Software Requirements Specification

for

Complete Women Healthcare

Version 0.1

Prepared by Ya Zuo, Linfei Jiang, Grant Margerum, Saurabh Patwari, Lucas Wolf

SANTA CLARA UNIVERSITY

29th May 2017

Table of Contents

Table of Figures

1. Introduction

1.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the "Complete Women Healthcare" (CWH) software. It will illustrate the purpose and complete declaration for the development of the software system. It will also explain system constraints, interfaces, and interactions with users. This document is primarily intended to be proposed to a customer for its approval and as a reference for the development team in creating the first version of this system.

1.2 Intended Audience and Reading Suggestions

The intended audience for this document is Software Engineering Group 1, the project sponsor. The targeted user is the general population of women from age 20 to 70. Throughout this document, the system will be broken up into the following sections: Project Description, System Features, External Interface Requirements, and Nonfunctional Requirements.

1.3 Product Scope

The "Complete Women Healthcare" is a mobile application which works as a one-stop health information centre for women. There will be two kinds of health-related information: general information used as a guideline for women; and customized information based on a user's personal data like age, weight, exercise status, etc. The primary objective is to let women easily get access to health information and resources. This will allow the users to clearly know which actions are required for health maintenance at each stage of their life. Another benefit the user will get is support via the user community where users can share their experience of similar situations. This outreach will allow members to support each other. All in all, this product is for women of all ages.

The health information will be personalized if the user chooses to share their information. This will help women easily find information and resources such as common health issues, preventative health care techniques, and suggestions for diet and exercise. The application will be free to download via a mobile phone store or similar service.

1.4 References

[1] IEEE Software Engineering Standards Committee, "IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications", October 20, 1998.

[2] IEEE The applicable IEEE standards, "IEEE Standards Collection," 2001 edition.

2. Overall Description

2.1 Product Perspective

This application will work as a one-stop health information center for women of different ages. It allows users to get some women's health informations and professional suggestions from doctors, and interact with other users for experience sharing.

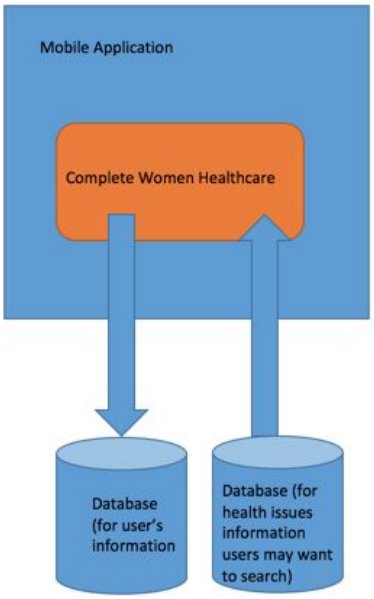

Fig.1 Mobile Application Interface

2.2 Product Functions

There are several major functions that Complete Women Healthcare will perform. The most important function is to provide different contents according to a user's personal status. At the main page, there is a button called "Update Personal Info" where a user can change their personal information like height, weight, pregnancy, etc. Once the user changes their status, health information such as diet and exercise will change

accordingly.

The medical information search result will be viewed in a list-view depending on which keyword the user types in.

The application also provide an online community so that users can communicate with each other and share their experiences. Users will also have the ability to join communities related to a specific topic or a particular ailment.

2.3 User Characteristics

The targeted user is the general population of women. Every user will have to fill out account details in order to create a profile. This profile is used for the personalization features of the application. Users may use limited features based on their needs; for example, users only needing to track their weight may use the Diet and Exercise feature of the application. Another example is users that need suggestions for a particular ailment may use the Community and Database Search feature more often. This shows that although this application is targeted at a general population, the use of application can be catered to an individual user's preference.

2.4 Assumptions and Dependencies

Firstly, we assume the application will be installed on a mobile phone. We assume that age, weight, height, etc. will allow us to accurately determine the appropriate health information per user. We assume the users will be happy to share their experience (in the Community) and would benefit from the interaction. We depend on users to write content in Community so that the feature becomes viable. We assume that users will be comfortable sharing their personal health information and the information provided is accurate. We depend on doctors and other health information repositories to build our general database. We assume we will be able to create algorithms that give appropriate suggestions.

3. Requirement Specifications

3.1 User Interfaces

The first page (figure 1) let users login/sign-in. If the user already has an account, they click login and transition to the login page (figure 2). If user does not have an account, they have to click sign-in and go to

the sign-in page. At the sign-in page, we ask the users to fill out a form (figure 3).

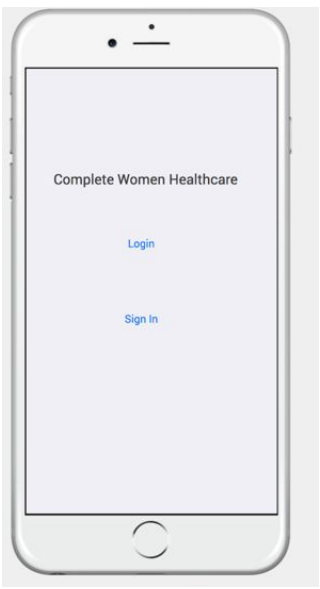

figure 1

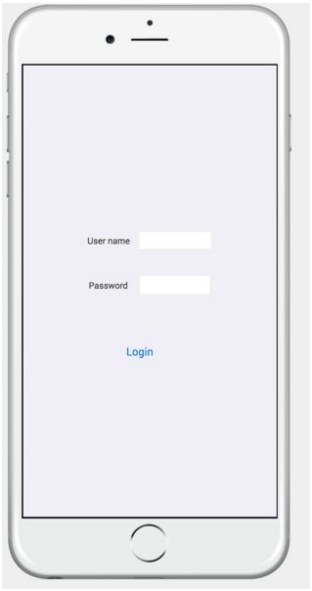

figure 2

figure 3

After users sign-in/login, they move to the Homepage. At the Homepage (figure 4), there is list of functions: Checklist (figure 5), Test to take (figure 6), Diet (figure 7), Exercise (figure 8), Doctor advice (figure 9), Community (figure 10), and Update personal info(show as figure 11). At the top of the Homepage, it will show the user's age, and most of the content of these functions is based on that age. if the user's age is 20, then the "Test to take" feature will list the tests which this age group should complete. Different age groups will have different tests.

