Software Architecture Document

for Virtual Room Reservation Assistant

Version 2.0

2021.01.07

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Table of Contents

1. Introduction

1.1 Purpose

This document provides a comprehensive architectural overview of the system, using a number of different architectural views to depict different aspects of the system. It is intended to capture and convey the significant architectural decisions which have been made on the system.
We will introduce some of our functions in later chapters.

1.2 Scope

This document helps users to know more about our product, and can use this system more smoothly.

1.3 Definitions, Acronyms and Abbreviations

- IIS
  - IIS stands for Internet Information Server, it is an integrated interface for managing various computer network services on Microsoft Windows Server.

1.4 References

- Collegiate Sports Paging System - Software Architecture Document
- Conceptual, Logical and Physical Data Model
- Example: Software Architecture Document
- Software Architecture Document — NBDiff 1 documentation
- Wikipedia: Entity-control-boundary
- Architectural System for Room Reservation (Class Diagram (UML))

1.5 Overview

There are some sections included in this document, some are more important, such as Architectural Goals and Constraints, Use-case views, Logical view, and Process view. These sections help users to understand more about how our system works, and shows the structure of our system to the users.

2. Architectural Representation

This document presents the architectural as a series of views; use case view, process view, deployment view, and implementation view. There will be more detailed introductions and of our system in later chapters.

3. Architectural Goals and Constraints

The following are the four key requirements that have an important impact on system structure and safety:

1. The functions of this system need to be logged in through a google account.
2. This system provides the function of querying certain data, so the interface of the system must be able to bear a certain amount of flow.
3. Must ensure the security of all the customer account's privacy.
4. When developing the system structure, the load and performance requirements of the system must be considered.

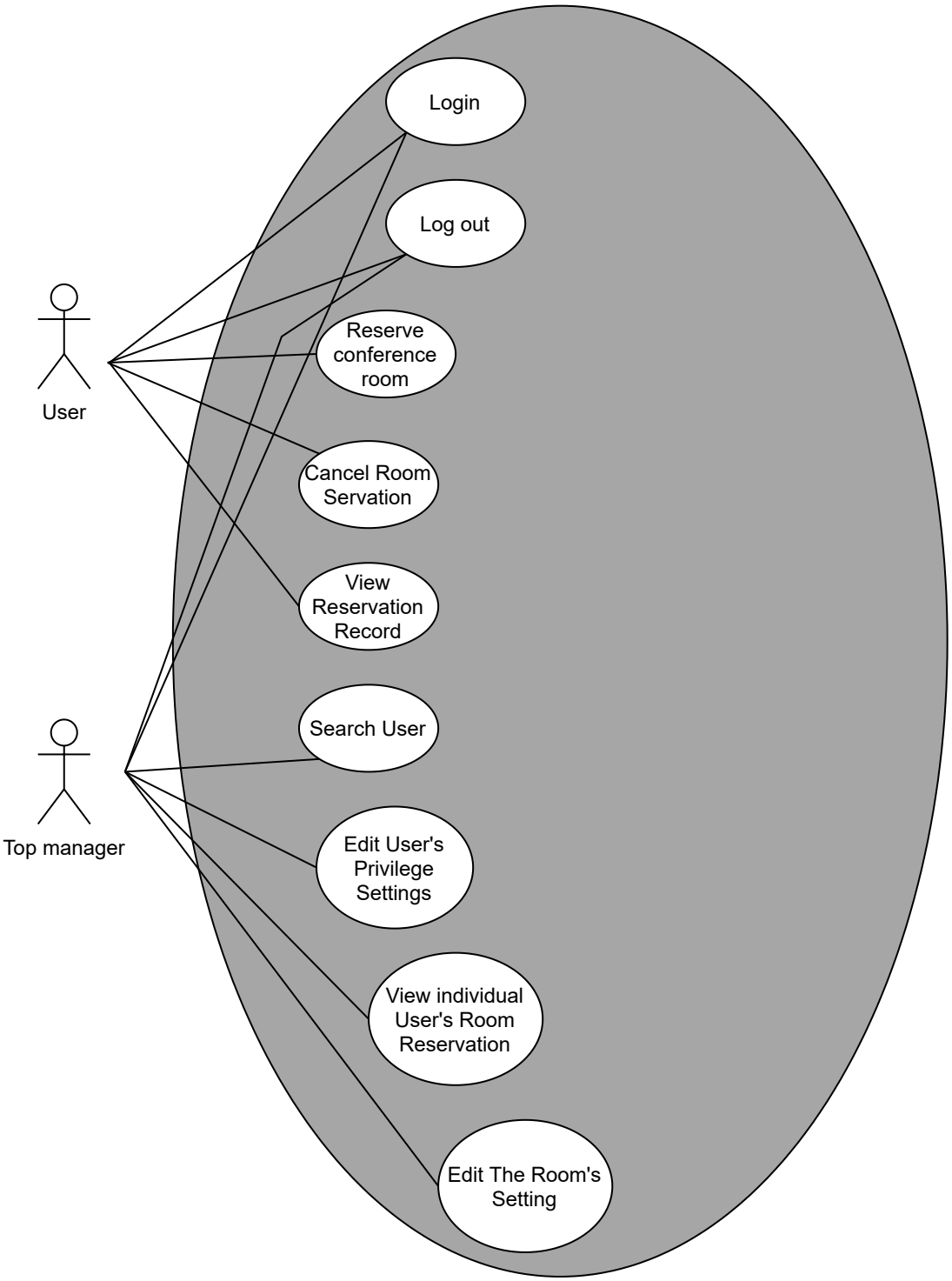
4. Use-Case View

This section lists the use cases which means significantly of our final system.
The reservation System use cases are:

- User Login
- Manager Login
- Log out
- User Reserve Conference Room
- User Views Reserving Record
- User Cancels Room Reservation
- Maintain Reservation Information
- Maintain Reservation Record
- Maintain User Privileges

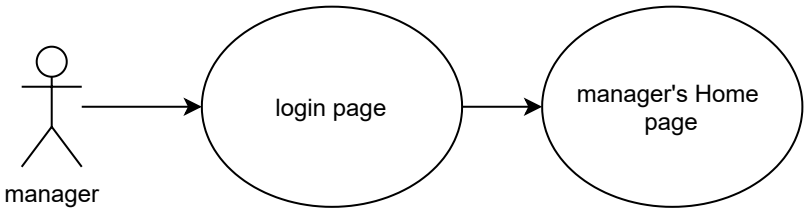
4.1 Use-Case Realizations

This section illustrates how the reservation system actually works by giving a few selected use-case realizations, and explains how the various design model elements contribute to their functionality.

