**D. Report No. 4 Software Design Description**

**1. Design Overview**

- *This document describes the technical and user interface design of Hospital Portal System. It includes the architectural design, the detailed design of common functions and business functions and the design of database model.*

*- The architectural design describes the overall architecture of the system and the architecture of each main component and subsystem.*

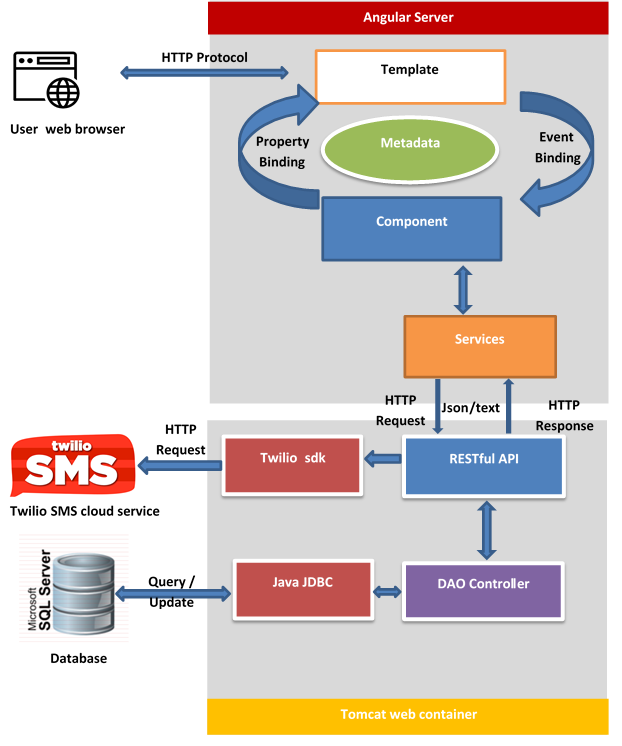
*- The detailed design describes static and dynamic structure for each component and functions. It includes class diagrams, class explanations and sequence diagrams for each use cases.*

*- The database design describes the relationships between entities and details of each entity.*

*- Document overview:*

* *Section 2: gives an overall description of the system architecture design.*
* *Section 3: gives component diagrams that describe the connection and integration of the system.*
* *Section 4: gives the detail design description which includes class diagram, class explanation, and sequence diagram to details the application functions.*
* *Section 5: describe screens design.*
* *Section 6: describe a fully attributed ERD.*
* *Section 7: describe algorithms.*

**2. System Architectural Design**

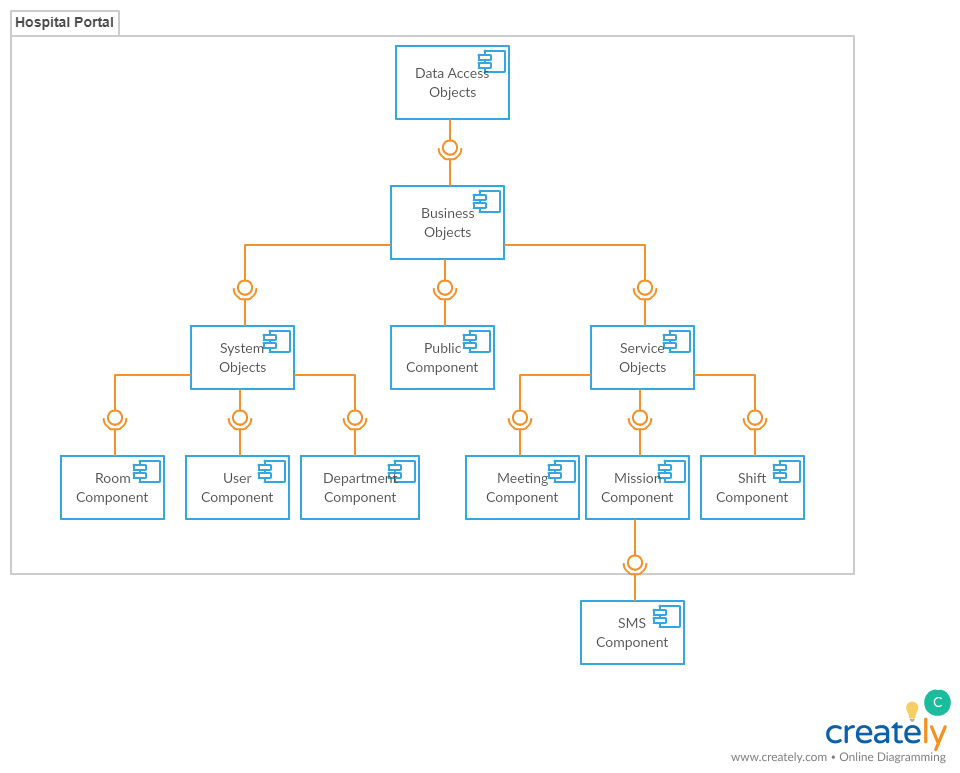
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**Figure 9 System architecture design**

