Software Requirement Specification

Diabetes Care

By

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Document History

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Chapter One | Introduction

1.1 Objective

The objective of the Software Requirement Specification document is out line overall requirement of “Diabetes Web application” project. This document has described clearly and accurately descriptively. About detail in Software Requirement Specification is included by function, performance, design consistency, and external interface. This document is based on the project proposal and project plan. It also constraint the general description of user type who is involved with the system.

The Software Requirement Specification document is also a guideline of design the “Diabetes Web application” system

1.2 Intended Audience and Reading Suggestions

This Software Requirement Specification is created for everyone who is involved with this “Diabetes web application” project. It will make convenience for those people as follow

1.2.1 Development Team

- To help the developer understand the requirement and plan how to work together.

1.2.2 Customer

- Help the customer to know the basic requirement of the “Diabetes Web application”

1.3 Project Scope

The main feature of “Diabetes Web application” are as follows:

- Authentication system.
- Account management.
- Nutritionists management.
- Admin management nutritionists.
- Health plan system.
- Statistics glycemic.
- Analyze diabetes.

1.4 Acronyms and Definitions

1.4.1 Acronyms

SRS: Software Requirement Specification
URS: User Requirement Specification
UC: Use Case
AD: Activity Diagram

1.4.2 Definitions

Feature Transformation of input parameters to output parameters based on a specified algorithm. It describes the functionality of a product in the language of the product. Used for requirements analysis, design, coding, testing or maintenance.

User Interface User interface (UI) is everything designed into an information device with which a human being may interact including display screen, keyboard, mouse, light pen, the appearance of a desktop, illuminated characters, help messages, and how an application program or a Web site invites interaction and responds to it. [1]

UML The Unified Modeling Language (UML) is a general -purpose modeling language in the field of software engineering, which is designed to provide a standard way to visualize the design of a system. [2]

Activity Diagram Activity diagrams are graphical representations of the workflows of stepwise activities and actions with support for choice, iteration and concurrency. Activity diagrams show the overall flow of control. [3]

Use Case A use case is a methodology used in system analysis to identify, clarify, and organize system requirements. The use case is made up of a set of possible sequences of interactions between systems and users in a particular environment and related to a particular goal. It consists of a group of elements (for example, classes and interfaces) that can be used together in a way that will have an effect larger than the sum of the separate elements combined. [4]

Use Case Diagram A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system. [5]

Chapter Two | Overall Description

2.1 Product Perspective

"Diabetes Care Web application" is web application to help customer to take care the diabetic. Customer will be convenient to protect complication from diabetes. This system will help customer to be more convenient to organize because the customer will get info to be analyzed from system. In term of visitor, they can search for the information and detail about diabetes. This system will be much more helpful for patient diabetes.

2.2 Product Feature

Diabetes project has separated the whole project to one processors. The description is shown below:

Progress I: Feature#1: Authentication system.
Feature#2: Account management.
Feature#3: Nutritionists management.
Feature#4: Admin management nutritionists.
Feature#5: Health plan system.
Feature#6: Statistics glycemic.
Feature#7: Analyze diabetes.

2.3 User Characteristics

User: User can direct access an application via their desktop, tablets, and phones to every part of this application by requesting internet connection. The patient is the person who can create a health plan and monitor nutrition behavior for preventing theirs from the complications disease. Admin is the person who can manage the account of doctor, nurse, and nutritionists. Doctor/Nurse is the person who can enter patient information into the system and management the activity in a part of insert/update/delete. And the nutritionist is the person who can control the nutrition in part of insert/update/delete.

2.4 Development Environment

Laptops

- DELL
  Processor: Intel(R) Core(TM) i5-6200U CPU @ 2.30GHz 2.14 GHz
  Memory: 4.00 GB (3.90 GB usable)
  System type: 64-bit Operating System.x64-based processor

Chapter Three | Functional Requirement

3.1 User Requirement Specification

Feature#1: Authentication system.

URS-01: The user can log in to a web application.

URS-02: Use can log out from a web application.

Feature#2: Account management.

URS-03: The nurse can enter patient (username, password, name, age, gender, weight, height, diabetes type and date that start treatment) to the database server on a web application.

URS-04: Patient can view information of his on profile page.

URS-05: Patient can edit information on profile page.

URS-06: Patient can change the password for login.

URS-07: Admin can manage nutritionists on administrator page.

URS-08: Admin can manage nurse on administrator page.

URS-09: Admin can manage doctor on administrator page.

Feature#3: Nutrition management.

URS-10: Nutritionists can manage food on nutrition management page.

Feature#4: Activity management

URS-11: Nurse or Doctor can manage activity on activity management page.

Feature#5: Activity plan and recommend system.

URS-12: Patient can select the symptoms on health plan page.

URS-13: Patient can get the suggestion about exercise from the system.

Feature#6: Nutrition plan system.

URS-14: Patient can add food from the database to record in a health plan.

URS-15: Patient can view the average of glycemic index and calorie of food in the selected plan.

URS-16: Patient can delete a food from the health plan.

Feature#7: Health monitor system.

URS-17: Patient can record blood sugar value to the database.

URS-18: Patient can view body mass value that calculated by using BMI = weight (Kg) / (height (m) * height (m)).

URS-19: Patient can view the statistic line graph of blood sugar and body mass.

URS-20: Patient can view interpretation about blood sugar level from the system.

Feature#8: Behavior monitors system.

URS-21: Patient can select food name from the database.

URS-22: Patient can check the list of medicine.

URS-23: Patient can get analyze of nutrition behavior in each day.

URS-24: Patient can view the daily graph of the glycemic level.

3.2 User Requirement specification and Software Requirement Specification

Feature#1: Authentication system.

URS-01: The user can log in to a web application.

Requirement

SRS-01: The system shall provide the login UI to receive username and password.

SRS-02: The system shall provide button “login”.

SRS-03: The system shall validate username and password.

SRS-04: The system shall display error message “Invalid login attempt”, when user input wrong username and password

SRS-05: The system shall display error message the “Please input Username”, when the user does not input username.

SRS-06: The system shall display error message the “Please input Password”, when the user does not input password.

SRS-07: The system shall redirect to behavior page, when the patient login to the web application.

SRS-08: The system shall redirect to home page, when the doctor or nurse login to the web application.

SRS-09: The system shall redirect to administrator page, when admin login to the web application

URS-02: The user can log out from web application.

Requirement

SRS-10: The system shall provide button “Log out”.

SRS-11: The system shall redirect to home page.

Feature#2: Account management.

URS-03: The nurse can be registration patient on a Web Application.

Requirement

SRS-12: The system provides the register UI which includes input fields to input username, password, confirm Password, e-mail, first name, last name, a select box to select gender of patient, age, address, a select box to select diabetes type of patient, height, weight, and start treatment

SRS-13: The system shall provide button “Submit”.

SRS-14: The system shall redirect to home page, when nurse registers patient success.

SRS-15: The system shall validate input field username, password, confirm Password, e-mail, first name, last name, gender, age, address, diabetes type, height, weight, and start treatment.
SRS-16: The system shall provide error message the “email is already taken”, when the user input email is already in the database.
SRS-17: The system shall provide error message the “email is invalid”, when user input wrong format e-mail.
SRS-18: The system shall provide error message the “Username is already taken”, when the user input username is already in the database.
SRS-19: The system shall provide error message the “Username field is required”, when the user does not input username.
SRS-20: The system shall provide error message the “Password field is required”, when the user does not input password.
SRS-21: The system shall provide UI to user input again.
SRS-22: The system shall provide error message the “First Name field is required”, when the user does not input the first name.
SRS-21: The system shall provide UI to user input again.
SRS-23: The system shall provide error message the “Last Name field is required”, when user does not input the last name.
SRS-21: The system shall provide UI to user input again.
SRS-24: The system shall provide two select options male and female in the select box gender of the user.
SRS-25: The system shall provide error message the “Age field is required”, when the user does not input age.
SRS-26: The system shall provide error message “age is invalid”, when user input wrong format age.
SRS-21: The system shall provide UI to user input again.
SRS-27: The system shall provide error message the “Address field is required”, when the user does not input address.
SRS-21: The system shall provide UI to user input again.
SRS-28: The system shall provide two select options diabetes type 1 and diabetes type 2 in the select box diabetes type of user.
SRS-29: The system shall provide error message “height is invalid”, when user input wrong format height.
SRS-30: The system shall provide error message the “Height field” is required, when the user does not input height.
SRS-21: The system shall provide UI to user input again.
SRS-31: The system shall provide error message “weight is invalid”, when user wrong input format weight.
SRS-32: The system shall provide error message the “Weight field” is required, when the user does not input weight.

SRS-21: The system shall provide UI to user input again.

SRS-33: The system shall provide error message the “Start Treatment field” is required. When the user does not input, start treatment.

SRS-21: The system shall provide UI to user input again.

SRS-34: The system shall save user information to database, when user input data success.

SRS-35: The system shall redirect to home page, when registration is a success.

URS-04: The patient can view information of his on profile page.

Requirement

SRS-36: The system shall provide link redirect to profile page.

SRS-37: The system shall redirect to the profile page.

SRS-38: The system shall display the information of the user.

URS-05: The patient can edit information on the profile page.

Requirement

SRS-39: The system shall provide UI, which includes input fields to input username, password, confirm Password, e-mail, first name, last name, a select box to choose gender, age, address, a select box to select diabetes type, height, weight, and start treatment for edit patient info.

SRS-13: The system shall provide button “Submit”.

SRS-40: The system shall redirect to a profile page, when patient edit information success.

SRS-40: The system shall validate input field Username, Password, Confirm Password, E-mail, First Name, Last Name, Gender, Age, Address, Diabetes Type, Height, Weight, Start treatment

SRS-41: The system shall provide error message “e-mail is invalid”, when user input wrong format phone number.

SRS-42: The system shall provide error message “age is invalid”, when user input wrong format age.

SRS-43: The system shall provide error message “height is invalid”, when user input wrong format height.

SRS-44: The system shall provide error message “Weight is invalid”, when user wrong input format weight.

SRS-45: The system shall save change in the database.

URS-06: The patient can change the password for login.

Requirement

SRS-46: The system shall provide input fields to current input password, new password, confirm the password.

SRS-13: The system shall provide button “Submit”.

SRS-47: The system shall redirect to the profile page, when user change password success.

SRS-48: The system shall validate the input fields current password, new password, confirm the password.

SRS-49: The system shall provide error massage “current password is field”, when the current password not correct.

SRS-50: The system shall provide error massage “new password is field”, when new password not same confirm the password.

SRS-51: The system shall provide error massage “new password and confirm password does not match”, when user input a new password and confirm password does not match.

URS-07: Admin can manage the account on administrator page.

Requirement

SRS-52: The system shall provide UI to create new account include input fields to input username, password, first name, last name, and selection box to select the role of the user.

SRS-53: The system shall provide three select options doctor, nurse, and nutritionists in the select role of the user.

SRS-13: The system shall provide “Submit” button.

SRS-54: The system shall save data in the database, when admin click button “Submit”.

SRS-55: The system shall redirect to the home page of account management, when admin creates new account success.

SRS-56: The system shall provide UI to edit include input fields to input username, password, first name, last name, and selection box to select the role of the user.

SRS-53: The system shall provide three select options doctor, nurse, and nutritionists in the select role of the user.

SRS-13: The system shall provide “Submit” button.

SRS-57: The system shall save change data in the database, when admin click button “Submit”.

SRS-58: The system shall redirect to a home page of account management, when edit accounts success.

SRS-59: The system shall provide “Delete” button.

SRS-60: The system shall delete the account from the database, when admin click button “Delete”.

Feature#3: Nutrition management.

URS-10: Nutritionists can manage food on nutrition management page.

Requirement

SRS-59: The system shall provide UI to create new foods which include input field to input food name, glycemic index, and calorie.

SRS-60: The system shall validate input field food name, glycemic index, and calorie.

SRS-61: The system shall provide error message “glycemic index is invalid”, when user wrong input format.
SRS-62: The system shall provide error message “calorie is invalid”, when user wrong input format.
SRS-13: The system shall provide “Submit” button.
SRS-63: The system shall save data in the database, when nutritionists click button “Submit”.
SRS-64: The system shall redirect to the home page of nutrition management, when to create new foods success.
SRS-65: The system shall provide UI to edit include input field to input food name, glycemic index, and calorie.
SRS-60: The system shall provide error message “glycemic index is invalid”, when user wrong input format.
SRS-61: The system shall provide error message “calorie is invalid”, when user wrong input format.
SRS-13: The system shall provide “Submit” button.
SRS-66: The system shall save change data in the database, when nutritionists click button “Submit”.
SRS-67: The system shall redirect to the home page of nutrition management, when to edit food success.
SRS-59: The system shall provide “Delete” button.
SRS-68: The system shall delete foods from the database, when nutritionists click button “Delete”.

Feature#4: Activity management.

URS-11: Nurse or Doctor can manage activity on activity management page.

Requirement

SRS-69: The system shall provide UI to create the new activity which includes input field patient symptom and exercise advice to a database.
SRS-13: The system shall provide “Submit” button.
SRS-70: The system shall save data in the database, when nurse/doctor clicks button “Submit”.
SRS-71: The system shall redirect to a home page of activity management, when to create new activity success.
SRS-72: The system shall provide UI to edit the data include input field patient symptom and exercise advice to a database.
SRS-13: The system shall provide “Submit” button.
SRS-73: The system shall save change data in the database, when nurse/doctor click button “Submit”.
SRS-74: The system shall redirect to the home page of activity management, when editing activity success.
SRS-59: The system shall provide “Delete” button.

SRS-75: The system shall delete an activity from the database, when nurse/doctor click button “Delete”.

Feature#5: Activity plan and recommend system.

URS-12: The patient can select the symptoms on health plan page.

Requirement

SRS-76: The system shall provide a select box to select symptoms of the patient.

SRS-77: The system shall provide five select option ที่มีปัญหาข้อเข่า ข้อเท้าหรือเท้า, ผู้ที่เป็นปลายประสาทอักเสบ มีอาการชาเท้า, ผู้ที่เบาหวานขึ้นตา, ผู้ที่มีโรคหัวใจ in the select box symptoms of patient.

