Software Requirement Specification

Diabetes Care

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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: Activity management.
Feature#5: Activity plan and recommend system.
Feature#6: Nutrition plan system.
Feature#7: Health monitors system.
Feature#8: Behavior monitors system.

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: window 10 64-bit Operating System.x64-based processor

Chapter Three | Functional Requirement

3.1 User Requirement Specification

Feature#1: Authentication system.

URS-01: The patient, doctor, nurse and admin can login to a web application by using username and password.

URS-02: The patient, doctor, nurse and admin can log out from a web application.

Feature#2: Account management.

URS-03: The doctor and nurse can enter patient information (username, password, confirm password, first name, last name, age, gender, weight, height, address, city, zip code, diabetes type and date that start treatment) to the database server on a web application.

URS-04: The doctor and nurse can access to patient information (first name, last name, age, gender, weight, height, diabetes type, blood sugar value, and start treatment).

URS-05: The patient can view information include first name, last name, age, gender, weight, height, address, city, zip code, medicine, diabetes type, blood sugar value, and start treatment on profile page.

URS-06: The patient can edit information include first name, last name, age, gender, diabetes type, weight, and height on profile page.

URS-07: The patient can change the password for login.

URS-08: The admin can add nurse, doctor, and nutritionists account to the system on administrator page.

URS-09: The admin can edit nurse, doctor, and nutritionists account on administrator page.

URS-10: The admin can delete nurse, doctor, and nutritionists account from the system on administrator page.

Feature#3: Nutrition management.

URS-11: The nutritionists can add food information (food name, food calories and food glycemic index) to the system on nutrition management page.

URS-12: The nutritionists can edit food information (food name, food calories and food glycemic index) on nutrition management page.

URS-13: The nutritionists can delete food information (food name, food calories and food glycemic index) from the system on nutrition management page.

Feature#4: Activity management

URS-14: The nurse and doctor can add the exercise recommend (symptom, suggestion, proper exercise, exercise inappropriate, and step exercise) to the system on exercise management page.

URS-15: The nurse and doctor can edit the exercise recommend (symptom, suggestion, proper exercise, exercise inappropriate, and step exercise) on exercise management page.

URS-16: The nurse and doctor can delete the exercise recommend from the system on exercise management page.

Feature#5: Activity plan and recommend system.

URS-17: The patient t can select the symptoms on health plan page.

URS-18: The patient can get the suggestion about exercise which include (symptom, suggestion, proper exercise, exercise inappropriate, and step exercise) from the system.

Feature#6: Nutrition plan system.

URS-19: The patient can add food from the database to record in a health plan.

URS-20: The patient can view the total of glycemic index and calorie of food that selected in health plan.

URS-21: The patient can delete a food from the health plan.

Feature#7: Health monitors system.

URS-22: The patient can record blood sugar value to the database.

URS-23: The patient can view body mass index.

URS-24: The patient can view basal metabolic rate.

URS-25: The patient can view the statistic line graph (x = blood sugar value, y = date) of blood sugar.

URS-26: The patient can view interpretation about blood sugar level from the system.

Feature#8: Behavior monitors system.

URS-27: The patient can select food name from the database.

URS-28: The patient can check the list of medicine.

URS-29: The patient can get analyze of nutrition behavior as image (, ,).

URS-30: The 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 patient, doctor, nurse and admin can login to a web application by using username and password.

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 verify username and password with the database.
SRS-04: The system shall display error message “Invalid login attempt”, when user input username and password that not exist on the database.
SRS-05: The system shall validate field username and password.
SRS-06: The system shall display error message “The UserName field is required”, when the user does not input username.
SRS-07: The system shall display error message “The Password field is required”, when the user does not input password.
SRS-08: The system shall redirect to behavior page, when the patient login to the web application success.
SRS-09: The system shall redirect to index page and display nurse/doctor bar, when the doctor or nurse login to the web application.
SRS-10: The system shall redirect to index page and display nutritionists bar, when the nutritionists login to the web application.
SRS-11: The system shall redirect to index page and display admin bar, when admin login to the web application

URS-02: The patient, doctor, nurse and admin can log out from a web application.

Requirement

SRS-12: The system shall provide button “Log out”.
SRS-13: The system shall destroy session, when user click log out button.
SRS-14: The system shall redirect to home page, when user log out success.

Feature#2: Account management.

URS-03: The doctor and nurse can enter patient information (username, password, confirm password, first name, last name, age, gender, weight, height, address, city, zip code, diabetes type and date that start treatment) to the database server on a web application.

Requirement

SRS-15: The system provides the register UI which includes input fields to input username, password, confirm password, first name, last name, age, gender, weight, height, address, city, zip code, diabetes type and date that start treatment
SRS-16: The system shall provide button “Submit”.

SRS-17: The system shall verify email and provide error message “the email is already taken”, when the user input email is already in the database.
SRS-18: The system shall validate email and provide error message “the email is invalid”, when user input wrong format e-mail.
SRS-19: The system shall verify username and provide error message “the Username is already taken”, when the user input username is already in the database.
SRS-20: The system shall validate username and provide error message “the Username field is required”, when the user does not input username.
SRS-21: The system shall validate password and provide error message “the Password field is required”, when the user does not input password.
SRS-22: The system shall validate password and provide error message “The password must be at least 6 characters long”, when the user input password less than 6 characters.
SRS-23: The system shall validate confirm password and provide error message “the confirm password field is required”
SRS-24: The system shall validate confirm password and provide error message “the confirm password and password does not match.
SRS-25: The system shall validate first name and provide error message “the First Name field is required”, when the user does not input the first name.
SRS-26: The system shall validate last name and provide error message “the Last Name field is required”, when user does not input the last name.
SRS-27: The system shall provide two select options male and female in the select box gender of the user.
SRS-28: The system shall validate age and provide error message “the Age field is required”, when the user does not input age.
SRS-29: The system shall validate age and provide error message “age is must be a number”, when user input wrong format age.
SRS-30: The system shall validate address and provide error message the “Address field is required”, when the user does not input address.
SRS-31: The system shall provide two select options diabetes type 1 and diabetes type 2 in the select box diabetes type of user.
SRS-32: The system shall validate height and provide error message “height must be a number”, when user input wrong format height.
SRS-33: The system shall validate height and provide error message the “Height field is required”, when the user does not input height.
SRS-34: The system shall validate weight and provide error message “weight must be a number”, when user wrong input format weight.
SRS-35: The system shall validate weight and provide error message the “Weight field is required”, when the user does not input weight.
SRS-36: The system shall provide error message the “Start Treatment field” is required. When the user does not input, start treatment.

SRS-37: The system shall save user information to database, when nurse or doctor information success.

SRS-38: The system shall redirect to home page, when nurse or doctor registration is a success.

URS-04: The doctor and nurse can access to patient information (first name, last name, age, gender, weight, height, diabetes type, blood sugar value, and start treatment).

Requirement

SRS-39: The system shall provide a search field.

SRS-40: The system shall provide a search button.

SRS-41: The system shall validate search field.

SRS-42: The system shall display error message “Please input patient name”, when the doctor or nurse not input name of patient on search field.

SRS-43: The system shall search for the patient based on first name from the database.

SRS-44: The system shall display list of patients as a table providing first name, last name, age, gender, weight, height, diabetes type, blood sugar value, and start treatment, when finish SRS-40.

SRS-45: The system shall display error message “___”, when the system can’t find the patient name in the database.

URS-05: The patient can view information include first name, last name, age, gender, weight, height, address, medicine, diabetes type, blood sugar value, and start treatment on profile page.

Requirement

SRS-46: The system shall provide UI label which include first name, last name, age, gender, weight, height, address, medicine, diabetes type, blood sugar value, and start treatment

SRS-47: The system shall receive the information of current patient which include first name, last name, age, gender, weight, height, address, medicine, diabetes type, blood sugar value, and start treatment from the database.

SRS-48: The system shall display label which include first name, last name, age, gender, weight, height, address, medicine, diabetes type, blood sugar value, and start treatment on profile page.

URS-06: The patient can edit information include first name, last name, age, gender, diabetes type, weight, and height on profile page.

Requirement

SRS-49: The system shall provide UI, which includes input fields to input first name, last name, and select box to choose gender, age, select box to select diabetes type, height, weight, and start treatment for edit patient info.

SRS-16: The system shall provide button “Submit”.
SRS-50: The system shall validate input field first name, last name, a select box to choose gender, age, select box to select diabetes type, height, weight, and start treatment.
SRS-51: The system shall display error message “The field Height must be a number.”, when user input wrong format height.
SRS-52: The system shall display error message “The field Weight must be a number.”, when user wrong input format weight.
SRS-53: The system shall display error message “The Age field is required.”, when the user does not input age.
SRS-54: The system shall display error message “The Weight field is required.”, when the user does not input weight.
SRS-55: The system shall verify height and provide error message “The Height field is required.”, when the user does not input height.
SRS-56: The system shall save change the information which include field first name, last name, a select box to choose gender, age, select box to select diabetes type, height, weight, and start treatment in the database.
SRS-57: The system shall redirect to a profile page, when patient edit information success.

URS-07: The patient can change the password for login.
Requirement

SRS-58: The system shall provide input fields which include current password, new password, and confirm the password.
SRS-59: The system shall provide button “Change password”.
SRS-60: The system shall verify the input field current password, new password, and confirm the password.
SRS-61: The system shall verify current password and provide error message “Incorrect password”, when the patient input current password that not match the password on the database.
SRS-62: The system shall verify new password and provide error message “The New password field is required”, when the patient not input new password.
SRS-63: The system shall validate the input field current password, new password, and confirm the password.
SRS-64: The system shall validate new password and provide error message “The New password must be at least 6 characters long”, when the patient input new password less than 6 characters.
SRS-65: The system shall validate confirm password and provide error message “new password and confirm password does not match”, when the patient input a new password and confirm password does not match.

SRS-66: The system shall save change new password on the database, when user change password success.

SRS-67: The system shall redirect to the profile page, when user change password success.

URS-08: The admin can add nurse, doctor, and nutritionists account to the system on administrator page.

Requirement

SRS-68: The system shall provide UI to create new account include input fields to input username, password, email, and selection box to select the role of the user.

SRS-69: The system shall provide three select options doctor, nurse, and nutritionists in the select role of the user.

SRS-16: The system shall provide “Submit” button.

SRS-70: The system shall validate input field username, password, and e-mail.

SRS-71: The system shall display error message “the e-mail is invalid”, when the admin input email wrong format.

SRS-72: The system shall verify input field username, password, and e-mail with database.

SRS-73: The system shall display error message the “email is already taken”, when the admin input email is already in the database.

SRS-74: The system shall verify username error message “the username is already taken”, when the admin input username is already in the database.

SRS-75: The system shall verify username and display error message the “username field is required”, when the admin does not input username.

SRS-76: The system shall verify password and display error message the “password field is required”, when the admin does not input username.

SRS-77: The system shall verify email and display error message the “email field is required”, when the admin does not input username.

SRS-78: The system shall save data in the database, when admin click button “Submit”.

SRS-79: The system shall redirect to the home page of account management, when admin creates new account success.

URS-09: The admin can edit nurse, doctor, and nutritionists account on administrator page.

Requirement

SRS-80: The system shall provide UI to edit account include input fields to input email, password, and selection box to select the role of the user.

SRS-81: The system shall provide three select options doctor, nurse, and nutritionists in the select role of the user.

SRS-16: The system shall provide “Submit” button.

SRS-82: The system shall validate input field email and password.
SRS-83: The system shall display error message “the email is already in the database”, when the admin input email is already in the database.
SRS-84: The system shall display error message “the email is invalid”, when user input wrong format e-mail.
SRS-85: The system shall provide error message “The password must be at least 6 characters long”, when the admin input new password less than 6 characters.
SRS-86: The system shall redirect to account management page, when the admin finish edit user account.

URS-10: The admin can delete nurse, doctor, and nutritionists account from the system on administrator page.

Requirement

SRS-87: The system shall provide UI label list of user account.
SRS-88: The system shall provide delete button.
SRS-89: The system shall provide confirm message, when the admin click delete button
SRS-90: The system shall cancel to delete user account, when admin click “cancel” on confirm message.
SRS-91: The system shall remove user account from the database, when admin click “yes” on confirm message.
SRS-92: The system shall redirect to account management page, when the admin delete account success.

Feature#3: Nutrition management.

URS-11: The nutritionists can add food information (food name, food calories and food glycemic index) to the system on nutrition management page.

Requirement

SRS-93: The system shall provide UI to create new foods which include input field to input food name, glycemic index, and calorie.
SRS-94: The system shall provide “create” button
SRS-95: The system shall validate input field food name, glycemic index, and calorie.
SRS-96: The system shall display error message “The glycemic index must be a number”, when the nutritionists input character on glycemic index field.
SRS-97: The system shall display error message “The calorie must be a number”, when the nutritionists not input calorie.
SRS-98: The system shall display error message “The glycemic index field is request”, when the nutritionists input character on glycemic index field.
SRS-99: The system shall display error message “The calorie field is request”, when the nutritionists not input calorie.

SRS-100: The system shall save data of food name, food glycemic and food calories to the table “Foods” on the database, when nutritionists click button “Create”.

SRS-101: The system shall redirect to nutrition management page, when the nutritionists create new foods success.

URS-12: The nutritionists can edit food information (food name, food calories and food glycemic index) on nutrition management page.

Requirement

SRS-102: The system shall provide UI to edit include input field to input food name, glycemic index, and calorie.

SRS-103: The system shall provide “save” button

SRS-104: The system shall validate input field food name, glycemic index, and calorie.

SRS-105: The system shall display error message “The glycemic index must be a number”, when the nutritionists input character on glycemic index field.

SRS-106: The system shall display error message “The calorie must be a number”, when the nutritionists not input calorie.

SRS-107: The system shall display error message “The glycemic index field is request”, when the nutritionists input character on glycemic index field.

SRS-108: The system shall display error message “The calorie field is request”, when the nutritionists not input calorie.

SRS-109: The system shall save change the data of food name, food glycemic, food calorie on the database, when nutritionists click button “Save”.

SRS-110: The system shall redirect to nutrition management page, when the nutritionists edit foods success.

URS-13: The nutritionists can delete food information (food name, food calories and food glycemic index) from the system on nutrition management page.

Requirement

SRS-111: The system shall provide UI label list of food to the nutritionists.

SRS-88: The system shall provide delete button.

SRS-112: The system shall provide confirm page, when the nutritionists click delete button.

SRS-113: The system shall cancel to delete food, when nutritionists click “cancel” on confirm message.

SRS-114: The system shall remove food from the database, when nutritionists click “yes” on confirm message.

SRS-115: The system shall redirect to nutrition management page, when the nutritionists confirm to delete account.

Feature#4: Activity management

URS-14: The nurse and doctor can add the exercise recommend (symptom, suggestion, proper exercise, exercise inappropriate, and step exercise) to the system on exercise management page.

Requirement

SRS-116: The system shall provide UI to create the new activity which includes input field symptom, suggestion, proper exercise, exercise inappropriate, and step exercise.

SRS-94: The system shall provide “create” button

SRS-117: The system shall save data of symptom, suggestion, proper exercise, exercise inappropriate, and step exercise to the database.

SRS-118: The system shall redirect to exercise management page, when the doctor or nurse finish creates new exercise.

URS-15: The nurse and doctor can edit the exercise recommend (symptom, suggestion, proper exercise, exercise inappropriate, and step exercise) on exercise management page.

Requirement

SRS-119: The system shall provide UI to edit the data include input field symptom, suggestion, proper exercise, exercise inappropriate, and step exercise.

SRS-103: The system shall provide “save” button.

SRS-120: The system shall save change data of symptom, suggestion, proper exercise, exercise inappropriate, and step exercise in the database.

SRS-121: The system shall redirect to exercise management page, when the doctor or nurse creates new exercise success.

URS-16: The nurse and doctor can delete the exercise recommend from the system on exercise management page.

Requirement

SRS-122: The system shall provide UI label list of exercises to nurse or doctor.

SRS-88: The system shall provide delete button.

SRS-123: The system shall provide confirm page, when nurse or doctor click delete button.

SRS-124: The system shall cancel to delete exercise, when nurse or doctor click “cancel” on confirm message.

SRS-125: The system shall remove exercise from the database, when nurse or doctor click “yes” on confirm message.

SRS-126: The system shall redirect to exercise management page, when the doctor or nurse confirm to delete account.

Feature#5: Activity plan and recommend system.

URS-17: The patient can select the symptoms on health plan page.

Requirement

SRS-127: The system shall provide a select box of symptoms.

SRS-128: The system shall provide select options for example peripheral neuropathy, diabetic retinopathy, heart disease, and The problems at knee, Ankles or feet in the select box symptoms of patient.

SRS-129: The system shall provide “select” button.

SRS-130: The system shall select the symptoms by symptoms name from the table “Exercises” on the database.

SRS-131: The system shall display detail of exercises, when select symptoms success.

URS-18: The patient can get the suggestion about exercise which include (symptom, suggestion, proper exercise, exercise inappropriate, and step exercise) from the system.

Requirement

SRS-132: The system must finish on URS-17

SRS-133: The system shall display detail table of exercise which includes symptom detail, exercise appropriate, exercise inappropriate, and steps of exercise, when patient select the symptoms success.

Feature#6: Nutrition plan system.

URS-19: The patient can select food from the database to record in a health plan.

Requirement

SRS-134: The system shall retrieve of all food names from the database.

SRS-135: The system shall provide a dropdown list displaying a list of food name.

SRS-136: The system shall provide “Add” button.

SRS-137: The system shall record the selected food into the database.

SRS-138: The system shall display list of food including food name, food glycemic, and food calories, when success process.

URS-20: The patient can view the total of glycemic index and calorie of food that selected on health plan.

Requirement

SRS-139: The system shall provide UI label to display the average value of glycemic index and calories of food.

SRS-140: The system shall get the data of glycemic index and calories of food from the database.

SRS-141: The system shall calculate the value of glycemic index and calories.

SRS-142: The system shall display the average value of glycemic index of food that selected on health plan.
SRS-143: The system shall display the average value of calorie of food that selected on health plan.

URS-21: The patient can delete a food from the health plan.
Requirement

SRS-144: The system shall provide label list of food name to the patient.
SRS-88: The system shall provide delete button.
SRS-145: The system shall delete a food from the database, when the patient click delete button.

Feature#7: Health monitors system.
URS-22: The patient can record blood sugar value to the database.
Requirement

SRS-146: The system shall provide input field to input blood sugar.
SRS-147: The system shall provide button “add”.
SRS-148: The system shall record the value to table “Glycemic” on the database.
SRS-149: The system shall validate input field blood sugar.
SRS-150: The system shall display error message “blood sugar must be a number”, when the patient input character.
SRS-151: The system shall display error message “blood sugar cannot be negative”, when the user input blood sugar minus value.
SRS-152: The system shall display blood sugar on graph.

