**MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

**Health Support Tracking System**

|  |  |
| --- | --- |
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| **Ext. Supervisor** | N/A |
| **Capstone Project code** | HSTS |

-Ho Chi Minh City, 09/09/2015-

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# Definitions, Acronyms, and Abbreviations

|  |  |  |
| --- | --- | --- |
| **No.** | **Abbreviation & Acronym** | **Definition** |
| 1 | BLE | Bluetooth Low Energy |
|  |  |  |

# Introduction

## Project Information

- Project name: **Health Support Tracking System**

- Project Code: **HSTS**

- Product Type: **Mobile Application, Website**

- Start Date: **September 07th, 2015**

- End Date: **December 12th, 2015**

## Introduction

In modern society, the people worry about their health. The fat is the most important problems. The doctor diagnoses the patient with medicine and exercises. However, the patient uses medicine without exercises or forgets using medicine that cause problem in effective treatment. Besides, some patient need to be followed and updated treatment after a period. Patient need to consult in time to treatment.

The smart activity wristband appear providing functional with tracking workouts, calories burned, step. Besides, that device can synchronize bluetooth and automatically to the computer and over 150 leading smart phones.

So, this system will help doctor tracking practice information of patient, then doctor will setup new treatment for patient. We will remind patient use medicine, do exercise. Doctor can make appointment to patient. Patients do not need waste time to meet doctor. Patient’s treatment will update day by day follow what they do.

## Current Situation

When someone need to track their practice, they will choose one wristband and install suitable mobile application for manage this device. Every day, people walk, run… then the mobile app will collect data and display out to screen. Next day, the device will reset data and it will count again. Some device support to store data at stock’s server.

## Problem Definition

Below are the advantages and disadvantages of some activity and healthy tracking applications and on Android smartphone:

* Advantages.
  + Easy and fast tracking information like number of step, calories burned.
  + Have a group use that app to practice together.
* Disadvantages:
  + Do not have participation of doctor.
  + Only support for one smartphone or one wristband.
  + Cannot suggestion the treatment or exercises.
  + Cannot notify to doctor, patients.
  + Unusable regiment in treatment.
  + Display unusable information.

## Proposed Solution

The application uses a combination between a smart phone and a wristband device to gather the patient’s number of steps, calories burned, and others. Basing on the collected data, the doctor makes the treatment decision within system suggestion. The system will collect data from patient to propose the suggestion to the doctor, then doctor will make treatment decision.

### Feature functions

* The nurse can input the basic information of patient.
* The doctor can agree to treat or not.
* When doctor agree the treatment, the system will allow the patient to access account from mobile device.
* The mobile application can collect patient’s data and send to server every day.
* The system compares it with standard regimen, then suggests for doctor.
* The doctor can view, edit and approve the regimen.
* The patient can receive treatment plan, notification from doctor.
* The system will remind the patient what he/she should do following treatment plan every day.
* The doctor can make the next appointment schedule.
* The patient can see current information of wristband, history and edit their information.

### Advantages and disadvantages

* Advantages:
  + The system provides for doctor pieces of tracking information to make treatment plan more effectively.
  + The patient will receive doctor’s treatment suggestions frequently.
  + The patient never forgets to use medicines or does others because this system will remind them.
* Disadvantages:
  + The doctor must have the personal computer and internet connection to access tracking information.
  + This system only used with people from 20 - 60 ages and does not have special diseases.
  + The patient also must have a suitable smartphone with wristband device and internet connection to send information as well as receive treatment plan.
  + The patient must always use mobile application and wristband in the right way. In some cases, the patient is unnecessary to use wristband (for example: the flu). If not the system will collect wrong data and the treatment may be worse...

## Functional Requirements

Function requirements of the system are listed as below:

### Nurse.

* Nurse creates patient profile before patient meet doctor.
* Nurse will assign patient to suitable doctor.

### Doctor.

* Doctor can view patient’s medical history.
* Doctor can view treatment suggestion provided by system.
* Doctor can edit treatment, do treatment.
* Doctor can make appointment.

### Admin.

* Admin can manage nurse, doctor and patient account.

### Staff.

* Staff can manage supported devices, such as add new device specification to database.

### Patient.

Patient only uses a mobile application:

* Patient can view treatment plan.
* Patient can be remind to use medicine, do exercises… every day.
* Patient can view appointment.
* Patient can send a simple notice to doctor.

## Role and Responsibility

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Full Name | Role | Position | Contact |
| 1 | Kieu Trong Khanh | Project Manager | Instructor | khanhkt@fpt.edu.vn |
| 2 | Ha Kim Quy | Developer | Leader | quyhkse61160@fpt.edu.vn |
| 3 | Tran Dang Quan | Developer | Member | quantdse60878@fpt.edu.vn |
| 4 | Phan Nhat Anh | Developer | Member | anhpnse90158@fpt.edu.vn |
| 5 | Man Huynh Khuong | Developer | Member | khuongmhse61148@fpt.edu.vn |
| 6 | Nguyen Duy Khuong | Developer | Member | Khuongnd60493@fpt.edu.vn |

Table 1 Roles and Responsibility

# Software Project Management Plan

## Problem Definition

### Name of this Capstone Project

Heal Support Tracking System (HSTS).

### Problem Abstract

At the moment, there is no system can connect between doctor and patient effectively in Vietnam. Large hospitals can manage their patient’s profile very good, but they have not provided the doctor a good way to track their patient actively yet. The patient also do treatment following doctor’s guide without necessary support. Sometime, they forget to use medicine or miss the appointment, etc. Therefore, the effect of treatment is very low. For a common disease like fat, the treatment require patient having to use medicine and do exercise every day. However if they do exercise over guideline, they may be cause an unexpected problem when do exercise in high frequency.

For the goal that improving the treatment, we provide a system to make more communication between doctor and patient. By collecting patient’s information every day, the doctor can make the treatment more effectively. For example, the doctor can change the medicine immediately. The patient can save their time because they can receive newest medicine over a message or a notification. The patient also will be remind to meet appointment with doctor, etc.

### Project Overview

#### Current Situation

Below are the problems encountered in this project:

* **Collect requirement**: The medical treatment of a lot of diseases is the privacy asset of hospitals so we are difficult to access these documents.
* **Medical knowledge**: This project requires member have enough medical knowledge about treatments, common diseases and process.
* **Technique**: Some manufacturer do not use standard of bluetooth developer.
* **Absent of the team member**: team members can get sick or unexpected problems.

#### The Proposed System

With some friendship and relationship, we found some standard regimen of diseases. It had helped us control scope, requirement.

To resolve medical knowledge problem. We found our friend to help us understand some standard regimen, which we found. When we understand about some regimen we can make a common field data have to have in a standard regimen.

With technique problem we had bought one wristband and research about BLE technology, GATT service. After research, we had found some common information to help us find data of wristband.

We assign responsibility in vertical to make sure if any members cannot continue to work in our team, there will be the least harm to the project processes of wristband.

##### Mobile Application

This application is used by patient, include below functions:

* Show treatment which accepted by doctor.
* Remind using medicine, doing exercises, appointment with doctor.
* Collect data from wristband and send to server.

##### Web Application

For nurse:

* Create new patient history.
* Assign patient to doctor.

For doctor:

* View treatment suggested by system.
* Edit treatment.
* Do treatment.
* Make appointment.
* View history of patient.
* Send notification, message to patient.
* Manage standard regimen.

For administrator:

* Manage user account.

For staff:

* Manage supported device.

#### Boundaries of the System

This system is used for a patient in the age from 20 to 60 years old only. Especially, we recommended that our system is focus on common and easy to treat diseases, such as: flu, fat, etc. Any complex and difficult to treat disease, require more human resources or high technology equipment, such as cancer, HIV/AIDS… is not supported in this system.

