

Online Health Shopping Portal
Analysis and Design Document
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Online Health Shopping Portal	Version: 2.0
	Date: 25/04/2018
Version 2.0	

Revision History

Date	Version	Description	Author
05/04/2018	1.0	Domain Model + Architectural Design	Ana-Maria Nanes
25/04/2018	2.0	Design Model + Data Model	Ana-Maria Nanes

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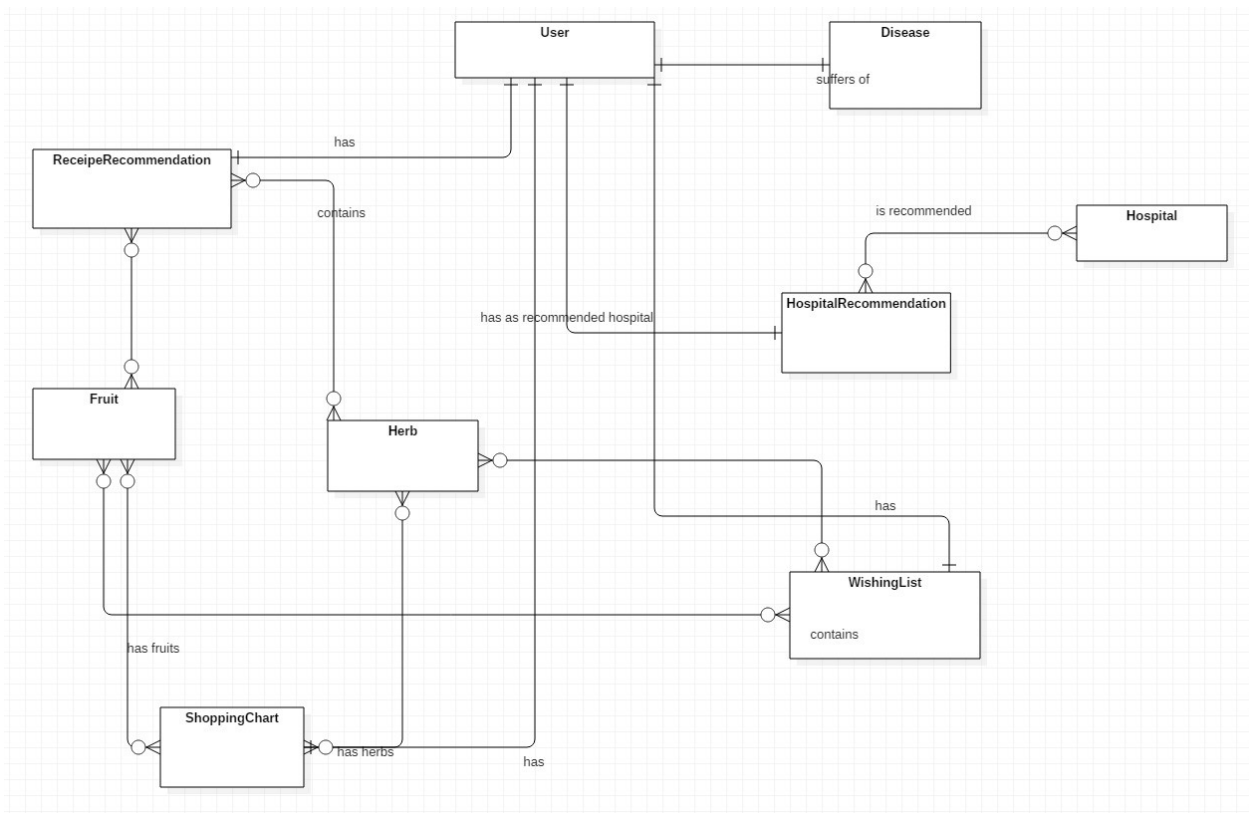
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I. Project Specification

The application is an online platform that helps the users in curing their disease by giving the list of fruits and herbs that the user should consume in order to get rid of its disease. The main purpose of the application is to help the user to find the accurate products according to the introduced disease and to reduce as much as possible the search time. The system also allows the user to see the description of each herb or fruit in the system in order to read about the benefits of consuming it. The user also has the possibility to add products to the chart and buy them. The system also includes a module in which the user can search for the hospitals depending on the name of the disease that user enters. The user can choose the products or can select the option that recommends exactly the necessary herbs and fruits.

