Final Design Document

for

<Hotel Management System>

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I. System architecture:

1) Domain Driven Design (DDD) Layered Architecture

This system is built with Domain Driven Design (DDD), there are 4 main layers:

- **Presentation Layer** (User Interface Layer): This layer is used to display information to the user and receive new data. It can be done by Web application, Desktop or by any presentation technology. This layer depends on the Application layer.
- **Application Layer:** This layer contains business logic. It is responsible for monitoring and coordinating application activities that are executed on the Domain. Does not contain logic or business, does not store the state of the business. This layer depends on the Domain layer.
- **Domain Layer**: This layer is the heart of the software business. Businesses and logic are placed in this layer. Entity (Class) states and operations that are used to describe operations are placed here. This is information exchanged with different systems, or describes objects that can be saved to a database, or used to forward to an infrastructure layer such as a repository.
- **Database Layer** (Infrastructure Layer): This class acts as a support library for all current classes. It provides communication between layers, implements business persistence for business objects.

Domain-Driven Design (DDD) brings benefits and solves a lot of system problems of Hotel Management System:

- Separation of Concerns: Layered Architecture helps separate different concerns within the application. In the context of a Hotel Management System, this separation allows us to organize our code into distinct layers, each with a specific purpose.
- Scalability and Modularity: Layered Architecture enables independent development and deployment of different layers. If you need to enhance or replace a specific layer (e.g., UI or data access), it won't impact the entire system. This flexibility is crucial for maintaining and evolving

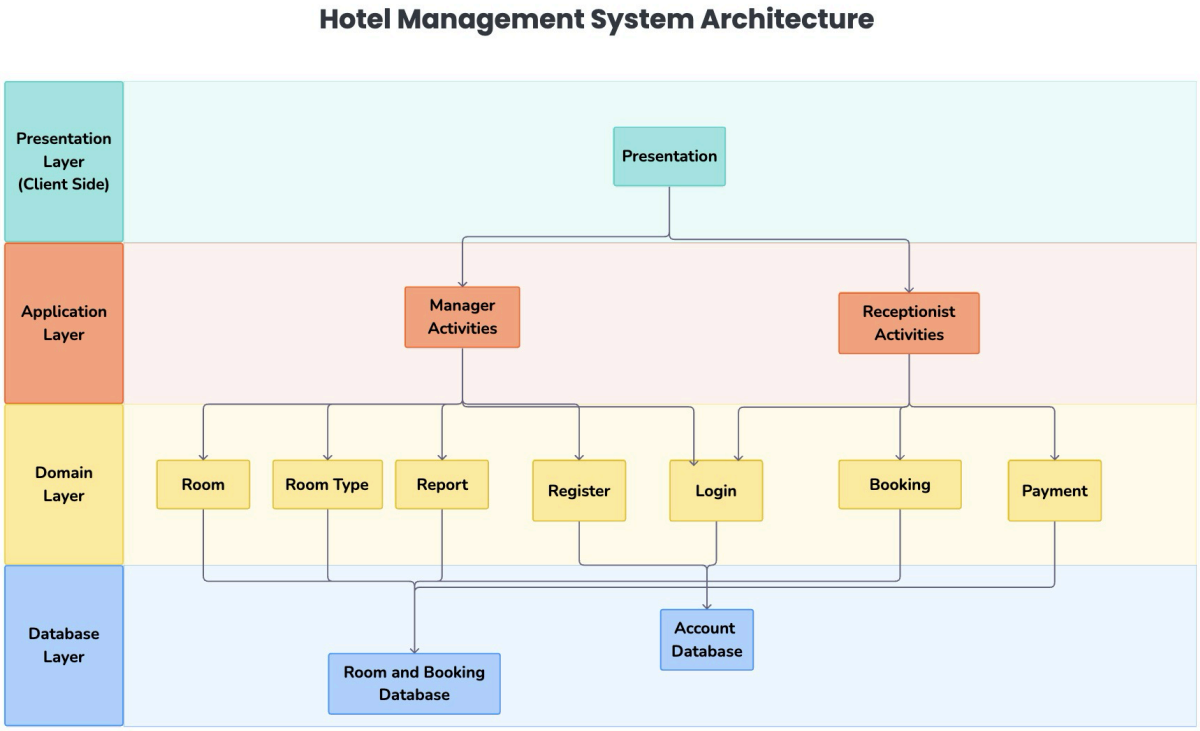
large applications.

- Enforcement of Restrictions: By enforcing communication restrictions between layers, we achieve encapsulation. When a layer changes or is replaced, only the affected layers need to be updated. This minimizes the ripple effect across the entire application.
- Reduced Dependency and Easier Testing:Layered Architecture reduces dependencies between components. Each layer has a well-defined responsibility, making it easier to modify and maintain the application over time. Testing becomes simpler because individual components can be tested independently.

Domain-Driven Design Layered Architecture promotes modularity, scalability, and separation of concerns, making it a valuable choice for building complex systems like Hotel Management System.

2) Architectural Model:

Domain Driven Design (DDD) Layered Architecture



3) Domain Component:

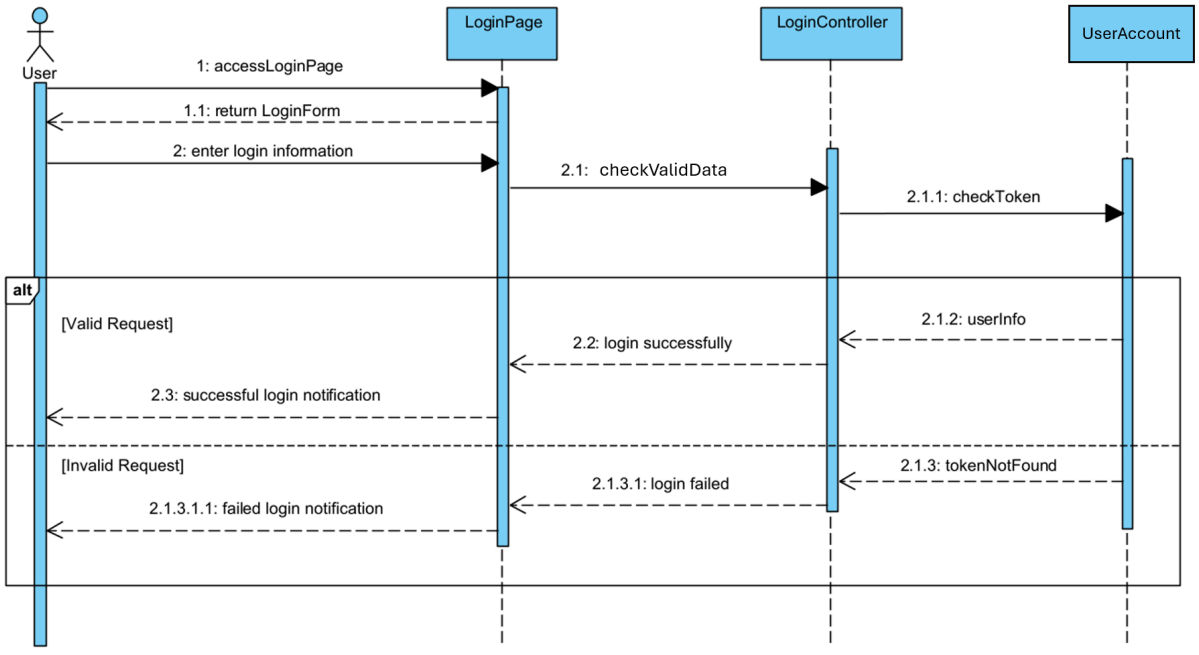
Name	Description
Login	The Login component in a Hotel Management System often plays an important role in controlling access to system functions and data. The Login component allows users to enter their credentials, including username and password, to authenticate their identity and access the system. Users are manager and receptionist. The Login component typically includes a form that allows users to enter their login information. It can also provide options like “Forgot Password” to help users recover their login information if needed. The Login component needs to be secure to prevent unauthorized access. This is typically done through encrypting credentials and allowing only valid access. Furthermore, it maintains user sessions and permissions, enabling secure access to platform features and resources while protecting against unauthorized access.
Register	The Registration component in the Hotel Management System is responsible for creating a new account for the user. The Registration component allows the user to create a new account by providing necessary information such as name, date of birth , phone number, account, password, email. The user can be a new customer or a new employee who needs to create an account to access the system. The Registration component typically includes a form that allows users to enter their registration information. It may also provide a “Sign up by email” option to create an account. The Registry component needs to be secure to prevent unauthorized access. This is typically done through encrypting registration information and allowing only valid access.
Room Type	The Room Type component in the Hotel Management System plays an important role in managing and classifying hotel room types. This component provides a list of room types and their information,

	allowing managers to create new room types, edit information about room types, and delete room types.
Room	The Room component in the Hotel Management System plays an important role in managing and classifying hotel rooms. This component provides a list of rooms and their information, allowing managers to create new rooms, edit information about rooms, and delete rooms.
Booking	The Booking component in the Hotel Management System plays an important role in managing and tracking hotel reservations. The Reservations component allows users to book rooms, services, and amenities. It also allows us to manage bookings, prices, customer information and payments. The user is a hotel receptionist who needs to manage reservations. The Booking component allows users to search for available rooms, view room information, book and pay online. The Booking component needs to be secure to prevent unauthorized access. This is typically done through encrypting payment information and allowing only authorized access.
Payment	The Payment component in the Hotel Management System plays an important role in processing payment transactions. The Payments component allows users to make payments for services they have used, including rooms, room service, restaurant services, and others. It also allows hotels to add incidental charges to the final bill and quickly generate invoices and receipts. The user is a hotel receptionist who needs to process payment transactions. The Payment component includes an intuitive interface that allows users to make payments online or at the reception desk, allowing for extraction and printing of invoices. The Payments component needs to be secure to prevent unauthorized access. This is done through encrypting payment information and allowing only valid access.
Report	The Report component in the Hotel Management System plays an important role in providing detailed and up-to-date information about the system's

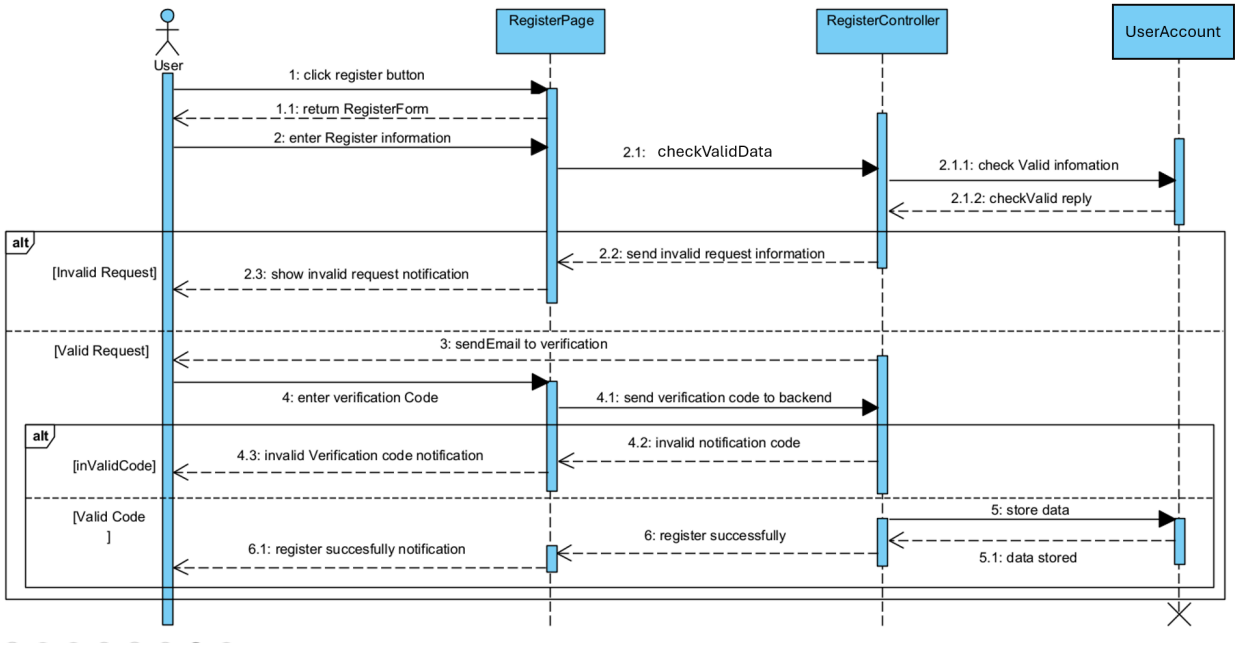
	performance. The Report component allows users to generate detailed reports on various activities in the system, including room management, reservations, and other services. This helps in monitoring performance and managing resources effectively. The user is a manager and needs to analyze data and information from the system. The Report component includes a user-friendly interface that allows users to select different reporting criteria, and generate reports based on these criteria. It can also provide options like "Export Report" to help users save and share reports. The Report Generation component needs to be secure to prevent unauthorized access to sensitive data and information. This is typically done through controlling access and allowing only users with valid permissions to create and view reports.