SRS-78: The system shall provide “select” button.

URS-13: The patient can get the suggestion about exercise from a system.

Requirement

SRS-79: The system shall provide information which includes symptom detail, exercise appropriate, exercise inappropriate, and steps of exercise, when patient select the symptoms success.

Feature#6: Nutrition plan system.

URS-14: The patient can select food from the database to record in the health plan.

Requirement

SRS-80: The system shall provide a select box to select food name from the database.

SRS-81: The system shall provide select options list of food name.

SRS-82: The system shall provide “Add” button.

SRS-83: The system shall remember the food that selected to the database of user food.

SRS-84: The system shall review food to the user, when success process.

URS-15: The patient can view the average of glycemic index and calorie of food in the selected plan.

Requirement

SRS-85: The system shall provide text number of an average glycemic index.

SRS-86: The system shall provide text number of average calorie.

URS-16: The patient can delete the food from the health plan.

Requirement

SRS-87: The system shall provide a button to “delete” food from the list.

SRS-89: The system shall delete a food from the list of the health plan.

SRS-90: The system shall save change in the database of user food.

Feature#7: Health monitors system.

URS-17: The patient can record blood sugar value to the database.

Requirement

SRS-91: The system shall provide input field to input blood sugar.

SRS-92: The system shall provide button “add” to a user.

SRS-93: The system shall record the value in the database.

SRS-94: The system shall validate input field blood sugar.

SRS-95: The system shall provide error message “blood sugar is invalid”, when the user input wrong format blood sugar.

SRS-96: The system shall provide error message “blood sugar cannot be negative”, when the user input blood sugar minus value.

URS-18: Patient can view body mass value that calculated by using BMI = weight (Kg) / (height (m) * height (m)).

Requirement

SRS-96: The system shall calculate body mass from information (weight, height) of patient by using BMI = weight (Kg) / (height (m) * height (m)).

SRS-97: The system shall display body mass (BMI, BMR) on health plan page.

URS-19: The patient can view the statistic line graph of blood sugar and body mass.

Requirement

SRS-99: The system shall provide line graph.

SRS-100: The system shall request blood sugar value and BMI value from the database.

SRS-101: The system shall display blood sugar value and BMI value in the graph.

URS-20: The patient can view interpretation about blood sugar level from the system.

Requirement

SRS-102: The system shall provide UI for display recommend to the user include (levels of diabetes, Symptom, How to take care).

SRS-103: The system shall request the blood sugar value to analyze and find the levels of diabetes.

SRS-104: The system shall display the levels of diabetes and symptom and how to take care.

Feature#8: Behavior monitors system.

URS-21: The patient can select food name from the database.

Requirement

SRS-80: The system shall provide a select box to select food name from the database.

SRS-81: The system shall provide select options list of food name.

SRS-105: The system shall provide “select” button.

SRS-106: The system shall review food that selected to the user.

URS-31: The patient can check the list of medicine.

Requirement

SRS-107: The system shall provide a checkbox to check the list of medicine.

URS-32: The patient can get analyze of nutrition behavior in each day.

Requirement

SRS-108: The system shall provide image color to display result analyze.

SRS-109: The system shall provide three colors which include green, yellow, and red.

SRS-110: The system shall request data of food and medicine in each day to analyze.

SRS-111: The system shall display analyze result green color, when the user gets glycemic index value less than 120 and check all list of medicine.

SRS-112: The system shall display analyze result yellow color, when the user gets glycemic index value more than 120 and check all list of medicine or get glycemic index value less than 120 and not check all list of medicine.

SRS-113: The system shall display analyze result red color, when the user gets glycemic index value more than 120 and not check all list of medicine.

URS-33: The patient can view the daily graph of the glycemic level.

Requirement

SRS-114: The system shall provide line graph.

SRS-115: The system shall get glycemic index value from foods that selected.

SRS-116: The system shall calculate the glycemic index value.

SRS-117: The system shall display the glycemic value of foods that calculated on the graph.

Chapter Four | Specification Requirement

4.1 Use Case Scenarios

4.1.1 Use Case Diagram All Feature

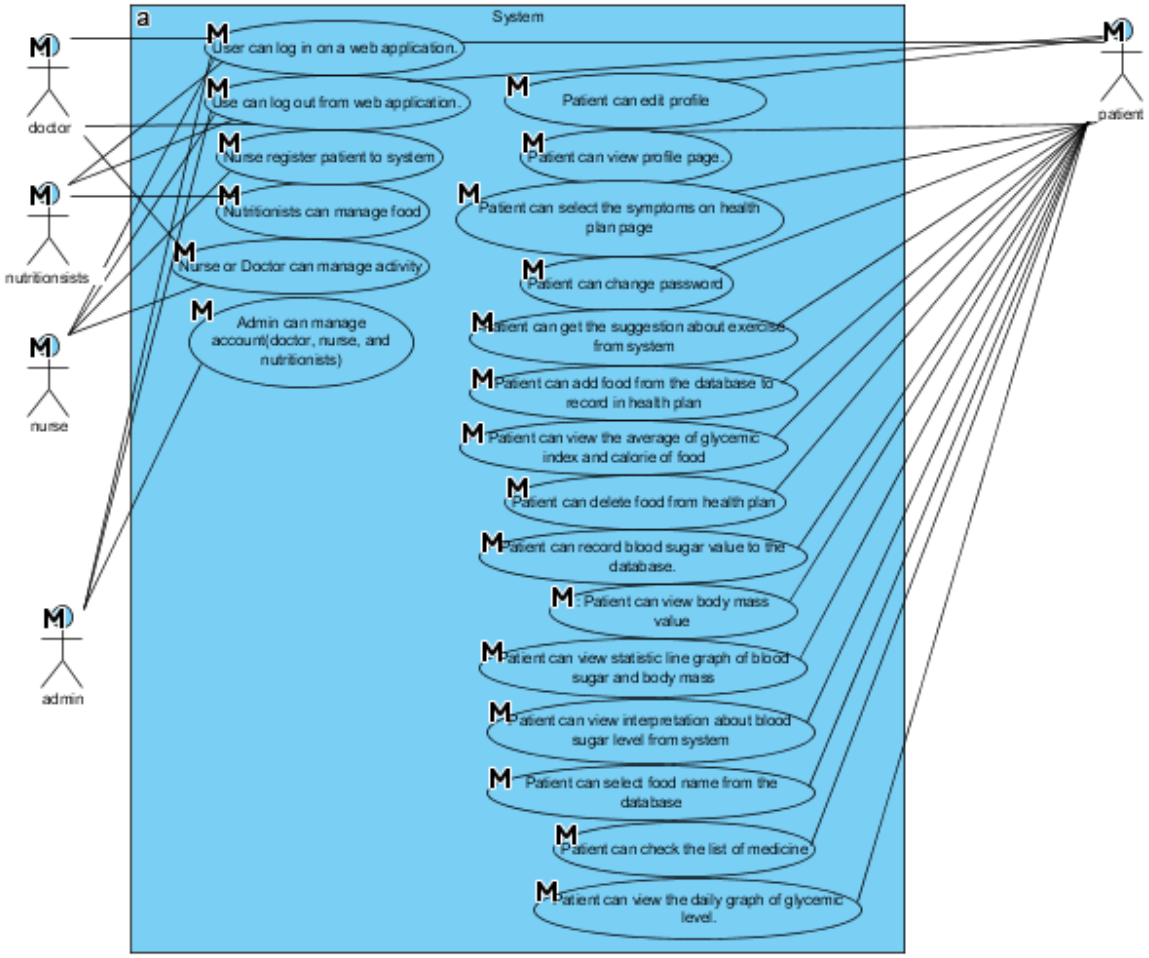

Figure 1: Use Case diagram of Diabetes

Use Case Diagram: Authentication system.

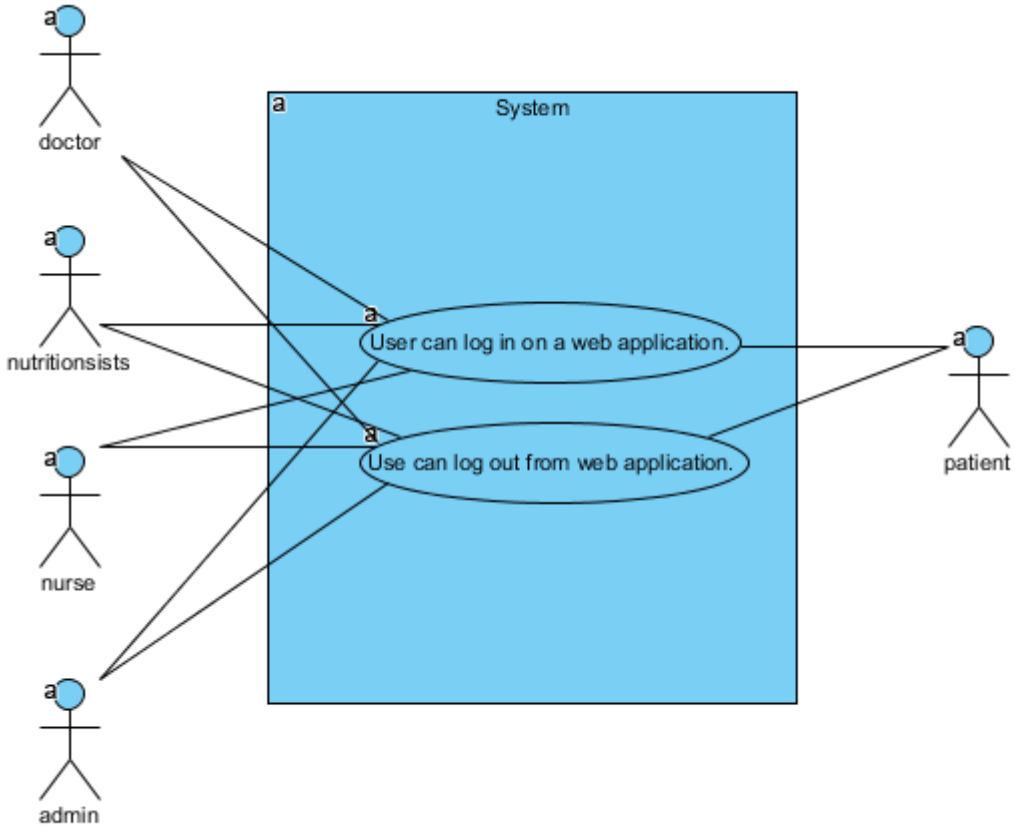

Figure 2: Use Case diagram of Authentication system.

Use Case Diagram: Account management.

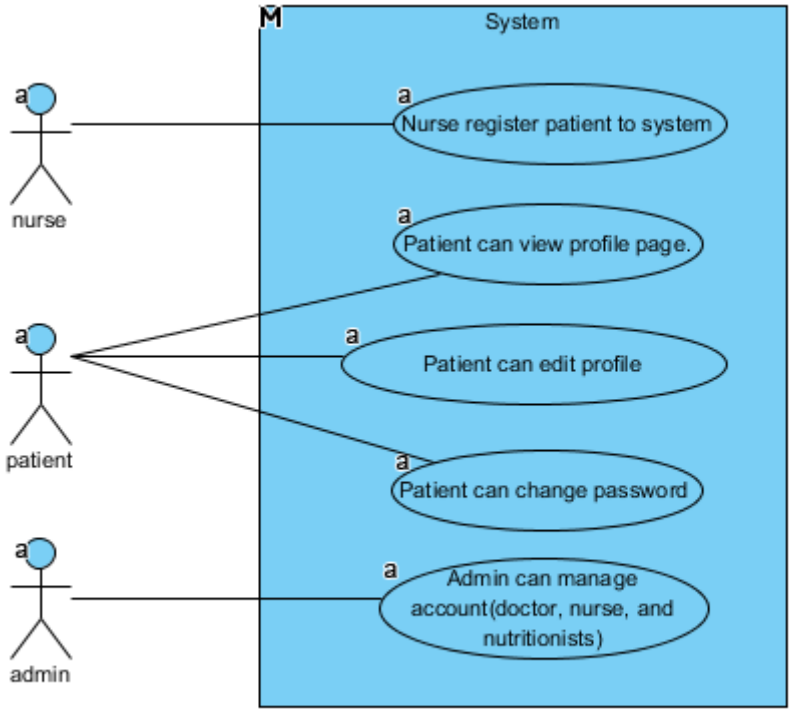

Figure 3: Use Case diagram of Account management.

Use Case Diagram: Nutritionists management

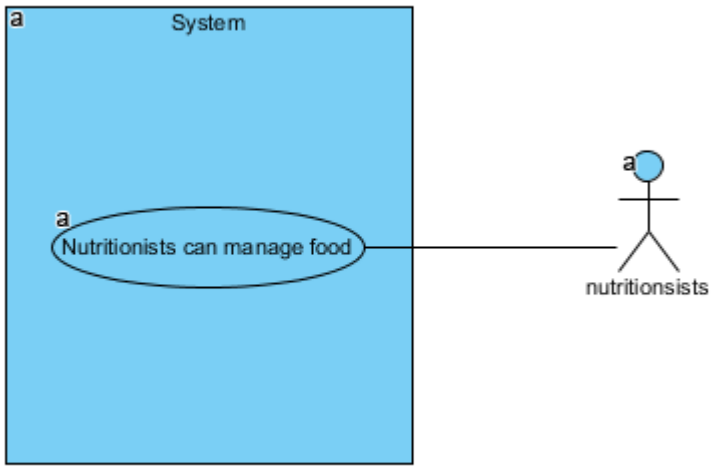

Figure 4: Use Case diagram of Nutritionists management.