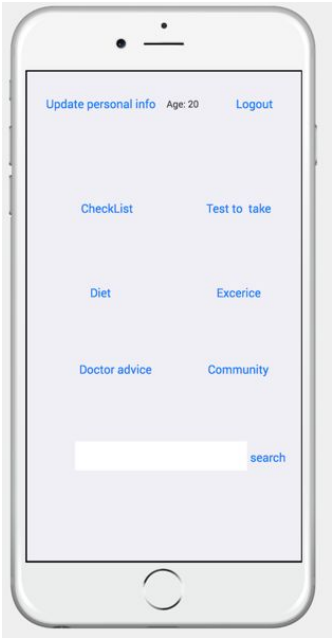

figure 4

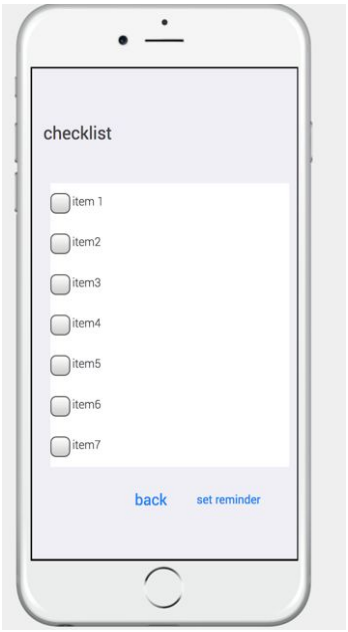

figure 5

figure 6

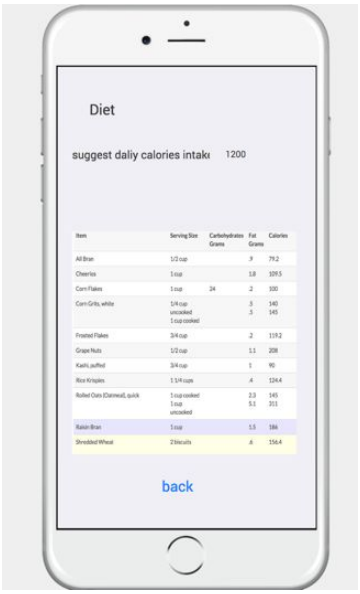

figure 7

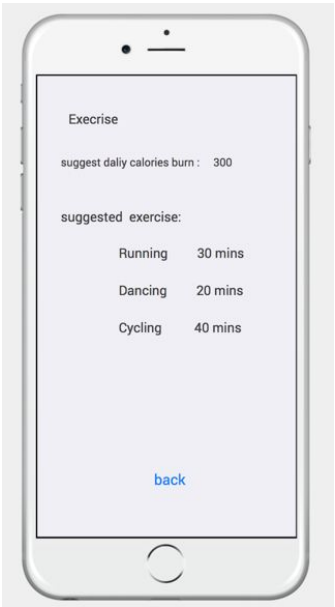

figure 8

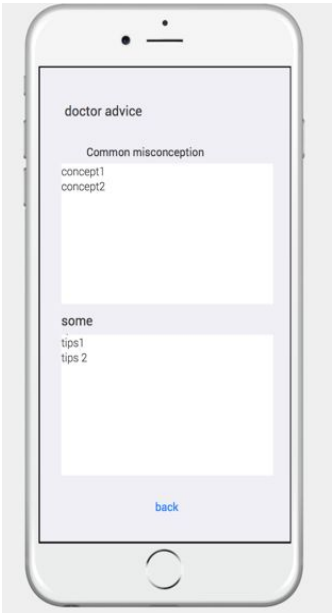

figure 9

figure 10

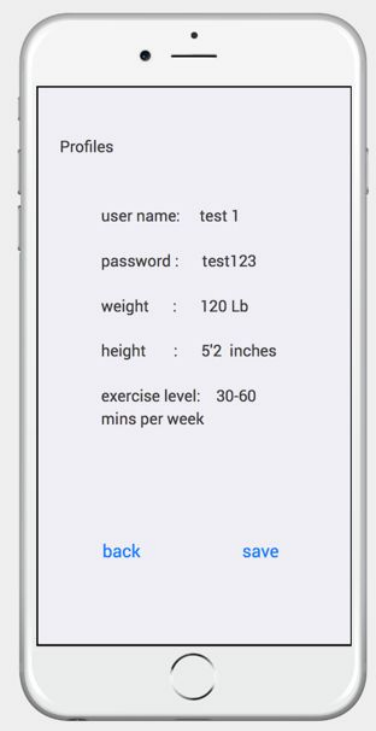

figure 11

3.2 Software and Communications Interfaces

Database: account database, general knowledge database and user community database.

For most of the health suggestions, there is a basic information filter for each user case based on their personal information.

For checklists, we have a subsystem that will take care of reminders. This will be both reminders that users set up themselves, but also optional reminders that our system deems is appropriate for the user.

For both the diet and exercise functions, we have subsystem to calculate suggestions for users.

The client application (UI) will communicate with the application server (backend) via HTTPS. This mechanism be used to authenticate the user and fetch that user's personal information. Subsequent updates to this information will also be sent via HTTPS so as to update the database.

The application server will be connected to a relational database that holds the user's personal data.

The application server will also be connected to a separate relational database that holds the community-related data. As this information is less sensitive, it should not be held to the same data security requirements as the user's personal data. This database's primary purpose is to store topics, posts, comments, moderation state, and other community-related data.

Finally, the application server will also be used to serve general information to the user. This will be comprised of original content submitted by health-care professionals. This will also require a web-based tool to allow these professionals to easily submit articles. A document-oriented database such MongoDB is the suggestion to house this information.

This data will replayed between the client and server via the HTTP mechanism.

4. System Feature

This application uses 7 features of Doctor's advice, Diet, Test to take, Checklist, Exercise, Community and Database Search. But to use these features user has to login. This makes another feature to save and secure the user profile by login. All the features will be explained below with use case for each feature.

4.1 Account

Accounts are used to store a user's personal information, search history, chat history, etc. The personal information includes age, weight, height, pregnancy status, and exercise level. Pregnancy status, weight, height and exercise level are used in most personalization features provided in the application.

