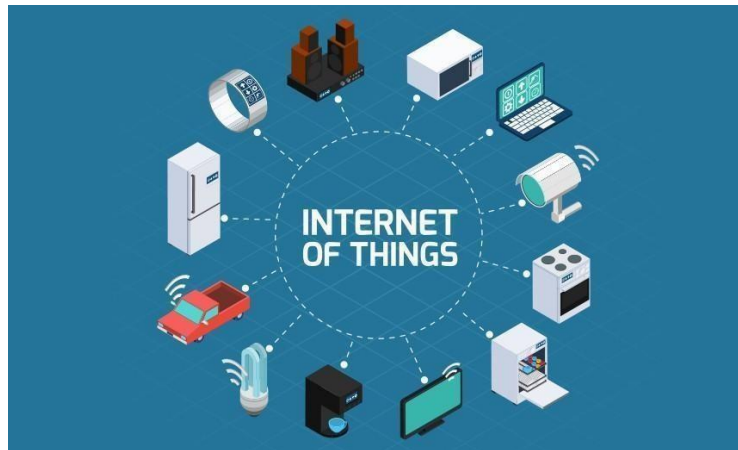


# CHAPTER I

## INTRODUCTION

### 1.1. Background

As a concept, the Internet of Things, wasn't officially named until the year of 1999, one of the first examples of an applied Internet of Things concept was from the early 1980s, it was a Coca Cola machine, which was situated at the Carnegie Melon University [1]. Local programmers would connect the refrigerated appliance to the internet, to check if there was a drink available, and whether the drink was cold or not.



**Figure 1.1** Internet of Things.

On the year 2013, the Internet of Things had evolved into a system using multiple technologies, which range from the Internet to wireless communication and from to embedded systems. The traditional fields of automation (including the automation of buildings and homes), wireless sensor networks, GPS, control systems, and others, all support the IoT.

The total number of vehicles in Indonesia reaches 133 million units in 2019, which has increased to 5.3 percent of the 2018 total. From this figure, the largest percentage of vehicle types was a motorcycle with 84 percent. Secondly is passenger car 11.6 percent. The remaining 4.4 percent total is the combination of buses and cargo cars [2].

In campus environment such as Telkon University, difficulties in finding a parking spot may cause inconveniences to some drivers because it may make them arrive late for lectures. Drivers sometimes attempt to park their vehicles in places that are not supposed to, such as the pedestrian path. Which caused congestion and unnecessary long queues.

This thesis develops a web app in which an end user will able to check which parking spot is occupied, empty, and already being booked. They also can book their own parking spot through the app, the database used in this web app is MongoDB.

## **1.2. Problem Formulation**

Based on the previous background, the problem formulation of this final project are as follow:

1. How does the reservation system work?
2. How is the design and the implementation of the parking reservation?
3. How does the micro-controller aid the reservation system?
4. How does the web app work on the reservation system?
5. How is the Quality of Service on the smart parking's reservation system?

## **1.3. Objectives**

1. Develop a smart parking parking reservation system through the use of web app.
2. Connect the microcontroller (ESP32) to the web app.

## **1.4. Scope of Work**

The problem limitation in this thesis are as follows:

1. Using a web app to reserve parking space.
2. Using ESP32 for the microcontroller.
3. Detection of car is for information only.
4. the data obtained from the sensors is stored in PostgreSQL.
5. The testing parameters include the success rate of the hardware in calculating

the QoS.

6. Testing of the parking system is only carried out during the development of the thesis.

### **1.5. Research Methods**

This final project research is limited by the following matters. The objectives of this final project are as follows:

1. Study of literature

This literature study is to understand and study the concept of reservation system design on smart parking from written sources such as journals, books, articles, and documents relevant to the problems being studied as a means of information on the success of this final project.

2. Design

This design is made of the entire system from the web-app to the microcontoller.

3. The test scenario

This testing phase simulates and tests tools to determine the performance of the system is built

4. Consultation

At this stage it is carried out periodically with the supervisor, relating and considering the design of the device.

### **1.6. Bachelor's Thesis Organization**

The rest of this thesis is organized as follows:

- CHAPTER 1 BASIC CONCEPT

This chapter contains the background, problem formulation, objectives, problem boundaries, research methods, and writing systematics

- CHAPTER 2 BASIC CONCEPT

This chapter contains an explanation of the theory, tools, and equipment used.

- **CHAPTER 3 SYSTEM DESIGN AND IMPLEMENTATION**

This chapter contains the workflow for designing smart parking in multi-story parking, how the application works and measuring the Quality of Service on the device.

- **CHAPTER 4 RESULTS AND ANALYSIS**

- **CHAPTER 5 CONCLUSION AND SUGGESTION**