II. Sequence diagram

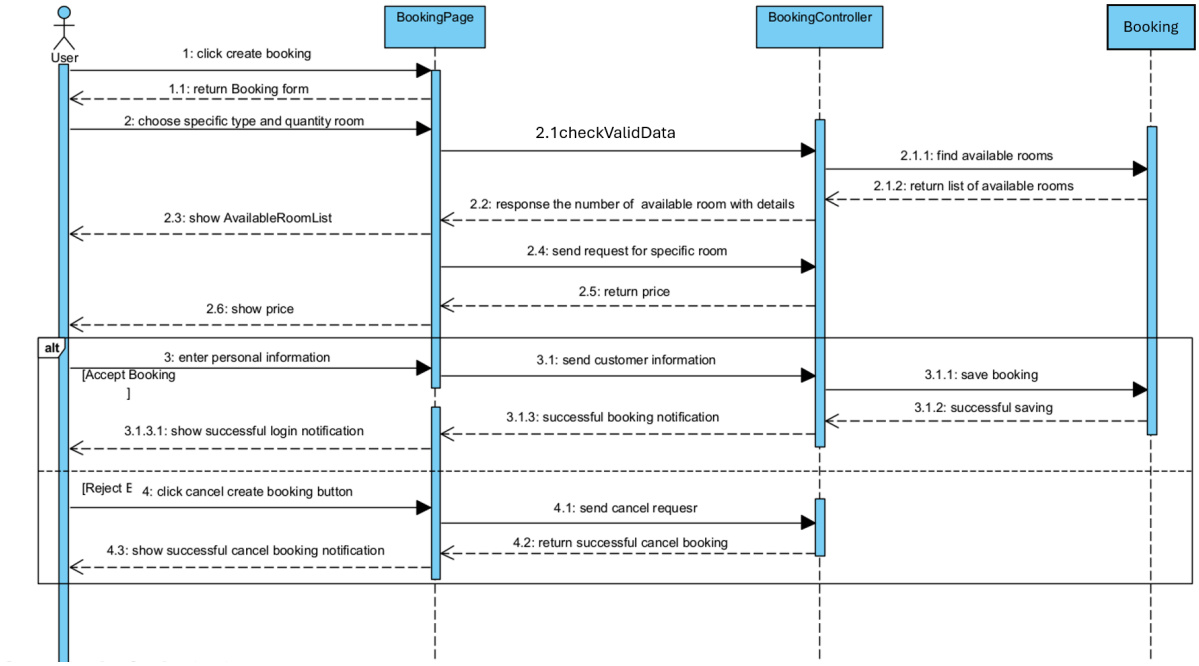
2.1 Login



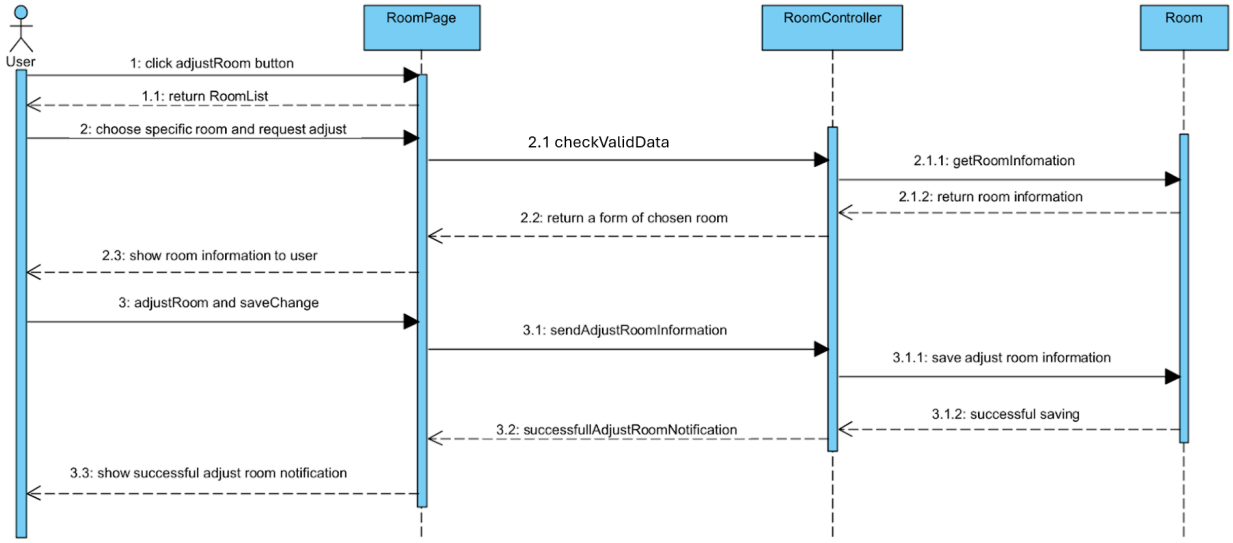
2.2 Register



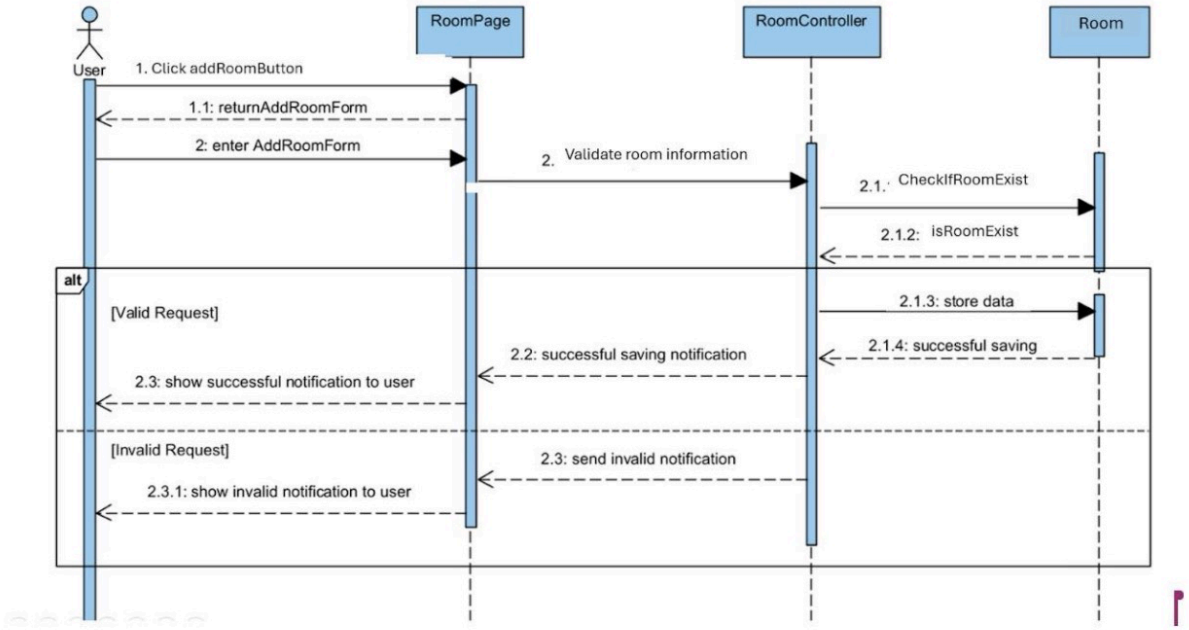
2.3 Create Booking



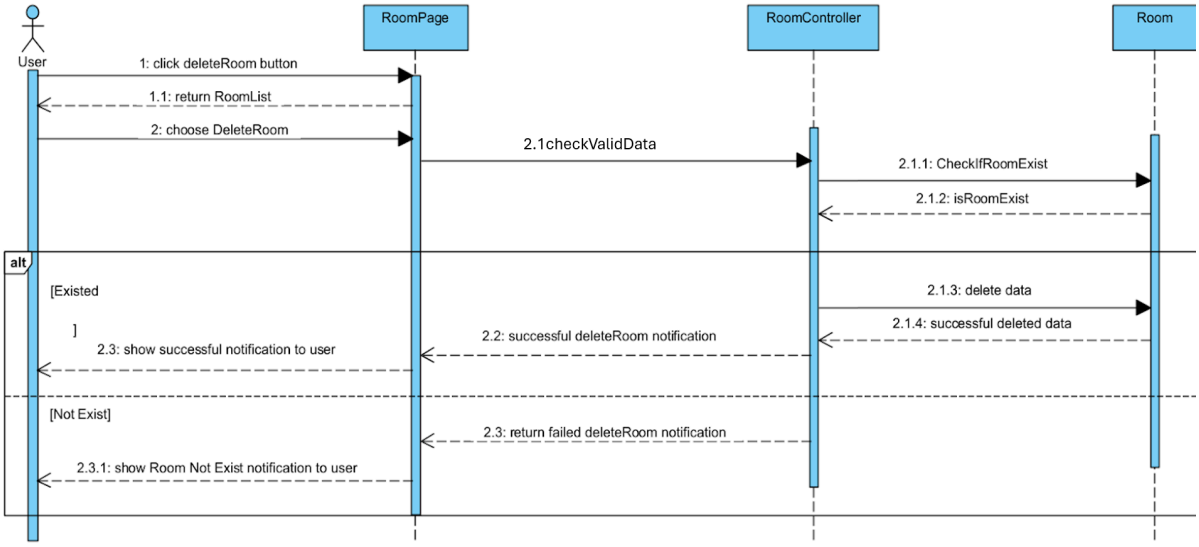
2.4 Adjust Room



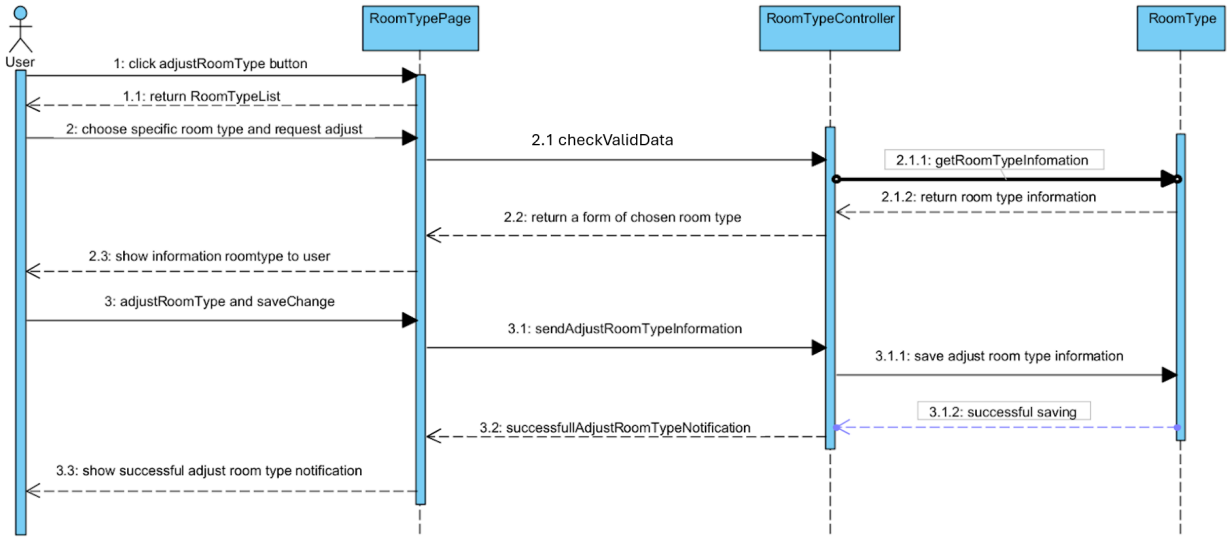
2.5 Add Room



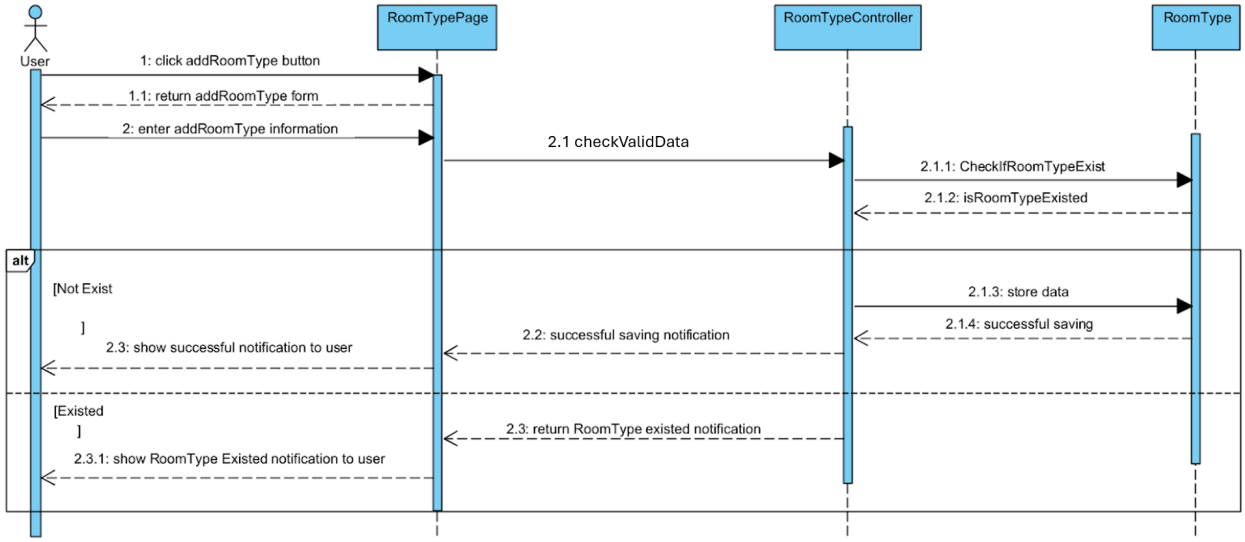
2.6 Delete Room



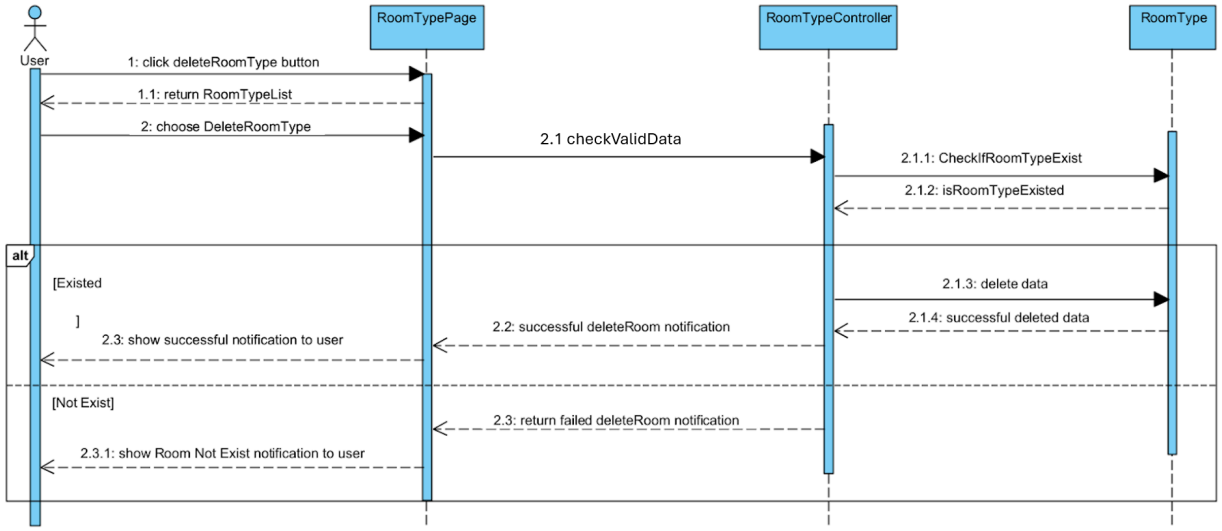
2.7 Adjust Room Type



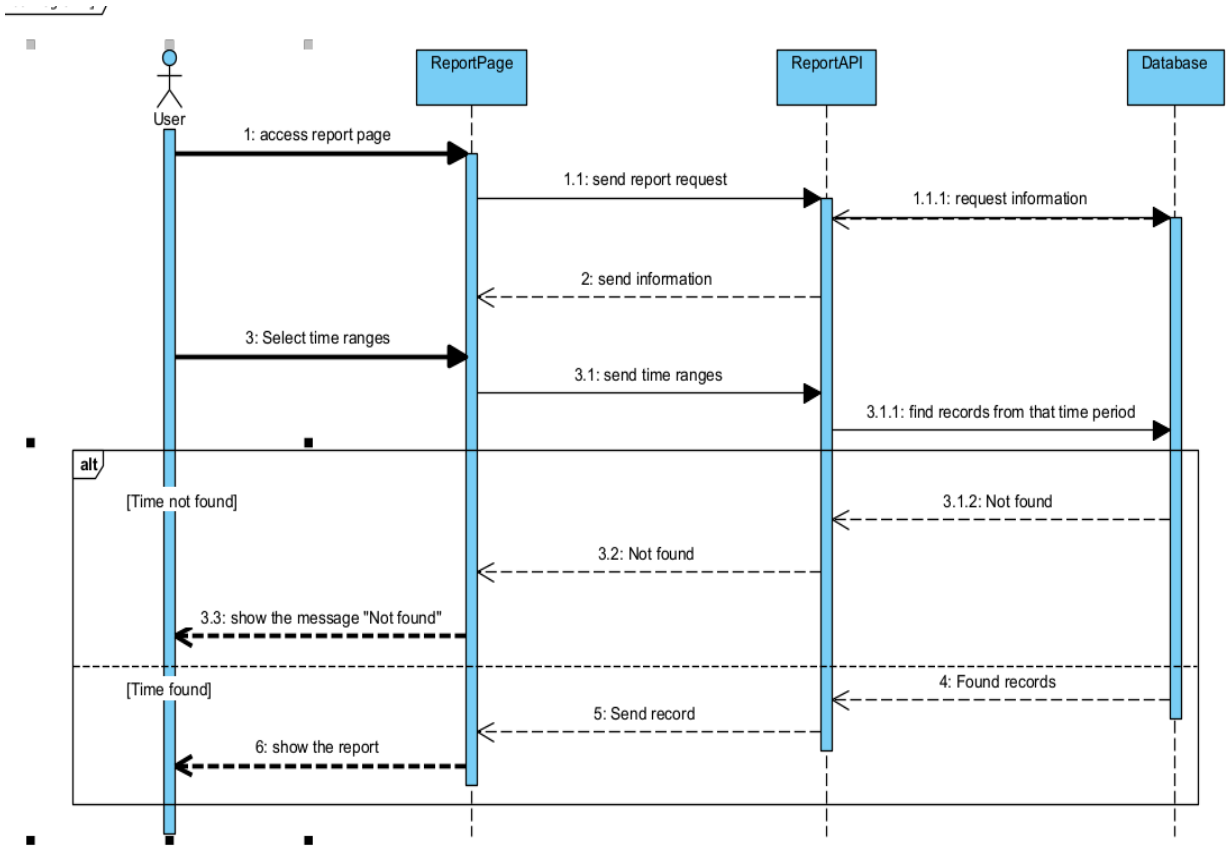
2.8 Add RoomType



2.9 Delete Room Type

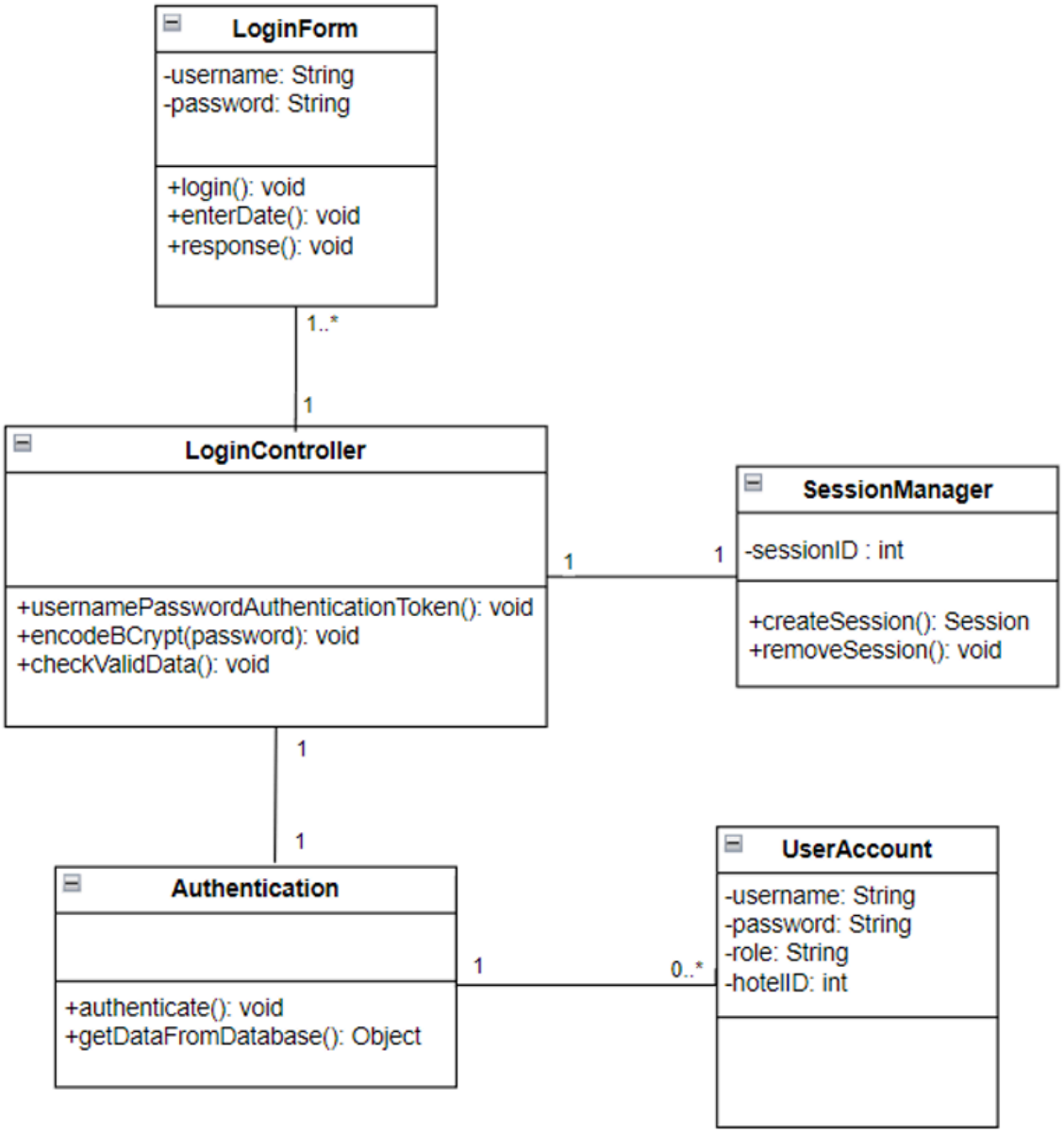


2.10 Generate Report

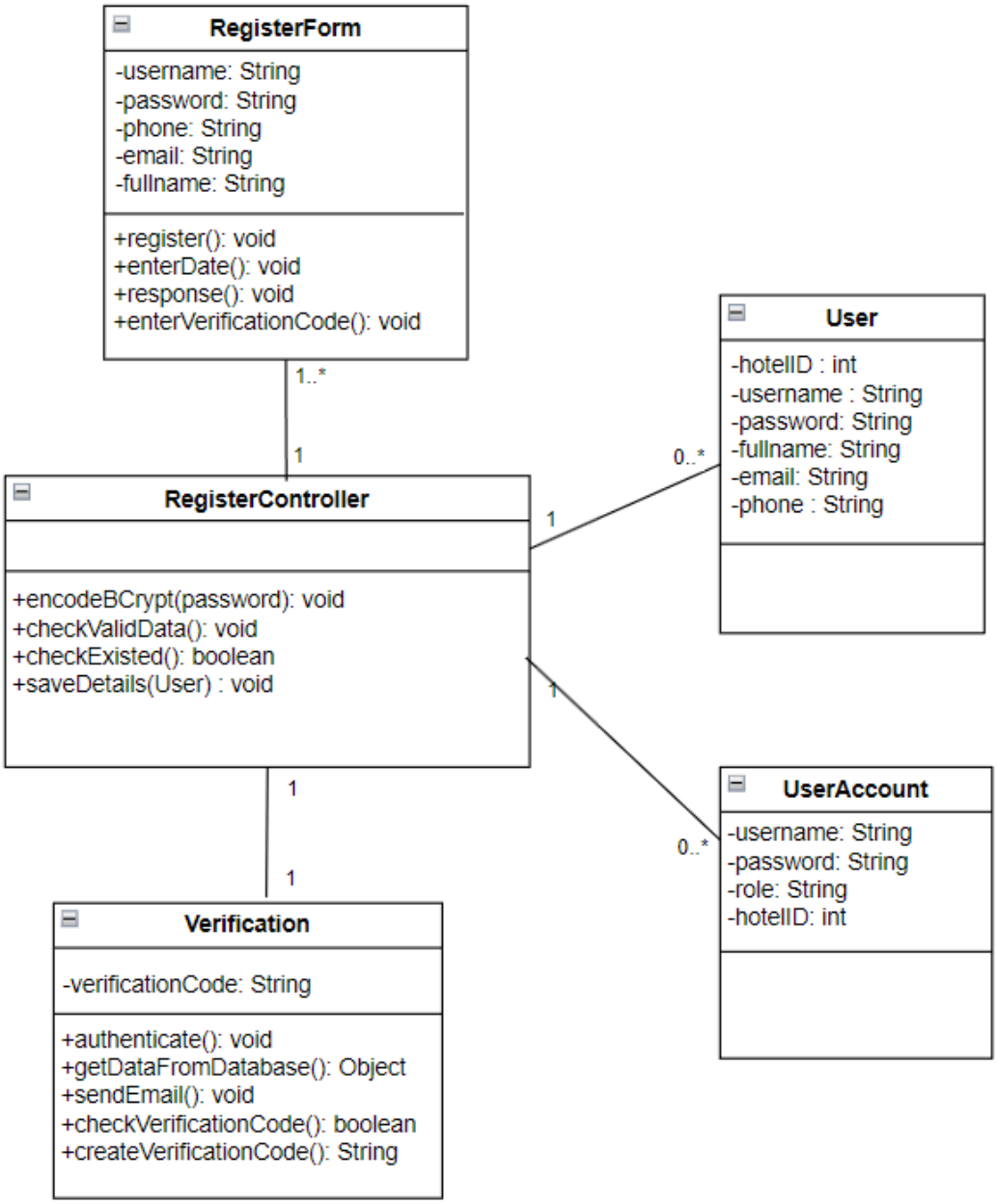


III. Class diagram

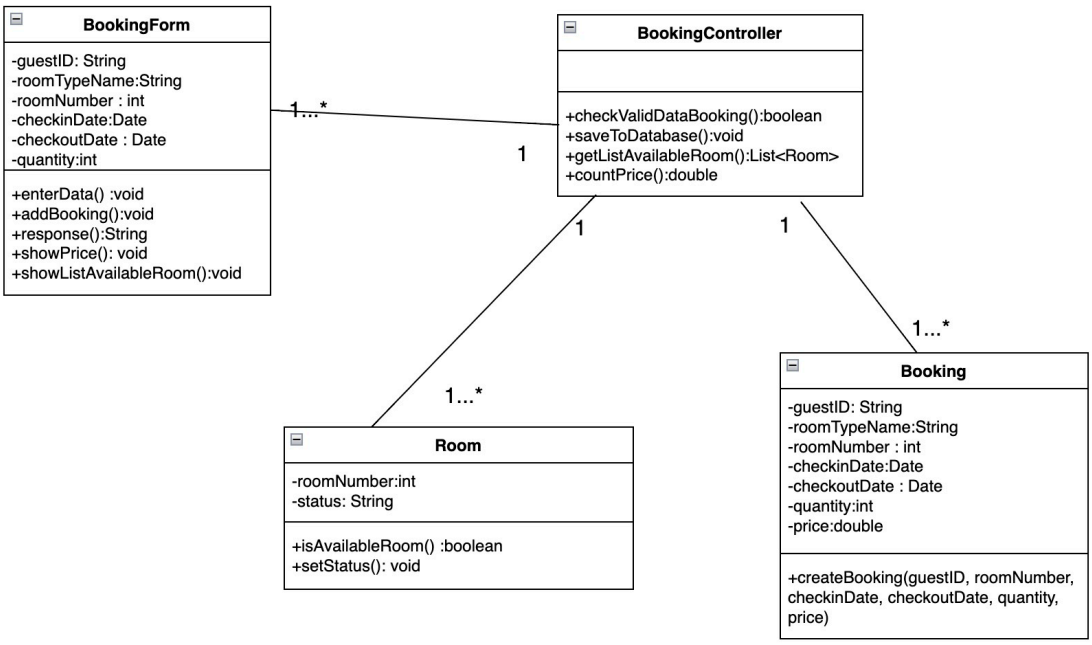
3.1 Login



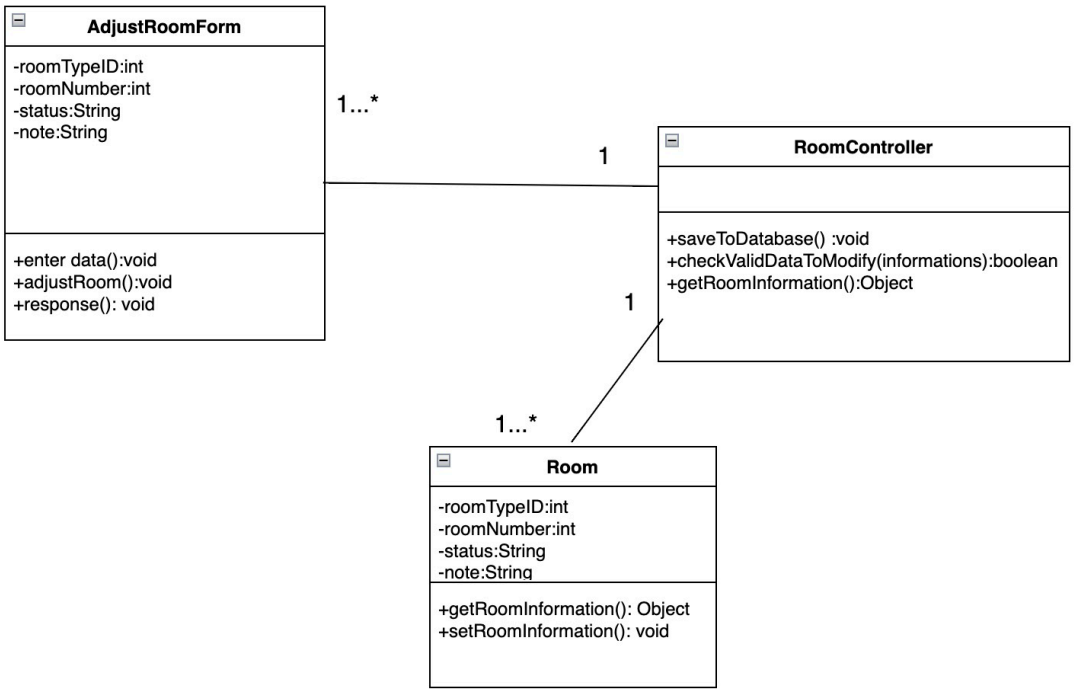
3.2 Register



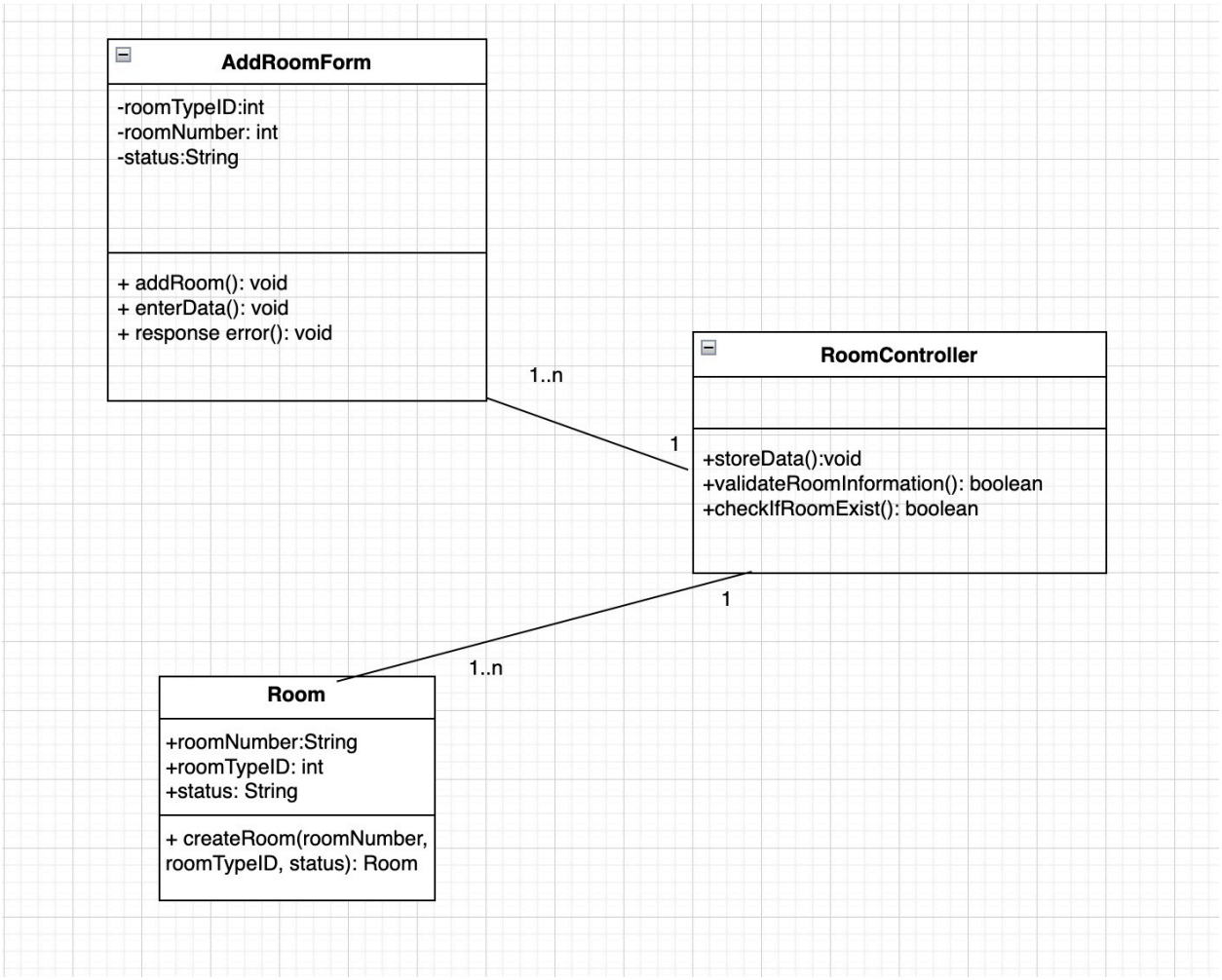
3.3 Create booking



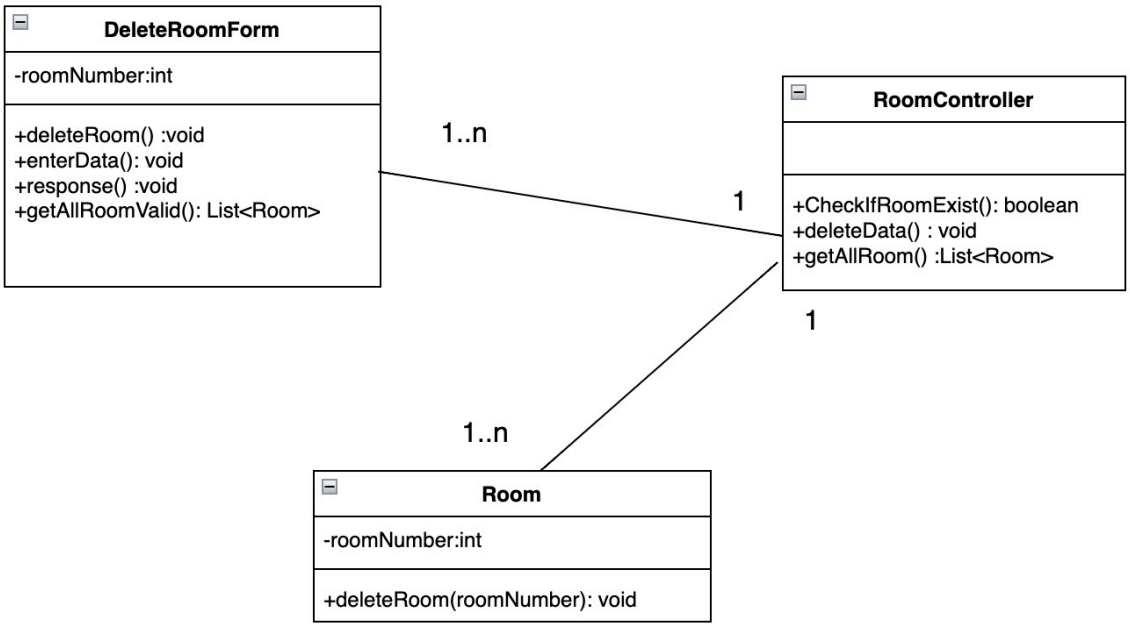
3.4 Adjust room



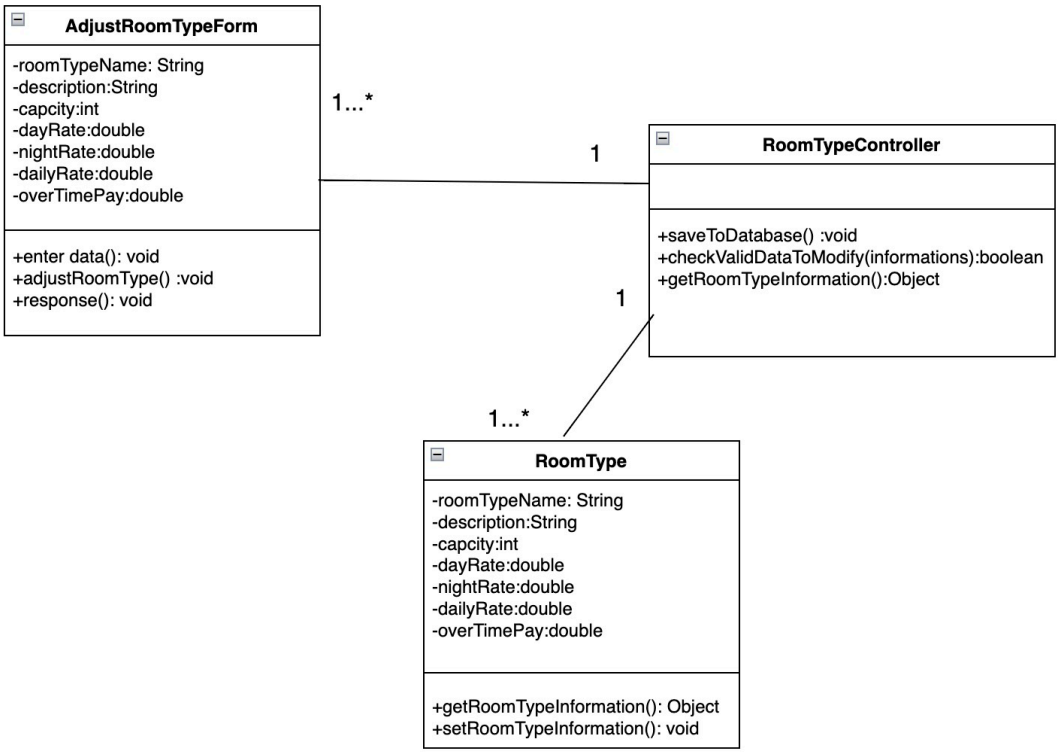
3.5 Add room



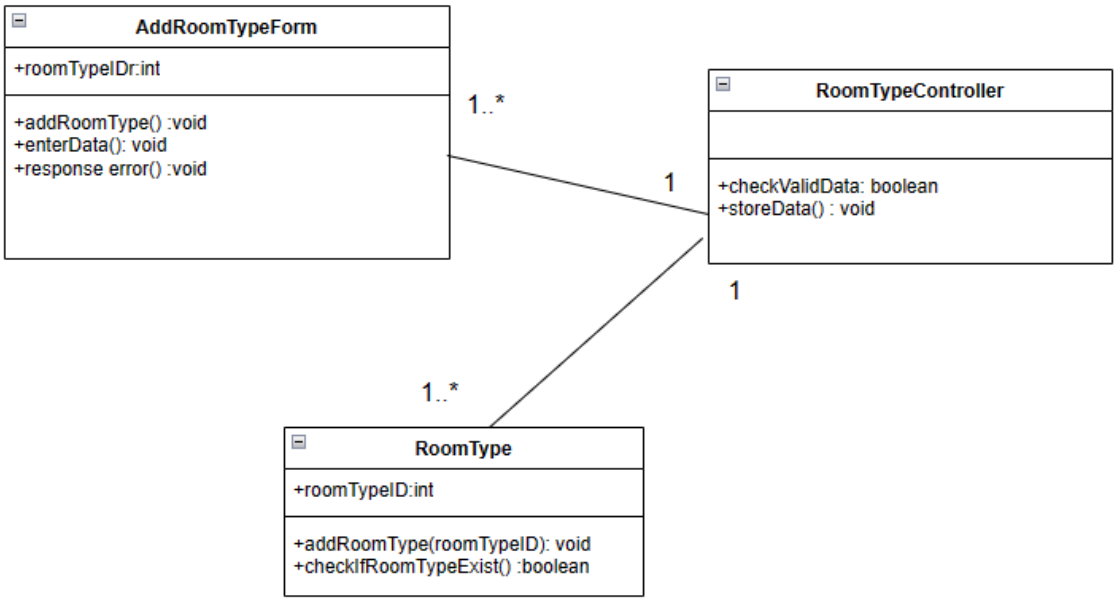
