Final Design Document

Hotel Management System

Smart Taj

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1. Introduction

1.1 System Description

The project hotel management system is a web-based application that allows the hotel manager to oversee all activities online. The hotel manager is very busy and does not have time to sit and manually handle all of the activities on paper. This application gives him the power and flexibility to manage the entire system from a single online system. The hotel management system provides information regarding the hotel, room booking, bill generation, and other necessary features. The system allows the manager to post available rooms in the system. The guests can visit the site and register themselves with the required information expected by the system. Admin has the power of either approving or disapproving the customer's booking request. Other hotel services can also be viewed by the customers and can book them too. As a result, the system is helpful for both customers and managers to manage hotel activities portably.

A user registration form is available, where new users can create an account by providing the necessary information to the system like Email, contact, Aadhar Card number etc. Users can request a room booking for a particular date and time. There are mainly two types of rooms available, like a single and double bed with AC or Non-AC. Users can select as per their choice. When a user books a room, The system sends requests directly to the admin account. Admin can see all of the requests and the user details for each one and make decisions on whether or not to cancel them.

There are many payment methods available such as cash, net banking, or an ATM card. Some users might get a special discount on room booking based on previous booking details. Sometimes, lucky users also get a discount if a special offer is available. To clear payment, the payment portal would use a payment gateway. Once payment is received, an automatic receipt will be generated and sent to the manager, and the Receptionist will be notified to make the room ready before they arrive. Users have a choice to cancel their room (if booked) but, in that case, will not get 100% of their money.

The system has an admin login, who has the system's authority, and he is responsible for approving and disapproving the user's request for room booking. Admin can add and delete notifications and updates in the system.

1.2 Objectives & Motivation

The goal of a hotel management system is to serve as a link between guests and hotels. People nowadays arrange events, vacations, and weddings, and visitors require hotel rooms. People are no longer required to physically visit hotels to negotiate over hotel rates; instead, they go online and reserve rooms according to their preferences. Many functions related to consumers and hotel workers will be available through this web-based hotel management system.

It will help in more efficient management of consumer data and simplify the booking process. It will be a two-way benefit, with the hotel owner being able to keep track of the customer's online booking and the consumer receiving positive feedback. Because there are so many consumers booking records, there are challenges with physical record updating and deletion, but this system resolves these issues.

Some of the critical objectives are:

- User allotment with room is scheduled to make it convenient for the user.
- Managing user details with privacy and keeping user satisfaction is at most priority,
- User can see all hotel rooms with prices and can select best room about his/her preferences
- They can cancel reservations at any moment with some cost.
- Manager of the hotel can set rates, see consumers info, change in inventory, change room status.
- secure payment methods for users.
- make the system efficient enough so that after the cancellation of a room, other users can book that room.
- For query, users can contact the hotels at any time.
- Simple and interactive GUI - Due to the Simple user interface of this web application, users don’t need to put more effort into using this system.
- Weather Data around the Hotels should be there so that users can get Idea about which place to choose according to the weather at those places.

2. Product Scope

2.1 Product Functions

- **User Registration:** A user registration form is available, where new users can create an account by providing the necessary information to the system like ID proof, Email, contact number, username, password etc. If all the data of the user is unique then the system sends the automated mail to the user's mail for the verification of the account.

- **User login:** customer needs to provide the valid username and password for the login into their account.

- **Manage room:** Users can see the list of available rooms and if any room will be under maintenance or already booked by other customers in advance then users cannot book that room.

- **Manage Staff:** Admin can see the staff member details like staff member name, phone number, bank account number and track record of all the staff in the hotel.

- **Manage User**: Admin can see all users details to see the frequency of the customer and also payment paid by the customer. Admin/Receptionist can update the customer details according to customers' latest information.

- **Manage inventory**: Admin/Owner can see the total (food + furniture) inventory used and what number of inventories was in stock. If the stock is below the threshold value then the manager has to immediately order the appropriate number of inventories using the previous data. (Threshold value is calculated using the previous month's used inventories).

- **Search room**: Users can request a room booking for a particular date and time. There are mainly two types of rooms available, like a single and double bed with AC and Non-AC. Users can choose as per their choice. Users can also see the remaining time of the already booked room for the future booking reference.

- **Approving/Disapproving Requests**: The system sends booking requests directly to the admin account. Admin can see all of the requests and the user details for each one and make decisions on whether or not to cancel them. If the customer is not authenticating via mail or phone number then the admin can block that particular customer.

- **Order food:** Customers can see the online menu card from the website and order the food providing the code/food name of the food from the menu card and the quantity as their preference.

- **Booking & order information:** System provides the unique code for each customer. This helps to store all the booking and order details for that particular customer.

- **Pricing Details:** Users can see the rate of room in the price description section parallelly with room number. Also, only the admin can change the price details.

- **Payment Details:** When a customer wants to leave the hotel, they can enter their booking information for the payment. Customers must pay using one of the available payment methods, such as cash, net banking, or an ATM card. To clear payment, the payment portal would use a payment gateway.

- **Issue bill & feedback:** Once payment is received, an automatic receipt will be generated and the feedback form will be sent to the mentioned Email address.

- **Special discount**: Some users might get a special discount on room booking based on previous booking details. Sometimes, lucky users also get a discount if a special offer is available.

- **Room cancellation:** Users have a choice to cancel their room (if booked) but in that case, they will not get 100% of their money.

- **Help desk:** Customers can call the staff for any query using the help button on the website.

2.1 Project Deliverables

a) Milestones

Week-1 & Week-2 : - At the initial phase, we will do research on the Hotel Management System. After that we do data analysis and gather all the requirements. We will think of some futuristic invitation that can be compiled with the existing system. After deciding all the functionalities, we will make a design for our system and start to develop some basic functionality.

Week-3 & Week-4: In the second phase, we will move forward to approach the next functionalities to deploy on the system and create a web website. After the first version of the website is successfully built, we will test the system and take feedback from the testers and analyze it.

Week-5 & Week-6: At the last phase, we will deploy the final version of the website from updating the website using the feedback. After successfully deploying the website, we will test the website on our side to see if all the functionalities will work, then we publish the website on server or not, then first we have to fix those problems, then publish the website. At last, we will make some brief report (documentation) of our system.

b) List of final deliverables

1. Complete documentation (internal included)
2. Report for audit
3. User guide (includes deployment guide, end user guide etc.).

c) System Interface

This Software is designed to run on any platform above Microsoft Windows 7 (32bit). Microsoft .NET Frameworks 4.0 or above. Microsoft SQL Server Management Studio Express 2010. This software can be easily accessible from any browser.

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e) User interfaces

The user interface for software shall be compatible with any type of web browser such as Mozilla Firefox, Google Chrome, and Internet Explorer.
It also provides statistical information regarding the occupancy rate and profit of the hotel in graphical as well as excel form with easy understanding formulas.

f) Hardware interfaces

The computer or laptop should have the required updated browsers and other specifications which are mentioned in the system interfaces section. Also the reservation alert and the apologies message will be sent to the one the member of hotel staff as an email notification, Therefore the broadband internet connection is required at both side. Also to print the bill we have to get one laser printer on the table as well.

g) Software interfaces

This software required the Windows 7 or above OS system on PC or laptop. It also uses the database server of MongoDB or Microsoft SQL Server Management Studio Express 2010 . Also web server of Apache Tomcat Server
1.3.5 Communications interfaces
The System shall be using HTTP/HTTPS for communication over Internet and for intranet communications, it shall use TCP/IP protocol.

h) Operations

This software allows various types of users with some restrictions like customers can not access the hotel administration details.
The manager can handle the hotel accurately using this software.
The software takes back-up of the data every month so that there will be not loss of the data.
The manager can manage the inventory of the food department using the software therefore there is enough inventory to serve the customers.

3. H/W and S/W requirements

3.1 Hardware:

User hardware requirement:

CPU	2 GHz
RAM	4 GB
HDD	64 GB
Monitor of PC/laptop	Colour monitor

3.2 Software:

User required software: -

Operating system	windows 7+
Presentation Layer	PHP, CSS, HTML, JSP, FLASH
Documentation Tools	Ms office, Pdf viewer
Browser	Chrome, Mozila Firefox etc
HTML	HTML 5

4. Technology / Architecture

- Product development
- software analysis
- Patterns to design
- UML tools and tech
- Database server
- SQL
- PgAd

- Draw. IO for ER diagrams tools
- Strategy for Software Development
- Editors - VS code, Atom
- Web dev Languages - HTML, CSS, JS
- Bootstrap
- Different CDNs
- Embedded JS
- NodeJS
- Express JS
- APIs - Postman
- Git, Github
- Hyper

5. Limitations

The Internet is mandatory for using the software.

6. Assumptions and dependencies

We assume that the client is using Windows 7 or above. One assumption about the software is that it will always be used on devices in which sufficient connectivity to the internet is accessible, if users lose connection they will not be able to access our web app.

7.Development Technology

We will use HTML extensively on the front-end with embedded java-script templating, for styling will use CSS Bootstrap. We will use Node-JS for backend and will have many routes for handling GET/POST requests sent by users. The database connectivity will be planned using SQL.

8. Usability requirements

- Contact support
- Multi language support
- Easy interfaces for users
- Guiding tour of the interface

9. Performance requirements

- Optimize the time for the services means not long wait for services on the software
- Multi Device login
- Multiple language translation
- Manage the traffic of the request in efficient way

10. Logical database requirements

Customers can't see the administrative details of the hotels. (Private/Privacy) On the bill customer phone number, email-id, bank account number, Id proof number should be hidden in a way that can not be figured out by an unconditional person.

11. Design constraints

- Use of the cloud services to minimize the cost
- Use of the data server in optimize method

12. Techs Used and Benefits

HTML, CSS, JS, and Embedded JS are the four components of the front end. These four elements serve as the foundation for a web page, providing content, styling, and a dynamic user interface. We use Bootstrap and other different sites that provide icons and fonts for efficient styling, and we use CDNs for these things because it's very fast and easy to use, and it also provides content delivery faster because it uses the shortest path, and it can send content from any location near the user.

Node JS – Express JS is used to create the back-end, and Express JS is a NodeJS framework. It's simple to set up and use, and it delivers excellent performance for real-time applications. Using Express and EJS, transferring material from one page to another and implementing numerous pages is a breeze. For the database, we use SQL. It does not necessitate coding skills — A huge number of lines of code are not necessary for data retrieval, and SQL query processing is extremely fast. With Express JS, it's simple to do so.

APIs - For weather APIs, we'll use "https://openweathermap.org/api." With this API, we'll be able to acquire accurate weather for every location, and users will be able to make informed decisions about where they should go.Git and Git-Hub will be used to store the project's repo, whereas Hyper is a terminal that will be used to explore and run commands rapidly during development.

12.1 Standard to be followed throughout the project

Our project will have Clear definition of purpose, delivered on time and when needed, Reliability, Efficiency, accurate and precise user documentation, accurate and precise technical documentation.

We will keep these things separate like the production, development, and test environments. This will ensure that the production system's security is rigorously maintained, while the development and test environments can maximize productivity with fewer security constraints.

Throughout the project, special attention must be paid to capturing and implementing security and privacy requirements on an ongoing basis. This must be reflected in the post-implementation review.

12.2 Standard to be followed for the source CODE:

The name of the global variable and the first letter of each class should start with a capital letter.

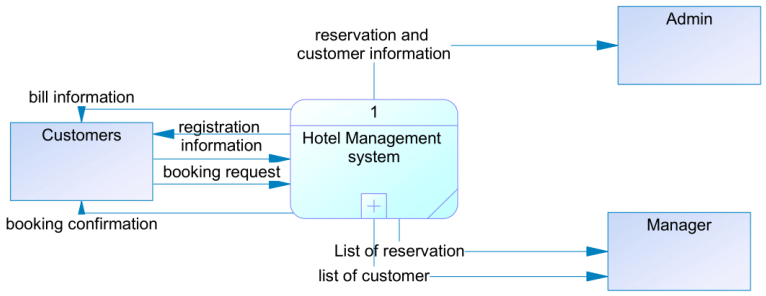
We implement our code in a way that can be updated whenever we find any problem on the system or if we want to add a new feature then we can also add the code without any much complexity.

Variable and function naming convention in camel case.