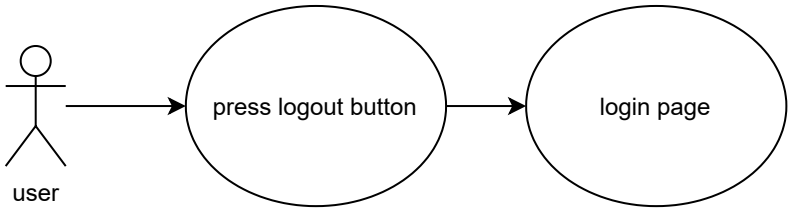


No.	Actor	Description
1	User	A person who need to reserve a room
2	Top Manager	A manager who manages the overall room setting, user privileges and both user's and room's information

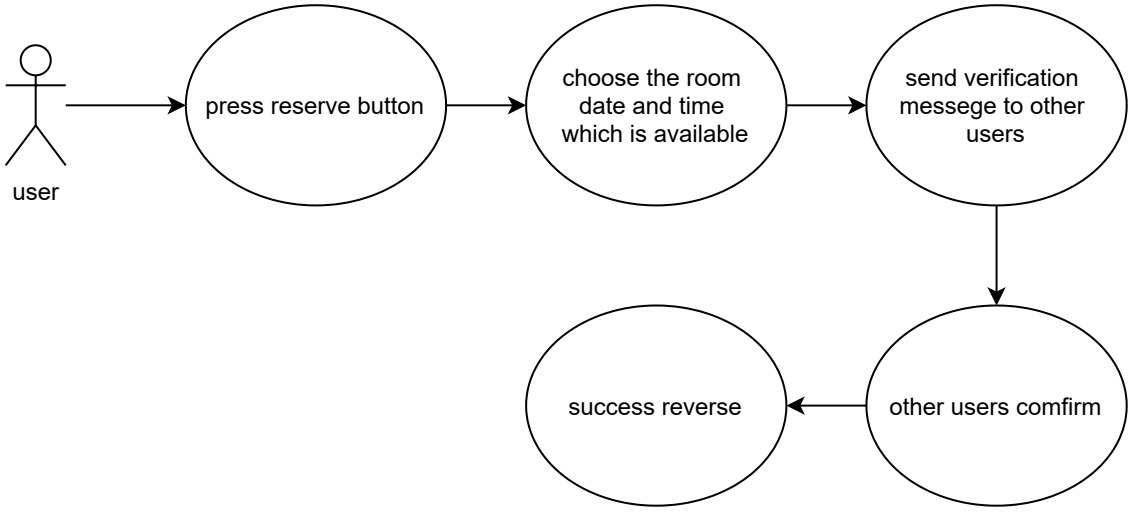
User Login



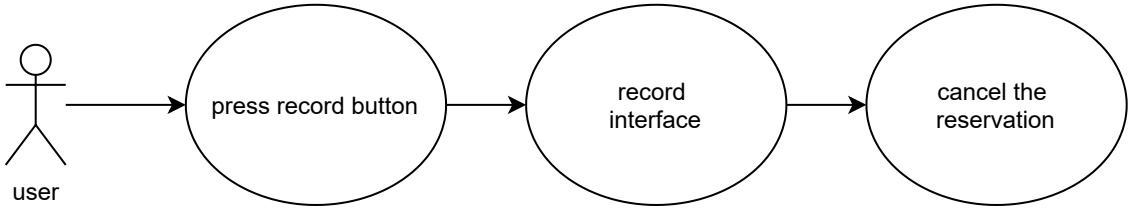
User Log out



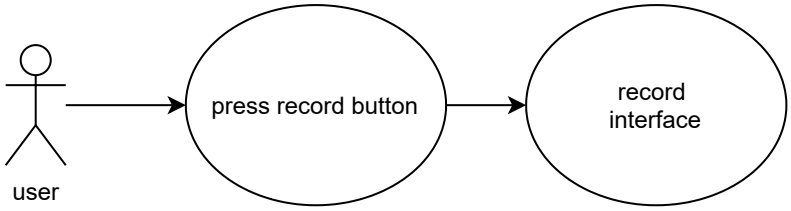
User Reserves Conference Room



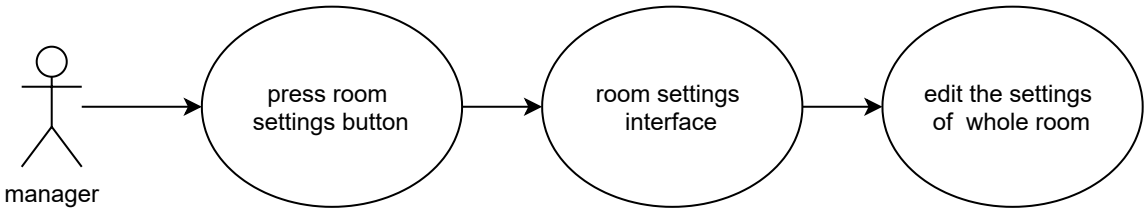
User Cancel Room Reservation

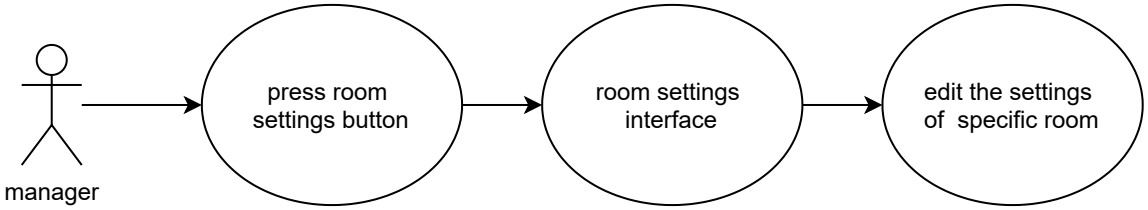


User Views Reserving Record

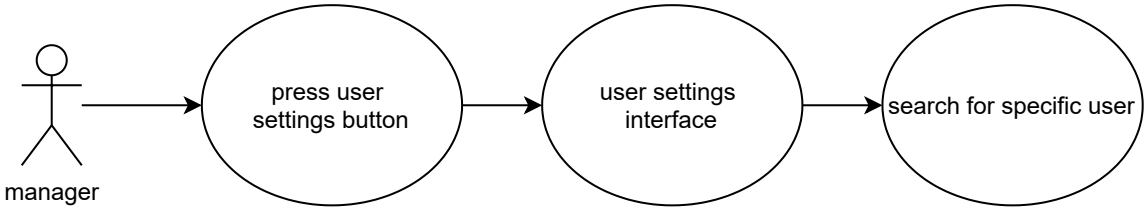


Manager Edits The Room's Overall Settings

