­­ ­MINISTRY OF EDUCATION AND TRAINING

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**FPT UNIVERSITY**

Capstone Project Document

**Call-Center on Mobile for Clinics**

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

-Ho Chi Minh City, ***18/05/2018*-**

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Definitions, Acronyms, and Abbreviations

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| **Name** | **Definition** |
| PO | Product owner |

A. Introduction

## 1. Project Information

* Project name: **Call-Center on Mobile for Clinic**
* Project Code: **CallClinic**
* Product Type: **Mobile Application**
* Start Date: **May 18th, 2018**
* End Date: **August 31th, 2018**

## 2. Introduction

Due to the growing trend and demand for customer service, the hiring of staff to assist the patients are quite expensive for the clinic. To solve the problem, we introduced the Call-Center on Mobile for Clinic. According to research and analysis, this will minimize the cost of customer service, so we recommend this solution to clinics.

We build automated response systems, to solve the cost problem of clinics. The system allows the clinic to adjust the appointment time, automatically answering some basic issues, saving the cost of hiring staff. In addition, we also collect feedback from patients and improvements based on feedback.

## 3. Current Situation

Currently, the appointment of private clinics must be done manually. If the number of patients is low, appointments made through phone calls are made directly to the doctor or clinic staff.

During peak days, when the clinic has many patients, the situation becomes worse, the current solution of these clinics is to load numbers in order, patients will wait until the turn. The current solution, however, solves the problem that patients will be examined in the order, but if the number of patients is too large, patients with the following numbers will have to wait, which is very time-consuming. Some patients will not even pick up the number or leave because they know they have to wait for too long, they would rather go to another clinic.

This leads to a significant reduction in the revenues of the clinic. Not to mention that in those peak days, the quality of the examination will decrease because the examination time will be less.

## 4. Problem Definition

**There is a wide range of disadvantages of the current situation:**

* Patients have difficulty to book appointments and choose a Doctor.
* Small Clinics do not have funds to hire Call-Center to provide patient care service and schedule appointment service.
* Clinics are managing patient information, schedule appointment manually, that way makes them time-consuming and inconvenient.
* Clinics need a staff for wait a call from patients.

## 5. Proposed Solution

### 5.1 Feature functions

Our solution is to set up an automated appointment scheduling system for private clinics.

The system automatically records and schedules the appointment. Appointments will automatically schedule base on doctor's hours and patient's free time. The end result is that the doctor will only need follow those schedule, and the patient will receive the correct date and time without the need to pick up or wait for the appointment. Clinics free times will be optimized and no more overload.

### 5.2 Values and Challenges

**Values:**

* Save time, money for both patients and doctor
* Improve clinic experience

**Challenges:**

* Device must be Android version 5.0 or higher
* There’re some strong competitors such as:laysokhambenh.vn

## 6. Functional Requirements

Functional requirements of the system are listed as below:

* **Patient component**
* Be notification
* Record calling
* Send data to service
* **Doctor component**
* View list appointment
* Register profile
* **Service component**
* Merge list appointment
* Auto receive customer’s call
* Send list patient to doctor
* Notification for patient and doctor

## 7. Role and Responsibility

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Full Name** | **Role** | **Position** | **Contact** |
| 1 | Kiều Trọng Khánh | Project Manager | Supervisor | khanhkt@fpt.edu.vn |
| 2 | Nguyễn Thế Phương | Developer | Leader | Phuongntse62087@fpt.edu.vn |
| 3 | Phan Thành thuận | Developer | Member | Thuanptse62063@fpt.edu.vn |
| 4 | Nguyễn Cao Duy | Developer | Member | duyncse61032@fpt.edu.vn |
| 5 | Nguyễn Lương Tuấn Kiệt | Developer | Member | kietnltse61696@fpt.edu.vn |

Table 1 Roles and Responsibilities

B. Software Project Management Plan

## 1. Problem Definition

### 1.1 Name of this Capstone Project

* **Official name:**  Call-Center on Mobile for Clinic
* **Vietnamese name:** Hệ thống nhận cuộc gọi tại phòng mạch tư nhân
* **Abbreviation:** CallClinic

### 1.2 Problem Abstract

Currently, Clinic in Vietnam Nam are overloaded due to patients come to the clinic and wait a quite long time. In addition, hiring staff to assist the patients, operator staff will increases the cost of the clinic. Because there is always a need for support staff and operator staff all day and night. So, we developed an autoresponder system when patients call to the clinic.