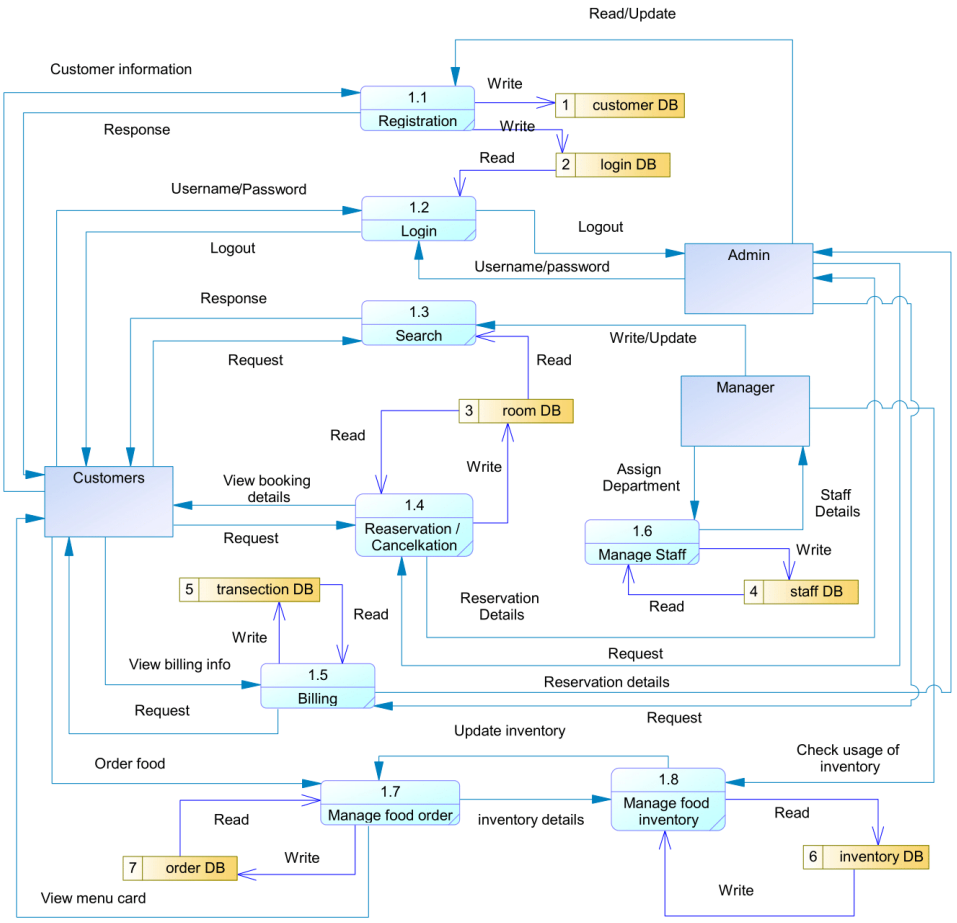
Separate file for all utility function

Some Useful Diagrams for the software development

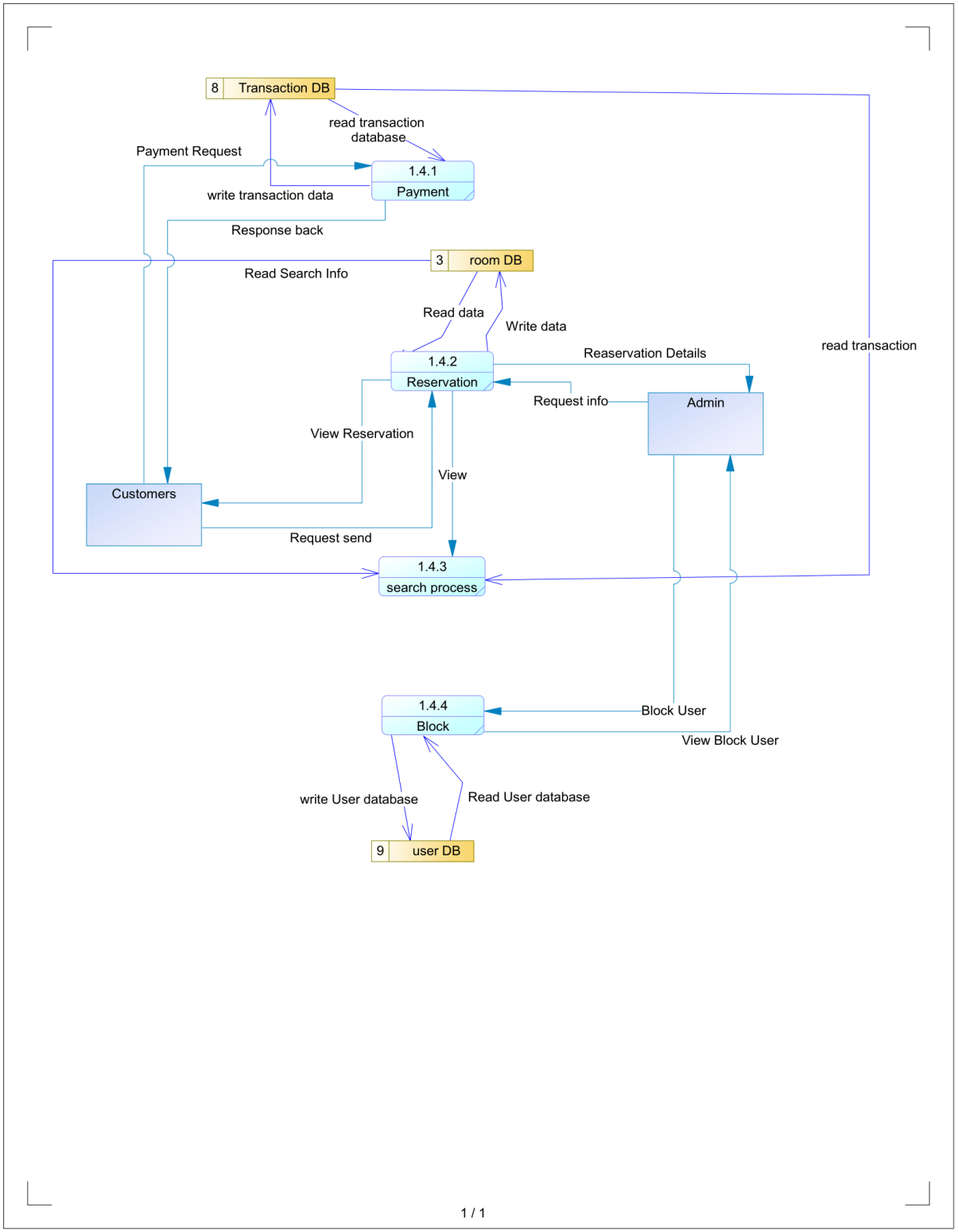
13. 1 DFD: Level 0 (Context Diagram)