Use Case Diagram: Activity management

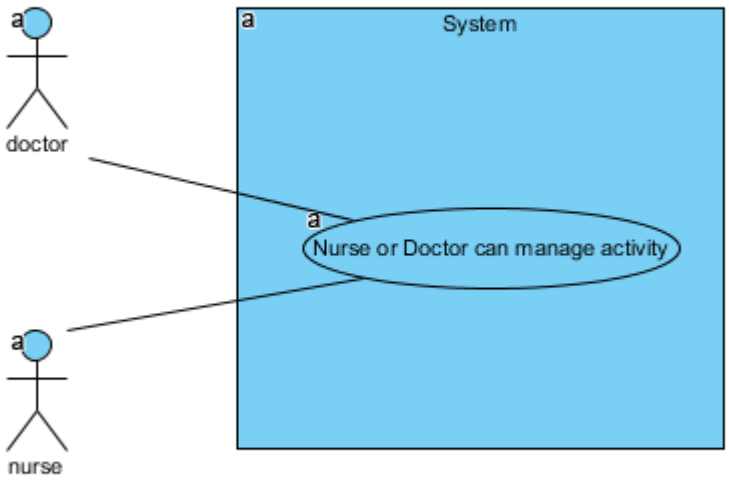

Figure 5: Use Case diagram of Activity management.

Use Case Diagram: Activity plan and recommend system.

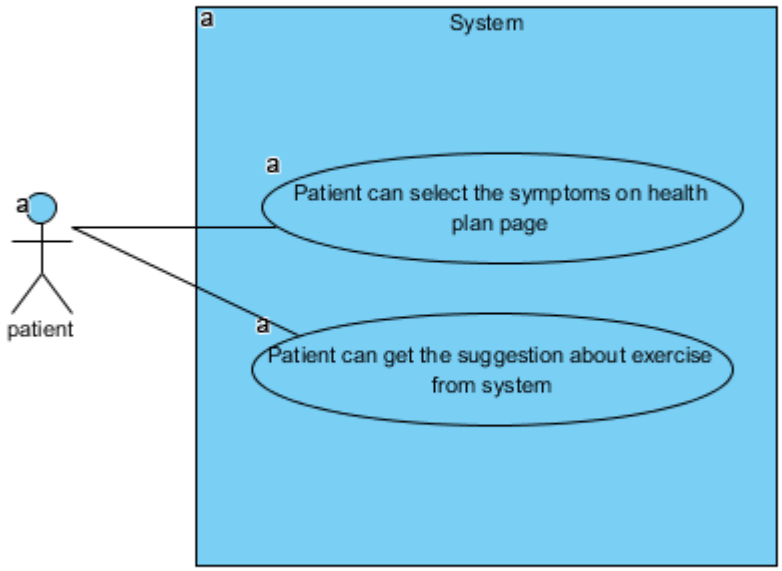

Figure 6: Use Case diagram of Activity plan and recommend system.

Use Case Diagram: Nutrition plan system.

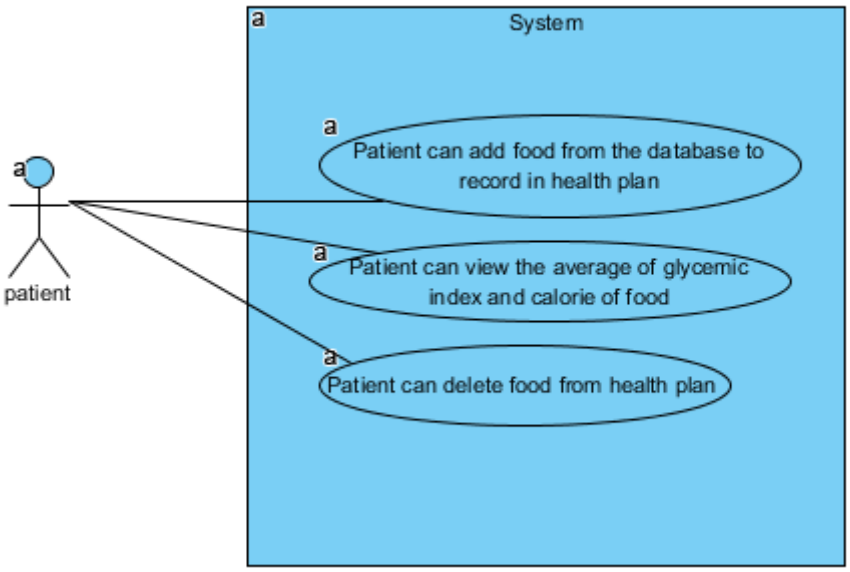

Figure 7: Use Case diagram of Nutrition plan system.

Use Case Diagram: Health monitors system.

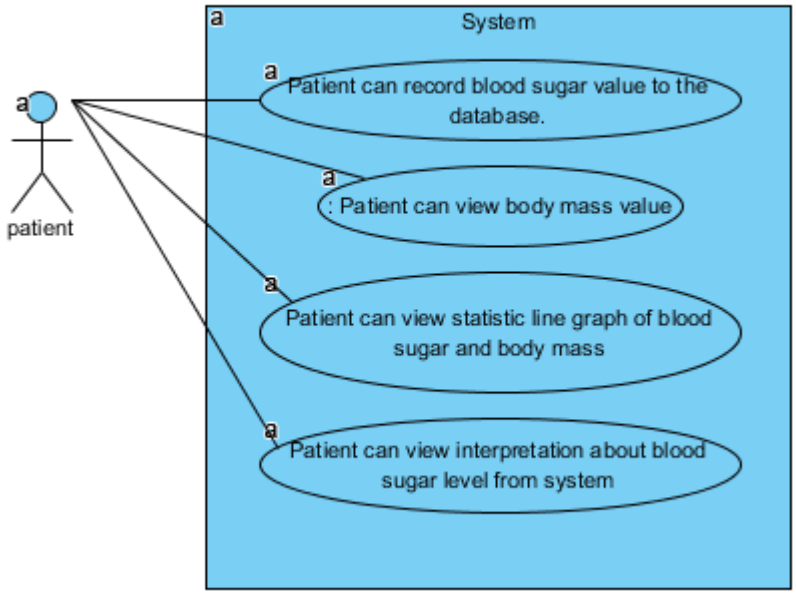

Figure 8: Use Case diagram of Health monitors system.

Use Case Diagram: Behavior monitors system.

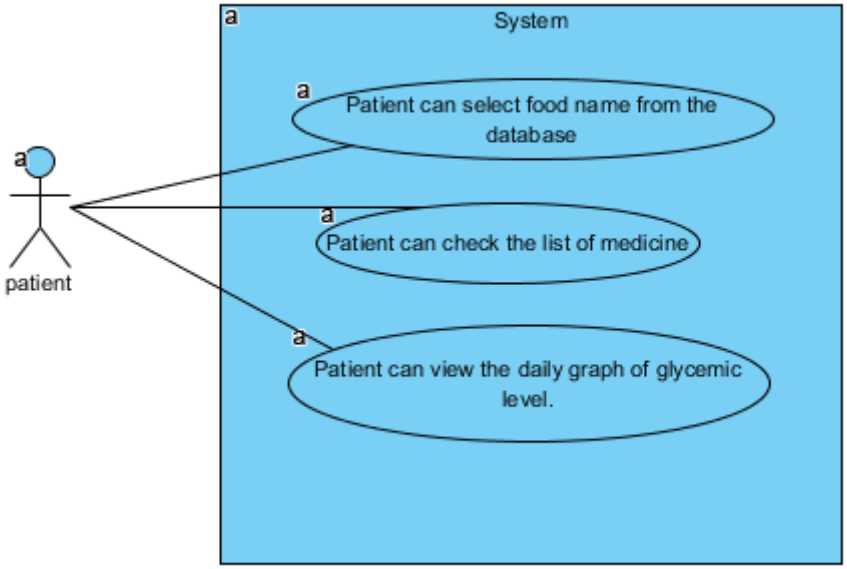

Figure 9: Use Case diagram of Behavior monitors system.

Chapter Four | Specification Requirement

4.1 Use Case Scenarios

Use Case ID	UC01		
Use Case Name	User can log in on a Web Application.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient, Nutritionists, Admin		
Description	User login to web application by use username and password		
Trigger	- User selects login button.		
Preconditions	- User must register in the system		

Use Case Input Specification			
Input	type	Constraint	Example
Username	string	Must not empty	usertest
Password	string	- Must not empty - 6-12 characters of capital or small alphabet letters or number	-

Post conditions	- User login to system	
Normal Flows	User	System
	3. User must input data which includes (username and password). 5. User must click login.	1. The system shall provide UI which includes (username and password). 2. The system shall request user input data which includes (username and password). 4. The system shall provide “login” button
Alternative Flow	In step of 3 of Normal Flow, if users input wrong username or password. 1. System shall provide the user interface to display the error message. 2. Users can view the error message. 3. Users input again 4. The system shall resume to step 3 of normal flow	
Exception Flow	-	

Assumption	1. Users understand English. 2. Users must have username and password in system

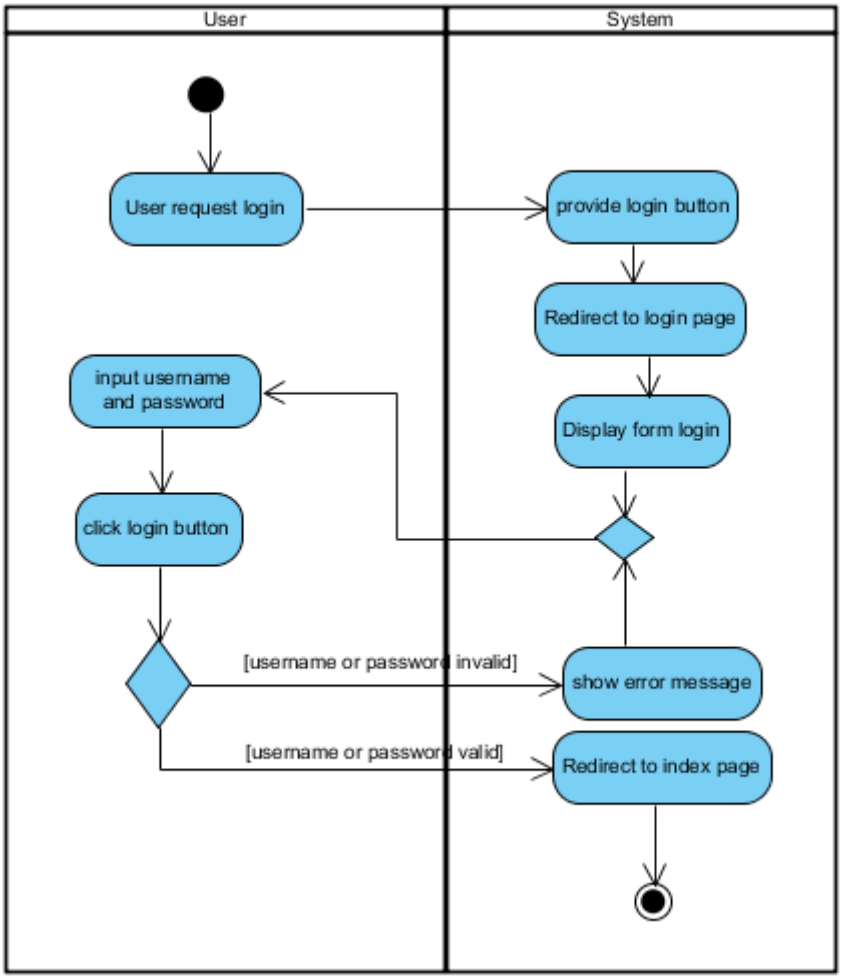

Figure 9: Activity Diagram of login.

Use Case ID	UC02		
Use Case Name	User can log out from system.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient, Nutritionists, Admin		
Description	User logout from web application.		
Trigger	- User selects logout button.		
Preconditions	- User login to the Diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- User logout from system	
Normal Flows	User	System
	2. User must click logout button.	1. The system shall provide “logout” button
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English.	

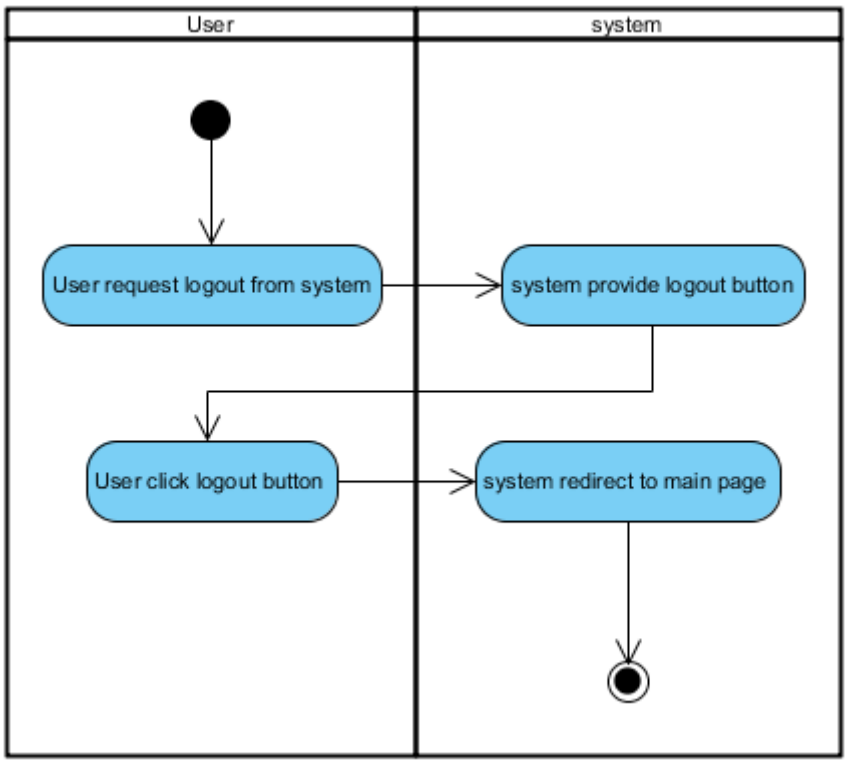

Figure 10: Activity Diagram of Patient logout.

