

# CHAPTER I

## INTRODUCTION

### 1.1 Background

Internet of Thing (IoT) is a concept which an object has the ability to transfer data over a network without requiring human to human or human to machine interaction. IoT can also be described as a connection between smart devices, such as smart-phone, Smart TV, and sensor, to the internet which can be used to communicate between devices with people and among devices [1]. To assemble a system that can be categorized as the IoT, we need a network that connects things or devices which able to detect changes in the system, huge database, and embedded intelligence to improve the data processing capabilities performance.

Electricity is a very important energy used in developing countries. Most fields require electricity, such as households, office, shops, and industry. In agriculture, electricity is needed in the process of the rice milling so the rice can be cooked. The increasing need for electricity with limited electricity supply demands us to save electricity usage. The optimal use of electricity and in accordance with our needs will save the cost of electricity use. Several previous experiments have made the solar usage system as a Big data based power source [2], by utilizing a fast calculation system performed by a computer. However, there is a limited cost in the monitoring system and only a small possibility can be implemented.

Based on the background, this thesis will make a system that can monitor the use of electricity and the distribution limit of electrical energy of a building in a day, integrated with the Internet of Things (IoT) with affordable cost. The system on this undergraduate thesis uses several sensors to read the use of electricity in a building or room. Then, the data are sent into a microcomputer that has implanted

system of electricity usage, also commemorates if the building or room has passed or approaching the power limit per day.

## **1.2 Problem Formulation**

Based on the background that has been raised, there are some problems formulated as follows:

1. The unpredictable habits of the electricity user allow for excessive and inefficient use of electricity which causes the borrowing of power consumption. This affects the cost of electrical charges. Hence, it requires a system design that limit the power consumption in a building/ house per day.
2. The system is one of the smart home applications. To help the user, the system must be monitored and easily controlled by the user through a smart-phone based app.
3. In order to use the system more optimally, there should be Quality of Service (QoS) parameters on the network to know how the network quality. QoS parameters analyzed in this undergraduate thesis are delay, throughput, availability and reliability. also deviation of tools.

## **1.3 Objective**

The purpose of this thesis is to design and implement a system based on IoT to the smart building/home to control and monitor the power consumption in a day. This thesis also looks for the hardware that meets the specifications. Furthermore, writer also analyzes the performance results of the system.

## **1.4 Scope and Limitation**

The limitations of the problems in this undergraduate thesis are as follows:

1. System prototype is tested on room scale.

2. Using the internet as an intermediary communications tool with a microcomputer.
3. The monitored data are data of usage that use in a building or room.
4. This Undergraduate Thesis does not discuss network security.
5. The sensor a that used in the system is ACS 712.

## **1.5 Research Methodology**

The research methodology is experimental with the following stages:

### **1. Study of Literature**

This stage is done by searching references related to the topic of this thesis. The sources used are from the previous research, books, journals and websites.

### **2. System Modeling**

The system modeling is done after getting the right reference for system development. This stage includes designing the system which begins with sketching the flow chart of the work systems. After that, writer also makes the realization of the design into a prototype.

### **3. System Testing**

The system testing is done by taking data from the work system and analyzing the data, whether it has met the goal or not. If it has not, there will be a re-examination and correction so we obtain the result of the appropriate test.

### **4. Analysis and Conclusions**

This final step is performed to analyze the parameters of system performance that have been made. After making observations and analyzing the built system, we can conclude the research result.

## **1.6 Structure of The Proposal**

The rest of the thesis is describe as follows:

- Chapter 2 LITERATURE REVIEW

This chapter describes the theories, tools and equipment related in this research.

- Chapter 3 SYSTEM DESIGN AND EXPERIMENTAL SETUP

This chapters describe system design and experimental setup

- Chapter 4 RESULT AND ANALYSIS

This chapters describe the result and analysis of the proposed post-processing method

- Chapter 5 CONCLUSION AND SUGGESTION

This chapters describe suggestion on how to improve the proposed post-processing method