

# MONITORING AND ALERT SYSTEM FOR USING COMPUTER LABORATORY VIA LINE APPLICATION

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## ABSTRACT

Internet of Things (IOT) is the idea of monitoring and alert real-world objects through the Internet. This research applies IOT which work with sensor to monitoring using computer laboratory of department of information technology and alert via Line application. The proposed of this paper is real time management for checking by using PIR (Passive Infrared) motion sensor. The system uses infrared sensor and CCTV to monitoring when have computer laboratory users who are not on the class schedule the system will alert via Line application to administrators. The result of evaluation system found that the prototype can support computer laboratory admin to monitoring usage in level good and can protecting government property.

**Keywords:** Internet of Thing, Raspberry Pi, Motion sensor, computer laboratory

## 1. INTRODUCTION

In every university, there is a practical teaching model in the computer lab by using most of the classes according to the class schedule that has already been taught. At present, there are investigation methods from the computer lab staff, which sometimes have gaps that cannot be verified in real time. Therefore, the security of the property and the safety of users is extremely important because if there is an error or an abnormality in the use of the laboratory, the computer should be able to know immediately to fix the problem to minimize damage which the researcher has adopted the current technology that can connect to the LINE application is Notification API or notification via the LINE application so that users can receive various notifications immediately.

Therefore, the researcher has the idea of developing a system to quickly solve such problems in the notification and monitoring of access to the computer lab in the event that there are users outside of the schedule that has provided instruction to laboratory administrators through the LINE application immediately. The researcher has introduced Internet of Thing (IOT) technology, which is a collaboration between devices and control via the network to help so that management can be monitored in real time. The operation of the system will bring PIR (Passive Infrared) motion sensor which is used to detect infrared rays that lie across the sensor. When people come to use in the computer lab, here, they will work in conjunction with the camera that is installed internally and notified via the LINE application of the laboratory staff in abnormality events. The work of the system is firstly to install sensors such as PIR (Passive Infrared) and store the environment data from the sensor, process, and send to the Cloud system via the LINE message API in real time, allowing monitoring of access more quickly.

## 2. OBJECTIVES

1. To develop alert system for using computer laboratory via line application.
2. To monitoring for using computer laboratory via line application.

## 3. RELATED WORK

Internet of Things can be defined as a loosely coupled, decentralized system, made of smart objects or autonomous physical or digital network-equipped objects which are able to collect environmental data and to process these data. [1] Sensors are analog or digital devices able to detect physical characteristic of the environment, such as temperature, dust [9], pressure and etc. [2] Actuators are devices which works like switches

which can be used for controlling other devices. Sensors and actuators are not enough by themselves for creating smart environments. In the sphere of the IOT, a widely spread microcontroller platform is Arduino and one of the best known microcomputers is Raspberry Pi. The IOT platform can connect a sensor infrastructure which represent data generators with clients interesting in obtaining data which represent consumers. Sensor infrastructure can contain one or many sensors. Researcher can be mobile and connected to the same cloud wirelessly. [10] Data acquired by using the sensor infrastructure are stored into a nonrelation database. Clients are able then to access these data. [3] Database can be delocalized and distributed in order to exchange and store information.

Nowadays, IOT platforms are based on cloud infrastructure. Mainly these platforms are used for collecting data from sensors and other smart devices from the environment in which are implemented. Cloud services and resources can be delivered by three cloud service models [4 - 6]: Platform as a Service (PaaS), Software as a Service (SaaS) and Infrastructure as a Service (IaaS). In this research the focus is on IOT PaaS.

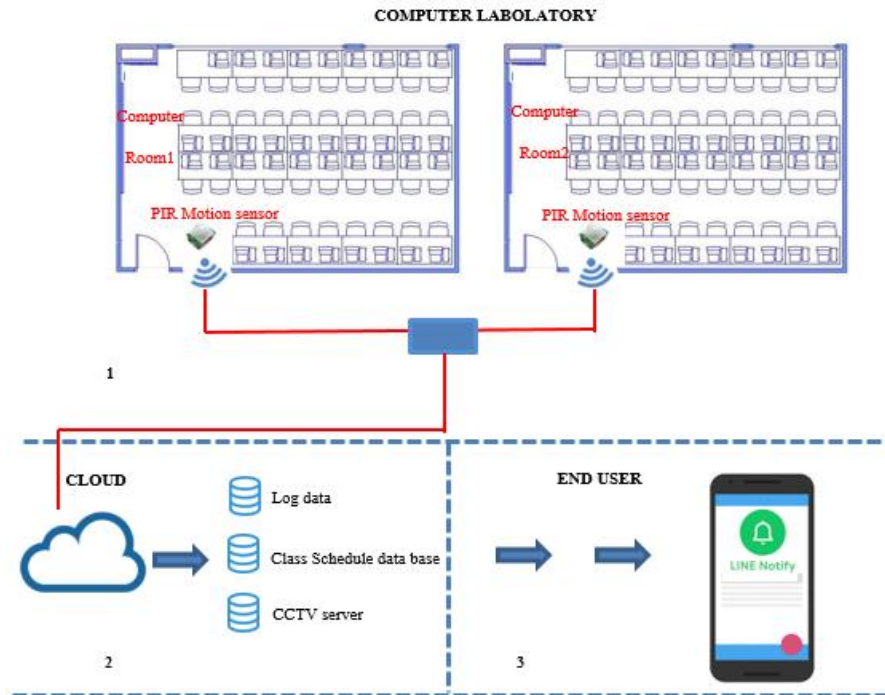
Cloud Computing was a new concept of the information technology implementation, where cloud computing used as a medium to provide media savings and an application that accessible through a computer network with centralized data center. [7] Some unique features and computing technology advantage was multitenancy or shared resources based on the business model where the resources used together with some users in the same resources at the network level, users' level, and the application level. Massive scalability, even the organization may have hundreds or thousands of systems, cloud computing had performance until tens of millions system, in addition to the ability to use a large scale of wide band and data storage. Self-provisioning of resources, resources that were own by the user, as these systems had the additional ability of processing, software, data storage, and network. Flexibility, users able to increase or decrease computing resources, and release resources to other use if no longer needed. [8]