#### Development Environment

##### Hardware requirements

* For continuous integrating server:

|  |  |  |
| --- | --- | --- |
| Hardware | Minimum Requirements | Recommended |
| Internet Connection | 512Kbps | 4 Mbps |
| Operating System | Ubuntu Server 12 LTS | Ubuntu Server 14.04.2 LTS |
| Computer Processor | Intel® Pentium II | Intel® Core(TM) i5 CPU , M 460 @ 2.53GHz |
| Computer Memory | 1GB of RAM | 4GB of RAM or more |

Table 2 Hardware requirement for continuous integrating server

* For web development:

|  |  |  |
| --- | --- | --- |
| Hardware | Minimum Requirements | Recommended |
| Internet Connection | 512Kbps | 8 Mbps |
| Operating System | Windows Vista, 7, 8 | Windows 7, 8 |
| Computer Processor | 1 GHz | Intel® Core(TM) i5 CPU , M 460 @ 2.53GHz |
| Computer Memory | 2GB of RAM | 4GB of RAM or more |

Table 3 Hardware requirement for web development

* For mobile development:

|  |  |  |
| --- | --- | --- |
| Hardware | Minimum Requirements | Recommended |
| Internet Connection | 512Kbps | Wi-Fi Connection 12MB |
| Operating System | Android 4.3 | Android 4.4.2 |
| Hardware | BLE supported | BLE supported |
| Memory | 512 MB of RAM | 1GB of RAM or more |

Table 4 Hardware requirement for mobile development

##### Software requirements

.

|  |  |
| --- | --- |
| Tools | Uses |
| MySQL Server 5.6 | Used for creating and manage the database for system. |
| IntelliJ IDEA 14.1.4 | Used for implementing website and web service. |
| Android Studio 1.3.2 | Used for implementing Android mobile |
| Github server | Used for storing source codes, documents. |
| SourceTree 1.6.20 | Used for version control |
| Software Ideas Modeler 8 | Used for creating models and diagrams |

Table 5 Software requirement for this project

## Project organization

### Software Process Model

This project is developed under waterfall model. We apply customized waterfall model to capable with current situation in our team. We choose this model because the following reasons:

* This is a project with clear requirement.
* Based on researches and clarify standard regimen of diseases are stable, clear, fixed and well understood by all team members.
* This project use BLE technology, which we have standard in bluetooth developer and android support.



Figure 1 Modified Waterfall Development Model

Reference: Page 30, chapter 2, Software process model, SOFTWARE ENGINEERING 9th Edition, by Ian Sommerville

### Roles and responsibility

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Full name** | **Role in Group** | **Responsibilities** |
| **1** | Kieu Trong Khanh | Supervisor/Project Manager | * Specify user requirement * Control the development process * Give out technique and business analysis support |
| **2** | Ha Kim Quy | Team leader, BA, DEV, Tester | * Managing process * Clarifying requirements * Prepare documents * GUI Design * Designing database * Coding * Create test plan * Testing |
| **3** | Tran Dang Quan | BA, DEV, Tester | * Clarifying requirements * Prepare documents * GUI Design * Designing database * Coding * Create test plan * Testing |
| **4** | Phan Nhat Anh | BA, DEV, Tester | * Clarifying requirements * Prepare documents * GUI Design * Designing database * Coding * Create test plan * Testing |
| **5** | Man Huynh Khuong | BA, DEV, Tester | * Clarifying requirements * Prepare documents * GUI Design * Designing database * Coding * Create test plan * Testing |

Table 6 Roles and Responsibility Details

### Tools and Techniques

|  |  |
| --- | --- |
| Tool / Technique | Name / version |
| Frontend | HTML, CSS, JavaScript, jQuery, Bootstrap |
| Backend | JavaEE, Spring, Hibernate |
| Web server | Apache Tomcat 7 |
| Development tool | IntelliJ IDEA 14.1.4 |
| DBMS | MySQL 5.6 |
| Source control | SourceTree 1.6.20 |
| Modeling tool | Software Ideas Modeler |
| Document tool | Microsoft Word 2013 |

## Project Management Plan model

### Software development life cycle

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Phase** | **Description** | **Deliverables** | **Resource needed** | **Dependencies and**  **Constrains** | **Risks** |
| **Requirement Analysis** | - Collect requirements from customer.  -Identify and clarify requirements for the system in general. | -Introduction of proposed system.  -Software requirement specification.  -Project Task Plan.  - Prototypes | 20 man- days | N/A | - Missing requirement  - Unclear scope of  project  - Lack of member share  of understand |
| **Design** | - Architecture design for the system  - Detail design using top-down break down  - Choose Architecture style | - Software Design Document  - Base code structure  - Technology notes | 20 man- days | Depend on  “Requirement  Analysis” | - Lack of experience.  - Not fulfil requirement. |
| **Implementation** | - Coding system core functions and other feature with GUI  - Unit test | - Main user’s functions on mobile and website  - Unit test document | 50 man- days | Depend on “Design”. | - Lack of experience and knowledge.  - Human mistake. |
| **Testing** | - Integration test the system  - Alpha test  - Correct bugs  - Beta test  - Acceptance test | - Test document  - Defect log | 20 man- days | Depend on  “Implementation” | - Lack of experience  - Missing test case |
| **Maintenance** | - Deploy on sever and mobile | - Installation guide  - User Manual | 10 man- days | Depend on  “Testing” | - Lack of experience. |

Table 7 Software Development Life Cycle Detail

### Phase Detail

#### Phase 1: Requirement Analysis

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Collect requirements** | Find which systems currently provide similar service, their strengths and weakness. | QuyHK, QuanTD, AnhPN, KhuongMH |
| **2. Identify and clarify main functions.** | Define which main functions system should provide. | QuyHK, QuanTD, AnhPN, KhuongMH |
| **3. Create System**  **Introduction.** | Complete Introduction Report. | QuyHK |
| **4. Software Project**  **Management Plan.** | Prepare Project Management Plan. | QuyHK |
| **5. Prototype.** | Build a prototype of proposed system (Website/Mobile). | QuyHK, AnhPN, KhuongMH |
| **6. SRS** | Create SRS document. | QuyHk, QuanTD, AnhPN, KhuongMH |

Table 8 Phase 1: Requirement Analysis

#### Phase 2: Design

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Detailed Design** | Compare new document with existed documents of system. | QuyHK, QuanTD, AnhPN, KhuongMH |
| **2. Database Design** | Based on parsed data to recommendation.  Based on other needs to recommendation. | QuyHK, QuanTD, AnhPN, KhuongMH |
| **3. Technology research** | BLE, Gatt Service. | QuyHK |
| **4. Design Document** | Create software design document | QuyHK, Quan TD, AnhPN, KhuongMH |

Table 9 Phase 2: Design

#### Phase 3: Implementation

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Front-end web functions** | Implement front-end functions on web | AnhPN |
| **2. Front-end mobile functions** | Implement front-end functions on mobile | QuyHK, KhuongMH |
| **3. Back-end web functions** | Implement back-end functions on web | QuanTD, AnhPN, KhuongMH |
| **4. Mobile functions** | Implement mobile application | QuyHK |
| **5. Unit testing** | Write test case and testing for web functions | QuanTD, AnhPN, KhuongMH |
| Write test case and testing for mobile functions | QuyHK |

Table 10 Phase 3: Implementation

#### Phase 4: Testing

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Integration testing** | Write test case and testing systems | QuyHK, AnhPN, KhuongMH, QuanTD |
| **2. Alpha testing** | Do alpha test with customer | QuyHk, AnhPN, KhuongMH, QuanTD |

Table 11 Phase 4: Testing

#### Phase 5: Maintenance

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Installation guide** | Write installation guide | QuyHK |
| **2. User Manual** | Write user manual | QuanTD, KhuongMH, AnhPN |

Table 12 Phase 5: Maintenance

**3.3 All Meeting Minutes**

Refer to Meeting Minutes folder.

## Coding Convention

Java: Using to develop website.