II. Elaboration – Iteration 1.1

1. Domain Model



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2. Architectural Design

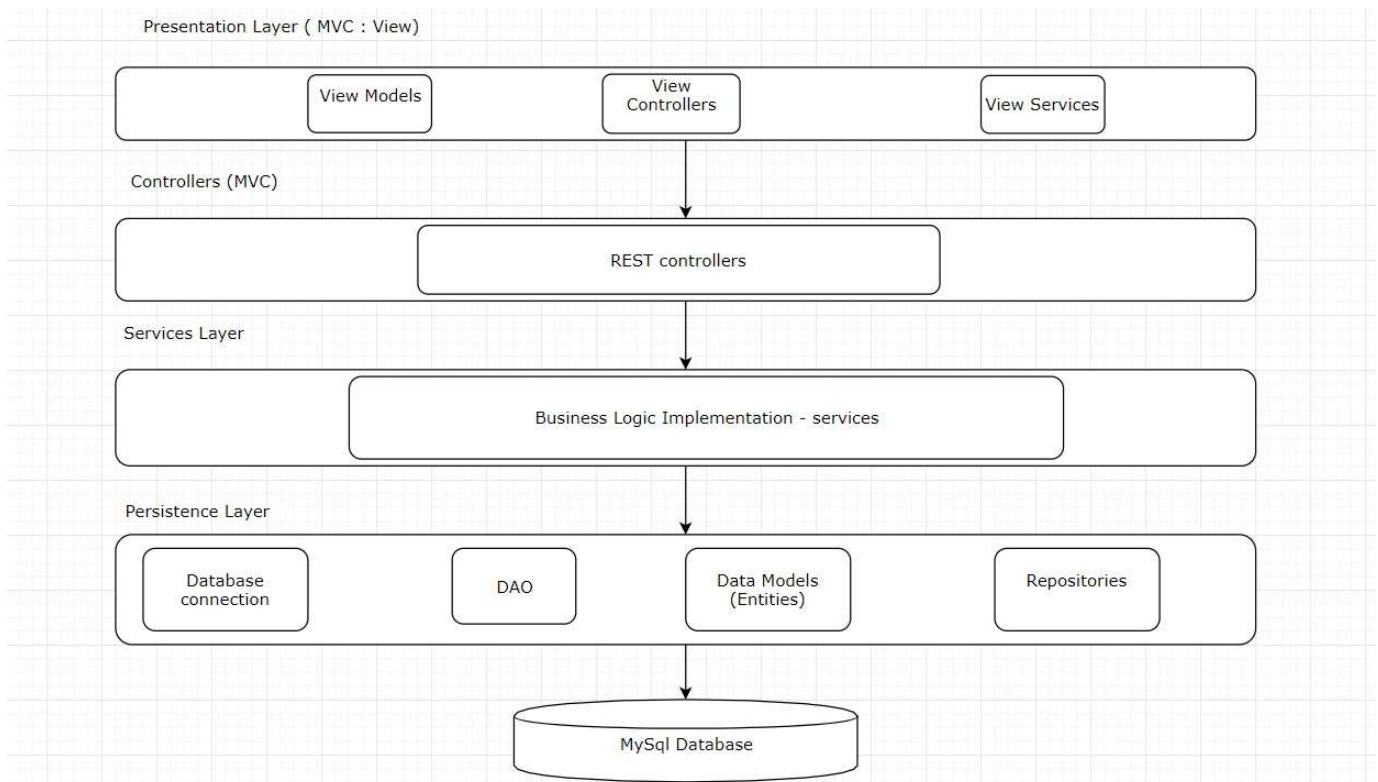
2.1 Conceptual Architecture

The architectural patterns used are the following:

- Model-View-Controller architectural pattern
- Layers Architectural pattern
- Client-Server Architecture

The used design patterns will be:

- Observer Design Pattern
- Iterator
- Builder
- Dependency Injection
- Inversion of Control



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1. Layers Architectural Pattern

This pattern can be used in order to structure the application such that it can be decomposed into groups of subtasks. Each layer implements subtasks at a particular level of abstraction and each layer provides services to the next higher level. The following 4 layers will be used in order to offer the application the accurate structure:

- ❖ Presentation Layer
- ❖ Controller Layer
- ❖ Business Logic Layer
- ❖ Data Access Layer

These layers are modeled using different packages inside the application.

2. The Model-View-Controller Architectural Pattern

Model–view–controller (MVC) is an architectural pattern commonly used for developing user interfaces that divides an application into three interconnected parts. This is done to separate internal representations of information from the ways information is presented to and accepted from the user. The MVC design pattern decouples these major components allowing for efficient code reuse and parallel development.