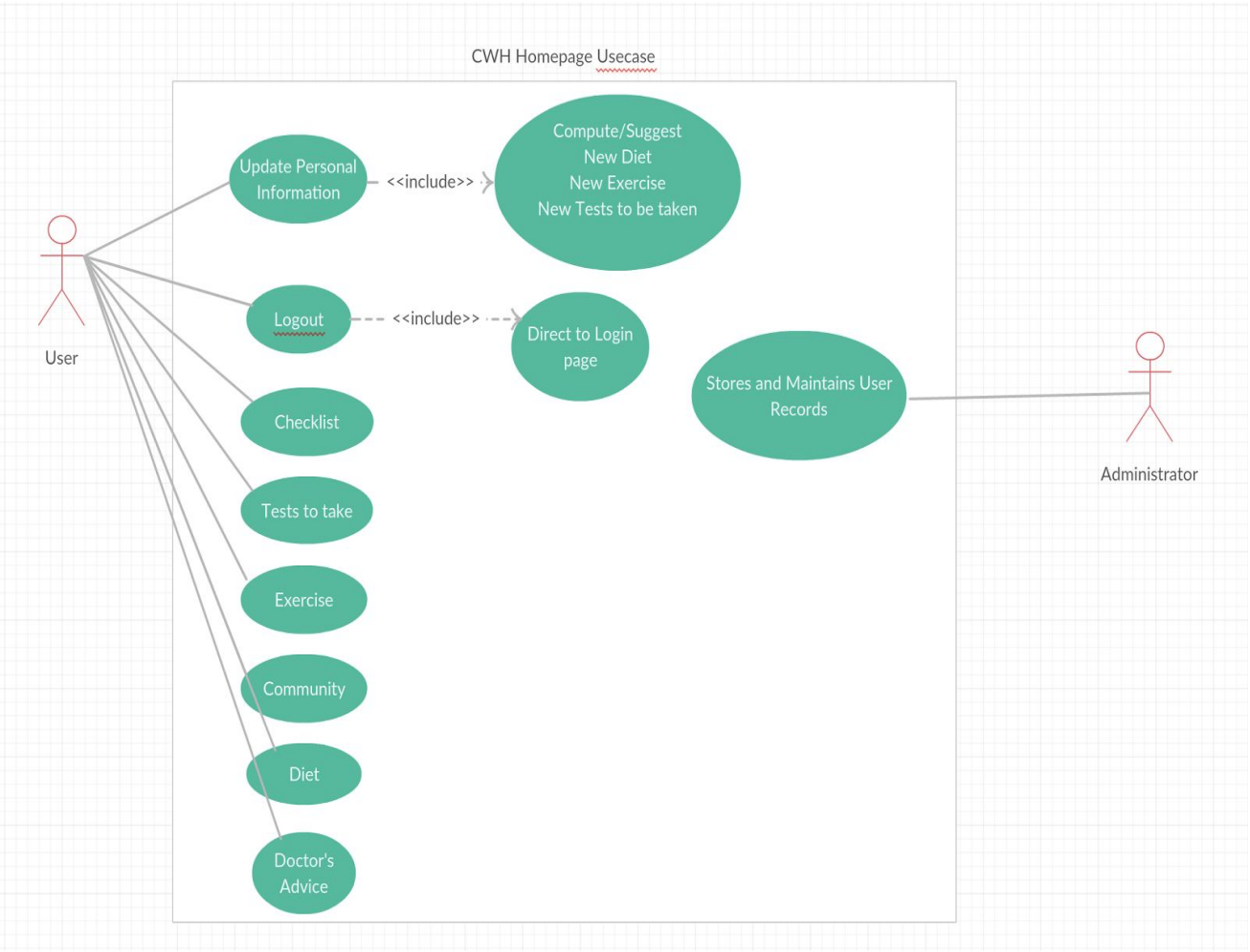

Fig.2 Homepage Use Case

4.1.1 Create User

The signup page will include their username, password, age, pregnancy status, weight, height and exercise level. If the username that user has set is already present then the system will notify user to enter another username.

4.1.2 Login

Users use username and password to login into their account. Username and password are used to identify user. If the username or password entered by the user is incorrect then the system requests user to re enter correct username and password.