3.6 Delete room



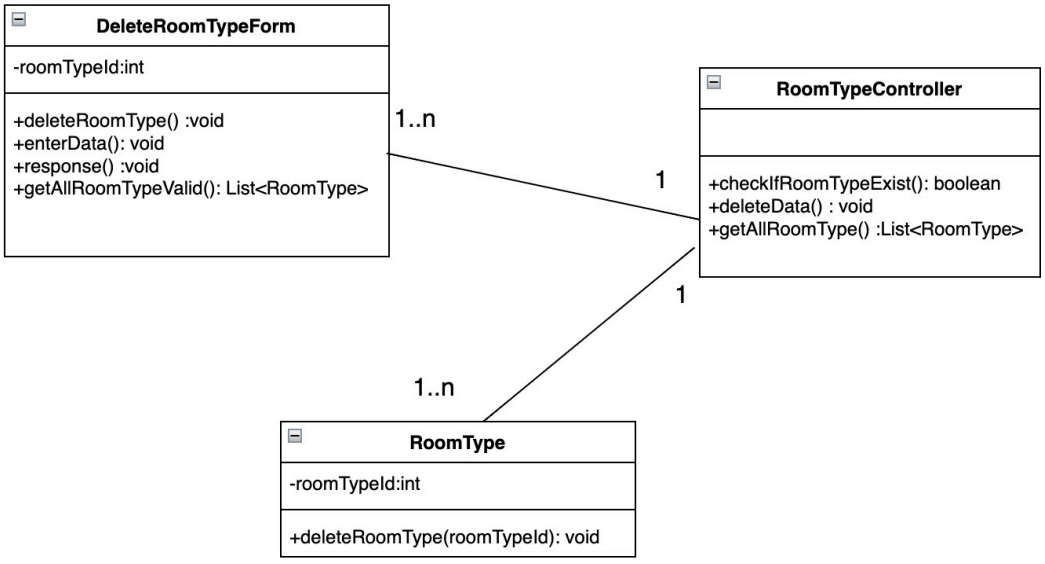
3.7 Adjust Room Type



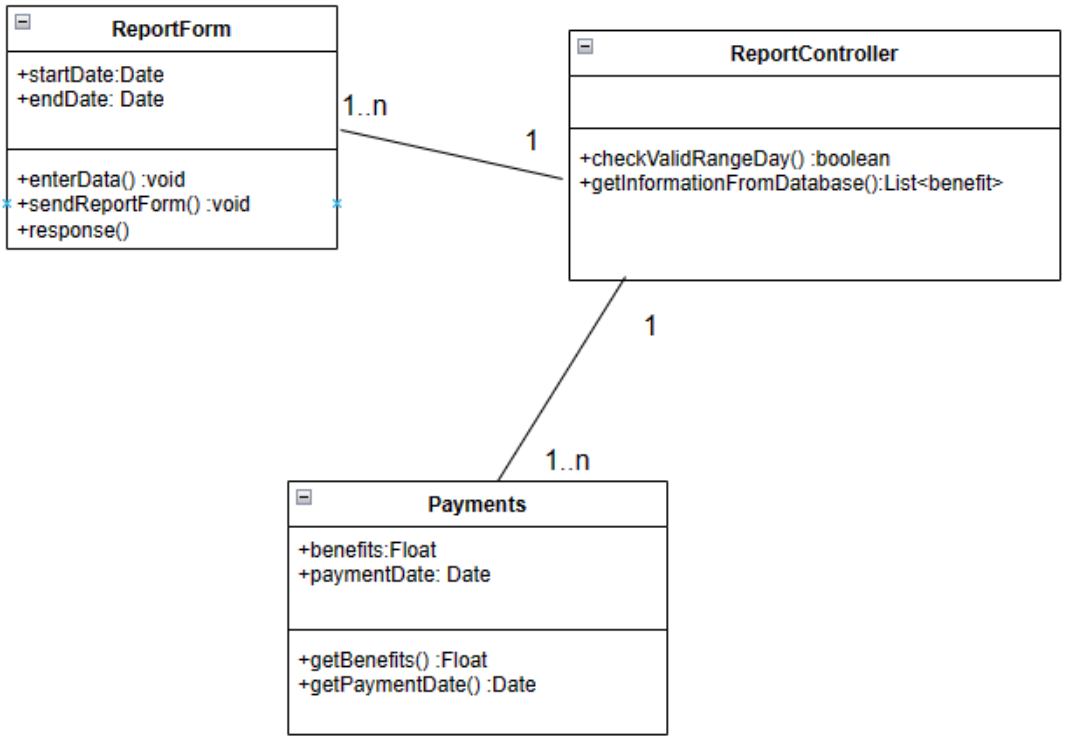
3.8 Add RoomType



3.9 Delete RoomType



3.10 Generate Report



IV. User interface design:

4.0 Login and Register

The Sign In interface provides 2 fields. The first field is the email and the second field is the password to log in

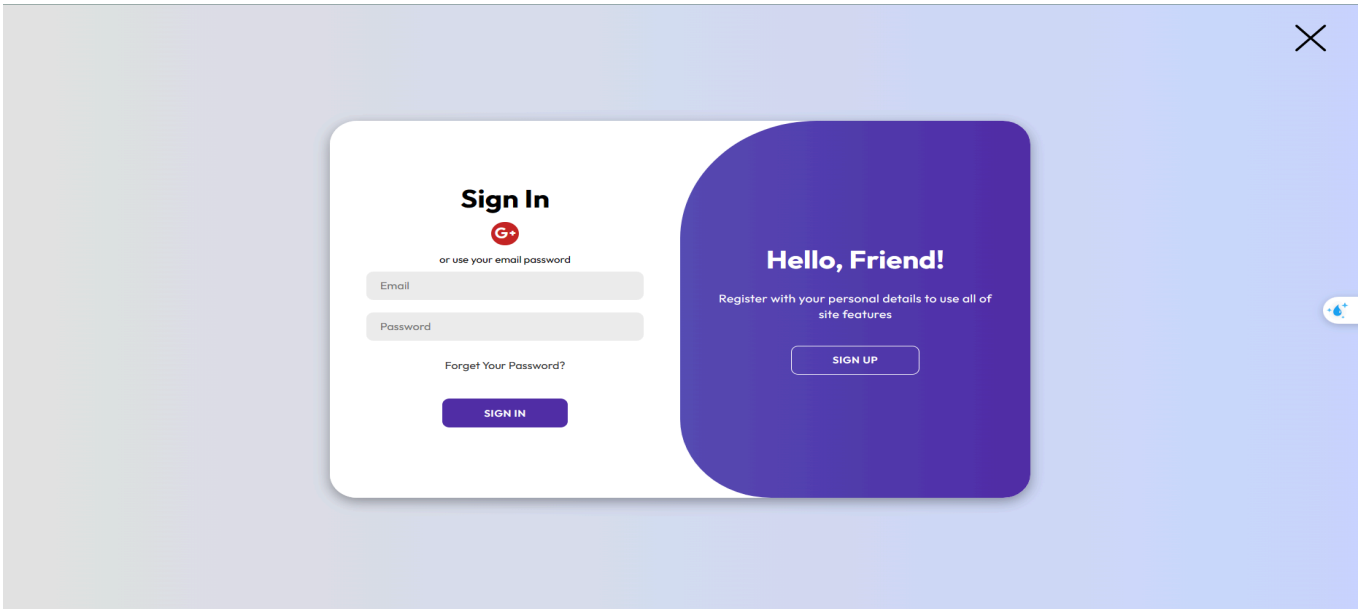


Illustration of the Sign In interface

When you press the Sign Up button, it will switch to the Sign Up interface. The Sign Up interface will provide 5 fields for account creation:

- Name: Full name of the user
- Username: User's account name
- Email
- Phone number
- Account password

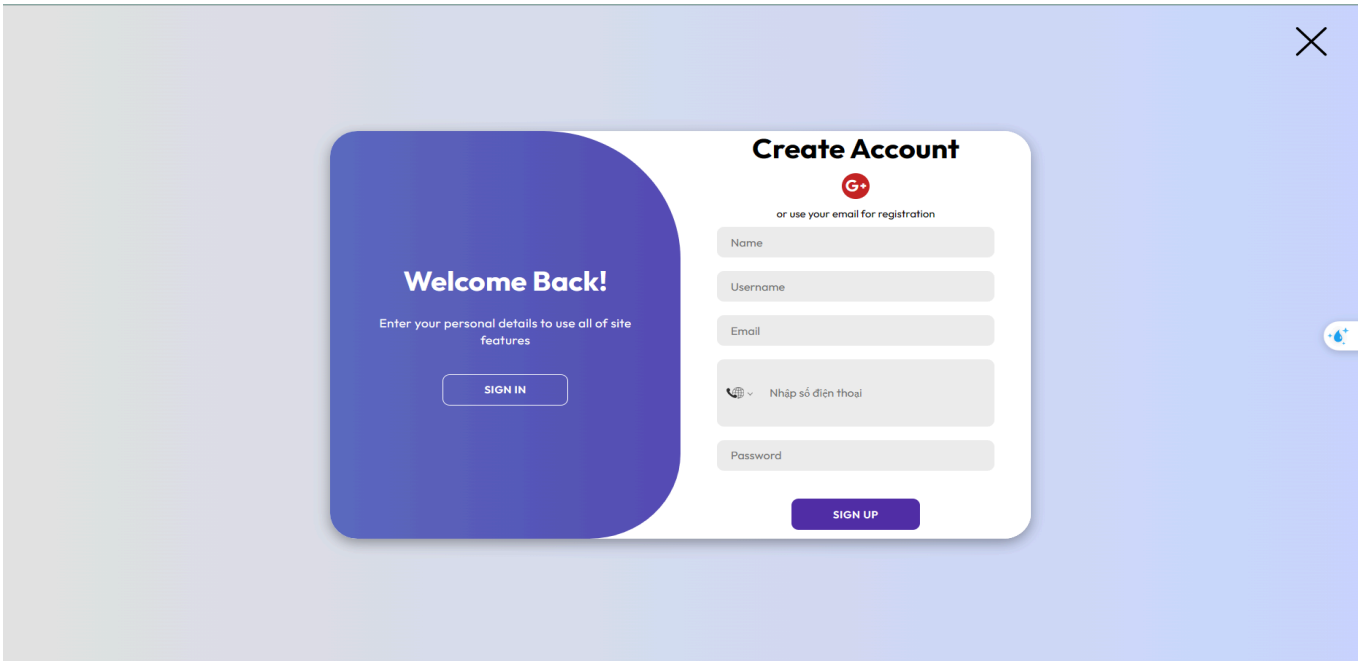


Illustration of the Register interface

After pressing the Sign Up button, you will move to the verification page. An OTP code will be sent to the email the user used to register their account. The user will enter the OTP code and press the Verify button.

