**MINISTRY OF EDUCATION AND TRAINING**



**FPT UNIVERSITY**

Capstone Project Document

**Health Support Tracking System**

|  |  |
| --- | --- |
| **Group 2** | |
| **Group members** | Ha Kim Quy – QuyHKSE61160  Tran Dang Quan – QuanTDSE60878  Phan Nhat Anh – AnhPNSE90158  Man Huynh Khuong - KhuongMHSE61148  Nguyen Duy Khuong – Khuongnd60493 |
| **Supervisor** | Mr. Kieu Trong Khanh |
| **Ext. Supervisor** | N/A |
| **Capstone Project code** | HSTS |

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

# Table of Contents

[Table of Contents 3](#_Toc430072498)

[List of Tables 5](#_Toc430072499)

[List of Figures 6](#_Toc430072500)

[Definitions, Acronyms, and Abbreviations 7](#_Toc430072501)

[A. Introduction 8](#_Toc430072502)

[1. Project Information 8](#_Toc430072503)

[2. Introduction 8](#_Toc430072504)

[3. Current Situation 8](#_Toc430072505)

[4. Problem Definition 8](#_Toc430072506)

[5. Proposed Solution 9](#_Toc430072507)

[5.1. Feature functions 9](#_Toc430072508)

[5.2. Advantages and disadvantages 9](#_Toc430072509)

[6. Functional Requirements 10](#_Toc430072510)

[6.1. Create a patient profile in system. 10](#_Toc430072511)

[6.2. Get information of wristband and save in smartphone. 10](#_Toc430072512)

[6.3. Android application send information of wristband to server. 10](#_Toc430072513)

[6.4. System Management 10](#_Toc430072514)

[6.5. System send treatment of doctor to patient. 10](#_Toc430072515)

[6.6. Application support to remind use medicine, do exercise, appointment doctor. 10](#_Toc430072516)

[6.7. Manage regimen of disease. 10](#_Toc430072517)

[6.8. Manage nurse, doctor. 10](#_Toc430072518)

[7. Role and Responsibility 10](#_Toc430072519)

[B. Software Project Management Plan 11](#_Toc430072520)

[1. Problem Definition 11](#_Toc430072521)

[1.1. Name of this Capstone Project 11](#_Toc430072522)

[1.2. Problem Abstract 11](#_Toc430072523)

[1.3. Project Overview 11](#_Toc430072524)

[2. Project organization 12](#_Toc430072525)

[2.1. Software Process Model 12](#_Toc430072526)

[2.2. Roles and responsibility 13](#_Toc430072527)

[2.3. Tools and Techniques 14](#_Toc430072528)

[3. Project Management Plan 14](#_Toc430072529)

[3.1. Software development life cycle 14](#_Toc430072530)

[3.2. Phase Detail 15](#_Toc430072531)

[4. Coding Convention 16](#_Toc430072532)

# List of Tables

[Table 1 Roles and Responsibility 10](#_Toc408811660)

[Table 2 Hardware Requirement for Server 12](#_Toc408811661)

[Table 3 Hardware Requirement for Mobile 12](#_Toc408811662)

[Table 4 Roles and Responsibility Details 14](#_Toc408811663)

[Table 5 Software Development Life Cycle Detail 15](#_Toc408811664)

[Table 6 Phase 1: Requirement Analysis 15](#_Toc408811665)

[Table 7 Phase 2: Design 16](#_Toc408811666)

[Table 8 Phase 3: Implementation 16](#_Toc408811667)

[Table 9 Phase 4: Testing 16](#_Toc408811668)

[Table 10 Phase 5: Maintenance 16](#_Toc408811669)

# List of Figures

[Figure 1 Modified Waterfall Development Model 13](#_Toc408811670)

# 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 forget use medicine that cause problem in effective treatment. Besides, some patient need to be followed and update treatment after a period. Patient need to consult in time to treatment.

The smart activity wristband appear providing functional with tracking workouts, calories burned, steps. 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 require meet patient. Patients does not need waste time to meet doctor. Patient’s treatment will update day by day follow what they do.

This document also discribes our working process in 4 months includes our perspective in the system, component designs and detailed core workflows. We hope this document will help everyone understand about this system.

## Current Situation

When someone need to tracking their practice, they will choose one wristband and install application for that device in smartphone. Then, they will run, walking,…, application will collect data and show data to user. Next day, device will reset data and it will count again.

## Problem Definition

Below are the advantages and disadvantages of current bus application in Windows Phone store and website in Vietnam:

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

## 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 way to heal.

### 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 suggest 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 - 40 ages.
  + 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:

### Create a patient profile in system.

* Nurse input information when patient meet doctor.
* Doctor will accept treatment to patient and provide account.

### Get information of wristband and save in smartphone.

* Application on smartphone can get information of wristband save in local.

### Android application send information of wristband to server.

* When patient’s smartphone have internet. Application will send data from local to server.

### Suggest Regiment of patient to doctor.

* When collect data of patient, system will compare with regimen and suggest treatment to doctor.