**2.1 Web application architecture description:**

In Web Application, the system was built based on MVC, while the front end and back end are separated and communicate using the HTTP protocol. With Modal and Controller at the back end and View at front end. We chose a separate structure because of the following advantages:

* Back end to support J2EE compatible MVC and REST API JDBC structure and easy use familiar.
* Front end with Angular 5, support for binding data, one page design, and compatible modules on the mobile interface.
* Separating the controller and model from the view will facilitate future multi-interface and multi-language application development.
* Due to the unique nature of the hospital, the database will sometimes have to be stored locally at the hospital. Separating two servers will ensure that the hosting server on cloud still meets the requirements.
* Technology is selected based on the skill and experience of the developer team.

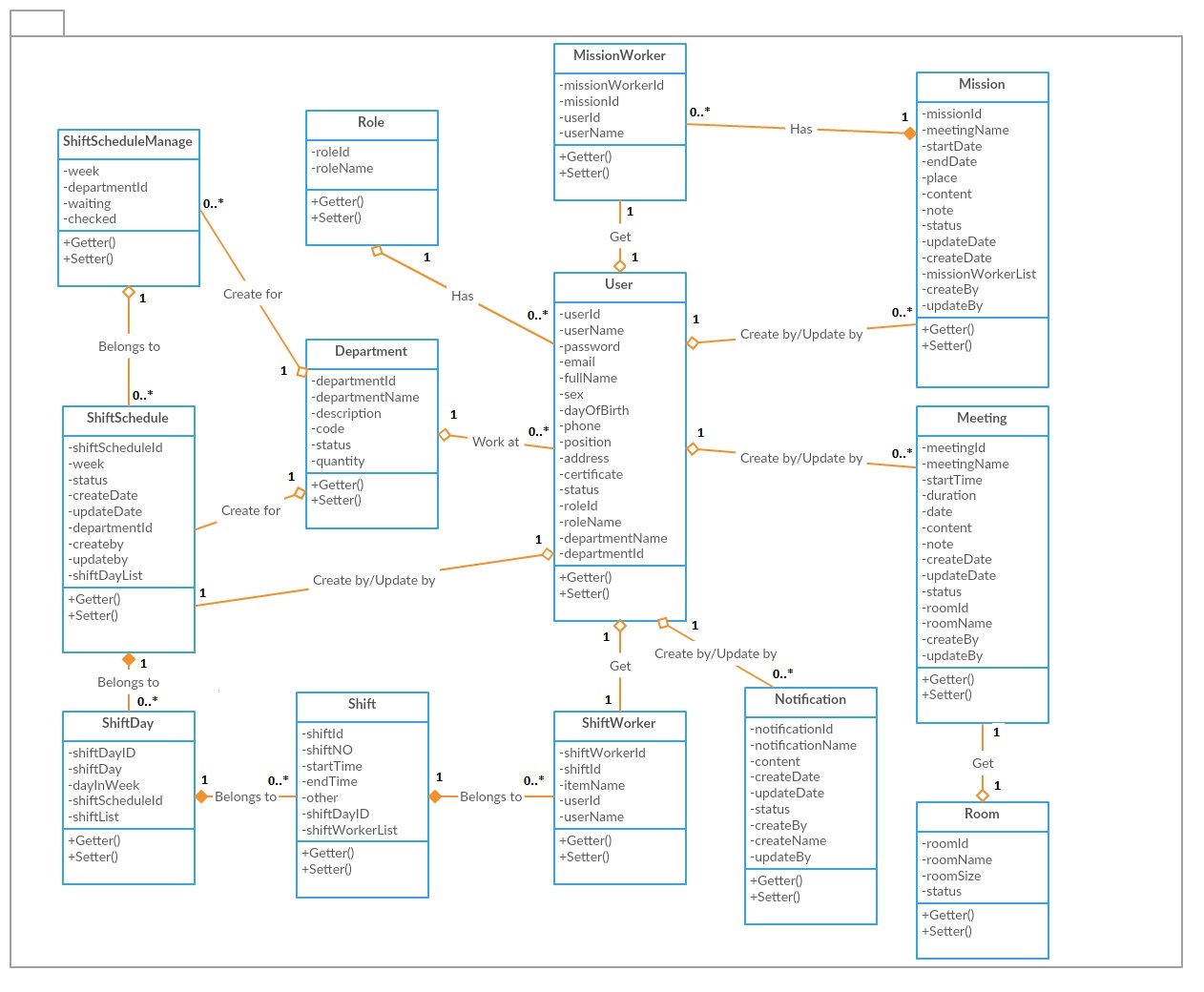
**3. Component Diagram**

**Figure 10 Component Diagram**

**Table 10 Component Dictionary**

|  |  |
| --- | --- |
| Component Dictionary: Describes components | |
| Data Access Objects | Component to handle interaction between the system and database |
| Business Objects | Common objects to handle domain business operations for each component |
| System Objects | Common objects to handle domain operations for each system component |
| Public Component | Component to handle guest activities in the system |
| Service Objects | Common objects to handle domain operations for each service component |
| Room Component | Component to handle room resource in the system |
| User Component | Component to handle account in the system |
| Department Component | Component to handle department in the system |
| Meeting Component | Component to handle meeting scheduler in the system |
| Mission Component | Component to handle mission scheduler in the system |
| Shift Component | Component to handle shift scheduler in the system |
| SMS Component | Handle SMS process with Twilio SMS API |

**4. Detailed Description**

**4.1 Class Diagram**

**Figure 11 Class Diagram**

|  |  |
| --- | --- |
| *Class dictionary: describe Class* | |
| **Class Name** | **Description** |
| Department | Contain the department information |
| User | Contain the user information |
| Meeting | Contain the meeting information |
| Mission | Contain the mission information |
| Room | Contain the room information |
| Notification | Contain the notification information |
| Mission worker | Contain the mission worker information |
| Shift worker | Contain the shift worker information |
| Role | Contain the role information |
| Shift | Contain the shift information |
| Shift schedule manage | Contain the shift schedule manage information |
| Shift schedule | Contain the shift schedule information |
| Shift day | Contain the shift day information |