Summary:

* Naming Convention:
  + Variable names should be short yet meaningful. The choice of a variable name should be designed to indicate to the casual observer the intent of its use.
  + Methods should be verbs, in mixed case with the first letter lowercase, with the first letter of each internal word capitalized.
* Declarations Convention:
  + One declaration per line is recommended since it encourages commenting.

Using Java Code Convention From:

<http://www.oracle.com/technetwork/java/codeconvtoc-136057.html>

# Software Requirement Specification

## User Requirement Specification

### Doctor requirement

Doctor is user who uses service of system. The doctor can use some following functions:

* View patient’s medical history
* Make prescription
* Make appointment
* Manage regiment
  + Insert regimen.
  + Update regimen.
  + Delete regimen.

### Staff requirement

Staff is people who works directly with system to help system can support for multiple wristband:

* Manage supported device
  + Add device
  + Update device
  + Delete device

### Patient requirement

Patient is people who use service of system. The patient can use some following functions:

* Send notify to doctor
* Setup new profile
* Logout

### Admin requirement

Admin is people who manages account. Administrator can use some following functions:

* Manage account includes:
* Remove account
* Add account
* Update account
  + 1. **Nurse requirement**

Nurse is user who uses service of system. The doctor can use some following functions:

* Create patient’s profile
* Update patient’s profile
  + 1. **Guest requirement**

Guest is user does not login to this system. Guest only have one function.

* Login

## System Requirement Specification

### External Interface Requirement

#### User interface

* The user interface uses Vietnamese language in android app and English language in web application.
* The user interface displays best on 1024x768-screen size.

#### Hardware Interface

* Android Smartphone with BLE support and android 4.3 or above.

#### Software Interface

* Web application: work with Firefox (v30 or above), Chromes (v14 or above), Internet Explorer (v10 or above) browse.
* Mobile application: Android operating system (v 4.3 or above).

#### Communication Protocol

* Use HTTP protocol 1.1 for communication between the web browser and the web server.
* Use HTTP protocol 1.1 for communication between the mobile application and the web service.

### System Overview Use Case

#### Web Application



#### Mobile Application



### List of Use Case

#### Web Application

##### <Guest> Overall Use Case



###### <Guest> Login



|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE - UCA01** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.0 |
| **Use Case Name** | Log in | | |
| **Author** | QuanTD | | |
| **Date** | 1/10/2015 | **Priority** | Normal |
| **Actor:**   * Guest   **Summary:**   * This use case allows authorized user logging in system.   **Goal:**   * Guest can log in the system.   **Triggers:**   * Guest send the login command.   **Preconditions:**   * N/A   **Post Conditions:**   * **Success:** User login system. * **Fail:** Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Guest goes to login view. | System require information:   * Username: free text input. * Password: free text input. | | 2 | Guest input information. |  | | 3 | Guest send login command to system. | Guest will login system with their specific role.  [Exception 1, 2] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Guest enter wrong identity information. | Wrong identity information, system shows error messsage. |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 |  | System show message the “System is busy” when the internet is lost. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | User send login command. | System show error message and request guest to login again because of wrong username or password. |   **Relationships:** N/A  **Business Rules:**   * Password are encrypted before sending to server. * After login to system, user will see suitable view basing their role.   + Doctor will see Doctor view, including list of patient and appointment schedule.  + Nurse will see Nurse view, including list of patient and register patient view.  + Doctor Manager will see list of regimen.  + Administrator will see list of user account.  + Staff will see list of available device. | | | |

##### <Authorized User> Overall Use Case

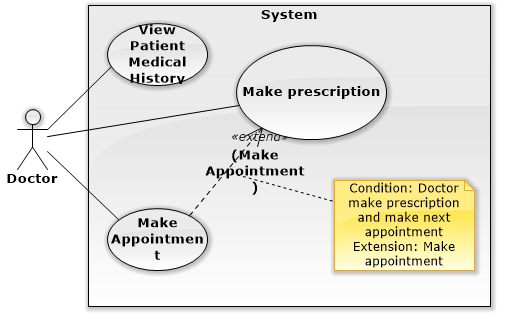


###### <Authorized User> Logout

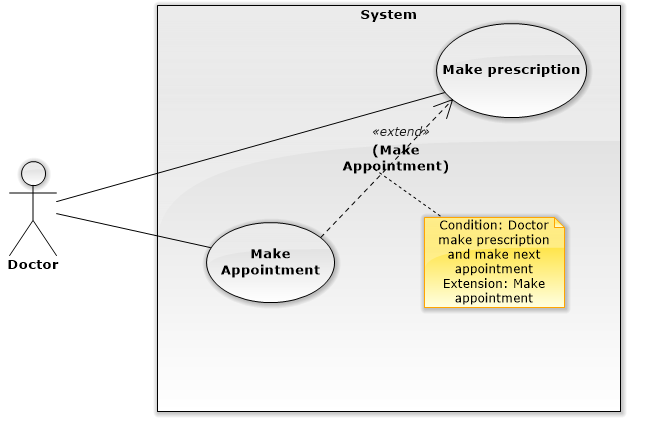


|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – UCA02** | | | |
| **Use Case No.** | UCA02 | **Use Case Version** | 1.1 |
| **Use Case Name** | Log out | | |
| **Author** | QuanTD | | |
| **Date** | 1/10/2015 | **Priority** | High |
| **Actor:**   * Authorized user.   **Summary:**   * This use case allows authorized user logging out of system.   **Goal:**   * User can logout of system.   **Triggers:**   * User send logout command or send other command after not available too long.   **Preconditions:**   * User must be logged in the system before.   **Post Conditions:**   * **Success:** Display login view. * **Fail:** Display login view.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User send log out command | Display login view.  [Alternative 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User send any command after not available too long. | Display login view. |   **Exceptions:**  **Relationships:** N/A  **Business Rules:**   * If user not available longer than 5 minutes, they will see the login view when they be back. | | | |

##### <Doctor> Overall Use Case

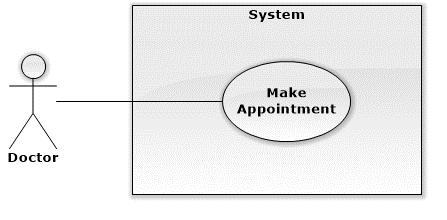


###### <Doctor> Make Prescription



|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – UCA06** | | | |
| **Use Case No.** | UCA06 | **Use Case Version** | 1.0 |
| **Use Case Name** | Make prescription | | |
| **Author** | AnhPN | | |
| **Date** | 24/09/2015 | **Priority** | High |
| **Actor:**   * Doctor.   **Summary:**   * This use case allows doctor to make prescription to patient.   **Goal:**   * New prescription data is created.   **Triggers:**   * Doctor send command to make prescription request. * Doctor must select patient.   **Preconditions:**   * Doctor must be logged in the system before. * Doctor must select patient.   **Post Conditions:**   * **Success:** New prescription insert to history treatment of patient and send detail prescription to application android. * **Fail:** Display error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | * Doctor goes medical history of patient view. |  | | 2 | * Doctor send command to make prescription request. | System display patient’s information and suggest treatment information.  [Exception 1] | | 3 | * Doctor input diagnostic, medicines, food, practice, Note, appointment date. | System required:  - Diagnostic: free text input, required, length 3-40.  - Medicines:  + Name of medicine: free text input, required, length 3-20.  + Number of times per day: free text input, required, length 3-10.  + Number of quantity per time: free text input, required, length 3-10.  - Food:  + Name of food: free text input, required, length 3-20.  + Time: 3 option, breakfast or lunch or dinner.  - Practice:  + Name of practice: free text input, required, length 3-20.  + Intensity: free text input, required, length 3-10.   * Appointment Date: default 1 week form current day, format day “dd/mm/yyyy/”, required. * Note: free text area. | | 4 | * Doctor send command to submit request. | System validate information, display popup request for confirmation.  [Exception 2,3] | | 5 | * Doctor send command to submit request. | System display popup finish treatment request for confirmation.  [Alternative 1] | | 6 | * Doctor send command to Yes request. | System create new prescription, send detail to android application, show message” Create new prescription success”. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor send command to No request. | System create new prescription, send detail to android application, show message” Create new prescription success”. |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor send command to make prescription request. | System shows error message “No regimen for suggest”. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | Doctor send command to submit request. | System shows error message to ask doctor input missing required fields |   [Exception 3]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 3 | Appointment date is a day past of current day. | System shows error message to notify doctor appointment date must before current day less 1 day. |   **Relationships:** Extend from “Make Appointment”.  **Business Rules:**   * Information patient must input before make prescription. * Regimen must be included in system. * Medicines: required. * Food: optional. * Practice: optional. | | | |