URS-23: The patient can view body mass index.
Requirement

SRS-153: The system shall provide label to display BMI value.
SRS-154: The system shall get the data of weight and height of patient from the database.
SRS-155: The system shall calculate body mass (BMI) by

$$\text{BMI} = \frac{\text{Weight(m)}}{(\text{Height(m)} \times \text{Height(m)})}$$

SRS-156: The system shall display the BMI on the label.

URS-24: The patient can view basal metabolic rate.
Requirement

SRS-157: The system shall provide label to display BMR value.
SRS-158: The system shall get the data of weight, height, gender, and age of patient from the database.
SRS-159: The system shall calculate basal metabolic rate (BMR) by

$$\mathbf{BMR(male)} = \mathbf{66} + \left(\mathbf{13.7} \times \boldsymbol{weight}\,(\boldsymbol{kg})\right) + (\mathbf{5} \times \left(\boldsymbol{height}(\boldsymbol{cm})\right) - (\mathbf{6.8} \times \boldsymbol{age})$$
$$\mathbf{BMR(female)} = \mathbf{665} + \left(\mathbf{9.6} \times \boldsymbol{weight}\,(\boldsymbol{kg})\right) + (\mathbf{1.8} \times \left(\boldsymbol{height}(\boldsymbol{cm})\right) - (\mathbf{4.7} \times \boldsymbol{age})$$

SRS-160: The system shall display result of BMR on the label.

URS-25: The patient can view the statistic line graph (x = blood sugar value, y = date) of blood sugar.
Requirement

SRS-161: The system shall provide UI to display line graph (x = blood sugar value, y = date).
SRS-162: The system shall get data after finish URS-22.
SRS-163: The system shall display blood sugar on line graph (x = blood sugar value, y = date).

URS-26: The patient can view interpretation about blood sugar level from the system.
Requirement

SRS-164: The system shall provide UI to display the interpretation of blood sugar.
SRS-162: The system shall get data after finish URS-22.
SRS-165: The system shall display table include (levels of diabetes, Symptom, How to take care).

Feature#8: Behavior monitors system.
URS-27: The patient can select food name from the database.
Requirement

SRS-166: The system shall retrieve of all food names from the database.
SRS-167: The system shall provide a dropdown list displaying a list of food name.
SRS-168: The system shall provide “select” button.
SRS-169: The system shall record the selected food into the database.
SRS-170: The system shall display list of food.

URS-28: The patient can daily record the consumed medicine.

Requirement

SRS-172: The system shall retrieve the list of medicine of a patient from the database.

SRS-173: The system shall display a check list of patient's medicine.

SRS-174: The system shall provide a "save" button.

SRS-175: The system shall save the consumed medicine into the database.

URS-29: The patient can view the nutrition consumption behavior as image (, ,).

Requirement

SRS-129: The system shall retrieve consumed medicine and consumed foods from the database.

SRS-130: The system shall determine the average value of glycemic index.

SRS-130: 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-131: 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-132: 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-30: The patient can view the daily graph of the glycemic level.

Requirement

SRS-106: The system shall provide UI to display line graph(x = glycemic value, y = date).

SRS-133: The system shall get data after finish URS-27.

SRS-134: The system shall calculate the total glycemic index of food.

SRS-135: The system shall display the total of glycemic value on line graph(x = glycemic value, y = date).

Chapter Four | Specification Requirement

4.1 Use Case Scenarios

4.1.1 Use Case Diagram All Feature

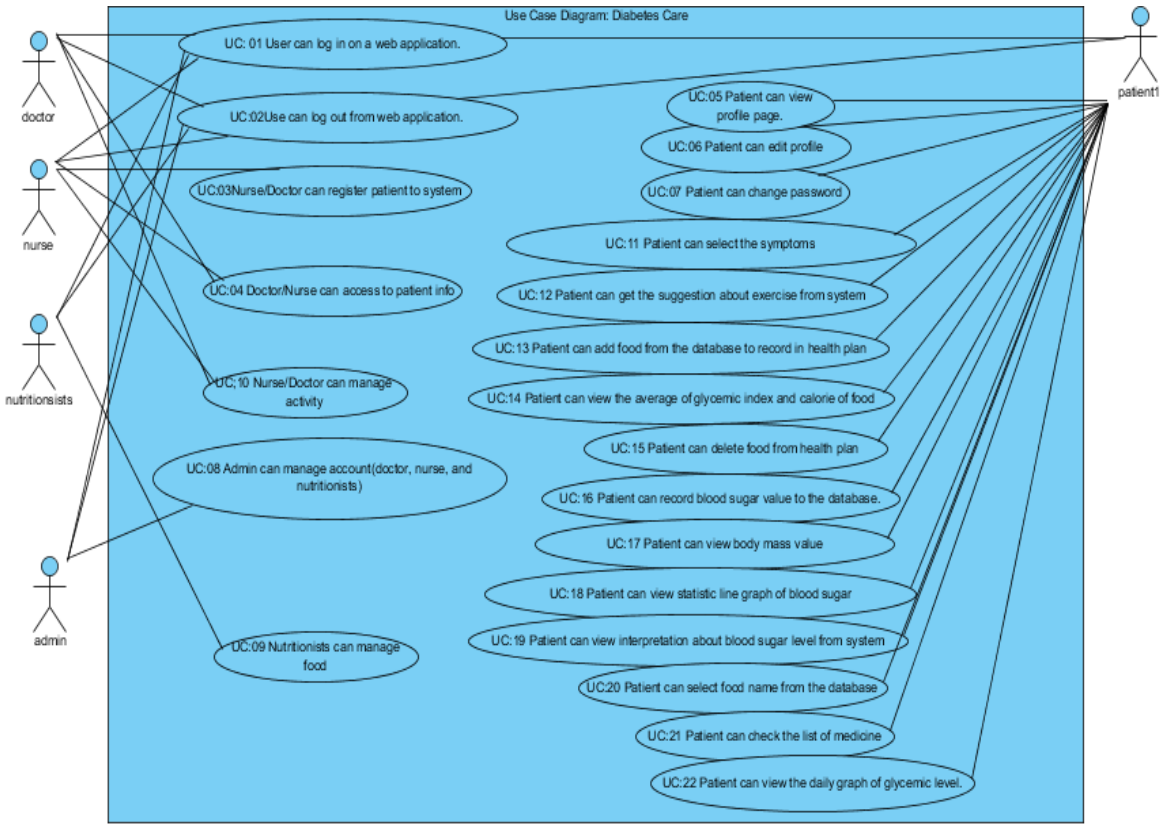

Figure 1: Use Case diagram of Diabetes

Use Case Diagram: Authentication system.

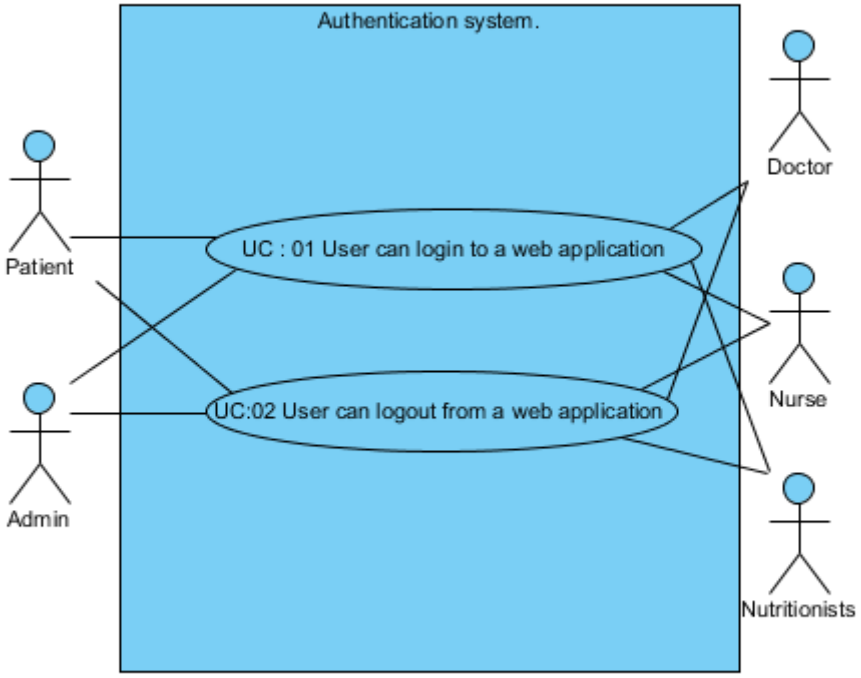

Figure 2: Use Case diagram of Authentication system.

Use Case Diagram: Account management.

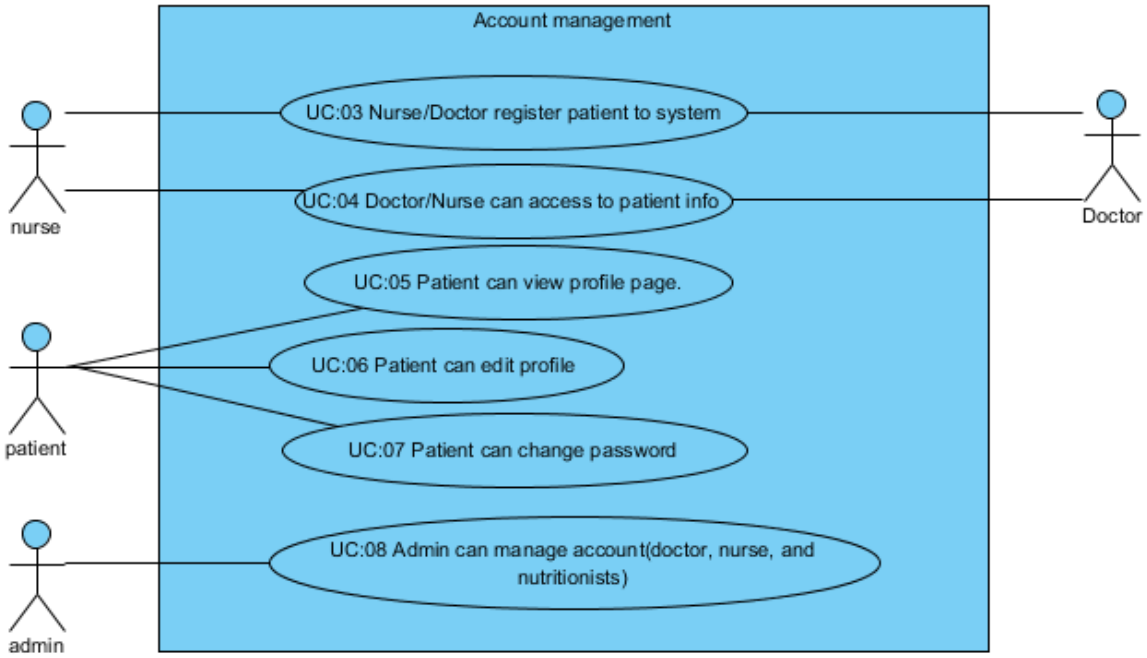

Figure 3: Use Case diagram of Account management.

Use Case Diagram: Nutritionists management

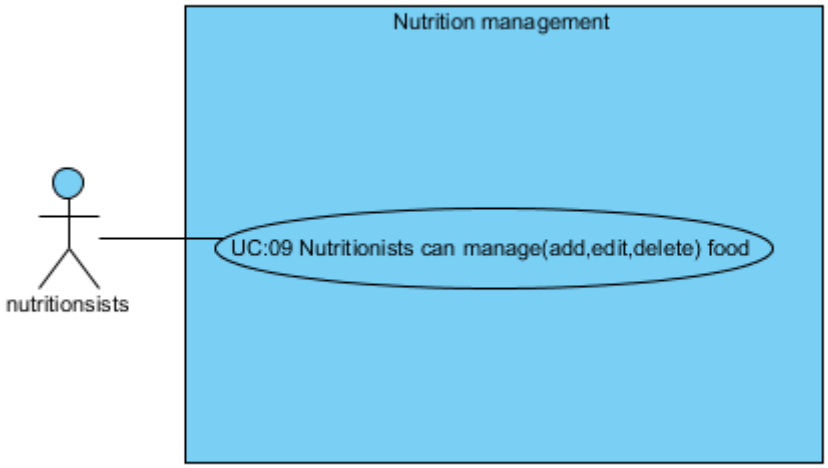

Figure 4: Use Case diagram of Nutritionists management.

Use Case Diagram: Activity management

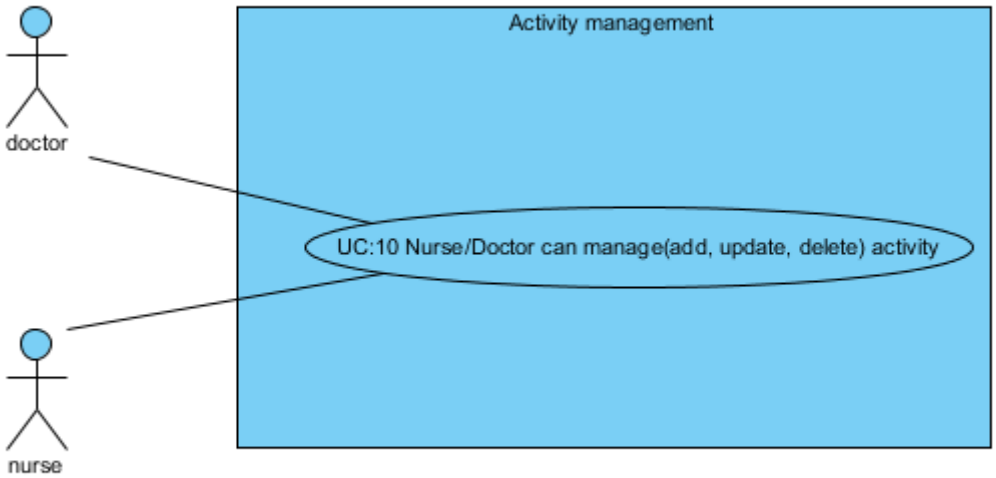

Figure 5: Use Case diagram of Activity management.

Use Case Diagram: Activity plan and recommend system.

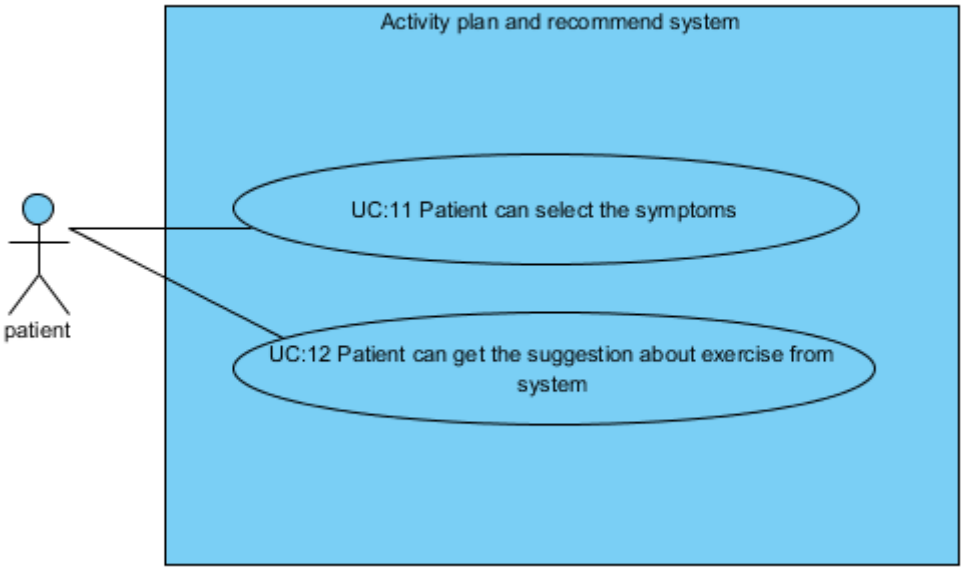

Figure 6: Use Case diagram of Activity plan and recommend system.

Use Case Diagram: Nutrition plan system.

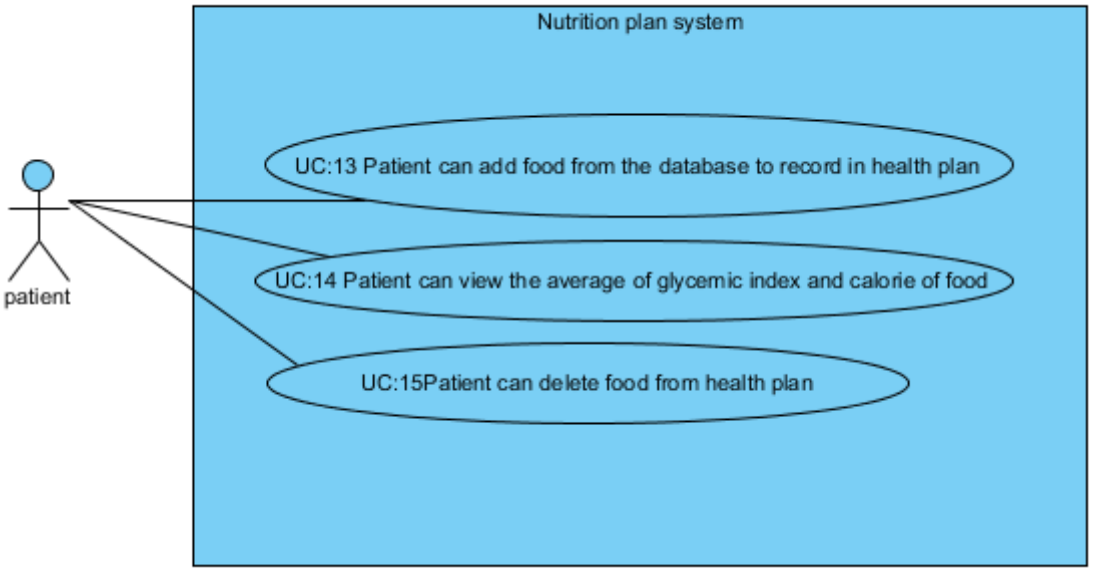

Figure 7: Use Case diagram of Nutrition plan system.

Use Case Diagram: Health monitors system.