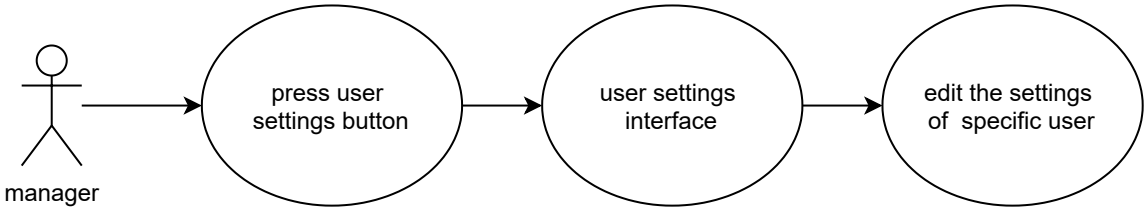




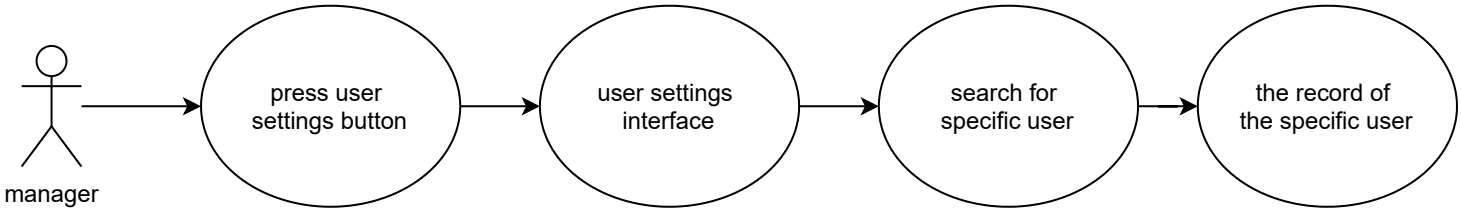
Manager Search users



Manager Edits User's Privilges Settings



Manager views individual user's room reservation record



5. Logical View

5.1 Overview

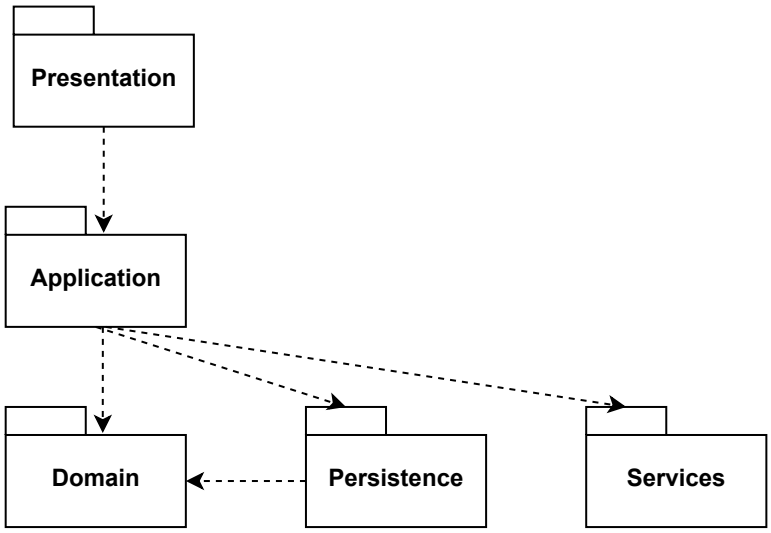
This section is for our system logic view. It describes the categories used in the system. It will also be divided into several packages, and describes the relationship and organization between the packages. It also contains the practical process of important use cases, and allows you to understand the relationship between the system's subsystems, packages and layers.

