

**ONLINE SHOP**

**Software Design Document**

– Hanoi, May 2022 –

**Table of Contents**

Table of Contents

[Project Report 3](#_Toc106050031)

[1. Status Report 3](#_Toc106050032)

[2. Team Involvements 3](#_Toc106050033)

[I. Overview 4](#_Toc106050034)

[1. Code Packages/Namespaces 4](#_Toc106050035)

[2. Database Table 5](#_Toc106050036)

[II. Code Designs 6](#_Toc106050037)

[1. <Feature/Function Name> 6](#_Toc106050038)

[a. Class Diagram 7](#_Toc106050039)

[b. Class Specifications 7](#_Toc106050040)

[c. Sequence Diagram(s) 10](#_Toc106050041)

[2. Feature “Login” 11](#_Toc106050042)

[a. Class Diagram 11](#_Toc106050043)

[b. Sequence Diagram(s) 12](#_Toc106050044)

[3. Feature “SignUp” 13](#_Toc106050045)

[a. Class Diagram 13](#_Toc106050046)

[b. Sequence Diagram(s) 14](#_Toc106050047)

[4. Feature “Logout” 14](#_Toc106050048)

[b. Sequence Diagram(s) 16](#_Toc106050049)

[5. Feature “AddToCart” 16](#_Toc106050050)

[b. Sequence Diagram(s) 17](#_Toc106050051)

[6. Feature “View Product detail” 18](#_Toc106050052)

[a. Class Diagram 18](#_Toc106050053)

[b. Sequence Diagram(s) 18](#_Toc106050054)

[7. Feature “Home Page” 19](#_Toc106050055)

[a. Class Diagram 19](#_Toc106050056)

[b. Sequence Diagram(s) 19](#_Toc106050057)

[8. Feature “Slider” 20](#_Toc106050058)

[a. Class Diagram 20](#_Toc106050059)

[b. Sequence Diagram(s) 20](#_Toc106050060)

[9. Feature “Product List” 21](#_Toc106050061)

[a. Class Diagram 21](#_Toc106050062)

[b. Sequence Diagram(s) 21](#_Toc106050063)

[10. Feature “Cart Detail” 22](#_Toc106050064)

[a. Class Diagram 22](#_Toc106050065)

[b. Sequence Diagram(s) 22](#_Toc106050066)

[11. Feature “Cart Completion”(CheckOut) 23](#_Toc106050067)

[a. Class Diagram 23](#_Toc106050068)

[b. Sequence Diagram(s) 23](#_Toc106050069)

[12. Feature “Change Password” 24](#_Toc106050070)

[a. Class Diagram 24](#_Toc106050071)

[b. Sequence Diagram(s) 25](#_Toc106050072)

[13. Feature “User Profile (Admin Profile)” 25](#_Toc106050073)

[a. Class Diagram 25](#_Toc106050074)

[b. Sequence Diagram(s) 26](#_Toc106050075)

[III. Database Tables 26](#_Toc106050076)

[1. Order 26](#_Toc106050077)

[2. Order detail 27](#_Toc106050078)

[3. Blog 27](#_Toc106050079)

[4. Blog\_categories 28](#_Toc106050080)

[5. User account 28](#_Toc106050081)

[6. Authority 28](#_Toc106050082)

[7. Feedback 28](#_Toc106050083)

[8. Cart 29](#_Toc106050084)

[9. Cart\_item 29](#_Toc106050085)

[10. Post 30](#_Toc106050086)

[11. Post\_categories 30](#_Toc106050087)

[12. Product 30](#_Toc106050088)

[13. Product category 31](#_Toc106050089)

[14. Slide 31](#_Toc106050090)

[15. Status 32](#_Toc106050091)

[16. Product category 32](#_Toc106050092)

[17. Image 32](#_Toc106050093)

[18. Tool and Infrastructures 32](#_Toc106050094)

# Project Report

## 1. Status Report

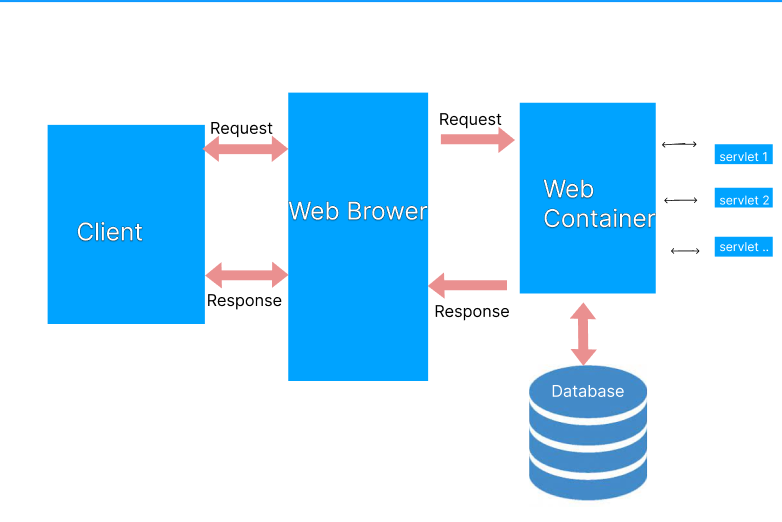
|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Work Item** | **Status** | **Notes (Work Item in Details)** |
| 1 | Overall Description | Completed |  |
| 2 | System Architecture Design | Completed |  |
| 3 | System Detailed Design | Completed |  |
| 4 | Object Specifications | Completed |  |
| 5 | Data & Database Design | Completed |  |

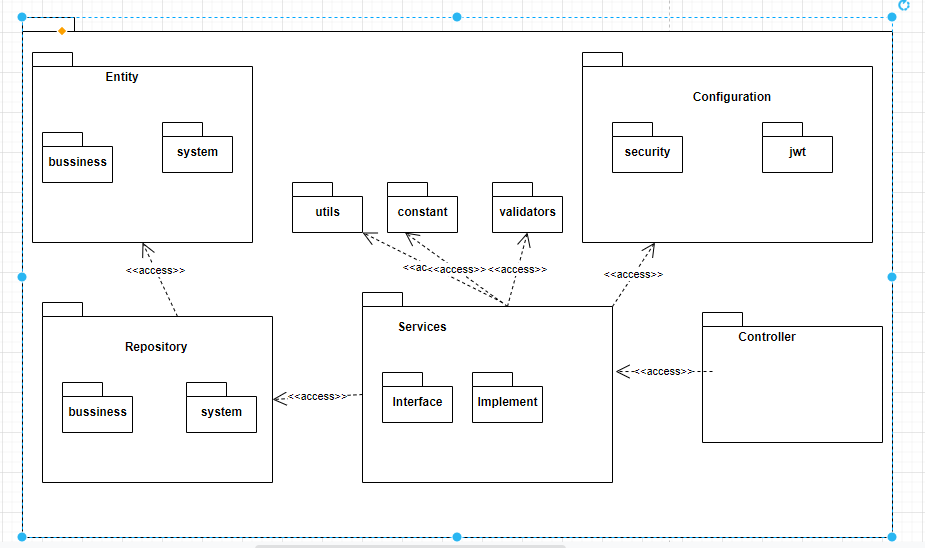
## 2. Team Involvements

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Task** | **Member** | **Notes (Task Details, etc.)** |
| 1 | Overall Description | DucLM |  |
| 2 | System Architecture Design | DucLM+HungNM |  |
| 3 | System Detailed Design | DucLM+ThachDP |  |
| 4 | Object Specifications | HoangNV+VoNVA |  |
| 5 | Data & Database Design | HoangNV+HungNM |  |