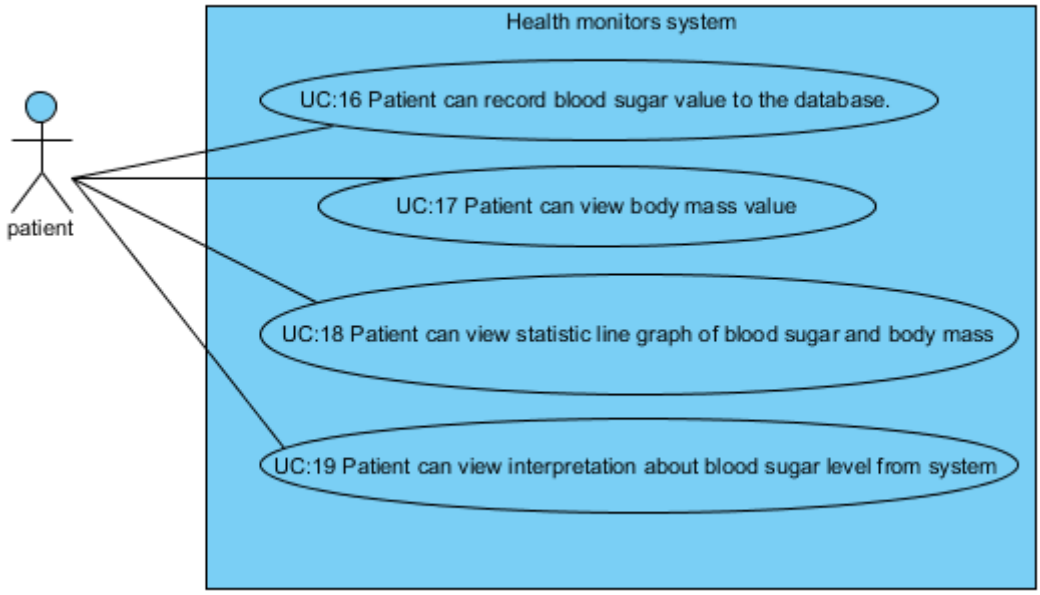

Figure 8: Use Case diagram of Health monitors system.

Use Case Diagram: Behavior monitors system.

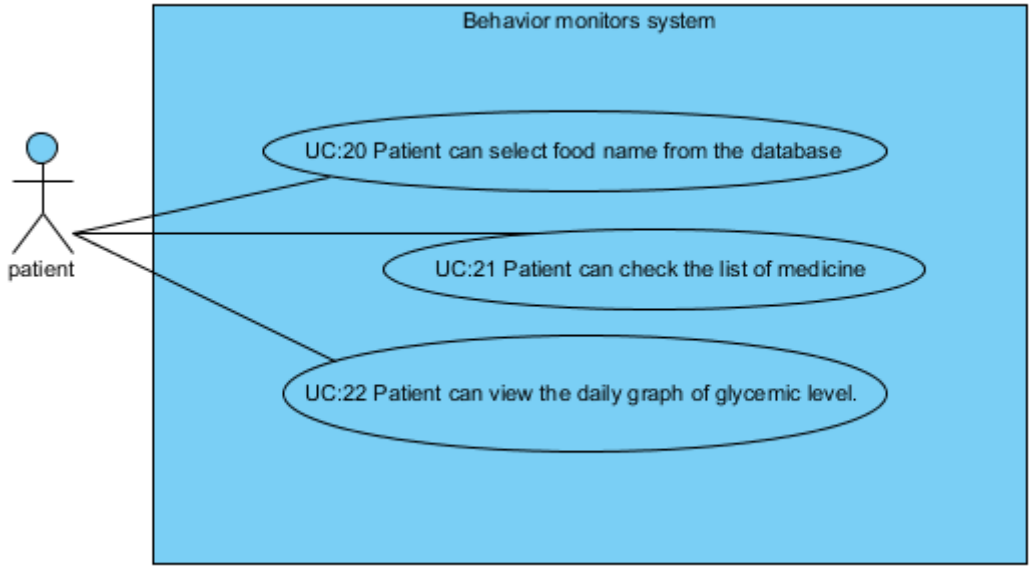

Figure 9: Use Case diagram of Behavior monitors system.

4.2 Use Case Scenarios

Use Case ID	UC01		
Use Case Name	User can log in on a Web Application.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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. - Username was already on the database. - 8-20 character.	usertest
Password	string	- Must not empty - Password was already on the database. - 6-20 characters of capital or small alphabet letters or number.	passwordtest

Post conditions	- User login to system	
Normal Flows	User	System
	2. User must input data includes username and password. 3. User click login.	1. The system shall provide UI includes username and password. 4. The system shall verify (username and password) 5. The system shall redirect to index page.
Alternative Flow	In step of 5 of Normal Flow, if users input wrong username or password. 1. The system shall display the error message “Invalid login attempt”. 2. The system shall return to step 2 of normal flow. In step of 5 of Normal Flow, if users not input username or password. 1. The system shall display error message “The username field is required”, when user not input username. 2. The system shall display error message “The password field is required”, when user not input password. 3. The system shall return to step 2 of normal flow.	

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

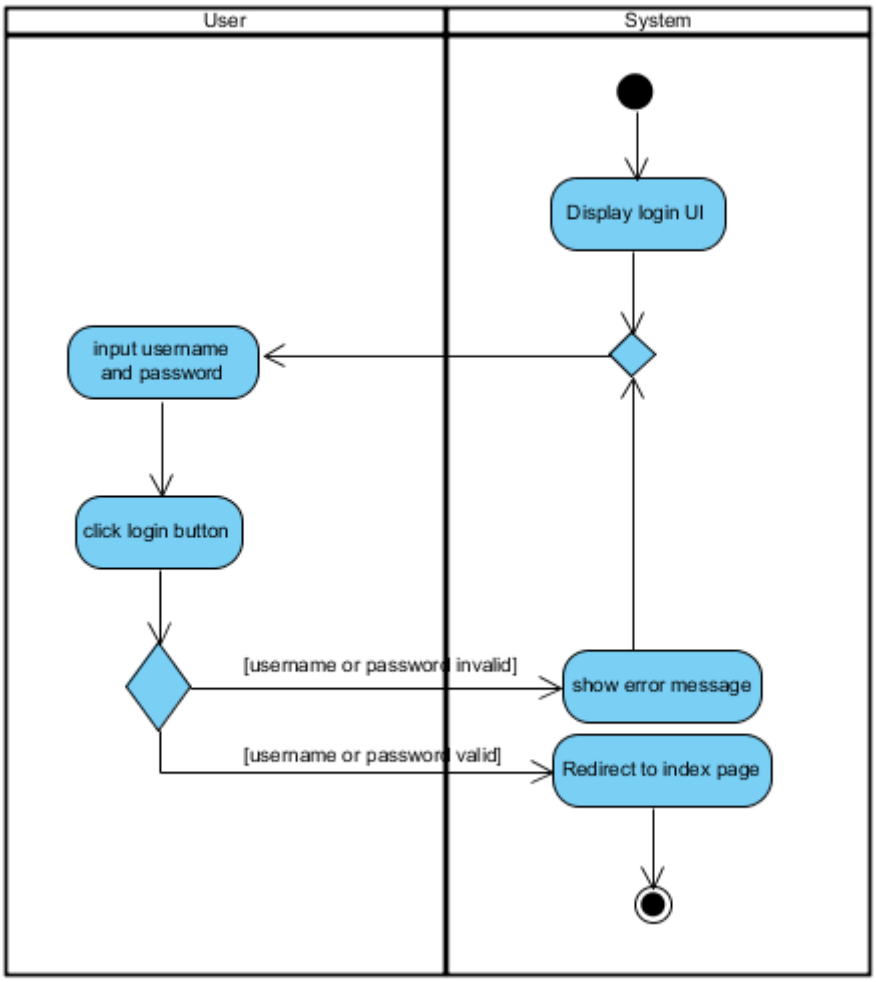

Figure 9: AD: 01: login.

Use Case ID	UC02		
Use Case Name	User can log out from system.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient, Doctor, Nutritionists, Admin		
Description	The patient, doctor, nurse and admin can login to a web application by using username and password.		
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 click logout button.	1. The system shall provide “logout” button 3. The system shall destroy session. 4. The system shall redirect to index page.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English.	

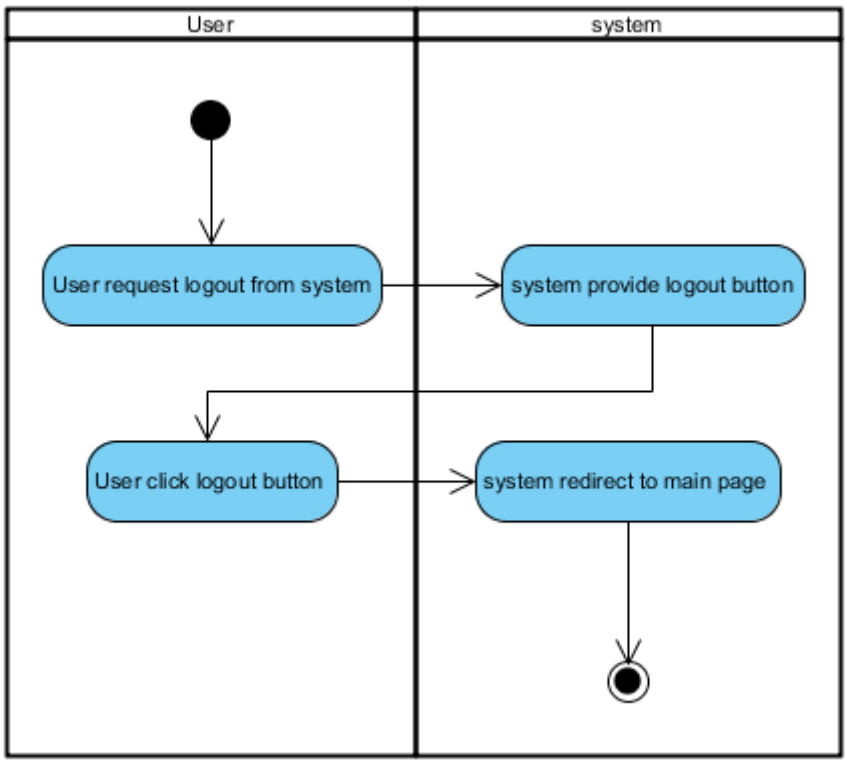

Figure 10: AD: 02: Patient logout.

Use Case ID	UC03		
Use Case Name	Nurse/Doctor can register patient to the web application		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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, address, diabetes type and 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. - Must not already on the database. - 8-20 character.	usertest
password	string	- Must not empty - 6-20 characters of capital or small alphabet letters or number	Password1
Confirm password	string	- Must be same with password - Must not empty - 6-20 characters of capital or small alphabet letters or number	Password1
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	double	- Must input to be number - Must not empty	60.00
height	double	- Must input to be number - Must not empty	175.00
Gender	boolean	- Must not empty - Must select between male = 0 and female = 1	0
Diabetes type	boolean	- Must not empty - Must select between type1=0 and type2 = 1	0
Start treatment	Date	- Must not empty	12/12/2012

<table>
<tr><td></td><td></td><td colspan="2">- Must input to be date format.</td><td></td></tr>
<tr><td>address</td><td>String</td><td colspan="2">-Must not empty</td><td>Mang phayao 56000</td></tr>
<tr><td>Post conditions</td><td colspan="4">- Registration success the data must store on the database.</td></tr>
<tr><td>Normal Flows</td><td colspan="2">User</td><td colspan="2">System</td></tr>
<tr><td></td><td colspan="2">2. User must input data includes username, password, confirm password, e-mail, first name, last name, gender, age, address, diabetes type, height, weight, and start treatment.
3. User must click “Submit” button.</td><td colspan="2">1. The system shall provide UI includes username, password, confirm password, e-mail, first name, last name, gender, age, address, diabetes type, height, weight, and start treatment.
The system shall provide “Submit” button
4. The system shall verify data includes username, password, confirm password, e-mail, first name, last name, gender, age, address, diabetes type, height, weight, and start treatment.
5. The system shall save user information to database
6. The system shall redirect to home page</td></tr>
<tr><td>Alternative Flow</td><td colspan="4">In step of 6 of Normal Flow, if users not input the data on field.
1. The system shall display error message the “The username field is required”, when the user does not input username.
2. The system shall display error message the “The Password field is required”, when the user does not input password.
3. The system shall provide error message the “first name field is required”, when the user does not input the first name.
4. The system shall provide error message the “last name field is required”, when user does not input the last name.
5. The system shall provide error message the “age field is required”, when the user does not input age.
6. The system shall provide error message the “address field is required”, when the user does not input address.
7. The system shall provide error message the “height field is required”, when the user does not input height.</td></tr>
</table>

	8. The system shall provide error message the “Weight field is required”, when the user does not input weight. 9. The system shall return to step 2 of normal flow. In step of 6 of Normal Flow, if users input wrong format. 1. The system shall provide error message the “email is invalid”, when user input wrong format e-mail. 2. The system shall provide error message “age is invalid”, when user input wrong format age. 3. The system shall provide error message “height must be a number”, when user input wrong format height. 4. The system shall provide error message “weight must be a number”, when user wrong input format weight. 5. The system shall return to step 2 of normal flow. In step of 6 of Normal Flow, if users input email that already in the database. 6. The system shall provide error message the “email is already taken”, when the user input email is already in the database. 7. The system shall return to step 2 of normal flow. In step of 6 of Normal Flow, if users input password less than 6 character. 8. The system shall provide error message “The password must be at least 6 characters long”, when the user input password less than 6 characters. 9. The system shall return to step 2 of normal flow.
Exception Flow	-
Assumption	1. Users understand English.

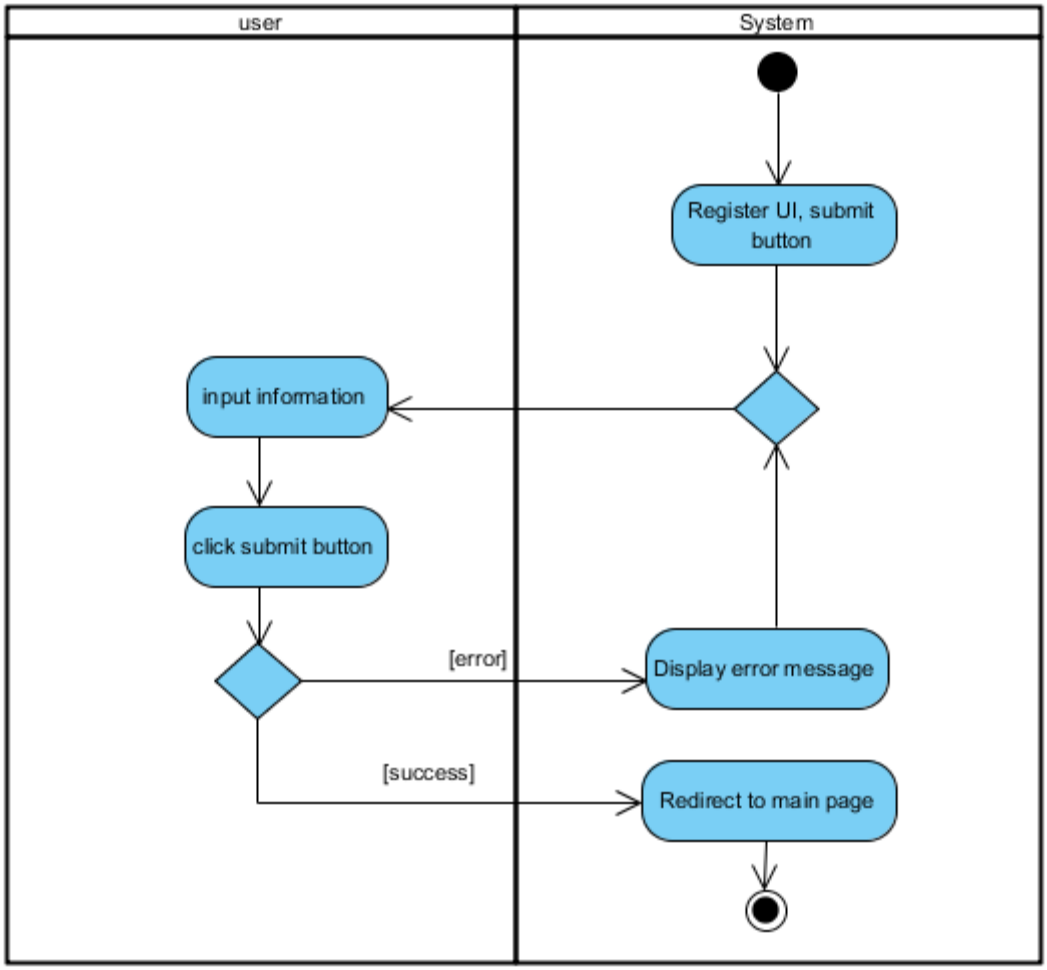

Figure 11: AD: 03: Registration.

Use Case ID	UC04		
Use Case Name	Doctor/Nurse can access to patient info.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Doctor, Nurse		
Description	The doctor and nurse can access to patient information (first name, last name, age, gender, weight, height, diabetes type, blood sugar value, and start treatment).		
Trigger	- Doctor or nurse selects patient list link button.		
Preconditions	- Doctor login to the web application by doctor account. - Nurse login to the web application by nurse account.		

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

Post conditions	- Doctor access to patient info success. - Nurse access to patient info success.	
Normal Flows	User	System
	3. The user input name of patient in search field 4.The user click “search”	1. The system shall provide a search field. 2. The system shall provide a search button 5. The system shall validate search field 6. The system shall search for the patient based on first name from the database. 7. The system shall display list of patients as a table providing first name, last name, age, gender, weight, height, diabetes type, blood sugar value, and start treatment
Alternative Flow	In step 5 of Normal Flows, if user not input name on search field. 1. The system shall display error message, when the doctor or nurse not input name of patient on search field. 2. The system shall return to step 3 of normal flow.	
Exception Flow	-	

Assumption	1. Users understand English.

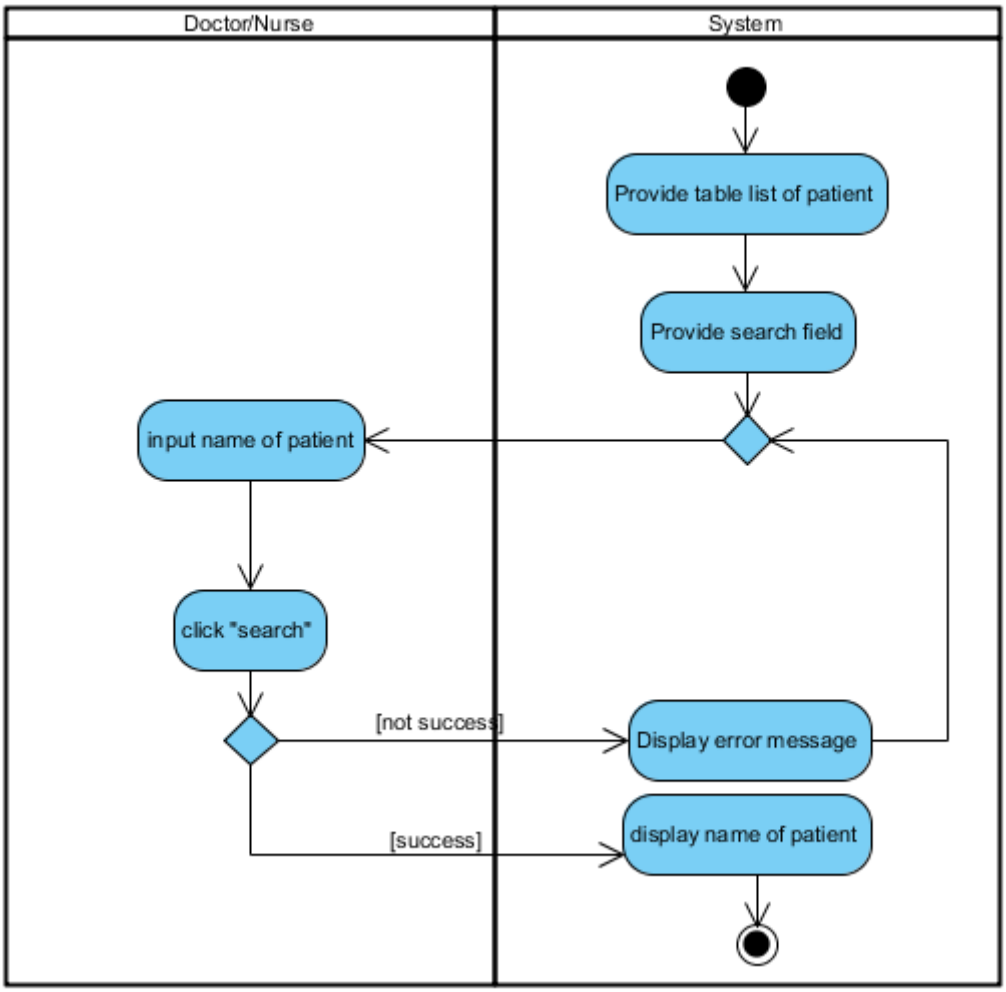

Figure 12: AD: 04: Doctor/Nurse can access to patient info.