Table 11: Class dictionary

**4.2 Class Diagram Explanation**

***4.2.1 Role***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| RoleId | int | Private | Unique identifier of a role |
| RoleName | string | Private | Role name |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.2 Department***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| DepartmentId | int | Private | Unique identifier of a department |
| DepartmentName | string | Private | Department name |
| Description | string | Private | Description of department |
| Status | int | Private | Status of department |
| Code | string | Private | Code of department |
| Quantity | int | Private | Number of employee in department |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.3 User***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| UserId | int | Private | Unique identifier of a user |
| UserName | string | Private | Username |
| Password | string | Private | Password of user |
| Email | string | Private | Email of user |
| FullName | String | Private | Full name of user |
| Sex | int | Private | Sex of user |
| DayOfBirth | date | Private | Day Of Birth of user |
| Phone | string | Private | Phone of user |
| Position | string | Private | Position of user |
| Address | string | Private | Address of user |
| Certificate | string | Private | Certificate of user |
| Status | int | Private | Status of user |
| RoleId | int | Private | RoleId of user |
| RoleName | string | Private | Role name of user |
| DepartmentName | string | Private | Department name of user |
| DepartmentId | int | Private | DepartmentId of user |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.4 Shift schedule manage***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| Week | string | Private | Unique identifier of Shift schedule manage |
| DepartmentId | int | Private | DepartmentId of Shift schedule manage |
| Waiting | int | Private | Waiting status |
| Checked | int | Private | Checked status |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.5 Shift schedule***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| ShiftScheduleId | int | Private | Unique identifier of Shift schedule |
| Week | int | Private | Week of Shift schedule |
| Status | int | Private | Status of Shift schedule |
| CreateDate | datetime | Private | Create date of Shift schedule |
| UpdateDate | datetime | Private | Update date of Shift schedule |
| DepartmentId | int | Private | DepartmentId of Shift schedule |
| CreateBy | int | Private | Create by |
| UpdateBy | int | Private | Update by |
| ShiftDayList | list (ShiftDay) | Private | Shift day list |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.6 Shift day***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| ShiftDayId | int | Private | Unique identifier of Shift day |
| ShiftDay | string | Private | Shift day |
| DayInWeek | string | Private | Day in week |
| ShiftScheduleId | int | Private | Shift schedule Id |
| ShiftList | list (Shift) | Private | Shift list |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.7 Shift***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| ShiftId | int | Private | Unique identifier of shift |
| ShiftNo | int | Private | Shift no of shift |
| StartTime | time | Private | Start time of shift |
| EndTime | time | Private | End time of shift |
| Other | string | Private | Other |
| ShiftDayId | int | Private | Shift day Id |
| ShiftWorkerList | List (shift worker list) | Private | Shift worker list |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.8 ShiftWorker***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| ShiftWorkerId | int | Private | Unique identifier of shift worker |
| ShiftId | int | Private | Shift Id of shift worker |
| itemName | string | Private | Item name of shift worker |
| UserId | int | Private | UserId for shift worker |
| UserName | string | Private | Username for shift worker |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.9 MissionWorker***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| MissionWorkerId | int | Private | Unique identifier of mission worker |
| MissionId | int | Private | MissionId |
| UserId | int | Private | UserId for mission worker |
| UserName | string | Private | Username for mission worker |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.10 Mission***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| MissionId | int | Private | Unique identifier of mission |
| StartDate | date | Private | Start date of mission |
| EndDate | date | Private | End date of mission |
| Place | string | Private | Place of mission |
| Content | string | Private | Content of mission |
| Note | string | Private | Note of mission |
| Status | int | Private | Status of mission |
| UpdateDate | date | Private | Update date of mission |
| CreateDate | date | Private | Create date of mission |
| MissionWorkerList | List (MissionWorker) | Private | Mission worker list |
| CreateBy | int | Private | Create by |
| UpdateBy | int | Private | Update by |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.11 Meeting***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| MeetingId | int | Private | Unique identifier of meeting |
| MeetingName | string | Private | Meeting name |
| StartTime | time | Private | Start time of meeting |
| Duration | time | Private | Duration of meeting |
| Date | date | Private | Date of meeting |
| Content | string | Private | Content of meeting |
| Note | string | Private | Note of meeting |
| Status | int | Private | Status of meeting |
| UpdateDate | date | Private | Update date of meeting |
| CreateDate | date | Private | Create date of meeting |
| RoomId | int | Private | RoomId for meeting |
| RoomName | string | Private | Room name for meeting |
| CreateBy | int | Private | Create by |
| UpdateBy | int | Private | Update by |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.12 Notification***  
*Attribute*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| NotificationId | int | Private | Unique identifier of notification |
| NotificationName | string | Private | Notification name |
| Content | string | Private | Content of notification |
| Status | int | Private | Status of notification |
| UpdateDate | date | Private | Update date of notification |
| CreateDate | date | Private | Create date of notification |
| CreateBy | int | Private | Create by |
| CreateName | string | Private | Create name |
| UpdateBy | int | Private | Update by |