13.2 DFD: Level 1 (Overview Diagram)

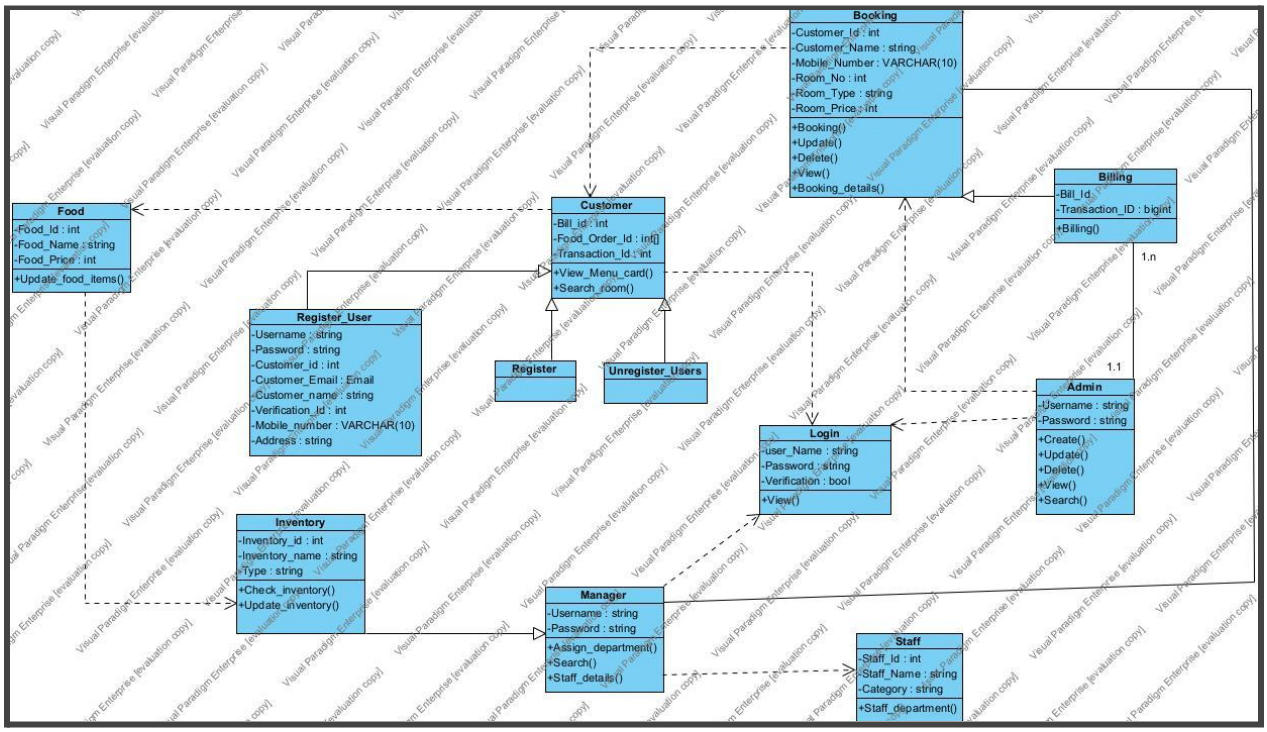


13.3 DFD: Level 2 (Detailed Diagram)

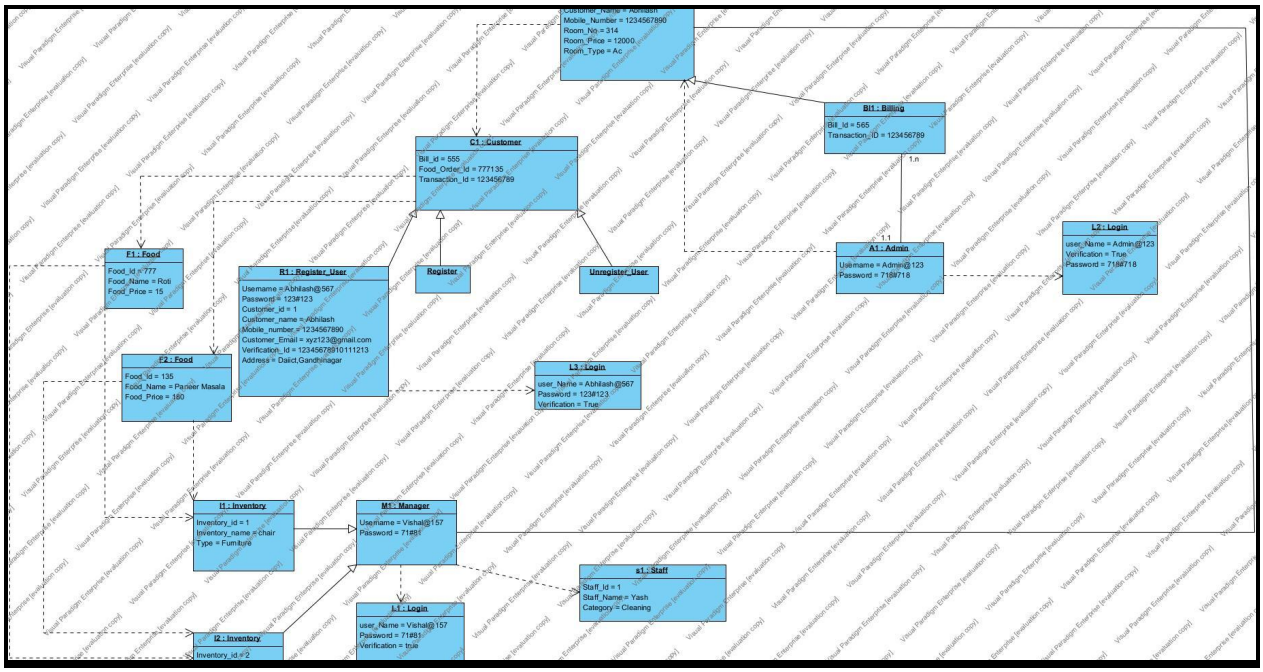


14. Structural Diagram

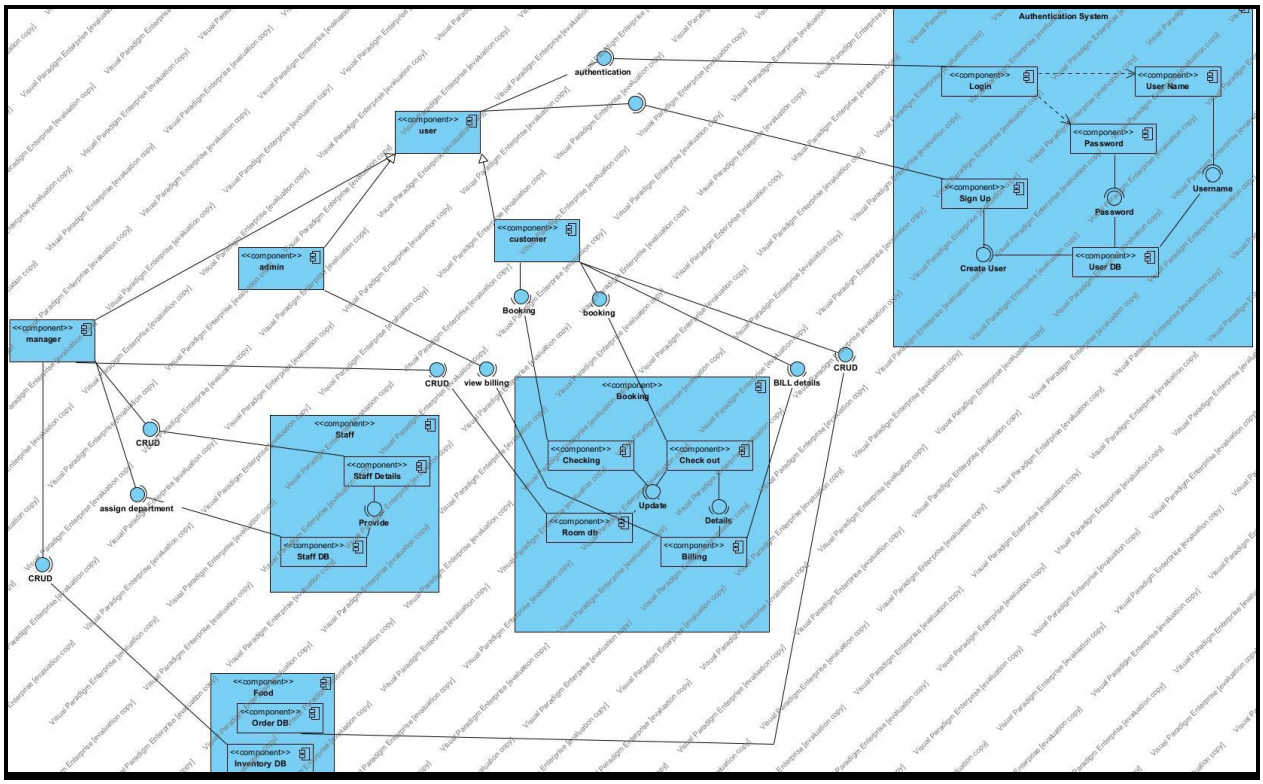
14.1 Class Diagram



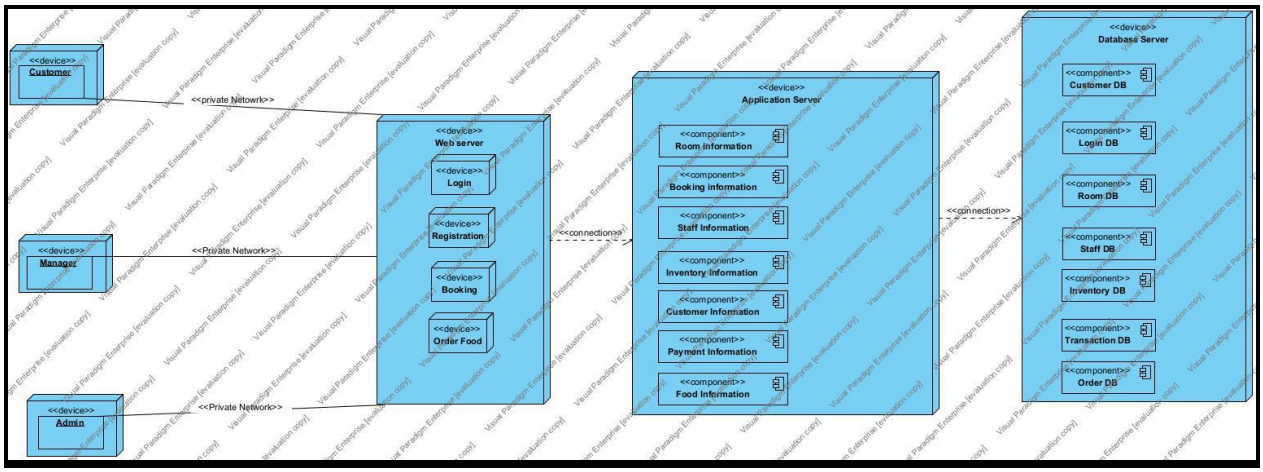
14.2 Object Diagram



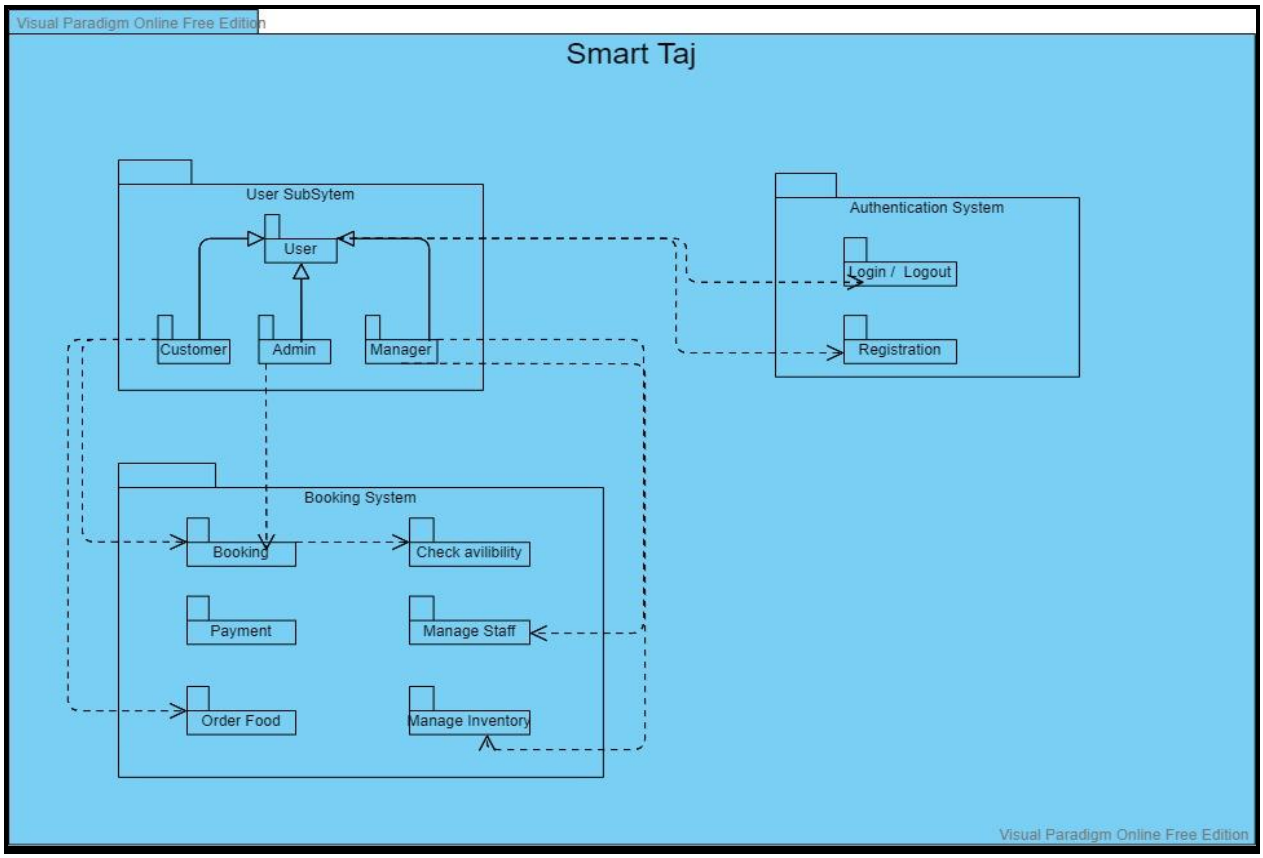
14.3 Component Diagram



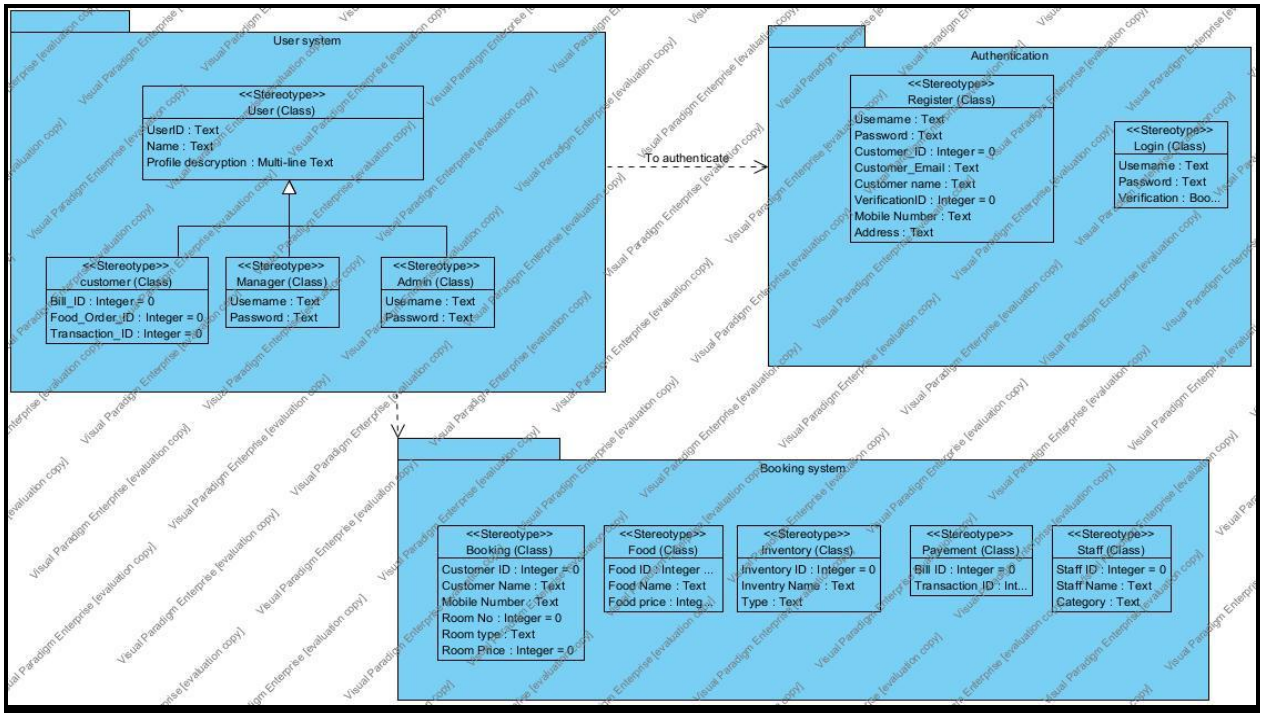
14.4 Deployment Diagram



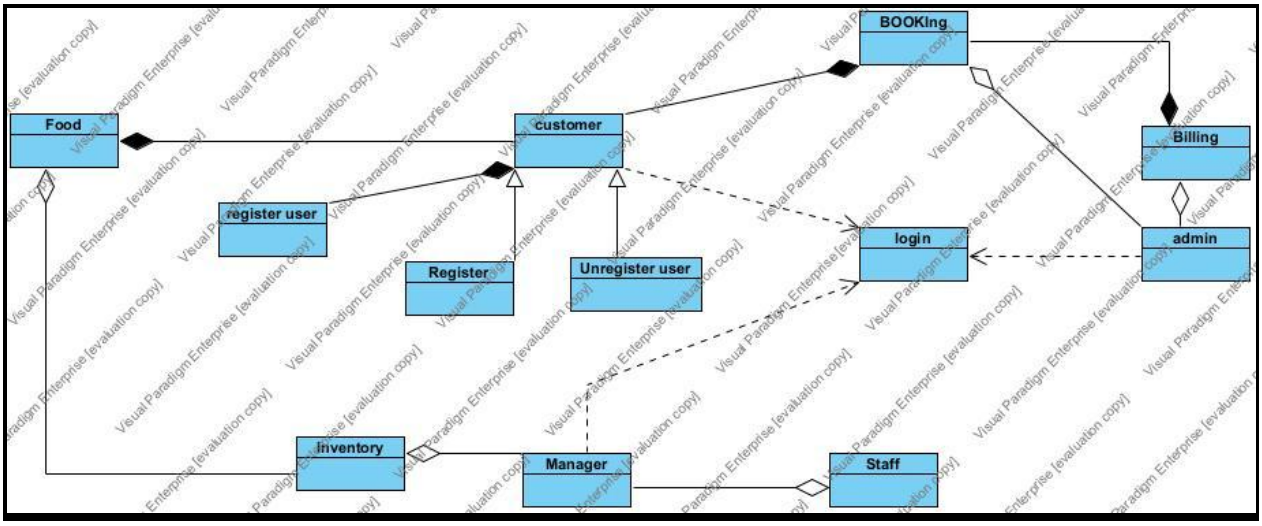
14.7 Package Diagram



14.6 Profile Diagram

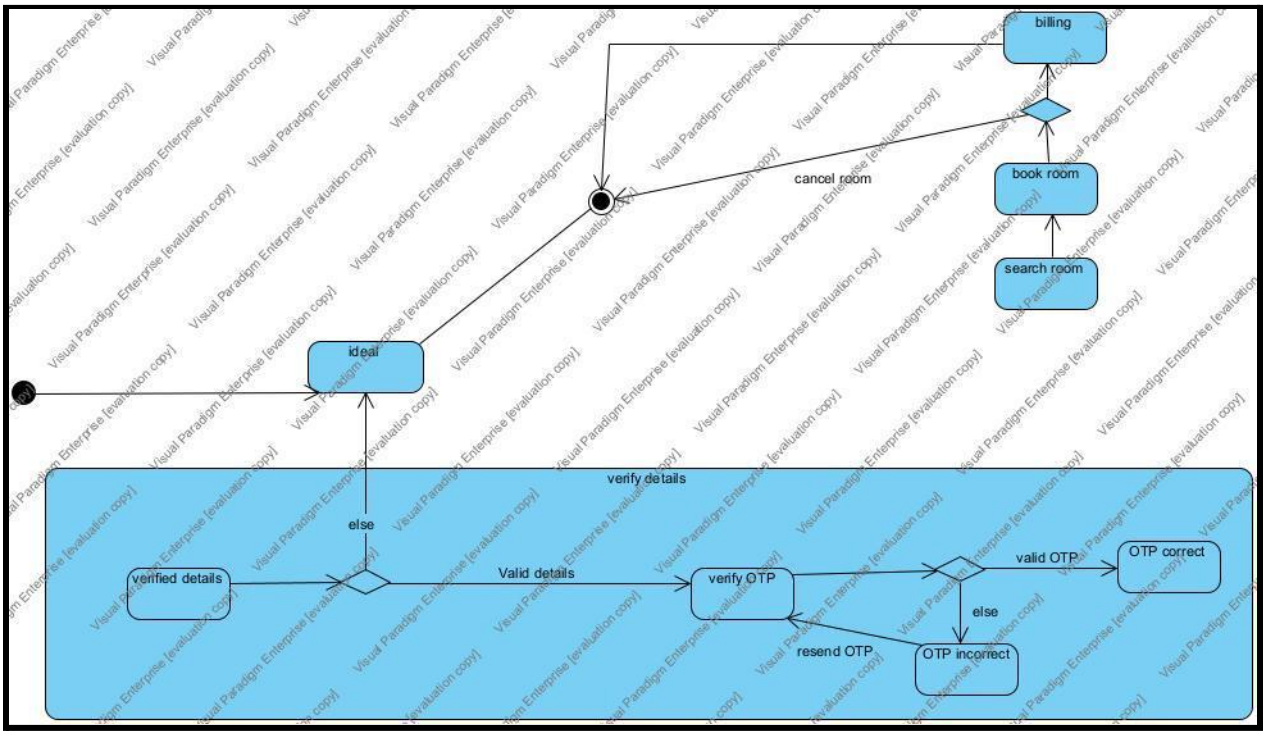


14. 7 Composite Structural Diagram