Use Case ID	UC03		
Use Case Name	Nurse can register patient to the web application		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nurse, Patient		
Description	The nurse can enter patient (username, password, confirm password, email, first name, last name, age, gender, weight, height, diabetes type and date that start treatment) to the database server on a web application.		
Trigger	- Nurse or Patient selects register button on navigation.		
Preconditions	-		

Use Case Input Specification			
Input	type	Constraint	Example
username	string	Must not empty	usertest
password	string	- Must not empty - 6-12 characters of capital or small alphabet letters or number	Mkog0k86o
Confirm password	string	Must be same with password	-
e-mail	string	- email address format (made up of a local part, an @ symbol, than a domain part) - Must not empty	example@email.com
First name	string	Must not empty	Jirayu
Last name	string	Must not empty	Chinpongsuwan
age	Int	- Must input to be number - Must not empty	20
weight	int	- Must input to be number - Must not empty	60
height	int	- Must input to be number - Must not empty	175
Post conditions	- Registration success.		

Normal Flows	User	System
	1. User must select “register” button.	2. The system shall provide UI which includes (Username, Password, Confirm Password, E-mail, First Name, Last Name, Gender, Age, Address, Diabetes Type, Height, Weight, Start treatment)

	3. User must input information which includes (Username, Password, Confirm Password, E-mail, First Name, Last Name, Gender, Age, Address, Diabetes Type, Height, Weight, Start treatment) 5. User must click “Submit” button.	4. The system shall provide “Submit” button
Alternative Flow	In step of 3 of Normal Flow, if users forget to input the information that the system request 1. System shall provide the user interface to display the error message. 2. Users can view the error message. 3. Users input again	
Exception Flow	-	
Assumption	1. Users understand English.	

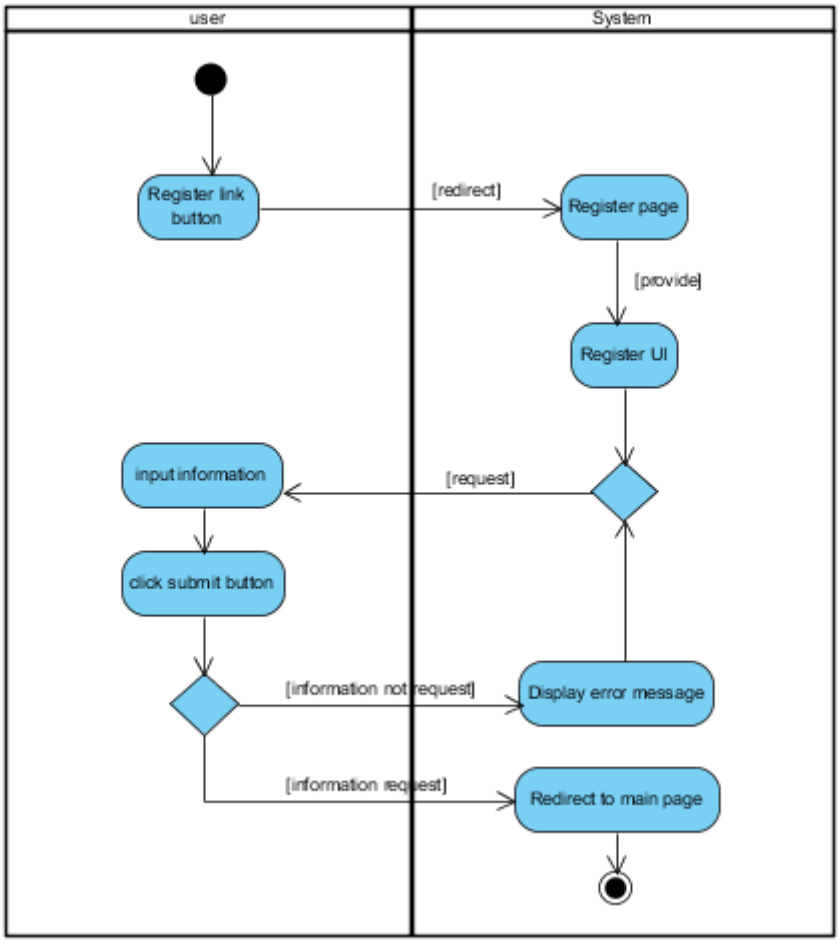

Figure 11: Activity Diagram of Register patient.

Use Case ID	UC04		
Use Case Name	Profile.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can view the information of his on profile page.		
Trigger	- User selects profile link button.		
Preconditions	- User login to the Diabetes web application..		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- User can view the information of user profile.	
Normal Flows	User	System
	1. User click button link to profile.	2. The system shall redirect to profile page. 3. The system shall display his profile on profile page.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English.	

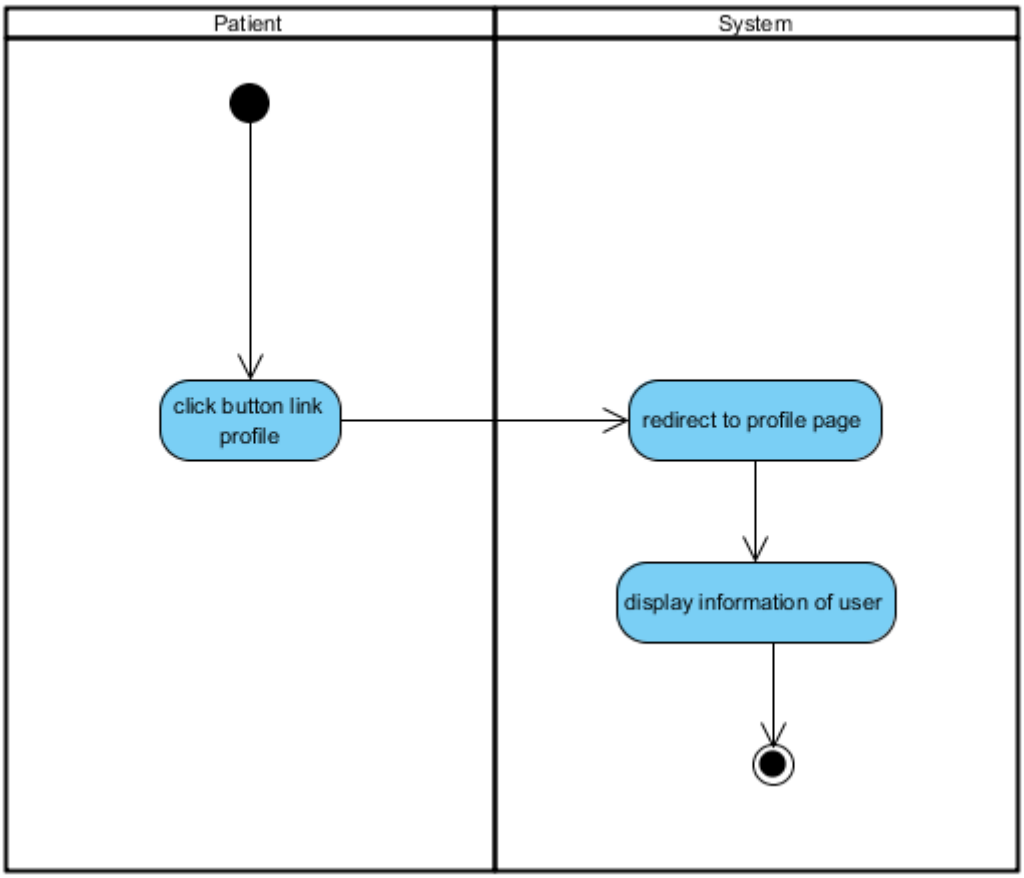

Figure 12: Activity Diagram of View information of his on profile page.

Use Case ID	UC05		
Use Case Name	Edit profile		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can edit the information of his.		
Trigger	- User selects profile link button.		
Preconditions	- User login to the Diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
First name	string	Must not empty	Jirayu
Last name	string	Must not empty	Chinpongsuwan
age	Int	- Must input to be number - Must not empty	20
weight	int	- Must input to be number - Must not empty	60
height	int	- Must input to be number - Must not empty	175

Post conditions	- User can edit account success.	
Normal Flows	User	System
	2. Patient click profile button link. 5. Patient click “edit” button 7. Patient input new information which includes (Username, Password, Confirm Password, E-mail, First Name, Last Name, Gender, Age, Address, Diabetes	1. The system shall provide “profile link” button. 3. The system shall redirect to profile page. 4. The system provide “edit” button. 6. The system provides UI to edit information which includes (Username, Password, Confirm Password, E-mail, First Name, Last Name, Gender, Age, Address, Diabetes Type, Height, Weight, Start treatment).

	Type, Height, Weight, Start treatment) 9. User click save.	8. The system provide “save” button. 10. The system shall save change in data base
Alternative Flow	In step of 7 of Normal Flow, if users input wrong format age, height, and weight. 1. System shall provide the user interface to display the error message “… is invalid”. 2. Users can view the error message. 3. Users input again 4. The system shall resume to step 7 of normal flow	
Exception Flow	-	
Assumption	1. Users understand English.	

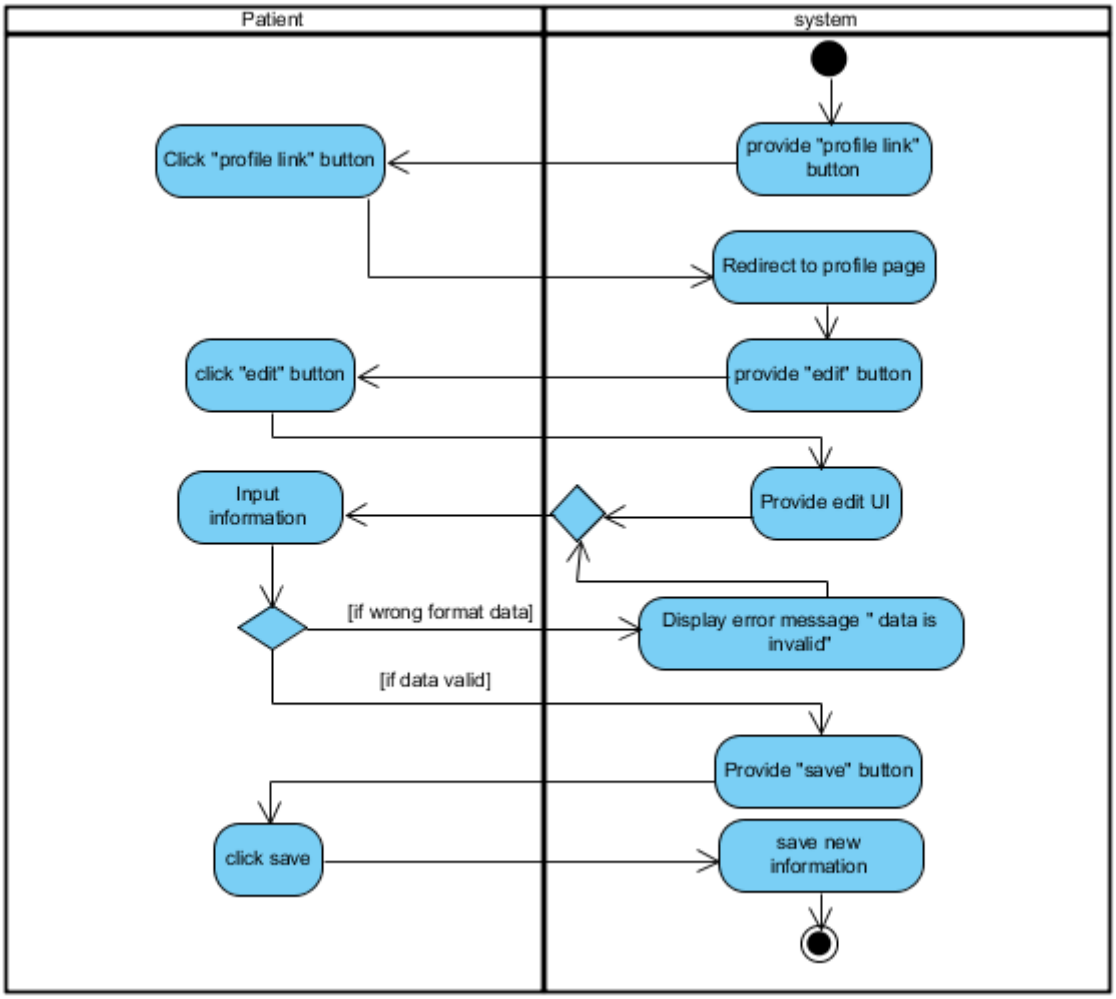

Figure 13: Activity Diagram of Edit account .

Use Case ID	UC06		
Use Case Name	Chang password		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can change password for login.		
Trigger	- User selects profile link button.		
Preconditions	- Patient login to the Diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
Current password	string	- Must have in the database - Must not empty - 6-12 characters of capital or small alphabet letters or number	-
New password	string	- Must not empty - 6-12 characters of capital or small alphabet letters or number	-
Confirm password	string	Must be same with password	-

Post conditions	- Patient can change password success	
Normal Flows	User	System
	2. Patient click profile button link. 5. Patient click “change password” button 7. Patient input data which include (current password, new password) 9. Patient click “submit”.	1. The system shall provide “profile link” button. 3. The system shall redirect to profile page. 4. The system provide “change password” button. 6. The system shall provide UI for change password which includes (current password, new password) 8. The system shall provide “submit” button.

Alternative Flow	In normal flow step 7. If the patient input wrong current and not input data. 1. the system shall display error message “current password is not valid” 2. The patient must input current password again. 3. The system shall resume to step 7 of normal flow 4. The system shall display error message “field is required.” 5. The patient must input data again. 6. The system shall resume to step 7 of normal flow
Exception Flow	-
Assumption	1. Users understand English.