#### 4. RESEARCH METHODOLOGY

Refer to the study of important theories and related research enabling researchers to apply various knowledge used to develop the system by using the Internet of Things technology, defined as steps in conducting research, with the following details:

##### 1. Methodology Framework

From Figure 1 shows the framework of the monitoring and notification system of the computer lab through the LINE application. From step 1: the motion sensor is installed in the computer lab. When someone come to use, the sensor will detect the motion and send the value via the network system to the API Line as in step 2. After that the system will proceed the data base that in the range of the field of study Teaching and learning in which the database is stored in Cloud Storage. The data that is unusual and does not match the classroom usage schedule. This will be sent to alert the computer lab administrator by notifying them via the LINE application which is an Access Token that has already been applied and set up as in step 3.



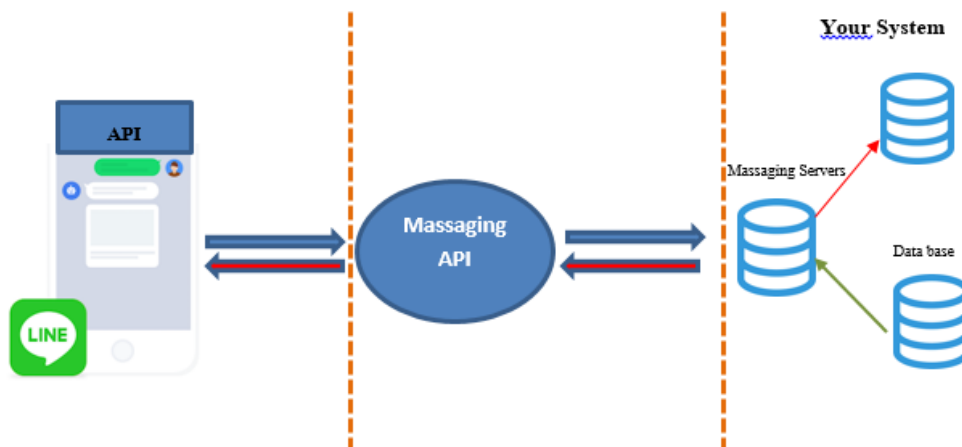
**Figure 1**

Framework of the monitoring and notification system of the computer lab through the LINE application

## 2. Line Notify Process

The notification process through the Line Application will be conducted when there is a user in the computer lab during the time that is not in the schedule of the course that has been taught. The sensor detects motion. The camera then captures the user and alerts immediately to the mobile phone lab application of the computer lab administrator.

The Line Notify function is a service from the LINE application which can send various notification messages to the account that has applied to use the service or the person who is a member only. This messages cannot be notified to other chat rooms. By using the API request, there will be a subscription and the Access Token will be issued as the code used for API access, which LINE will issue in only one time. This code will be inserted into the Code and modified to be compatible with the Raspberry Pie board to get the desired messages.



**Figure 2** Line Notify Process

## 5. EVALUATION SYSTEM AND RESULTS

This research has measured the satisfaction of using CCTV from 20 service users which including students and administrator in assessment. The subjects were asked to rate the relevancy of the search results on a five-point scale: Score 1 is the level of satisfaction improvement, score 2 is minimum level of satisfaction, score 3 is medium level of satisfaction, score 4 is good and Score 5 is very good satisfaction. The satisfaction that CCTV can be viewed via mobile phone or computer, camera circuit, helps to take care of the safety of the property, CCTV has benefits for themselves., CCTV is cost effective, interface for use, satisfaction with notification via the application line Overall, the average satisfaction was at a high level.

**Table 1**

The assessment in satisfaction in Via Line application.

Satisfaction List	Mean	Std.Error
CCTV Usage	3.6000	.28470
CCTV can be viewed via mobile	3.7000	.26258
Helps to take care of the safety of the property	3.6000	.26557
CCTV has benefits for themselves	3.95000	.26631
CCTV is cost effective	3.5000	.24602
Interface suitable for user	3.7500	.26031
Notification via the application line Overall	3.6833	.19380
Average	3.6833	.19380

## 6. CONCLUSION

Monitoring and notification system for accessing to computer labs via the LINE application is a system development in response to the teaching management of the Information Technology Department which helps solving the problem of checking the access in case of an unusual event. The system will check and notify via the LINE application to the computer lab administrator which will help to reduce the time to check and solve problems quickly because they can alert and monitor in real time. In the future, we can improve the accuracy of detection of various values of sensor devices to make the system more efficient.

## 7. ACKNOWLEDGMENTS

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