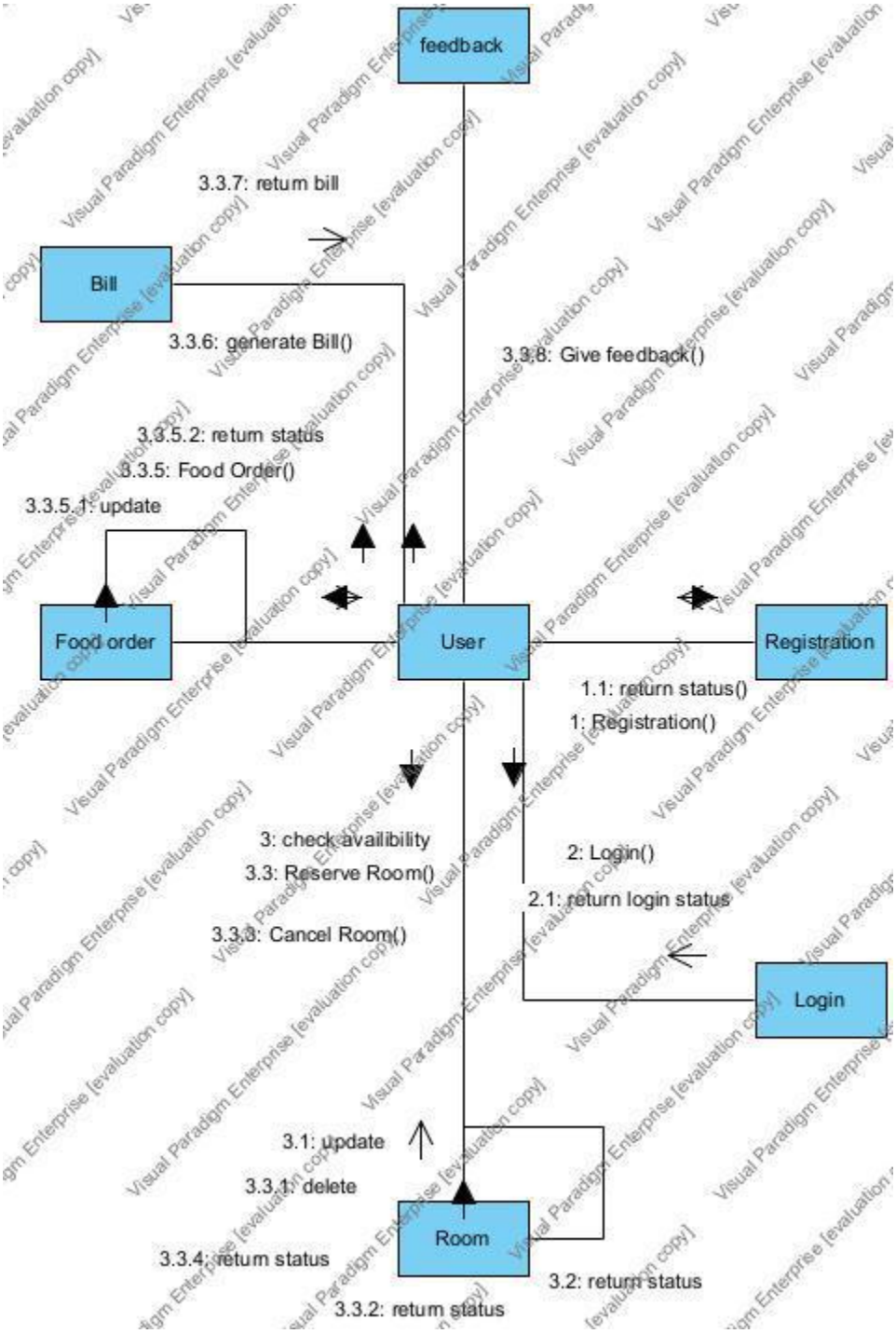


15. Behavioral Diagram

15.1 State Machine Diagram

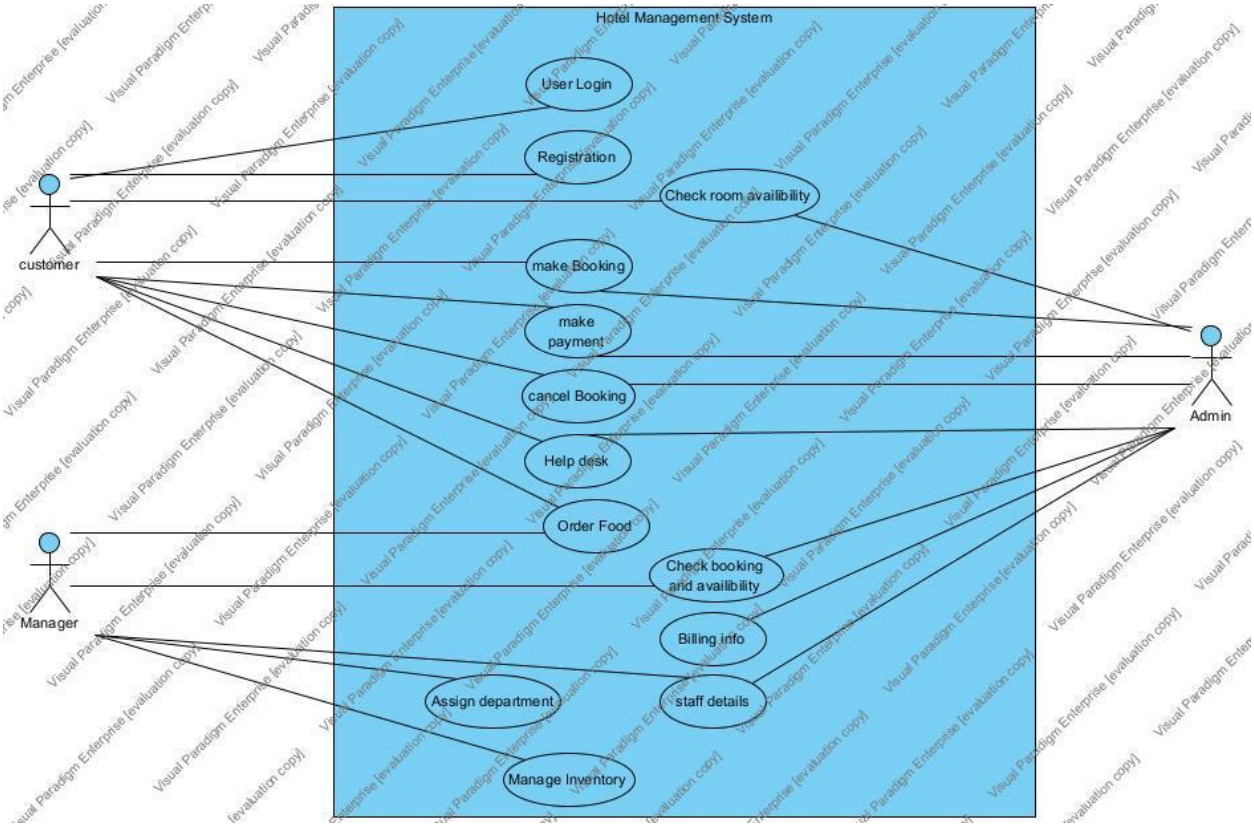


15.2 Communication Diagram

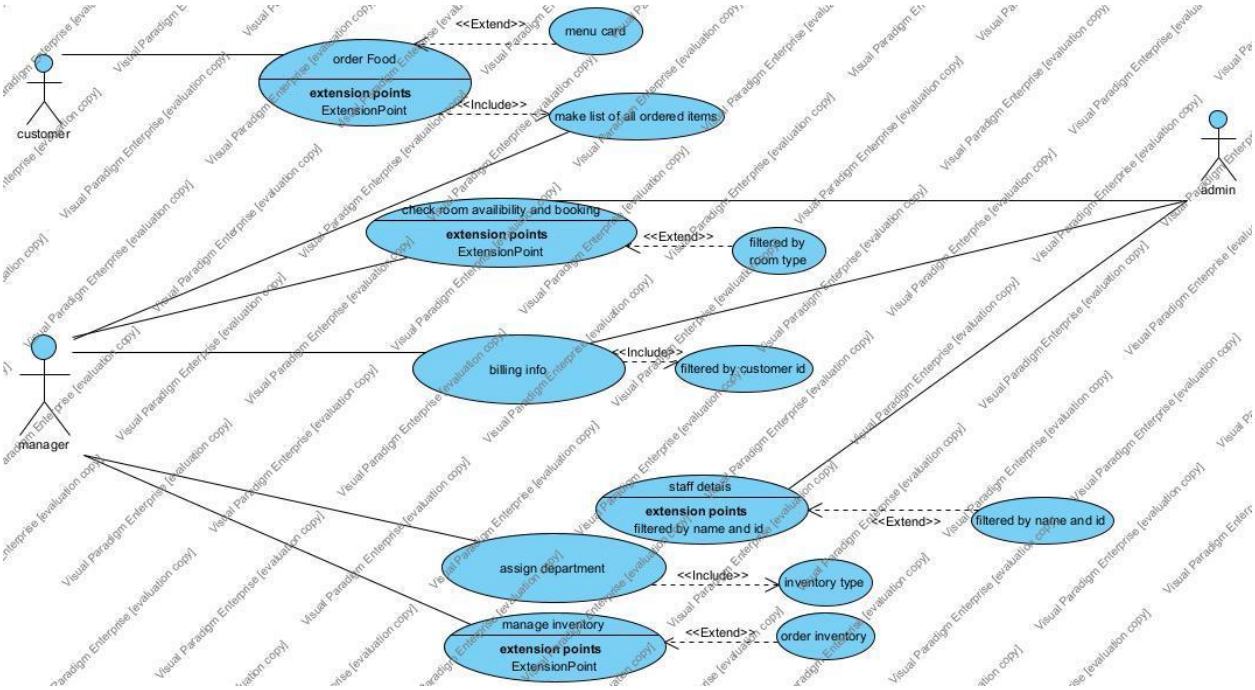

feedback
3.3.7: return bill
Bill
3.3.6: generate Bill()
3.3.8: Give feedback()
3.3.5.2: return status
3.3.5: Food Order()
3.3.5.1: update
Food order
User
Registration
1.1: return status()
1: Registration()
3: check availibility
3.3: Reserve Room()
2: Login()
2.1: return login status
3.3.3: Cancel Room()
Login
3.1: update
3.3.1: delete
Room
3.3.4: return status
3.2: return status
3.3.2: return status