*Method*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

***4.2.13 Room***  
*Attribute*

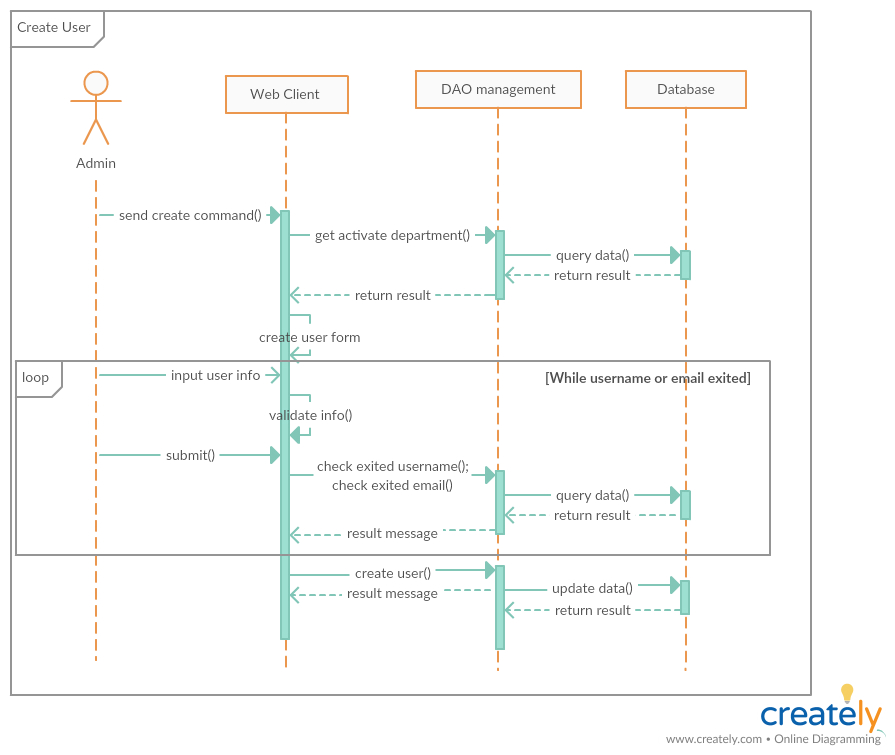
|  |  |  |  |
| --- | --- | --- | --- |
| ***Attribute*** | ***Type*** | ***Visibility*** | ***Description*** |
| RoomId | int | Private | Unique identifier of room |
| RoomName | string | Private | Room name |
| RoomSize | int | Private | Number of seats in room |
| Status | int | Private | Status of room |