Use Case ID	UC05		
Use Case Name	View profile.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	The patient can view information include first name, last name, age, gender, weight, height, address, medicine, diabetes type, blood sugar value, and start treatment 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 provide UI label which include first name, last name, age, gender, weight, height, address, medicine, diabetes type, blood sugar value, and start treatment 3. The system shall receive the information of current patient which include first name, last name, age, gender, weight, height, address, medicine, diabetes type, blood sugar value, and start treatment from the database. 4. The system shall display label which include first name, last name, age, gender, weight, height, address, medicine, diabetes type, blood sugar value, and start treatment on profile page.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English.	

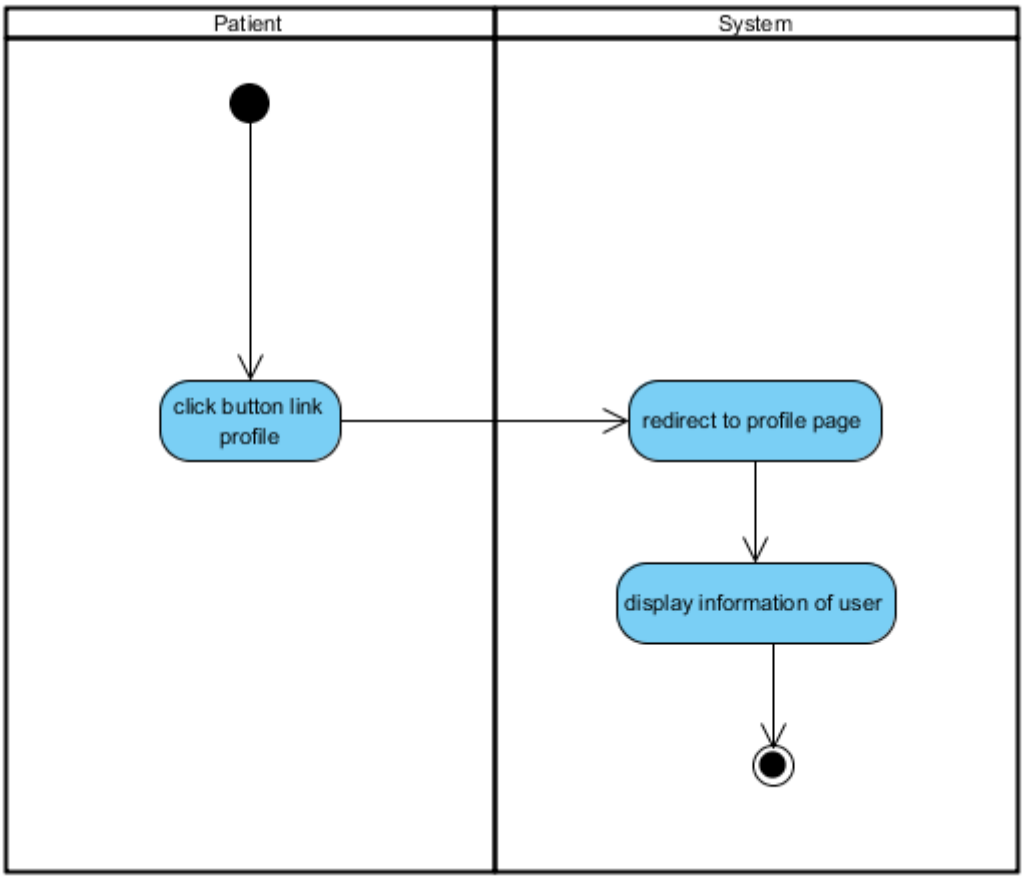

Figure 13: AD: 05: View information of his on profile page.

Use Case ID	UC06		
Use Case Name	Edit profile		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can edit the information (first name, last name, a select box to choose gender, age, height, and weight) 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	-	Jirayu
Last name	string	-	Chinpongsuwan
age	int	- Must input to be number - Must not empty	20
weight	double	- Must input to be number - Must not empty	60.00
height	double	- Must input to be number - Must not empty	175.00
Gender	boolean	- Must not empty - Must select between meal and female	male

Post conditions	- User can edit account success.	
Normal Flows	User	System
	3. Patient input new information includes first name, last name, gender, age height, weight. 4. User clicks “Submit”.	1. The system provides UI to edit information includes first name, last name, gender, age, height, weight. 2. The system shall provide button “Submit”. 5. The system shall verify input data includes first name, last name, gender, age, height, weight. 6. The system shall save change in data base
Alternative Flow	In step of 5 of Normal Flow, if users input wrong format height, and	

	weight. 1. The system shall provide error message “The field Height must be a number”, when user input wrong format height. 2. The system shall provide error message “The field Weight must be a number”, when user wrong input format weight. 3. The system shall return to step 3 of normal flow
Exception Flow	-
Assumption	1. Users understand English.

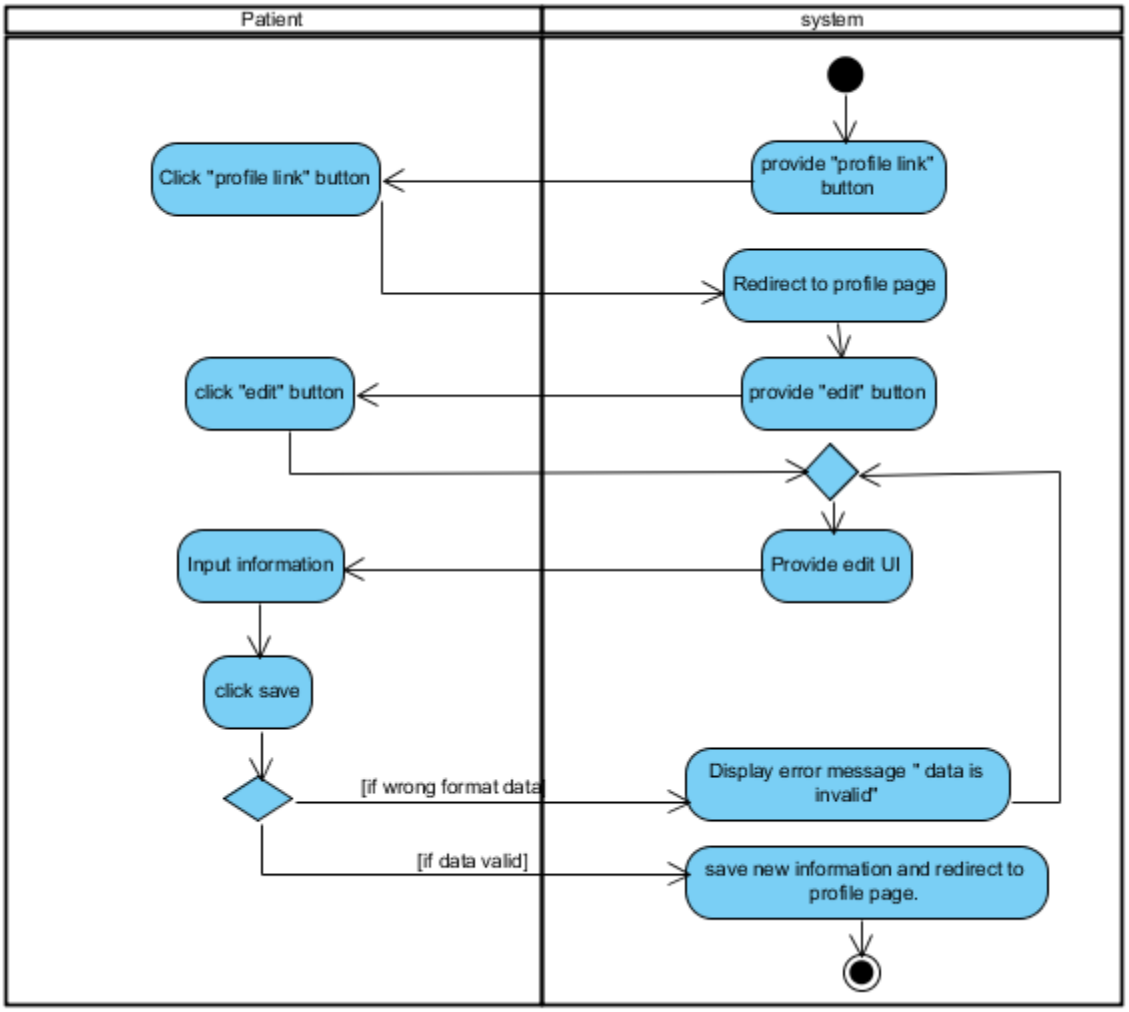

Figure 13: AD: 06: Edit account.

Use Case ID	UC07		
Use Case Name	Chang password		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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 already in the database - Must not empty - 6-20 characters of capital or small alphabet letters or number	passwordtest
New password	string	- Must not empty - 6-20 characters of capital or small alphabet letters or number	passwordtest1
Confirm password	string	Must be same new password	passwordtest1

Post conditions	- Patient can change password success	
Normal Flows	User	System
	3. Patient input data include current password, new password 4. Patient clicks “submit”.	1. The system shall provide UI for change password includes current password, new password and confirm the password. 2. The system shall provide button “Change password”. 5. The system shall verify an validate input data include current password, new password 6. The system shall redirect to user profile page
Alternative Flow	In normal flow step 5. If the patient input current password not correct. 1. The system shall provide error message “Incorrect password”, when the patient input current password not correct. 2. The system shall return to step 3 of normal flow. In normal flow step 5. If the patient not input new password.	

	1. The system shall provide error message “The New password field is required”, when the patient not input new password. 2. The system shall return to step 3 of normal flow In normal flow step 5. If the patient input new password less than 6 character. 1. The system shall provide error message “The New password must be at least 6 characters long”, when the patient input new password less than 6 characters. 2. The system shall return to step 3 of normal flow In normal flow step 5. If the patient input new password and confirm password dose not match. 1. The system shall provide error message “new password and confirm password does not match”, when the patient input a new password. 2. The system shall return to step 3 of normal flow
Exception Flow	-
Assumption	1. Users understand English.

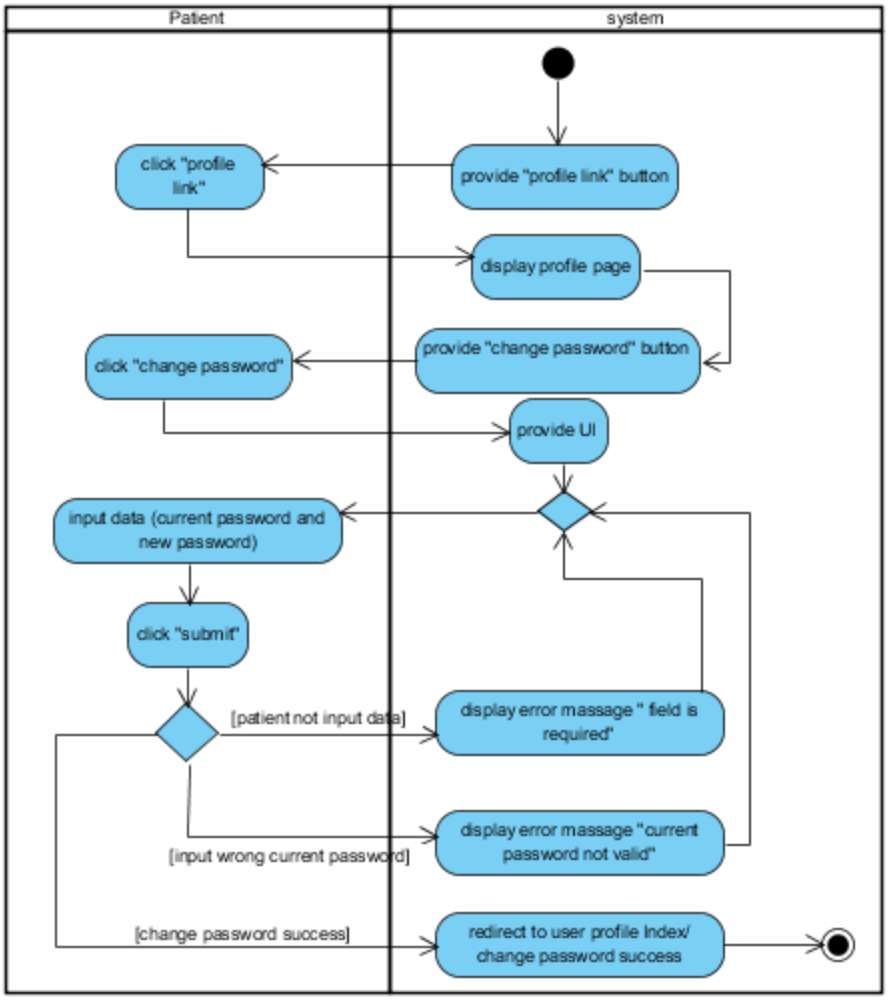

Figure 14: AD: 07: Chang password.

Use Case ID	UC08		
Use Case Name	Admin add user account		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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, email and select role.		
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 - 6-20 characters of capital or small alphabet letters or number	-
email	string	- email address format made up of a local part, an @ symbol, than a domain part - Must not empty	example@email.com

Post conditions	- Admin add account success.	
Normal Flows	User	System
	4. Admin input info includes username, password, email and role. 5. Admin click “Submit” button.	1. The system shall provide UI to create new account include input fields to input username, password, email, and selection box to select the role of the user. 2. The system shall provide three select options doctor, nurse, and nutritionists in the select role of the user. 3. The system shall provide “Submit” button. 6. The system shall verify and validate input info includes username, password, email and role. 7. The system shall redirect to admin

		page, when create new user account success.
Alternative Flow	In normal flow step 6 If the admin input e-mail that already in the database. 1. The system shall provide error message the “email is already taken”, when the admin input email is already in the database. 2. The system shall return to step 4 of normal flow. In normal flow step 6 If the admin input wrong format e-mail. 1. The system shall provide error message “the e-mail is invalid”, when the admin input wrong format e-mail. 2. The system shall return to step 4 of normal flow. In normal flow step 6 If the admin input password less than 6 characters. 1. The system shall provide error message “The password must be at least 6 characters long”, when the admin input new password less than 6 characters. 2. The system shall return to step 4 of normal flow.	
Exception Flow	-	
Assumption	1. Users understand English.	

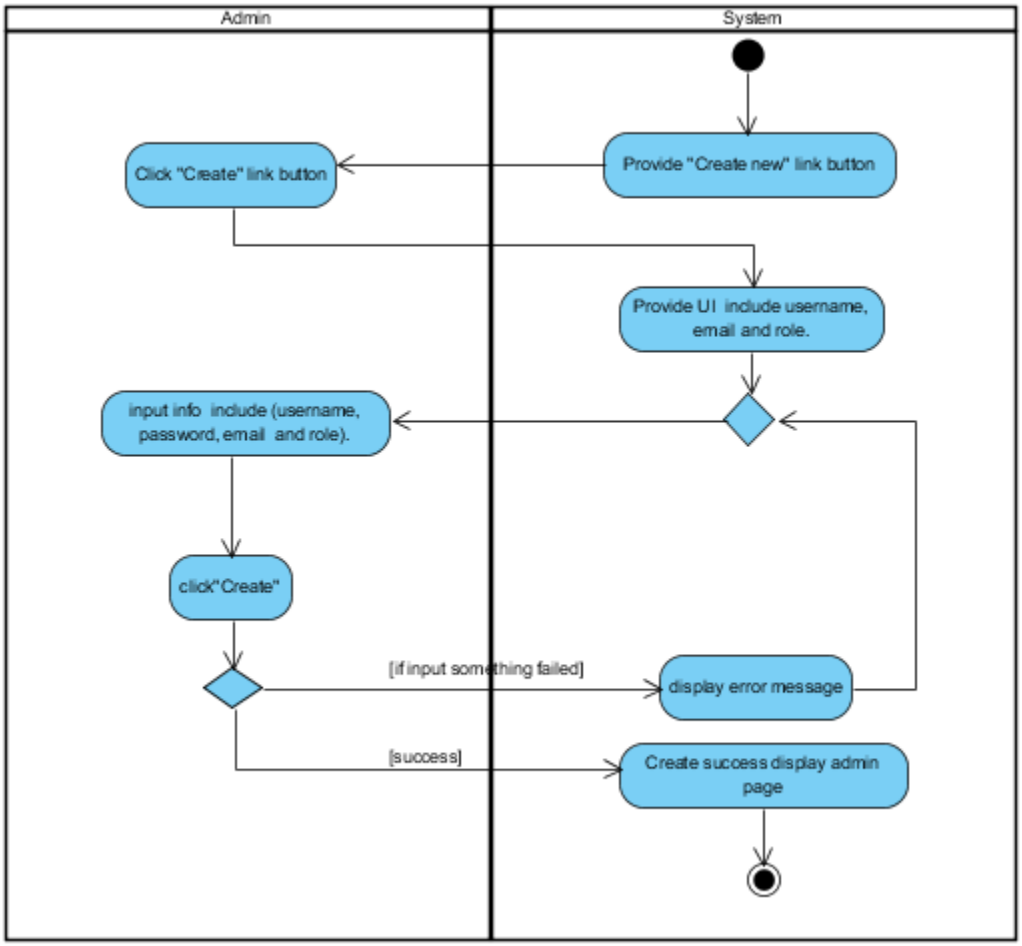

Figure 15: AD: 08: Admin add account.

Use Case ID	UC09		
Use Case Name	Admin edit user account		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Admin		
Description	Admin can edit username, password, and role on user account manage page.		
Trigger	- Admin clicks account management.		
Preconditions	- Admin login to the administration system.		

