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|  | MINISTRY OF EDUCATION AND TRAINING |

FPT UNIVERSITY

Report Week 2 – Topic Introduction

**Indoor Commodity Tracking System Application Bluetooth Low Energy**

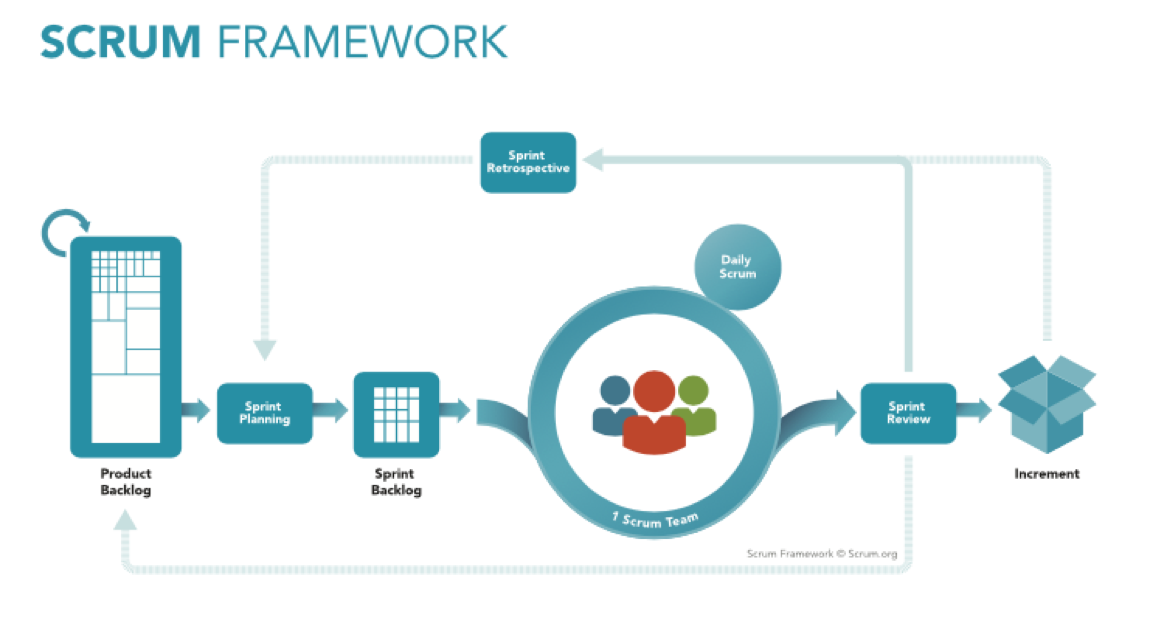
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| **Group 2** | |
| **Group members** | **Tạ Đức Huy – SE61754**  **Mai Thế Quân – SE61192**  **Đoàn Văn Phát – SE61827** |
| **Supervisor** | **Mr. Nguyễn Đức Lợi** |
| **Ext. Supervisor** | **N/A** |
| **Capstone Project code** | **BTRACKING** |

-Ho Chi Minh City, **September 14th 2018**

## Problem Definition

## Project Organization

* 1. Software Process Model

In this project, we apply the Agile Scrum framework for some reasons. First of all, we are inexperienced with many new technologies which are used for developing the project. So, we divide the development process into several Sprints. In each Sprint, we try to research new technologies, construct the system and test all needed functions at the same time. Secondly, it is more flexible to adapt changes because the requirements are not clear at the beginning and it takes a large amount of time to clarify them. Last but not least, using Agile Scrum framework helps us to recognize problems occurring in the development process earlier, so, if we do make mistakes, we will learn and resolve them to complete the final product.