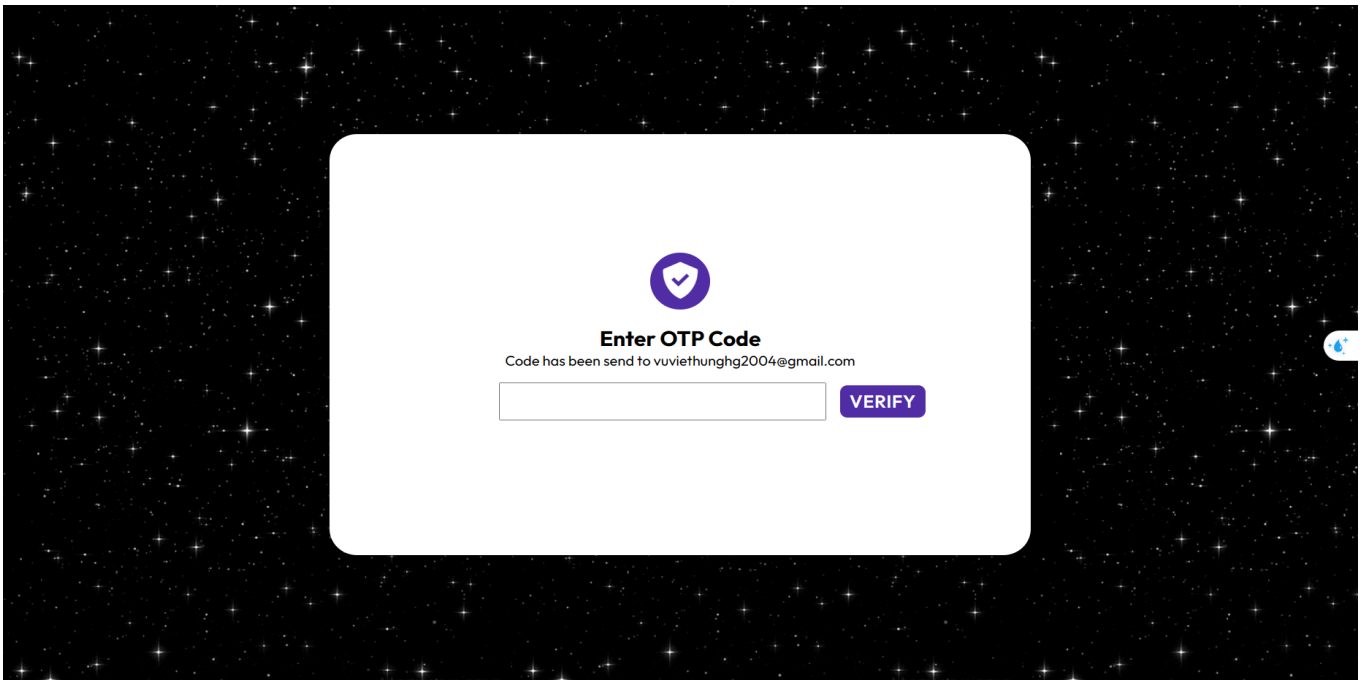


Illustration of the OTP code verification interface

4.1 Room Type

4.1.1 Main interface of room type

ROOM TYPE ROOM LIST

Room Category

ID	Name	Description	Day Rate	Night Rate	Daily Rate	Overtime Pay $/h	Capacity	Edit	Delete
1	Standard	Standard room with basic amenities	50	100	150	2	2		
2	Deluxe	Deluxe room with ocean view	30	150	200	2	2		
3	Suite	Luxurious suite with living area	50	250	300	2	4		
4	Family Room	Spacious room suitable for families	60	200	250	4	4		
5	Junior Suite	Has an area of 60 - 70m2, with beautiful views	100	250	300	4	4		
6	Executive Suite	Has an area of up to 80m2, equipped with both standing and lying bathtubs	45	300	350	4	6		
7	Bungalow	One-story house, with unique architecture and beautiful view	60	270	320	1	4		
8	Superior	Has better quality than Standard rooms	40	120	170	1	3		

Illustration of room list interface

4.1.2 Add Room Type

Users click on the "+" icon in the upper right corner of the screen. The filling form will automatically appear

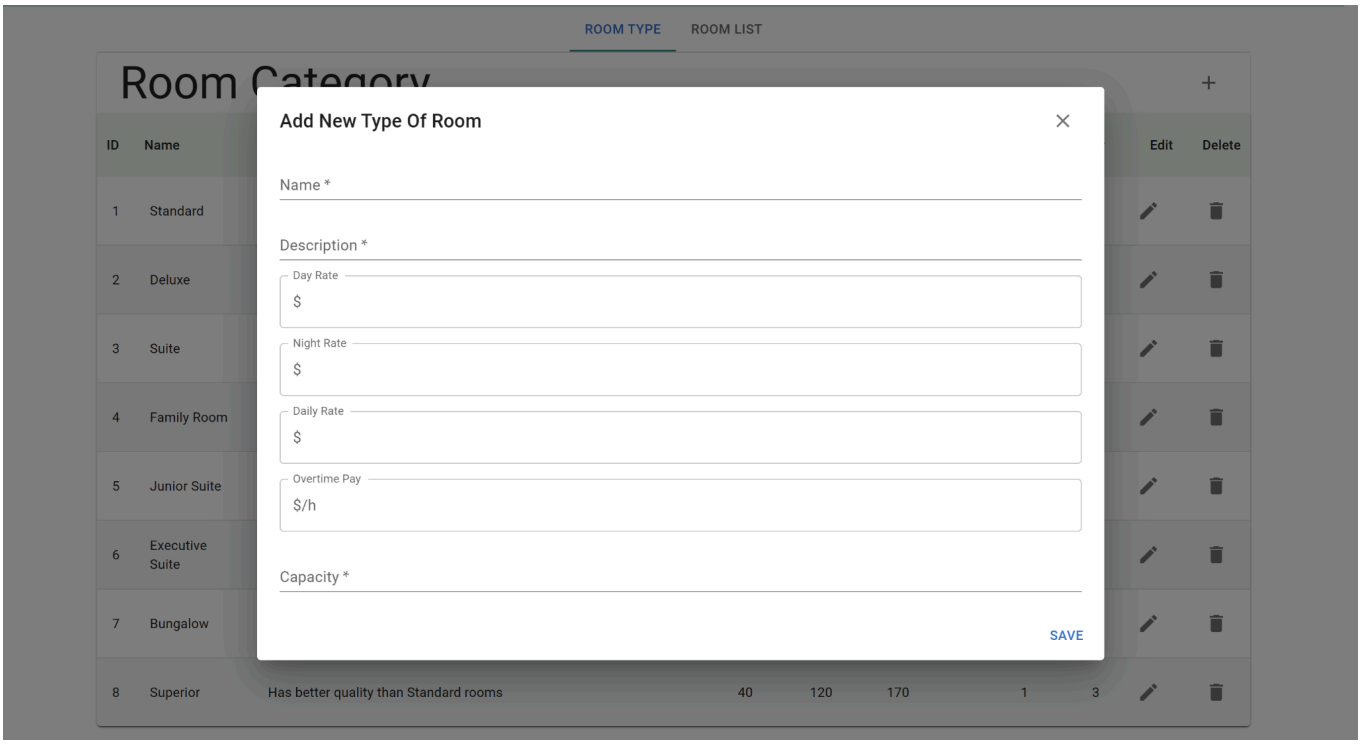
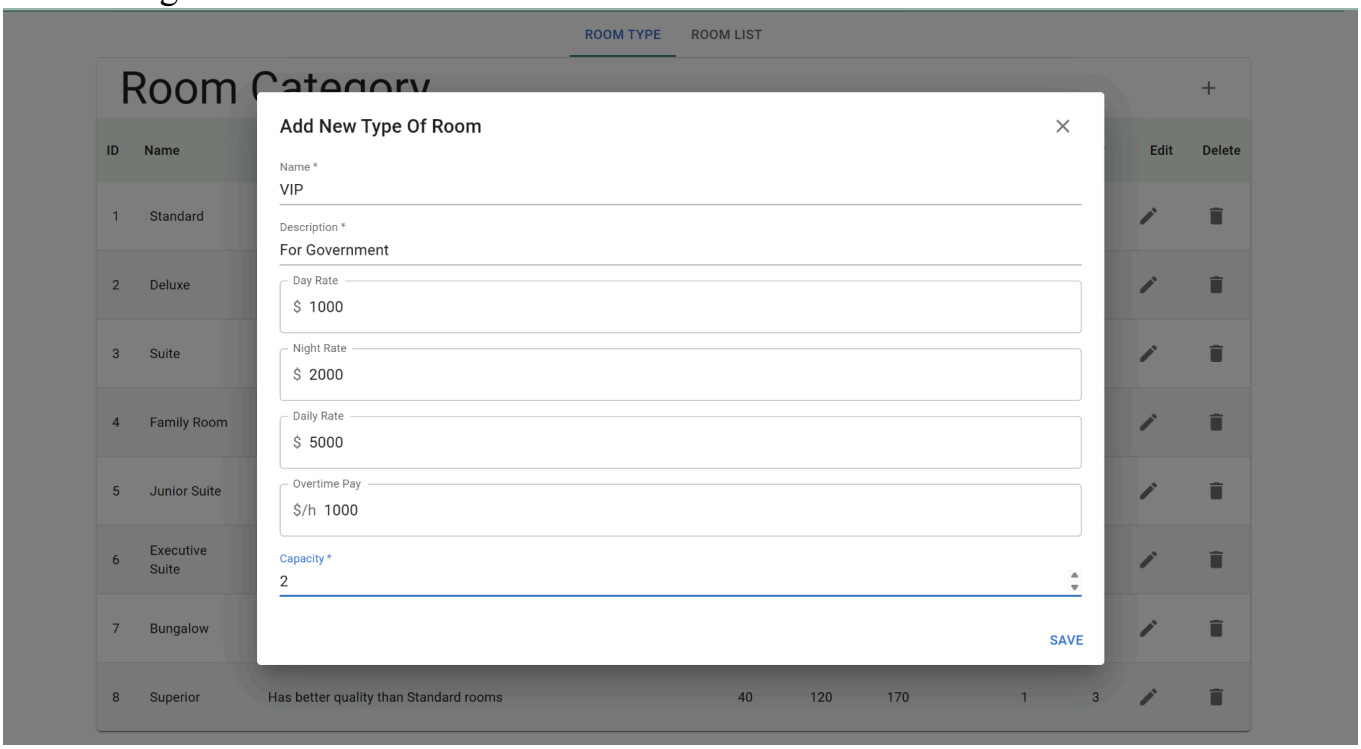


Illustration of the Add new type of Room form

After filling in all the information:



The user clicks Save and the new room type will be rendered on the screen

4.1.3 Edit Room Type

The user clicks on the Edit icon right on the row where they want to edit the information, an Edit Form will appear containing all the user's current information.

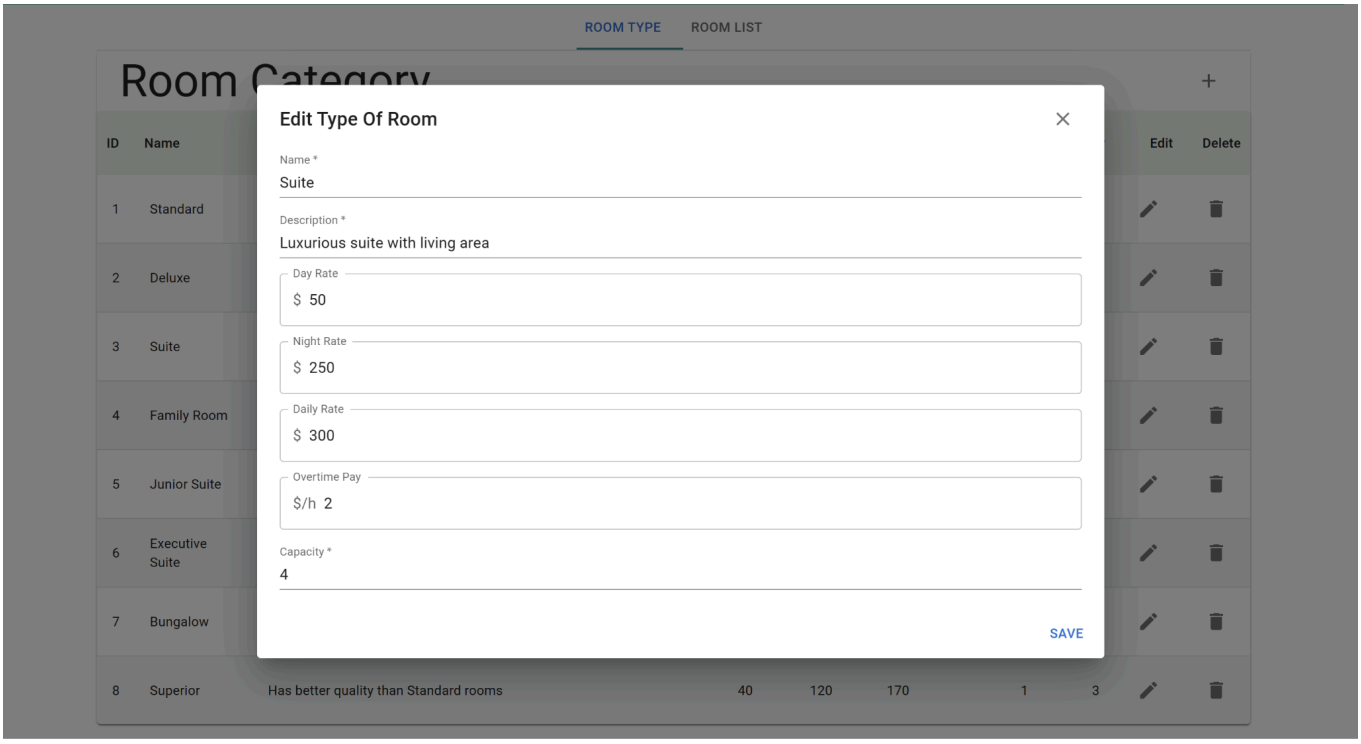
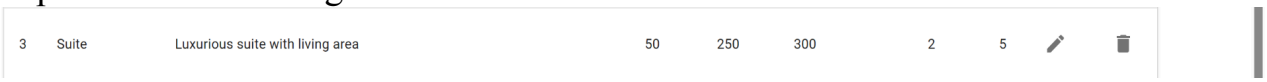


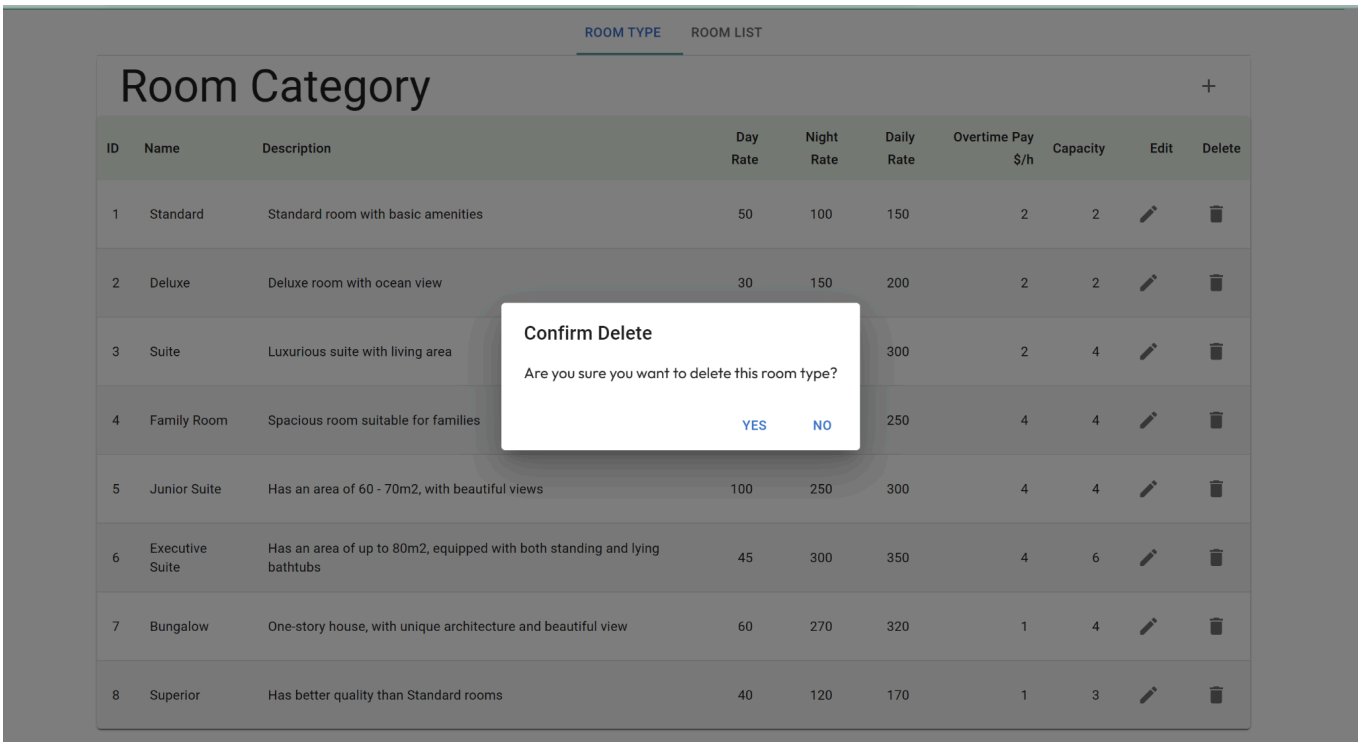
Illustration of the Edit type of Room form

Then users customize as desired. After adjustment (eg: Capacity:5). The interface will be updated after clicking SAVE.



4.1.4 Delete Room Type

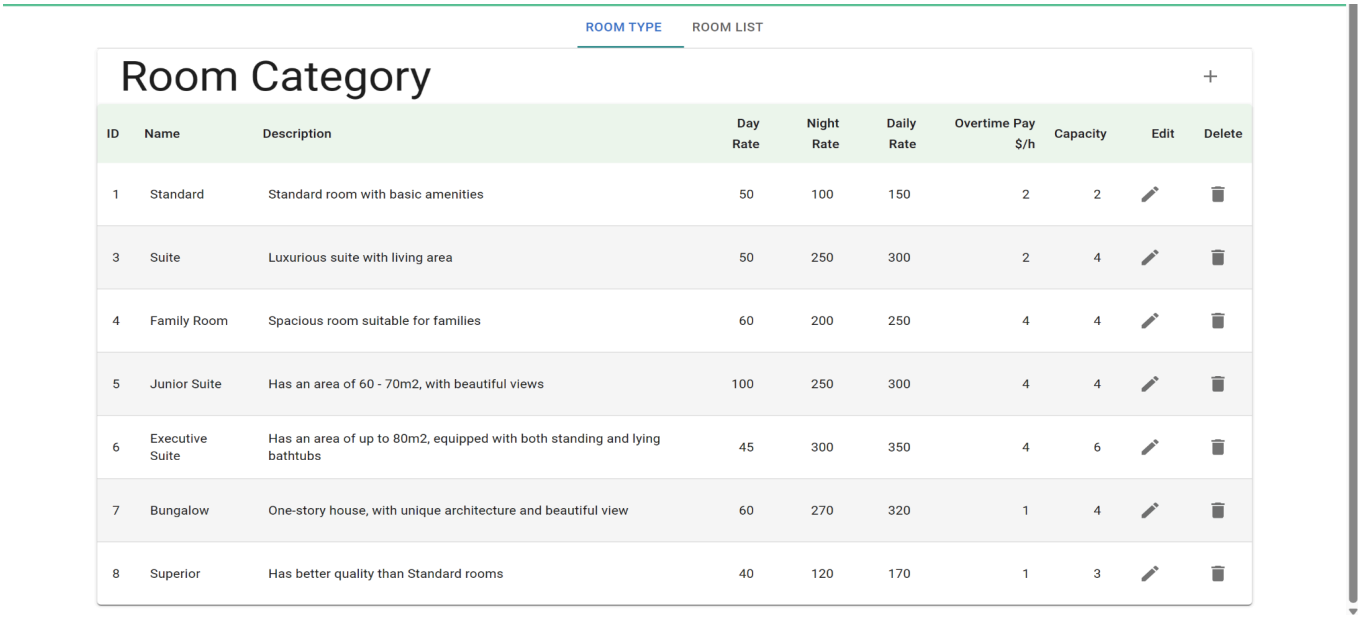
The user clicks on the DELETE button right on the row they want to delete, then a deletion confirmation message will appear (Suppose the room with ID is 2 is selected).