15.3 Use case Diagram

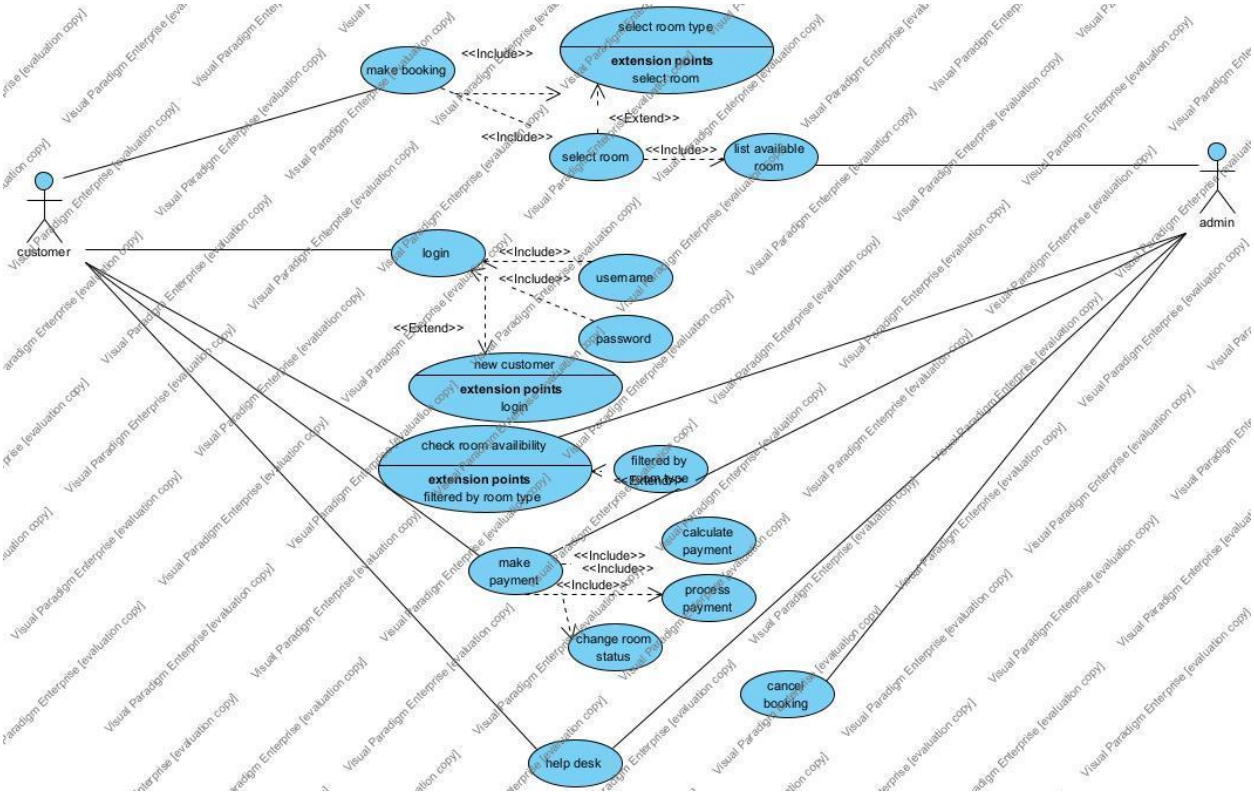
3.1



3.2

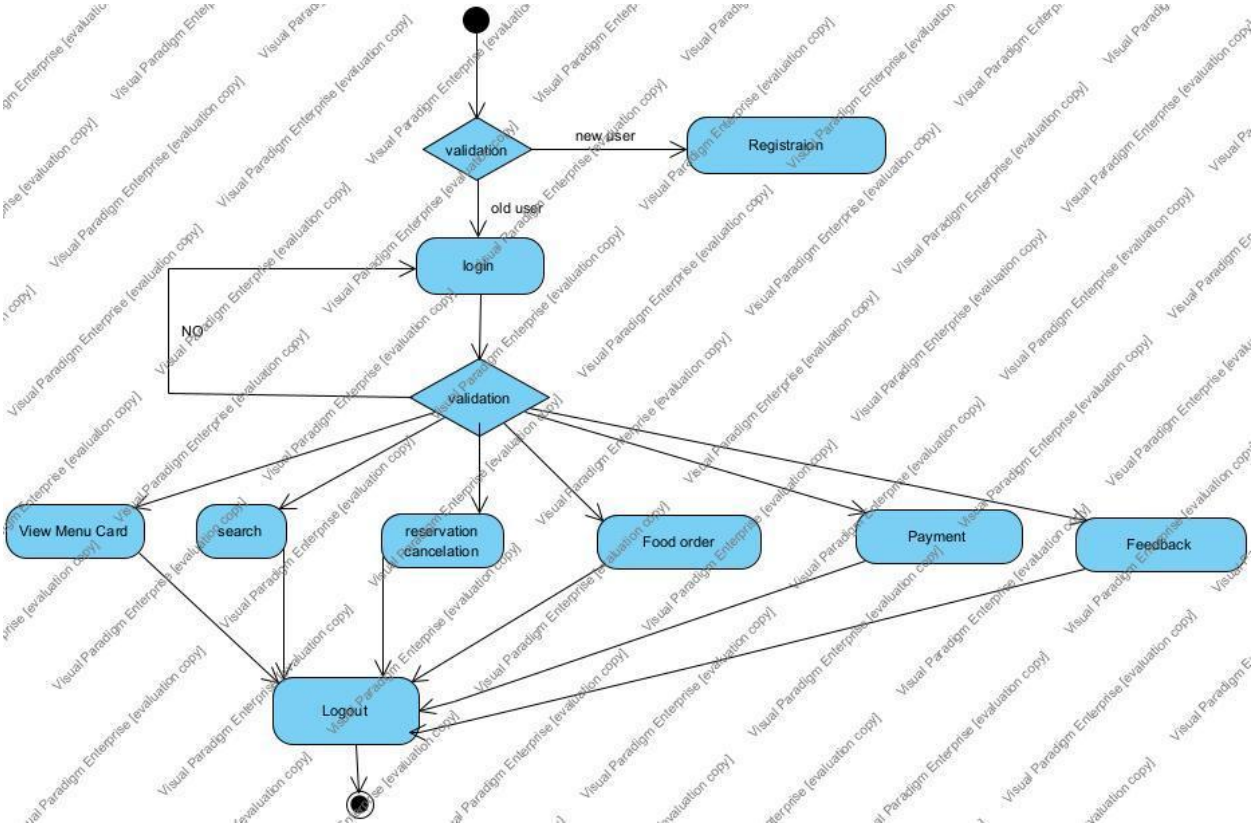


3.3

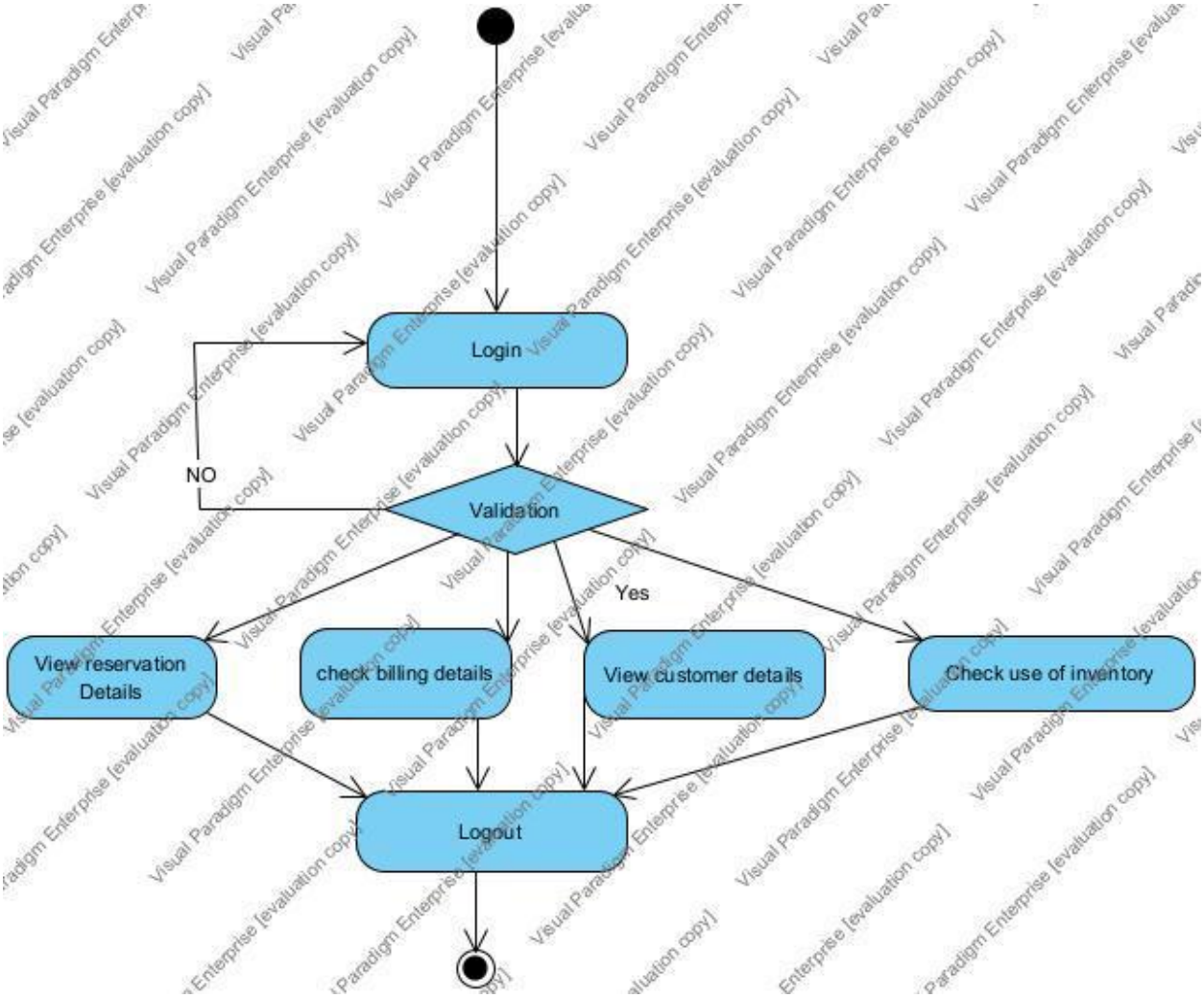

customer
admin
make booking
<<Include>>
select room type
extension points
select room
<<Extend>>
<<Include>>
select room
<<Include>>
list available room
login
<<Include>>
<<Include>>
username
password
<<Extend>>
new customer
extension points
login
check room availibility
extension points
filtered by room type
filtered by room type
<<Extend>>
make payment
<<Include>>
<<Include>>
<<Include>>
calculate payment
process payment
change room status
cancel booking
help desk