* 1. Roles and Responsibility

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| No | Full name | Roles | Responsibilities |
| 1 | Nguyễn Đức Lợi | Supervisor, Project Manager | * Specify user requirements and system requirements. * Give advices, technical supports and solutions. * Supervise the development process. |
| 2 | Tạ Đức Huy | Team leader, developer, tester | * Manage all progresses. * Clarify requirements. * Create development plan. * Divide and assign tasks for members. * Design database * Coding. * Testing. * Prepare and verify documents. |
| 3 | Mai Thế Quân | Team member, developer, tester | * Clarify requirements. * Coding. * Testing. * Prepare documents. |
| 4 | Đoàn Văn Phát | Team member, developer, tester | * Clarify requirements. * Design GUI * Coding. * Testing. * Prepare documents. * Manage budgets. |

* 1. Tools and Techniques

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| Tools / Techniques | Name / Version |
| Operating system | Windows 10, Ubuntu |
| Frontend | JavaScript, jQuery, CSS, HTML, Bootstrap |
| Backend | Yii2 Framework |
| Embedded | C/C++, NodeJS |
| Modeling tool | Draw.io, Star UML |
| IDE | Visual Studio Code, PHP Storm |
| DBMS | MySQL |
| Source control | Github |
| Project management tool | Trello |

## Project Management Plan

1. Project management plan detail

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| Phase | Overall | Description | Assignees | Estimated Duration | Risks |
| Sprint 1 | **Define and analyze requirements** | - Define requirements and scope.  - Research on Beacon, ESP and MQTT. | All team members | 2 weeks | - Misunderstand requirements.  - Difficult to approach new technologies and hardware. |
| - What is Beacon location system?  - Analyze requirements.  - Research hardware: Beacon, ESP 32, Rasberry and MQTT.  - Block diagram.  - Choose code language: backend, frontend and embedded  - Research on the module ESP32 and test transmitting and receiving data.  - Make a comparison between Google Location and Beacon Location.  - Report 1: Introduction. | Tạ Đức Huy  Đoàn Văn Phát |
| - What is Beacon?  - What is MQTT?  - Research hardware: Beacon, ESP 32, Rasberry.  - How to calculate distance from Beacon to ESP? | Mai Thế Quân |
| Sprint 2 | **Research algorithm and system design** | - Design Use case diagram.  - Describe each use case in diagram.  - Report 2: Project Management Plan.  - Report 3: Requirement Specification. | All team members | 1 week | - New platform: Rasberry MCU.  - New protocol: MQTT.  - Hard to find references and technical supports.  - Problem with algorithm. |
| - Test:   * MQTT communicate between Rasberry and Web Server.   - Research:  + Algorithm to calculate coordinates of Beacon | - Tạ Đức Huy  - Đoàn Văn Phát |
| - Research:   * Algorithm to calculate distance from ESP 32 to Beacon | Mai Thế Quân |
| Sprint 3 | **Implementation and unit test** | - Flowchart of the system.  - Report 4: Design Description  - Programming firmware:   * Communication between Gateway and webserver * Communication between Gateway and Nodes. * Control Beacon. * Send Beacon’s coordinates to Server. * Announce when Beacon is out of Beacon’s area.   - Unit test. | All team members | 4 weeks | - Struggles in implementation.  - Hardware problems.  - Serious bugs.  - Time consuming for some difficult functions.  - |
| - Build a web application:   * Authentication as needed. * Use MQTT to communicate with the Gateway. * Store Beacon’s information: beacon id, coordinates, status, etc. * Control Beacon: power on/off * Create schedule for lamps.   - Test all functions above. | - Tạ Đức Huy  - Đoàn Văn Phát |
| * Distance from Beacon to ESP32 * Calculate coordinates of Beacon * Process Sound when Beacon is out of its area. | * Đoàn Văn Phát * Mai Thế Quân |
| Sprint 4 | **System completion and testing** | - Complete all required functions.  - System testing.  - Test cases.  - Report 5: System Implementation & Test.  - Additional features (if could):   * GPS function | All team members | 2 weeks | - System errors.  - Hardware problems. |
| Sprint 5 | **Demo-environment and documents completion** | - Develop a demo-environment.  - Deploy the web application.  - Verify all documents.  - Report 6: User’s Manual | All team members | 2 weeks |  |

1. All Meeting Minutes

## Coding Convention