Use Case Input Specification			
Input	type	Constraint	Example
password	string	- Must not empty - 6-12 characters of capital or small alphabet letters or number	-
email	string	- email address format (made up of a local part, an @ symbol, than a domain part) - Must not empty	example@email.com

Post conditions	- Admin edit account success.	
Normal Flows	User	System
	4. Admin input new info includes e-mail, password, and role. 5. Admin click “Submit” button.	1. The system shall provide UI to edit account include input fields to input email, password, and selection box to select the role of the user. 2. The system shall provide three select options doctor, nurse, and nutritionists in the select role of the user. 3. The system shall provide “Submit” button. 6. The system shall validate input data includes e-mail, password, and role. 7. The system shall redirect to admin page, when edit user account success.
Alternative Flow	In normal flow step 6. If the admin input e-mail that already in the database.	

	1. The system shall provide error message the “email is already taken”, when the admin input email is already in the database. 2. The system shall return to step 3 of normal flow. In normal flow step 6. If the admin input wrong format e-mail. 1. The system shall provide error message “the e-mail is invalid”, when the admin input wrong format e-mail. 2. The system shall return to step 3 of normal flow. In normal flow step 6. If the admin input password less than 6 characters. 1. The system shall provide error message “The password must be at least 6 characters long”, when the admin input new password less than 6 characters. 2. The system shall return to step 3 of normal flow.
Exception Flow	-
Assumption	1. Users understand English.

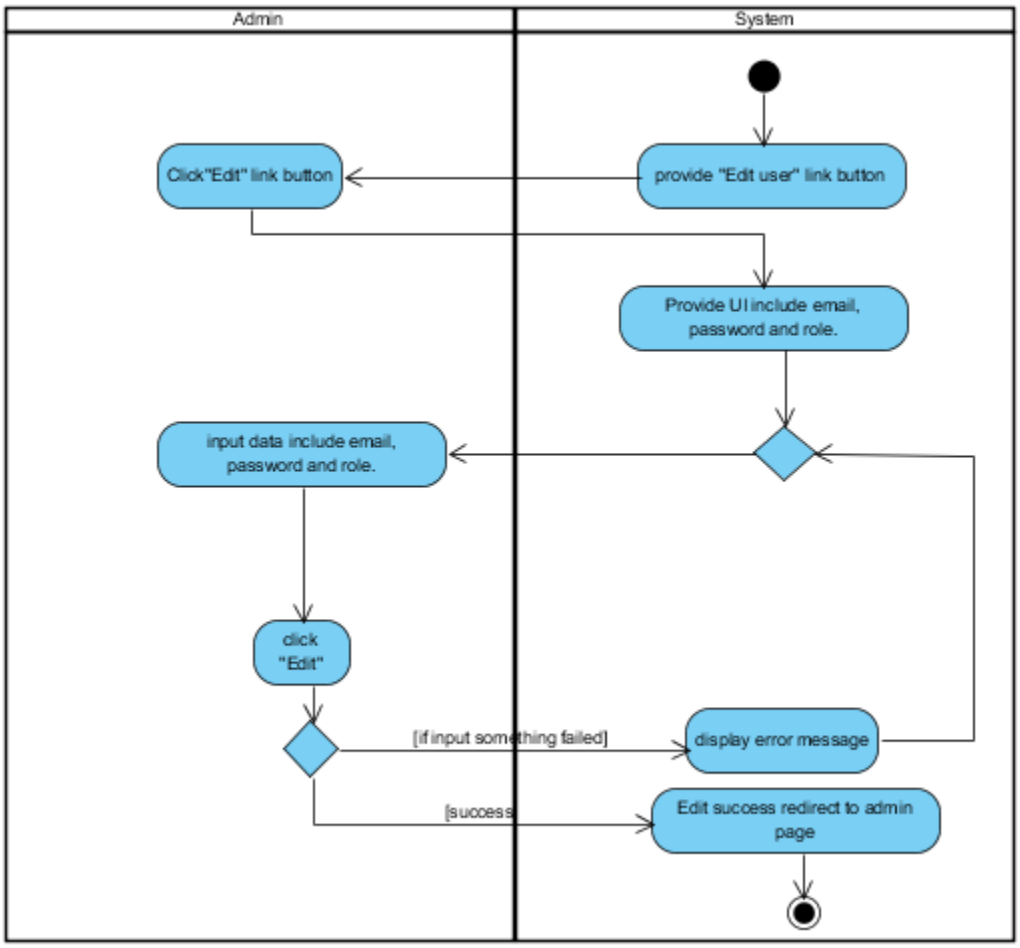

Figure 15: AD: 09: Admin edit account.

Use Case ID	UC10		
Use Case Name	Admin delete user account.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Admin		
Description	Admin can delete 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
-	-	-	-

Post conditions	- Admin deletes account success.	
Normal Flows	User	System
	2. Admin click “delete” button. 4. Admin must confirm delete.	1. The system shall provide UI label list of user account. 2. The system shall provide delete button. 3. The system shall display confirm message. 5. The system shall remove user account from the database. 6. The system shall redirect to account management page
Alternative Flow	In step 4 of Normal Flows, if user confirm delete select “yes”. 1. The system shall delete success. In step 4 of Normal Flows, if user confirm delete select “cancel”. 2. The system shall cancel delete data process.	
Exception Flow	-	
Assumption	1. Users understand English.	

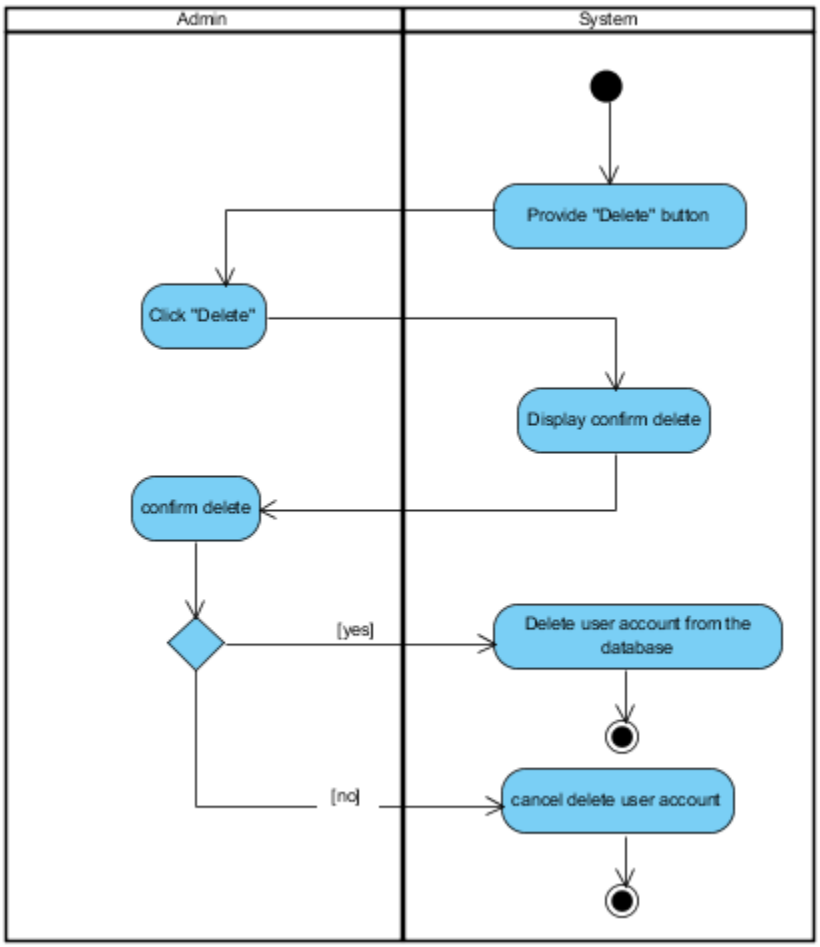

Figure 15: AD: 10: Admin delete account.

Use Case ID	UC11		
Use Case Name	Add food		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nutritionists		
Description	Nutritionists can add food on nutrition management page.		
Trigger	- Nutritionists click nutrition management.		
Preconditions	- Nutritionists login to the diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
Food name	string	- Must not empty.	foodtest
Glycemic index	double	- Must not empty. - Must be a number.	60.00
Calorie	double	- Must not empty. - Must be a number.	100.00

Post conditions	- Nutritionists can add food success.	
Normal Flows	User	System
	3. Nutritionists input info includes food name, the glycemic index of food, and food calorie. 4. Nutritionists click “create” button.	1. The system provides UI include food name, the glycemic index of food, and food calorie. 2. The system shall provide “create” button 5. The system shall validate input data includes food name, the glycemic index of food, and food calorie. 6. system shall save data of food name, food glycemic and food calories to the database 7. The system shall redirect to nutrition page, when create food success.
Alternative Flow	In normal flow step 5. If the nutritionists input character on glycemic	

	index field 1. The system shall provide error message “The glycemic index must be a number”, when the nutritionists input character on glycemic index field. 2. The system shall return to step 3 of normal flow. In normal flow step 5. If the nutritionists not input calorie. 1. The system shall provide error message “The calorie must be a number”, when the nutritionists not input calorie. 2. The system shall return to step 3 of normal flow. In normal flow step 5. If the nutritionists input character on glycemic index field. 1. The system shall provide error message “The glycemic index field is request”, when the nutritionists input character on glycemic index field. 2. The system shall return to step 3 of normal flow. In normal flow step 5. If the nutritionists not input calorie. 1. The system shall provide error message “The calorie field is request”, when the nutritionists not input calorie. 2. The system shall return to step 3 of normal flow.
Exception Flow	-
Assumption	1. Users understand English.

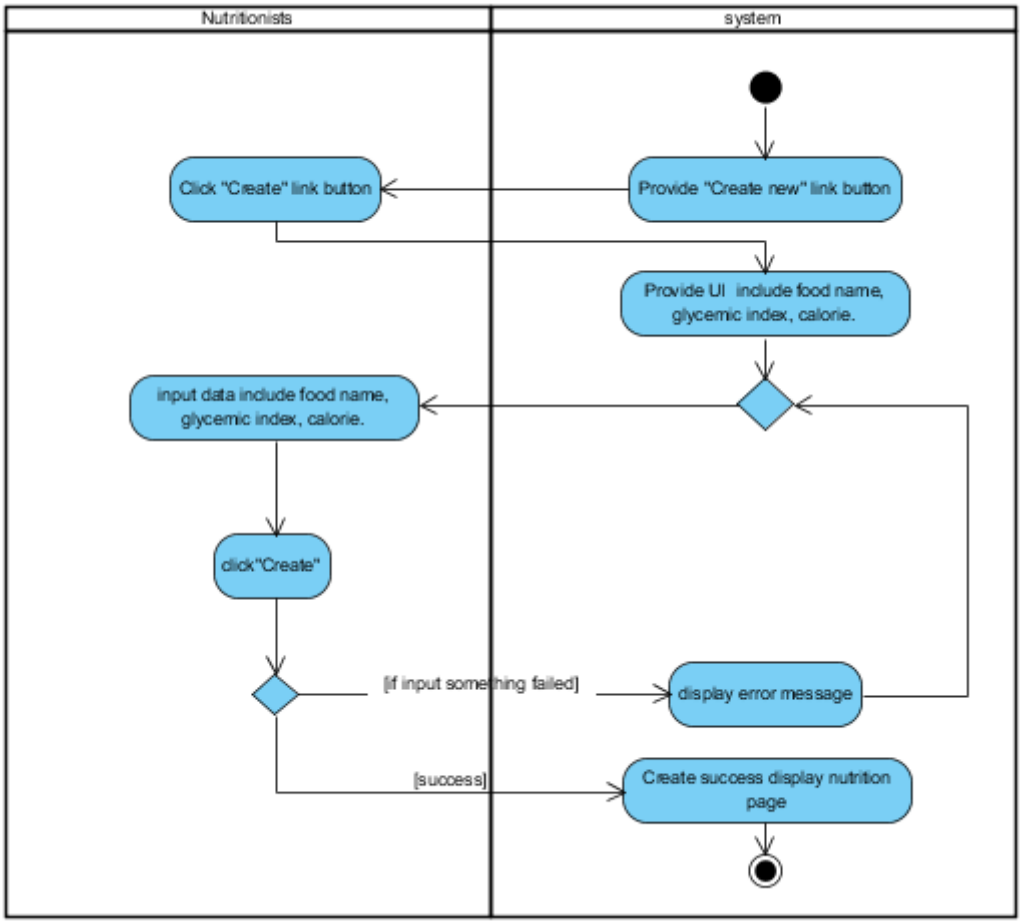

Figure 15: AD: 11: Nutritionists add food.

Use Case ID	UC12		
Use Case Name	Edit food		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nutritionists		
Description	Nutritionists can edit 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
Food name	string	- Must not empty.	newfood
Glycemic index	double	- Must not empty. - Must be a number.	61.00
Calorie	double	- Must not empty. - Must be a number.	110.00

Post conditions	- Nutritionists can edit nutrition success.	
Normal Flows	User	System
	3. Nutritionists input new info which includes food name, the glycemic index of food, and food calorie. 4. The nutritionists click “save” button.	1. The system provides UI for edit which include food name, the glycemic index of food, and food calorie. 2. The system shall provide “save” button 5. The system shall verify input data includes food name, the glycemic index of food, and food calorie. 6. The system shall save change the data of food name, food glycemic, food calorie on the database 7. The system shall redirect to nutrition page, when edit food success
Alternative Flow	In normal flow step 5. If the nutritionists input character on glycemic index field. 1. The system shall provide error message “The glycemic index	

	must be a number", when the nutritionists input character on glycemic index field 2. The system shall return to step 3 of normal flow. In normal flow step 5. If the nutritionists not input calorie. 1. The system shall provide error message "The calorie must be a number", when the nutritionists not input calorie. 2. The system shall return to step 3 of normal flow. In normal flow step 5. If the nutritionists input character on glycemic index field. 1. The system shall provide error message "The glycemic index field is request", when the nutritionists input character on glycemic index field. 2. The system shall return to step 3 of normal flow. In normal flow step 5. If the nutritionists not input calorie. 1. The system shall provide error message "The calorie field is request", when the nutritionists not input calorie. 2. The system shall return to step 3 of normal flow.
Exception Flow	-
Assumption	1. Users understand English.

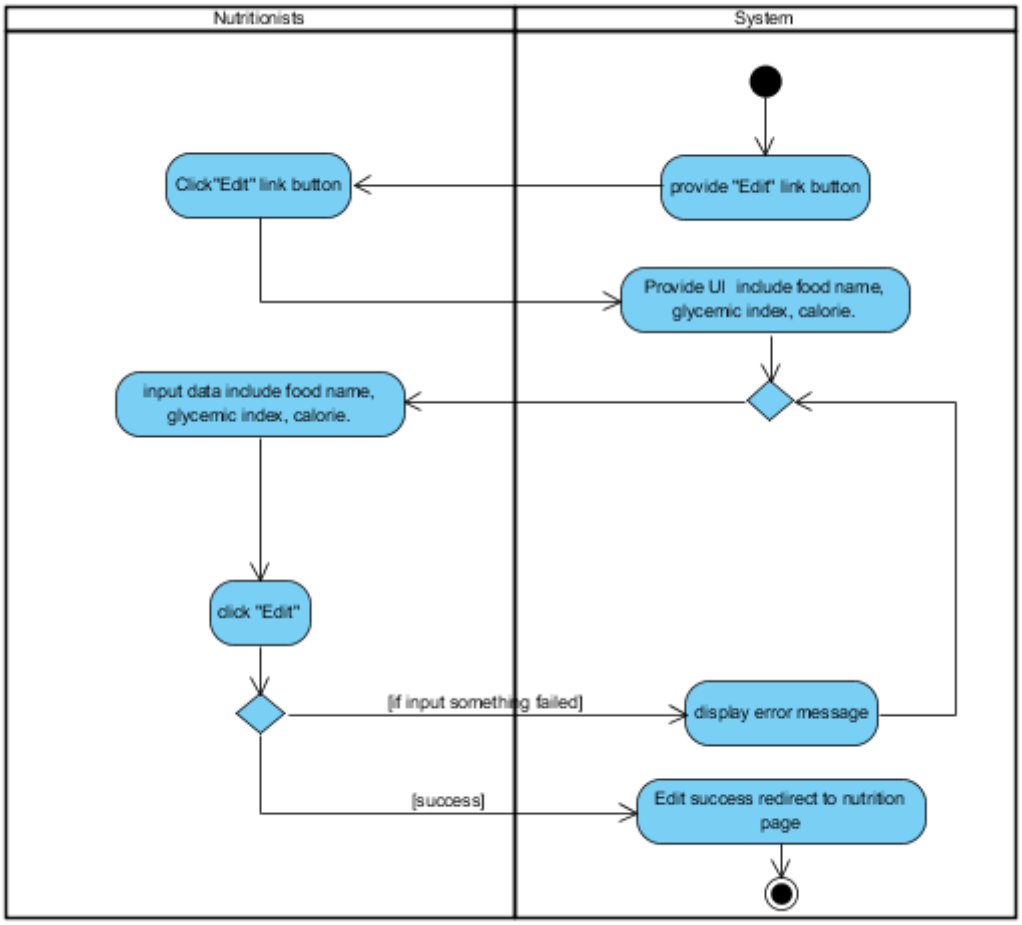

Figure 15: AD: 12: Nutritionists edit food.

Use Case ID	UC13		
Use Case Name	Delete food		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nutritionists		
Description	Nutritionists can delete 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 delete nutrition success.	
Normal Flows	User	System
	3. The nutritionists click “delete” button. 5. The nutritionists confirm delete food.	1. The system shall provide UI label list of food to the nutritionists. 2. The system shall provide delete button. 4. The system shall display confirm delete. 6. The system shall remove food from the database. 7. The system shall redirect to nutrition management page
Alternative Flow	In step 5 of Normal Flows, if user confirm delete select “yes”. 1. The system shall delete success. In step 5 of Normal Flows, if user confirm delete select “cancel”. 2. The system shall cancel delete data process.	
Exception Flow	-	
Assumption	1. Users understand English.	