15.4 Activity Diagram

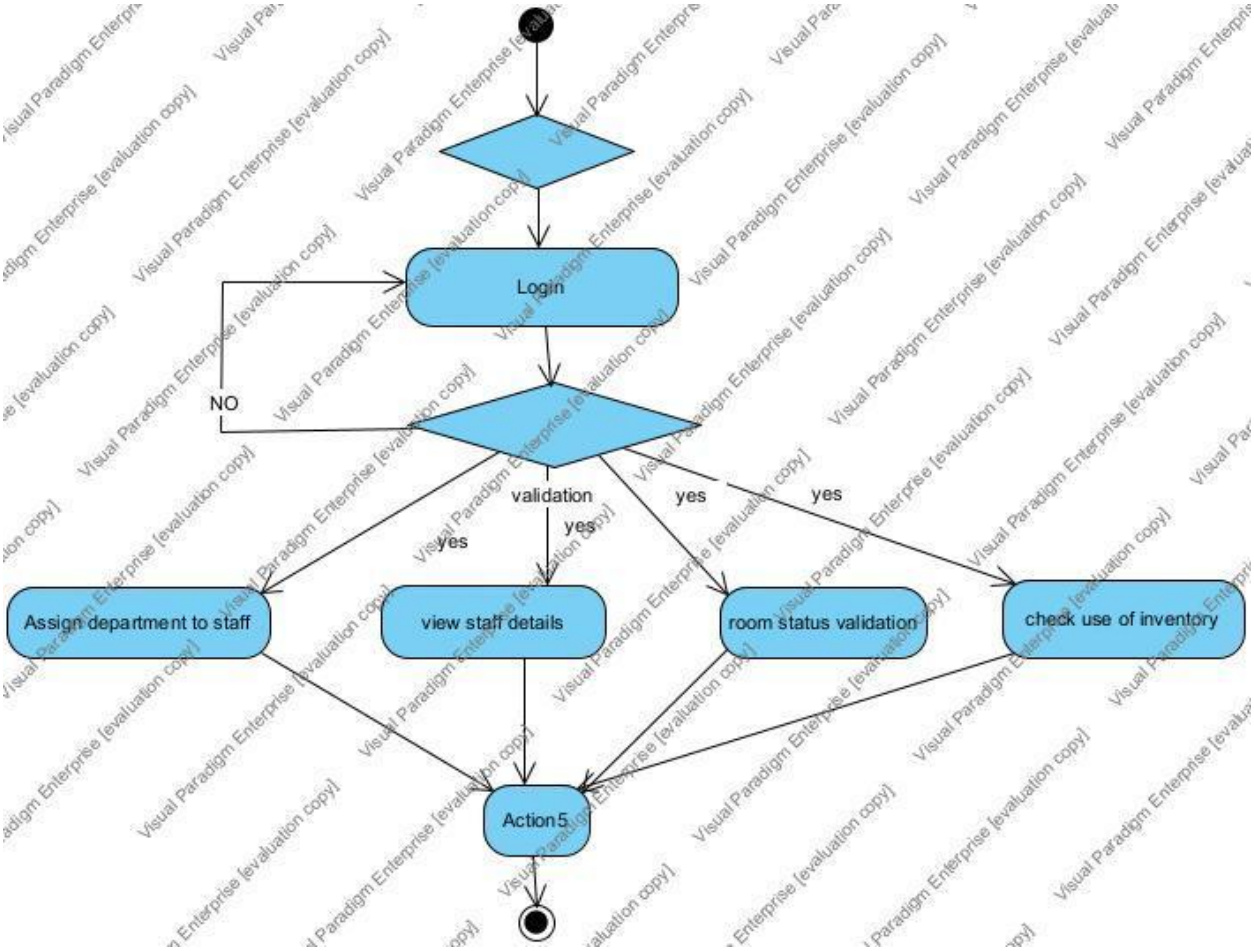
- User Activity Diagram



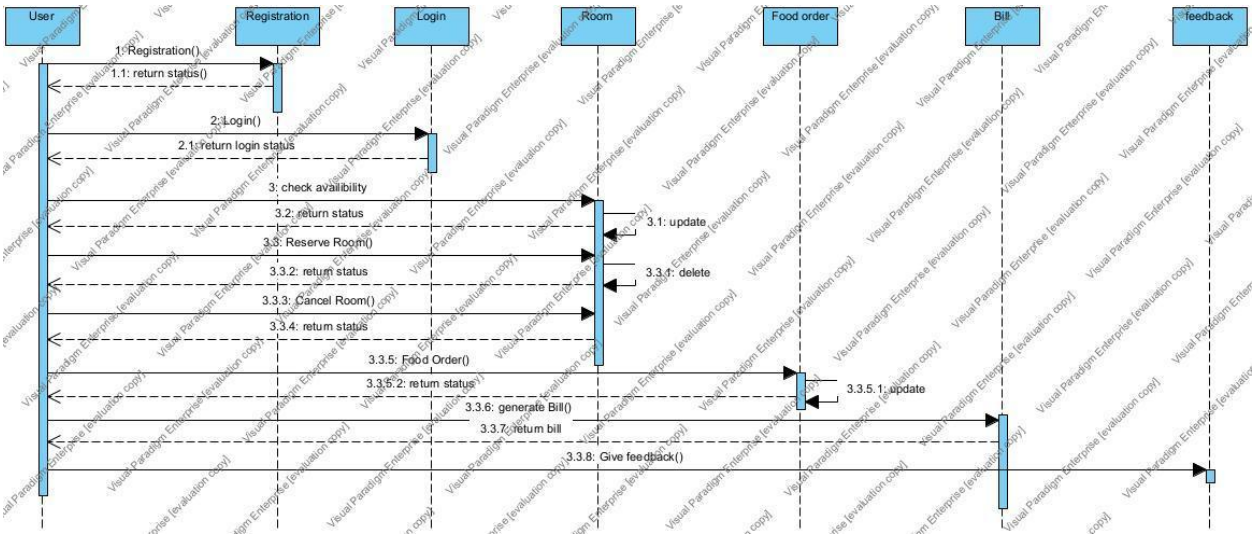
- Admin Activity Diagram



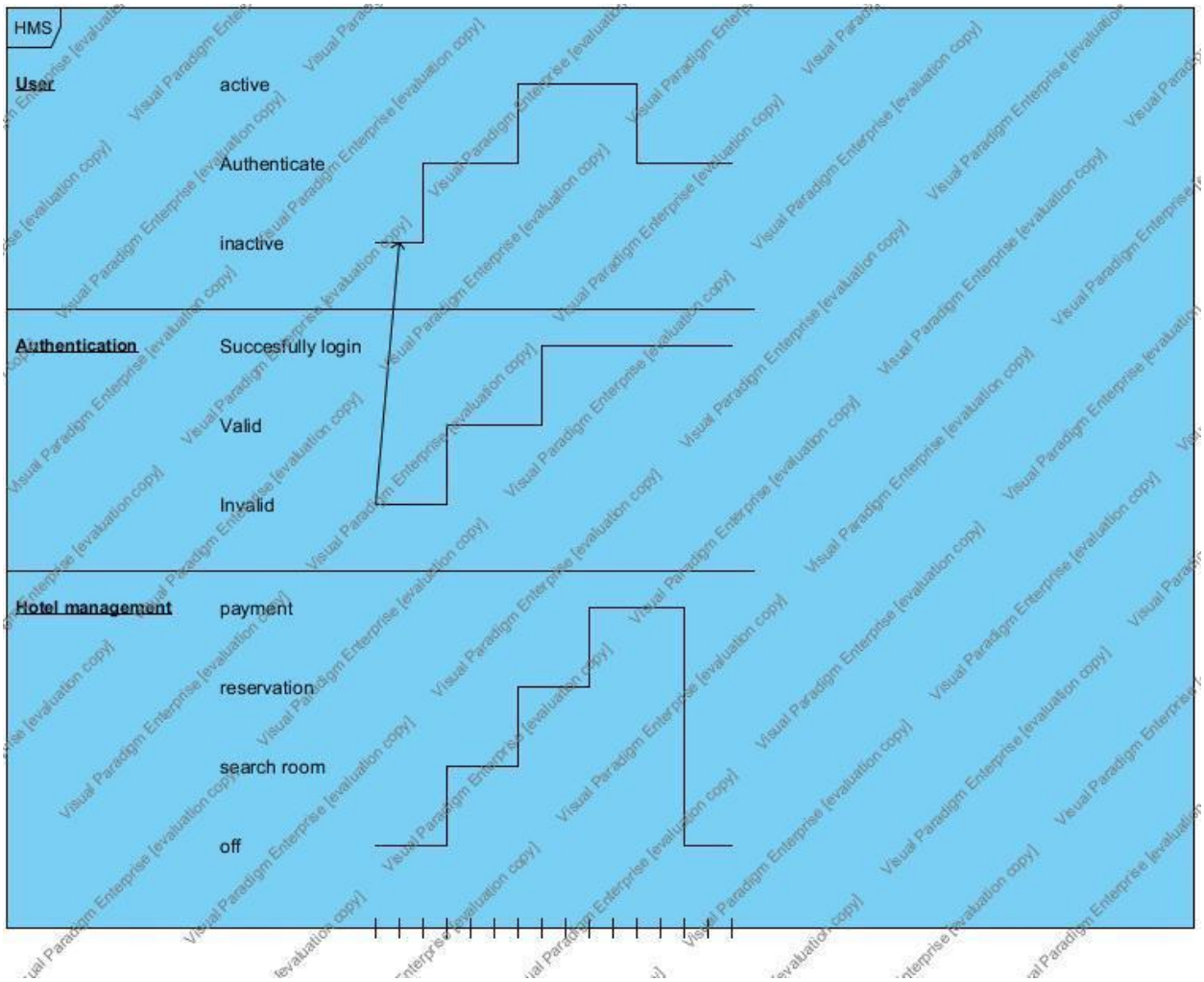
- **Manager Activity Diagram**



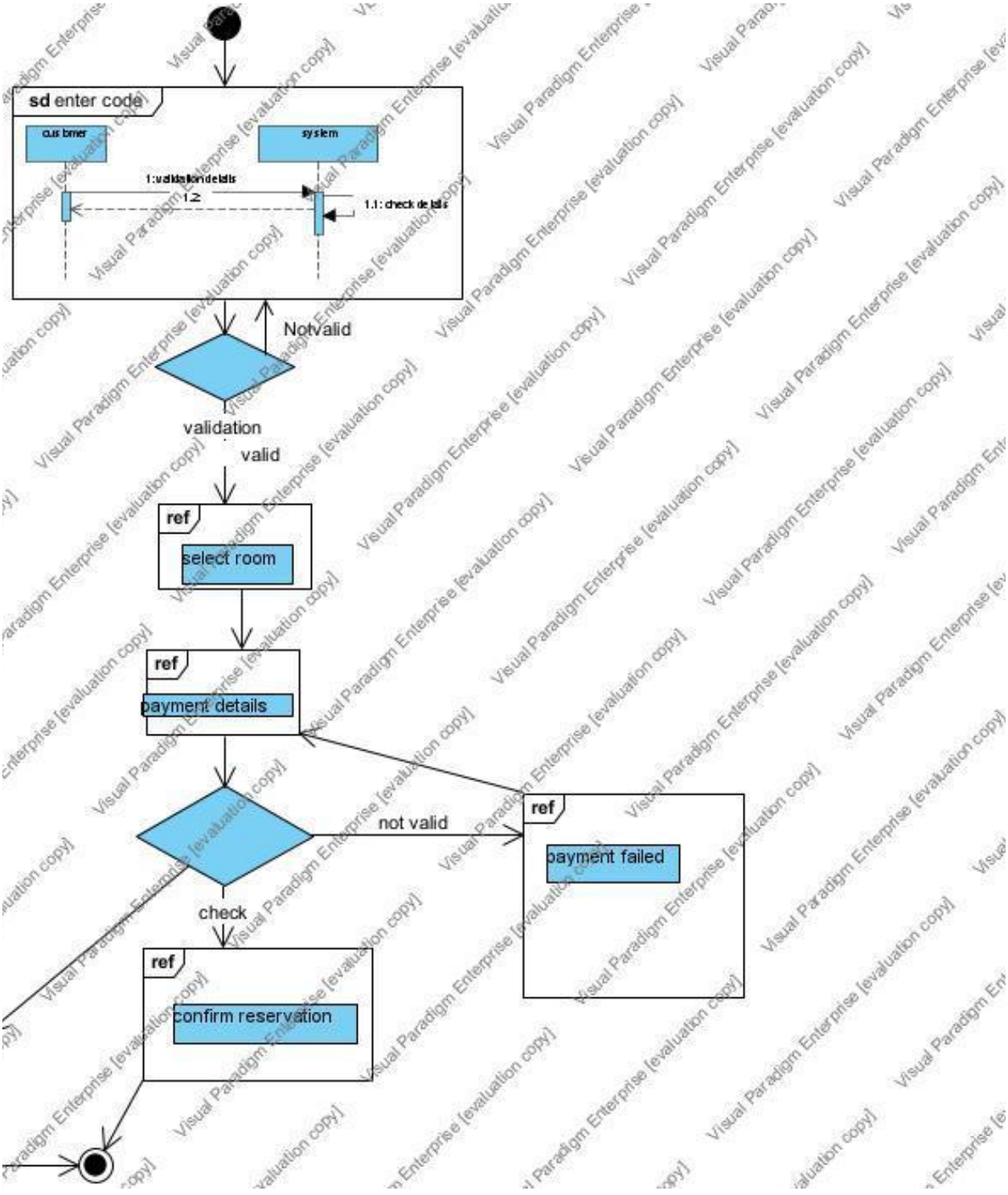
15.5 Sequence Diagram



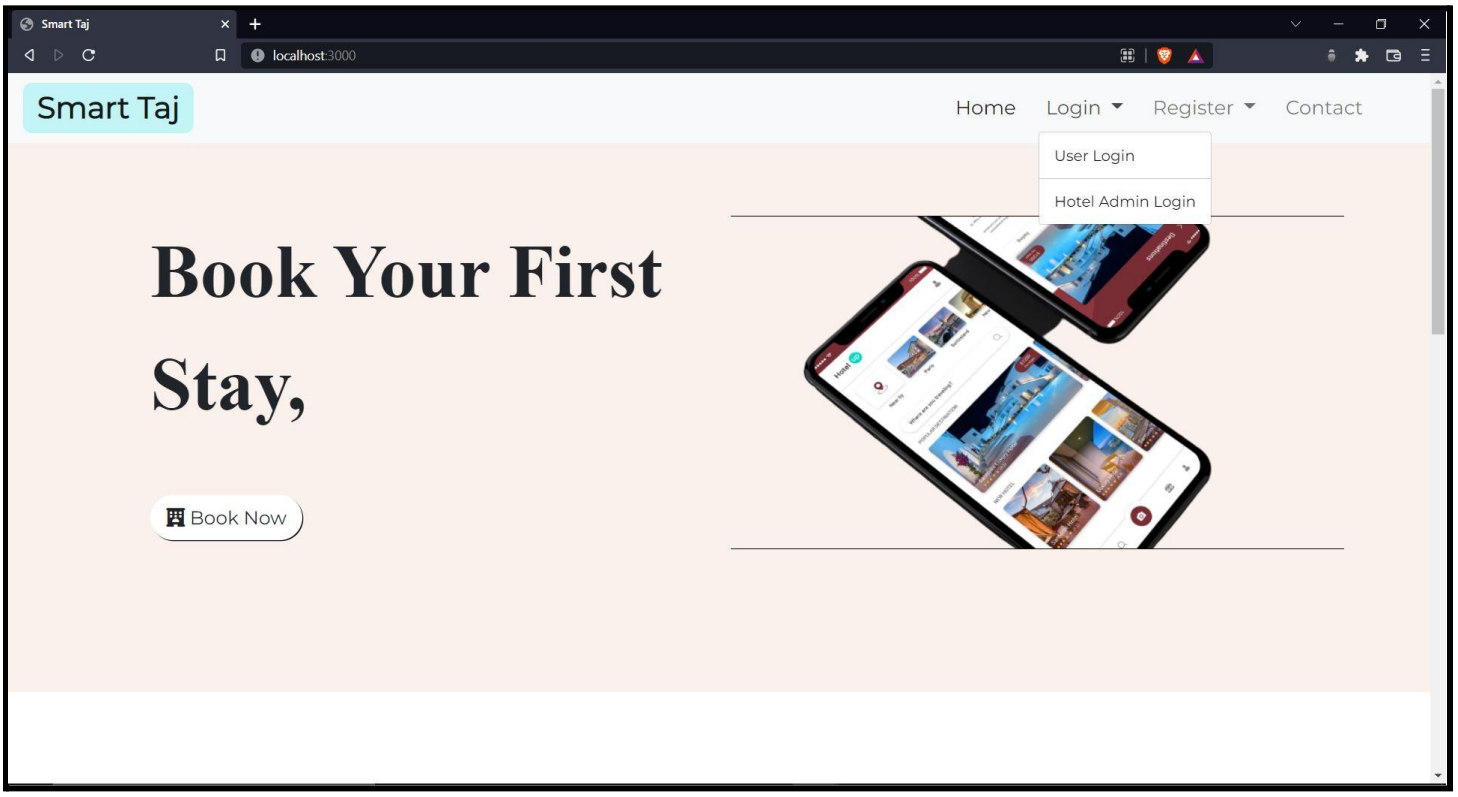
15.6 Timing Diagram

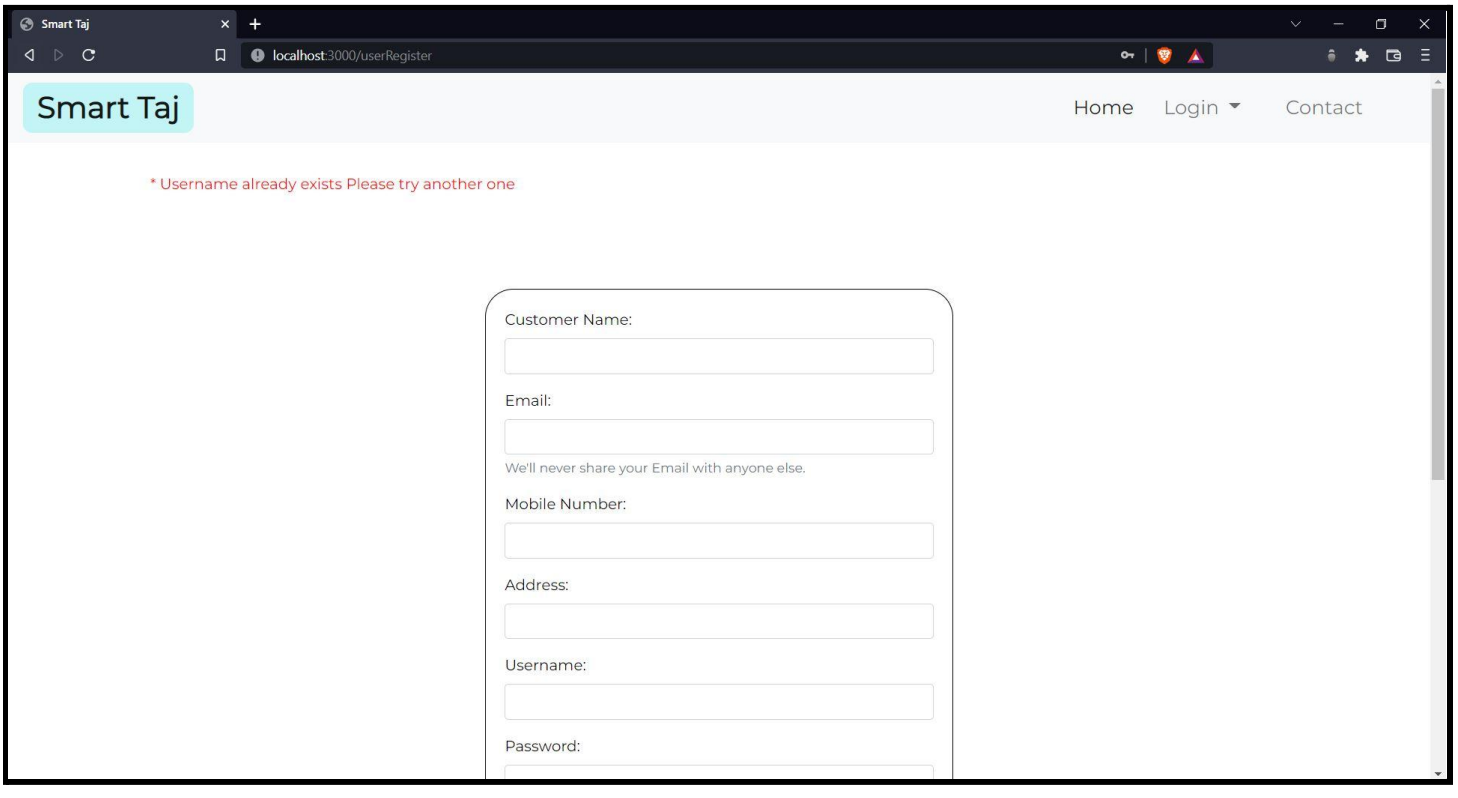