# I. Overview

## 1. Overall Architeture

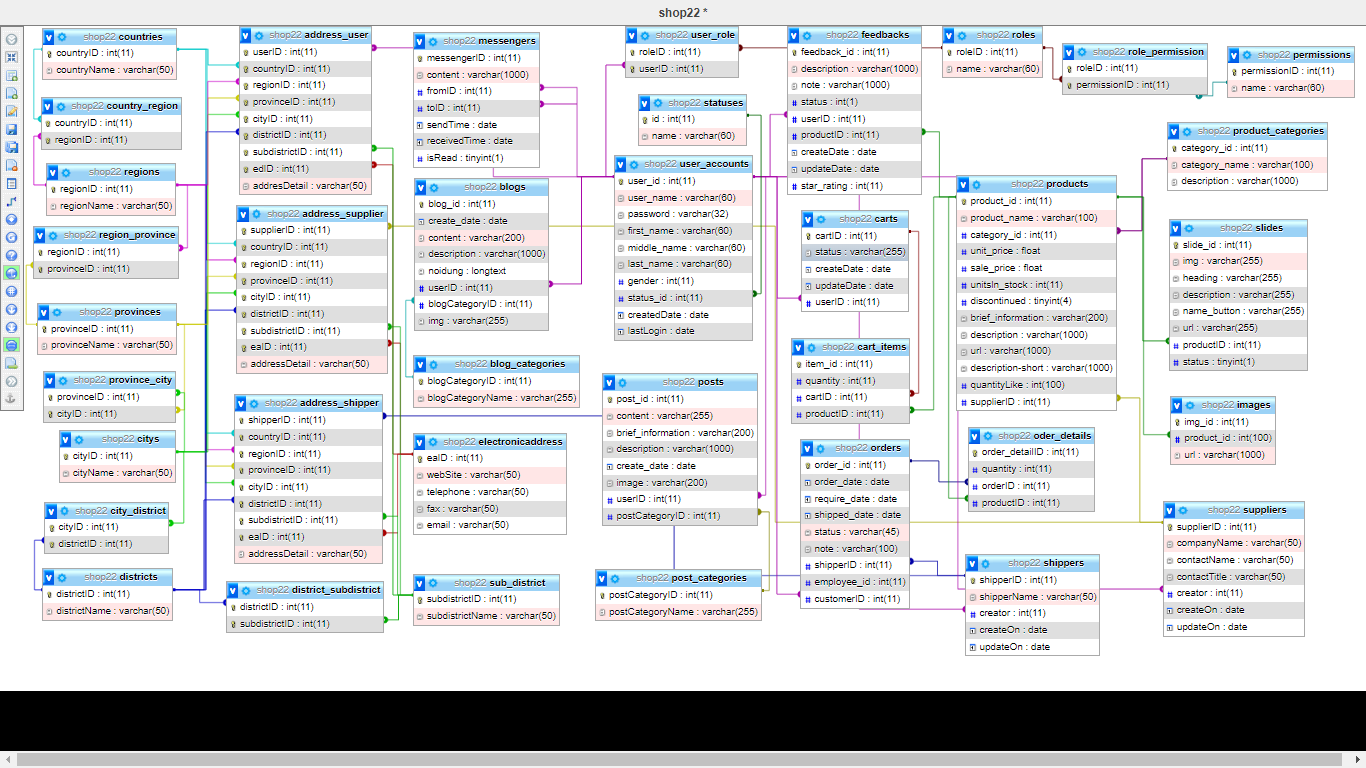


Package Diagram

***Package descriptions & package class naming conventions***

|  |  |  |
| --- | --- | --- |
| **No** | **Package** | **Description** |
| 1 | entity | The entities package contains entity classes that are the fundamental building blocks  of systems that an entity is a collection of fields and associated database operations.  They correspond to database tables and can have attributes, operations,  dependencies, inherited relations, and aggregations. |
| 2 | configurations | The Configuration package contains the necessary configuration of the easyStay  system. It helps to set up an environment for functionalities with extendable  reliability. |
| 3 | validators | The validator package contains classes that are responsible for validators information |
| 4 | controller | Controllers are responsible for controlling the flow of the application execution. When  a user makes a request to easyStay application, a controller is responsible for  returning the response to that request |
| 5 | service | Service classes can query multiple Repository classes and combine their data to form  new, more complex business objects. Further, they introduce a layer of abstraction  between the web application and the Repository so that they can change more  independently. |
| 6 | repository | The repositories package contains classes that handle getting data into and out of the  data store, with the important caveat that each Repository only works against a single  Entity class. |
| 7 | utils | Contains classes that provide support processing the system development. |
| 8 | constants | Contains all defined variables of easyStay system |

## 2. Database Table



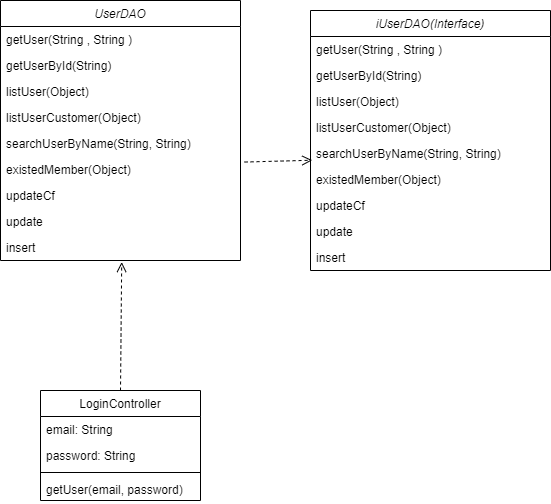
***Table descriptions & package class naming conventions are as below***