- ❖ Model - Model represents an object or JAVA POJO carrying data. It can also have logic to update controller if its data changes.
- ❖ View - View represents the visualization of the data that model contains.
- ❖ Controller - Controller acts on both model and view. It controls the data flow into model object and updates the view whenever data changes. It keeps view and model separate.

3. The Client-Server Architecture

The client–server model is a distributed application structure that partitions tasks or workloads between the providers of a resource or service, called servers, and service requesters, called clients. A client does not share any of its resources, but requests a server's content or service function. Clients therefore initiate communication sessions with servers which await incoming requests.

The client–server model is a standard model for network applications. A server is a process that is continuously running and waiting to be contacted by a client process. A client process initiates contact with the server by connecting to it at a specified port.

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The client-server type of the scenario for the application:

1. The server process is started on a computer system. It initializes itself and then waits for a client process to contact it with a service request.
 - ✓ In the case of my application, the server-side is implemented in Java using Spring MVC in order to access the data, to implement the services and to provide the application routes.
2. The client process, usually started on another system, is connected to the server's system over a network. The client process sends a request across the network to the server requesting service of some form, e.g. reading or writing a file on the server's system.
 - ✓ In the case of my application the client-side is implemented by an AngularJS application through which the request will be send.
3. When the server finishes processing the request, it waits for the next client request to arrive.
 - ✓ The client-side application can send as many request as desired, they will be received by the server and responses will be sent back with the requested data.

The communication protocol:

- ✓ In the case of the Online Health Shopping Portal the HTTP communication protocol will be used in order for the client side of the application to send requests and in order for the server side of the application to provide the responses with the required resources.

The Hypertext Transfer Protocol (HTTP) is an application protocol for distributed, collaborative, and hypermedia information systems. Hypertext is structured text that uses logical links (hyperlinks) between nodes containing text. HTTP is the protocol to exchange or transfer hypertext.

- ✓ Both the server and the client side will implement a certain routing mechanism. The router is the component that translates each incoming HTTP request to an action call (a public method in a controller class). Controllers will be found in the Java application and also in the AngularJS application.

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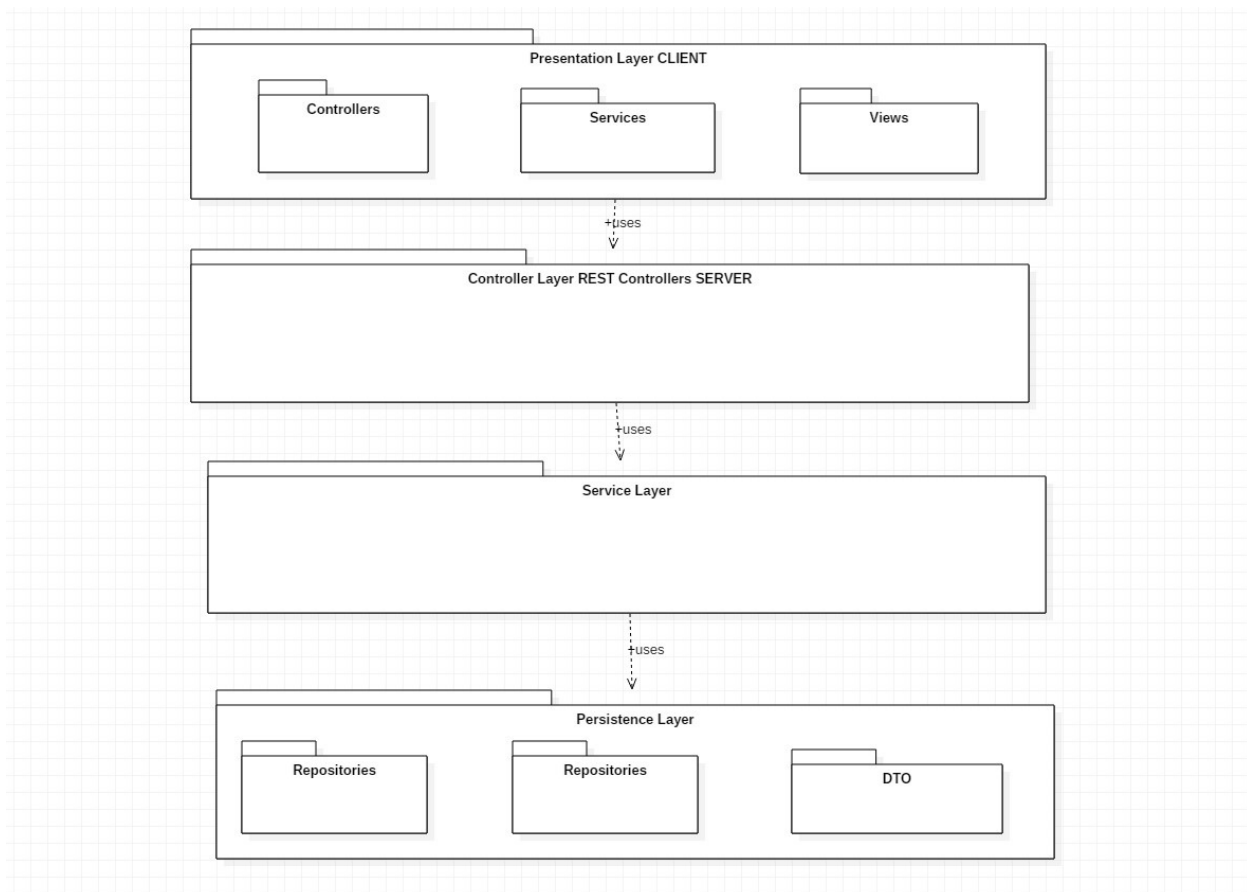
An HTTP request is seen as an event by the MVC framework. This event contains two major pieces of information:

- ❖ the request path (such as /clients/12, /photos/list), including the query string.
- ❖ the HTTP method.

The HTTP method can be any of the valid methods supported by HTTP (GET, PATCH, POST, PUT, DELETE, HEAD, OPTIONS).

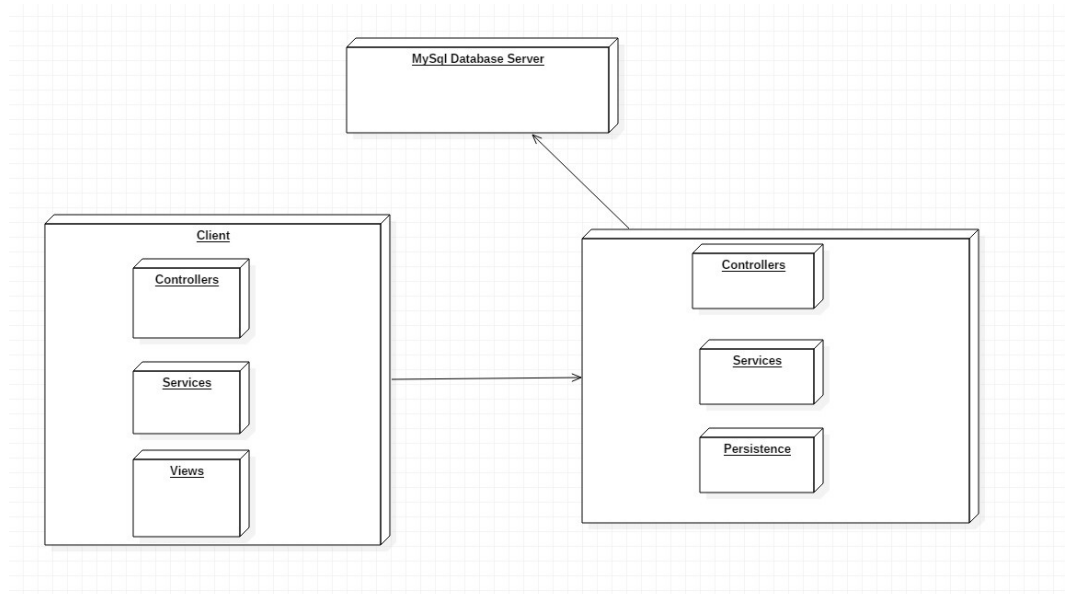
2.2 Package Design

The packages are used in order to model the layers.