###### <Doctor> Make Appointment



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| **USE CASE – UCA05** | | | |
| **Use Case No.** | UCA03 | **Use Case Version** | 1.0 |
| **Use Case Name** | Make appointment | | |
| **Author** | AnhPN | | |
| **Date** | 24/09/2015 | **Priority** | High |
| **Actor:**   * Doctor.   **Summary:**   * This use case allows doctor to make appointment with patient.   **Goal:**   * New appointment record is added into system.   **Triggers:**   * Doctor sends command to create appointment request.   **Preconditions:**   * Doctor must be logged in the system. * Doctor must select patient.   **Post Conditions:**   * **Success:** Insert new appointment into system and send appointment day to application android. * **Fail:** Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | * Doctor goes medical history of patient view. |  | | 2 | * Doctor send command to make appointment request. | System show popup calendar.   * Appointment Date: format day dd/mm/yyyy, ex: “29/10/2015”.   [Alternative 1] | | 3 | * Doctor input day for appointment |  | | 4 | * Doctor send command to make appointment request. | System show message “Make appointment success.”  [Alternative 2]  [Exception 3] | |  |  |  |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | - Doctor send command to cancel request | Pop-up is disappear. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor send command to make appointment request. | * System shows error message “Invalid day.” |   **Relationships:** N/A.  **Business Rules:**   * Appointment date must be in the future and not over 15 days form current day. Format day “dd/mm/yyyy”, ex: 25/09/2015. * When popup calendar, appointment date get default day is next 7 days form current day. | | | |

###### <Doctor> View Patient Medical History



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| **USE CASE – UCA02** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.1 |
| **Use Case Name** | View Patient Medical History | | |
| **Author** | AnhPN | | |
| **Date** | 23/09/2015 | **Priority** | High |
| **Actor:**   * Doctor.   **Summary:**   * This use case allows Doctor views medical history of patient.   **Goal:**   * Show medical history of patient for doctor.   **Triggers:**   * Doctor sends command to view medical history of patient request.   **Preconditions:**   * Doctor must be logged in the system before.   **Post Conditions:**   * **Success:** Medical history of patient show for doctor. * **Fail:** Show error message   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | * Doctor goes to search view. | System requires identity information form Doctor.   * Search Name: free text input | | 2 | * Doctor inputs search information |  | | 3 | * Doctor send command to search patient request. | System display list patients have same name with search information with information:   * Name: name of patients. * Birthday: birthday of patient, format day dd/mm/yyyy, ex: “29/10/2015”. * Start day: day begin to treatment, format day dd/mm/yyyy, ex: “29/10/2015” * Status: “treating” or “finish”. * Button make prescription.   [Exception 1] | | 4 | * Doctor select a row to view. |  | | 5 | * Doctor send command to view medical history of patient request. | System display   * Name: text, read only. * Age: text, read only. * Gender: text, read only. * Illness: text, read only. * Status: text, read only. * Description: text area, read only. * List day of medical history of patient with information:   + Date: the day when doctor make prescription, format day dd/mm/yyyy, ex: “29/10/2015”.  + Appointment: appointment of Date, format day dd/mm/yyyy, ex: “29/10/2015”.  + Status: “treating” or “finish”.  [Exception 2] | | 6 | * Doctor select row to view. |  | | 7 | * Doctor send command to view day request.   [Alternative 1] | System display medical history of patient in that day. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | If the day to view is current day. | Show make prescription. |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor send command to search patient request. | System shows error message “Can’t find patient’s name”. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | Doctor send command to view medical history of patient request. | System shows error message “No record.” |   **Relationships:** N/A  **Business Rules:**   * Search name is empty or null, system must show list patients have appointment in day for doctor. * List day of medical history of patient must have at least one record. Sorted descending by day of Date. | | | |

##### <Doctor Manager> Overall Use Case



###### <Doctor Manager> Insert Regimen



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| **USE CASE – UCA09** | | | |
| **Use Case No.** | UCA09 | **Use Case Version** | 1.0 |
| **Use Case Name** | Insert Regimen | | |
| **Author** | QuanTD | | |
| **Date** | 1/10/2015 | **Priority** | High |
| **Actor:**   * Doctor Manager.   **Summary:**   * This use case allows doctor manager create new regimen.   **Goal:**   * Regimen data for an illness is created in storage.   **Triggers:**   * Doctor send create regimen command.   **Preconditions:**   * User must login system before with role “Doctor Manager”.   **Post Conditions:**   * **Success:** New regimen data is inserted into storage. * **Fail:** New regimen data is not created into storage, system display error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Doctor manager send create new regimen command | System require input fields:   * Name of regimen: free text input, required, max length = 100. * Name of illness: free text input, max length = 100. * Range of patient’ age for apply: free text input, required, value is 1-100. * Detail of treatment phase:   + Number of treatment day: free text input, required, value is positive number only.  + Medicine name: free text input, required, value is available medicine in system.  + Using time: free text input, required, value is 0-23.  + Food name: free text input, optional, value is available food in system.  + Eating time: free text input, required if food name is not empty, value is 0-23  + Practice name: free text input, optional, value is available practice *in system.*  + Practice time: free text input, required if practice name is not empty, value from 0-23.  [Alternative 1] | | 2 | Doctor manager input all required field. |  | | 3 | Doctor manager send create regimen command | System required doctor manager confirming all inputted information  [Alternative 1]  [Exception 1] | | 4 | Doctor manager send submit command | System validate all information. If all information is valid, new regimen and detail of phases, medicines, foods and practices data are created in storage.  [Alternative 2] |   **Alternative Scenario:**  [Alternative 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor manager send cancel command | Display main view. Regimen data is not created in storage. |   [Alternative 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | Doctor manager send submit command | If inputted information is invalid, system notify doctor manager need to check and input fields again. |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor manager send create regimen command without inputting all required fields. | System notice that user need to input all required field. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | Doctor manager send submit command | System display error message that can’t create new regimen data. Creating regimen request is aborted. |   **Relationships:** Generalization of “Manage Regimen”  **Business Rules:**   * Name of regimen must not same as any available regimen in storage. * After regimen is created in storage, all information will be used for suggesting doctor make prescription to patient. * The initial status of regimen is set to ACTIVE. | | | |