|  |  |  |
| --- | --- | --- |
| **No** | **Table** | **Description** |
| 01 | authority | - Primary keys: id |
| 02 | blog | - Primary keys: blog\_id  - Foreign keys: category\_blog\_id  - Foreign keys: User\_Account\_user\_id |
| 03 | blog\_categories | - Primary keys: order\_id |
| 04 | cart | - Primary keys: user\_id  - Foreign keys: User\_Account\_user\_id |
| 05 | cart\_item | - Primary keys: user\_id  - Foreign keys: Cart\_user\_id  - Foreign keys: Products\_product\_id |
| 06 | feedback | - Primary keys: feedback\_id  - Foreign keys: User\_Account\_user\_id  - Foreign keys: products\_product\_id |
| 07 | image | - Primary keys: img\_id  - Foreign keys: product\_id |
| 08 | order\_detail | - Primary keys: order\_id  - Foreign keys: Order\_order\_id, Products\_product\_id |
| 09 | order | - Primary keys: order\_id  - Foreign keys: User\_Account\_user\_id |
| 10 | post | - Primary keys: post\_id  - Foreign keys: User\_Account\_user\_id |
| 11 | post\_categories | - Primary keys: post\_id  - Foreign keys: post\_id |
| 12 | product | - Primary keys: product\_id  - Foreign keys: category\_id |
| 13 | product\_categories | - Primary keys: category\_id |
| 14 | slide | - Primary keys: slide\_id |
| 15 | status | - Primary keys: id |
| 16 | user\_account | - Primary keys: user\_id  - Foreign keys: status\_id , authority\_id |
| 17 | Colors | - Primary keys: colorID |
| 18 | district | - Primary keys: id  - Foreign keys: \_province\_id |
| 19 | electronicaddress | - Primary keys: eaID |
| 20 | favorite\_product | - Primary keys: productID,userID  - Foreign keys: productID,userID |
| 21 | group | - Primary keys: groupID |
| 22 | messages | - Primary keys: messageID  - Foreign keys: messageID,creatorID |
| 23 | message\_recipient | - Primary keys: mrID  - Foreign keys: messageID,recipientGroupID,recipientID |
| 24 | permissions | - Primary keys: permissionID |
| 25 | product\_color | - Primary keys: colorID,productID  - Foreign keys: colorID,productID |
| 26 | project | - Primary keys: id  - Foreign keys: \_province\_id,district\_id |
| 27 | province | - Primary keys: id |
| 28 | roles | - Primary keys: roleID |
| 29 | role\_permission | - Primary keys: roleID,permissionID  - Foreign keys: roleID,permissionID |
| 30 | shipper | - Primary keys: shipperID |
| 31 | street | - Primary keys: id  - Foreign keys: : \_province\_id,district\_id |
| 32 | supplierID | - Primary keys: supplierID |
| 33 | Supplier\_address | - Primary keys: saID  - Foreign keys: provinceID,districtID,wardID,projectID,eaID |
| 34 | user\_address | - Primary keys: uaID  - Foreign keys: provinceID,districtID,wardID,projectID,eaID |
| 35 | User\_group | - Primary keys: ugID  - Foreign keys: userID,groupID |
| 36 | User\_role | - Primary keys: userID,roleID  - Foreign keys: userID,roleID |
| 37 | ward | - Primary keys: id  - Foreign keys: \_province\_id,district\_id |