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2.3 Deployment Diagrams



III. Elaboration – Iteration 1.2

1. Design Model

1.1 Dynamic Behavior

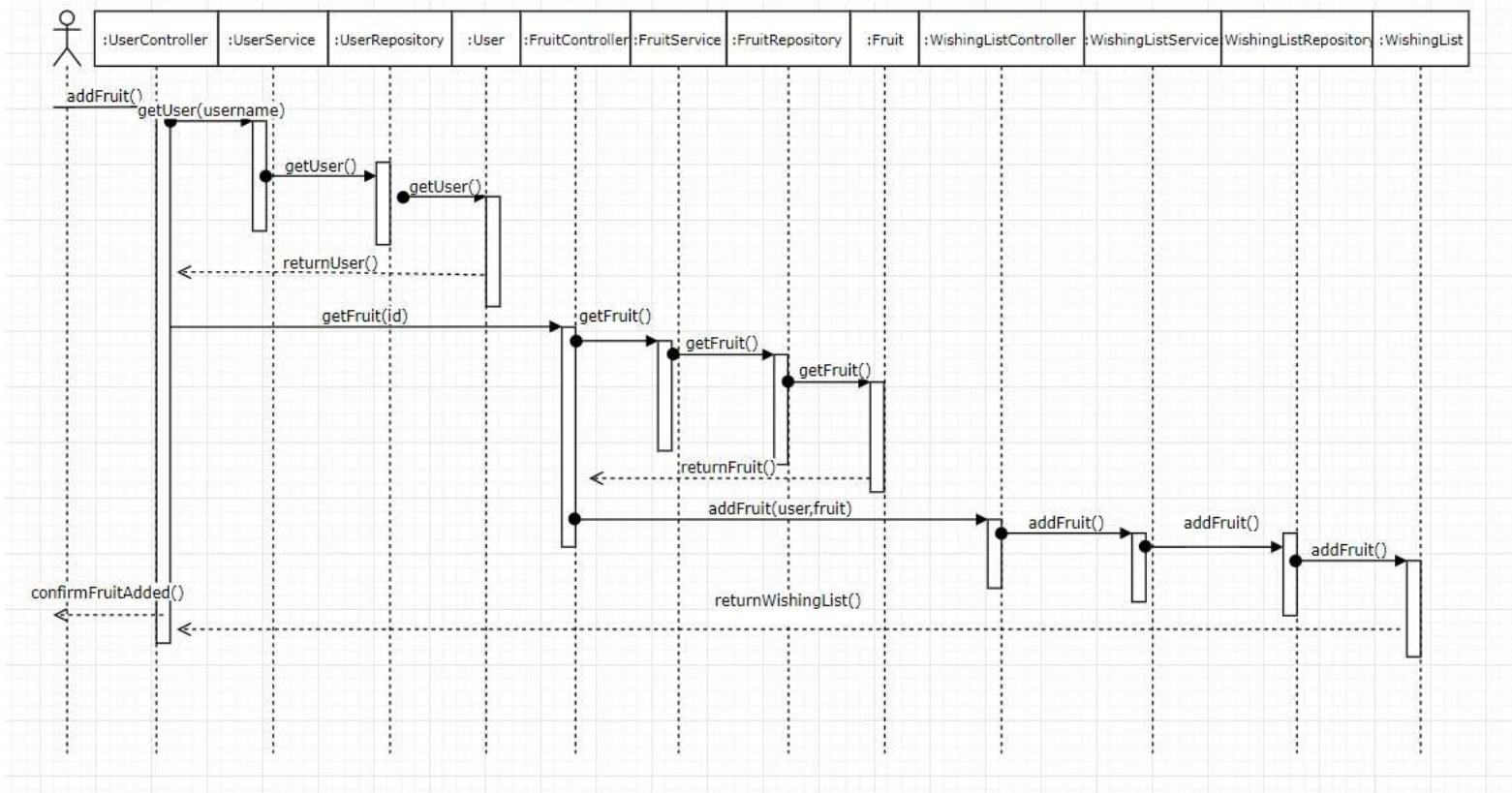
2 Relevant Scenarios are the following:

- ❖ The user wants to obtain a recommended receipe that consists of herbs and fruits for one of his/her sickness.
- ❖ The user wants add a fruit to his/her wishing list – the product is not in stock.