5.2 Architecturally Significant Design Packages

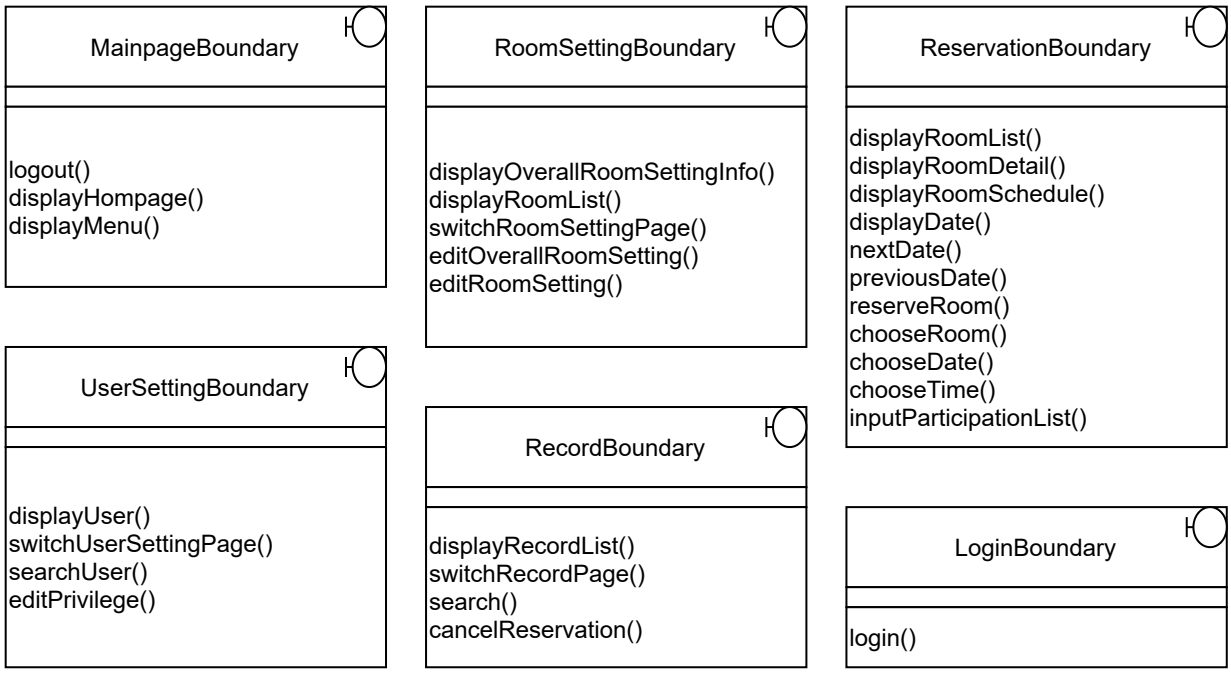
Our system mainly contains 5 main software packages, they are, respectively:

1. Presentation
    - This package introduces the main structure of the communication between the user and the system, including various boundaries, and provides users with functions such as displaying pages, changing settings, searching for information, reserving, etc.
2. Application
    - This package is mainly for the functions and architecture of the system's internal operations, including various controllers, providing the system to obtain data, create new data, send data to Google Calendar, update, disable or enable reservations and other functions.
3. Domain
    - Including some room packages, reservation packages, account packages, reservation center packages.
4. Persistence
    - Including the specific categories reserved by the system, in our design, only room data can be kept by the database.
5. Services
    - Contains the categories used for system maintenance. Currently all of our maintenance is manual.