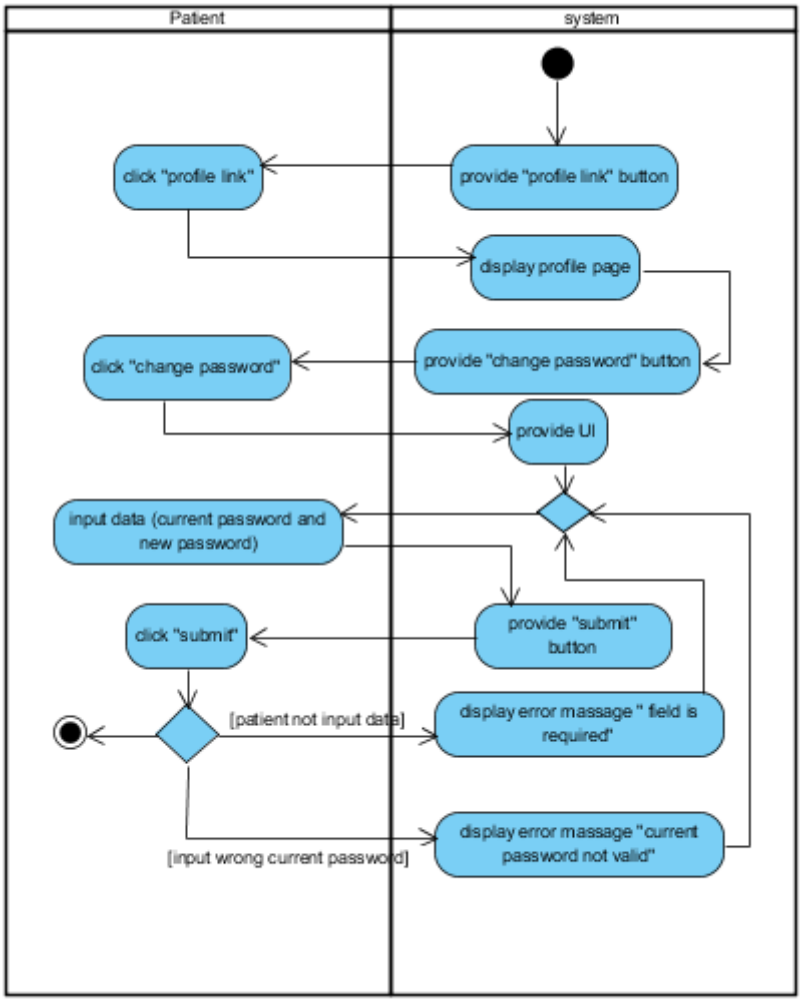

Figure 14: Activity Diagram of Chang password.

Use Case ID	UC07		
Use Case Name	Admin manage account		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Admin		
Description	• Admin can add nutritionists, nurse, and doctor to the system by input username, password, first name, last name and select role. • Admin can edit username, password, first name, last name and role. • Admin can nutritionists, nurse, and doctor from the system.		
Trigger	- Admin clicks account management.		
Preconditions	- Admin login to the administration system.		

Use Case Input Specification			
Input	type	Constraint	Example
username	string	Must not empty	username
password	string	- Must not empty - 6-12 characters of capital or small alphabet letters or number	-
name	string	Must not empty	admin

Post conditions	- Admin manages account success.	
Normal Flows	User	System
	2. Admin click “create new” 4. Admin input info which includes (username, password, first name, last name and role). 6. Admin click “submit” button. 8. Admin click “edit”.	1.The system provide “create new” button 3. The system provides UI which include (username, password, first name, last name and role). 5. The system provide “submit” button 7. The system provide “edit” button 9. The system provides UI for edit which include (username, password, first name, last name and role).

	10. Admin input new info which includes (username, password, first name, last name and role). 12. Admin click “submit” button. 14. Admin click “delete” button.	 11. The system provide “submit” button 13. The system provide “delete” button 15. The shall delete account that selected.
Alternative Flow	In normal flow step 4. If the admin don’t input data. 1. The system shall display error message “field is required.” 2. The admin must input data again. 3. The system shall resume to step 4 of normal flow	
Exception Flow	-	
Assumption	1. Users understand English.	

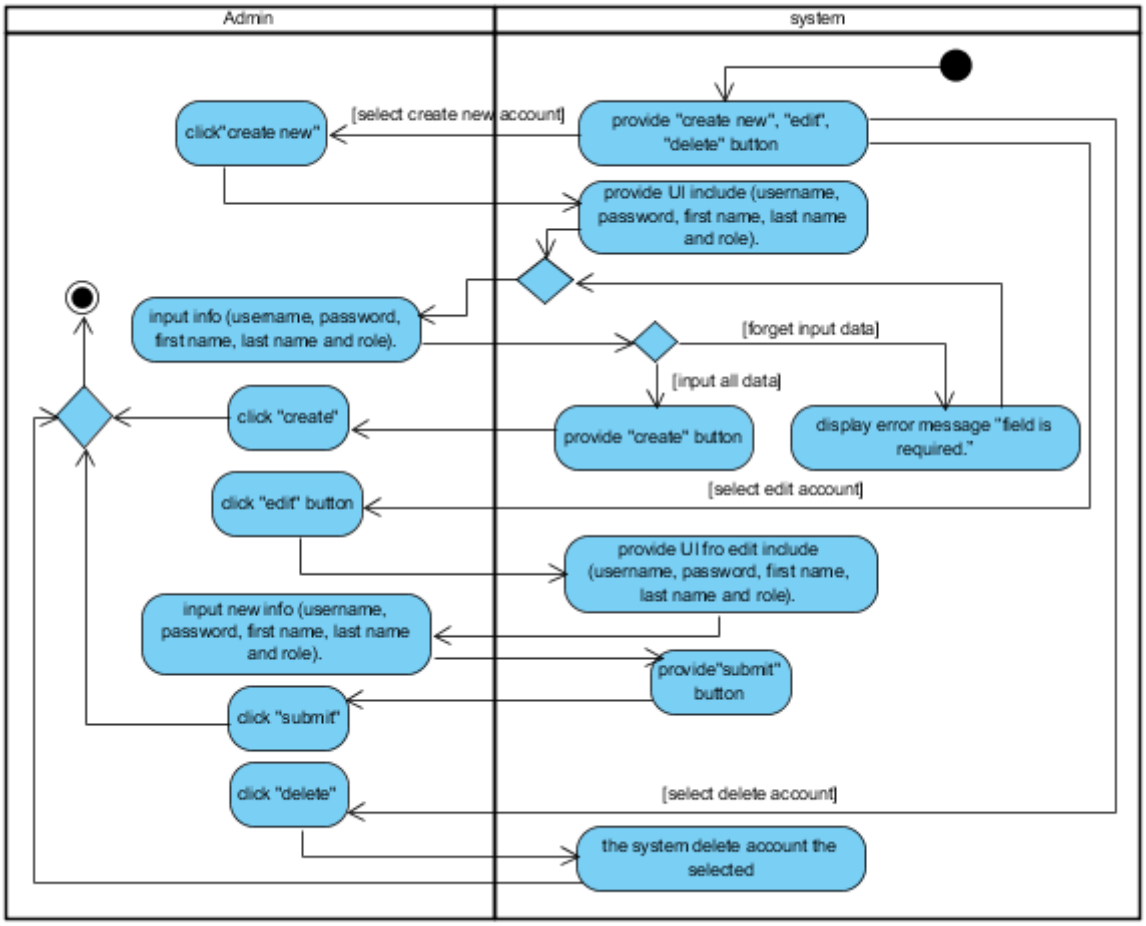

Figure 15: Activity Diagram of Admin manages account.

Use Case ID	UC08		
Use Case Name	Manage nutrition		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nutritionists		
Description	Nutritionists can manage food on nutrition management page.		
Trigger	- Nutritionists click manage foods.		
Preconditions	- Nutritionists login to the Diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Nutritionists can manage nutrition success.	
Normal Flows	User	System
	2. Nutritionists click “create new”	1.The system provide “create new” button
	4. Nutritionists input info which includes (food name, the glycemic index of food, and food calorie).	3. The system provides UI which include (food name, the glycemic index of food, and food calorie).
	6. Nutritionists click “submit” button.	5. The system provide “submit” button
	8. Nutritionists click “edit”.	7. The system provide “edit” button
	10. Nutritionists input new info which includes (food name, the glycemic index of food, and food calorie).	9. The system provides UI for edit which include (food name, the glycemic index of food, and food calorie).
		11. The system provide “submit”

	12. Nutritionists click “submit” button. 14. Nutritionists click “delete” button.	button 13. The system provide “delete” button 15. The system shall delete food that selected.
Alternative Flow	In normal flow step 4. If the admin don’t input data. 1. The system shall display error message “field is required.” 2. The nutritionists must input data again. 3. The system shall resume to step 4 of normal flow	
Exception Flow	-	
Assumption	1. Users understand English.	

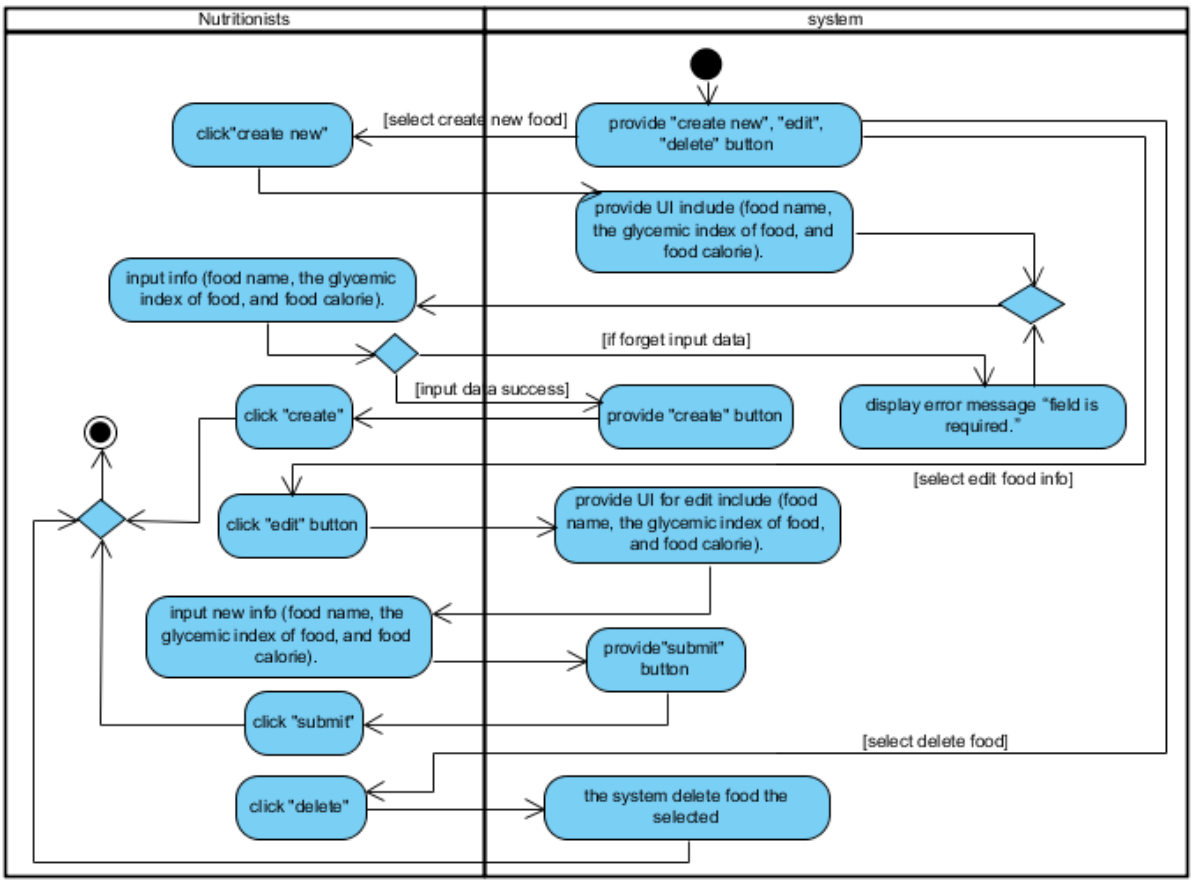

Figure 16: Activity Diagram of Add food list to system.

Use Case ID	UC07		
Use Case Name	Manage activity		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nurse, Doctor		
Description	Nurse or Doctor can manage activity on activity management page.		
Trigger	- Nurse or Doctor click manage activity.		
Preconditions	- Nurse or Doctor login to the Diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Nurse or Doctor can manage activity success.	
Normal Flows	User	System
	2. Nurse or Doctor click “create new”	1.The system provide “create new” button
	4. Nurse or Doctor input info which includes (symptom and exercise advice).	3. The system provides UI which include (symptom and exercise advice).
	6. Nurse or Doctor click “submit” button.	5. The system provide “submit” button
	8. Nurse or Doctor click “edit”.	7. The system provide “edit” button
	10. Nurse or Doctor input new info which includes (symptom and exercise advice).	9. The system provides UI for edit which include (symptom and exercise advice).
	12. Nurse or Doctor click	11. The system provide “submit” button

	"submit" button. 14. Nurse or Doctor click "delete" button.	13. The system provide "delete" button 15. The system shall delete activity that selected.
Alternative Flow	In normal flow step 4. If the admin don't input data. 1. The system shall display error message "field is required." 2. The doctor/nurse must input data again. 3. The system shall resume to step 4 of normal flow	
Exception Flow	-	
Assumption	1. Users understand English.	

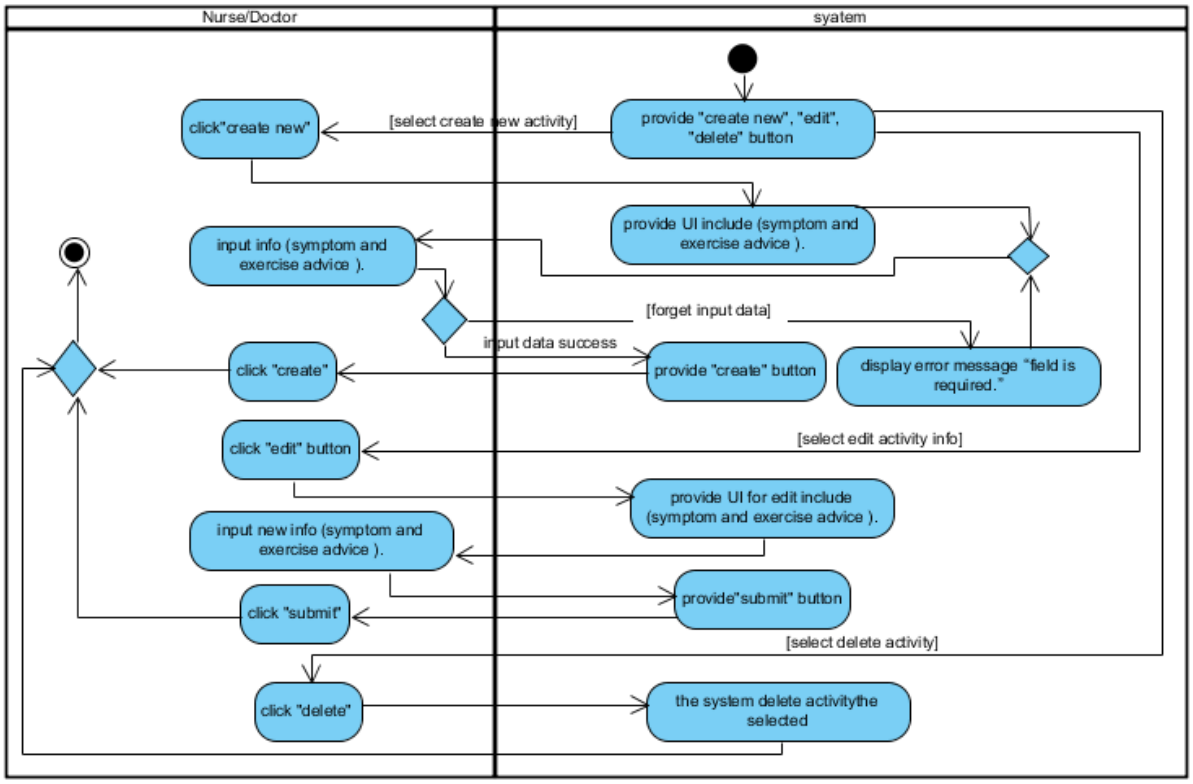

Figure 17: Activity Diagram of Manage activity.