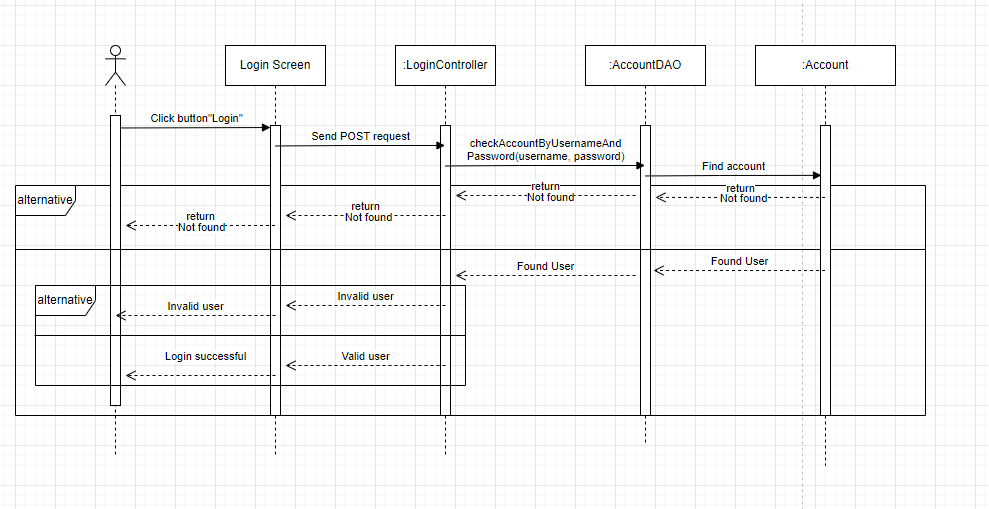
# II. Code Designs

## 1. Feature “Login”

### a. Class Diagram

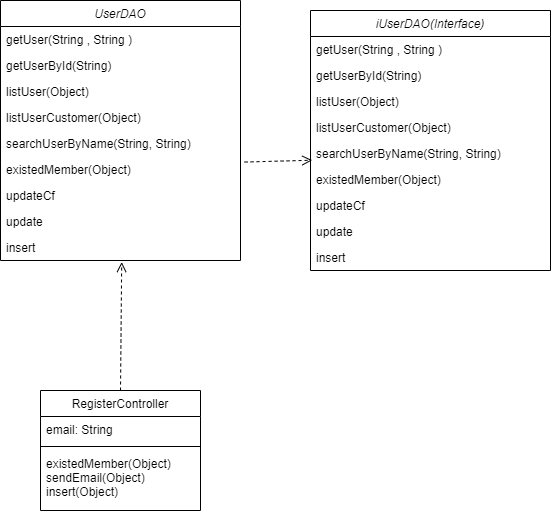


### b. Sequence Diagram(s)

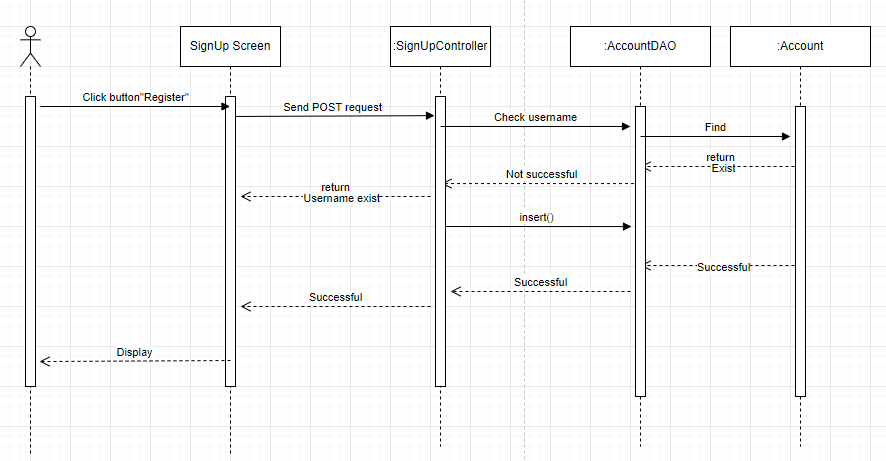


## 2. Feature “SignUp”

### a. Class Diagram

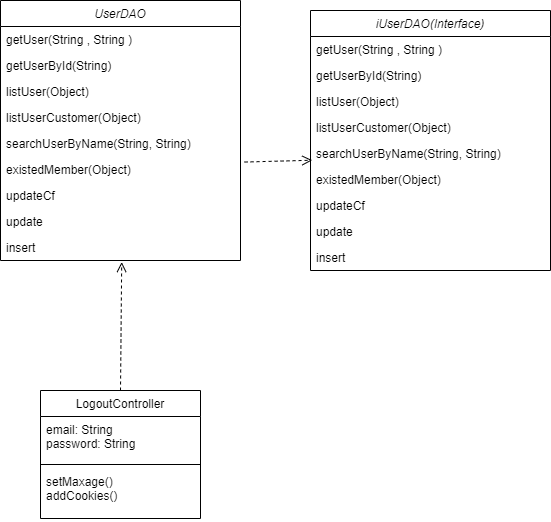


### b. Sequence Diagram(s)

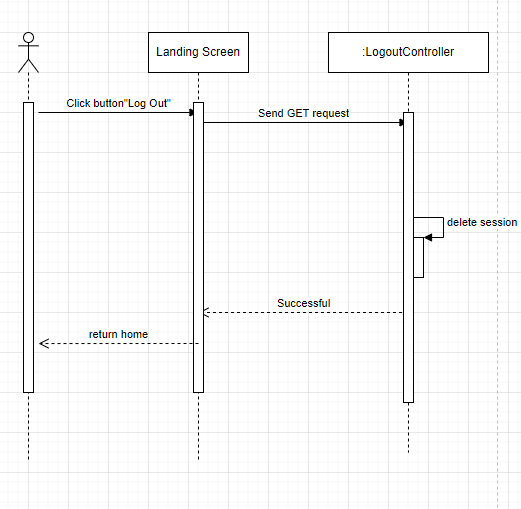


## 3. Feature “Logout”

**a. Class Diagram**

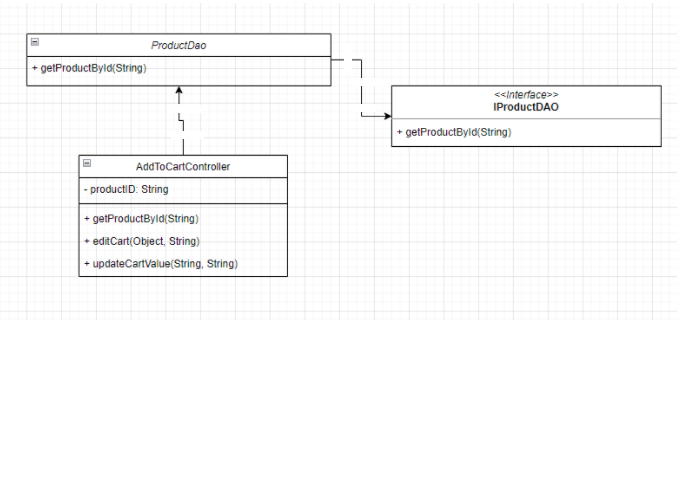


### b. Sequence Diagram(s)

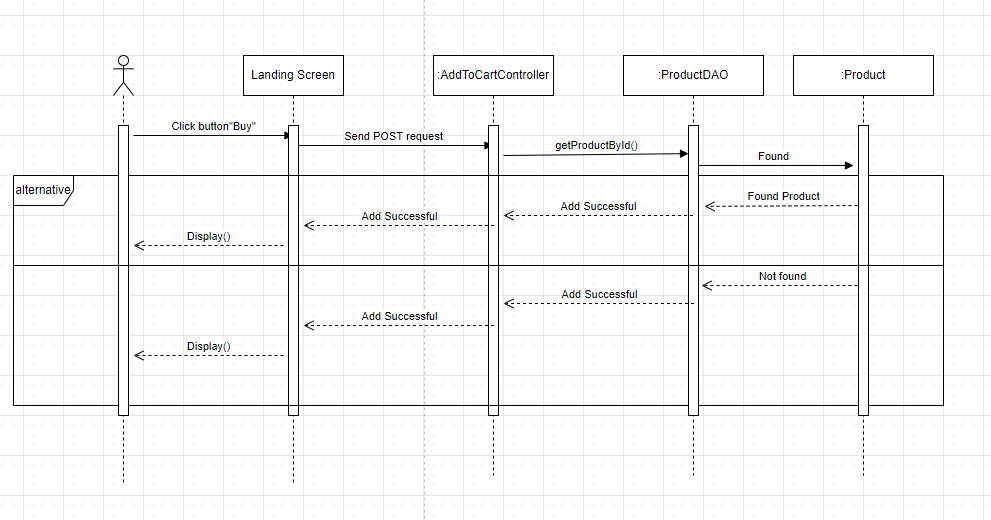


## 4. Feature “AddToCart”

**a. Class Diagram**

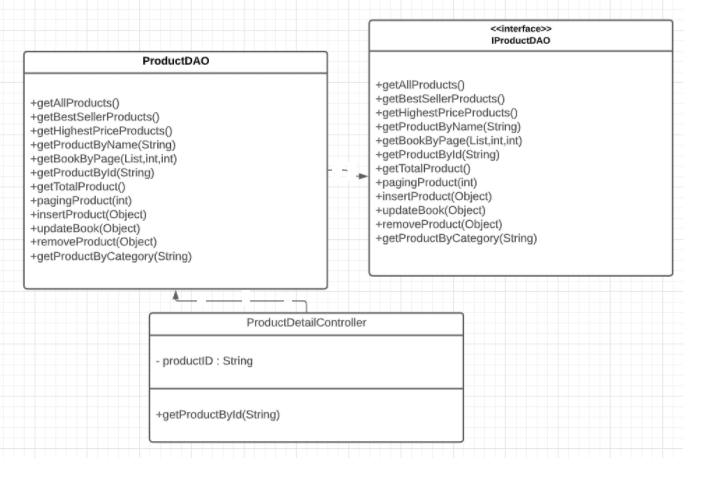


### b. Sequence Diagram(s)

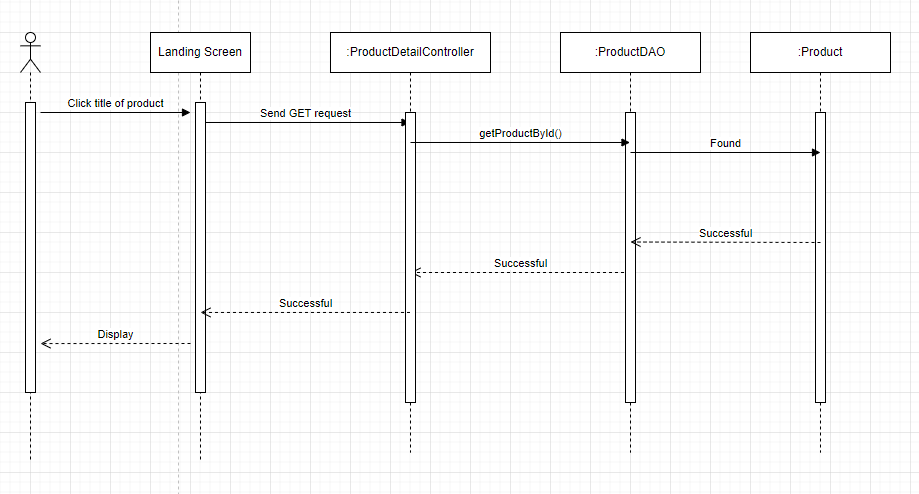