###### <Doctor Manager> Update Regimen



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| **USE CASE – UCA09** | | | |
| **Use Case No.** | UCA10 | **Use Case Version** | 1.0 |
| **Use Case Name** | Update Regimen | | |
| **Author** | QuanTD | | |
| **Date** | 1/10/2015 | **Priority** | High |
| **Actor:**   * Doctor Manager.   **Summary:**   * This use case allows doctor manager update current regimen.   **Goal:**   * Regimen data for an illness is updated into storage.   **Triggers:**   * Doctor send update regimen command.   **Preconditions:**   * User must login system before with role “Doctor Manager”. * The regimen must be available before.   **Post Conditions:**   * **Success:** New regimen data is inserted into storage. * **Fail:** New regimen data is not updated into storage, system display error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Doctor send update regimen command | System require input fields:   * Range of patient’ age for apply: free text input, required, value is 1-100. * Detail of treatment phase:   + Number of treatment day: free text input, required, value is positive number only.  + Medicine name: free text input, required, value is available medicine in system.  + Using time: free text input, required, value is 0-23.  + Food name: free text input, optional, value is available food in system.  + Eating time: free text input, required if food name is not empty, value is 0-23  + Practice name: free text input, optional, value is available practice *in system.*  + Practice time: free text input, required if practice name is not empty, value from 0-23.  [Alternative 1] | | 2 | Doctor input all required field. |  | | 3 | Doctor send update regimen command | System required doctor confirming all inputted information  [Alternative 1]  [Exception 1] | | 4 | Doctor send submit command | System validate all information. If all information is valid, regimen information and detail of phases, medicines, foods and practices data are updated into storage.  [Alternative 2] |   **Alternative Scenario:**  [Alternative 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor manager send cancel command | Display main view. Regimen data is not updated into storage. |   [Alternative 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | Doctor manager send submit command | If inputted information is invalid, system notify user need to check and input fields again. |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor manager send update regimen command without inputting all required fields. | System notice that user need to input all required field. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | Doctor manager send submit command | System display error message that can’t update regimen data. Updating regimen request is aborted. |   **Relationships:** N/A.  **Business Rules:**   * After regimen is updated in storage, all information will be used for suggesting doctor make prescription to patient. | | | |

###### <Doctor Manager> Delete Regimen



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| **USE CASE – UCA11** | | | |
| **Use Case No.** | UCA11 | **Use Case Version** | 1.0 |
| **Use Case Name** | Delete Regimen | | |
| **Author** | QuanTD | | |
| **Date** | 24/09/2015 | **Priority** | High |
| **Actor:**   * Doctor Manager.   **Summary:**   * This use case allows doctor manager delete a regimen.   **Goal:**   * Regimen is deleted from storage.   **Triggers:**   * Doctor send delete regimen command.   **Preconditions:**   * User must login system before with role “Doctor Manager”. * The regimen must be available before.   **Post Conditions:**   * **Success:** The regimen has been deleted. * **Fail:** Display error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Doctor send delete command | System require doctor manager to confirm deletion  [Alternative 1] | | 2 | Doctor send submit command | System display main view with message that regimen has been deleted. The regimen request is deleted from storage.  [Exception 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor send cancel command | Display main view. Regimen data is not deleted from storage. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Doctor send submit command | System display error message that can’t delete regimen data. Updating regimen request is aborted. |   **Relationships:** N/A.  **Business Rules:**   * After deletion, the regimen can’t be used to suggest doctor make prescription to patient. * The regimen can be deleted physically or logically from storage. | | | |

##### <Nurse> Overall Use Case



###### <Nurse> Create Patient’s Profile



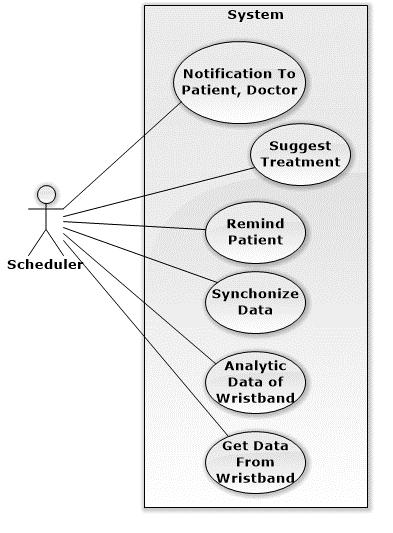
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| **USE CASE – UCA03** | | | |
| **Use Case No.** | UCA03 | **Use Case Version** | 1.0 |
| **Use Case Name** | Create patient profile | | |
| **Author** | QuanTD | | |
| **Date** | 1/10/2015 | **Priority** | High |
| **Actor:**   * Nurse.   **Summary:**   * This use case allows nurse to register new patient profile.   **Goal:**   * Nurse can create new patient profile.   **Triggers:**   * Nurse send create patient profile command.   **Preconditions:**   * User must be logged in system before with role “Nurse”.   **Post Conditions:**   * **Success:**   + New patient profile is created in storage.  + Credential information is sent to patient.  + Doctor will see new appointment with patient in his/her scheduler.   * **Fail:** Display error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Nurse send create patient profile command. | System require inputting information:   * Patient name: free text input, required, length = 3- 50. * Birthdate: date time input, required, value from 1900 to current year. * Gender: input text, required, value is F (Female) or M (Male) * Weight: free text input, required, value = 1- 1000, unit: kilogram. * Height: free text input, required, value = 1- 300, unit: centimeter. * Doctor: free text input, required, value is the available doctor in system. * Symptom: free text input, required, length = 10 – 1000. * Email: free text input, required, length = 10 – 100. * Phone number: free text input, required, max length = 15. | | 2 | Nurse input all required information |  | | 3 | Nurse send register patient profile command | Display message that profile has been created. Credential information is sent to patient’s email.  [Alternative 1]  [Exception 1, 2, 3] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Nurse send cancel command. | Display main view. New patient’s profile data is not created. |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Nurse send register patient profile command without inputting all required fields. | System notice that user need to input all required field. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | Nurse send register command | System display error message that can’t create new patient profile. New register patient profile request is aborted. |   [Exception 3]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 3 | Nurse send register command | System notify user that email is existed in system, required user inputting again. |   **Relationships:** N/A.  **Business Rules:**   * With old patient, nurse don’t need to create new patient profile. * New patient profile will be create with required information. * Symptom is the clinical status of patient when get sick, so it should be clear, short and easy to understand. * An email contain username and password should be send to patient, patient can use this credential information to login system. * The initial status of patient account will be set to ACTIVE. * Based on clinical symptom, new medical record data will be created. The initial status of this medical record will be set to AWAITING TO CHECK. | | | |

###### <Nurse> Update Patient’s History



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| **USE CASE – UCA04** | | | |
| **Use Case No.** | UCA04 | **Use Case Version** | 1.0 |
| **Use Case Name** | Update patient’s history. | | |
| **Author** | QuanTD | | |
| **Date** | 1/10/2015 | **Priority** | High |
| **Actor:**   * Nurse.   **Summary:**   * This use case allows nurse to update new patient’s history.   **Goal:**   * Nurse can update new medical record data related to patient into system.   **Triggers:**   * Nurse send updating patient’s history command.   **Preconditions:**   * User must be logged in system before with role “Nurse”. * The patient profile must is available before.   **Post Conditions:**   * **Success:**   + New patient’s history is created in storage.  + Doctor will see new appointment with patient in his/her scheduler.   * **Fail:** Display error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Nurse send update patient’s history command. | System require inputting information:   * Weight: free text input, required, value = 1- 1000, unit: kilogram. * Height: free text input, required, value = 1- 300, unit: centimeter. * Doctor: free text input, required, value is the available doctor in system. * Symptom: free text input, required, length = 10 – 1000. | | 2 | Nurse input all require field |  | | 3 | Nurse send update history command | Display that new patient’s history is added into system.  [Alternative 1]  [Exception 1, 2] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Nurse send cancel command | Display main view. |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Nurse send register patient profile command without inputting all required fields. | System notice that user need to input all required field. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | Nurse send update history command | System display error message that can’t update patient’s history. No medical record data is insert into storage. |   **Relationships:** N/A.  **Business Rules:**   * Clinical symptom must be clearly, shortly. * Patient’s profile must be available before. * Based on clinical symptom, new medical record data will be created. The initial status of this medical record will be set to AWAITING TO CHECK. | | | |

