancing efficiency and user convenience, this pattern aims to provide a dynamic and adaptable framework for managing reservations effectively.

Intent: The primary intent of the Optimized Reservation Workflow pattern in the context of the "Make Reservation" use case is to create a seamless, user-friendly experience for diners while ensuring optimal utilization of restaurant resources. This pattern intends to automate and optimize the steps involved in making a reservation, offering a responsive system that caters to varying diner preferences and restaurant capacities.

Motivation: Traditional reservation systems often involve manual steps and may lack adaptability to real-time changes in diner preferences and restaurant availability. The Optimized Reservation Workflow pattern is motivated by the need to address these challenges by introducing automation and dynamic

decision-making. By doing so, the pattern aims to improve the overall reservation process, benefiting both diners and restaurant managers.

Applicability: The Optimized Reservation Workflow pattern is particularly applicable to the "Make Reservation" use case within the ReserveWell Application. It caters to the interests of various stakeholders, including diners, restaurant managers, system administrators, the Payment Authorization Service, and the Development Team. The pattern is relevant in scenarios where:

- Diners seek an efficient and convenient reservation process.
- Restaurant managers aim to optimize table utilization and ensure a smooth dining experience.
- System administrators need a stable and scalable reservation system.
- The Payment Authorization Service requires seamless integration with the bank's system.

By adopting the Optimized Reservation Workflow pattern, the ReserveWell Application aims to provide a responsive, user-centric reservation experience while ensuring system stability, scalability, and adherence to best practices.

Structure

Diner:

- Role: Initiates the reservation process by interacting with the application's user interface.
- Relevant Data: Provides information such as the desired restaurant, the number of guests, preferred date and time, name, surname, email, and phone number.
- Behavior: Triggers the reservation confirmation process by confirming the provided information.

Restaurant Manager:

- Role: Manages reservations effectively and ensures a seamless dining experience.
- Relevant Data: Accesses and updates reservation information, including table availability, to optimize the dining experience.
- Behavior: Utilizes tools and functionalities to oversee the reservation process and ensure a smooth flow of restaurant operations.

Waitstaff:

- Role: Provides efficient and high-quality service to customers, including arranging tables' physical availability based on reservation updates.
- Relevant Data: Receives real-time updates on reservations and allocates tables accordingly to enhance customer service.
- Behavior: Utilizes tools within the application to organize seating arrangements and deliver a positive dining experience.

Reservation System

- Role: Central component responsible for managing reservations.
- Relevant Data: Stores and processes diner-provided information, generates a unique reservation ID, and updates the system with new reservations.
- Behavior: Validates and records diner reservations, ensuring the availability of the reserved table or dining area during the specified date and time.

User Interface Modules:

- Role: Facilitates interaction between the diner and the reservation system.
- Relevant Data: Displays restaurant options, reservation details, and confirmation messages.
- Behavior: Presents a user-friendly interface, collects diner inputs, and communicates reservation status.

Behavior

Diner Initiates Reservation:

The diner interacts with the user interface, selects a restaurant, specifies the number of guests, and chooses a date and time for the reservation.

Data Submission

Diner enters personal details (name, surname, email, phone number) and submits the reservation request.

System Validation:

The reservation system validates diner inputs, checking for availability and adherence to business rules.

Unique Reservation ID Generation:

Upon successful validation, the reservation system generates a unique reservation ID and associates it with the diner's reservation.

Reservation Confirmation

The reservation system updates its records, marking the reserved table or dining area as unavailable during the specified date and time.

Confirmation Message:

The user interface modules present a confirmation message to the diner, indicating a successful reservation.

Example

Consider a scenario where a diner, Sarah, uses the ReserveWell Application to make a reservation for two at her favorite restaurant. After entering the necessary details and confirming the reservation, the system generates a unique ID, reserves a table, and sends a confirmation message to Sarah's device. If payment is required, the Payment Authorization Service ensures a secure transaction with the bank. This example illustrates a seamless and optimized reservation workflow facilitated by the pattern.

Requirement realizations

View of participants

Diner

- Behavior: Initiates the reservation process, provides necessary information, and confirms the reservation.
- Attributes: Name, surname, email, phone number, selected restaurant, number of guests, preferred date and time.
- Relationships: Interacts with the user interface, triggers reservation confirmation.

Restaurant Manager

- Behavior: Manages reservations effectively, oversees real-time updates, and ensures a smooth dining experience.
- Attributes: Access to reservation management tools, real-time updates on reservations and table availability.
- Relationships: Interacts with the system to optimize table allocation and enhance the dining experience.