*Method*

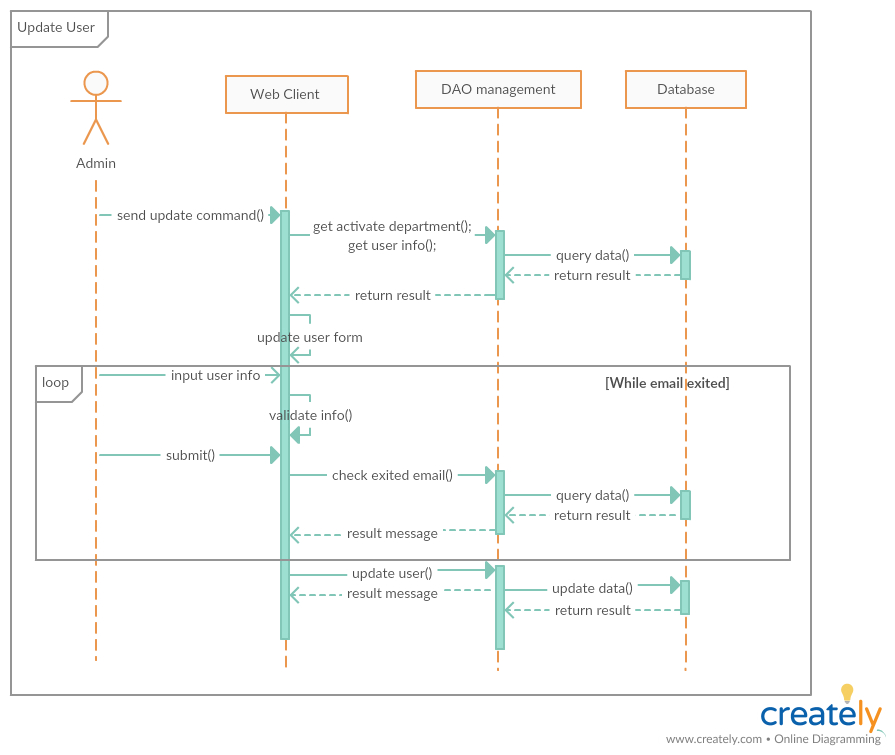
|  |  |  |  |
| --- | --- | --- | --- |
| ***Method*** | ***Return type*** | ***Visibility*** | ***Description*** |
| *Getter* | *Attribute type* | *Public* | *Get attribute value* |
| *Setter* | *Void* | *Public* | *Set value of attribute* |

**4.3 Interaction Diagram**

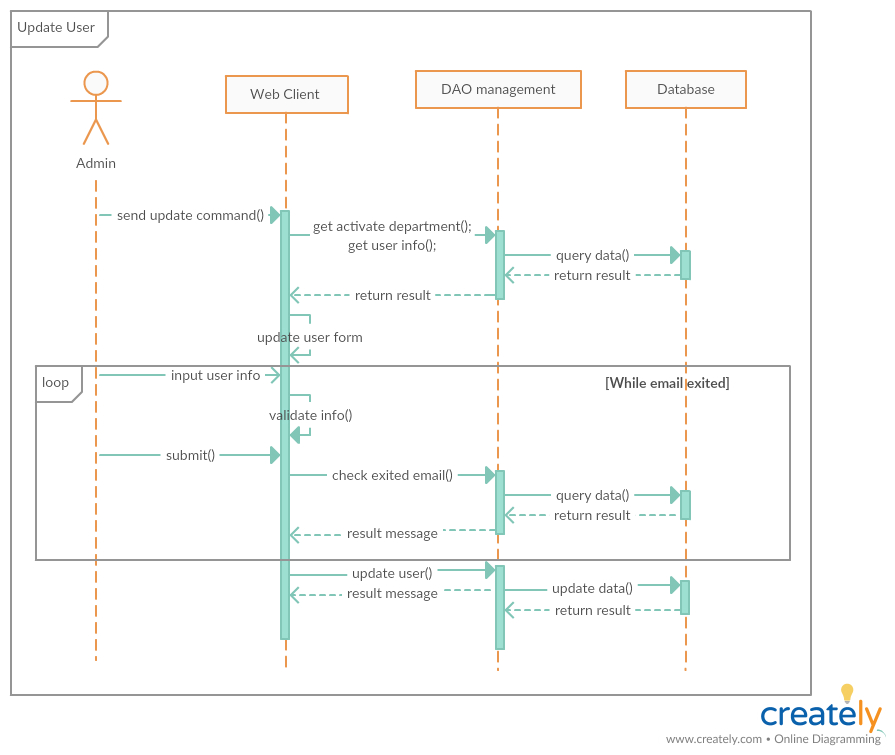
***4.3.1 Create user***

*****Summary: this diagram show process of staff creates new User.*

***4.3.2 Update user***

*****Summary: this diagram show process of staff update new User*

***4.3.2 Update user***

*****Summary: this diagram show process of staff update new User*

**5. Interface**  
**5.1 Component interface**