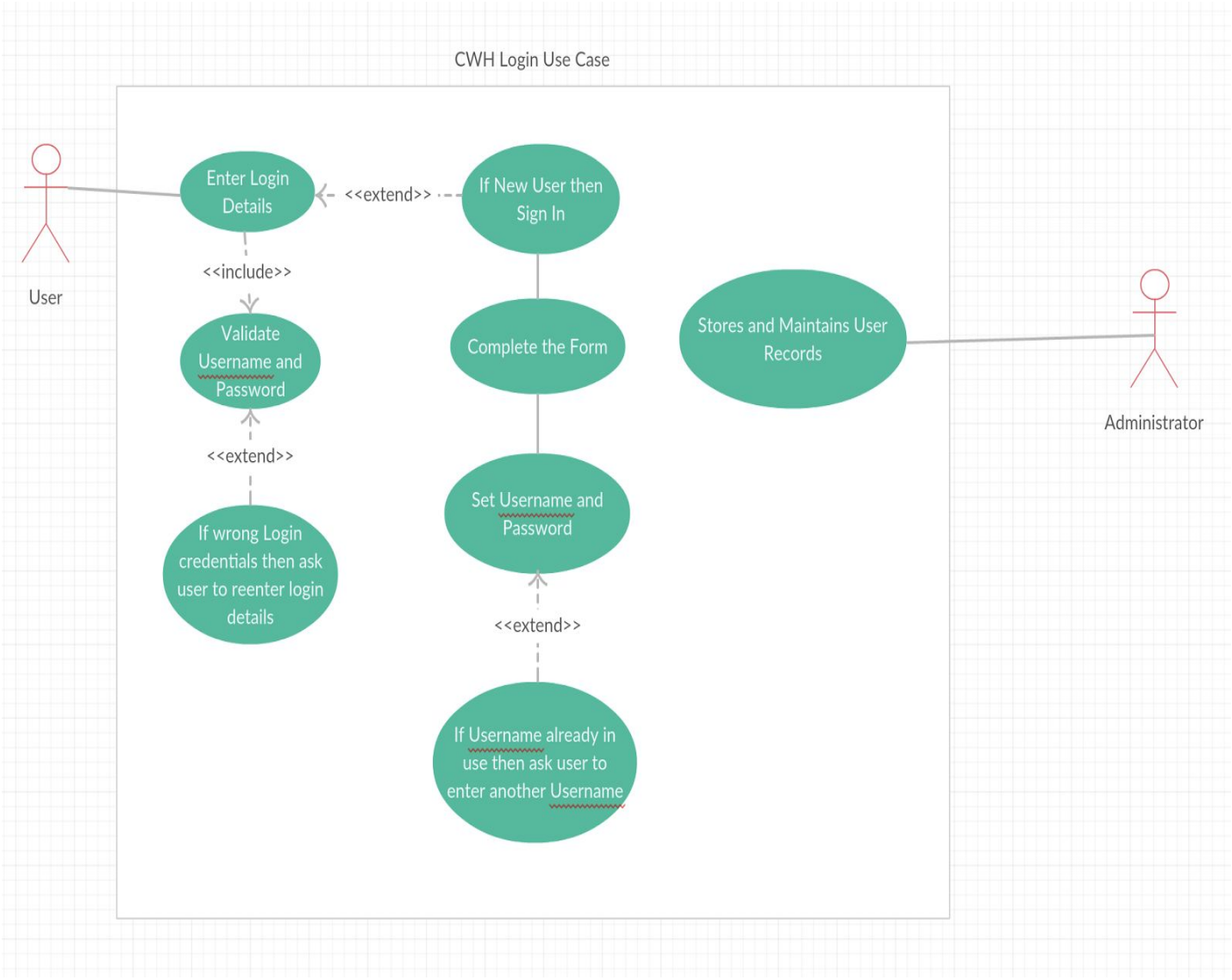

Fig.3 Login Use Case

After login, they can update their personal info and find personalized information.

4.2 Doctor's Advice

4.2.1 Common misconceptions

There are some common misconceptions people have according to experienced doctors. In this section, users will get to know what those misconceptions are and how to prevent them.

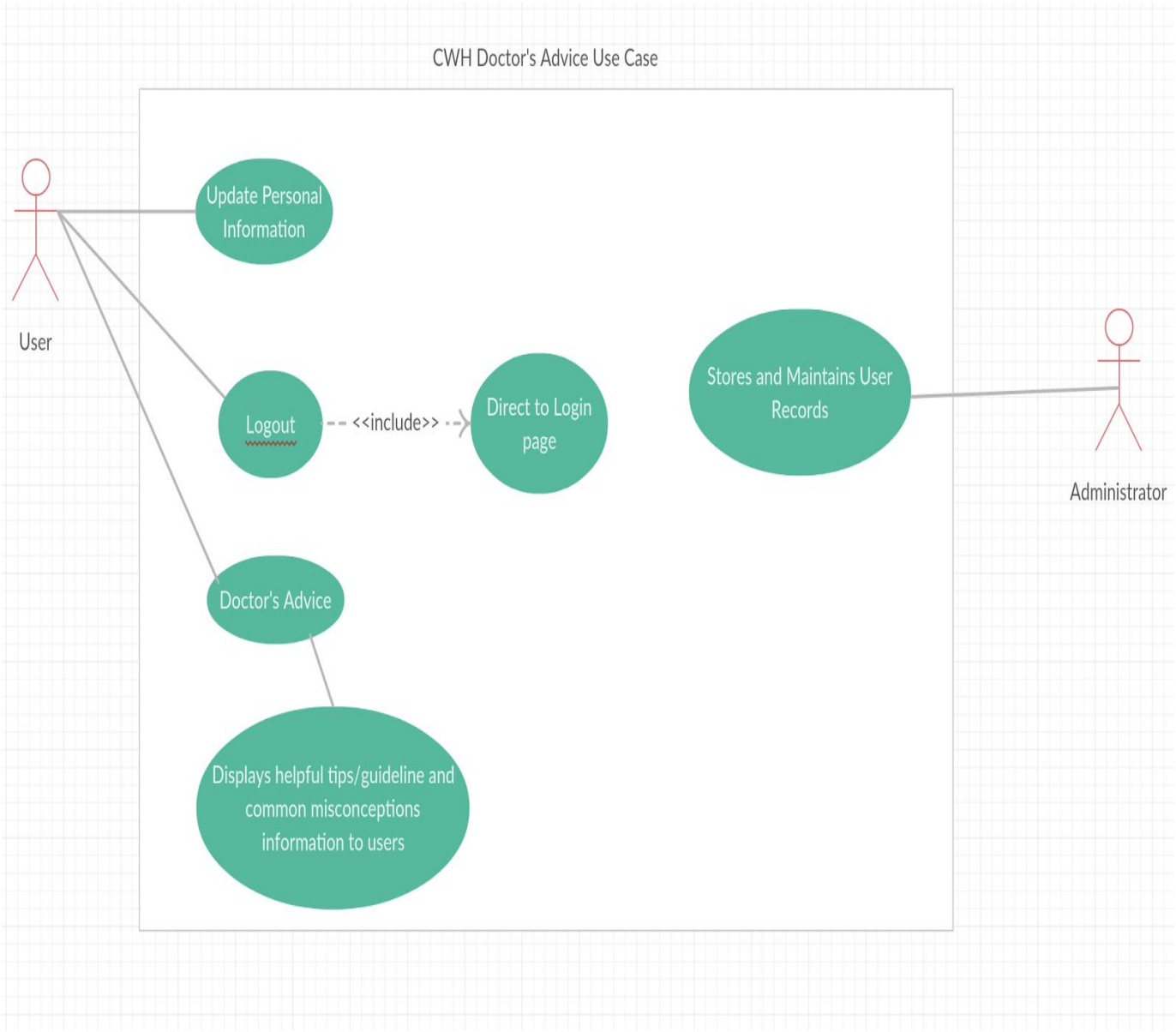

Fig.4 Doctor's Advice Use Case

4.2.2 Guideline / Helpful tips

This section will provide the health suggestions and guidelines from the doctor about what users can do for their health.

4.3 Diet

This section will provide a calculator to compute daily intake calories and show the results.