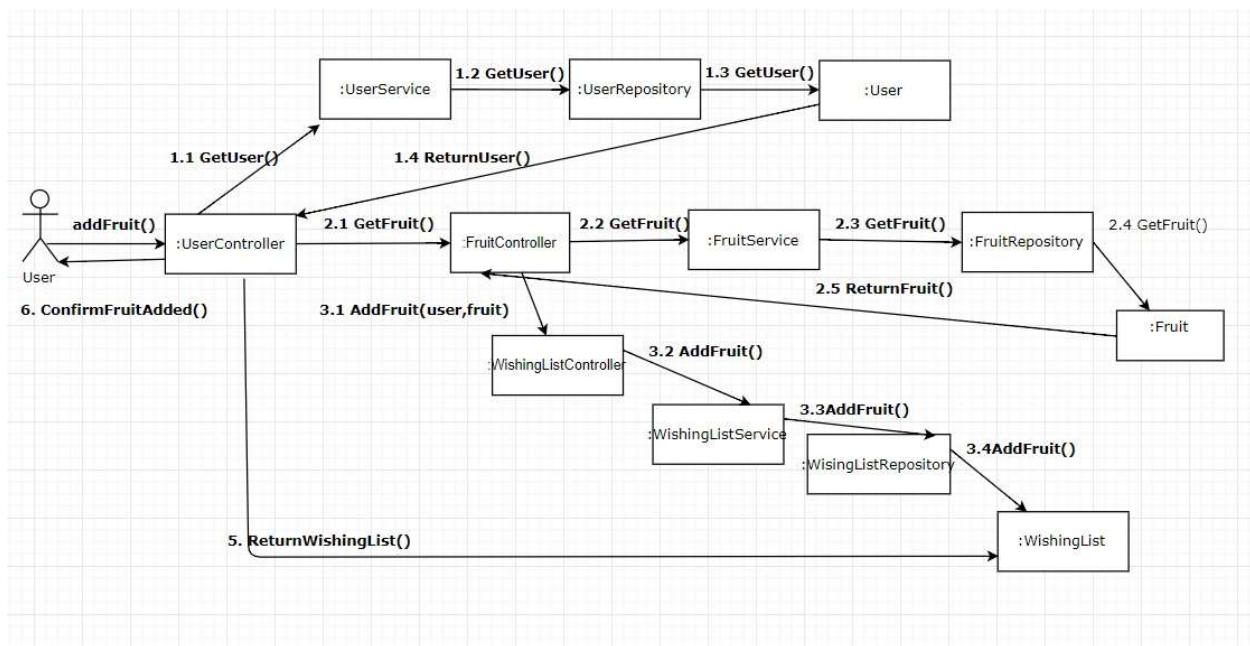
Use case 1: Add fruit to the wishing list

The sequence diagram is the following:

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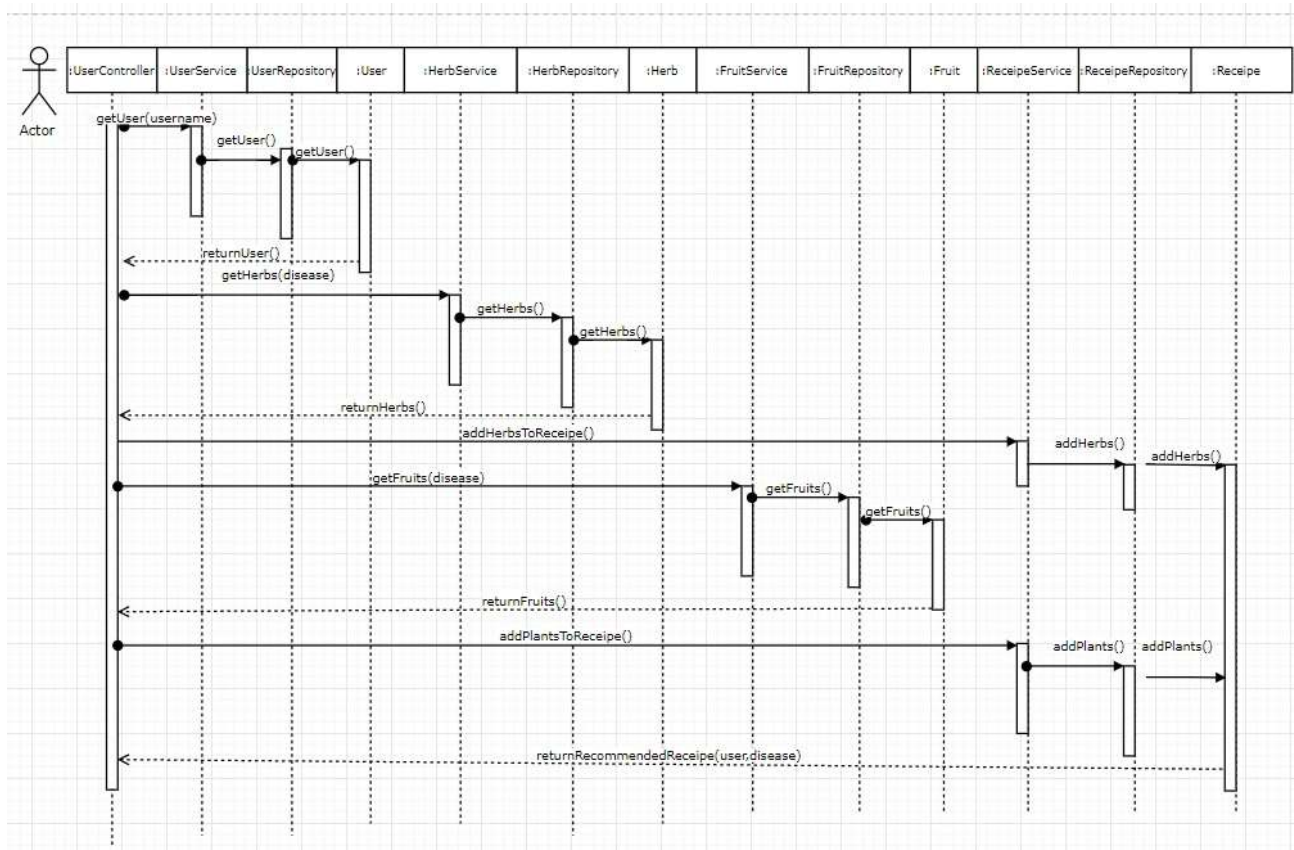
The communication diagram is the following:



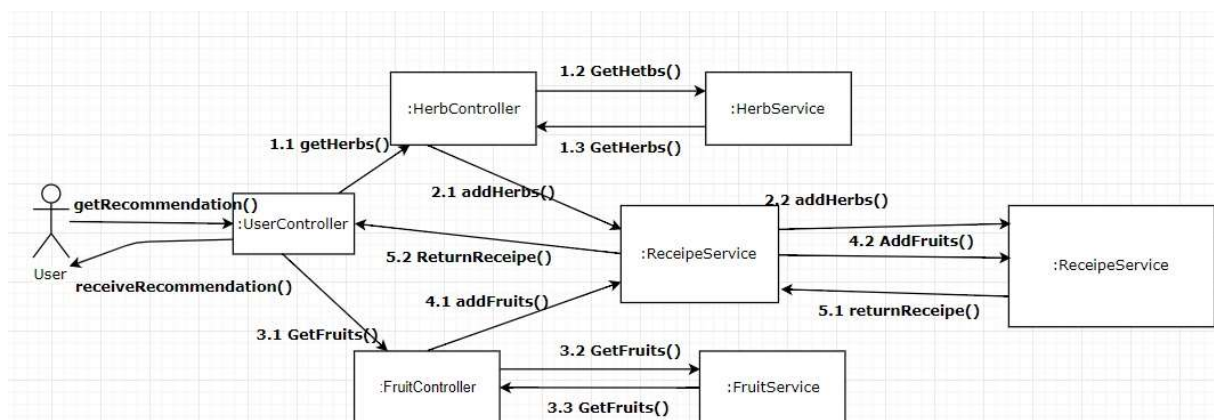
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Use case 2: Get recommended Receptipe

The sequence diagram is the following:

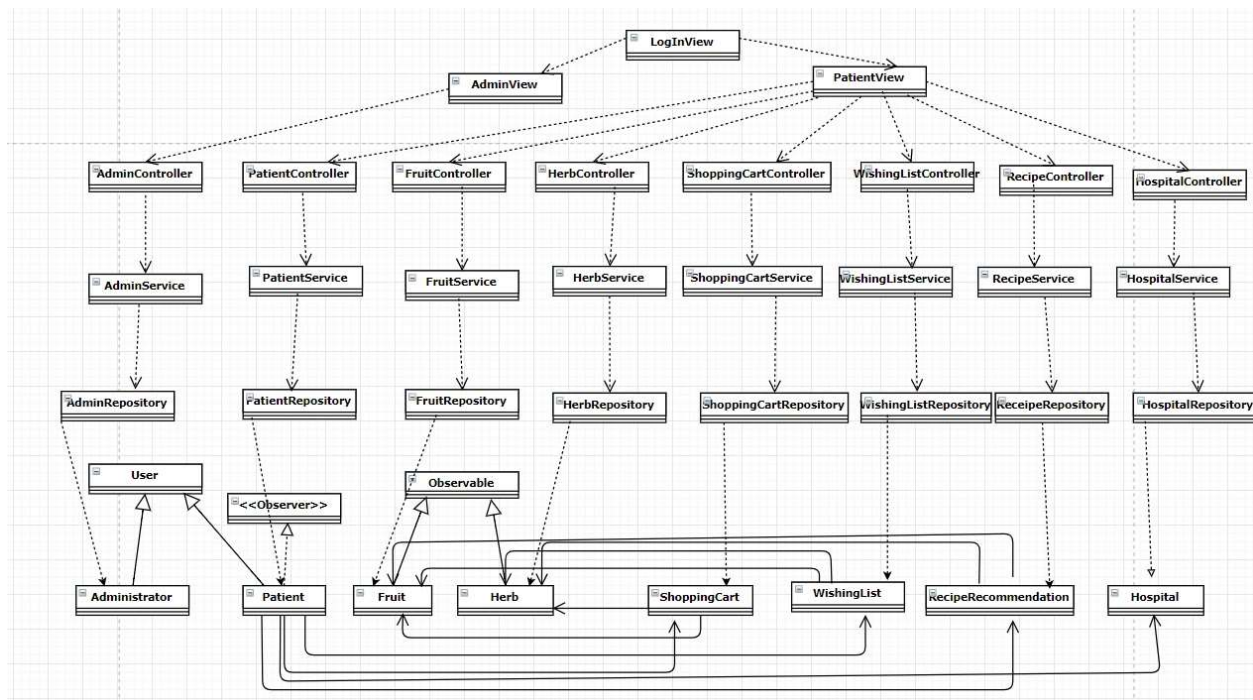


The communication diagram is the following:



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1.2 Class Design



The used design patterns are : Inversion of Control, Dependency Injection, Observer Design Pattern and Builder Design Pattern.

The Observer Design Pattern:

It is used in order to let the patients know when a product, herb or fruit, that they were interested in, is now on stock again. The class Patient will implement the Observer interface and the Fruit and Herb class will extend the Observable superclass.

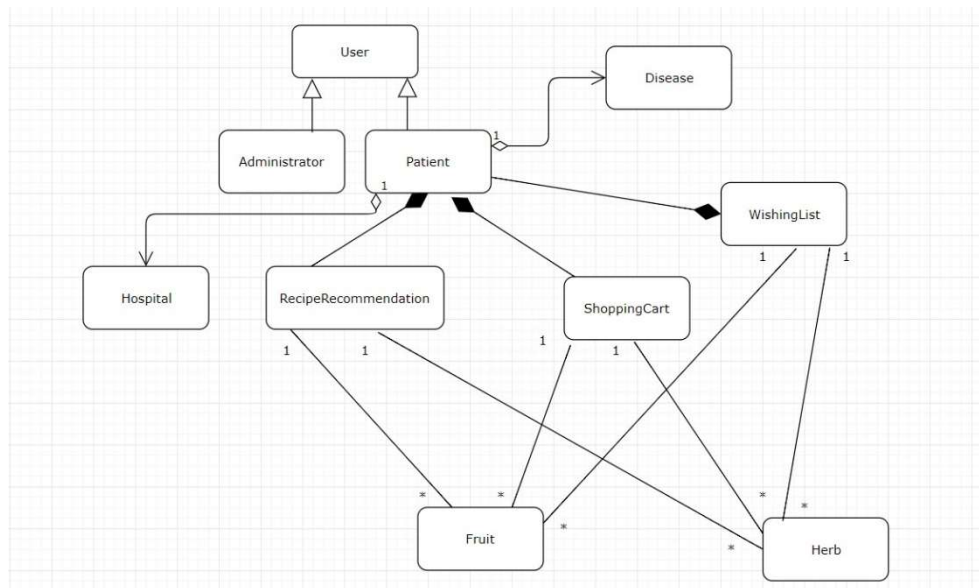
The Builder Design Pattern:

The Builder Design Pattern is used in order to set only certain fields of a class. For example, I choose to use it when creating the DTO classes. We have the main classes from the Entities package, from the Persistence Layer and we want to be able to create different views of the same entity – which is to set a value only on some of the fields of the class.

2. Data Model

The persistence data will be stored in a database. It will be modeled using a Relational Database Model. The database will be generated using an ORM. The used Database Management System is MySQL.

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3. Unit Testing

I will use Mockito to test my application. Mocking is primarily used in unit testing. An object under test may have dependencies on other (complex) objects. To isolate the behaviour of the object we want to test we replace the other objects by mocks that simulate the behavior of the real objects. In short, mocking is creating objects that simulate the behaviour of real objects.

I will write small tests in order to mainly test the functions implemented in the service layer.

IV. Elaboration – Iteration 2

1. Architectural Design Refinement

[Refine the architectural design: conceptual architecture, package design (consider package design principles), component and deployment diagrams. Motivate the changes that have been made.]

2. Design Model Refinement

[Refine the UML class diagram by applying class design principles and GRASP; motivate your choices. Deliver the updated class diagrams.]

V. Construction and Transition

1. System Testing

[Describe how you applied integration testing and present the associated test case scenarios.]

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2. Future improvements

[Present future improvements for the system]

VI. Bibliography