Logical View

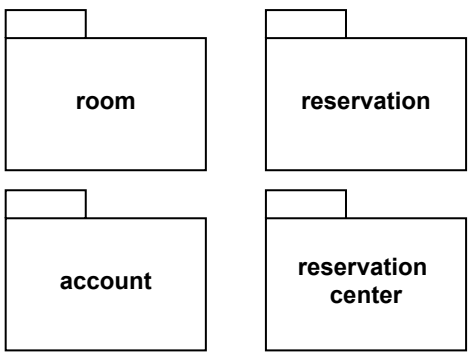


Presentation Package

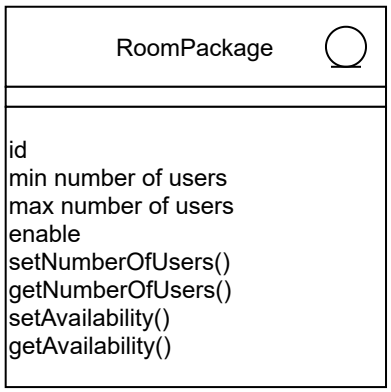


Application Package

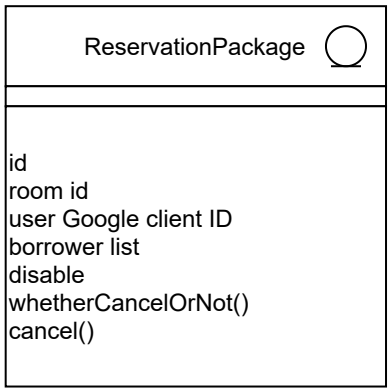
Domain Package



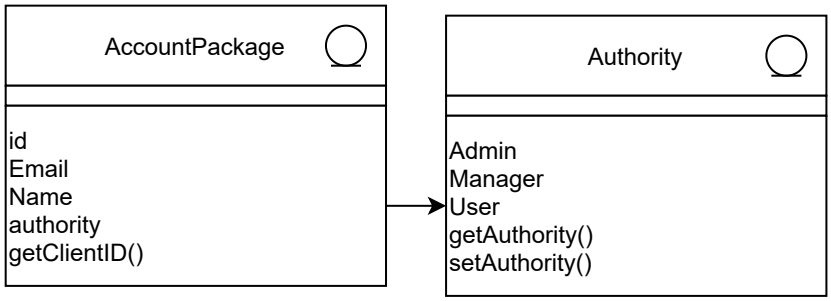
Room package



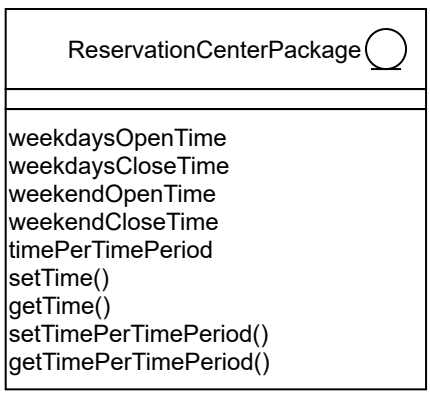
Reservation package



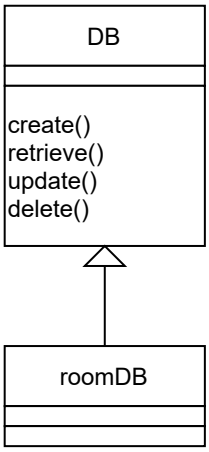
Account package



Reservation Center package

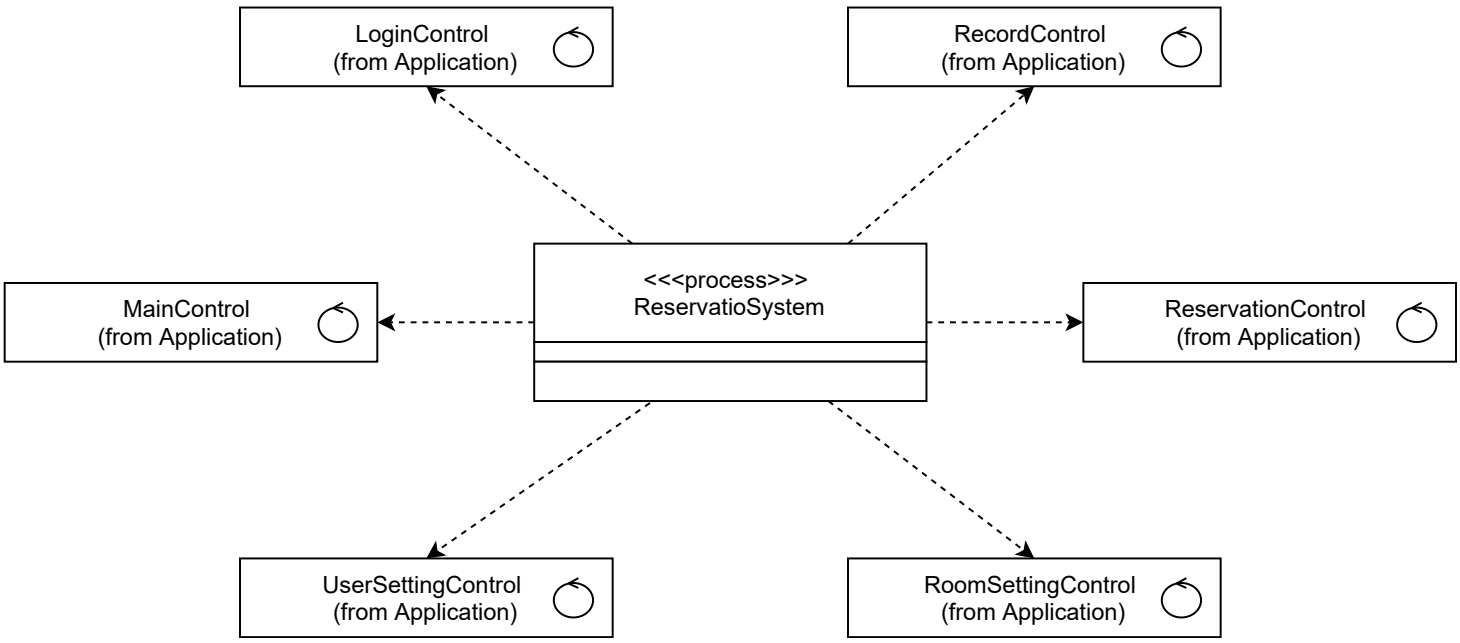


Persistence



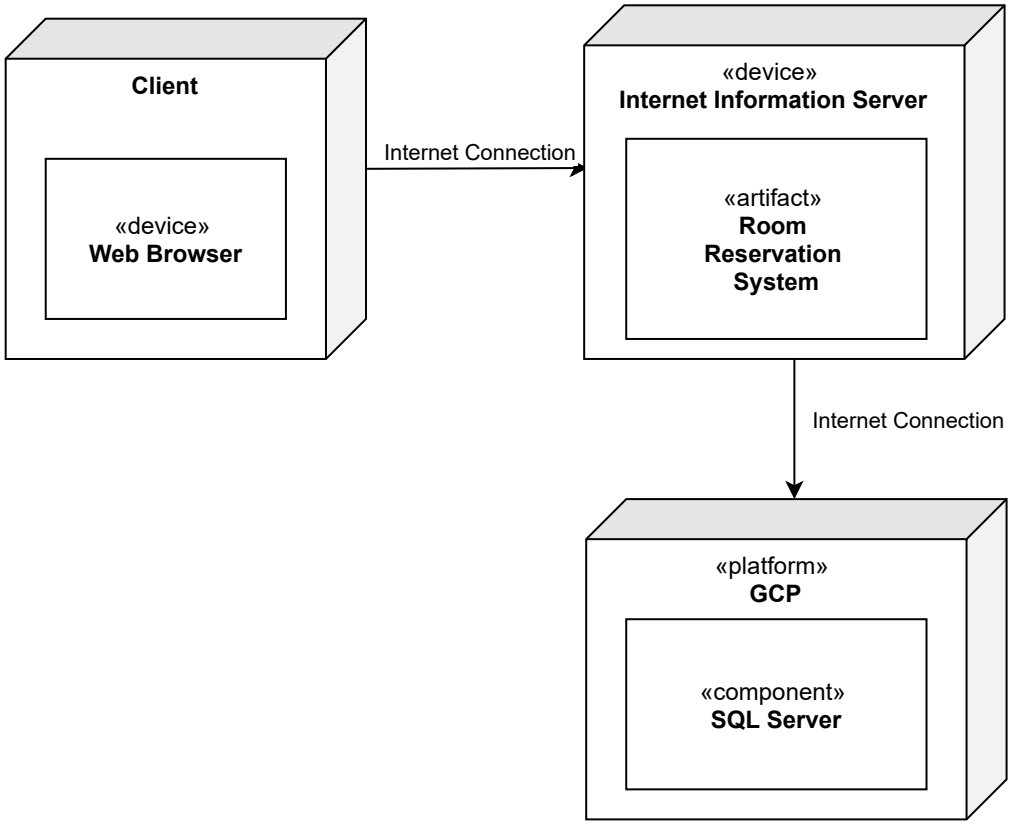
6. Process View

This chapter mainly divides the processes into lightweight process (single threads of control) and heavyweight process (groupings of lightweight processes). Then they are classified and organized through the process of data connection or interaction, such as transmission, interruption and collection.
In terms of design, all application functions provided by our reservation system can be shown in the flowchart below. (Please refer to Application Package for application functions)