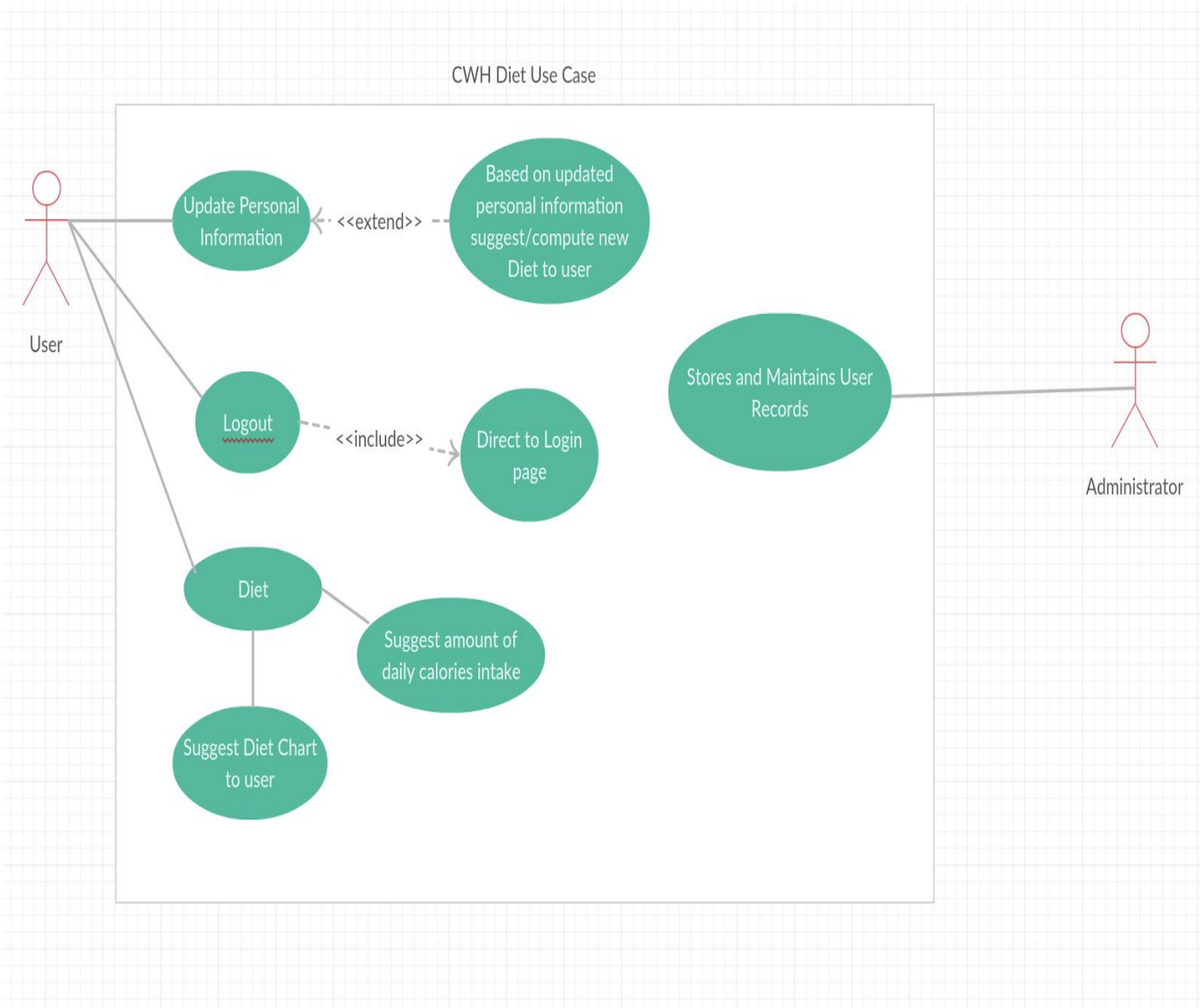

Fig.5 Diet Use Case

Based on the user information provided, the system can estimate nutrient needs such as recommended levels of saturated fat, sodium, potassium, fiber, protein and vitamins. It also provide a food nutrition chart to let users know which foods contain the proper nutrients.

4.4 Test to take

According to a user's age and pregnancy status, it will list some health tests and remind user to do tests regularly.