## 5. Feature “View Product detail”

### a. Class Diagram

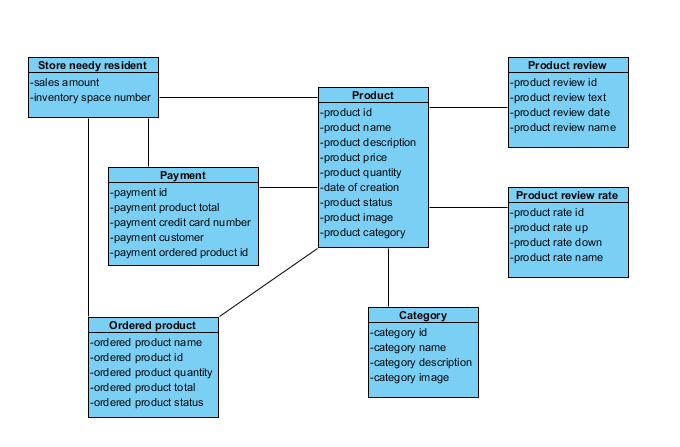


### b. Sequence Diagram(s)

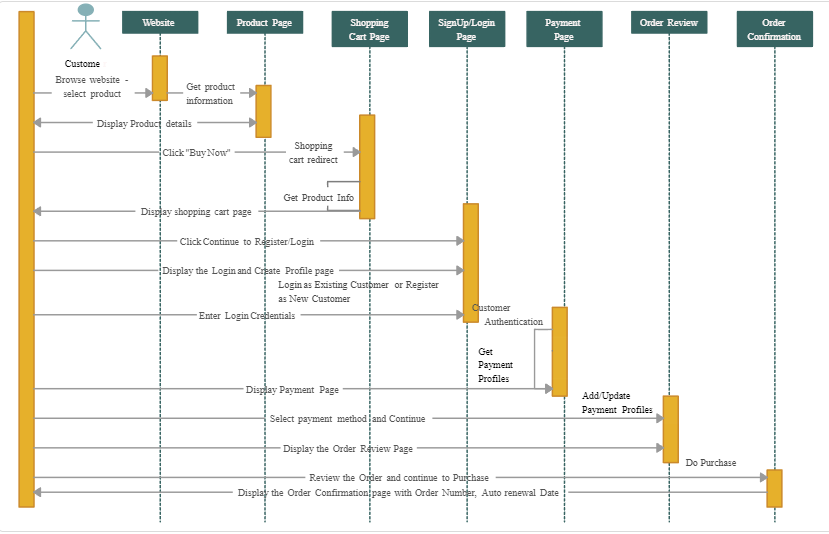


## 6. Feature “Home Page”

### a. Class Diagram

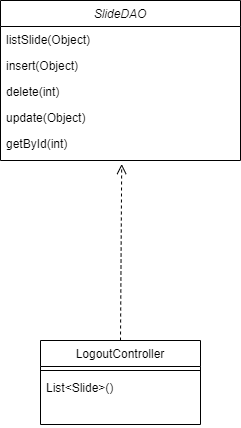


### b. Sequence Diagram(s)

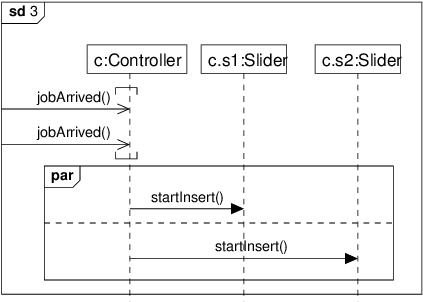


## 7. Feature “Slider”

### a. Class Diagram

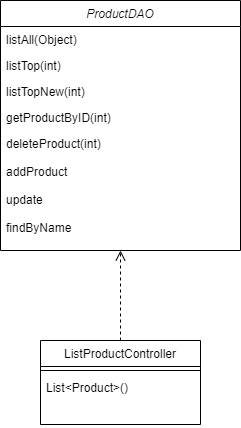


### b. Sequence Diagram(s)

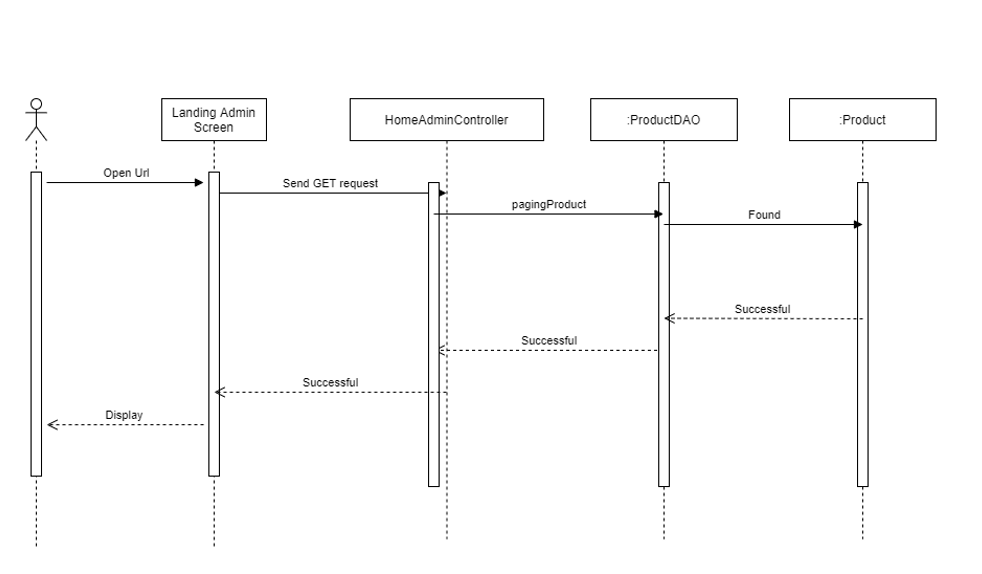


## 8. Feature “Product List”

### a. Class Diagram

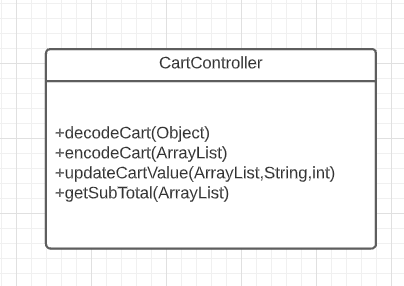


### b. Sequence Diagram(s)

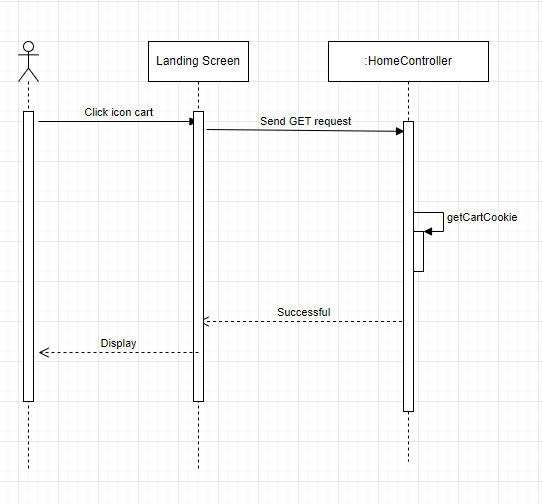