Use Case ID	UC08		
Use Case Name	Select the symptoms		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can select the symptoms on health plan page.		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to the web application.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient can select the symptoms success.	
Normal Flows	User	System
	2. Patient must select symptoms from drop down list. 4. Patient click “select”.	1. The system shall provide drop down list on health plan page. 3. The system provide “select button”
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Patient must be member of web application.	

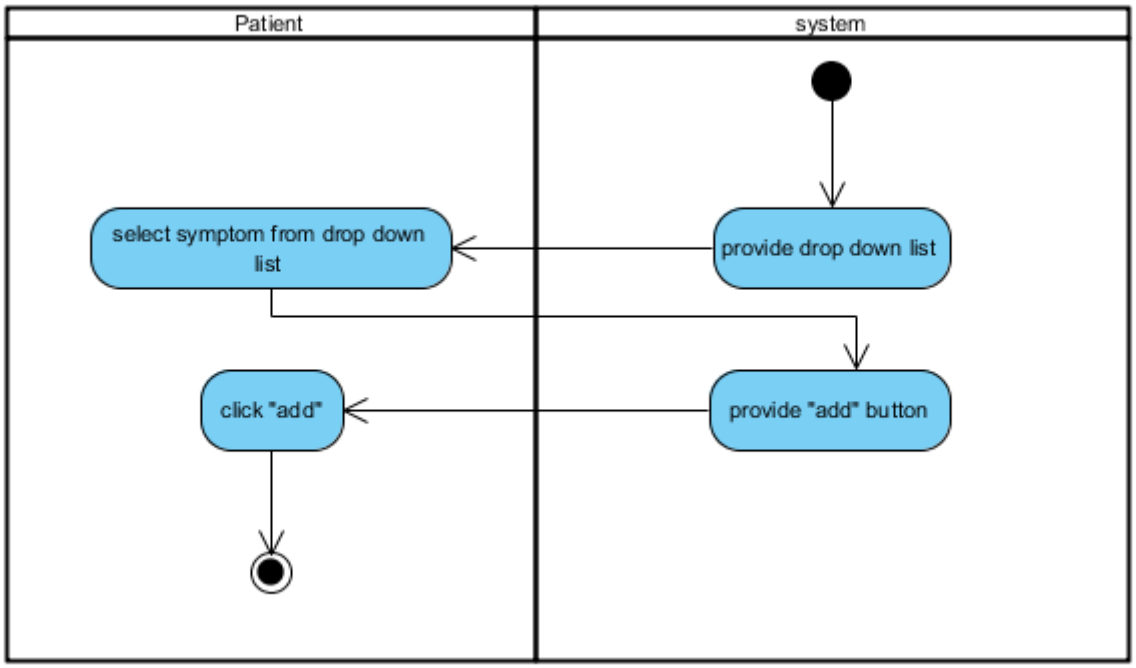

Figure 18: Activity Diagram of Select the symptoms.

Use Case ID	UC09		
Use Case Name	Get exercise suggestion.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can get the suggestion about exercise from system.		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to the web application.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient gets the suggestion about exercise from system.	
Normal Flows	User	System
	2. Patient must select symptoms from drop down list. 4. Patient click “select”.	1. The system shall provide drop down list on health plan page. 3. The system provide “select button” 5. The system displays the exercise suggestion to patient.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Patient must be member of web application.	

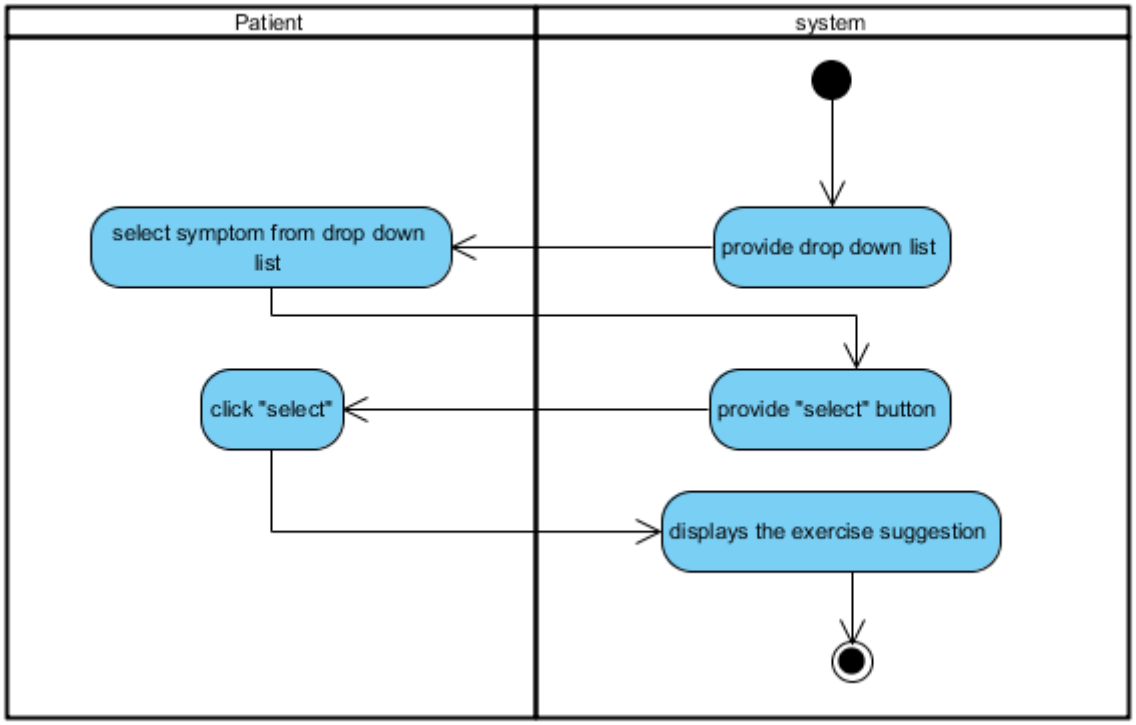

Figure 19: Activity Diagram of Get exercise suggestion.

Use Case ID	UC10		
Use Case Name	Add food to record health plan.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can add food from the database to record in health plan.		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to the Diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient can record the foods to health plan success.	
Normal Flows	User	System
	2. Patient must select. 4. Patient must click add.	1. The system shall provide drop down list of food. 3. The system shall provide add food button.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

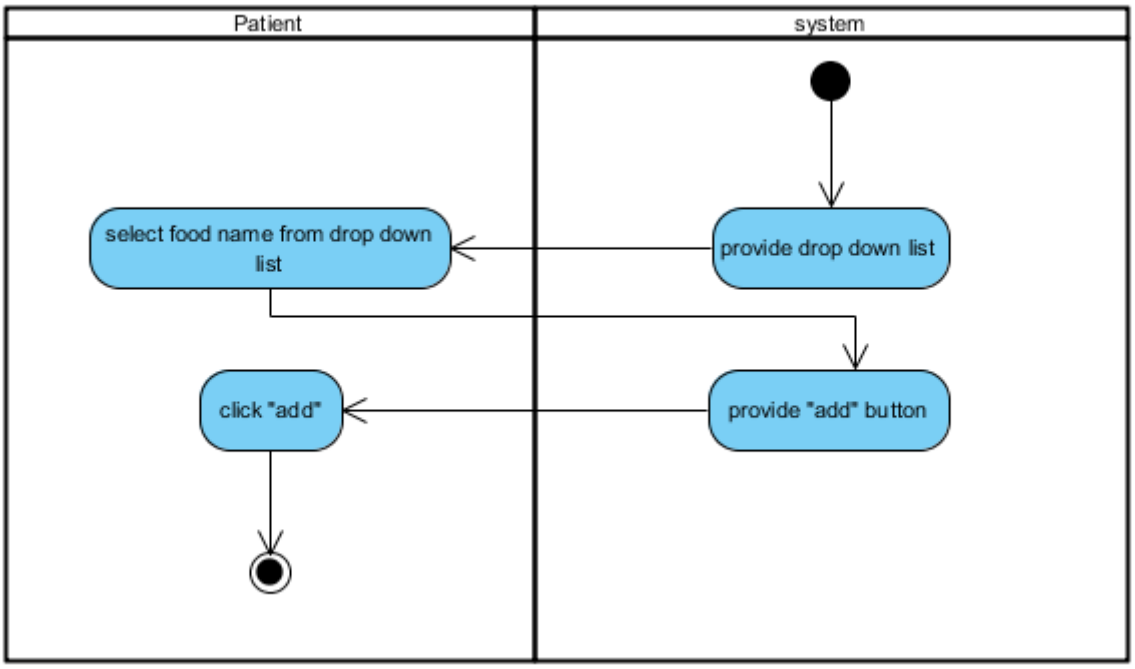

Figure 20: Activity Diagram of Add food to record health plan.

Use Case ID	UC11		
Use Case Name	View the average of glycemic index and calorie.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can view the average of glycemic index and calorie of food in the selected plan.		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- The system displays the average of glycemic index and calorie of food in the selected plan.	
Normal Flows	User	System
	4. Patient views the result average of glycemic index and calorie of food.	1. The system request data of food from food plan the database. 2. The system shall calculate the average of average of glycemic index and calorie of food. 3. The system provides text for display result.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

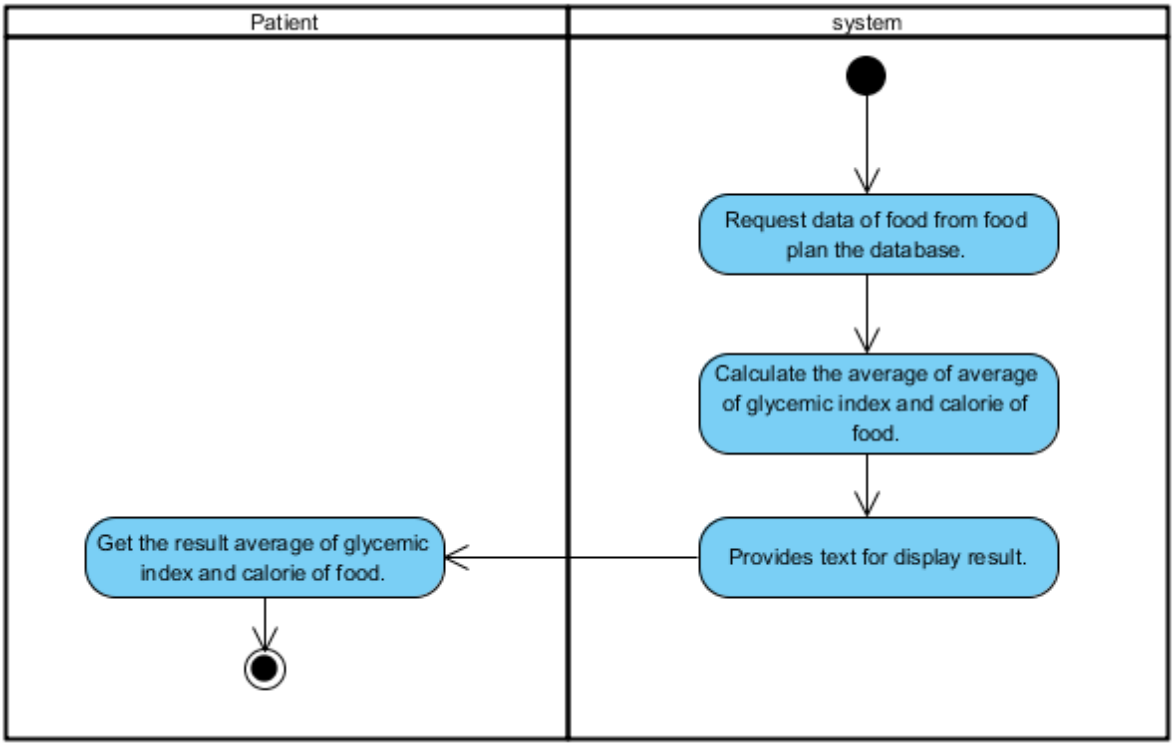

Figure 21: Activity Diagram of View the average of glycemic index and calorie.

Use Case ID	UC12		
Use Case Name	Delete food from health plan		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can delete food from health plan.		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient can delete food from his health plan success.	
Normal Flows	User	System
	2. Patient must select food. 3. Patient must click delete.	1. The system shall provide delete food button. 4. The system shall delete food from health plan.
Alternative Flow	-	
Exception Flow	-	
Assumption	3. Users understand English. 4. Users must be Patient of web application.	