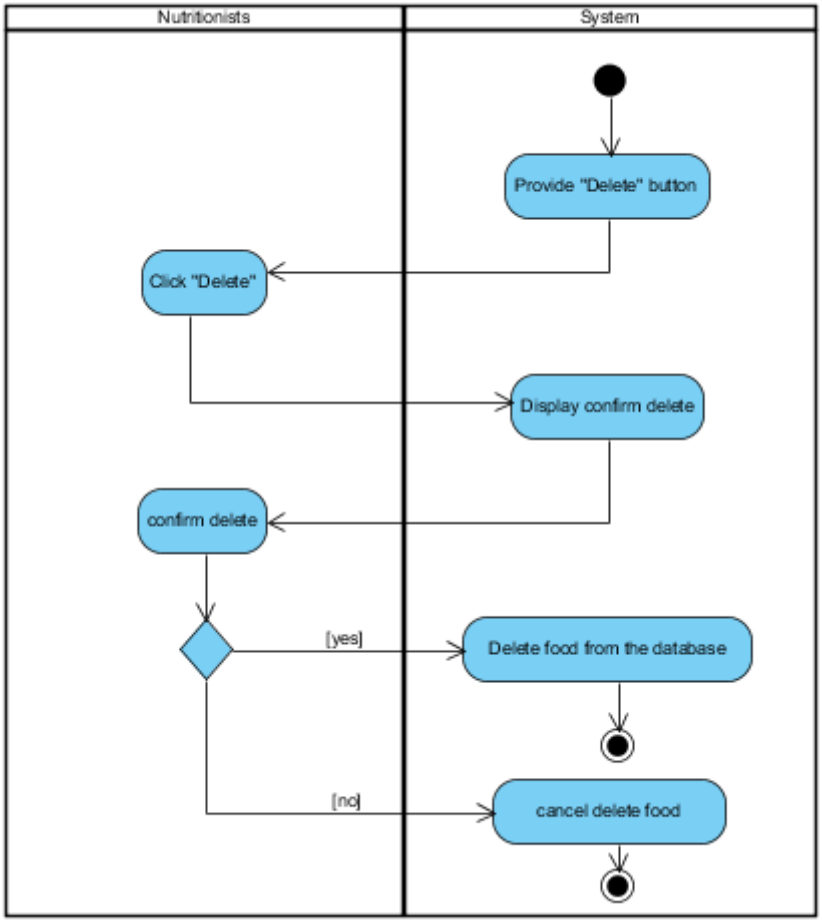

Figure 15: AD: 13: Nutritionists delete food.

Use Case ID	UC14		
Use Case Name	Add exercise		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nurse, Doctor		
Description	Nurse or doctor can add exercise on activity management page.		
Trigger	- Nurse or doctor click activity management page.		
Preconditions	- Nurse or doctor login to the diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
symptom	string	-	Symptom test
suggestion	string	-	Suggestion test
proper exercise	string	-	Proper exercise test
exercise inappropriate	string	-	Exercise inappropriate test
step exercise	string	-	Step exercise test

Post conditions	- Nurse or doctor can add exercise success.	
Normal Flows	User	System
	4. Nurse or doctor input info which includes input field symptom, suggestion, proper exercise, exercise inappropriate, and step exercise. 5. Nurse or doctor click “create” button.	1. The system shall provide UI to create the new activity which includes input field symptom, suggestion, proper exercise, exercise inappropriate, and step exercise. 3. The system shall provide “create” button 6. The system shall save data of symptom, suggestion, proper exercise, exercise inappropriate, and step exercise to the table “Exercises” on the database. 7. The system shall redirect to exercise management page

Alternative Flow	-
Exception Flow	-
Assumption	1. Users understand English.

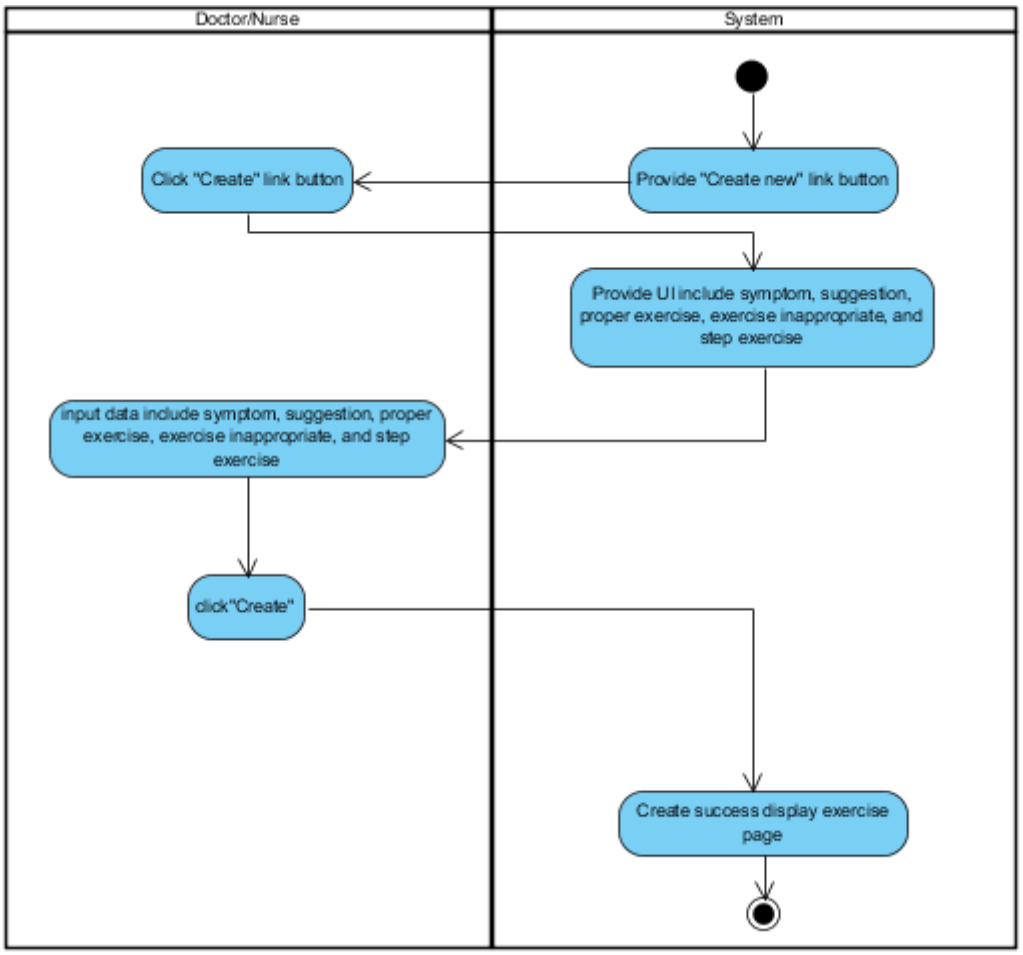

Figure 15: AD: 14: Doctor/Nurse adds exercise.

Use Case ID	UC15		
Use Case Name	Edit exercise		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nurse, Doctor		
Description	Nurse or doctor can edit exercise on activity management page.		
Trigger	- Nurse or doctor click activity management page.		
Preconditions	- Nurse or doctor login to the diabetes web application.		

Use Case Input Specification			
Input	type	Constraint	Example
symptom	string	-	Symptom test2
suggestion	string	-	Suggestion test2
proper exercise	string	-	Proper exercise test2
exercise inappropriate	string	-	Exercise inappropriate test2
step exercise	string	-	Step exercise test2

Post conditions	- Nurse or doctor can edit exercise success.	
Normal Flows	User	System
	3. Nurse or doctor input new info which includes input field symptom, suggestion, proper exercise, exercise inappropriate, and step exercise. 4. Nurse or Doctor click “save” button.	1. The system shall provide UI to edit the data include input field symptom, suggestion, proper exercise, exercise inappropriate, and step exercise. 2. The system shall provide “save” button. 5. The system shall save data of symptom, suggestion, proper exercise, exercise inappropriate, and step exercise to the database. 6. The system shall redirect to exercise management page.
Alternative Flow	-	
Exception Flow	-	

Assumption	1. Users understand English.

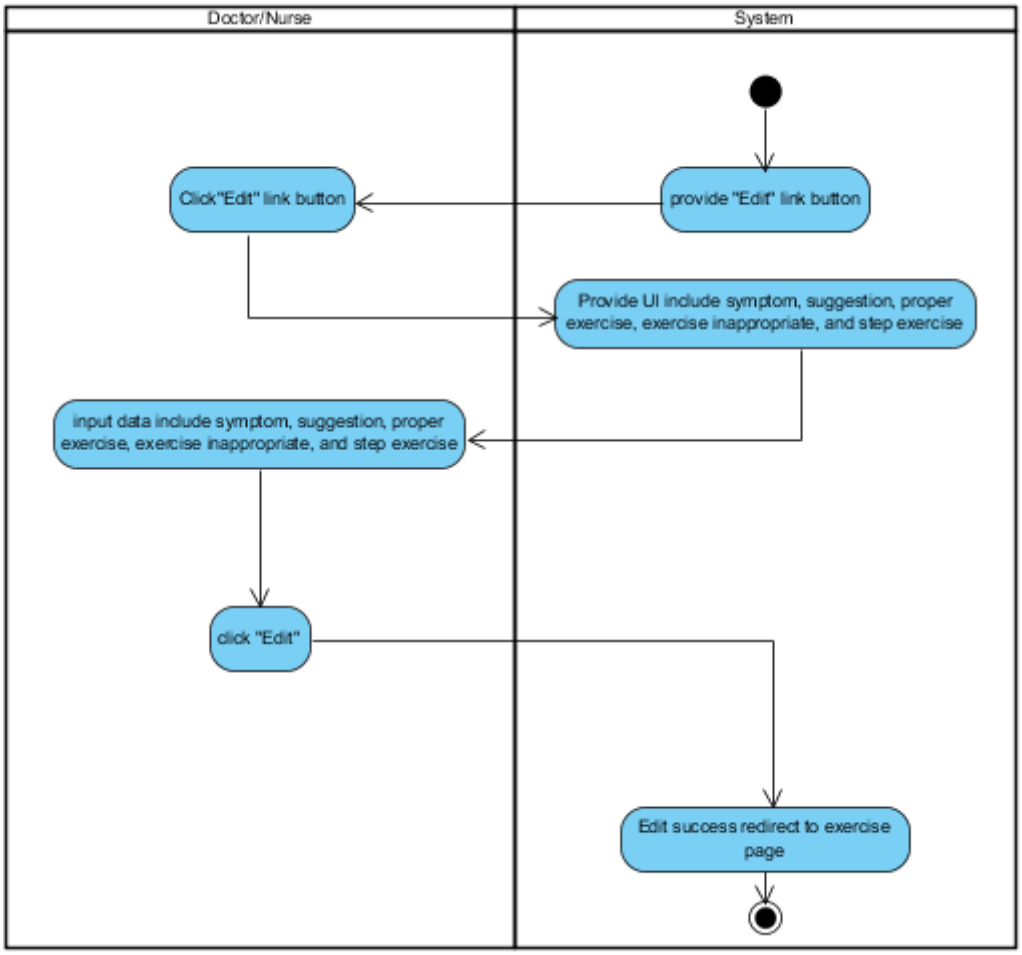

Figure 15: AD: 15: Doctor/Nurse edits exercise.

Use Case ID	UC16		
Use Case Name	Delete exercise		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Nurse, Doctor		
Description	Nurse or doctor can delete exercise on activity management page.		
Trigger	- Nurse or doctor click activity management page.		
Preconditions	- Nurse or doctor login to the diabetes web application.		

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

Post conditions	- Nurse or doctor can delete exercise success.	
Normal Flows	User	System
	3. The nurse or doctor click “delete” button. 5. The nurse or doctor confirms delete food.	1. The system shall provide UI label list of exercises to nurse or doctor. 2. The system shall provide delete button. 4. The system shall display confirm delete. 6. The system shall remove exercise from the database. 7. The system shall redirect to exercise management page
Alternative Flow	In step 5 of Normal Flows, if user confirm delete select “yes”. 3. The system shall delete success. In step 5 of Normal Flows, if user confirm delete select “cancel”. 4. The system shall cancel delete data process.	
Exception Flow	-	
Assumption	1. Users understand English.	

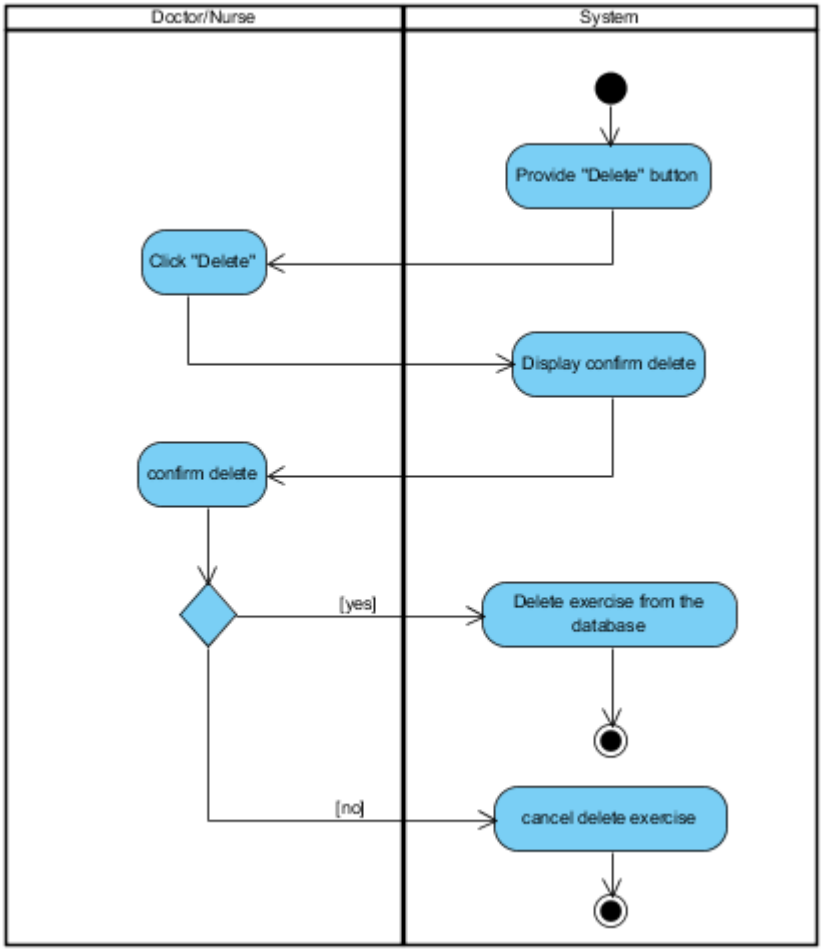

Figure 15: AD: 16: Doctor/Nurse deletes exercise.

Use Case ID	UC17		
Use Case Name	Select the symptoms		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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
	4. Patient select symptoms on drop down list. 5. Patient click “select”.	1. The system shall retrieve of all symptoms from the database. 2. The system shall provide a dropdown list displaying a list of symptoms. 3. The system provide “select button” 6. The system shall display detail of symptoms
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Patient must be member of web application.	

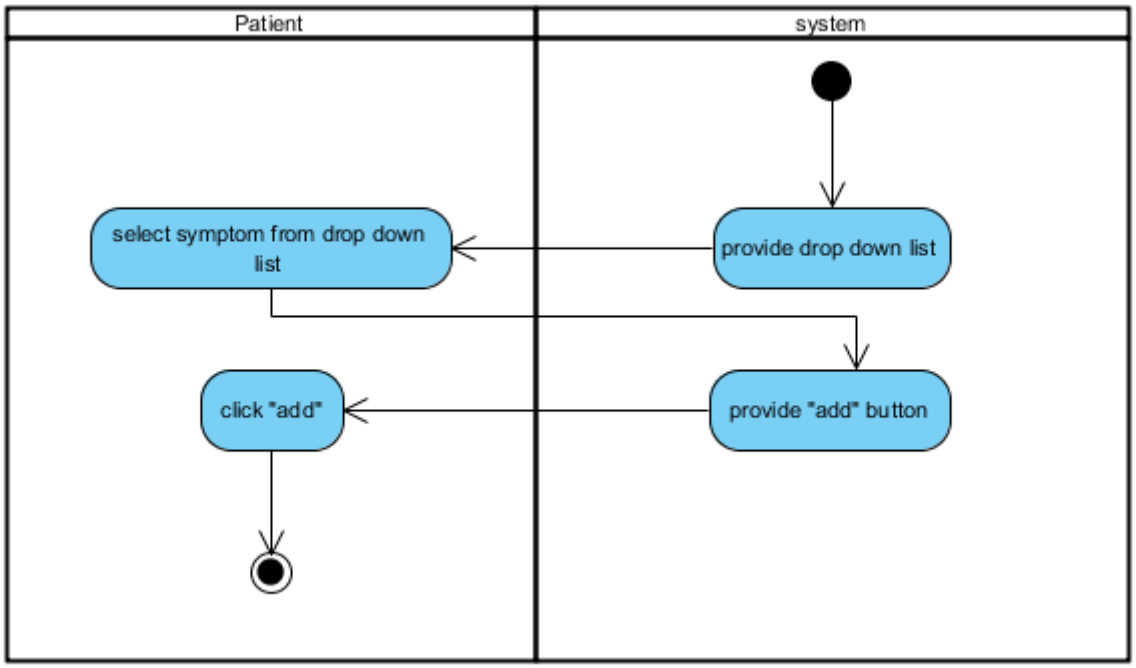

Figure 18: AD: 17: Select the symptoms.

Use Case ID	UC18		
Use Case Name	Get exercise suggestion.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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
	4. Patient select symptoms on drop down list. 5. Patient click “select”.	1. The system shall retrieve of all symptoms from the database. 2. The system shall provide a dropdown list displaying a list of symptoms. 3. The system provide “select button” 6. The system shall display detail table of exercise which includes symptom detail, exercise appropriate, exercise inappropriate, and steps of exercise, when patient select the symptoms success.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Patient must be member of web application.	

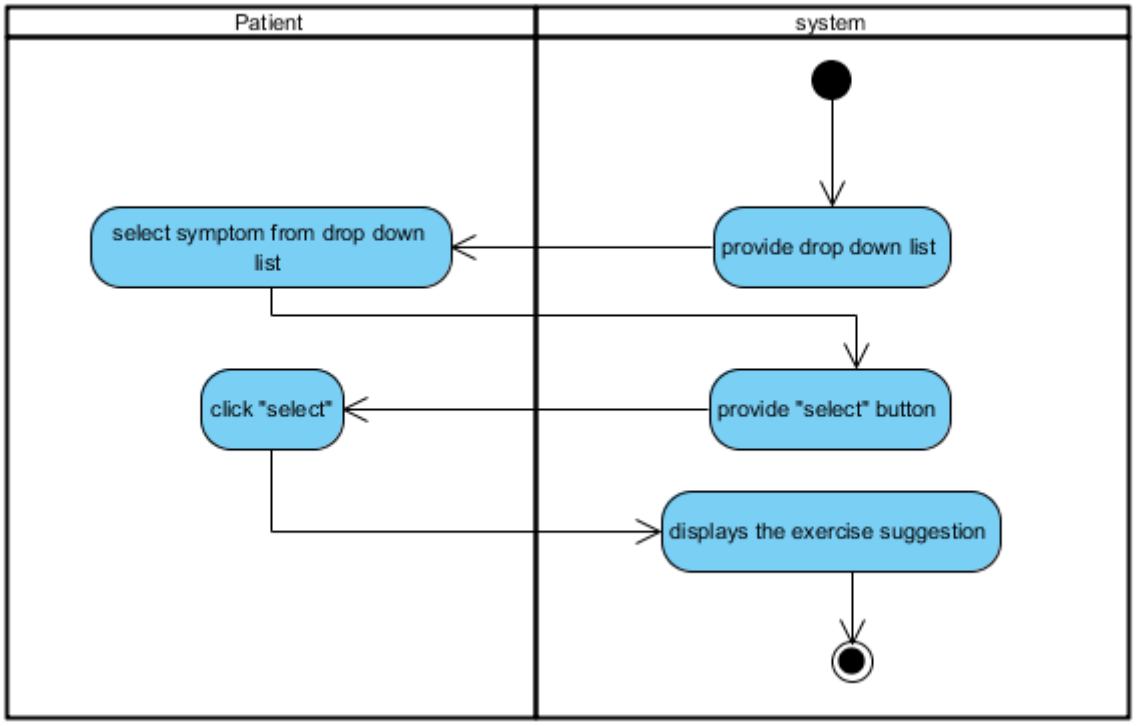

Figure 19: AD: 18: Get exercise suggestion.