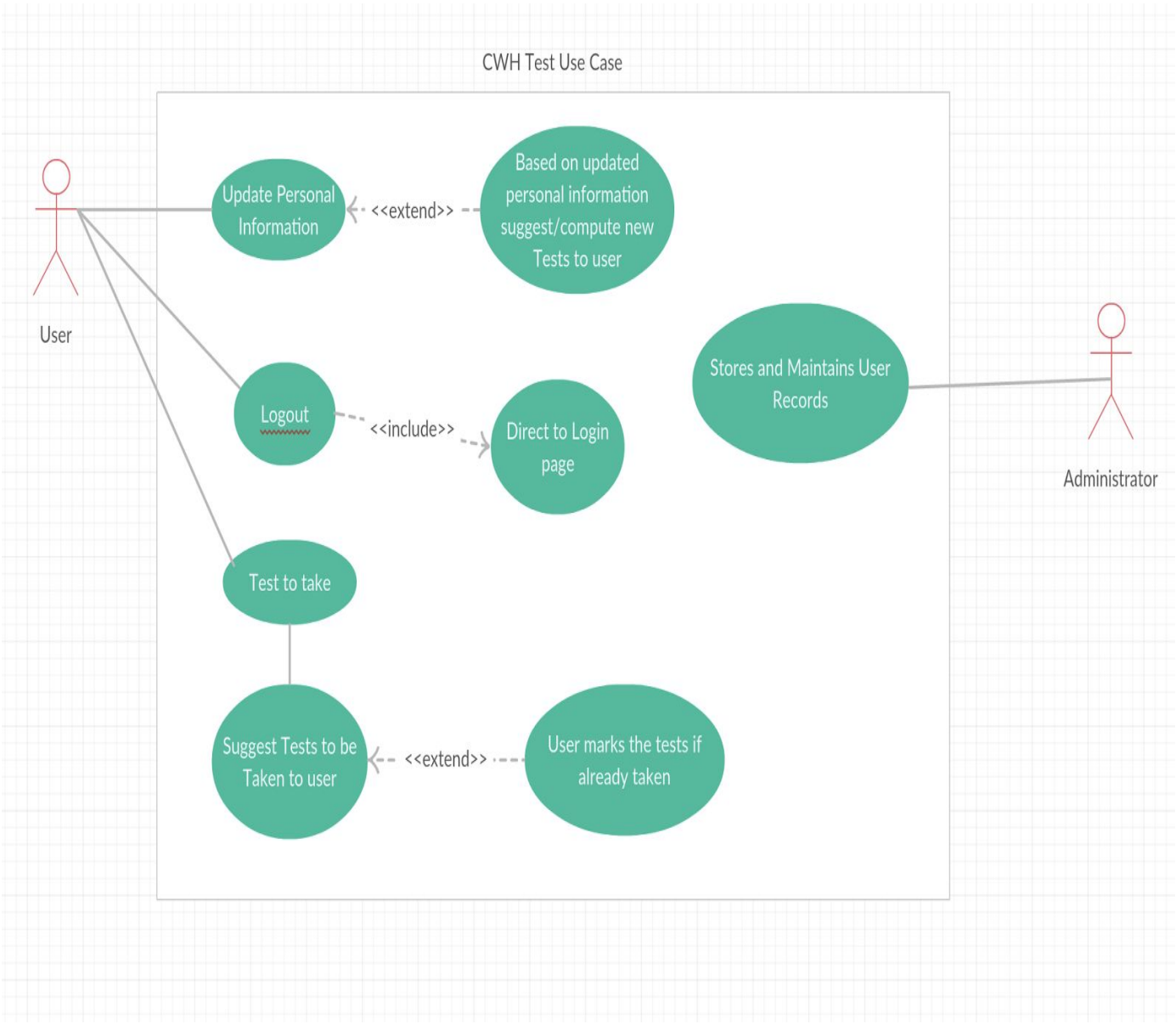

Fig.6 Test Use Case

4.5 Checklist

In this section, the user will have a list of health maintenance activities. For example, these activities can include wearing a seat belt, checking their smoke detector regularly, or visiting the doctor once a year. The users will be able to track their health behavior while ticking the things they have done.

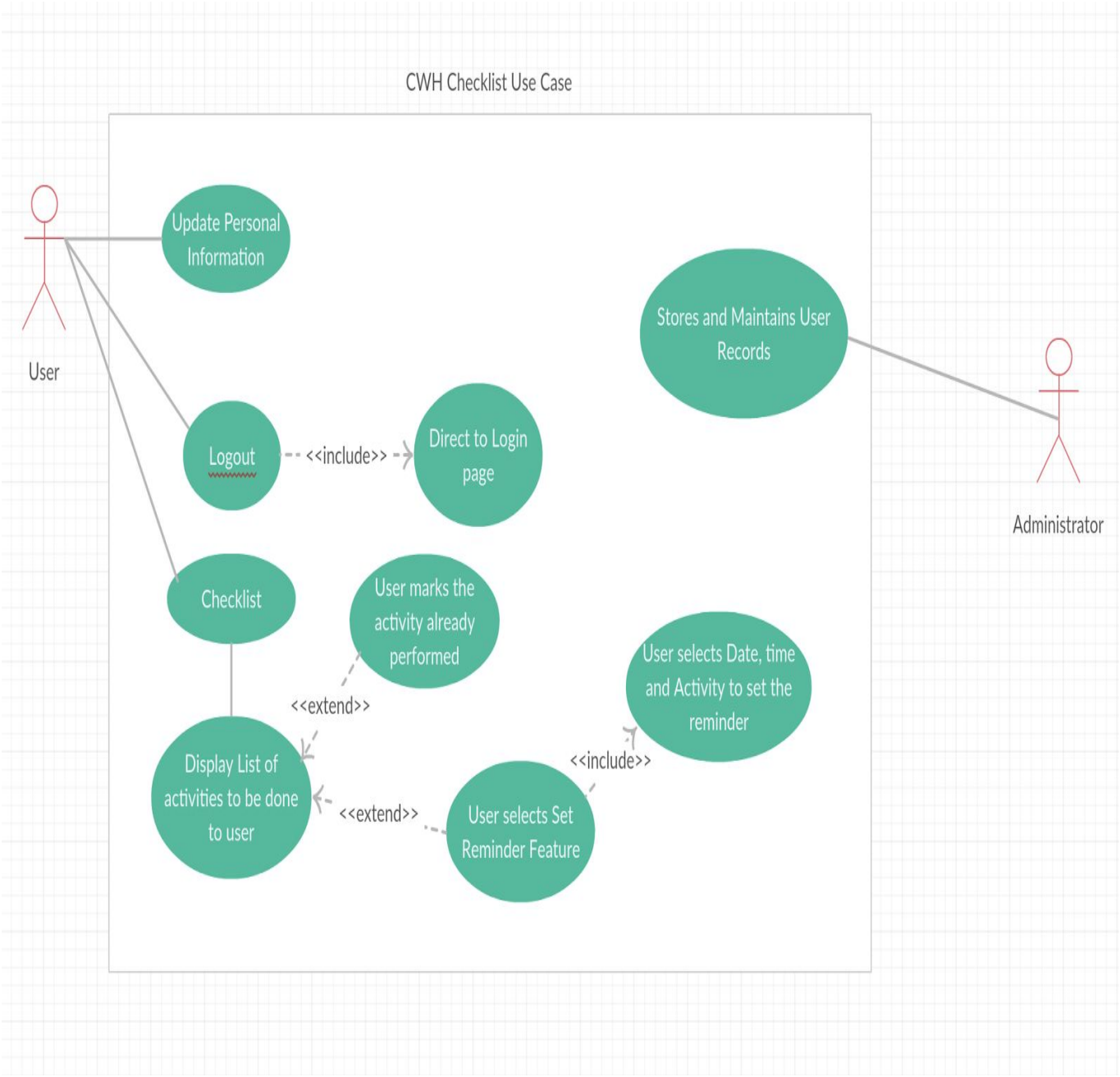

Fig.7 Checklist Use Case

Also, the reminder function is included in the checklist. User can choose to set a reminder to remind them to finish the tasks on the checklist. Possible ways to send these reminders include a pop-up notification or an email to their account. Once they set a reminder, if they finish all suggested tasks, the reminder will reset to the initial status automatically.

4.6 Exercise

This section will provide a suggestion for daily exercises such as running or dancing.