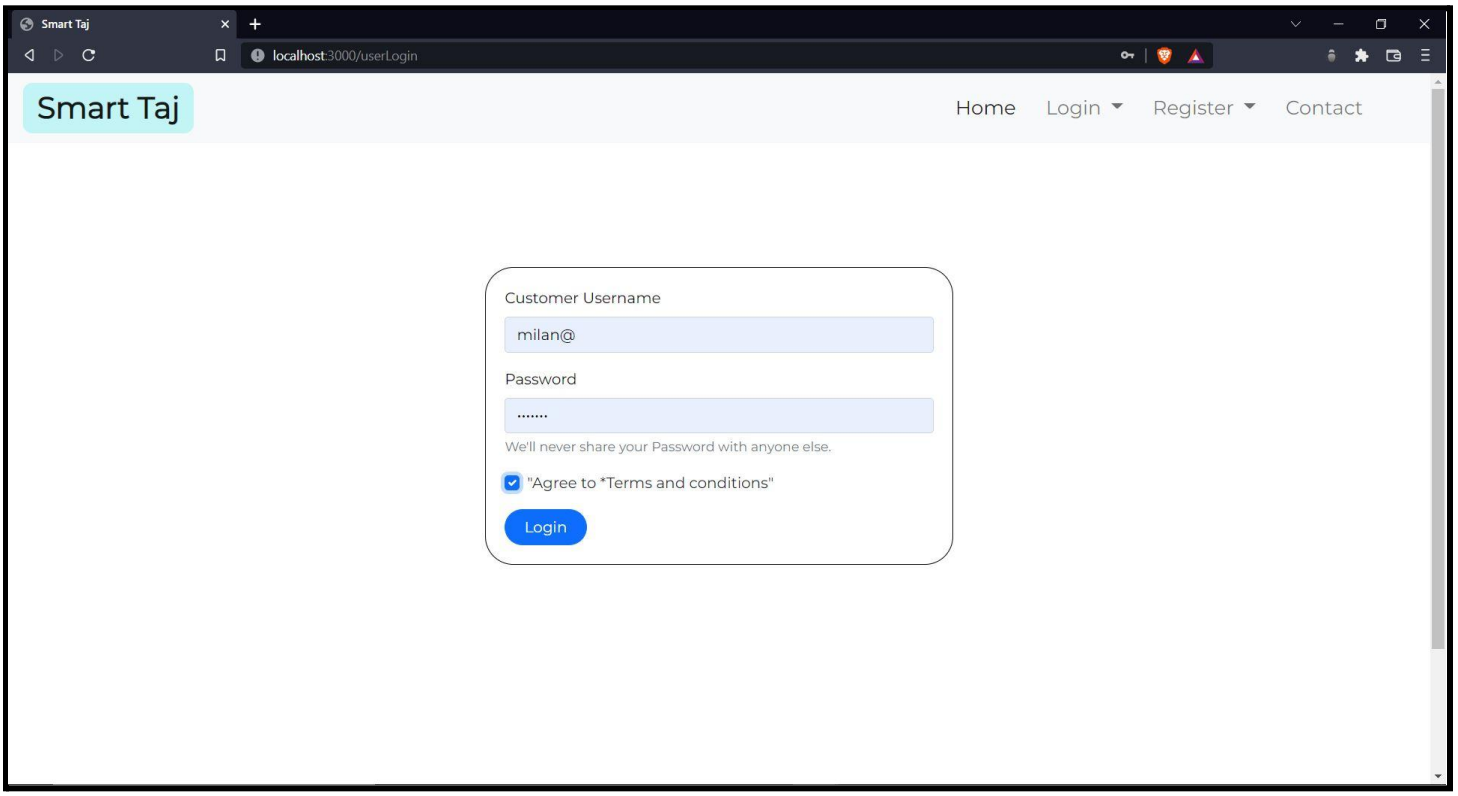
15.7 Interaction Overview Diagram

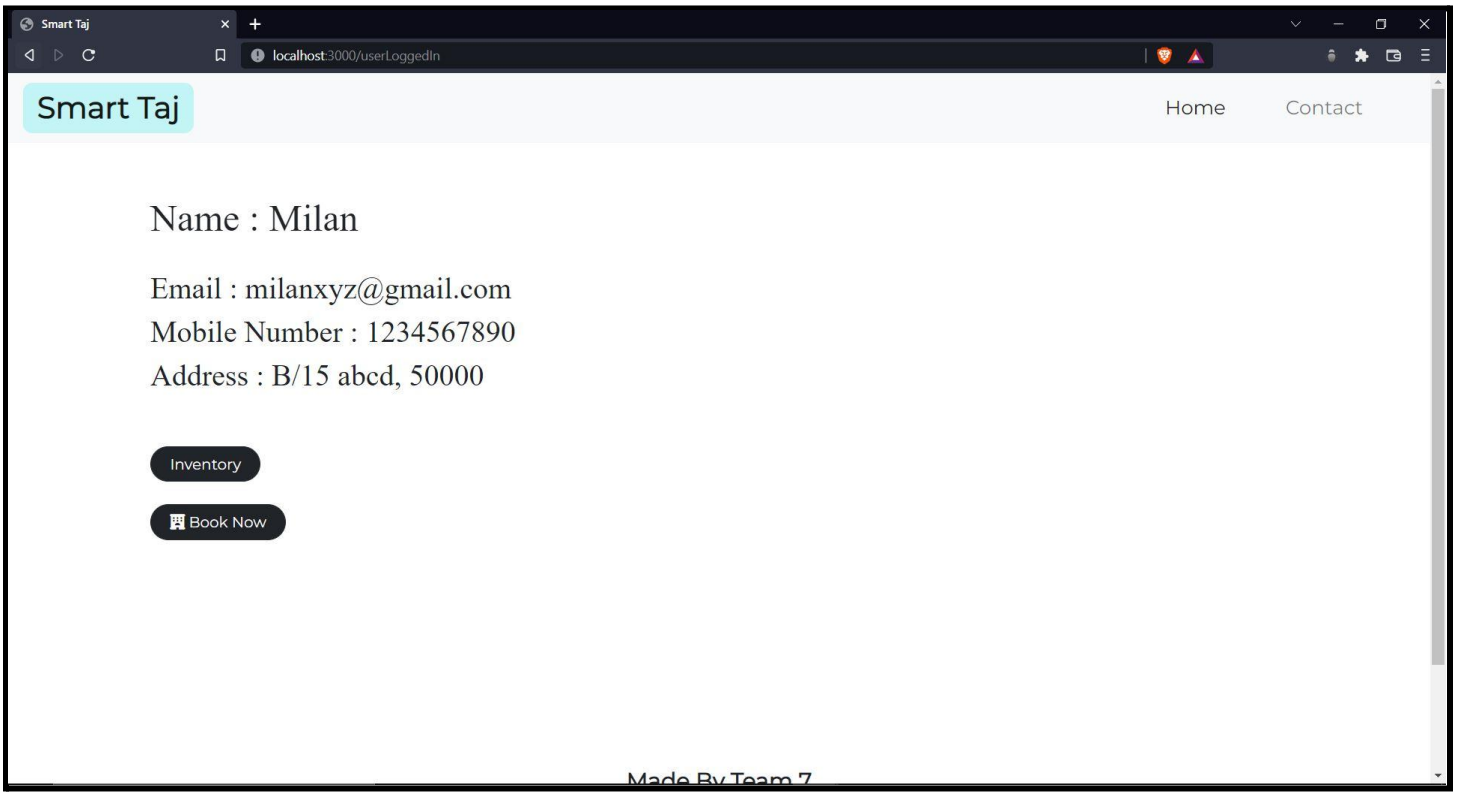


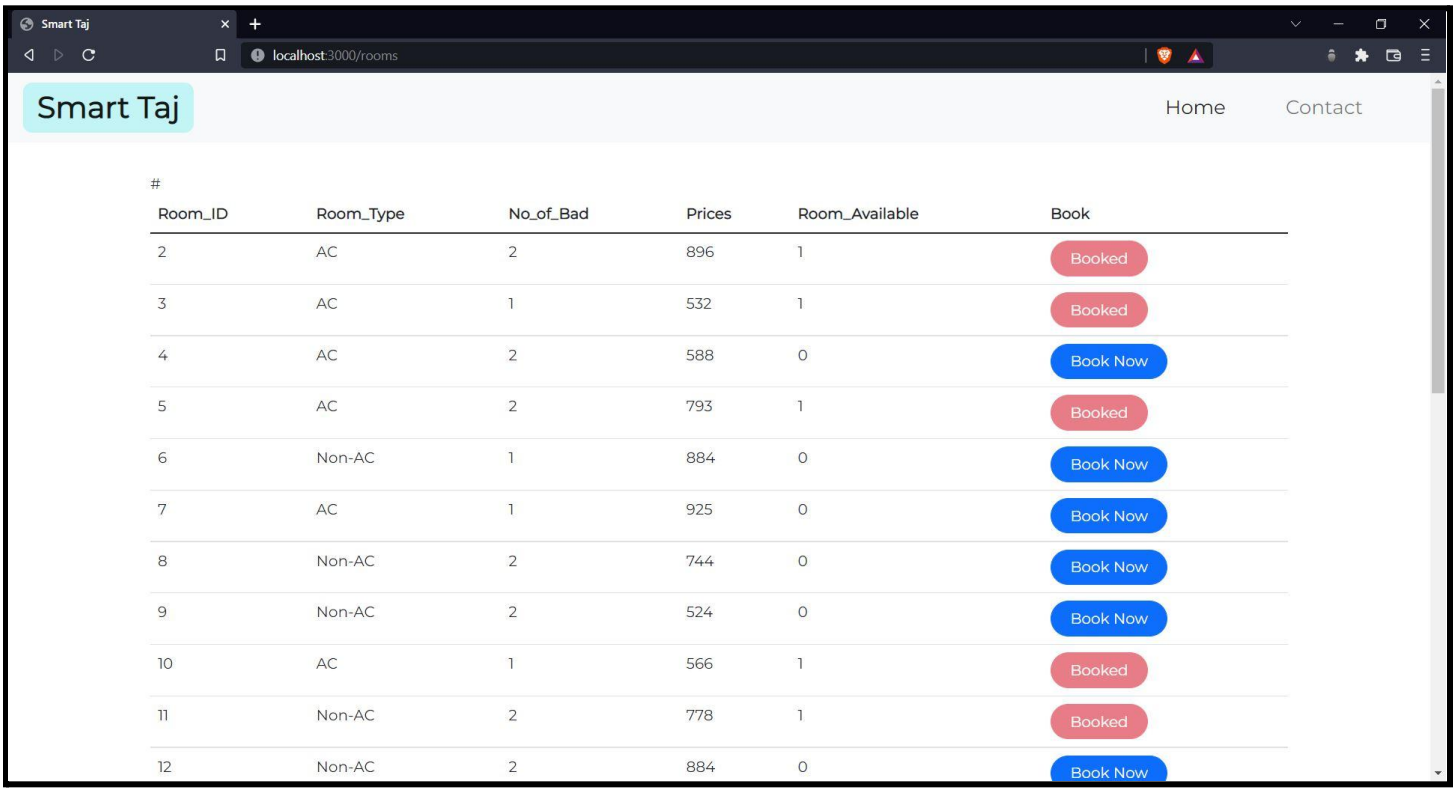
16 UI/UX design

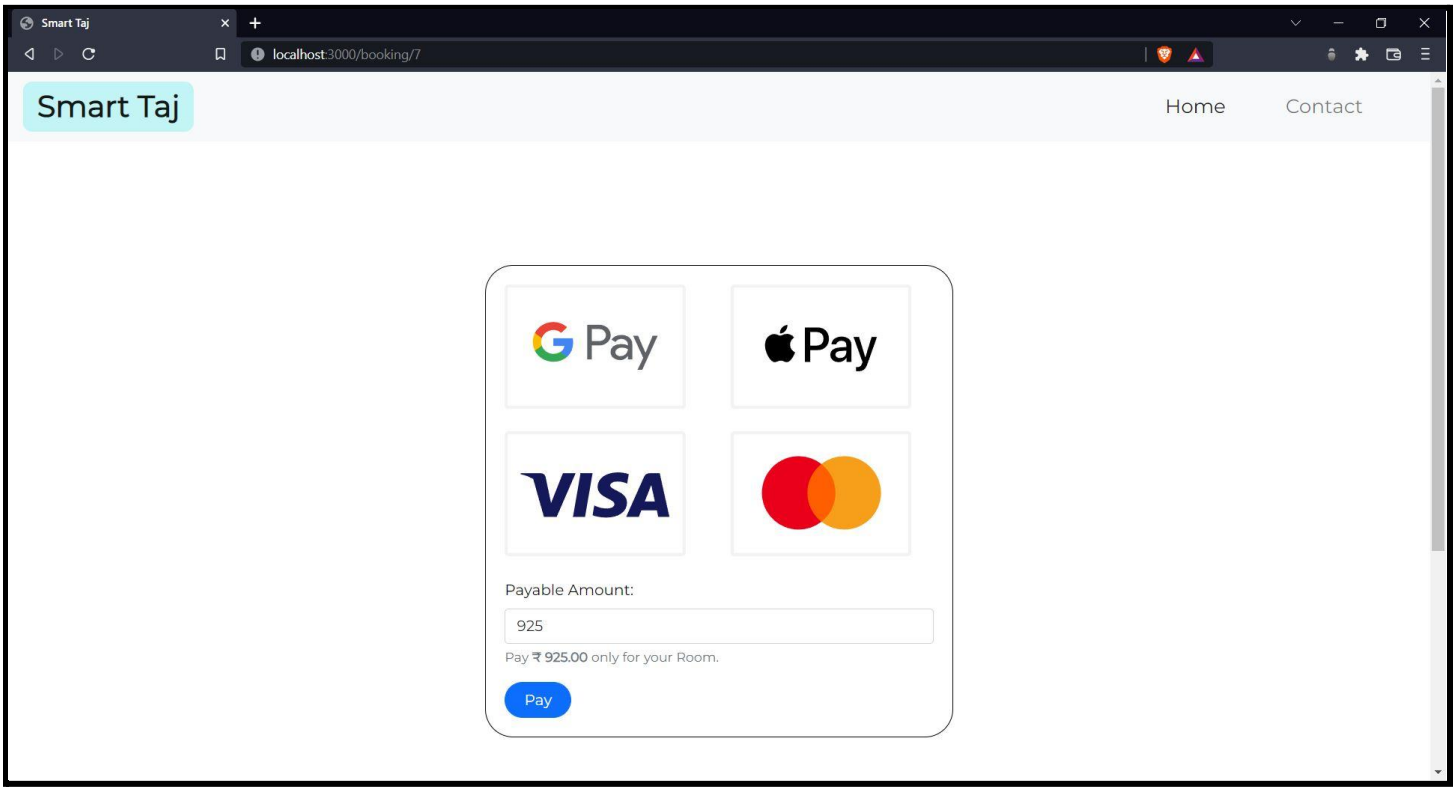





Smart Taj
localhost:3000/userLogin
Smart Taj
Home
Login
Register
Contact
Customer Username
milan@
Password
.....
We'll never share your Password with anyone else.
"Agree to *Terms and conditions"
Login