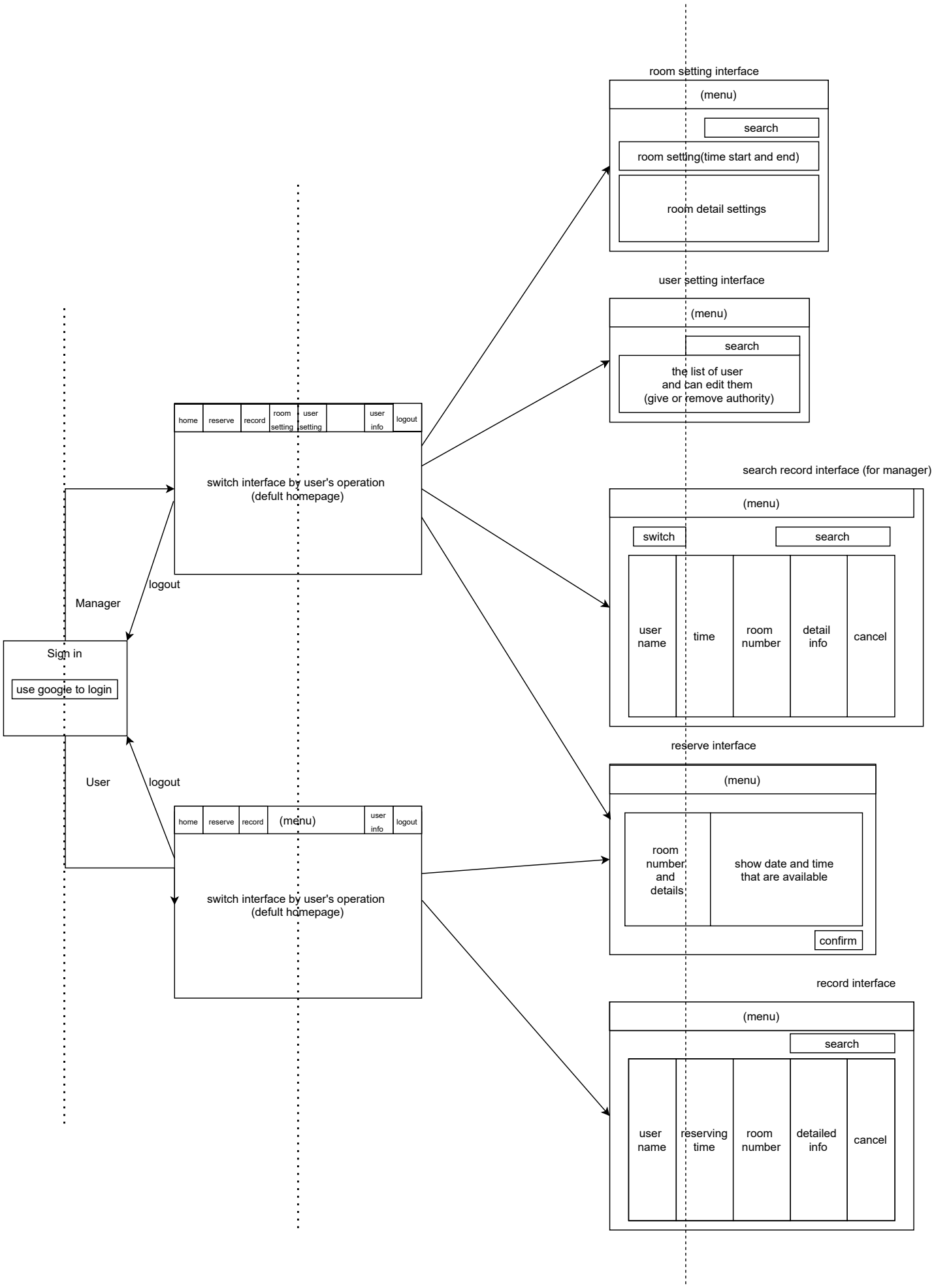
7. Deployment View

The Client machine is any device capable of running a Web browser (most likely a PC, but not necessarily), and it is connected to the Internet Information Server. SQL is the database we use.



8. Implementation View

8.1 Overview


room setting interface
(menu)
search
room setting(time start and end)
room detail settings
user setting interface
(menu)
search
the list of user
and can edit them
(give or remove authority)
home
reserve
record
room setting
user setting
user info
logout
switch interface by user's operation
(defult homepage)
search record interface (for manager)
(menu)
switch
search
user name
time
room number
detail info
cancel
logout
Manager
Sign in
use google to login
User
logout
reserve interface
(menu)
room number and details
show date and time that are available
confirm
home
reserve
record
(menu)
user info
logout
switch interface by user's operation
(defult homepage)
record interface
(menu)
search
user name
reserving time
room number
detailed info
cancel

This is the overview of our system, there are three major layers:

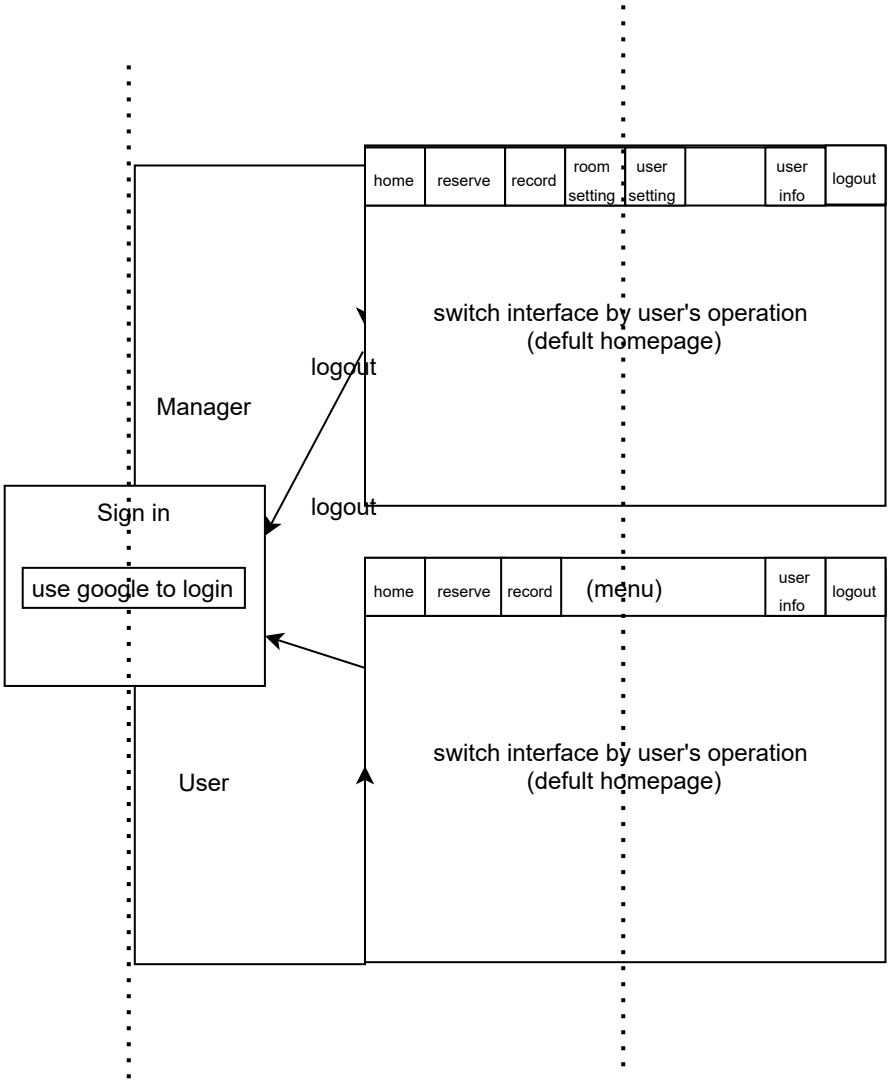
1. Sign in
2. Get Identity (User or Manager)
3. Functions

At first, the user enters the login page and log in to the system, the system will identify the user's ID, and display the user or manager's homapage. Then ,the user can choose which function to use.

8.2 Layers

Sign in

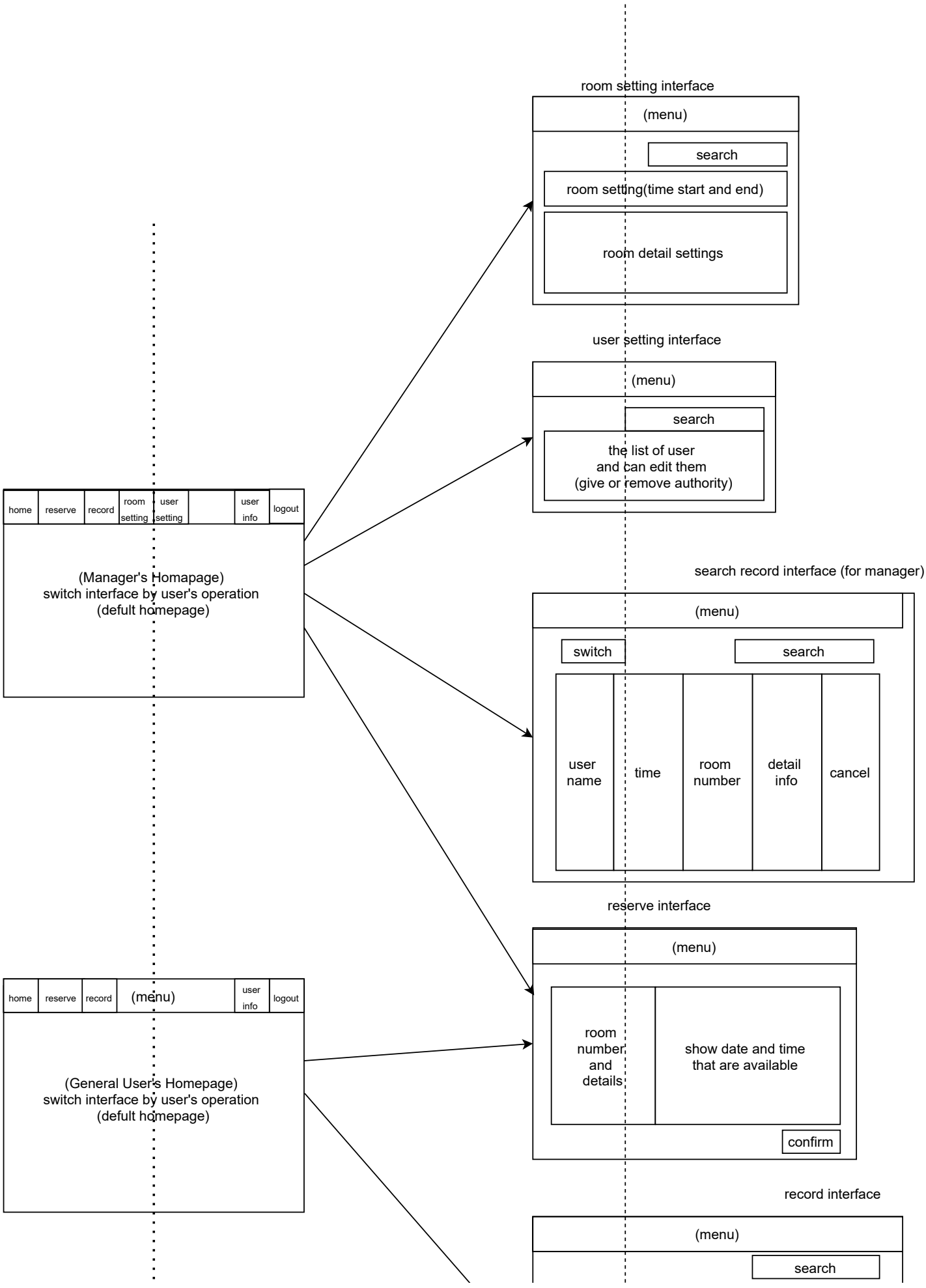
The subsystems include the user's homepage and manager's homapage.
After entering the homepage, the user could make different operations.