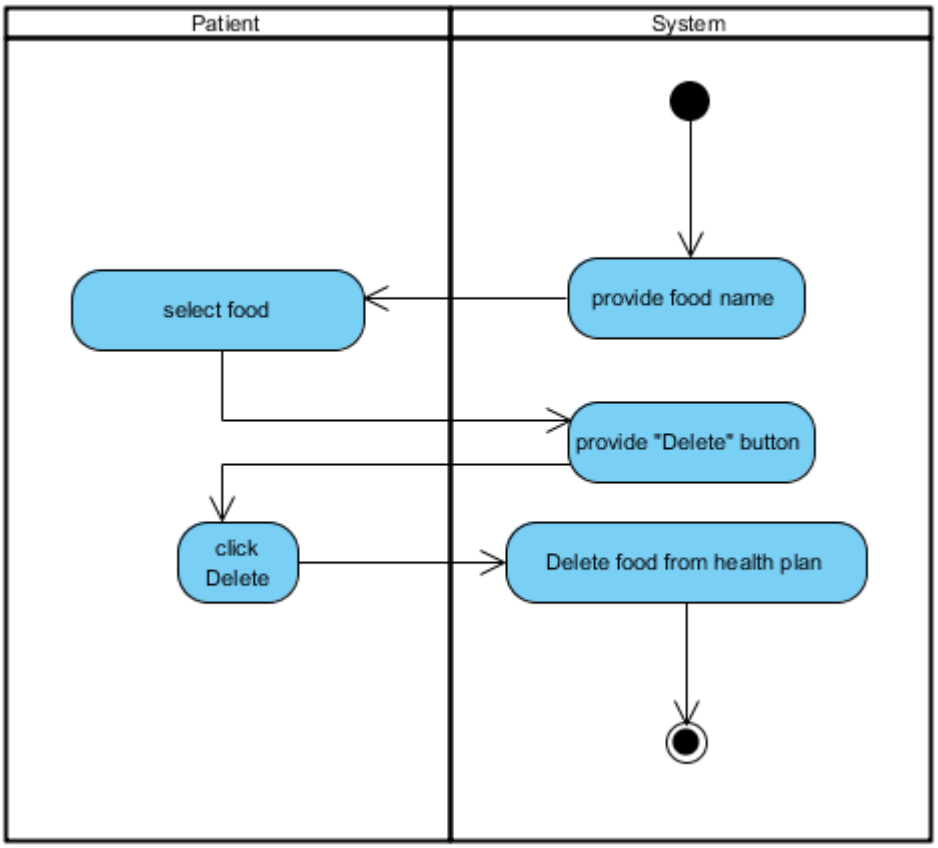

Figure 22: Activity Diagram of Delete food from health plan.

Use Case ID	UC13		
Use Case Name	Add glycemic.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can record blood sugar value to the database.		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
Blood sugar	double	- Must not input minus value - Must input to be number	102

Post conditions	- Patient can add the blood sugar value to the system success.	
Normal Flows	User	System
	2. Patient must input blood sugar value. 4. Patient must click add.	1. The system shall provide text field for add glycemic to user. 3. The system shall provide add button. 5. The system shall record data in the database
Alternative Flow	In normal flow step 2. If the patient input wrong format blood sugar. And The patient input blood sugar minus value. 1. The system display error message “blood sugar is invalid” 2. The patient must input data again. 3. The system shall resume to step 2 of normal flow 4. The system display error message “blood sugar cannot be negative”. 5. The patient must input data again. 6. The system shall resume to step 4 of normal flow	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

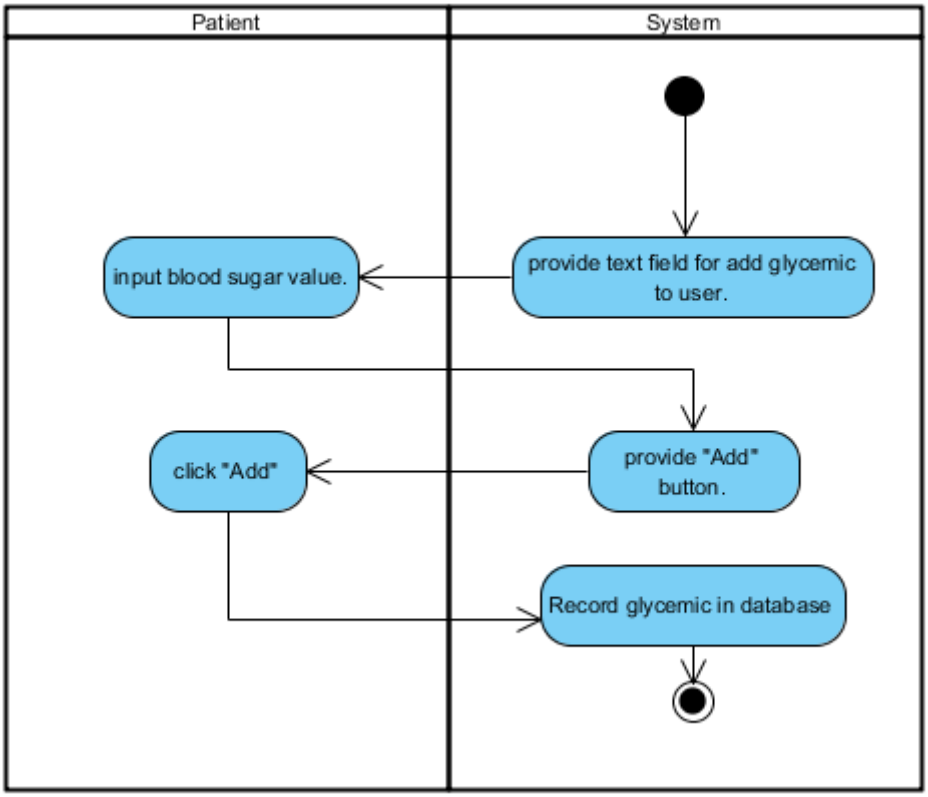

Figure 23: Activity Diagram of Add glycemic.

Use Case ID	UC14		
Use Case Name	View BMI.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can view body mass value that calculated by using BMI = weight (Kg) / (height (m) * height (m)).		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	Patient can view body mass value.	
Normal Flows	User	System
	4. Patient views the result BMI.	1. The system request data of patient (weight and height) from the database. 2. The system shall calculated by using BMI = weight (Kg) / (height (m) * height (m)). 3. The system provides text for display result.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

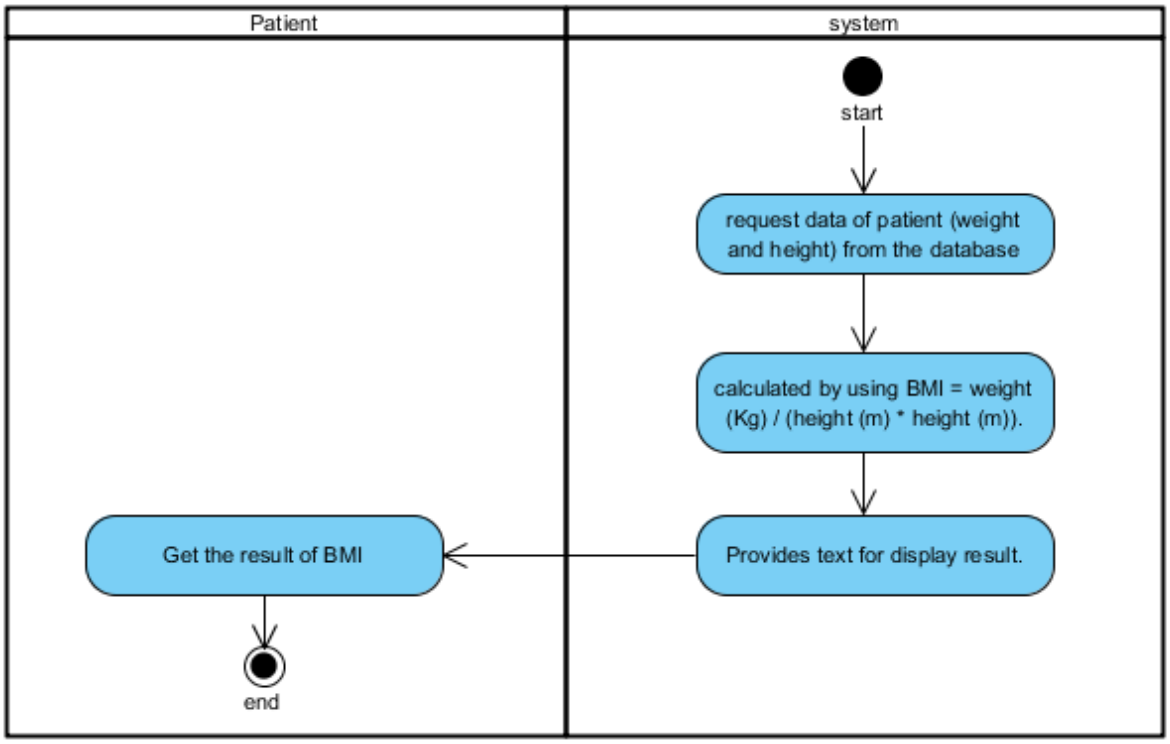

Figure 24: Activity Diagram of View BMI.

Use Case ID	UC15		
Use Case Name	View blood sugar and body mass graph.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can view statistic line graph of blood sugar and body mass.		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Display blood sugar value and body mass value on graph.	
Normal Flows	User	System
	5. The patient view display graph.	1. The system shall provide line graph. 2. The system request data of blood sugar value from the database and BMI value from method code. 3. The system request the data value of blood sugar and body mass to using on graph 4. The system display line graph to patient.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be Patient of web application.	

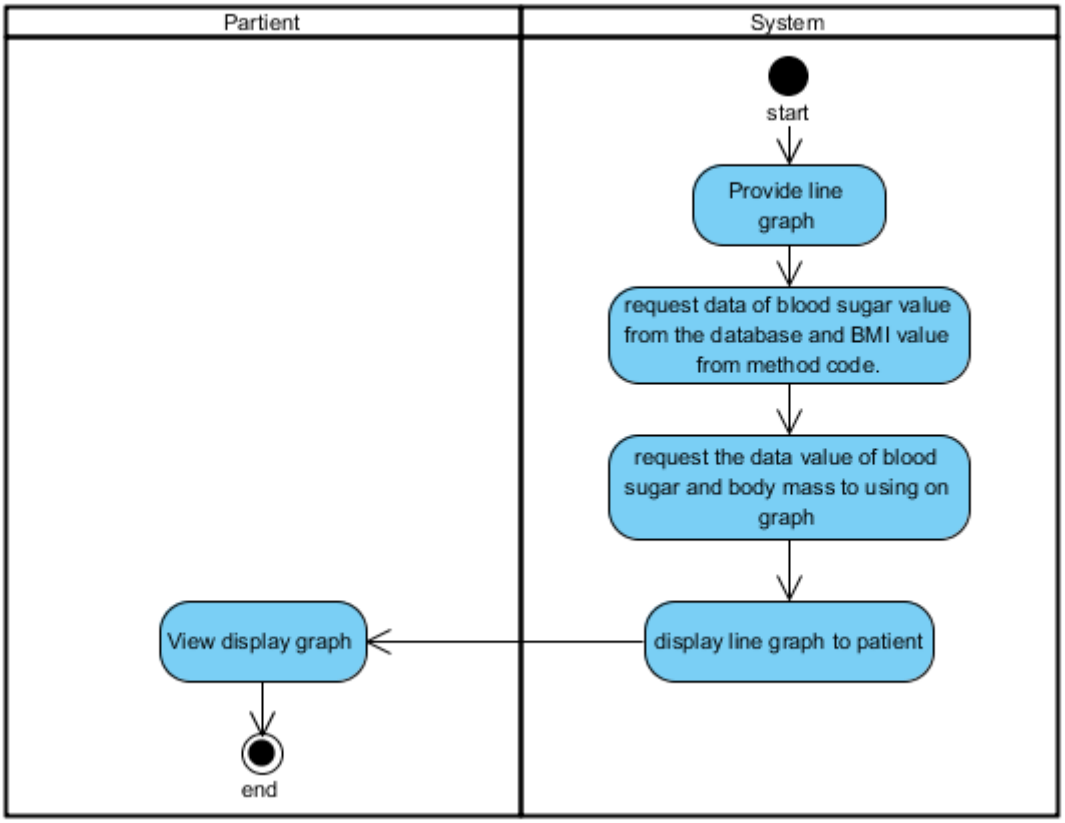

Figure 27: Activity Diagram of View glycemic graph.

Use Case ID	UC16		
Use Case Name	View interpretation of blood sugar.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can view interpretation about blood sugar level from system.		
Trigger	- Patient selects health plan link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient gets interpretation about blood sugar level from system.	
Normal Flows	User	System
	4. The patient view display of interpretation about blood sugar level on text area.	1. The system shall provide text area. 2. The system request data for gets interpretation about blood sugar level from database. 3. The system display data on text area.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

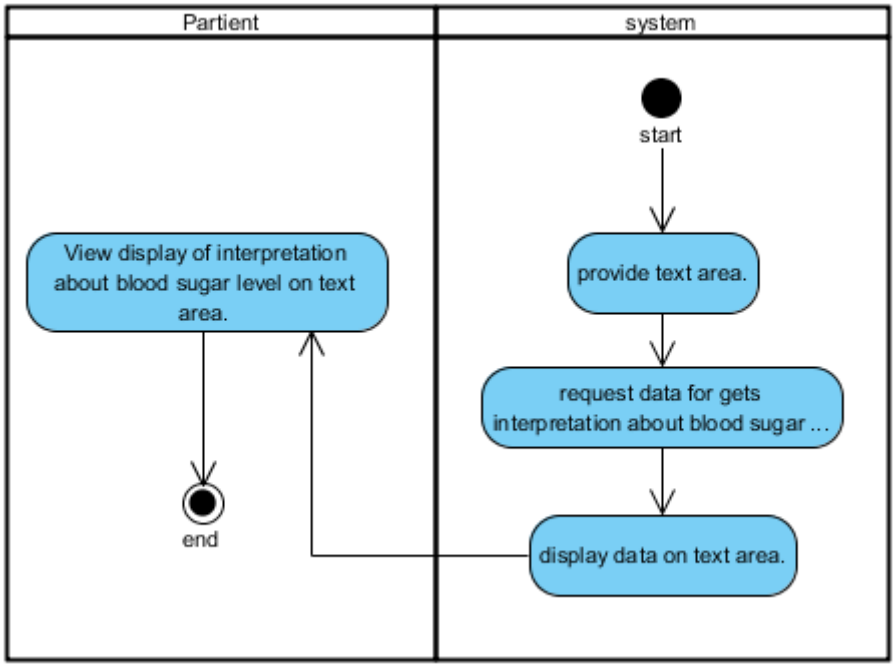

Figure 28: Activity Diagram of View interpretation of blood sugar.