ID	Name	Description	Day Rate	Night Rate	Daily Rate	Overtime Pay $/h	Capacity	Edit	Delete
1	Standard	Standard room with basic amenities	50	100	150	2	2		
2	Deluxe	Deluxe room with ocean view	30	150	200	2	2		
3	Suite	Luxurious suite with living area			300	2	4		
4	Family Room	Spacious room suitable for families			250	4	4		
5	Junior Suite	Has an area of 60 - 70m2, with beautiful views	100	250	300	4	4		
6	Executive Suite	Has an area of up to 80m2, equipped with both standing and lying bathtubs	45	300	350	4	6		
7	Bungalow	One-story house, with unique architecture and beautiful view	60	270	320	1	4		
8	Superior	Has better quality than Standard rooms	40	120	170	1	3		

Error message is displayed

When the user selects “Yes” the room will disappear from the table. When the user clicks "No" everything will remain the same. (Suppose you click YES) line number 2 will disappear from the table



ID	Name	Description	Day Rate	Night Rate	Daily Rate	Overtime Pay $/h	Capacity	Edit	Delete
1	Standard	Standard room with basic amenities	50	100	150	2	2		
3	Suite	Luxurious suite with living area	50	250	300	2	4		
4	Family Room	Spacious room suitable for families	60	200	250	4	4		
5	Junior Suite	Has an area of 60 - 70m2, with beautiful views	100	250	300	4	4		
6	Executive Suite	Has an area of up to 80m2, equipped with both standing and lying bathtubs	45	300	350	4	6		
7	Bungalow	One-story house, with unique architecture and beautiful view	60	270	320	1	4		
8	Superior	Has better quality than Standard rooms	40	120	170	1	3		

Room Category after deleting the room has ID 2

4.2 Room List

4.2.1 Main interface of room list: Provides information about room name, room type, price if rented during the day, night or by day and capacity

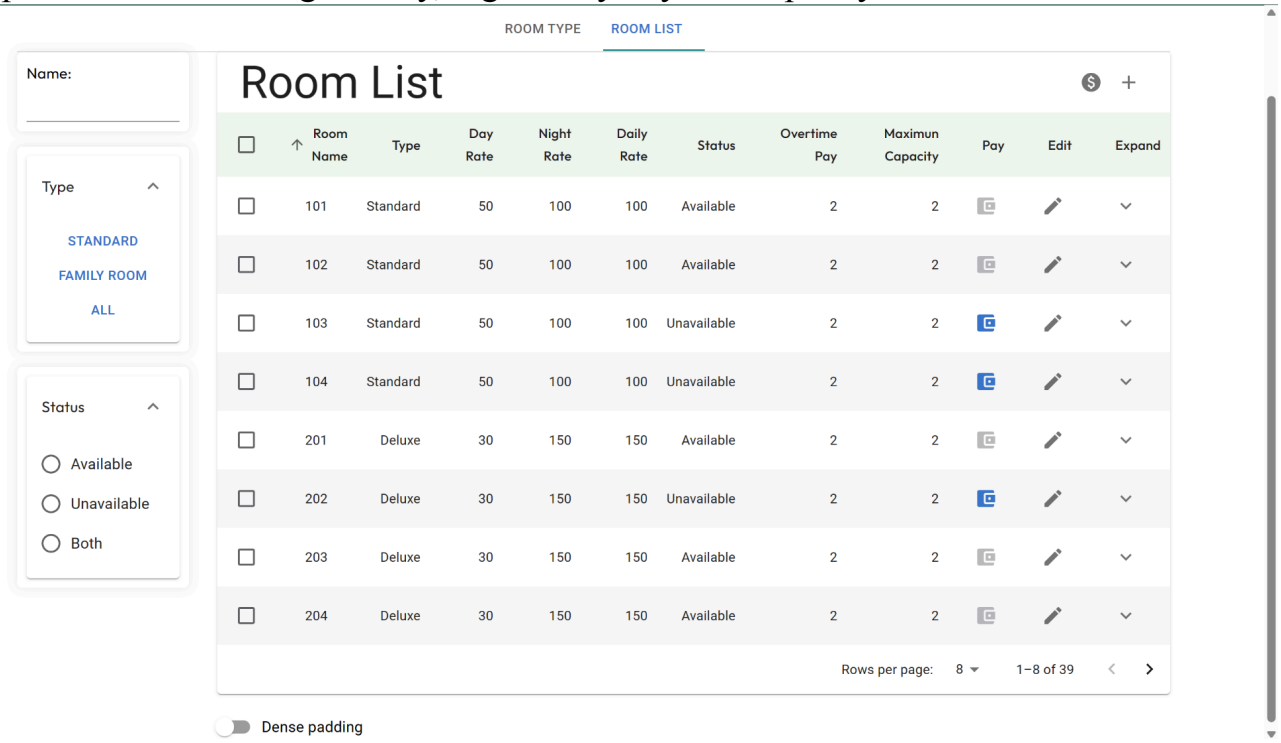
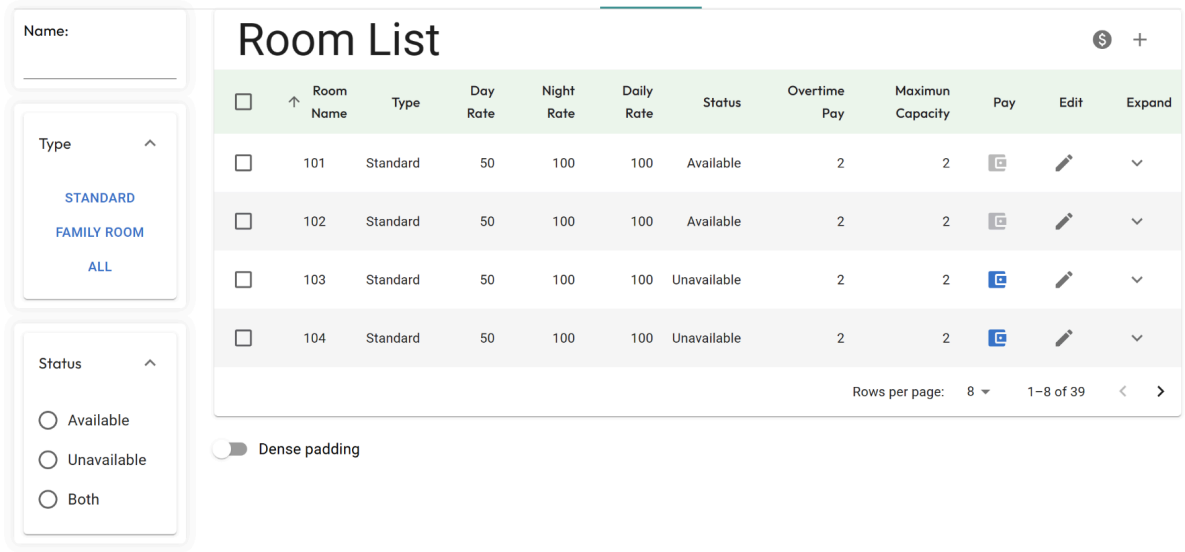


Illustration of Room List

4.2.2 Room Filter

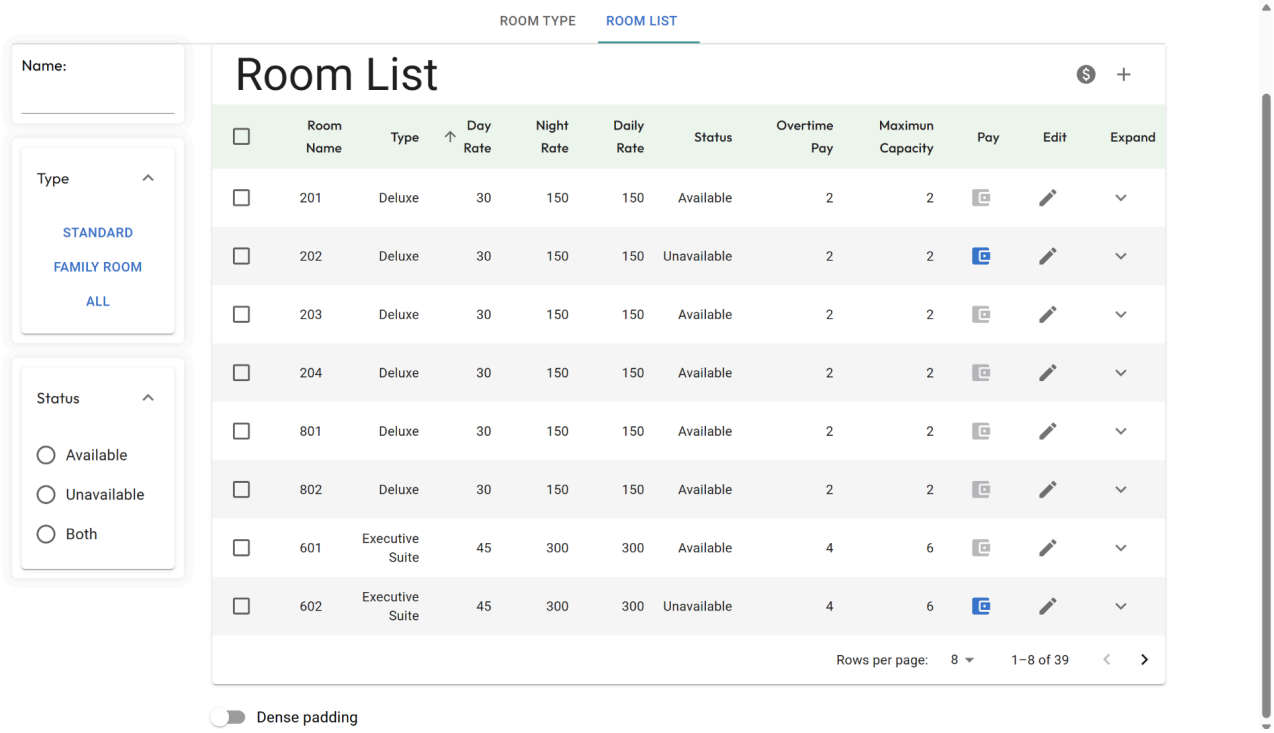
Is the sidebar part of the room list. When selecting table fields, they will only be displayed according to the selected field. (For example, select Type: Standard)



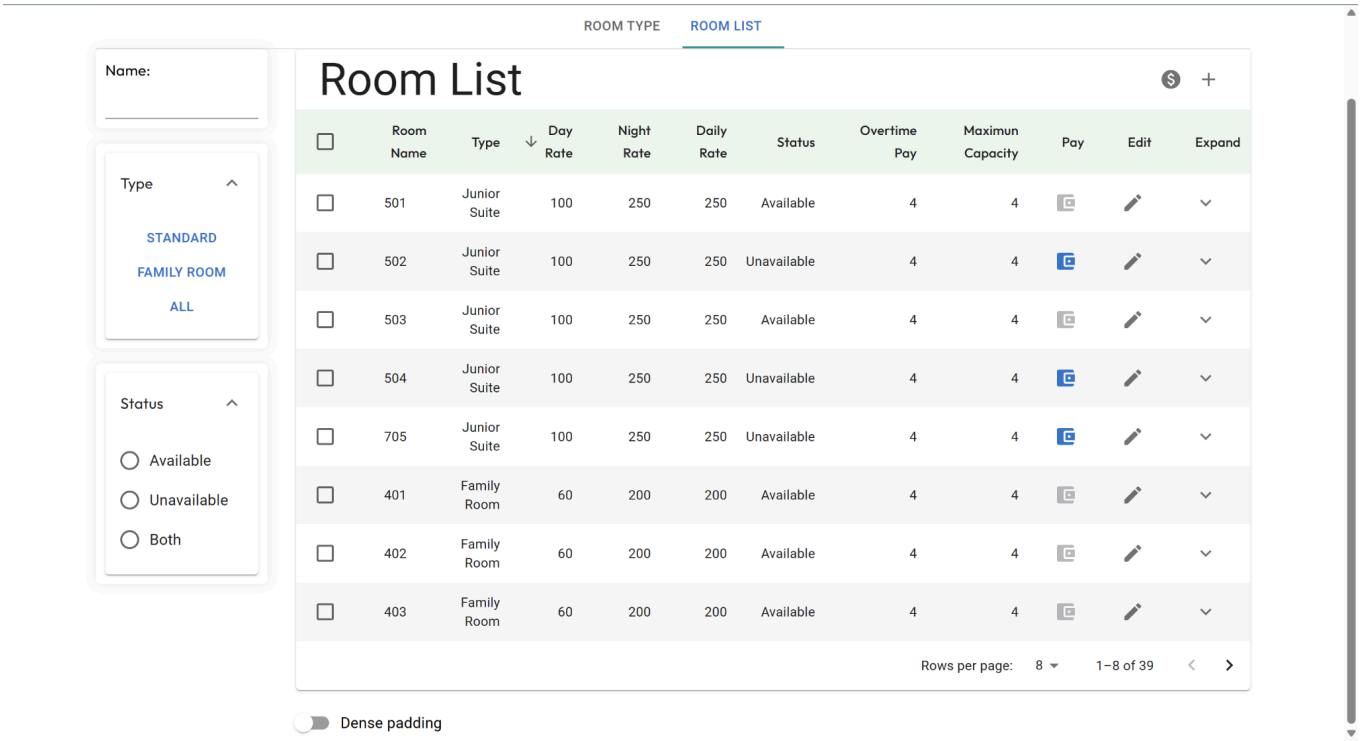
4.2.3 Room Table Sort

- In the table header next to each label there will be an arrow corresponding to the currently applied sort (the arrow only appears when moving the mouse to the label, otherwise the default will be sort by Room Name). Suppose in this case, choose Sort by Day Rate:

- Interface before sorting (Day Rate increasing - arrow direction going up)



- After sorting (Day Rate decreasing - arrow direction going down):



Users can click next to change the desired Sort order.

4.2.4: Add Room

Users click on the "+" icon in the upper right corner of the screen. (The “+” sign only appears when there are no checkboxes selected. Use the checkbox for deleting a room. When at least one checkbox is selected, the “+” icon will change to the DELETE icon). After clicking, a form to fill in information will appear.

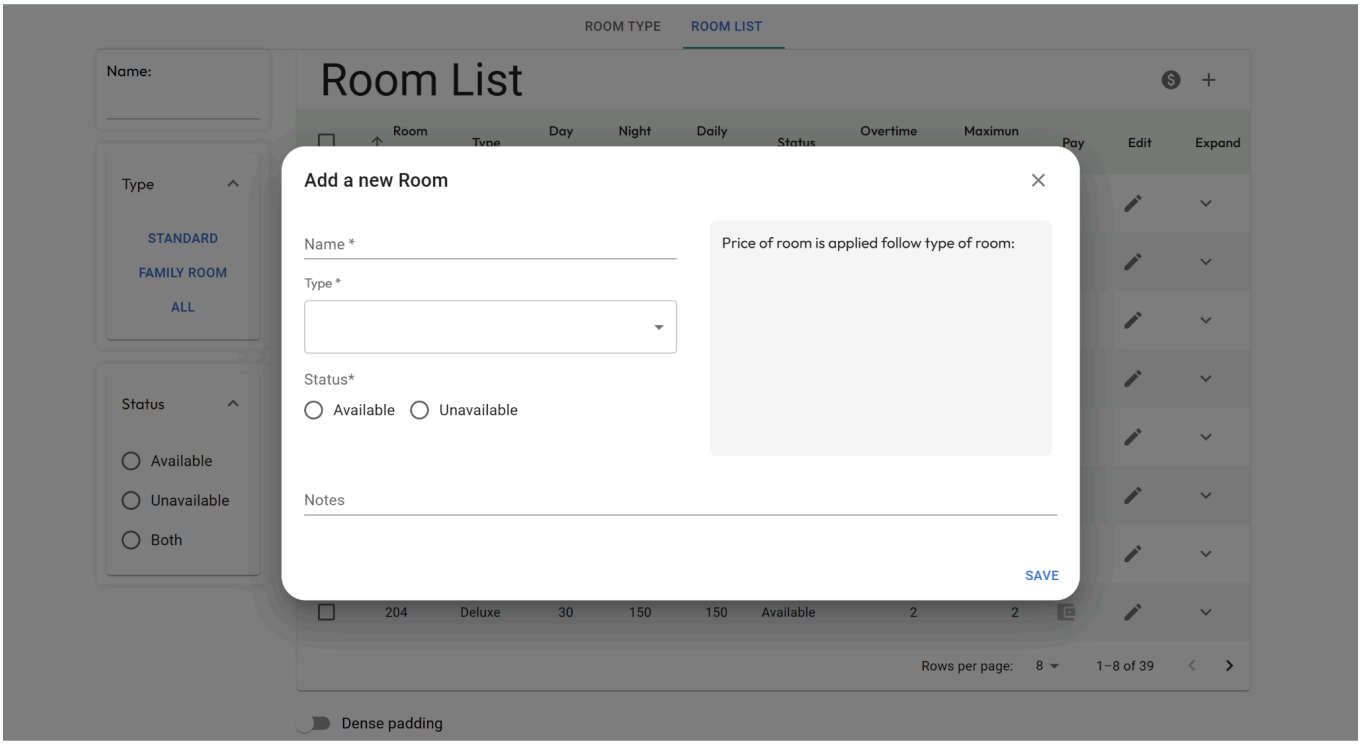


Illustration of Add a new Room form

Next, the user fills in all the necessary information to create a new room and click Save. However, if the necessary information has not been filled in, an Alert will appear. In addition, when setting up a new name, if that name is duplicated, you will be warned. Besides, when users select Type for the room, the necessary information will be displayed. Suppose in this case the user fills in the name 203 (duplicate name), selects the type "Suite" and deliberately does not select Status, the interface will be as follows:

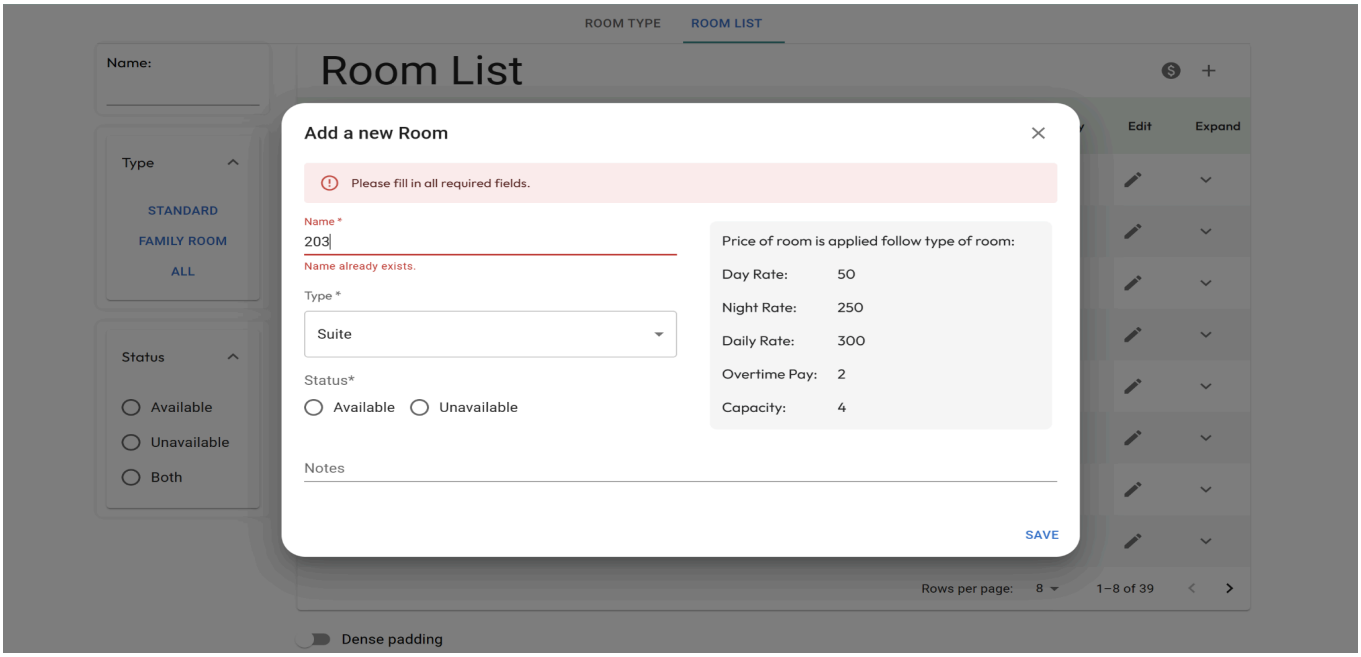
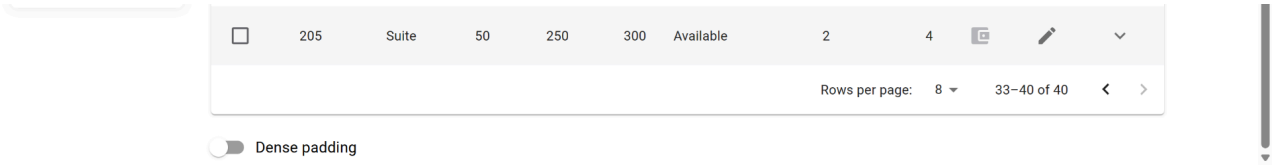


Illustration of the Add a new Room form showing an error message

If the user fills in the appropriate information, after clicking Save the room will be displayed at the bottom of the list and sorted in the correct position for the next render.



4.2.5: Edit Room

Users click directly on the Edit icon on the room they want to edit, an information form will appear with the room's current information pre-set. The user will then edit the information if necessary (Note that if you set the same name, you will receive a Warning). Suppose you choose room 102, the interface will be as follows:

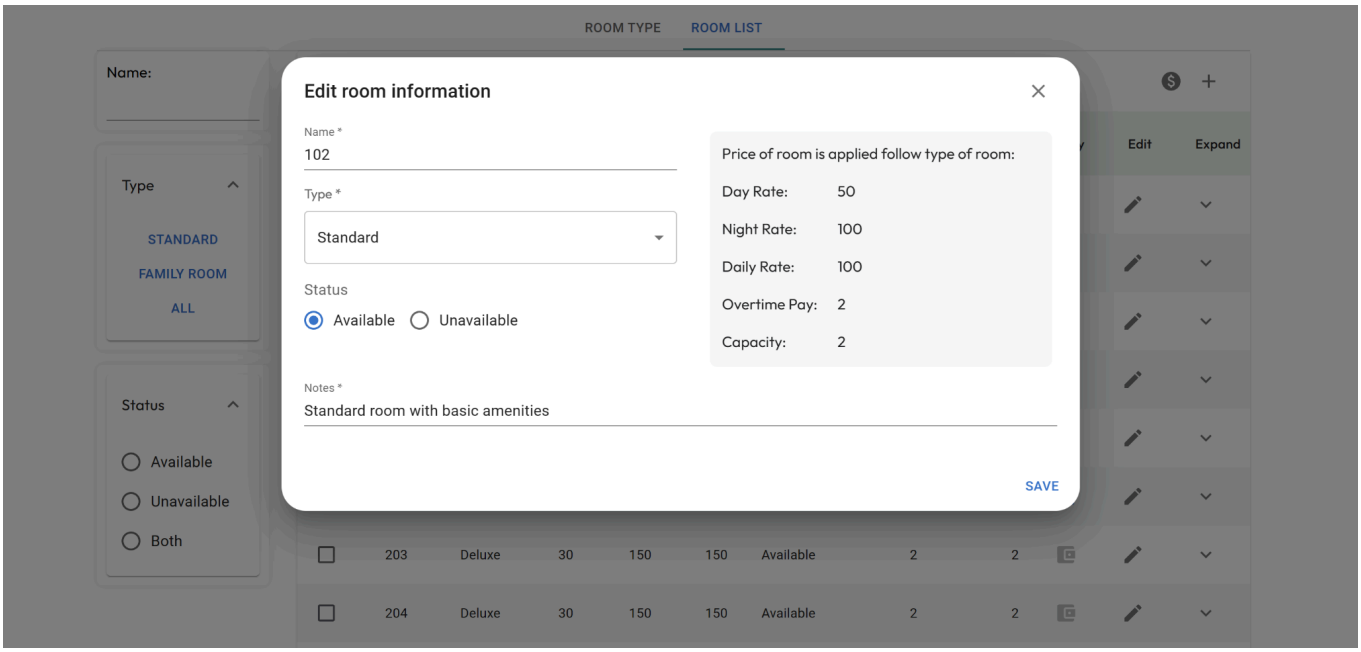
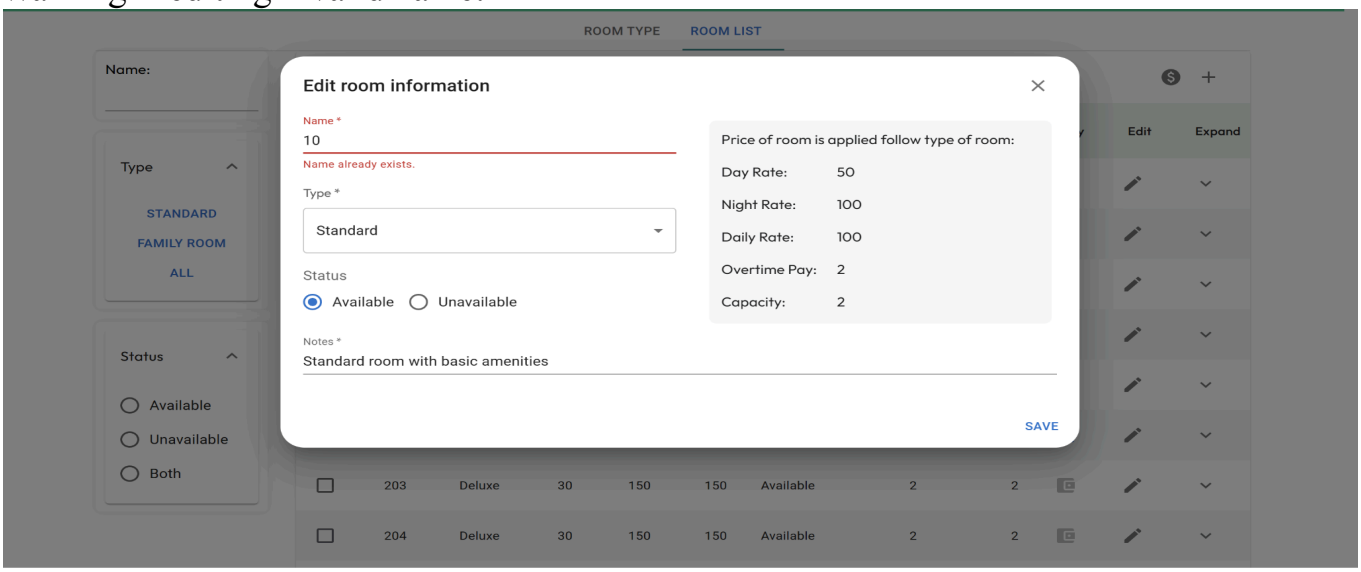
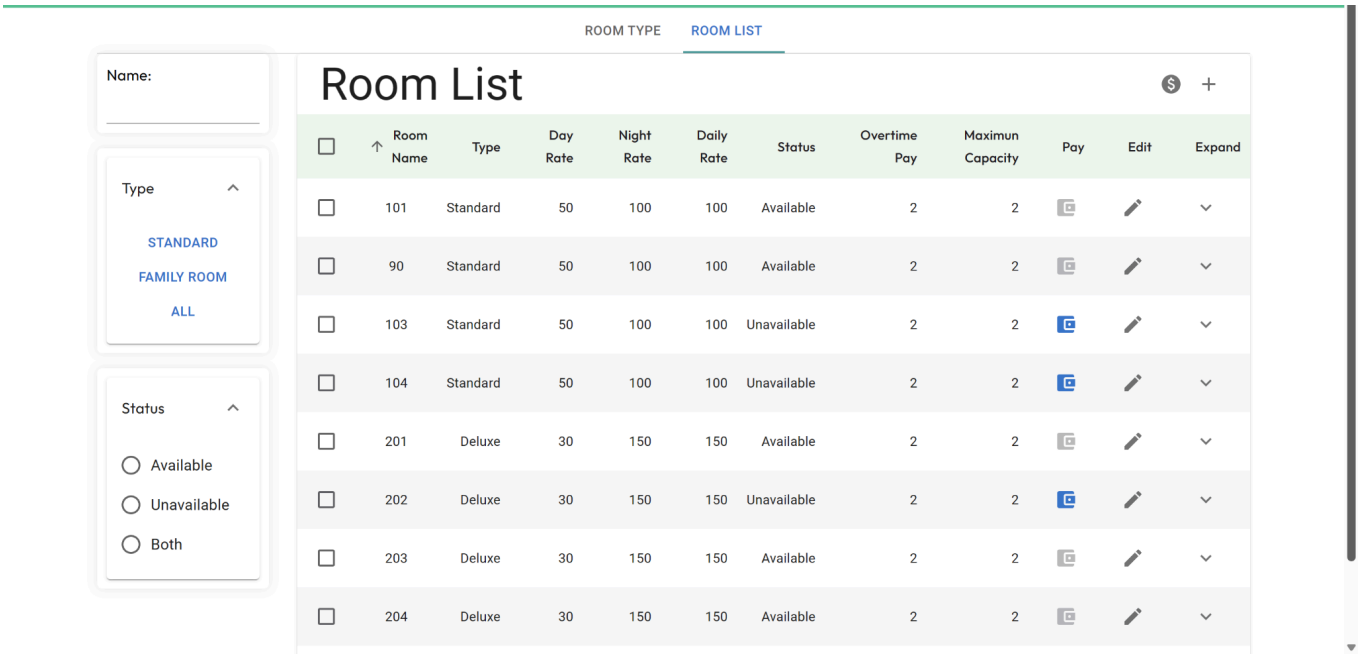


Illustration Edit room information form

Warning if editing invalid name:

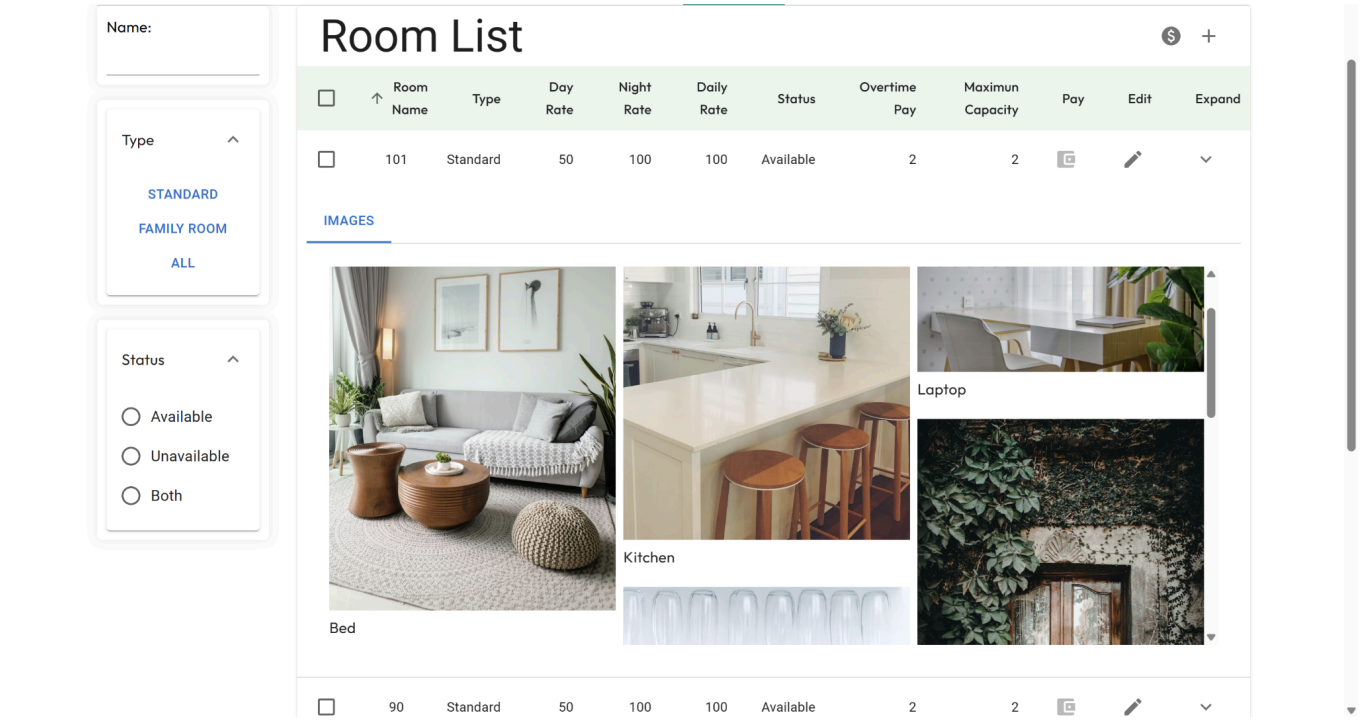


After clicking save, the room information will be updated



4.2.6 Room Image

Users click on the EXPAND icon right on the line containing the room they want to see photos. The images will be displayed and automatically arranged in a masonry layout for art

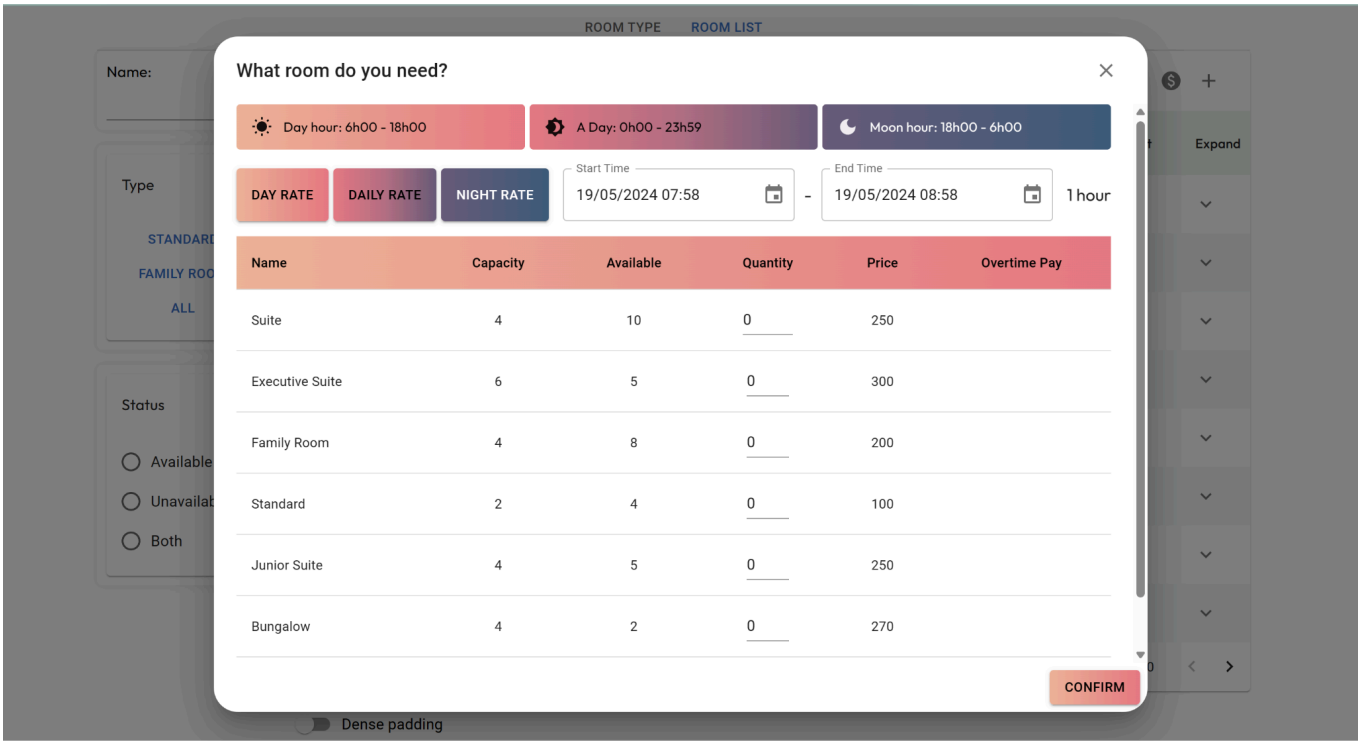


Room List interface after pressing expand in a specific room

4.3 Booking

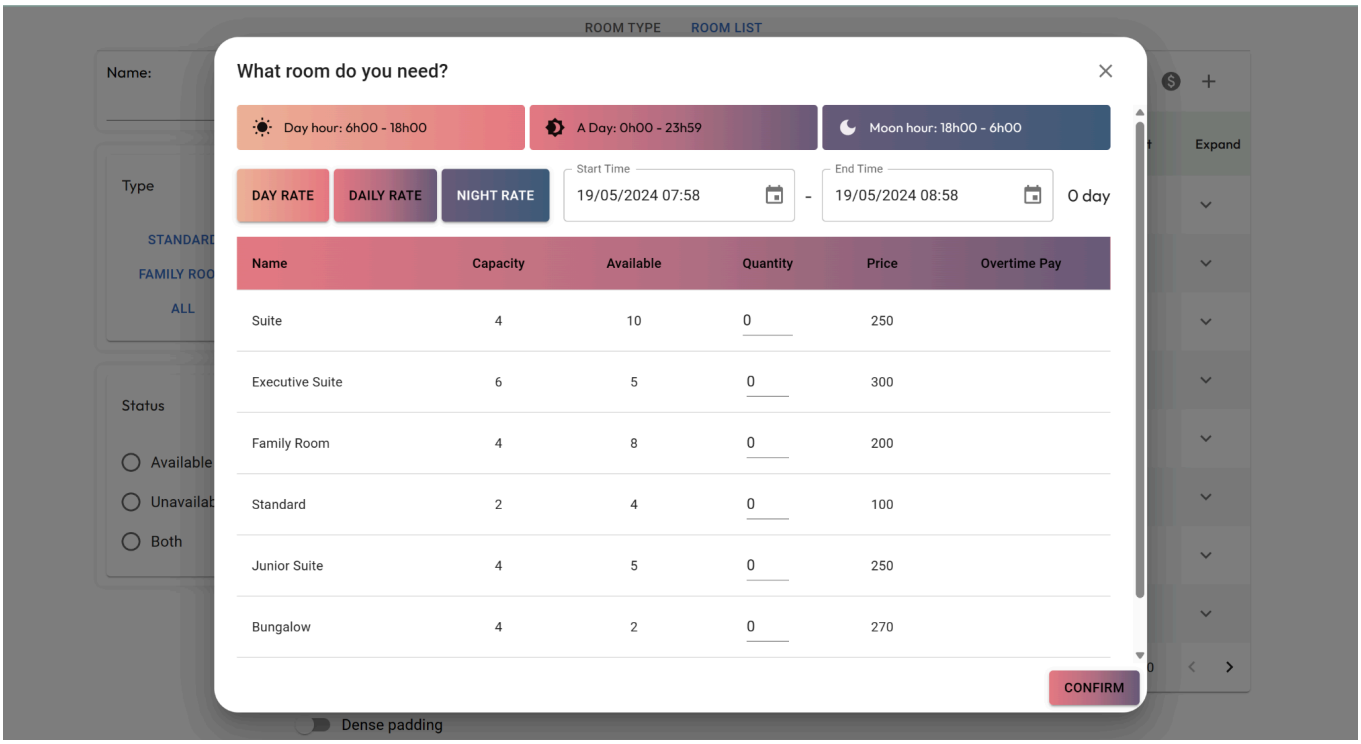
Users click on the "$" icon in the top right corner of the screen to create a new booking.

4.3.1. Booking main interface

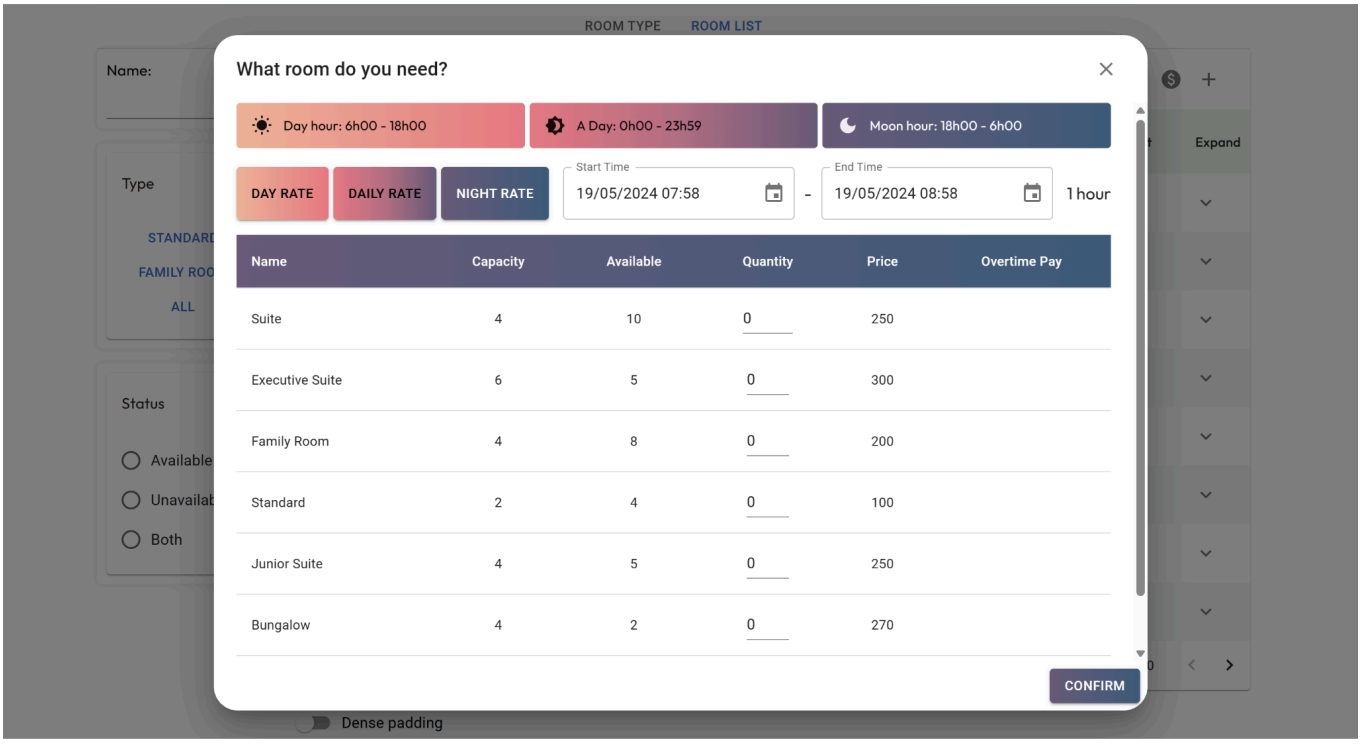


Booking main interface

When the user changes the Rate (Day Rate, DaiLy Rate, Night Rate), the interface will change as follows

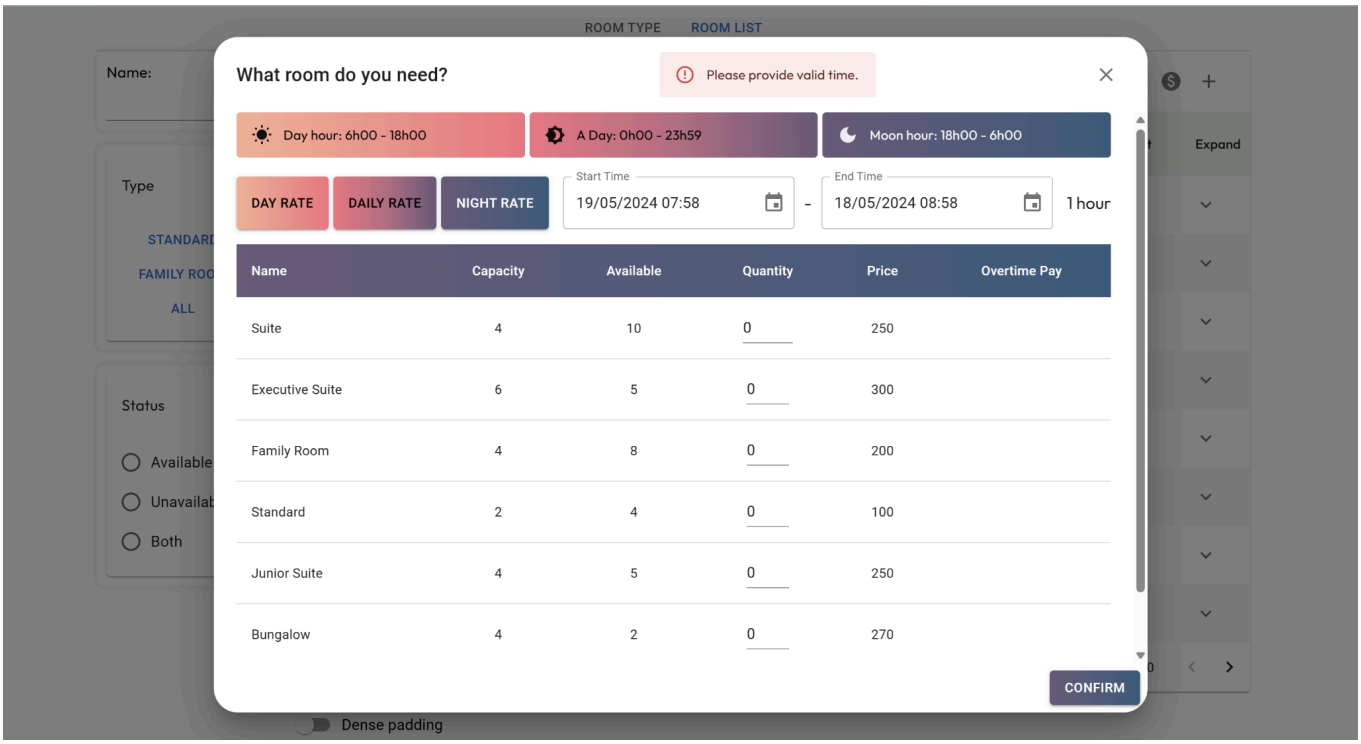


Booking form interface if Day Rate is selected



Booking form interface if selecting Night Rate

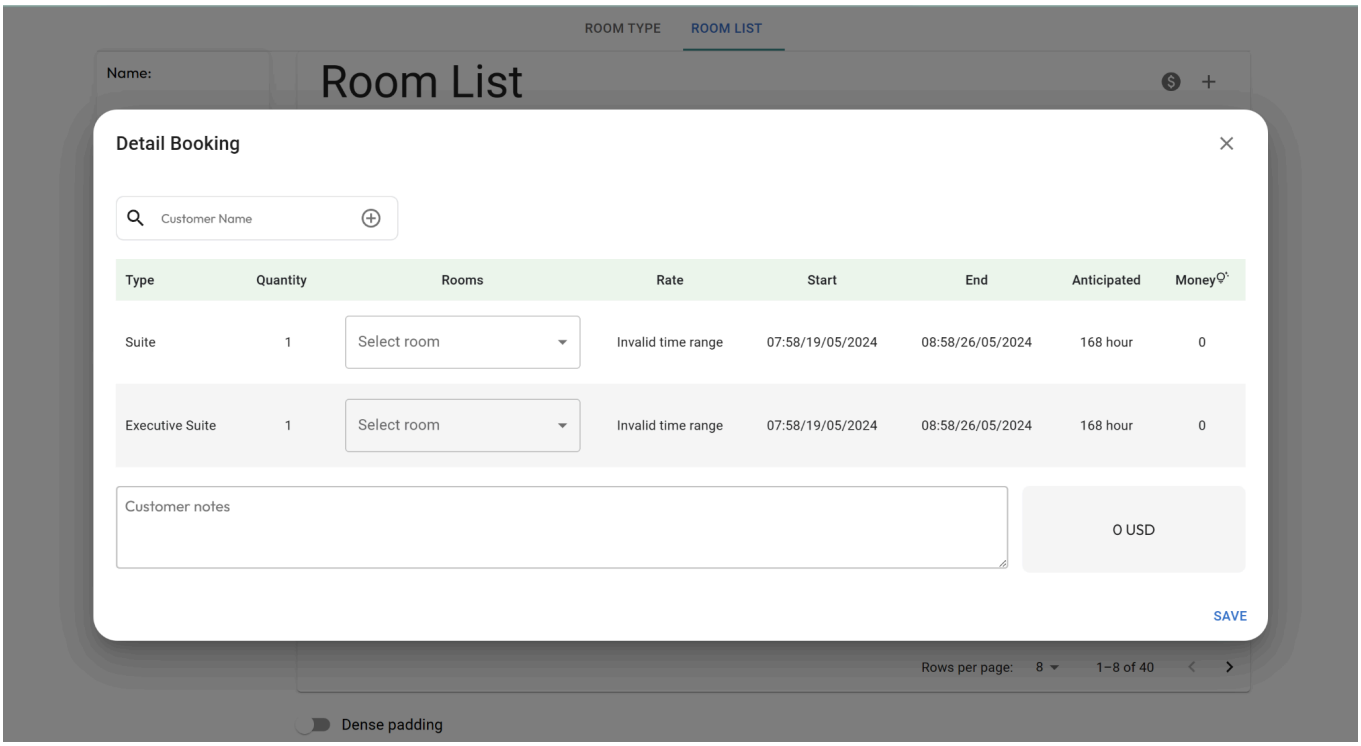
If the user provides an unknown time (for example, an end date before a start date) a warning will appear



An error message appears on the form if an invalid time is entered

4.3.2: Booking details interface

After the user selects the appropriate room type (Quantity of the selected room types > 0) and clicks CONFIRM, the Booking details interface will appear. Here, users continue to provide information including: customer information and appropriate room selection.