##### <Scheduler> Overall Use Case

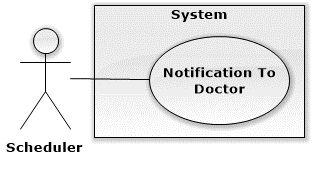


###### <Scheduler> Notification To Patient



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| **USE CASE – UCA07** | | | |
| **Use Case No.** | UCA08 | **Use Case Version** | 1.0 |
| **Use Case Name** | Notify to patient. | | |
| **Author** | QuanTD | | |
| **Date** | 1/10/2015 | **Priority** | High |
| **Actor:**   * Scheduler.   **Summary:**   * This use case allows patient receiving notification.   **Goal:**   * Scheduler can send notification to patient.   **Triggers:**   * The scheduling time is configured.   **Preconditions:**   * Appointment request data is inserted in storage before. * Prescription data is inserted in storage before.   **Post Conditions:**   * **Success:** Patient will receive notification, new notification data is inserted into storage. * **Fail:**   + Patient won’t receive notification.  **+** Log file will record error and time.  **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | *Server checks the current time.* *If it hits configured time, scheduler* *process starts.* | System read all unprocessed prescription and appointment request from storage.  [Exception 1]  With new record, system:   * Send new notification to patient. * Insert new notification data to storage. * Generate log file. [Alternative 1] [Exception 2] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | *Server checks the current time.*  *If it hits configured time, scheduler* *process starts.* | If old notification have been not sent yet:   * Send new notification to patient. * Update status of notification process to storage (uncompleted or not). * - Generate log file |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | *Server checks the current time.* *If it hits configured time, scheduler* *process starts.* | Scheduler can’t start:   * Generate log file with error and time. * Send notification to system administrator if need. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | *Server checks the current time.* *If it hits configured time, scheduler* *process starts.* | System can’t send notification to doctor:   * Generate log file with error and time. * Notification data is inserted into storage. |   **Relationships:** N/A.  **Business Rules:**   * Scheduler will try to send notification to patient in 3 times/scheduler running time. * If notification is sent to patient successfully, the status of notification data in storage will be set COMPLETED. * If notification can’t be sent to patient successfully, the status of notification data in storage will be set UNCOMPLETED. * The uncompleted notification will be try to send to patient in next scheduling. | | | |

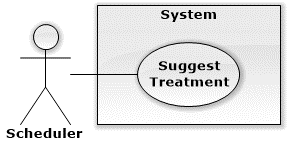
###### <Scheduler> Notification To Doctor



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| **USE CASE – UCA07** | | | |
| **Use Case No.** | UCA07 | **Use Case Version** | 1.0 |
| **Use Case Name** | Notify to doctor. | | |
| **Author** | QuanTD | | |
| **Date** | 1/10/2015 | **Priority** | High |
| **Actor:**   * Scheduler.   **Summary:**   * This use case allows doctor receiving notification.   **Goal:**   * Scheduler can send notification to doctor.   **Triggers:**   * The scheduling time is configured.   **Preconditions:**   * Patient feedback is inserted into storage.   **Post Conditions:**   * **Success:** Doctor will receive notification, new notification data is inserted into storage. * **Fail:**   + Doctor won’t receive notification.  **+** Log file will record error and time.  **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | *Server checks the current time.* *If it hits configured time, scheduler* *process starts.* | System read all unprocessed feedback from storage.  [Exception 1]  With new feedback, system:   * Send new notification to doctor. * Insert new notification data to storage. * Generate log file. [Alternative 1] [Exception 2] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | *Server checks the current time.*  *If it hits configured time, scheduler* *process starts.* | If old notification have been not sent yet:   * Send new notification to doctor. * Update status of notification process to storage (uncompleted or not). * - Generate log file |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | *Server checks the current time.* *If it hits configured time, scheduler* *process starts.* | Scheduler can’t start:   * Generate log file with error and time. * Send notification to system administrator if need. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 2 | *Server checks the current time.* *If it hits configured time, scheduler* *process starts.* | System can’t send notification to doctor:   * Generate log file with error and time. * Notification data is inserted into storage. |   **Relationships:** N/A.  **Business Rules:**   * Scheduler will try to send notification to doctor in 3 times/scheduler running time. * If notification is sent to doctor successfully, the status of notification data in storage will be set COMPLETED. * If notification can’t be sent to doctor successfully, the status of notification data in storage will be set UNCOMPLETED. The uncompleted notification will be try to send to doctor in next scheduling. | | | |

###### <Scheduler>Suggest Treatment



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| **USE CASE – UCA02** | | | |
| **Use Case No.** | UCA02 | **Use Case Version** | 1.1 |
| **Use Case Name** | Suggest Treatment | | |
| **Author** | AnhPN | | |
| **Date** | 23/09/2015 | **Priority** | High |
| **Actor:**   * Scheduler.   **Summary:**   * This use case allows scheduler suggest treatment for doctor.   **Goal:**   * Show suggest treatment.   **Triggers:**   * Doctor send command to make prescription request.   **Preconditions:**   * Doctor must be logged in the system before. * Doctor must select patient.   **Post Conditions:** None  **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | * Doctor goes medical history of patient view. |  | | 2 | * Doctor send command to make prescription | System display patient information and suggest treatment information. |   **Alternative Scenario:** N/A  **Exceptions:** N/A  **Relationships:** N/A  **Business Rules:**   * Information patient must input before make prescription. * Regimen must be included in system. | | | |

###### <Scheduler> Analytic data of wristband



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| **USE CASE – UCA02** | | | |
| **Use Case No.** | UCA02 | **Use Case Version** | 1.1 |
| **Use Case Name** | Analytic data of wristband | | |
| **Author** | QuyHK | | |
| **Date** | 29/09/2015 | **Priority** | High |
| **Actor:**   * Scheduler.   **Summary:**   * This use case allows scheduler use formular to analytic number of step from wristband.   **Goal:**   * Calculate calories burned, distance from patient’s data.   **Triggers:**   * System run a timer task that trigger check event.   **Preconditions:**   * System time is at 23:00.   **Post Conditions:**   * **Success**: System update data of patient. * **Fail**: Error detail will be tracked in a log file.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | System run timer task to calculate calories burned and distance walking or running. | System use formular to calculate and response:   * Calories burned. * Distance walking or running.   [Exception 1] |   **Alternative Scenario:** N/A  **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | System timer task is interrupted | No notification will be sent. Error detail will be tracked in a log file. |   **Relationships:** N/A  **Business Rules:**   * System have to analytic data using formular had latest update from staff. * System timer will send check event at 23:00 everyday. * System only calculate using data in that day. | | | |

###### <Scheduler> Get Data From Wristband



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| --- | --- | --- | --- |
| **USE CASE - UCA01** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.1 |
| **Use Case Name** | Get Data From Wristband | | |
| **Author** | QuyHK | | |
| **Date** | 24/09/2015 | **Priority** | Normal |
| **Actor:**   * Scheduler   **Summary:**   * This use case allows scheduler gets number of step from wristband.   **Goal:**   * Help system gets latest number of step of patient.   **Triggers:**   * Patient does not close application and bring wristband near with smartphone.   **Preconditions:**   * Users logged in to system as patient role, android application had connect with wristband.   **Post Conditions:**   * **Success:** Save number of step from wristband in local of android application and get data from wristband again after 30 minutes. * **Fail:** Get data from wristband again after 30 minutes.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Scheduler request get data from wristband. | System check status connect with wristband. If status is connect.  [Alternative 1]  System request value from number of step UUID.  System sends to scheduler value of number of step  [Exception 1, 2] | | 2 | Scheduler save number of step in local of android application. |  |   **Alternative Scenario:**  [Alternative 1]   |  |  |  | | --- | --- | --- | | No | Cause | System Response | | 1 | Status connect with wristband is disconnect. | System get data from wristband again after 30 minutes. |   **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Bluetooth is turn off. | System sends messsage request patient open bluetooth. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Scheduler is interrupted | System get data from wristband again after 30 minutes. |   **Relationships:** none  **Business Rules:**   * Scheduler will get data after 30 minutes everytime from 4:00AM to 10:00PM. * System reset data save in mobile everyday. * In one day, system only update value of number of step. * If wristband disconnect with android application, system does not get number of step. * System will remind patient open bluetooth and bring wristband near with their smartphone at 9:00 pm to get number of step last time. | | | |

##### <Admin> Overall Use Case

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###### <Admin> Insert Account