### Edit treatment of patient.

* Doctor view treatment and edit treatment to patient before send to patient.

### System send treatment of doctor to patient.

* System send treatment of doctor to patient.

### View history of patient.

* Doctor can view all history of patient, who being doctor treat.

### Application support to remind use medicine, do exercise, appointment doctor.

* Remind use medicine, do exercise, appointment doctor.

### Manage regimen of disease.

* Doctor add new regimen and new disease.
* Doctor update regiment of disease

### Manage nurse, doctor.

* Admin can insert new doctor, nurse.
* Delete a doctor, nurse.

## Role and Responsibility

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

Nowadays heal becomes attention of everyone. Many applications have been help they practice and improve their heal. But most of them only show what they do and does not do anything else. Doctor can not update state of patient everyday, If patient stay at home. Sometime they have to work and forget use medicine,...With that problem, we want to make a system to resolve it. Heal Support Tracking System is an system connect doctor and patients. It help patients follow regimen of doctor and doctor can checking everyday.

### Project Overview

#### Current Situation

Below are the problems encountered in this project:

* Only 64% smartphone have android 4.3 or more. Some wristband does not use BLE.
* Regimen is private information, so we have to use many relationship to get regimen of some illness.

#### The Proposed System

This system intended for patients being some normal illness which you only need use medicine, practice and eat follow treatment.

It use to help patient recuperate faster. Because, this system will remind use medicine, help doctor know information of patients everyday and they can setup new treatment or new appointment follow that data.

Excepting, We can suggest treatment for doctor follow regimen in database.

Our system includes two main subsystems: an online website for admin, doctor, nurse and mobile application to patient.

##### Mobile Application

* Show treatment which accepted by doctor.
* Remind use medicine, do exercises, appointment with doctor.
* Get data from wristband.
* Send data to server.

##### Web Application

* Add patient to system.
* Suggest treatment to doctor.
* Doctor edit treatment.
* Send appointment of doctor to patient.
* Doctor make a appointment.
* Add new UUID of Device.
* View history of patient.
* Doctor can manage treatment.
* Admin can manage account.
* Notification to patient.

#### Boundaries of the System

* The system can use by everyone from 20 – 40 ages. Patient have to have wristband, android 4.3 and over with BLE supported, Internet connection. Doctor have to have Computer with browser and Internet connection.

#### Development Environment

##### Hardware requirements

**For Server**

|  |  |  |
| --- | --- | --- |
| **Windows** | **Minimum Requirements** | **Recommended** |
| **Internet Connection** | Cable, Wi-Fi (4 Mbps) | Cable, Wi-Fi (8 Mbps) |
| **Operating System** |  |  |
| **Computer Processor** | Intel® Xeon ® 1.4GHz | Intel® Xeon ® Quad Core  (12M Cache, 2.50 GHz) |
| **Computer Memory** | 1GB RAM | 2GB or more |

Table 2 Hardware Requirement for Server

**For Mobile**

|  |  |  |
| --- | --- | --- |
| **Mobile** | **Minimum Requirements** | **Recommended** |
| **Internet Connection** | 2 Mbps | 4 Mbps |
| **Operating System** | Android 4.3 | Android 4.3 |
| **Hardware** | BLE supported | BLE supported |
| **Memory** | 5MB | 10MB or more |

Table 3 Hardware Requirement for Mobile

##### Software requirements

- Window 7: operating system and platform for development.

- MySQL: used to create and manage the database for system.

- Intellij: used to implement website and web service.

* Android Studio: used to implement android application

- Github and SourceTree: used for source control.

- Software Ideas Modeler: used to create models and diagrams.

## Project organization

### Software Process Model

Project is developed under modified scrum model



Figure 1 Modified Scrum Development Model

For more information: [http://scrumreferencecard.com/scrum-reference-card/](http://scrumreferencecard.com/scrum-reference-card/%20)

### Roles and responsibility

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

Table 4 Roles and Responsibility Details

### Tools and Techniques

* Mobile Application: Android 4.3.
* Front-end technologies: HTML5, CSS3, JavaScript, jQuery, AJAX.
* Back-end:
  + Website: Spring MVC, Hibernate.
* Web server: Apache Tomcat.
* Database Management System: MySQL.

## Project Management Plan

### 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 5 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 6 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 7 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, |
| **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 8 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 9 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 10 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.
  + When coding Java classes and interfaces, the following formatting rules should be followed:
    - No space between a method name and the parenthesis "(" starting its parameter list.
    - Open brace "{" appears at the end of the same line as the declaration statement.
    - Open brace "{" appears at the end of the same line as the declaration statement.
* Commenting Convention:
  + Doc comments describe Java classes, interfaces, constructors, methods, and fields. Each doc comment is set inside the comment delimiters /\*\*...\*/, with one comment per class, interface, or member.
  + Block comments are used to provide descriptions of files, methods, data structures and algorithms. Block comments may be used at the beginning of each file and before each method.
  + Training comments is a very short comments can appear on the same line as the code they describe, but should be shifted far enough to separate them from the statements.Using Java Code Convention From:

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