Use Case ID	UC19		
Use Case Name	Add food to record health plan.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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
	4. Patient select food on dropdown list. 5. Patient clicks “Add”.	1. The system shall retrieve of all food names from the database. 2. The system shall provide a dropdown list displaying a list of food name. 3. The system shall provide “Add” button. 6. The system shall record the selected food into the database. 7. The system shall display list of food including food name, food glycemic, and food calories, when success process.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

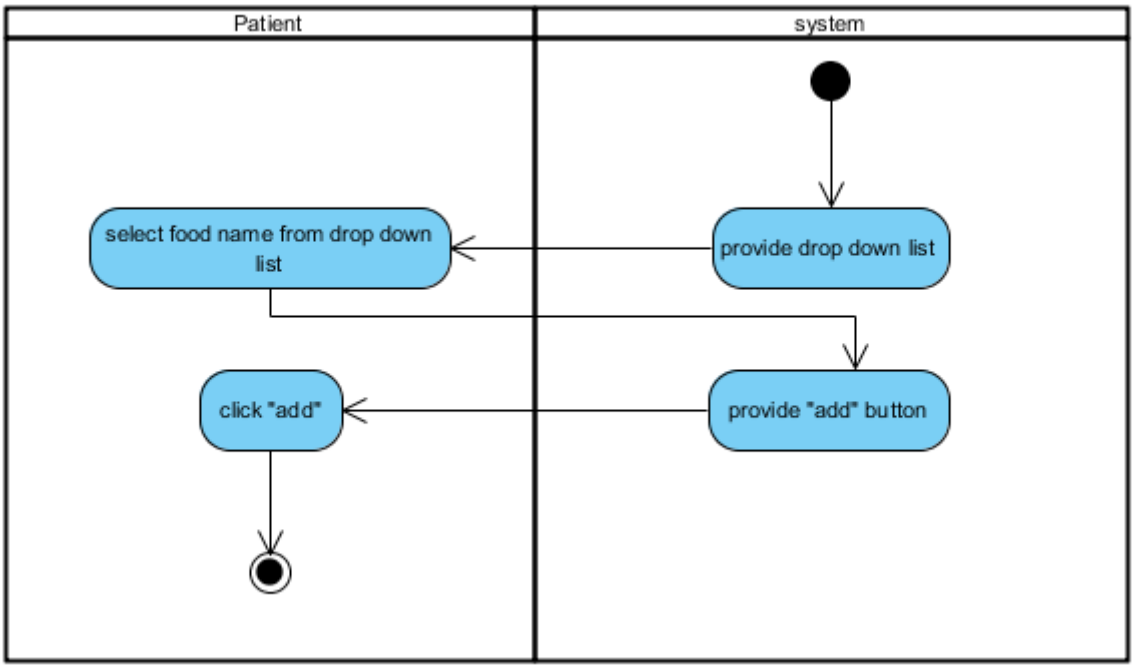

Figure 20: AD: 19: Add food to record health plan.

Use Case ID	UC20		
Use Case Name	View the average of glycemic index and calorie.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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 shall provide UI label to display the average value of glycemic index and calories of food. 2. The system shall get the data of glycemic index and calories of food from the database. 3. The system shall calculate the value of glycemic index and calories.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

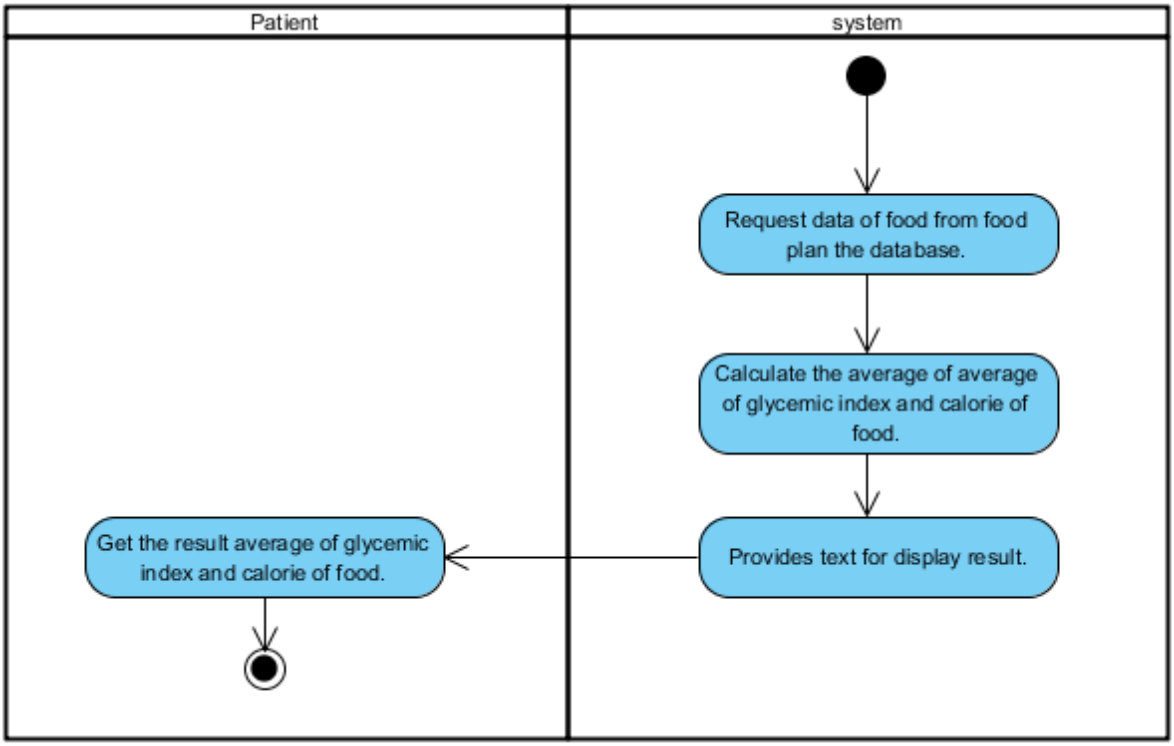

Figure 21: AD: 20: View the average of glycemic index and calorie.

Use Case ID	UC21		
Use Case Name	Delete food from health plan		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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
	3. Patient click delete.	1. The system shall provide label list of food name to the patient. The system shall provide delete button. 4. The system shall delete a food from the database.
Alternative Flow	-	
Exception Flow	-	
Assumption	3. Users understand English. 4. Users must be Patient of web application.	

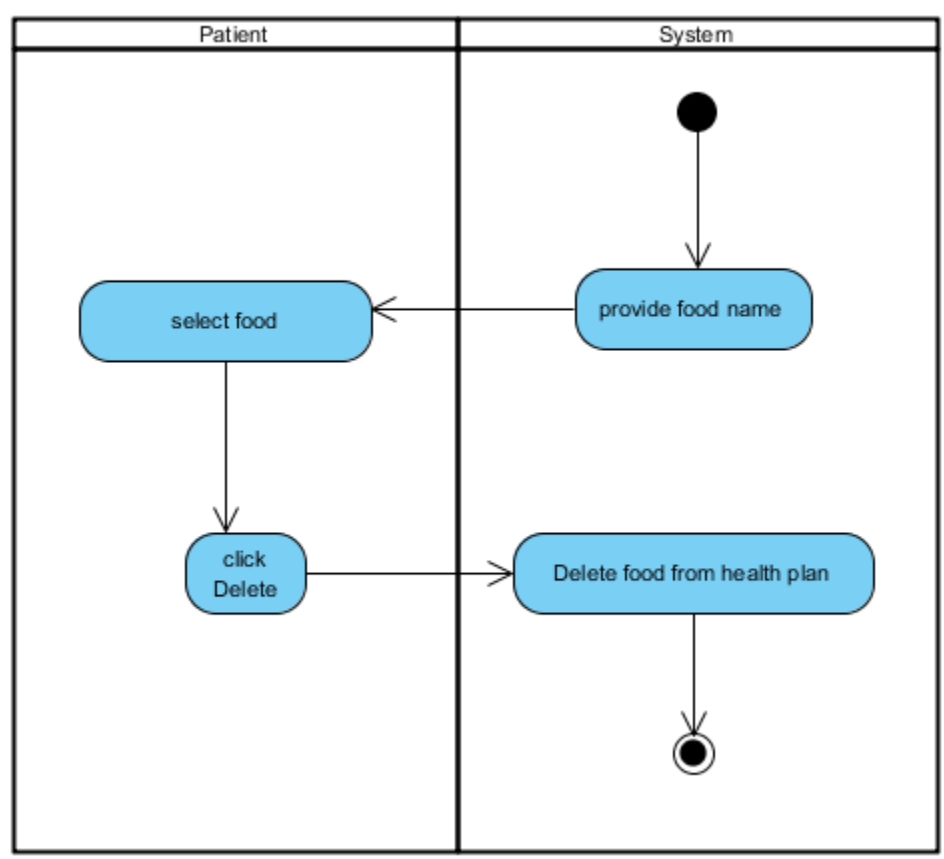

Figure 22: AD: 21: Delete food from health plan.

Use Case ID	UC22		
Use Case Name	Add glycemic.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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 negative value - Must input to be number	102.00

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

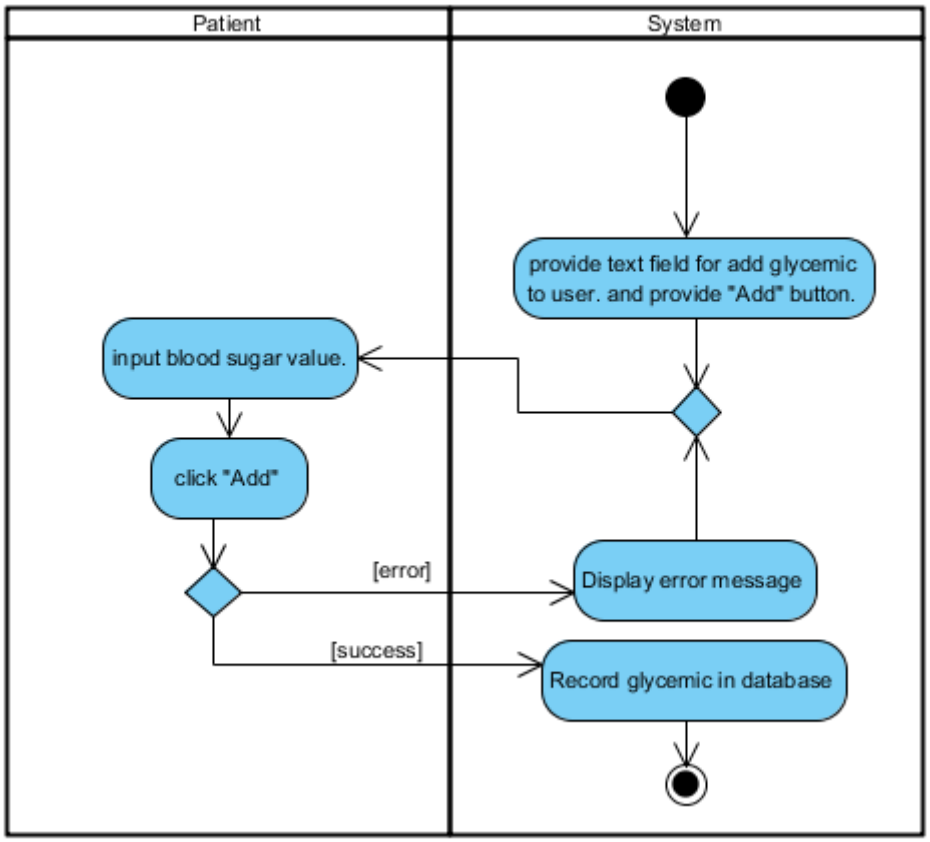

Figure 23: AD: 22: of Add glycemic.

Use Case ID	UC23		
Use Case Name	View BMI.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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
	5. Patient views the result of BMI.	1. The system shall provide label to display BMI value. 2. The system shall get the data of weight and height of patient from the database. 3. The system shall calculated by using BMI = weight (Kg) / (height (m) * height (m)). 4. The system shall display the BMI on the label.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

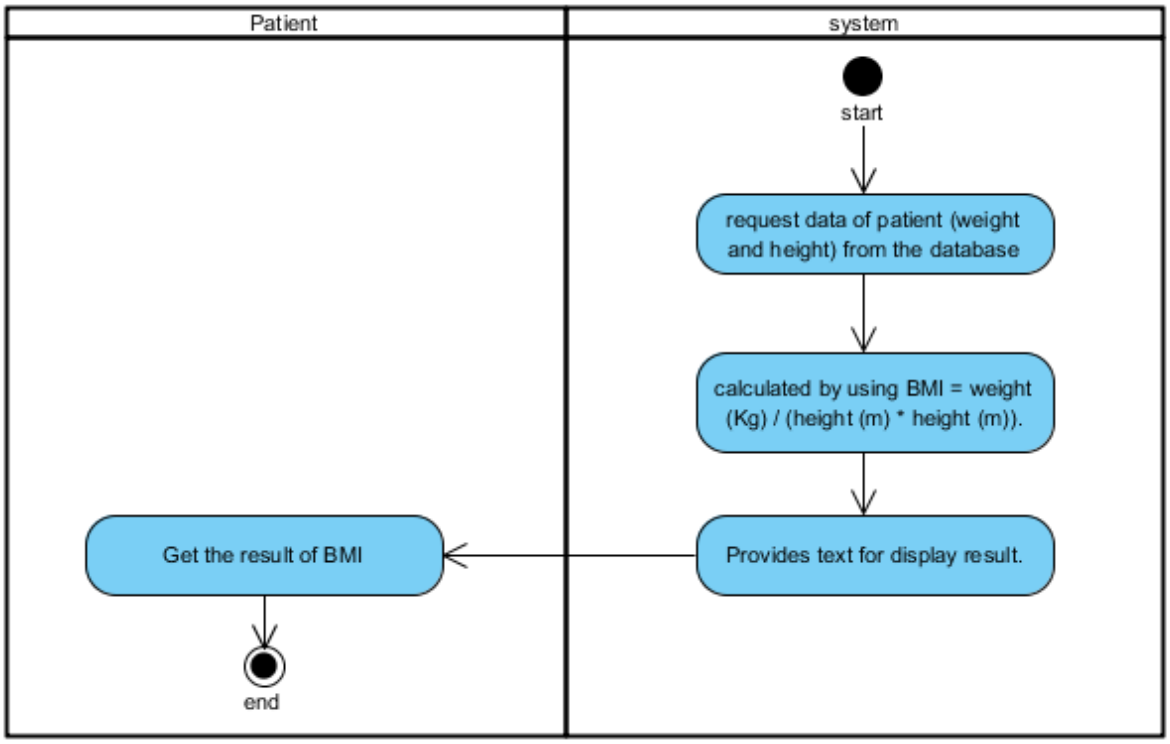

Figure 24: AD: 23: View BMI.

Use Case ID	UC24		
Use Case Name	View BMR.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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 $\mathbf{BMR(male)} = \mathbf{66} + (\mathbf{13.7} \times \boldsymbol{weight}\ (\boldsymbol{kg})) + (\mathbf{5} \times (\boldsymbol{height(cm)}) - (\mathbf{6.8} \times \boldsymbol{age})$ or $\mathbf{BMR(female)} = \mathbf{665} + (\mathbf{9.6} \times \boldsymbol{weight}\ (\boldsymbol{kg})) + (\mathbf{1.8} \times (\boldsymbol{height(cm)}) - (\mathbf{4.7} \times \boldsymbol{age})$.		
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 basal metabolic rate.	
Normal Flows	User	System
	5. Patient views the result of BMR.	1. The system shall provide label to display BMR value. 2. The system shall get the data of weight, height, gender, and age of patient from the database. 3. The system shall calculated by using $\text{BMR(male)} = 66 + (13.7 \times weight\ (kg)) + (5 \times (height(cm)) - (6.8 \times age)$ Or $\text{BMR(female)} = 665 + (9.6 \times weight\ (kg)) + (1.8 \times (height(cm)) - (4.7 \times age)$ 4. The system shall display result of BMR on the label.
Alternative Flow	-	

Exception Flow	-
Assumption	1. Users understand English. 2. Users must be member of web application.

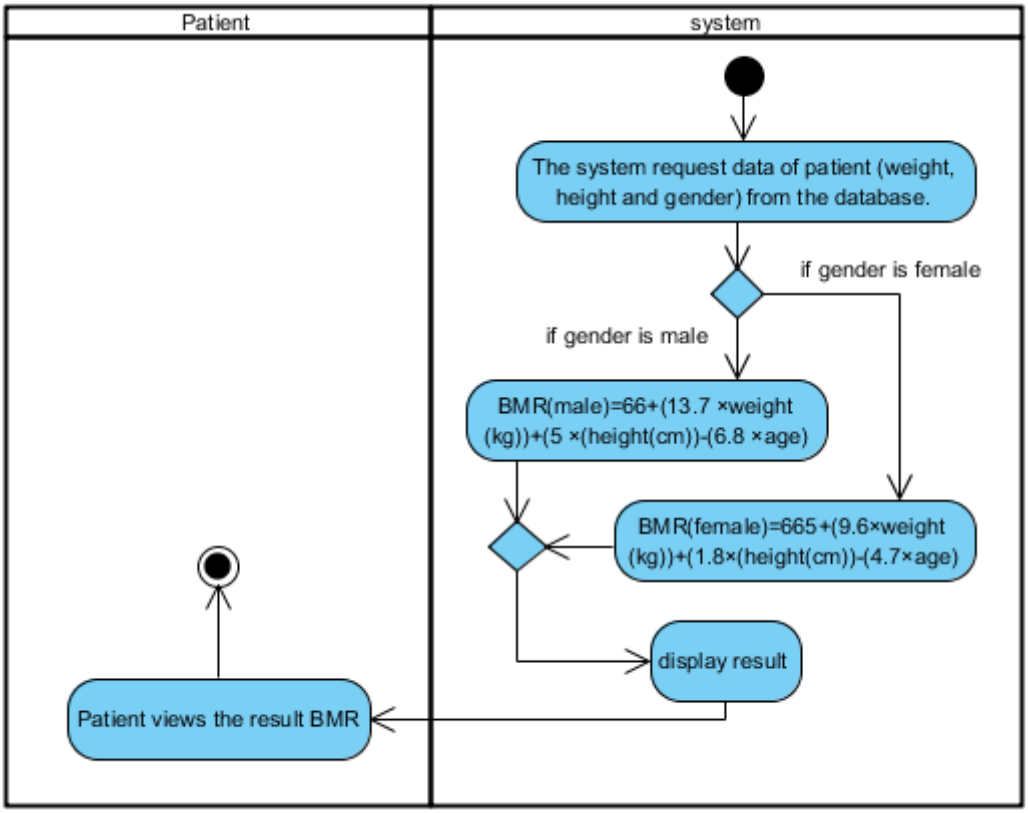

Figure 25: AD: 24: View BMR.

