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|  | MINISTRY OF EDUCATION AND TRAINING |

FPT UNIVERSITY

Report Week 1 – Topic Introduction

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

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

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

## Project Information

* **Project name:** INDOOR COMMODITY TRACKING SYSTEM APPLICATION BLUETOOTH LOW ENERGY
* **Project Code:** BTRACKING
* **Product Type:** Embedded Device, Web Application, API Web Server
* **Start Date:** 10/09/2018
* **End Date:** 30/11/2018

## Introduction

Indoor commodity tracking system uses Bluetooth connection to locate an object in a map. Map are generated from a structure of a house, a building or an area. Then, it displays on UI of web application. User can see their objects moving in the map. If the object moves out of the map, the system will ring the bell and announce to user.

## Current Situation

Nowadays, determining the location of an object is very importance. Specially, a camera is a device that only helps us see things in a certain range and we can’t set up the camera in the sensitive areas like the toilet. If we want a camera that can see a larger range, we must pay a lot of money. Besides, in the world have many applications used for location an object but these applications just can locate an object in Google Map by Google API, it locates an object by coordinates in a big map.

## Problem Definition

Advantage of existing system on the market

* Big amount of users
* Locate object in Google Map by Google API
* Drawbacks of existing system on the market

## Proposed Solution

Indoor Commodity Tracking System is a system to help people manage their objects in a direct map. This system consists the map which be provided by user. Then it displays user’s objects in the map and manages area that their object can move. The system will announce by bell or messages when an object moving out of its area. Indoor Commodity Tracking System can help people to manage their valuable things in the areas they want. Our system will also be competitively priced, easier installation, more exactly and intelligent compare to the existing systems. The name of system is BTRACKING system.

In general, our system includes a webserver which has a friendly UI allowing users to see the objects easily. It can communicate with gateway via a GSM/GPRS network by using TCP/IP protocol. The gateway of the system is RASPBERRY PI 3. Besides that, we have location block include the esp32 and beacon. Other devices like speaker are used as nodes. And

BTRACKING system includes a web app, location block, gateway and nodes with following functions:

### Feature Functions

* **Web App:**
  + Control the object on the map.
  + Check the system status.
* **Gateway and nodes:**
  + Gateway receive message from web application and control nodes.
  + Gateway receive coordinate from location block, handle it and then transmit them to web app.
* **Location block:**
  + Get and send coordinate to gateway.

### Advantages and Disadvantages

* **Advantages:**
  + Low costs which allow more affordable prices.
  + Can control using web app.
  + Can see all the objects on the map.
  + Can be easily set up anywhere.
  + Higher security.
* **Disadvantages:**
  + The range be limited by map.

## Functional Requirements

Functional requirements of the system are listed as below:

* Gateway:
* Use raspberry pi 3 as a local server
* Control nodes
* Receive data from location block.
* Transmit and receive data from/to the webserver to each node.
* Power supply component:
* Power supply operates for the entire system
* Distributed voltage 5V and 12V
* Web app:
* Control the system through wireless and API.
* Communicate with gateway through wireless.
* Get exactly coordinate from gateway and display on the map.
* Control warning.
* Check system status.
* Location block:
* ESP32 communicate with gateway through wireless.
* Beacon send message to ESP via Bluetooth.

## Role and Responsibility

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| No | Full name | Role | Position | Contact |
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Table 1: General Roles and Responsibilities of Member

## Conclusion

* Research to determine and implement the appropriate MCU for the Central Control Unit and other nodes
* Design and implement integrate PCB board.
* Research and implement NoSQL Database, Web Application.
* C, C++ embedded into Raspberry pi 3.
* Use software in design PCB, Schematic such as OrCAD, Proteus.
* Communication technique: TCP, HTTP, MQTT.