### 1.3 Project Overview

1.3.1 Current Situation

By research other systems, we found some problem current situation below:

* Swift (Programming Language for iOS Application): Our team hasn’t experienced in this platform before.

1.3.2 The Proposed System

Because Augmented Reality technology is going to become popular so we decided to research about it. There are many providers for AR solution, such as: Vuforia, Oculus, Apple, Google... with varied pricing. But there are two free, powerful AR platforms from two popular companies: ARKit of Apple and ARCore of Google. ARKit has been realease by apple at WWDC 2017. Besides, ARCore is preview version, it doesn’t advoid errors while implementing. ARKit is also used by large number of developer win world. So, we decided to choose ARKit instead of ARCore.

1.3.2.3 Scheduler

We develop a scheduler in web server application with following features:

1.3.3 Boundaries of the System

This section supposes that the government laws accept our e-commercial system and seller’s information. Our system provides e-commercial system for users to trading interior furniture and support AR & RC technologies to improve experience and convience.

1.3.4 Future Plans

The current system only support for iOS and staff has to approve seller’s pictures manually, so we recommend some features for future plans:

* Mobile application will be available on Android.
* Seller can use his/her own 3D model for product or trading model with other sellers.
* Apply color selection on 3D model.
* Support manipulate inventory & product’s quality.
* Apply multi-languages and currencies.
* Support rate quality for product.

1.3.5 Development Environment

1.3.5.1 Hardware requirements

**For server**

|  |  |  |
| --- | --- | --- |
| **Hardware** | **Minimum Requirements** | **Recommended** |
| Internet Connection | Cable, Wi-Fi (7 Mbps) | Cable, Wi-Fi (20 Mbps) |
| Computer Processor | Intel® Core ® i7 2.4GHz | Intel® Core ® i7 2.4GHz |
| Computer Memory | 8GB RAM | 12GB or more |

Table 2:

Table 2: Hardware Requirement for Server

**For smartphone**

|  |  |  |
| --- | --- | --- |
| **Hardware** | **Minimum Requirements** | **Recommended** |
| Internet Connection | Wi-Fi (7 Mbps) | Wi-Fi (14 Mbps) |
| Operating System | Android 5 | Android 7 |
| Memory | 2Gb | 3Gb or more |

Table 3: Hardware Requirement for Client

1.3.5.2 Software requirements

|  |  |  |
| --- | --- | --- |
| **Software** | **Name / Version** | **Description** |
| Environment | Java EE 7  Java android | Specification for developing web application  Specification for developing mobile application |
| Modeling tool | Star UML | Used to design diagram |
| IDE | Eclipse Neon.3 Release (4.6.3)  Android Studio 3.1.2  MySQL Workbench 6.3.9 | Programming tools |
| DBMS | MySQL 5.6.30 | Used to create & manage the database for system |
| Source control | GitKraken Pro (3.5.1) | Used for source control |
| Web browser | Chrome 42 or later | Testing browser |
| Mobile OS | Android 7 or later | Testing mobile application |

Table 4: Software requirements

## 2. Project organization

### 2.1 Software Process Model

This project is developed under Scrum model. Below are the reasons why we choose this model:

* We have researched about Augmented Reality before. The risk of changing algorithm is high because proving accuracy of those algorithms is complicated. We need to use “try and test” method.
* The project contains a complicated system and the AR concept is very new for us, so we we need to try many design before the system run stability.



Figure 1 Scrum framework

Reference: <https://www.scrum.org/resources/what-is-scrum>

### 2.2 Roles and responsibilities

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Full name** | **Role in Group** | **Responsibilities** |
| 1 | Kiều Trọng Khánh | Product Owner | * Specify scope and requirements * Control the development process * Give out technique and business analysis support * Product backlog management |
| 2 | Nguyễn Phước Anh Khoa | Scrum master | * Managing process * Designing database * Clarifying requirements * Prepare documents * Coding * Testing * Quality management * Risk management * Create test plan * Arrange meeting |
| 3 | Phan Hồng Đức | Scrum team member | * Designing database * Create test plan * Clarifying requirements * Prepare documents * Coding * Testing * GUI design |
| 4 | Bùi Thanh Thiên | Scrum team member | * Designing database * Create test plan * Clarifying requirements * Prepare documents * Coding * Testing * GUI design |