Waitstaff

- Behavior: Provides efficient and high-quality service, organizes tables based on real-time reservation updates.
- Attributes: Access to tools for table arrangement, real-time updates on table availability.
- Relationships: Interacts with the system to optimize table arrangements and contribute to positive customer service.

Reservation System

- Behavior: Validates diner inputs, generates unique reservation IDs, updates system records.
- Attributes: Reservation ID, restaurant availability status, reservation details.
- Relationships: Receives inputs from the diner, interacts with the Payment Authorization Service if required.

User Interface Modules

- Behavior: Presents restaurant options, collects and displays reservation details, communicates confirmation messages.
- Attributes: User interface components, reservation status messages.
- Relationships: Facilitates interaction between the diner and the Reservation System.

Basic scenario

Diner Initiates Reservation

Diner interacts with the user interface, selects a restaurant, and specifies the number of guests, date, and time for the reservation.

Data Submission

Diner enters personal details, and the system collects and validates the reservation request.

System Validation

The Reservation System validates diner inputs, checks restaurant availability, and confirms the reservation's feasibility.

Unique Reservation ID Generation

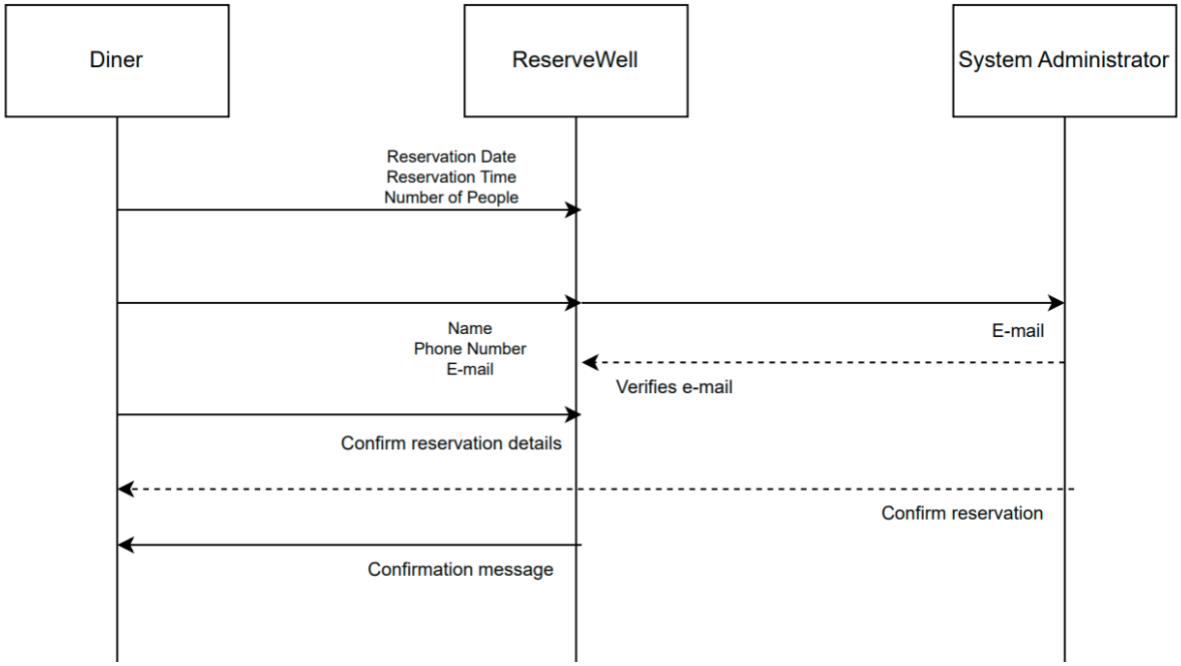
Upon successful validation, the Reservation System generates a unique ID and associates it with the reservation.

Reservation Confirmation

The Reservation System updates its records, marking the reserved table or dining area as unavailable during the specified date and time.

Confirmation Message

The User Interface Modules present a confirmation message to the diner, indicating a successful reservation.



Sequence Diagram For Basic Scenario

Additional scenarios

Scenario 1: System Failure and Recovery

In the event of a system failure, the diner restarts the system, triggering a request for recovery of the prior state. The system then reconstructs the prior state, ensuring a seamless continuation of the reservation process.

Scenario 2: Anomalies preventing recovery

If the system detects anomalies preventing recovery, it signals an error to the diner, records the error, and enters a clean state. The diner is then prompted to start a new reservation, ensuring data integrity and system stability.

Scenario: Diner Entered Incorrect Information

In case the diner enters incorrect e-mail address, the system notifies the diner and prompts the diner to re-enter the information until successfully verified.

Version	Date	Description
v1.0	26.11.2023	-
v1.1	25.11.2023	• According to advisor feedback, subsystems part is updated. • Additional scenario part is revised.