Use Case ID	UC17		
Use Case Name	Patient select food name from the database.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can select food name eat in that day from the database.		
Trigger	- Patient selects behavior monitor link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient select food success.	
Normal Flows	User	System
	2. Patient must select food. 4. Patient must click “select”.	1. The system shall provide drop down list of food. 3. The system shall provide “select” button. 4. The system shall provide text area to display food selected.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

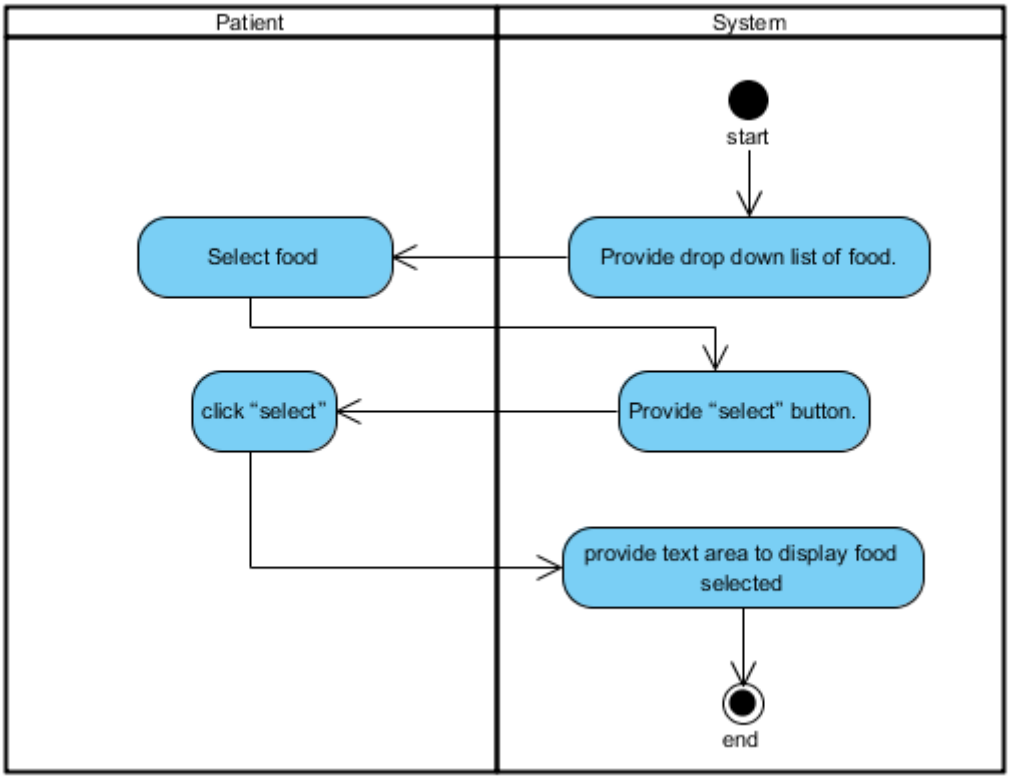

Figure 29: Activity Diagram of Patient select food name from the database.

Use Case ID	UC18		
Use Case Name	Patient can check the list of medicine.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can check the list of medicine on behavior monitor page.		
Trigger	- Patient selects behavior monitor link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient check list medicine success.	
Normal Flows	User	System
	2. Patient must click “check button” follow list of medicine.	1. The system shall provide check button and list of medicine name to patient.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

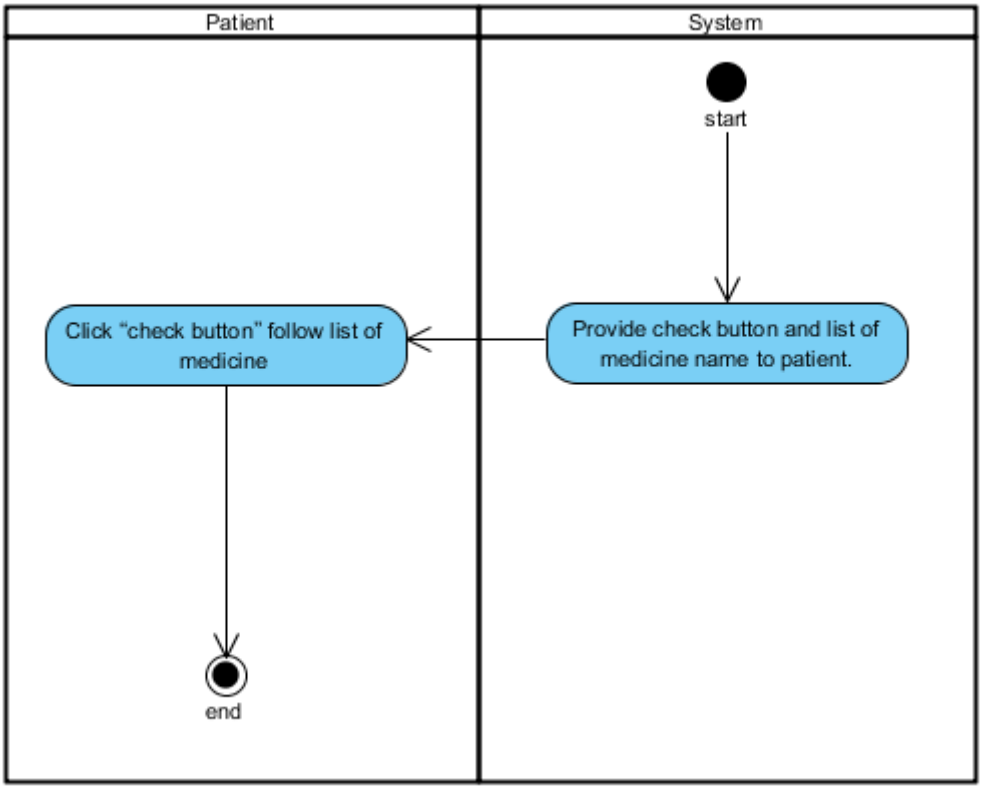

Figure 30: Activity Diagram of Patient can check the list of medicine.

Use Case ID	UC18		
Use Case Name	Analyze.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can get analyze of nutrition behavior in each day on behavior monitor page.		
Trigger	- Patient selects behavior monitor link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient can get analyze of nutrition behavior from system.	
Normal Flows	User	System
	4. The patient get analyze result from the system.	1. The system shall provide UI to display analyze result 2. The system request data of food and medicine to analyze 3. The system display analyze result on UI (color red, color yellow, color green)
Alternative Flow	In normal flow step 3. 1. The system shall display analyze result green color, when the user gets glycemic index value less than 120 and check all list of medicine. 2. The system shall display analyze result yellow color, when the user gets glycemic index value more than 120 and check all list of medicine or get glycemic index value less than 120 and not check all list of medicine. 3. The system shall display analyze result red color, when the user gets glycemic index value more than 120 and not check all list of medicine.	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

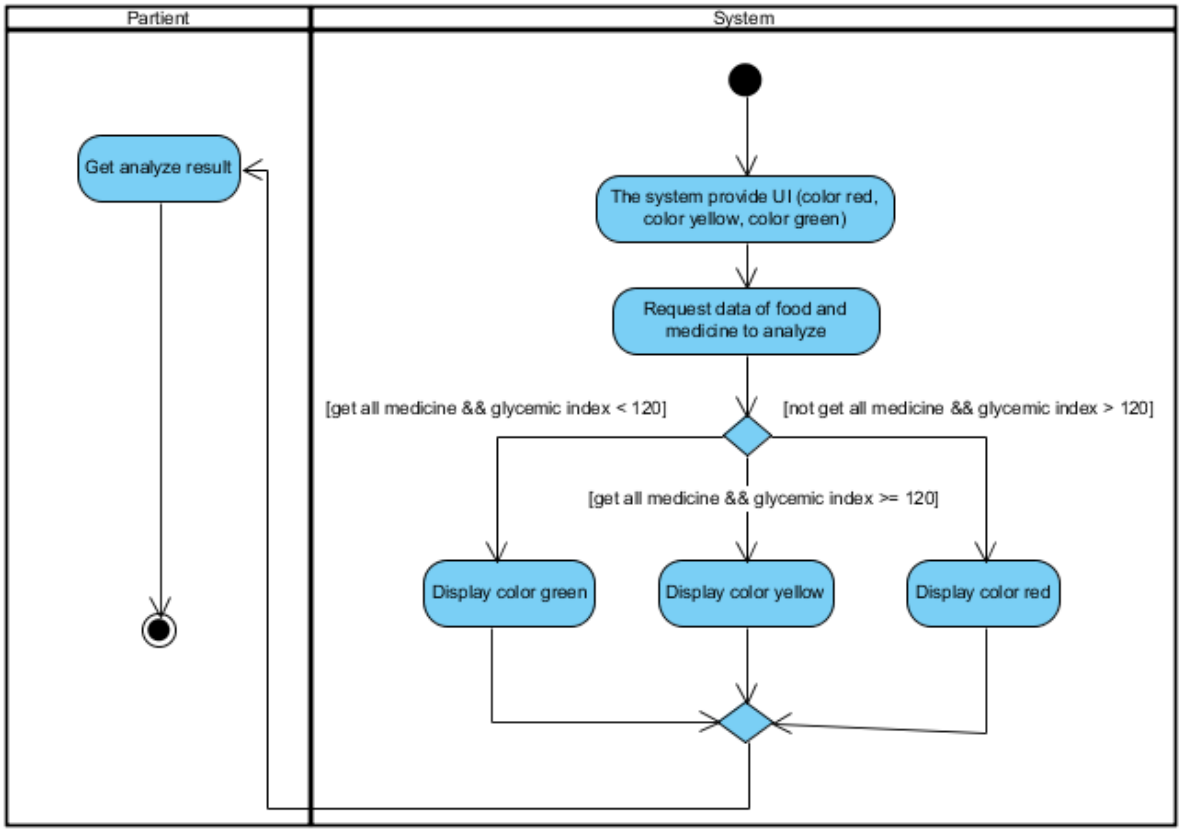

Figure 31: Activity Diagram of Analyze.

Use Case ID	UC19		
Use Case Name	View the daily graph of glycemic level.		
Created By	Jiraayu Chinpongsuwan	Last Update By	Jiraayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	The patient can view the daily graph of glycemic level on behavior monitor page.		
Trigger	- Patient selects behavior monitor link button.		
Preconditions	- Patient login to system.		

Use Case Input Specification			
Input	type	Constraint	Example
-	-	-	-

Post conditions	- Patient can view the daily graph of glycemic level.	
Normal Flows	User	System
	5. The patient view display graph.	1. The system shall provide line graph. 2. The system request data of glycemic index from food that selected in behavior monitor page 3. The system request the data of glycemic index to using on graph. 4. The system display line graph to patient.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

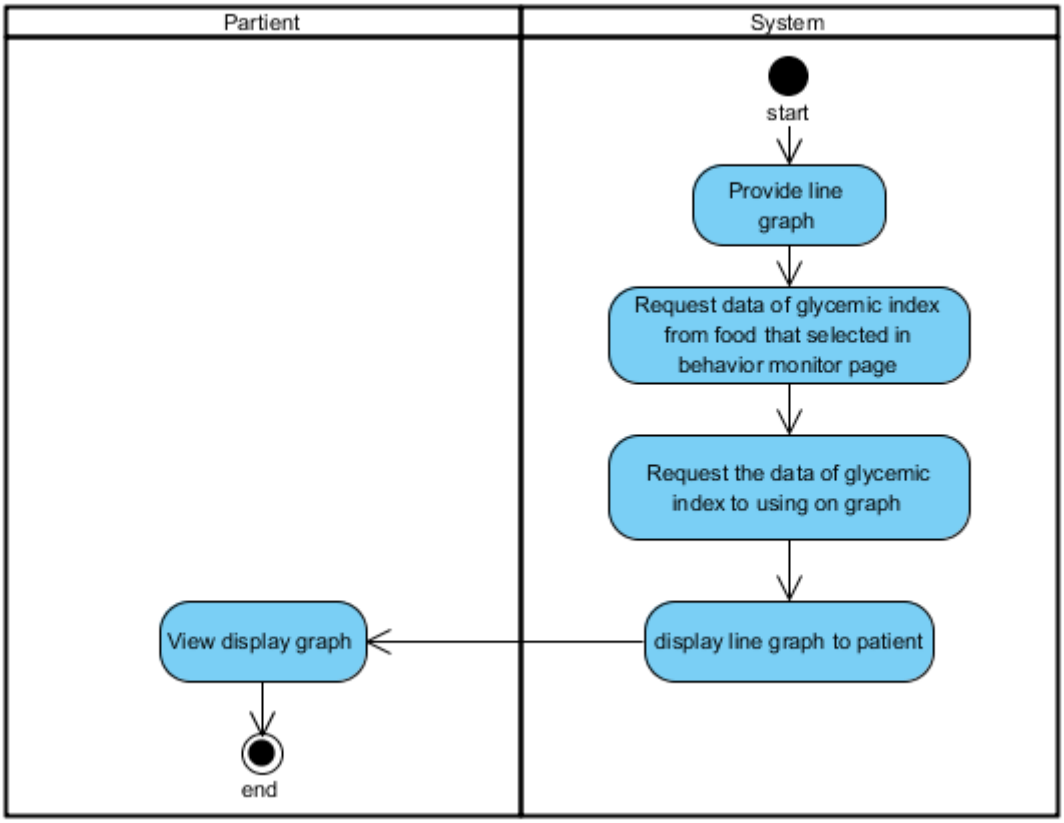

Figure 32: Activity Diagram of View the daily graph of glycemic level.