## 9. Feature “Cart Detail”

### a. Class Diagram

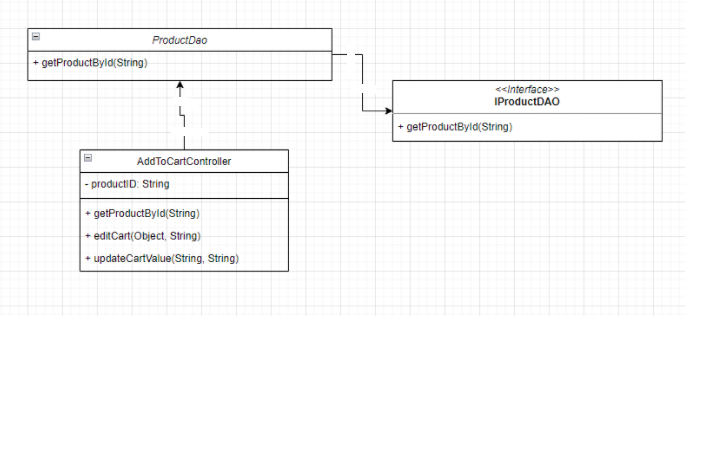


### b. Sequence Diagram(s)

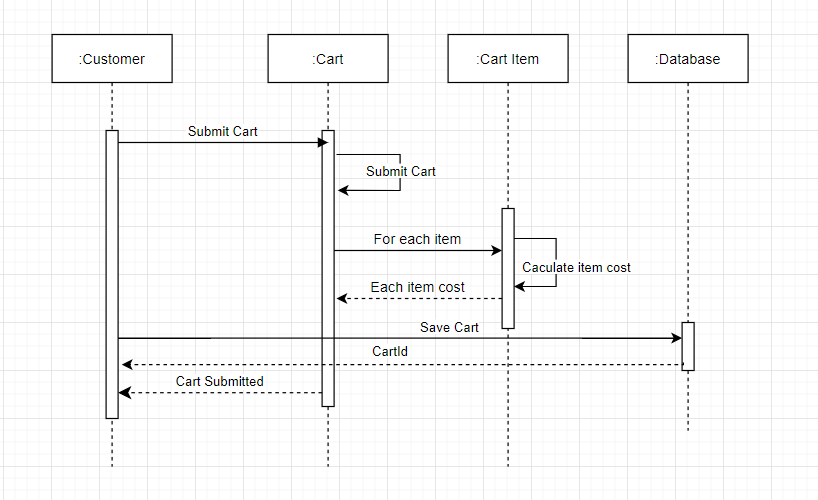


## 10. Feature “Cart Completion”(CheckOut)

### a. Class Diagram



### b. Sequence Diagram(s)



## 11. Feature “Change Password”

### a. Class Diagram

Diagram

Description automatically generated

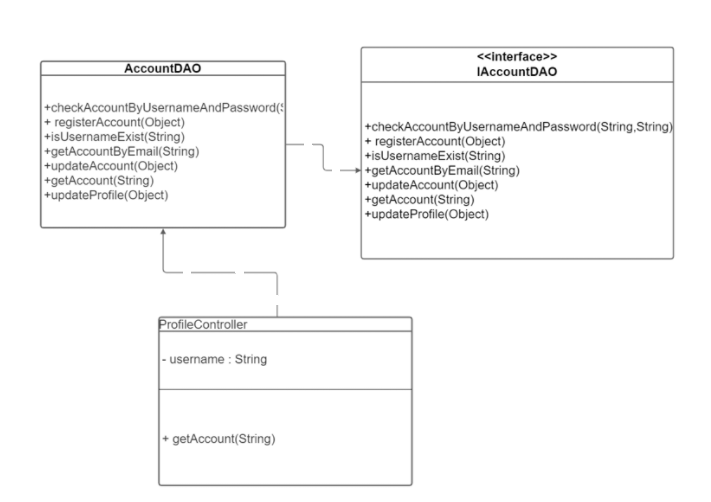
### b. Sequence Diagram(s)

Calendar

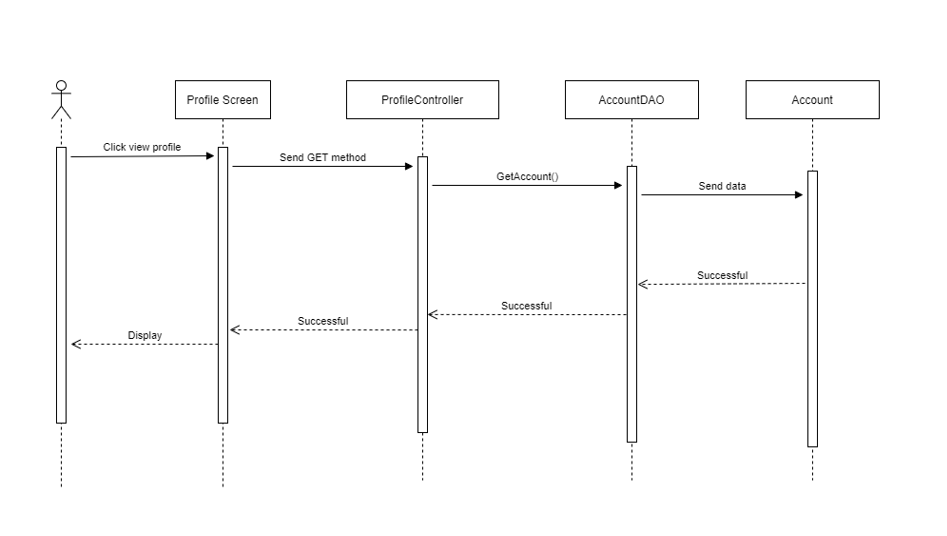
Description automatically generated

## 12. Feature “User Profile (Admin Profile)”

### a. Class Diagram



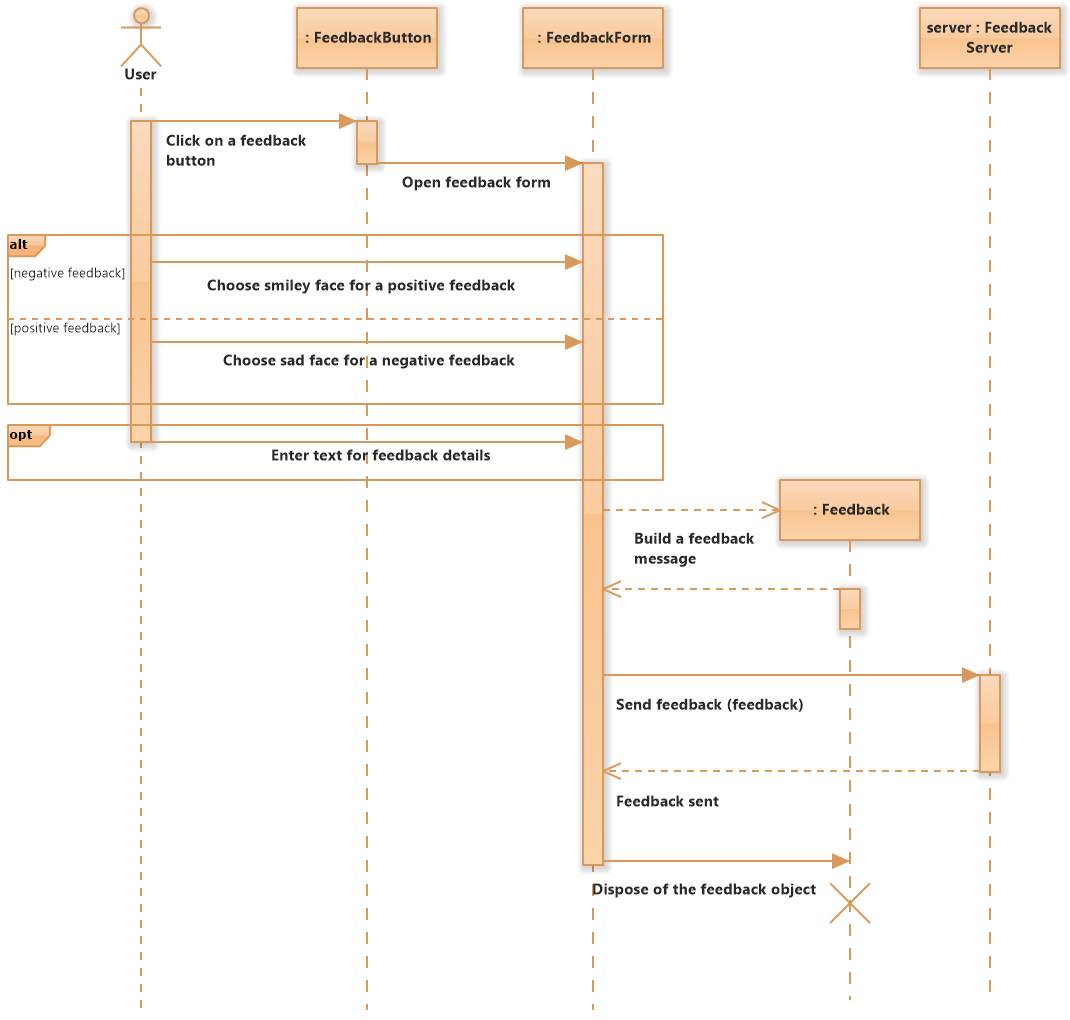
### b. Sequence Diagram(s)