Table 5: Roles and Responsibilities Details

### 2.3 Tools and Techniques

|  |  |
| --- | --- |
| **Tool** | **Name and version** |
| IDE | * Eclipse Neon.3 Release (4.6.3) * Xcode 9.3 |
| Source control | * GitKraken Pro (3.5.1) |
| Database Manager | * MySQL Workbench (6.3.9) |

Table 6: Tools

|  |  |
| --- | --- |
| **Technique** | **Name and version** |
| Front end | * HTML v5.0 * JQuery v3.2.1 * XML v1.0 * Bootstrap v3.3.7 |
| Back end | * Spring boot starter v4.1.6 RELEASE * Java v1.7 * Swift 4 * ARKit * Autodesk Forge Reality Capture v1 |
| Web server | * Apache Tomcat v8.5.11 |
| Database system | * MySQL 5.6.30 |

Table 6: Technique

## 3. Project Management Plan

### 3.1 Product Backlog

|  |  |  |  |
| --- | --- | --- | --- |
| **Story ID** | **Story** | **Task ID** | **Task** |
| 1 | Product Owner (PO) wants to have introduction document | 1.1 | Project Information |
|  |  | 1.2 | Introduction |
|  |  | 1.3 | Current Situation |
|  |  | 1.4 | Problem Definition |
|  |  | 1.5 | Proposed Solution |
|  |  | 1.6 | Role and Responsibility |
|  |  | 1.7 | Functional Requirements |
| 2 | Scrum master wants to have Product Backlog | 2.1 | Create Product Backlog |
| 3 | PO wants to have project management plan | 3.1 | Problem Definition |
|  |  | 3.2 | Project Organization |
|  |  | 3.3 | Project management plan |
|  |  | 3.4 | Coding Convention |

Table 8: Sprint Backlog

### 3.2 Sprint Backlog

3.2.1 Sprint 1 (18.05.2018 – 25.05.2018): Project initiation

3.2.1.1: Goal

- Sprint 1 must complete the following tasks:

1.1 Project Information

1.2 Introduction

1.3 Current Situation

1.4 Problem Definition

1.5 Proposed Solution

1.6 Role and Responsibility

1.7 Functional Requirements

2.1 Create Product Backlog

3.1 Problem Definition

3.2 Project Organization

3.3 Project management plan

3.4 Coding Convention

3.2.1.2: Development

|  |  |  |  |
| --- | --- | --- | --- |
| **Task ID** | **Task** | **Responsible** | **Review** |
| 1.1 | Project Information | PhuongNT | DuyNC |
| 1.2 | Introduction | DuyNC | ThuanPT, KietNLT |
| 1.3 | Current Situation | KietNLT | ThuanPT |
| 1.4 | Problem Definition | DuyNC | KietNLT |
| 1.5 | Proposed Solution | KietNLT | PhuongNT, KietNLT |
| 1.6 | Role and Responsibility | DuyNC | ThuanPT |
| 1.7 | Functional Requirements | ThuanPT | PhuongNT |
| 2.1 | Create Product Backlog | PhuongNT | DuyNC, ThuanPT |
| 3.1 | Problem Definition | PhuongNT | KietNLT |
| 3.2 | Project Organization | ThuanPT | KietNLT |
| 3.3 | Project management plan | PhuongNT | DuyNC, ThuanPT |
| 3.4 | Coding Convention | ThuanPT | PhuongNT |

### 3.3 All Meeting Minutes

All meeting minutes are saved at:

## 4. Coding Convention

Using Java and Swift to develop the application.

Summary:

* Code block Convention:
  + No line break before the opening brace.
  + Line break after the opening brace.
  + Line break before the closing brace.
  + Line break after the closing brace, *only if* that brace terminates a statement or terminates the body of a method, constructor, or *named* class.
* Naming Convention:
  + Package names are all lowercase, with consecutive words simply concatenated together (no underscores).
  + Class names are written in UpperCamelCase.
  + Constant names use CONSTANT\_CASE: all uppercase letters, with words separated by underscores.
  + Use camel-case style for variables and functions name
* Commenting Convention:
  + Place the comment on a separate line, not at the end of a line of code.
  + Begin comment text with an uppercase letter.
* Log data Convention:
  + Log URL on console before sending request.

Reference: [*https://google.github.io/styleguide/javaguide.html*](https://google.github.io/styleguide/javaguide.html)

# C. Report No. 3 Software Requirement Specification

## 1. User Requirement Specification