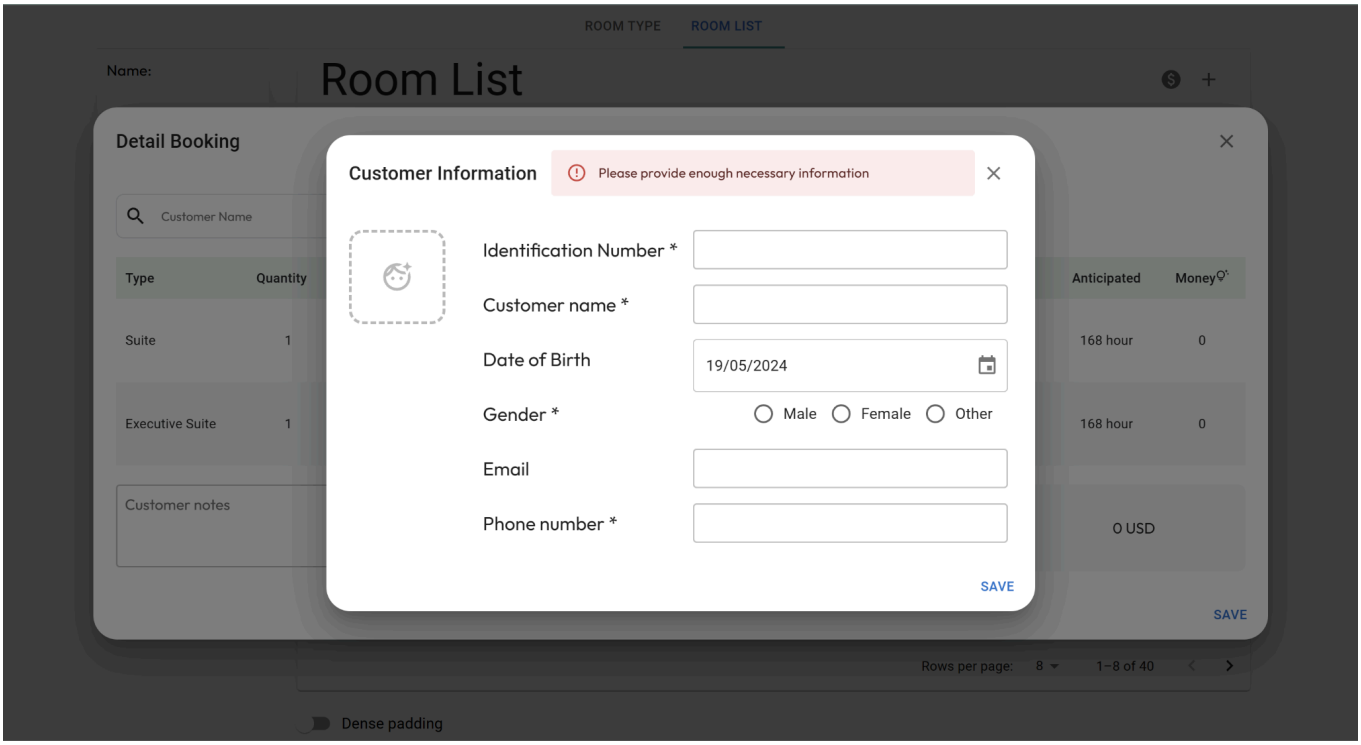


Detail Booking form interface

4.3.2.1: Giao diện thông tin khách hàng

The user clicks on the "+" icon on the screen. A Form providing information will appear

Then the user needs to fill in the necessary information. If not, you will be warned

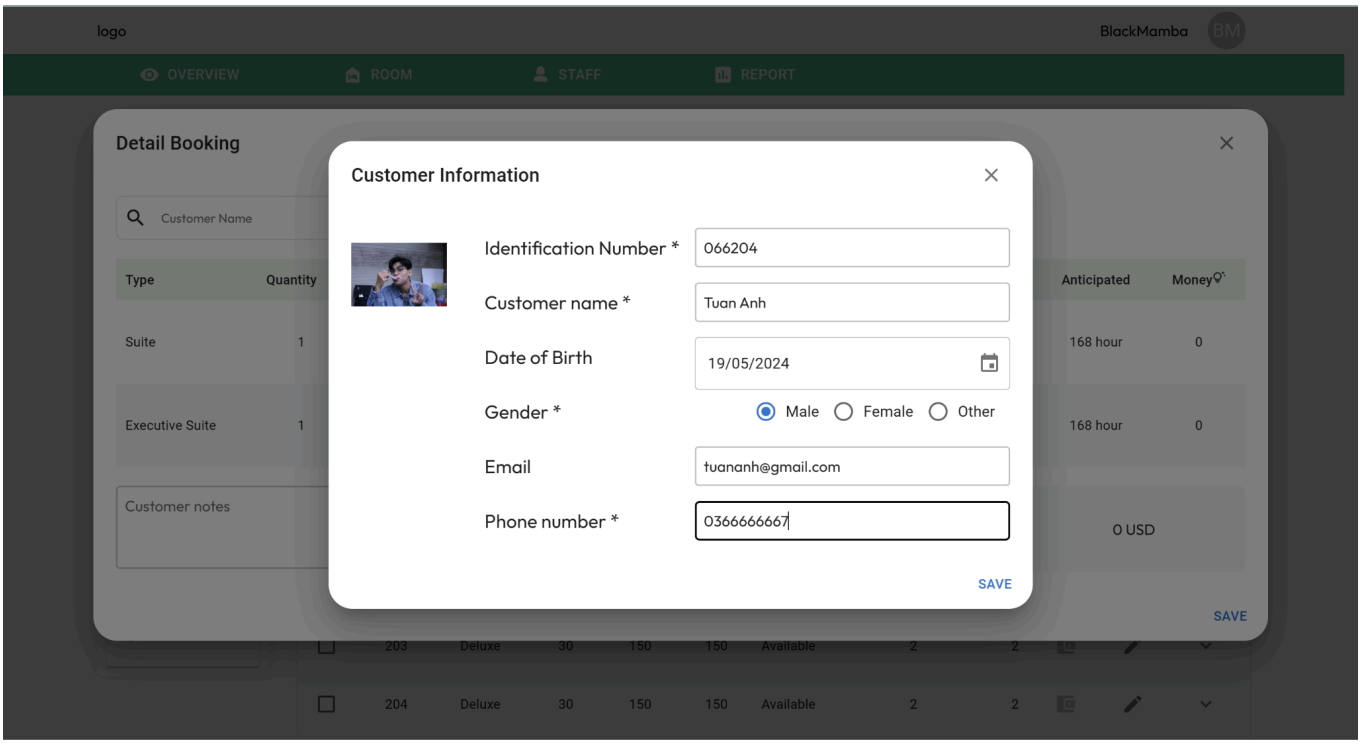


The Customer Information form displays a message asking for complete information

If the user provides all the necessary information, after clicking Save the information will be saved and the name will be displayed on Detail Booking.

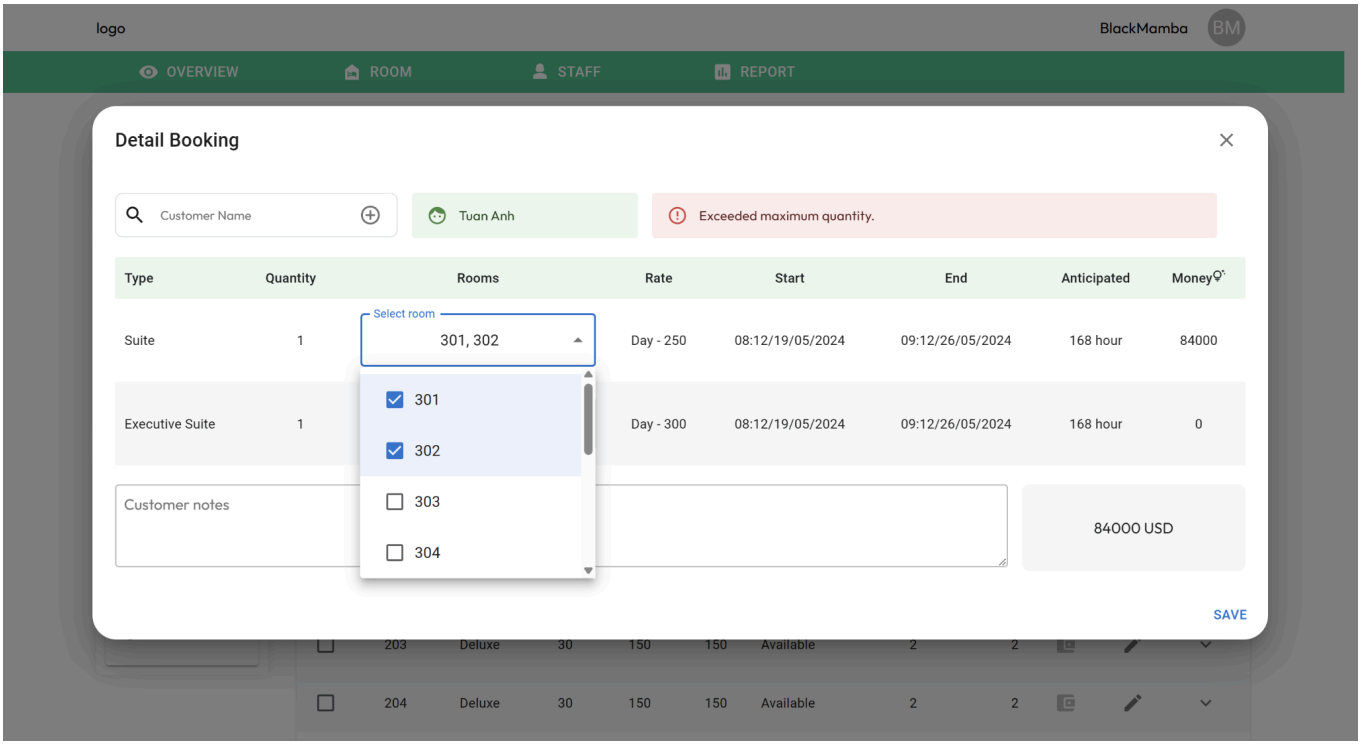
4.3.2.2

Detail Booking interface after having customer information



Customer Information interface when full customer information is available

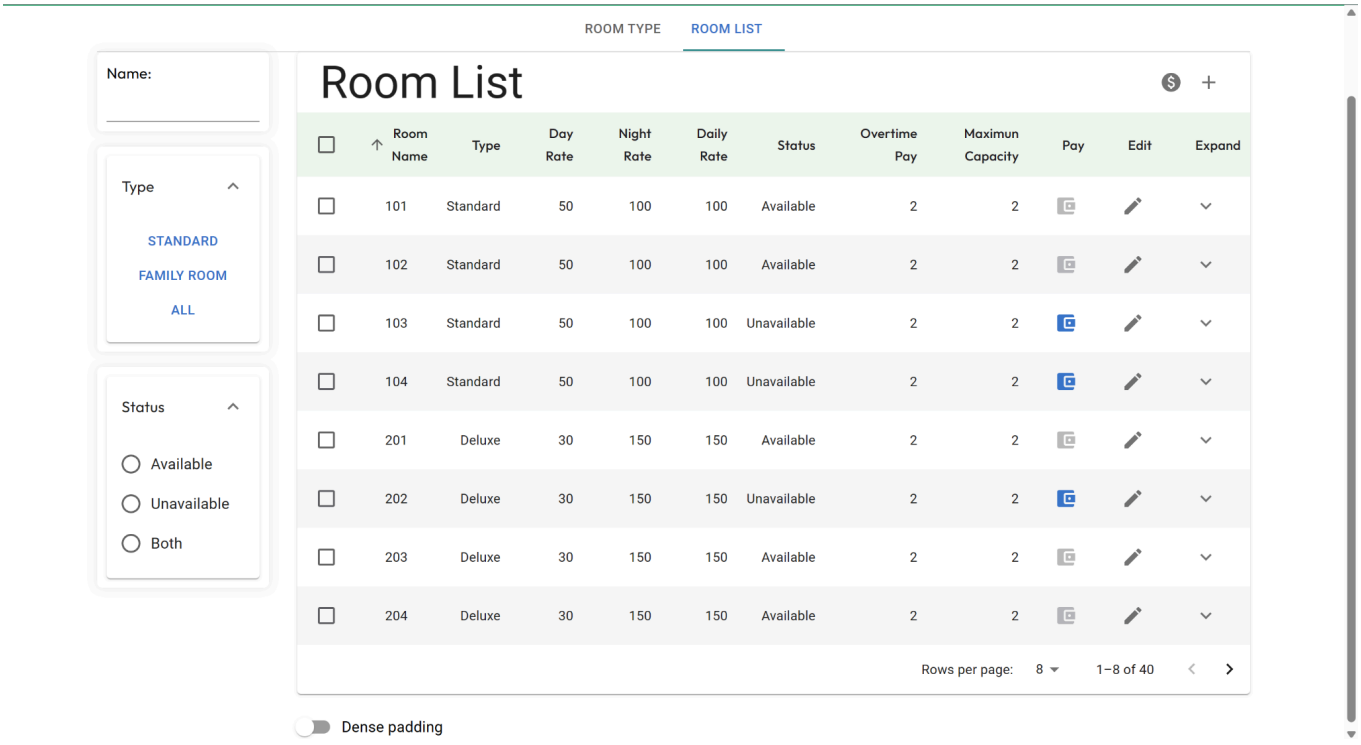
Next, the user selects the rooms. However, if you select more than the initially entered quantity, you will be warned. Suppose in this case you deliberately choose 2 Suite rooms when you initially only choose 1. If there is nothing wrong, when you click Save the booking will be saved and the room will be adjusted from "Available" to "Unavailable".



The Detail Booking interface displays an error message that exceeds the number entered

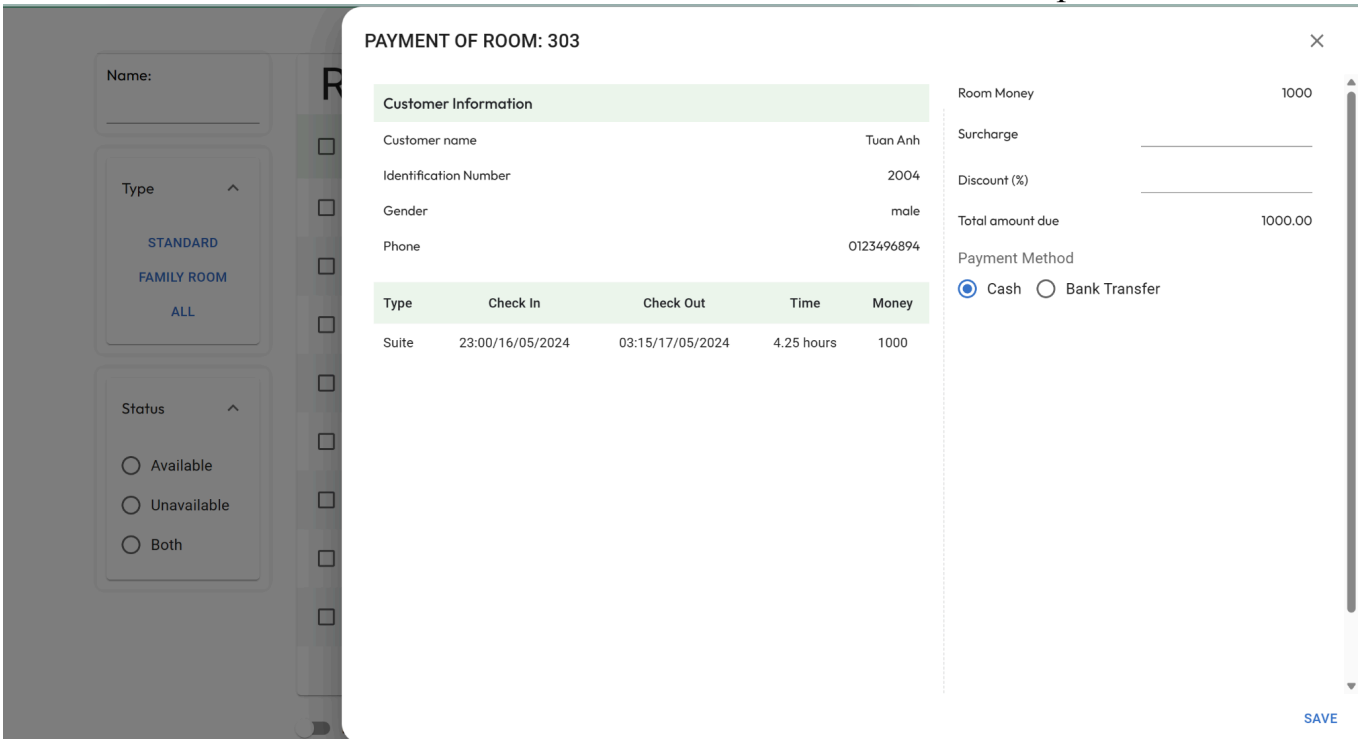
4.3.3 Payment interface

Users click directly on the Pay icon on the room they want to pay. (The icon will be green if the room is Unavailable and available for payment, and gray when Available). After pressing a Dialog will appear



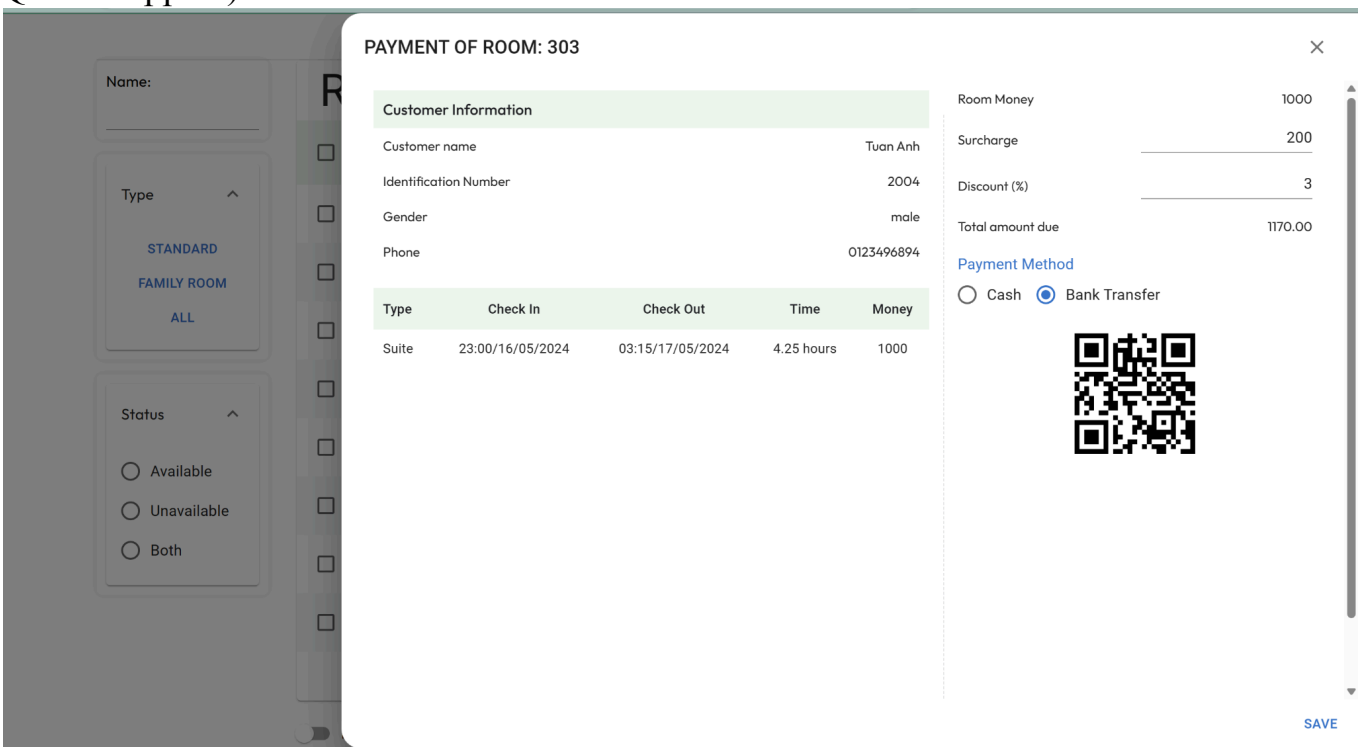
In the RoomList interface, only green icons can pay