## 13. Feature “Feedback”

### a. Class Diagram

### b. Sequence Diagram(s)



# III. Database Tables

## 1. Order

*This table contain order information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Order\_id | Int | 11 | x | x | PK | Order ID |
| 2 | Customer\_id | Int | 11 | x | x | FK | Customer ID |
| 3 | Name\_receiver | Varchar | 60 | x | x |  | Receive name |
| 4 | Phone | Int | 11 | x | x | FK | Phone number |
| 5 | Email | Varchar | 60 | x |  |  | Email address |
| 6 | Address | Varchar | 100 | x | x |  | Delivery address |
| 7 | Employee\_id | Int | 11 | x | x | FK | Employee ID |
| 8 | Order\_date | Date |  |  | x |  | Order date |
| 9 | Ship\_date | Date |  |  | x |  | Delivery date |
| 10 | Status | Varchar | 45 |  | x |  | Order status |
| 11 | Note | Varchar | 100 |  |  |  | Order note |
| 12 | User\_account | Int | 11 | x | x | FK | User account |

## 2. Order detail

*This table contain order detail information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Order\_id | Int | 11 | x | x | PK | Order ID |
| 2 | Product\_id | Int | 11 | x | x | PK | Product ID |
| 3 | Unit\_price | Float |  |  | x | FK | Unit price |
| 4 | Quantity | Int | 11 |  | x | FK | Order quantity |
| 5 | Order\_order\_id | Int | 11 |  |  | FK |  |
| 6 | Product\_product\_id | Int | 11 |  |  | FK |  |

## 3. Blog

*This table contain blog information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Blog\_id | Int | 11 | x | x | PK | Blog id |
| 2 | Create\_date | Date |  |  | x |  | Blog create date |
| 3 | Content | Varchar | 200 |  | x |  | Blog content |
| 4 | Description | Varchar | 1000 | x | x |  | Blog description |
| 5 | noidung | Longtext |  | x | x | FK | User account |
| 6 | User\_Account\_User\_id | Int | 11 |  | x | FK |  |
| 7 | category\_blog\_id | Int | 11 |  | x | FK |  |
| 8 | img | Varchar | 255 |  | x |  |  |

## 

## 

## 

## 4. Blog\_categories

*This table contain blog information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Blog\_id | Int | 11 | x | x | PK | Blog id |
| 2 | Blog\_name | Varchar | 255 |  |  |  | Blog create date |

## 

## 5. User account

*This table contain user account information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | User\_id | Int | 11 | x | x | PK | User ID |
| 2 | User\_name | Varchar | 60 | x | x |  | User name |
| 3 | Password | Varchar | 32 |  | x |  | Password |
| 4 | Full\_name | Varchar | 60 |  | x |  | User full name |
| 5 | Gender | Int | 11 |  |  |  | Gender |
| 6 | Phone | Int | 11 |  | x |  | Phone number |
| 7 | Email | Varchar | 60 |  |  |  | Email address |
| 8 | Status\_id | Int | 11 |  | x | FK | User authority |
| 9 | authority\_id | Int | 11 |  | x | FK | Decentralization |
| 10 | code | Varchar | 10 |  |  |  |  |

## 6. Authority

*This table contain user authority information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Id | Int | 11 | x | x | PK | Authority id |
| 2 | Name | Varchar | 60 |  | x |  | Authority name |

## 7. Feedback

*This table contain feedback information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Feedback\_id | Int | 11 | x | x | PK | Feedback id |
| 2 | Description | Varchar | 1000 |  | x |  | Description |
| 3 | Product\_id | Int |  | x | x | FK | Feedback product id |
| 4 | User\_account | Int |  | x | x | FK | User account |
| 5 | Note | Varchar | 1000 |  |  |  |  |
| 6 | Status | Bit |  |  |  |  |  |

## 8. Cart

*This table contain cart information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | User\_id | Int |  | x | x | PK | User ID |
| 2 | Status | Varchar | 255 |  | x |  | Cart status |
| 3 | Full\_name | Varchar | 60 |  | x |  | Full name |
| 4 | Phone | Int | 11 |  | x |  | Phone number |
| 5 | Email | Varchar | 60 |  |  |  | Email address |
| 6 | Address | Varchar | 100 |  | x |  | Address |
| 7 | User\_Account\_user\_id | Int | 11 |  | x | FK |  |

## 9. Cart\_items

*This table contain post information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Item\_id | Int | 11 | x | x | PK |  |
| 2 | Product\_id | Int | 11 |  | x | FK |  |
| 3 | Product\_name | Varchar | 100 |  | x |  |  |
| 4 | Url | Varchar | 1000 | x | x |  |  |
| 5 | Unit\_price | Int | 11 | x | x | FK |  |
| 6 | Quantity | Int | 11 |  | x | FK |  |
| 7 | Cart\_user\_id | Int | 11 |  | x | FK |  |
| 8 | Products\_product\_id | Int | 11 |  | x | FK |  |

## 

## 10. Post

*This table contain post information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Post\_id | Int | 11 | x | x | PK | Post ID |
| 2 | Content | Varchar | 255 |  | x |  | Post content |
| 3 | Brief\_information | Varchar | 200 |  | x |  | Create date |
| 4 | Description | Varchar | 200 | x | x |  | User ID |
| 5 | create\_date | Date |  | x | x |  | Product id |
| 6 | image | Varchar | 200 |  |  |  |  |
| 7 | User\_Account\_user\_id | Int | 11 |  | x | FK |  |

## 11. Post\_categories

*This table contain category information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Post\_id | Int | 11 | x | x | PK |  |
| 2 | Post\_name | Varchar | 255 |  | x |  |  |