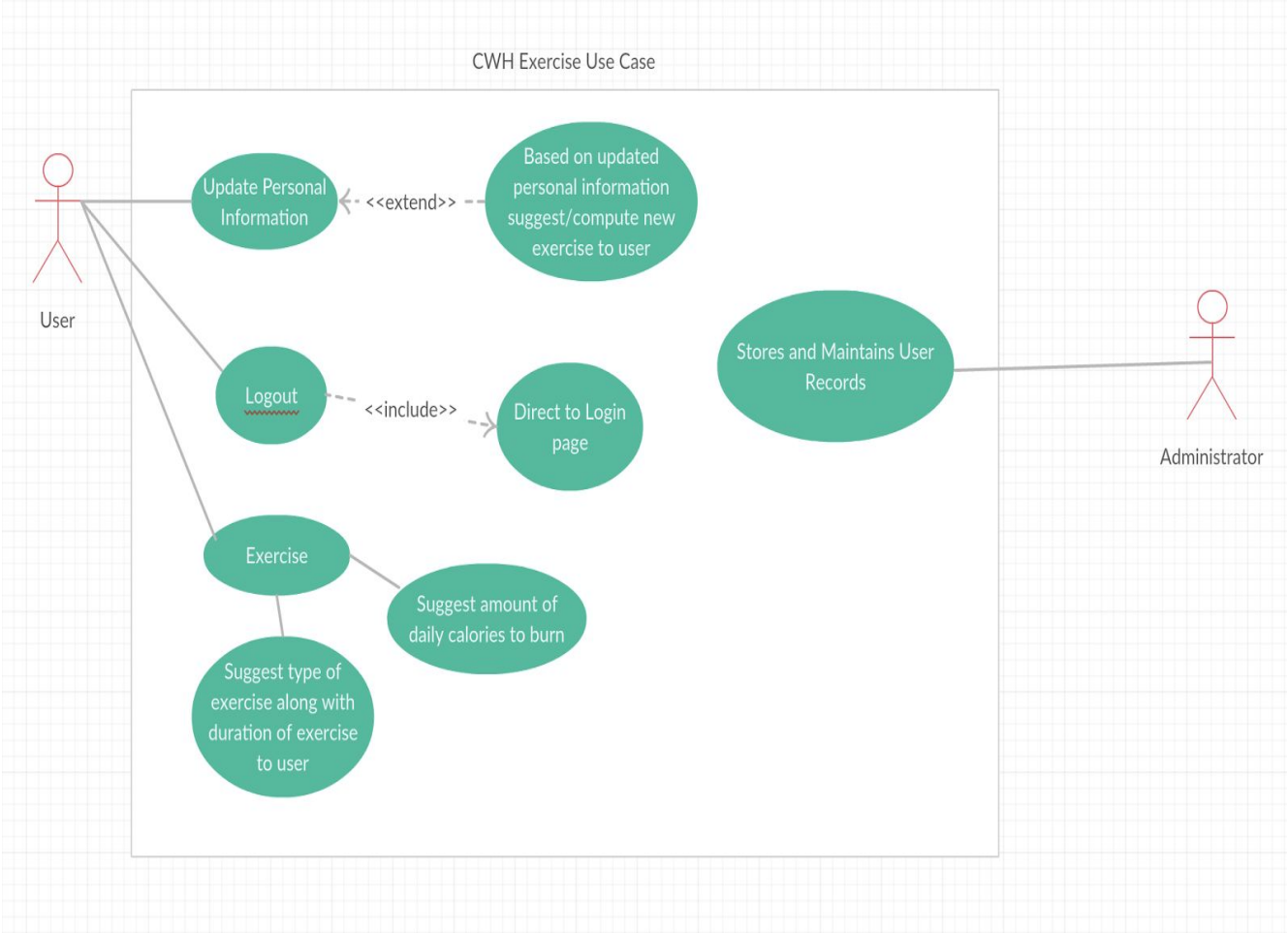

Fig.8 Exercise Use Case

It will use the user's weight and height to calculate how many calories to burn per day. Based on that computation, the application can show how many minutes the user should exercise.

4.7 Community

This feature allows the users to communicate with each other and share their experiences. First time users will be connected to a common group where they will be connected to all the users using the application. This feature will store data related to the user's chat history, followed groups, and group member information.