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| USE CASE – WA01 | | | |
| Use Case No. | WA01 | **Use Case Version** | 2.0 |
| Use Case Name | Insert Account | | |
| Author | KhuongMH | | |
| Date | 23/09/2015 | **Priority** | High |
| Actor:   * Admin   Summary:   * This use case allows admin to create new account in system.   Goal:   * Admin can create new account.   Triggers:   * Admin sends command to create new account in system.   Preconditions:   * User has to logged in to the system as Admin role.   Post Conditions:   * Success: New account will be create for guest. * Fail: Show error message.   Main Success Scenario:   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Admin goes to the register form. | System list out information of account in system and components:   * Username: free text input, required, length 3 - 50 * Password: free text input, required * Confirm Password: free text input, required * Full Name: free text input, required, length 3 - 80 * Address: free text input, required, length 3 - 250 * Role: select one of the options * Register: Button * Cancel: Button | | 2 | Admin fills in information of account and click on register button.  [Alternative 1] |  | | 3 | Admin sends command to create new account to system. | System shows message account has been created successfully.  [Exception 1] |   Alternative Scenario:   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Admin click on Cancel button to cancel the register process. | System redirect to previous page. |   Exceptions:   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Admin sends command to create new account to system | System shows error message user cannot create because duplicated username. |   Relationships: Generalization of “Manage Account”  Business Rules:   * New Account will be set status standard is De-activate. * New Account will be created with inputted information in the system. * System must ensure has not duplicated username. * All information about account still remain in the system. | | | |

###### <Admin> Update Account



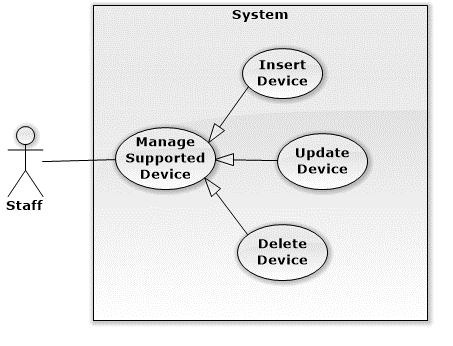
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| --- | --- | --- | --- |
| USE CASE – WA02 | | | |
| Use Case No. | WA02 | **Use Case Version** | 2.0 |
| Use Case Name | Update Account | | |
| Author | KhuongMH | | |
| Date | 23/09/2015 | **Priority** | High |
| Actor:   * Admin   Summary:   * This use case allows admin to update account’s profile.   Goal:   * Admin can update account’s profile.   Triggers:   * Admin sends command to update account’s profile to system.   Preconditions:   * User has to log in to the system as Admin role.   Post Conditions:   * Success: New information of account will update to system. * Fail: Show error message.   Main Success Scenario:   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Admin search username which he want to update and goes to see account’s profile | System list out information of account in system and components:   * Username: free text input, read-only * New Password: free text input * Confirm New Password: free text input * Full Name: free text input * Address: free text input * Role: select one of the options * Status: select one of the options * Update: Button * Cancel: Button | | 2 | Admin fill in updated information of account and click on update button.  [Alternative 1] |  | | 3 | Admin sends command to update account to system. | System shows message account has been updated successfully. |   Alternative Scenario:   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Admin click on Cancel button to cancel the register process. | System redirect to previous page. |   Exceptions: N/A  Relationships: Generalization of “Manage Account”  Business Rules:   * Account must be existed in the system. | | | |

###### <Admin> Delete Account

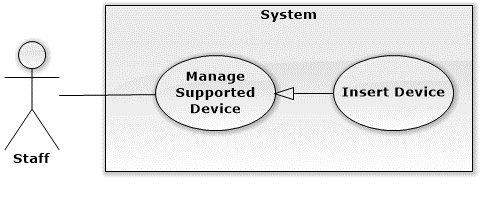


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| USE CASE – WA02 | | | |
| Use Case No. | WA02 | **Use Case Version** | 2.0 |
| Use Case Name | Delete Account | | |
| Author | KhuongMH | | |
| Date | 24/09/2015 | **Priority** | High |
| Actor:   * Admin   Summary:   * This use case allows admin to delete wrong inputted account.   Goal:   * Admin can delete wrong inputted account from system.   Triggers:   * Admin sends command to delete wrong inputted account from system.   Preconditions:   * User has to log in to the system as Admin role.   Post Conditions:   * Success: Admin is able to delete wrong inputted account. * Fail: Show error message.   Main Success Scenario:   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Admin search username which he want to delete |  | | 2 | Admin sends command to delete account to system. | System shows message account has been deleted successfully. |   Alternative Scenario: N/A  Exceptions: N/A  Relationships: Generalization of “Manage Account”  Business Rules:   * Account must be existed in system. | | | |

##### <Staff> Overall Use Case

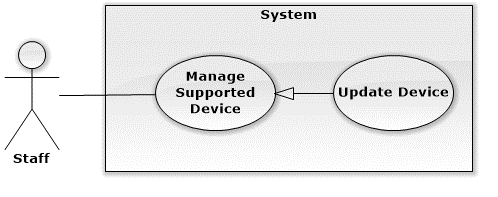


###### <Staff> Insert Device



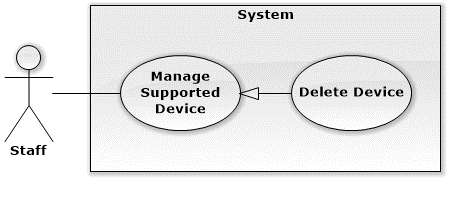
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| **USE CASE - UCA01** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.1 |
| **Use Case Name** | Insert Device | | |
| **Author** | QuyHK | | |
| **Date** | 30/09/2015 | **Priority** | Normal |
| **Actor:**   * Staff   **Summary:**   * This use case allows staff can add new device.   **Goal:**   * System can support read data of many type of wristband.   **Triggers:**   * Staff sends adding new device command.   **Preconditions:**   * User logged in to the system as staff role.   **Post Conditions:**   * **Success:** Device insert into database and show list device. * **Fail:** Error message displayed that wrong data input.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | * Staff goes to add new device view. | This view requires following information:   * Brand Name: text, required, length 2 - 24. * Brand UUID: text, required, length 8 * Number of Step UUID: text, required, length 8 * Position Number of Step: text, required, value from 0 - 20   Text input UUID have to have example: **0000180a** | | 2 | * Staff inputs Brand Name, UUID Brand Name, UUID Number of Step, Position of Number of Step. | When user finishes input one field, if condition doesn’t match. System will show an error message next to that field. | | 3 | * Staff sends command add new device. | System add new device information to system.  System update list device to show for staff and show message successfully. [Exception 1, 2, 3, 4] |   **Alternative Scenario:** N/A  **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Missing of required fields | Show message notify staff which field is required. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Wrong format of UUID | System message notify staff use right format of UUID |   [Exception 3]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Length of field’s value is out of range | Show message notify staff which field’s value is out of range |   [Exception 4]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Device had exist in system | Show message notify entered device is exist |   **Relationships:** N/A  **Business Rules:**   * UUID have to right format of Bluetooth standard on page <https://developer.bluetooth.org/gatt/characteristics/Pages/CharacteristicsHome.aspx> * An UUID have to start with 0000 in head and have to have 8 characters. * System will insert new device information including: Brand name, Brand UUID, Number of step UUID, Positon number of step to system. * All fields input does not empty. | | | |