## 12. Product

*This table contain product information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Product\_id | Int | 11 | x | x | PK | Product ID |
| 2 | Product\_name | Varchar | 100 |  | x |  | Product name |
| 3 | Category\_id | Int | 11 | x | x | FK | Category ID |
| 4 | Unit\_price | Float |  |  | x | FK | Product price |
| 5 | Sale\_price | Float |  |  | x | FK | Unit stock |
| 6 | Unitsln\_stock | Int | 11 |  |  | FK |  |
| 7 | Discontinued | Tinyint | 4 |  | x | FK |  |
| 8 | Brief\_information | Varchar | 200 | x | x |  |  |
| 9 | Description | Varchar | 1000 | x | x |  | Product description |
| 10 | Url | Varchar | 1000 |  |  |  | Product url |
| 11 | Description-short | Varchar | 1000 |  |  |  |  |

## 13. Product category

*This table contain category information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Category\_id | Int |  | x | x | PK | Category ID |
| 2 | Category\_name | Varchar | 100 |  | x |  | Category Name |
| 3 | Description | Varchar | 1000 |  |  |  | Description |

## 14. Slide

*This table contain category item information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Slide\_id | Int | 6 | x | x | PK |  |
| 2 | Img | Varchar | 255 | x | x |  |  |
| 3 | Heading | Varchar | 255 |  | x |  |  |
| 4 | Description | Varchar | 255 |  |  |  |  |
| 5 | Name\_button | Varchar | 255 |  | x |  |  |
| 6 | Url | Varchar | 255 |  |  |  |  |
| 7 | Status | Tinyint | 1 |  | x | FK |  |

## 15. Status

*This table contain category information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Id | Int | 11 | x | x | PK |  |
| 2 | Name | Varchar | 60 |  | x |  |  |

## 16. Product category

*This table contain category information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Feedback\_id | Int | 11 | x | x | PK |  |
| 2 | Description | Varchar | 1000 |  | x |  |  |
| 3 | User\_Account\_user\_id | Int | 11 |  | x | FK |  |
| 4 | Product\_product\_id | Int | 11 |  | x | FK |  |
| 5 | Star\_rating | Int | 11 |  | x | FK |  |

## 17. Image

*This table contain category information*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | Img\_id | Int | 100 | x | x | PK | Category ID |
| 2 | Product\_id | Varchar | 100 |  | x | FK | Category Name |
| 3 | Url | Varchar | 1000 |  |  |  | Description |

## 18. Tool and Infrastructures

|  |  |  |
| --- | --- | --- |
| **#** | **Category** | **Tools/Infrastructures** |
| 1 | Techology | Languague: Java + JSP+HTML+ Xamapp |
| 2 | IDEs/Editors | Netbeans IDE 8(8.2 or more) |
| 3 | Database | MySql of Xamapp |
| 4 | Diagram Programing | Draw.io |
| 5 | Documentation | Google docs/sheet, Word |
| 6 | Version Control And Manage Source Code | Gitlab, Google Drive |
| 7 | Deployment Server | None |
| 8 | Project Management | Google meet(Tasks)  Meeting minutes(schedule work) |

**18.1 Assumptions**

System’s name**: Online Shop** **(OS)**

This system is designed based on:

* Windows 10/11
* JDK 16
* Java
* Xamapp/MySQL
* Netbeans 8 (8.2 or more)

**18.2 Design Constraints**

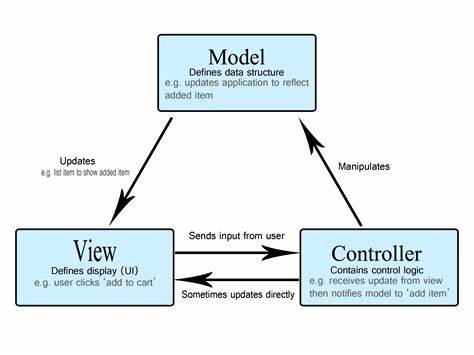
* It is a sales website with user and management sides. In the epidemic situation, a website for users to buy goods is really necessary.
* End-user’s Environment: Windows Version >=10.
* Database: MySQL and Xamapp.
* Support language: Eng and VN.
* Criteria: snappy, soft and responsive.
* Permission: Internet Access

**18.3 System Architecture Diagram**

****

**18.3.1 Component Explanation**

**18.3.1.1 MVC model**



MVC (short for Model - View - Controller) is a type of software architecture pattern that separates the logic in the application into three main components: Model, View and Controller with each component having a separate function.

* Models manage application behavior and data.
* View has the function to perform tasks related to display functions (text, images, graphics...) in the application.
* Controller has the function to perform tasks related to handling input provided to the application (maybe from users or other applications) and send requests to the Model or View for further processing.

**18.3.1.2 JSP, Servlet**



JSP stands for Java Server Pages is a technology for building web applications that support dynamic content and acts as a Java servlet technology. You can consider it a different option to a servlet, and it has a lot more capabilities than a servlet.

Servlet is a server-side Java program module that handles client requests and implements the servlet interface. Servlets can respond to any type of request, and they are commonly used to extend the applications hosted by web servers.

**18.3.1.3 Xamapp**



XAMPP is a popular**cross-platform web server** that allows programmers to write and test their code on a local webserver. It was created by Apache Friends, and the public can revise or modify its native source code. It includes MariaDB, Apache HTTP Server, and interpreters for PHP and Perl, among other computer languages.

**18.3.1.4 MySQL**



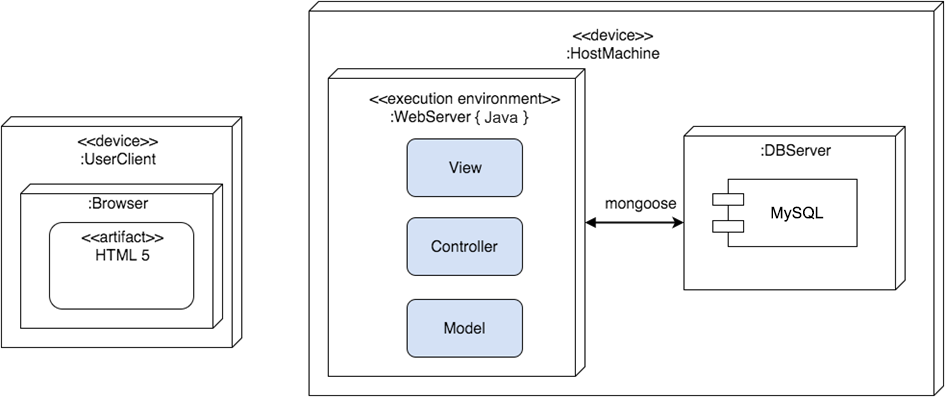
MySQL is a relational database management system (RDBMS) developed by Oracle that is based on structured query language (SQL). A database is a structured collection of data.

**18.3.1.5 NetBeans**



NetBeans is an integrated development environment (IDE) for Java. NetBeans allows applications to be developed from a set of modular software components called modules. NetBeans runs on Windows, macOS, Linux and Solaris. In addition to Java development, it has extensions for other languages like PHP, C, C++, HTML5, and JavaScript.

**19. Deployment Diagram**

****