Use Case ID	UC25		
Use Case Name	View blood sugar graph.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu Chinpongsuwan
Date Created	25/4/2016	Last Revision Date	25/4/2016
Actors	Patient		
Description	Patient can view statistic line graph (x = blood sugar value, y = date) of blood sugar.		
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
	4. The patient view display graph.	1. The system shall provide UI to display line graph (x = blood sugar value, y = date). 2. The system request data of blood sugar value from the database. 3. The system shall display blood sugar on line graph (x = blood sugar value, y = date).
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be Patient of web application.	

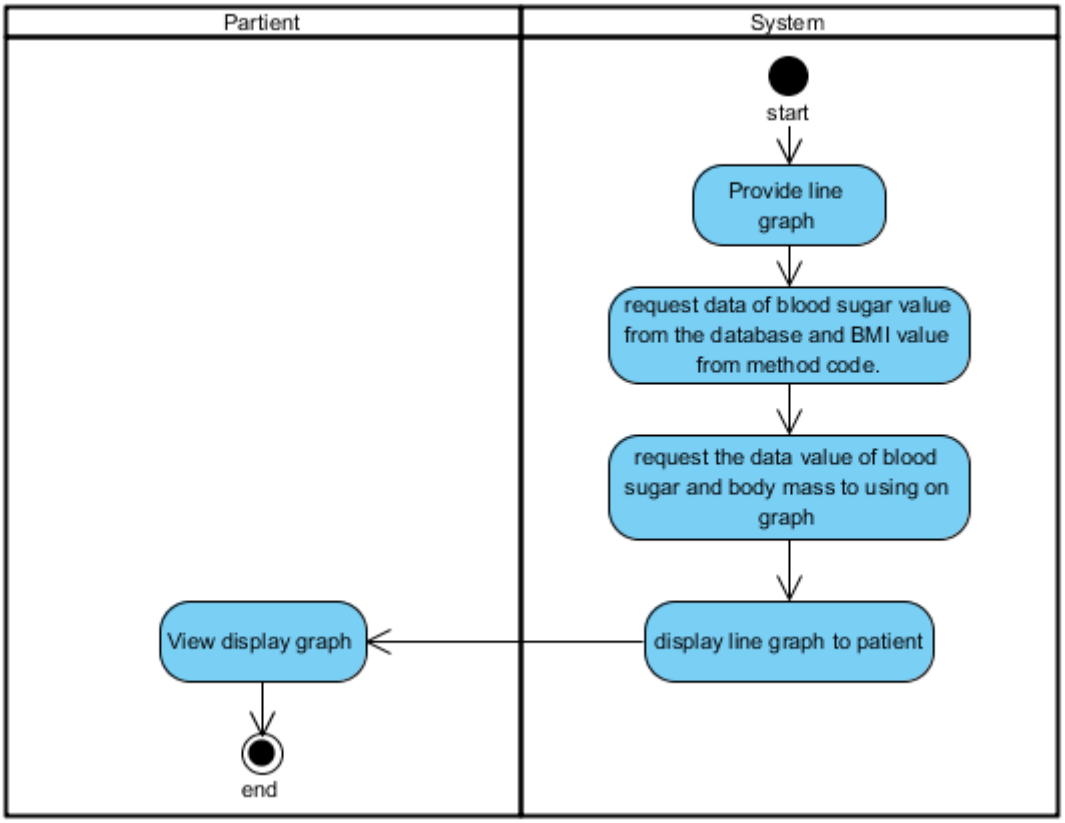

Figure 26: AD: 25: View glycemic graph.

Use Case ID	UC26		
Use Case Name	View interpretation of blood sugar.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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.	

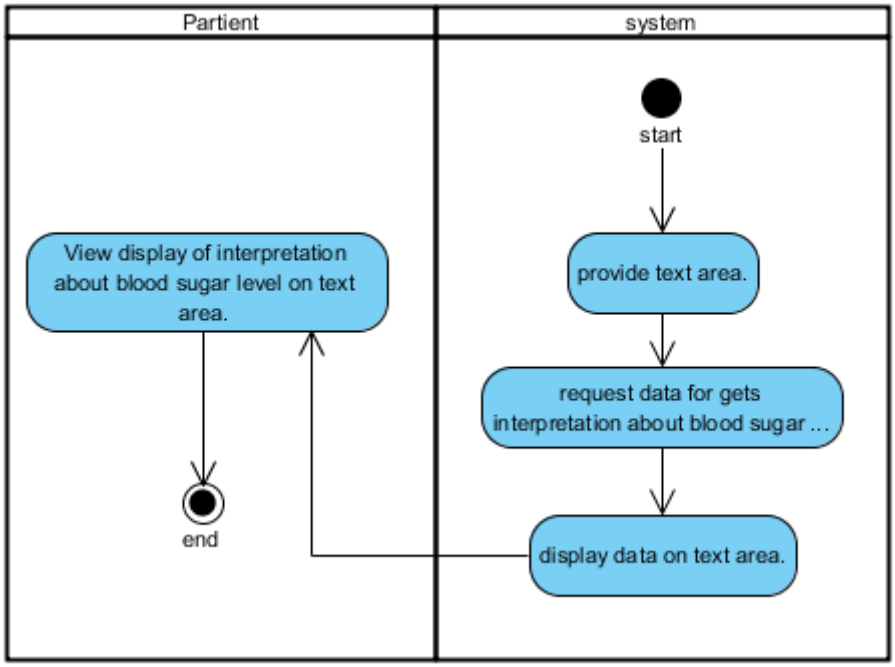

Figure 27: AD: 26: View interpretation of blood sugar.

Use Case ID	UC27		
Use Case Name	Patient select food name from the database.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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. 3. Patient must click “select”.	1. The system shall retrieve of all food names from the database. 2. The system shall provide a dropdown list displaying a list of food name. 3. The system shall provide “select” button. 4. The system shall record the selected food into the database. 5. The system shall display list of food.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

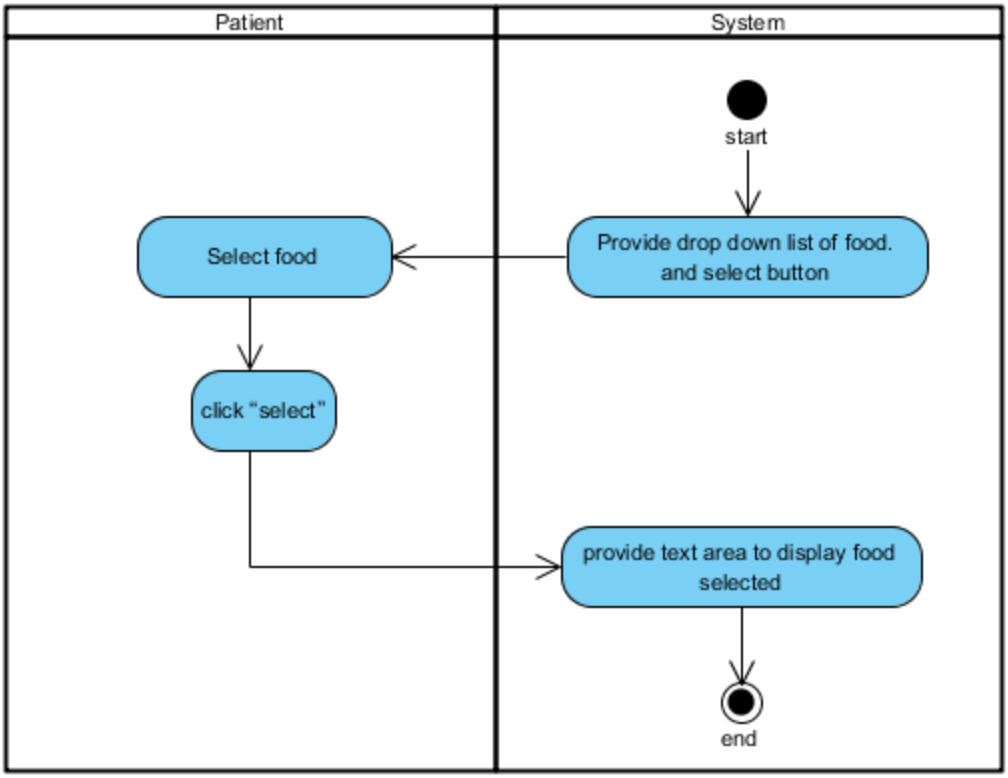

Figure 28: AD: 27: Patient select food name from the database.

Use Case ID	UC28		
Use Case Name	The patient can daily record the consumed medicine.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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
	4. Patient select list of medicine.	1. The system shall retrieve the list of medicine of a patient from the database. 2. The system shall display a check list of patient's medicine. 3. The system shall provide a "save" button. 5. The system shall save the consumed medicine into the database.
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

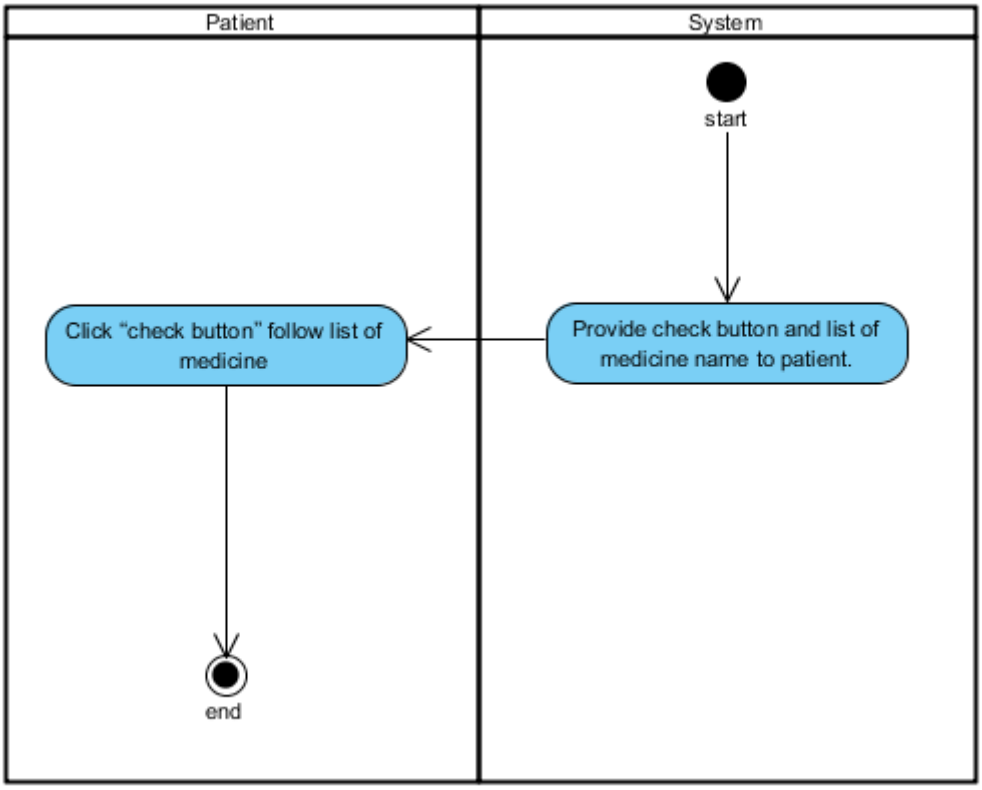

Figure 29: AD: 28: Patient can check the list of medicine.

Use Case ID	UC29		
Use Case Name	Analyze.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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.	

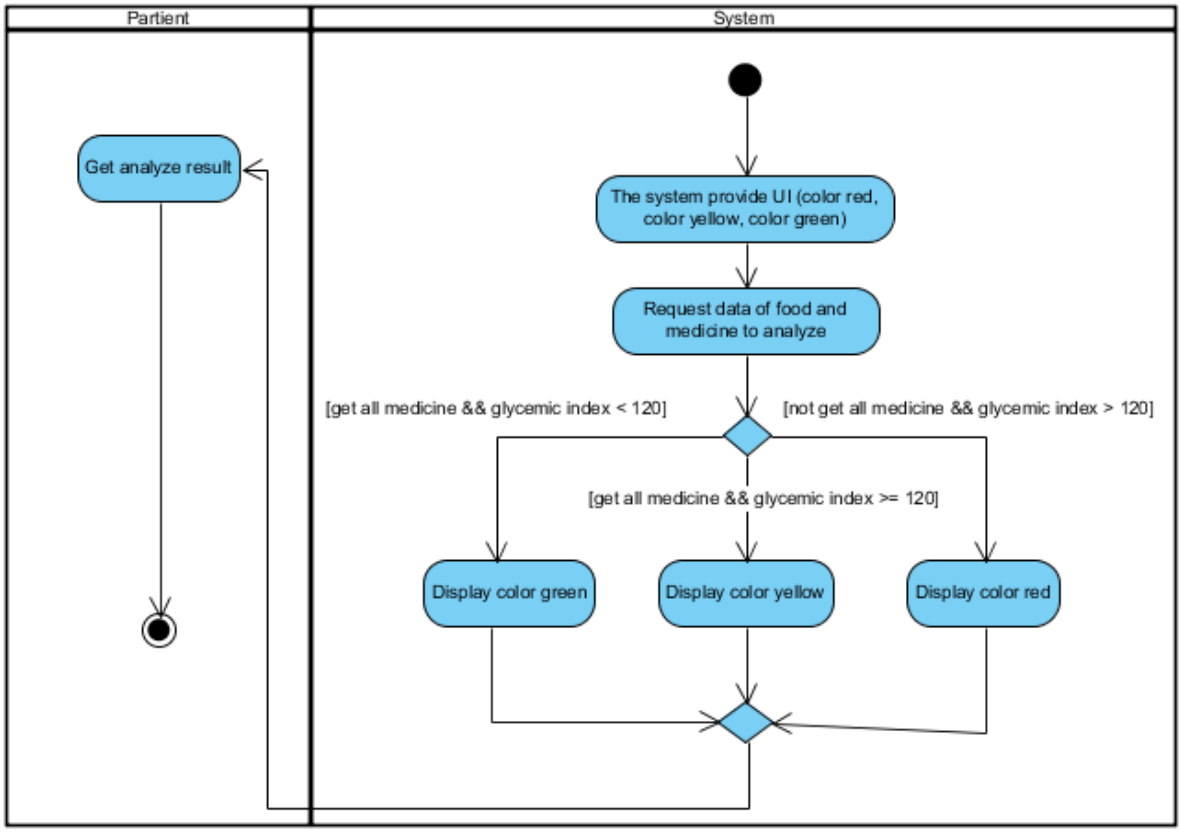

Figure 30: AD: 29: Analyze.

Use Case ID	UC30		
Use Case Name	View the daily graph of glycemic level.		
Created By	Jirayu Chinpongsuwan	Last Update By	Jirayu 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 UI to display line graph(x = glycemic value, y = date). 2. The system gets data of glycemic index from the database. 3. The system shall calculate the total glycemic index of food. 4. The system shall display the total of glycemic value on line graph(x = glycemic value, y = date).
Alternative Flow	-	
Exception Flow	-	
Assumption	1. Users understand English. 2. Users must be member of web application.	

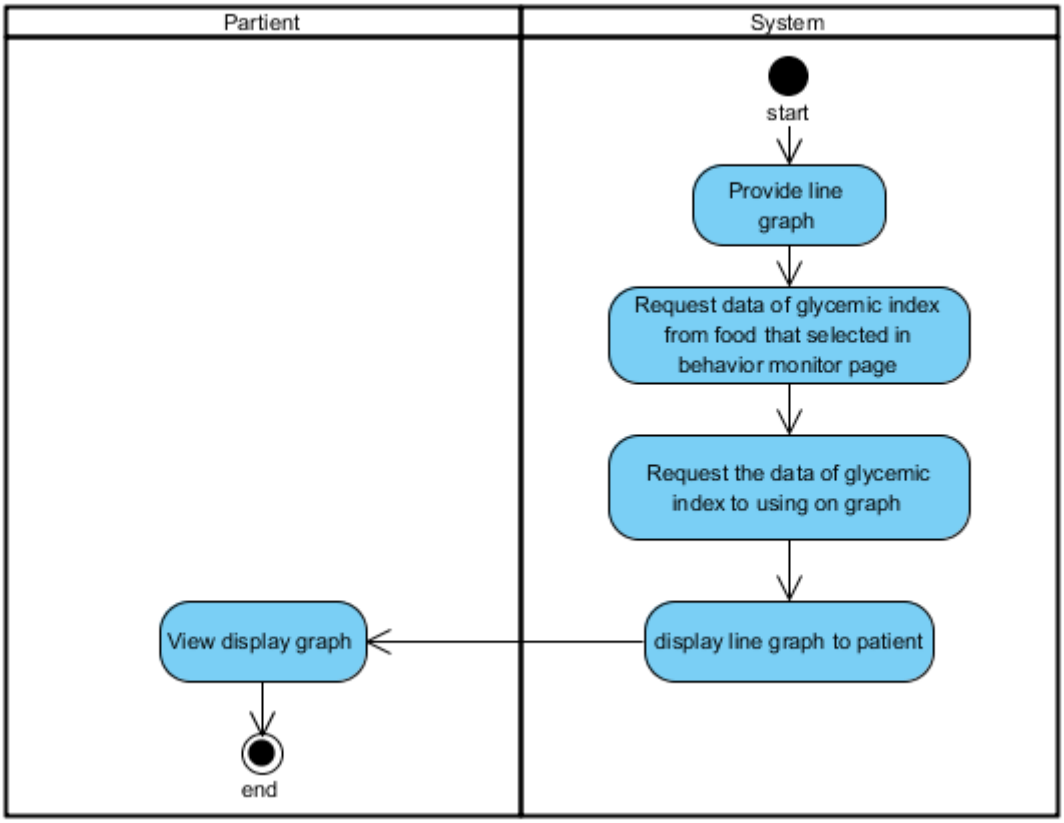

Figure 31: AD: 30: View the daily graph of glycemic level.