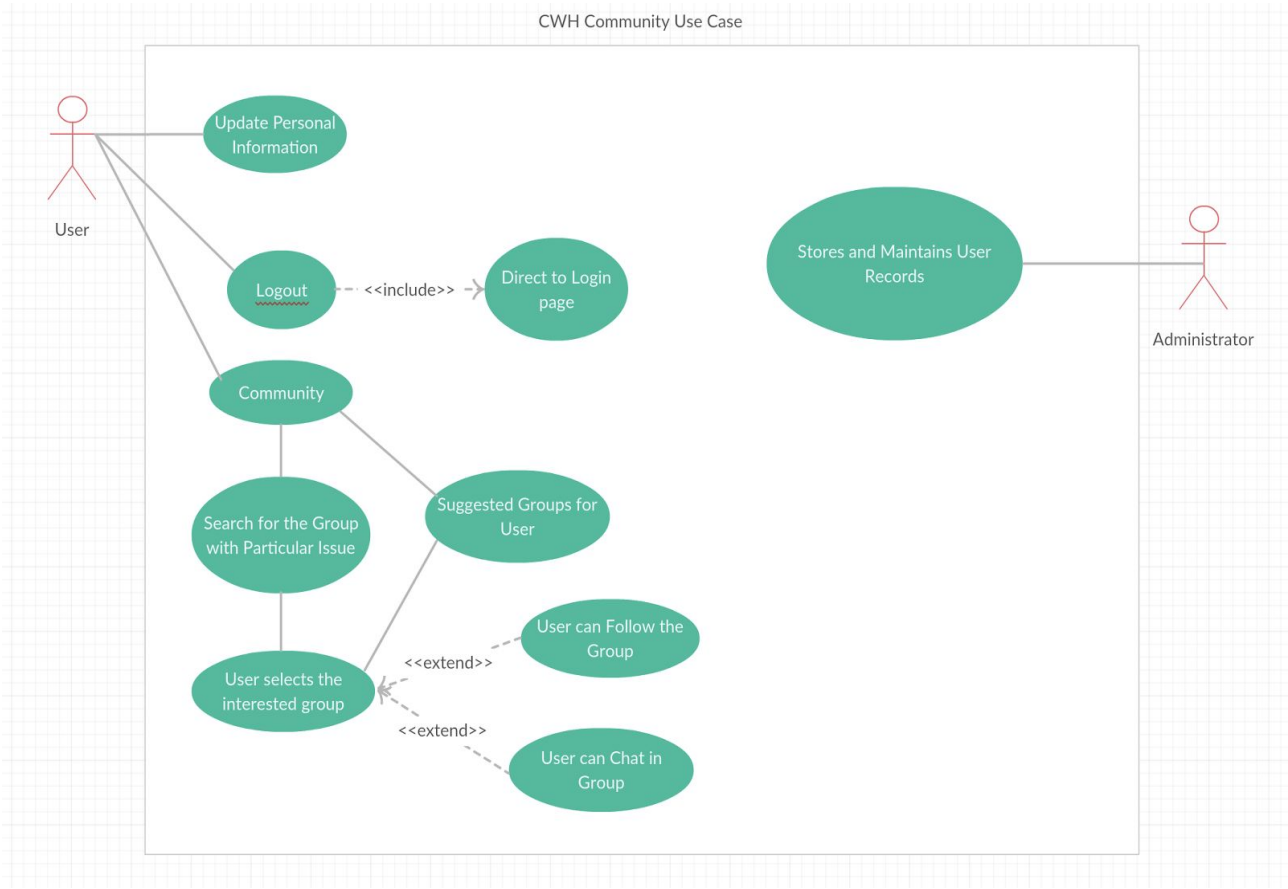

Fig.9 Community Use Case

4.6.1 Join group

User will use the search bar included in the Community page to search for a group to focused on a particular issue. The user can decide whether to follow that group or not. If the user decides to follow the group then that particular group will be stored in the user's community profile. This profile information will be stored in the community database alongside the other community-related data. Users can also select to follow groups suggested by the application.

4.6.2 Chat in Group

When a user selects one group and follows it, the user will have an option to chat with the users present in the group. The user will be able to see which users are online and can message the group about her concerns about an ailment.

4.8 Database Search

If a user wants to search about an ailment or some issue, she can search for it in the search bar provided in the main page. The search will redirect to the page where there will be description about the ailment. It will include Basic Information, Causes, Symptoms, Cure and Prevention.

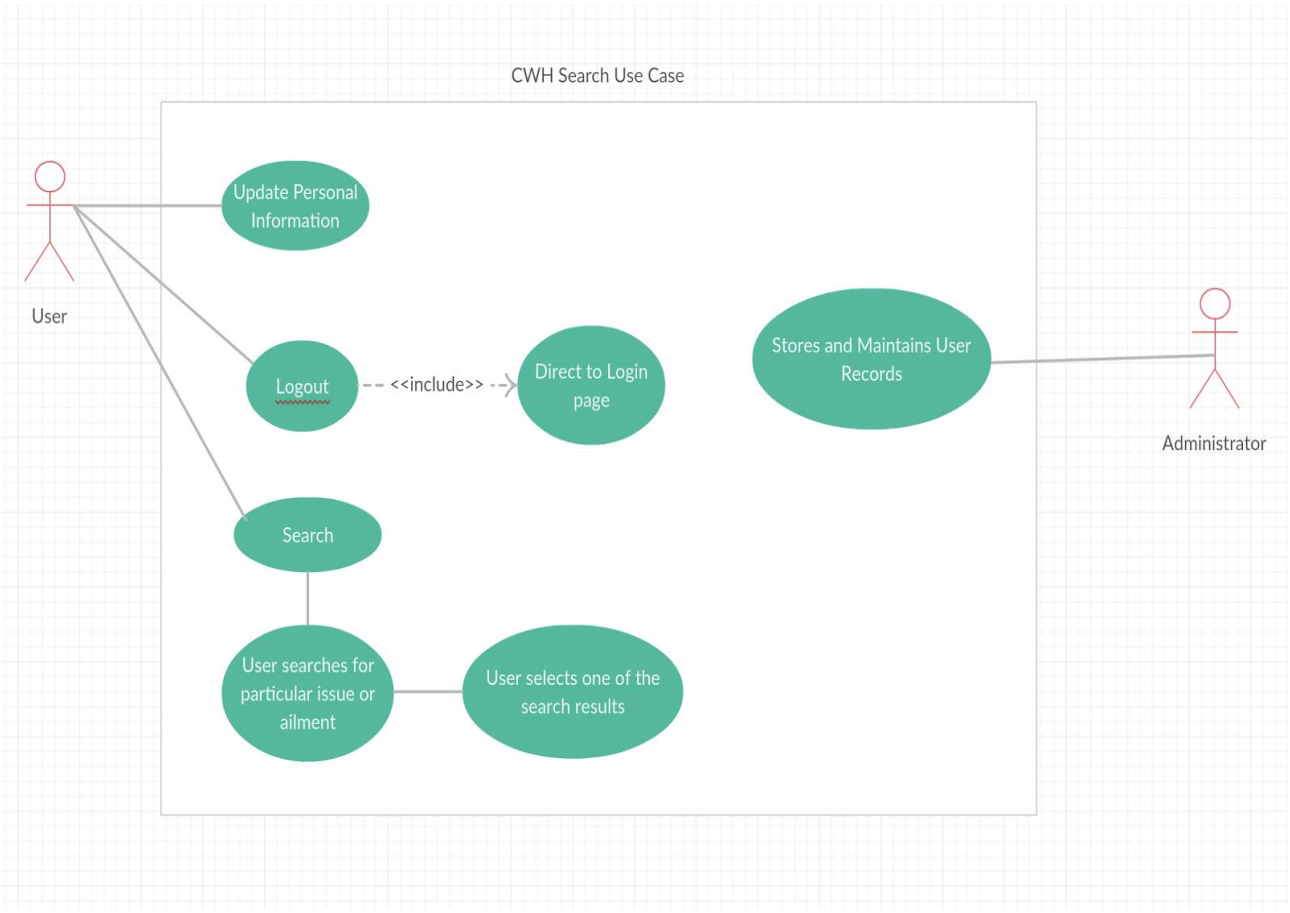

Fig.10 Search Use Case

4.8.1 Record history

This application will keep the search history and then based on the search history, this application will suggest the groups in community part which may related to search history.

5. Nonfunctional requirements

Due to the sensitive nature of personal information, this data must be encrypted at rest. It will only be decrypted when a user is logged in with valid credentials. The decrypted form of this data will be present

in memory only and returned to the user. The data will be always be encrypted when stored on disk. Separate data stores are present with different credentials so as to compartmentalize access.

The login flow will make use of common security protocols such as hashing and salting the password and only storing that hash on disk.