Get Identity(User or Manager)

After entering the homepage, user can choose to operate the function they want.
If you are an general user, you can choose whether to reserve a room or to see your reservation records.

If you are a manager of the system, you can choose to go to the room setting interface, user setting interface, or to the recording interface. As a user, you can also go to the reservation page to reserve a room.


room setting interface
(menu)
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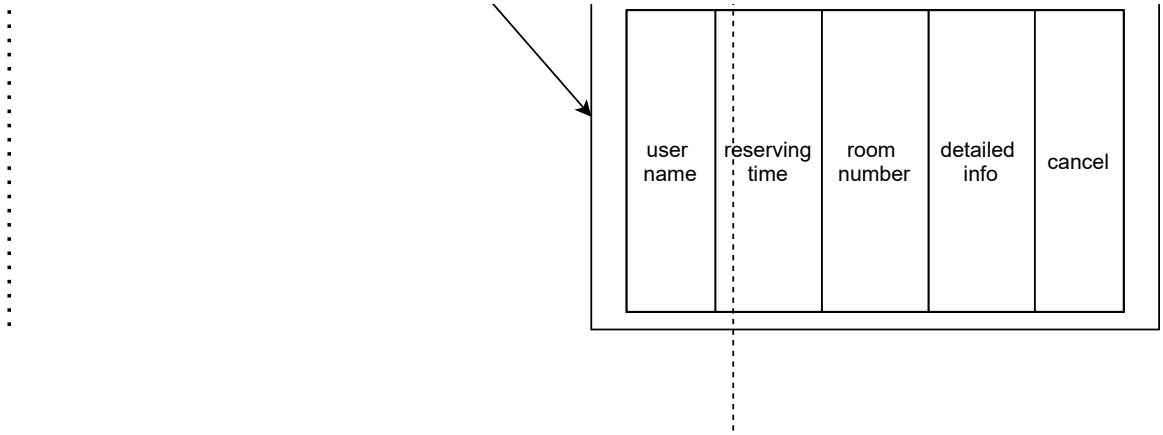
home
reserve
record
room setting
user setting
user info
logout
(Manager's Homapage)
switch interface by user's operation
(defult homepage)
search record interface (for manager)
(menu)
switch
search
user name
time
room number
detail info
cancel
reserve interface
(menu)
room number and details
show date and time that are available
confirm
home
reserve
record
(menu)
user info
logout
(General User's Homepage)
switch interface by user's operation
(defult homepage)
record interface
(menu)
search

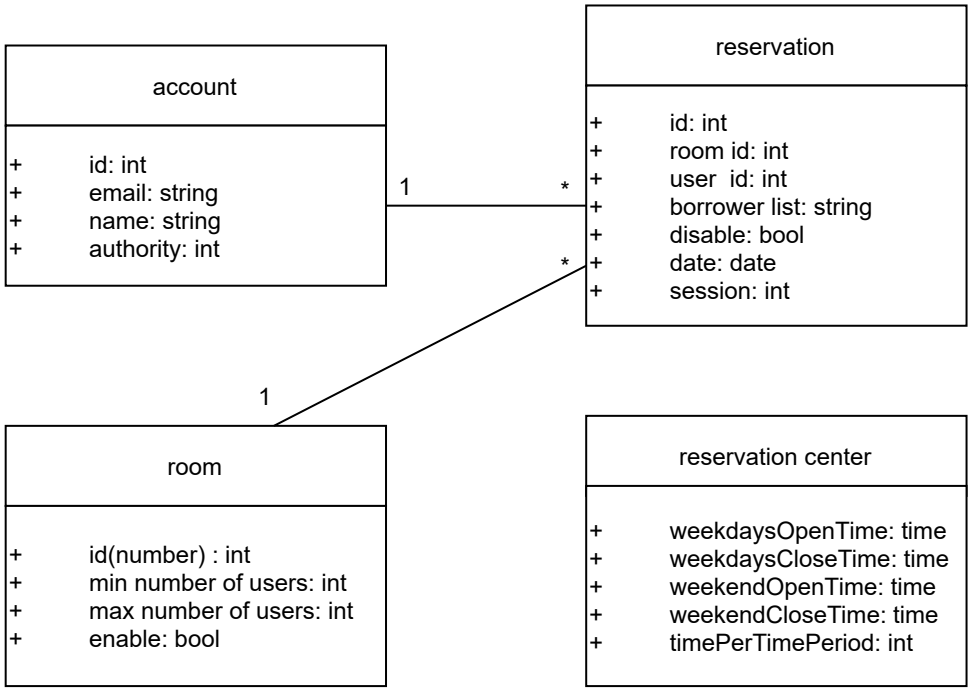


Functions

When getting into the function part, user can complete in operating the functions.

9. Data View

This section is the description of the persistent data storage of the system. It implemented the attridutes and the logic of the data storage.



10. Size and Performance

The software as designed will support 1,000 concurrent users, due to lack of conference rooms for users to reserve.

11. Quality

The software as described above is built by IIS, SQL server database, and provides a self-describing user interface.