Contains information about the current customer and the amount to be paid



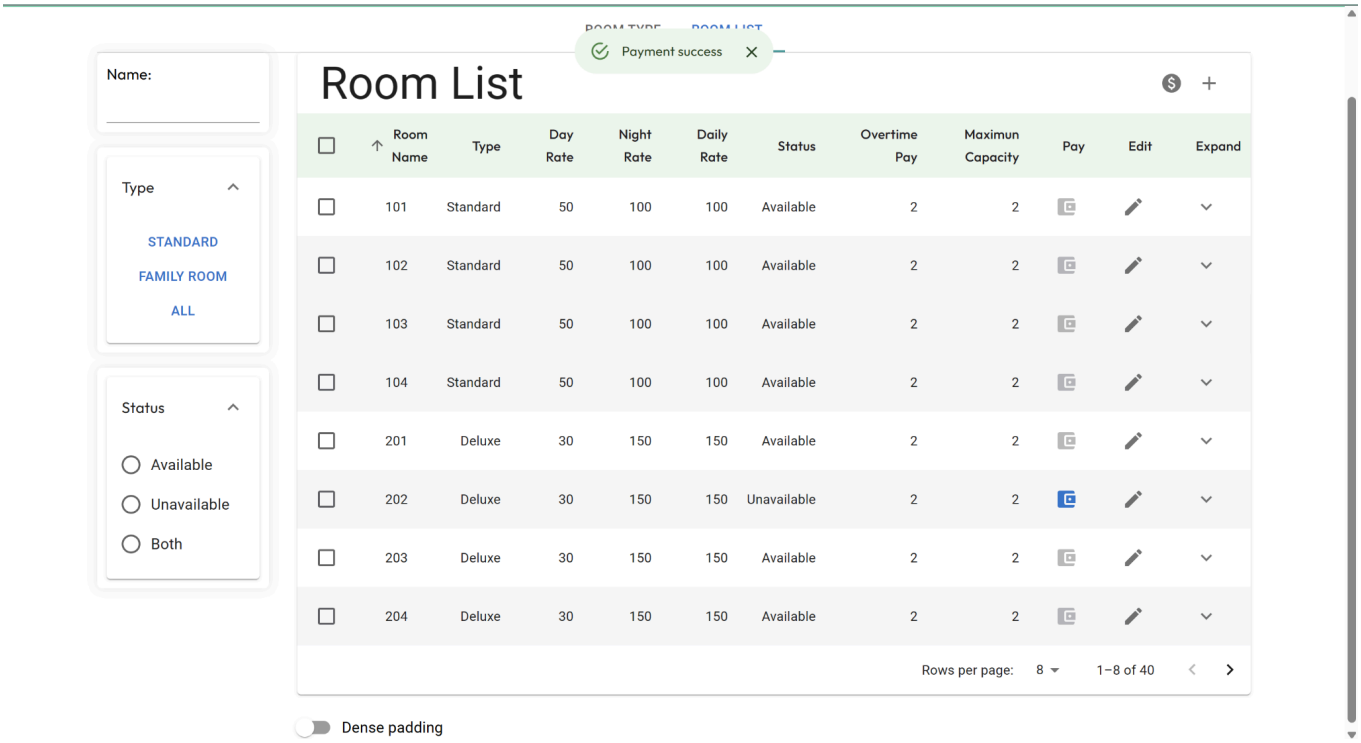
Payment interface

Users can choose to pay in cash or pay by bank transfer (when transferring, a QR will appear)



The Payment interface displays QR

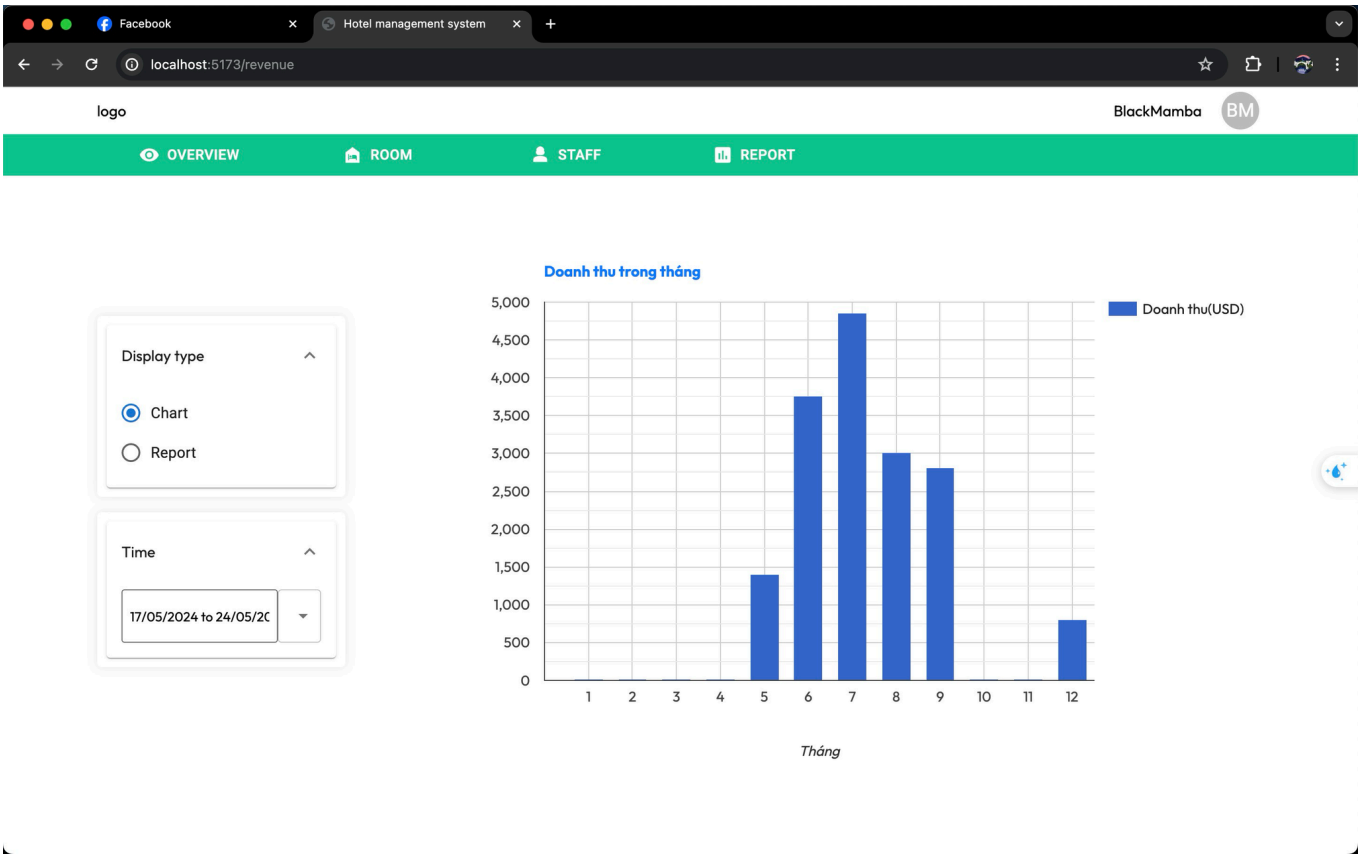
After clicking save, the information will be loaded for 3 seconds to complete and a success message will appear and the room will be changed to Available status.



Successful transaction

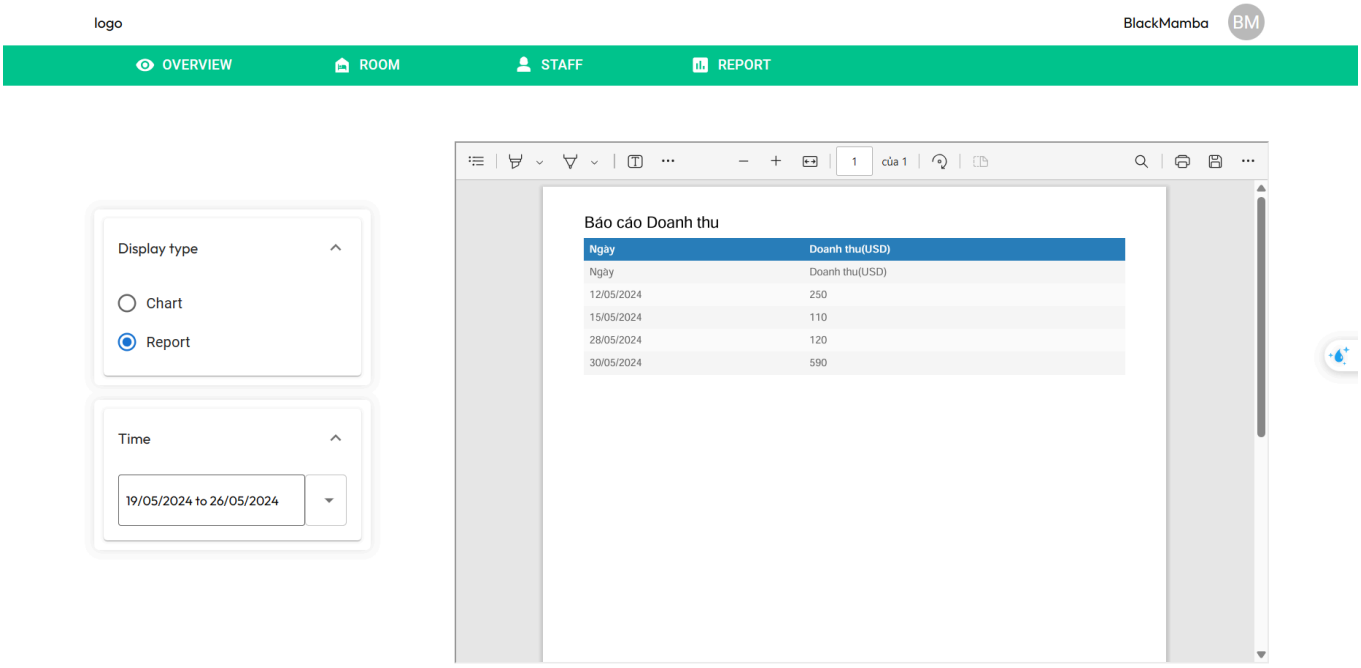
4.3 Report

The interface displays the hotel's revenue report so that the hotel can monitor revenue and make reasonable policies to increase revenue. The default initial view of revenue will be displayed in graph form:



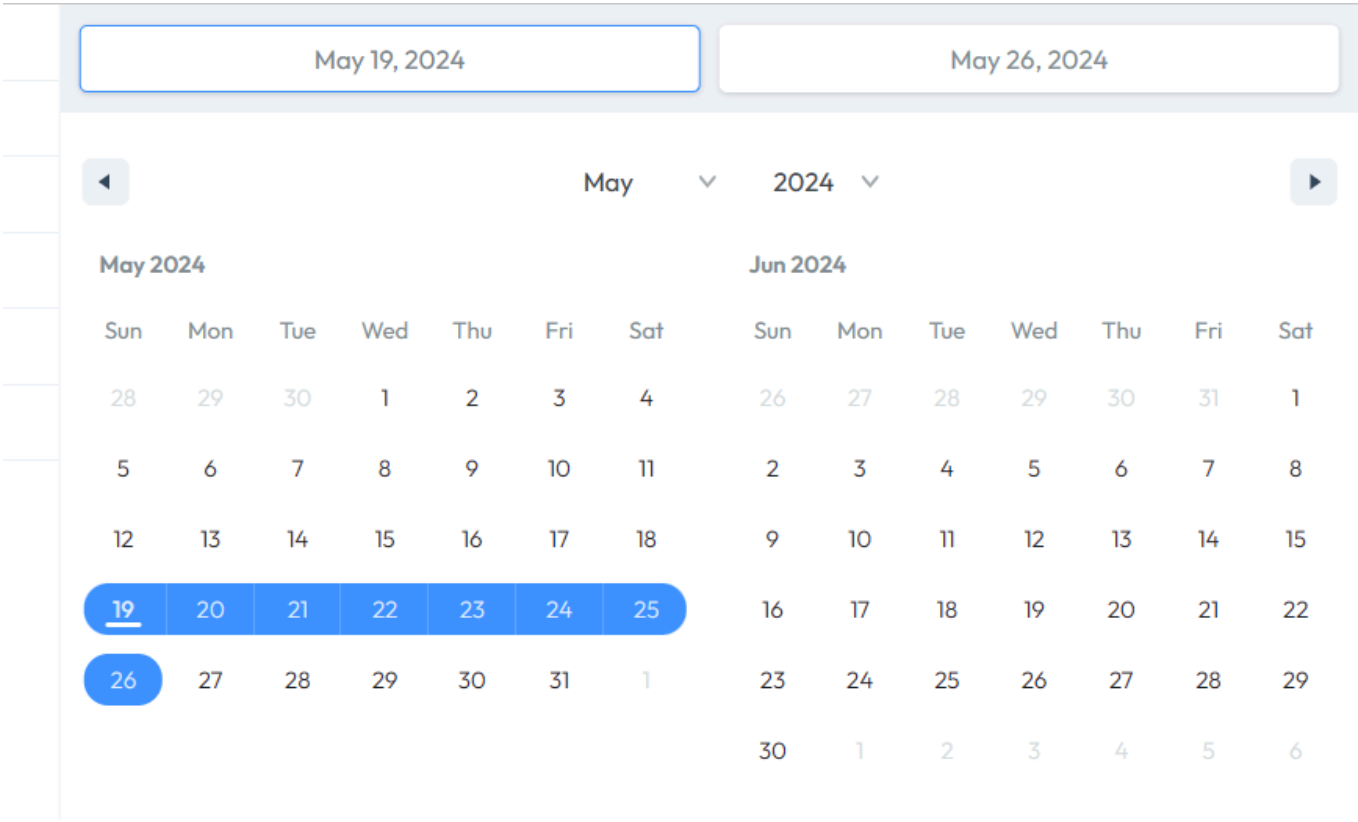
The main interface of the Revenue report is in chart form

The report can also be displayed in PDF format, when the user selects Report format in the Display Type menu.



Revenue report interface when in PDF format

Revenue report interface when in PDF format



Date Range Picker

V. Database design:

5.1.Description

For hotel management systems, MySQL is used to manage the database. Basically, the system's data requires mutual constraints, so MySQL stores data in SQL form. a good choice. Because it can be queried quickly, bringing a good experience to users. Besides, MySQL has a large user community, with many people solving problems and optimizing performance.

MySQL is also available on a variety of platforms, including Windows, Linux, and MacOS, making it a versatile choice for software development environments.

In the design of MySQL there are 4 concepts:

- Schema: Defines and describes the organizational structure of the database, including many Tables
- Table: Is a table with many columns and rows, represented in the database
- Column: Are the attributes of the entity
- Row: is a set of data records of an entity

5.2. Design:

a, Booking is the place to store information about a booking:

Field	**Means**
bookingId (int)	Primary Key
checkin_date (datetime)	Booking date
checkout_date(datetime)	Check-out date
guestid(int)	FK, lis the id of the booking customer, references to the Guest table
room_number(int)	Room number booked

total_price(float)	Total amount expected to be

b, Guest is the place to store information about the guest:

Field	**Means**
guestid(int)	Primary Key
date_of_birth(datetime)	customer’s birthday
email(varchar)	Customer’s email
first_name(varchar)	Customer’s first name
last_name(varchar)	Customer’s last name
phone(varchar)	Customer’s phone number
gender(varchar)	gender
cccd(varchar)	Identification Code
image (varchar)	Image
notes(varchar)	More information?

c, Hotel is the place to store information about the hotel:

Field	**Means**
hotelid(int)	Primary Key

address(varchar)	address of Hotel
name(varchar)	hotel’s name
phone(varchar)	phone number
work_time_start(varchar)	The hotel is now open for service
work_time_end(varchar)	The hotel now stops accepting services
email(varchar)	Hotel email
stars(int)	Evaluate hotel quality

d,Payment is where information about payment invoices is stored:

Field	**Means**
paymentid(int)	Primary Key
amount(float)	The money have to pay
bookingid(int)	FK, What booking does it refer to?
payment_date(varchar)	payment date
payment_method(varchar)	payment method

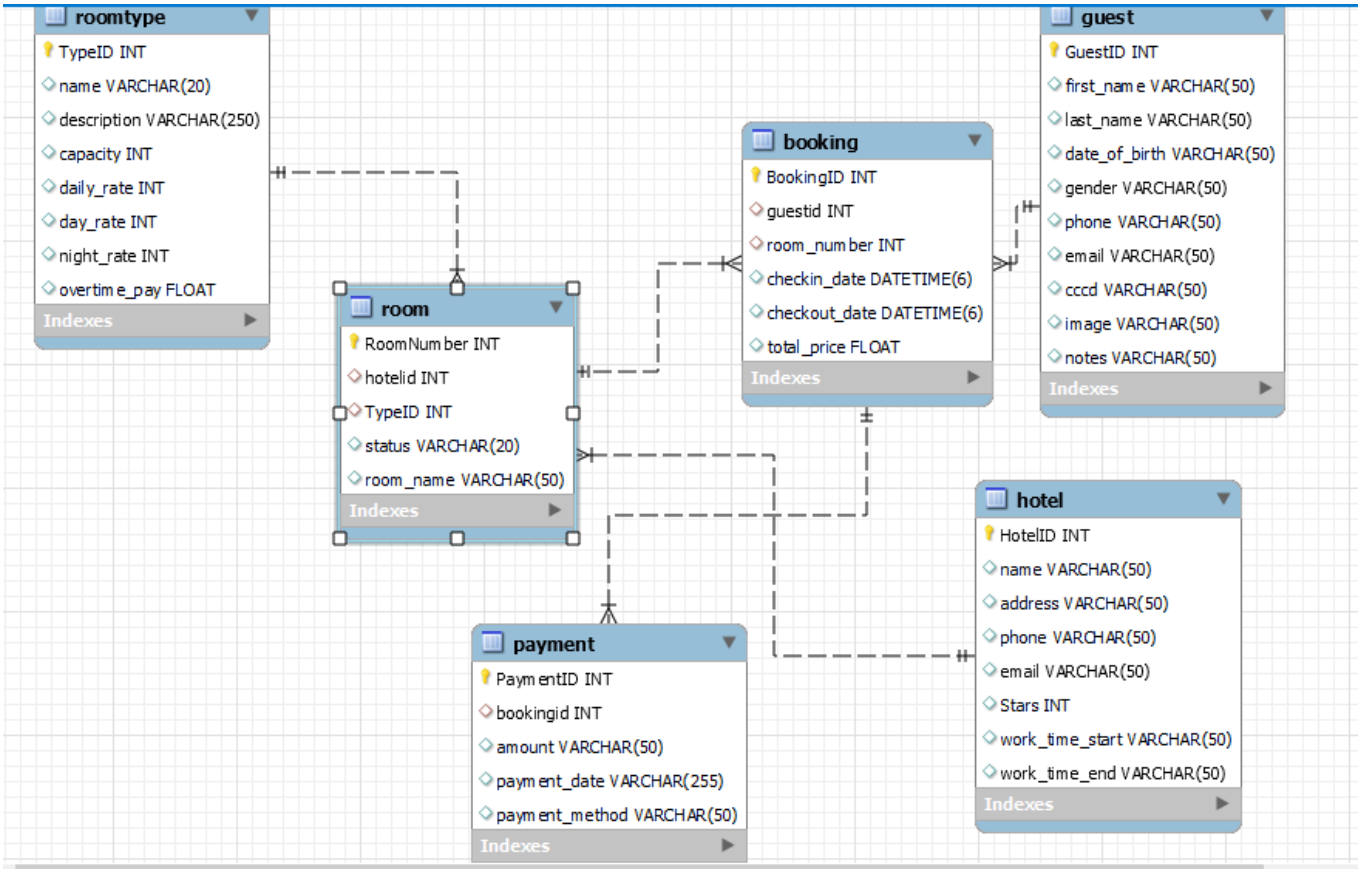
e, Room is the place to store information about rooms in the hotel:

Field	Means
room_number(int)	Primary Key
status(varchar)	room status
hoiteld(int)	FK, Which hotel is the reference to?
typeid(int)	FK, reference to the room type in the RoomType table
room_name(varchar)	room name

f, RoomType stores room types:

Field	Means
type(int)	Primary Key
capacity(int)	Number of people in 1 room allowed
description(varchar)	Describe room features
name(varchar)	Room type‘s name
night_rate(float)	How much does it cost at night?
daily_rate(float)	How much does it cost during the day?

day_rate(float)	How much does it cost all the day?
overtime_pay(float)	How much to pay for overtime:



g, User is the place to store account information representing a hotel

Field	**Means**
hotelId(int)	Primary Key
email (varchar)	Hotel representative account email

full_name (varchar)	Full name of representative
phone (varchar)	phone Number
user_name (varchar)	The account name that represents the hotel
user_password (varchar)	Password to log in to the hotel representative account

h, UserAccount is the place to store accounts for users, including managers, receptionists and admins

Field	**Means**
user_name (varchar)	Primary Key
password (varchar)	Account login password
active (bit)	Check if the account is locked or not
hotelId (int)	Hotel ID
role (varchar)	account's role

i, UserSession is where login sessions are stored after a user successfully logs in

Field	**Means**
sessionId (int)	Primary Key - session ID

role (varchar)	account’s role
user_name (varchar)	username