###### <Staff> Update Device



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| --- | --- | --- | --- |
| **USE CASE - UCA01** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.1 |
| **Use Case Name** | Update Device | | |
| **Author** | QuyHK | | |
| **Date** | 29/09/2015 | **Priority** | Normal |
| **Actor:**   * Staff   **Summary:**   * This use case allows staff can update device.   **Goal:**   * System can read data of wristband if manufacture chang UUID to save data on wristband.   **Triggers:**   * Staff sends the update device command.   **Preconditions:**   * User logged in to the system as staff role. * Staff select a device exist in system.   **Post Conditions:**   * **Success:** Device information will be updated in database and show list device to staff. * **Fail:** Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Staff goes to update device information. | View have to show these information:   * Brand Name: text, required, length 2 - 24. * Brand UUID: text, required, length 8 * Number of Step UUID: text, required, length 8 * Position Number of Step: text, required, value from 0 - 20   Text input UUID have to have example: **0000180a** | | 2 | Staff edit information of device. | When user finishes update one field, if condition doesn’t match. System will show an error message next to that field. | | 3 | Staff send command to save new information | System update information of device and show message nofity device is updated successfully.  [Exception 1, 2, 3, 4] |   **Alternative Scenario:** N/A  **Exceptions:**  [Exception 1]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Missing of required fields | Show message notify staff which field is required. |   [Exception 2]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Wrong format of UUID | System message notify staff use right format of UUID |   [Exception 3]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Length of field’s value is out of range | Show message notify staff which field’s value is out of range |   [Exception 4]   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Device had exist in system | Show message notify entered device is exist |   **Relationships:** N/A  **Business Rules:**   * An UUID have to start with 0000 in head and have to have 8 characters. * System will update new device information including: Brand name, Brand UUID, Number of step UUID, Positon number of step to system. * All fields input does not empty. | | | |

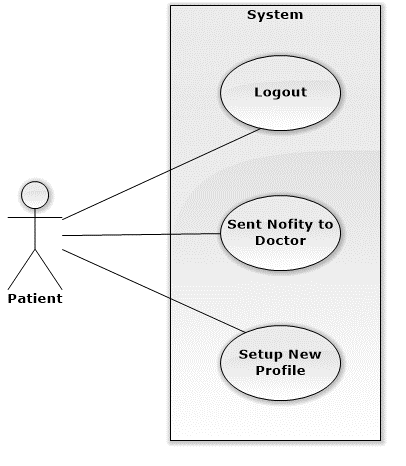
###### <Staff> Delete Device



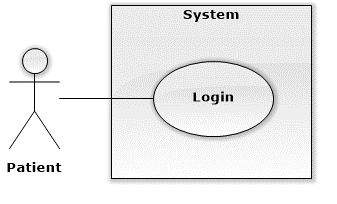
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| **USE CASE - UCA01** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.1 |
| **Use Case Name** | Delete Device | | |
| **Author** | QuyHK | | |
| **Date** | 23/09/2015 | **Priority** | Normal |
| **Actor:**   * Staff   **Summary:**   * This use case allows staff delete device.   **Goal:**   * System remove some device had been input wrong information or does not exist in market.   **Triggers:**   * Staff sends delete device command.   **Preconditions:**   * User logged in to the system as staff role.   **Post Conditions:**   * **Success:** Device will be delete in system and show list device to staff. * **Fail:** Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Staff goes to manage devices view | System list out information of devices in system:   * Brand Name: text. * Brand UUID: text. * Number of Step UUID: text. * Position Number of Step: text. | | 2 | Staff select device to delele in list. |  | | 3 | Staff sends command to delete device | System confirm with staff to delete device. | | 4 | Staff accept delete device  [Alternative 1] | System delete device and show message nofity device is deleted successfully.  [Exception 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Staff does not accept delete device | System show list device for staff. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Admin sends command to delete device. | System shows error message device cannot remove themselves from the system. |   **Relationships:** none  **Business Rules:**   * Their must be at least 01 device in the system. * Remove device in system. | | | |

#### Mobile Application

##### <Patient> Overall Use Case

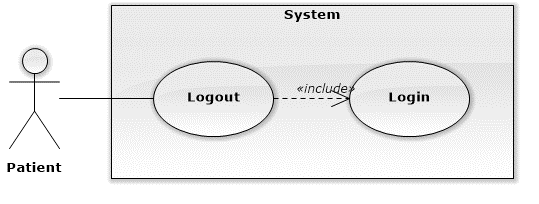


###### <Patient> Login



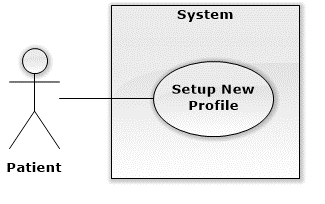
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| **USE CASE - UCA01** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.1 |
| **Use Case Name** | Log in | | |
| **Author** | Ha Kim Quy | | |
| **Date** | 23/09/2015 | **Priority** | Normal |
| **Actor:**   * Patient   **Summary:**   * This use case allows patient logging into system.   **Goal:**   * Patient can view the main page of android application.   **Triggers:**   * Patient input username and password on login page, then press “Log in”.   **Preconditions:**   * None.   **Post Conditions:**   * **Success:** Main page displayed. * **Fail:** Error message displayed that wrong username or password.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User input username and password, then press “Log in” button. | * Display main page if username and password are valid. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User input username and password, then press “Log in” button. | Display error message: “Wrong username or password.” |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User input username and password, then press “Log in” button. | Display error page with message: “System has getting error. Please try again later”. |   **Relationships:** none  **Business Rules:**   * The username is not empty or include whitespace, special character, max length is 20 characters. * The password is not empty or include whitespace, special character, max length is 20 characters. | | | |

###### <Patient> Logout



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| **USE CASE - UCA01** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.1 |
| **Use Case Name** | Logout | | |
| **Author** | Ha Kim Quy | | |
| **Date** | 24/09/2015 | **Priority** | Normal |
| **Actor:**   * Patient   **Summary:**   * This use case allows patient logout of system.   **Goal:**   * User can logout to change account or out of system.   **Triggers:**   * User select “Logout” button.   **Preconditions:**   * User must be logged in the system.   **Post Conditions:**   * **Success:** Display login layout. * **Fail:** Error message cannot logout system..   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Log out” button. | Display login page.  [Exception 1] |   **Alternative Scenario:** none  **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Log out” button | Display error page with message: “System has getting error. Please try again later”. |   **Relationships:** none  **Business Rules:** none | | | |

###### <Patient> Setup New Profile



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| --- | --- | --- | --- |
| **USE CASE - UCA01** | | | |
| **Use Case No.** | UCA01 | **Use Case Version** | 1.1 |
| **Use Case Name** | Setup New Profile | | |
| **Author** | Ha Kim Quy | | |
| **Date** | 24/09/2015 | **Priority** | Normal |
| **Actor:**   * Patient   **Summary:**   * This use case allows patient setup new profile of patient like height, weight.   **Goal:**   * Patient setup new information to help doctor follow status of patient.   **Triggers:**   * Patient select setup new profile.   **Preconditions:**   * User must be logged in the system.   **Post Conditions:**   * **Success:** Display message success. * **Fail:** Showerror message..   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks “Setup Profile” button on menu android application. | Display setup profile layout | | 2 | Patient setup some information and click “Done” button | Display message success and back to home layout  [Exception 1] |   **Alternative Scenario:** none  **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Done” button | Display error page with message: “System has setting error. Please try again later”. |   **Relationships:** none  **Business Rules:** none | | | |

## Software System Attribute

### Usability

#### Graphic User Interface

All the texts, labels and alerts of android app will be written by Vietnamese and web app will be written by English.

#### Usability

The system usability is easy to use that will need less than 1 days of training for doctor, nurse and staff to use system. We support partient can use this system and does not training more.

#### Installation

User can follow installation and manual guide for installation. If there are any problems, user cans contacnts developer for help.

### Reliability

* Android app will collect data of patient and sent to server anytime have Internet.

### Availability

### Security

* Input data are validated if necessary before saving to database.
* Users is authentication/authorization for all users when they login to the system.

### Maintainability

* System is separated into modules.

### Portability

* Admin, staff, nurse and doctor can use application on every OS supported web browser.
* Patient can use mobile application on every Android smartphone that have version greater than 4.3, bluetooth 4.0

### Performance

* Requests from web application are responded in less than 10 seconds at 5 Mbps bandwidth speed.
* Mobile application tracking data of wristband every 10 second and get treatment from server less than 1 minute at 2Mbps bandwidth speed.