Smart Taj
localhost:3000/userLoggedIn
Smart Taj
Home
Contact
Name : Milan
Email : milanxyz@gmail.com
Mobile Number : 1234567890
Address : B/15 abcd, 50000
Inventory
Book Now
Made By Team 7


Smart Taj
localhost:3000/rooms
Smart Taj
Home
Contact
#
Room_ID Room_Type No_of_Bad Prices Room_Available Book
2 AC 2 896 1 Booked
3 AC 1 532 1 Booked
4 AC 2 588 0 Book Now
5 AC 2 793 1 Booked
6 Non-AC 1 884 0 Book Now
7 AC 1 925 0 Book Now
8 Non-AC 2 744 0 Book Now
9 Non-AC 2 524 0 Book Now
10 AC 1 566 1 Booked
11 Non-AC 2 778 1 Booked
12 Non-AC 2 884 0 Book Now


Smart Taj
localhost:3000/booking/7
Smart Taj
Home
Contact
G Pay
Pay
VISA
Payable Amount:
925
Pay ₹ 925.00 only for your Room.
Pay

Smart Taj

localhost:3000/afterPaymentRoom/7

Smart Taj

Home Contact

You have Booked the Room with Room ID : 7 and it's AC Room.

Made By Team 7

Smart Taj

localhost:3000/inventory

Smart Taj

Home Contact

Tea ₹ 239

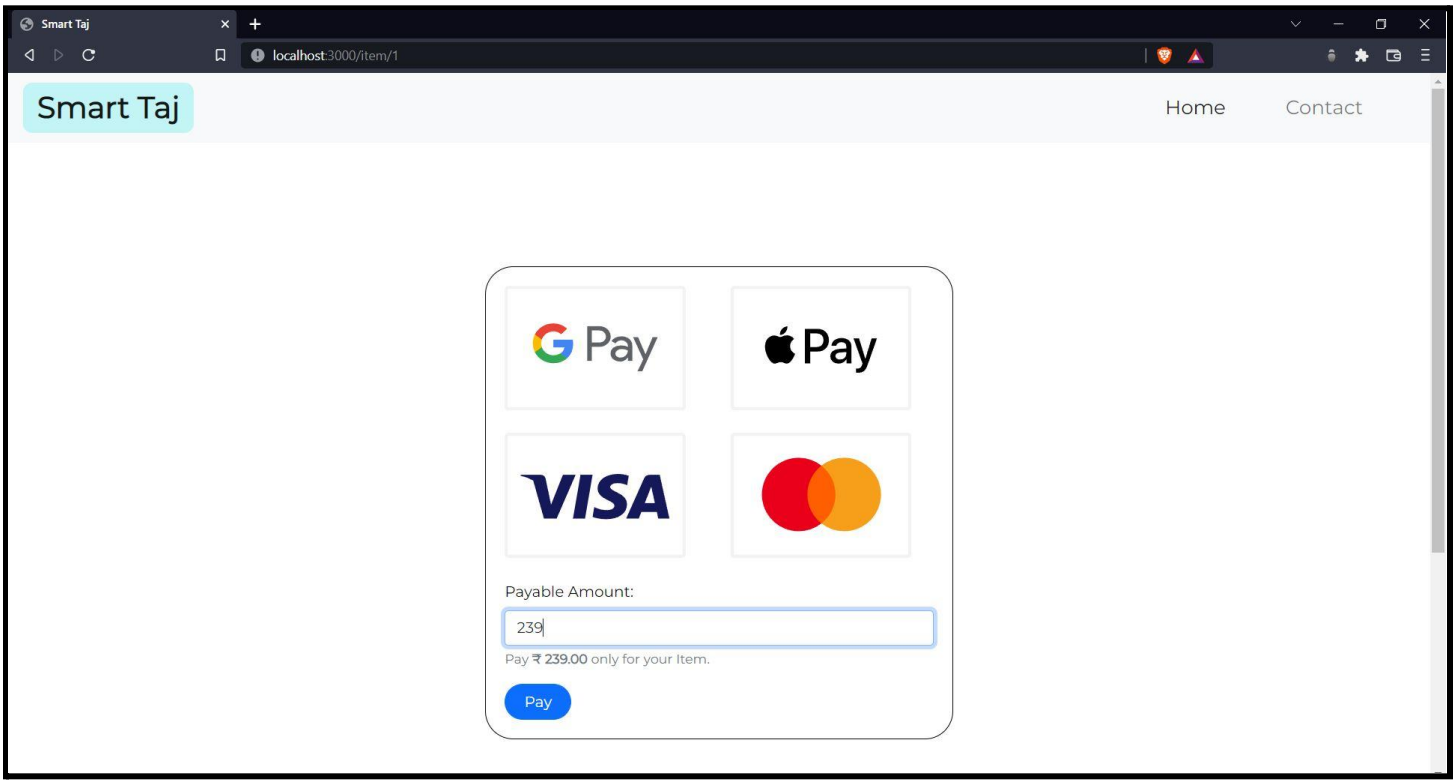
Biryani ₹ 464

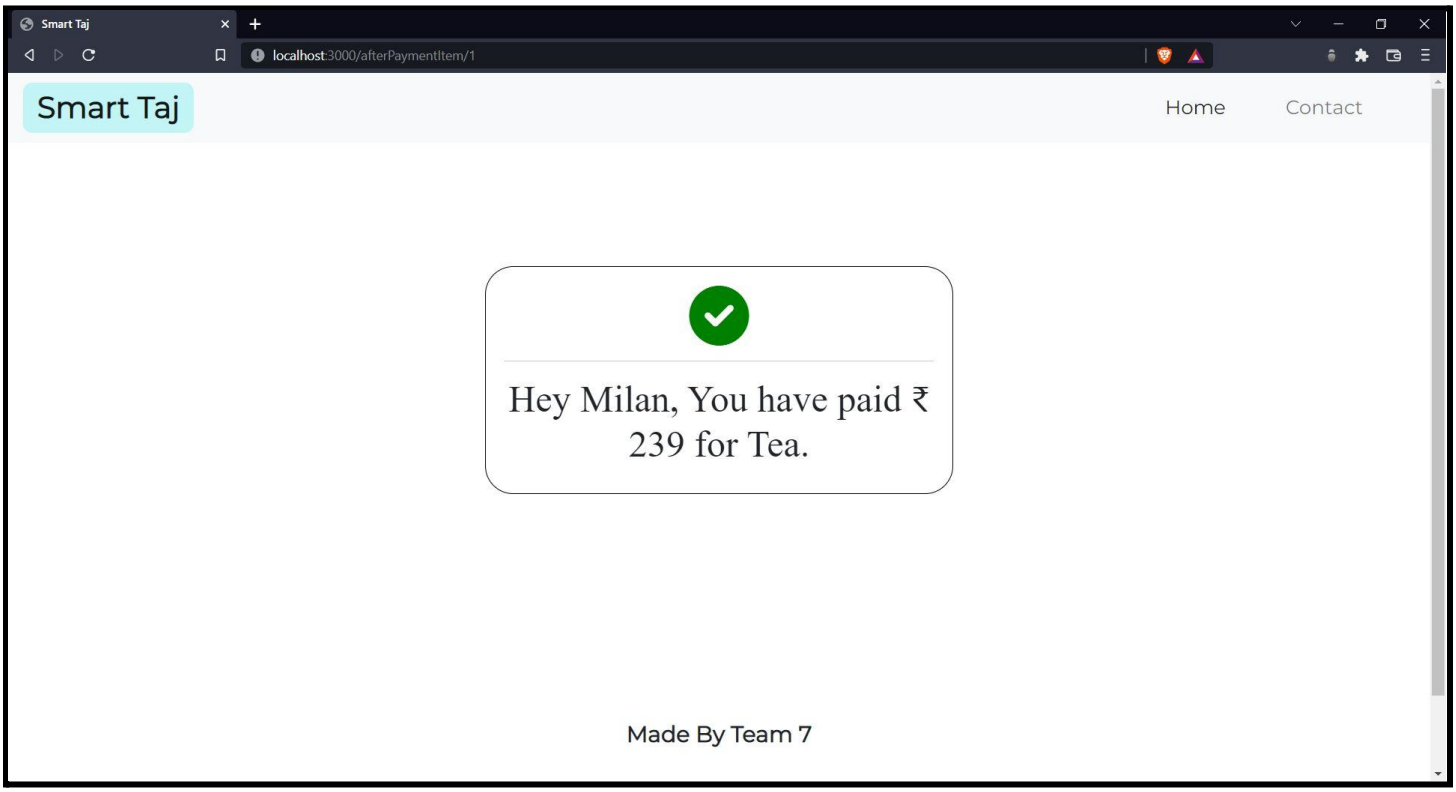
Smoked ₹ 651

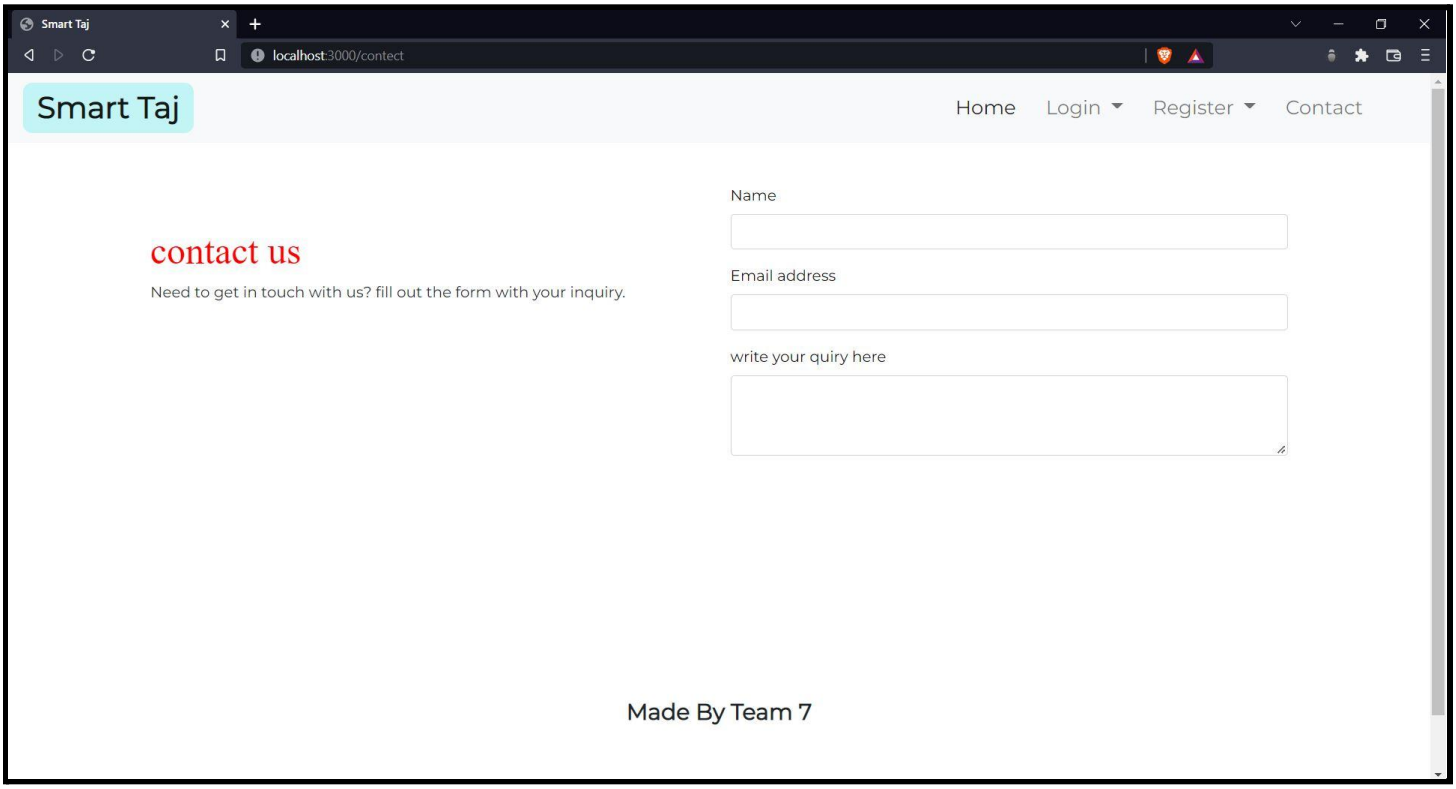
Taco ₹ 387

Pasta ₹ 271

Pizza ₹ 460


Smart Taj
localhost:3000/item/1
Smart Taj
Home
Contact
G Pay
Pay
VISA
Payable Amount:
239
Pay ₹ 239.00 only for your Item.
Pay


Smart Taj
localhost:3000/afterPaymentItem/1
Smart Taj
Home
Contact
Hey Milan, You have paid ₹ 239 for Tea.
Made By Team 7


Smart Taj
localhost:3000/contect
Smart Taj
Home
Login
Register
Contact
contact us
Need to get in touch with us? fill out the form with your inquiry.
Name
Email address
write your quiry here
Made By Team 7