CHAPTER 1
INTRODUCTION

1.1 Background

Transportation is an important need for human life. The development of transportation every day is very fast, especially the increase in the number of private vehicles that increasingly in line with population growth. Data from The Traffic Police Corps recorded this figure vehicles that are still operating throughout Indonesia in 2013 reached 104,211 million units, up 11% from the previous year

year (2012) as many as 94,299 million units [1].

The increasing number of residents of each city in Indonesia has an impact on the high frequency of activities in the city center, such as places of study or schools or shopping centers and university education, as well as the demand for transportation services is getting higher. With the increasing number and development of land transportation facilities and the increasing location of population activities scattered in various places, there is a need for a wider parking area. The reason, most people use vehicles. In addition to congestion, problems are also seen in the provision of parking spaces. The problem of parking spaces for vehicle users who park their vehicles, not in the right place. This causes the narrowing of the road so that it often causes traffic jams, certain events.

Parking problem is very important to be studied more deeply because almost all activities in the open space require parking facilities. Required parking space must be adequately available. Because the more significant the volume traffic that has activity either towards or towards the center the higher the need for this vehicle parking space is one of the causes. Therefore a parking space must be available at various activity centers. In addition, the appropriate settings parking is important to implement because the parking lot is chaotic arrangement will cause various problems. For example, find parking lot at shopping center in Jakarta on weekdays is very difficult. Drivers lose time looking for vacant parking spaces. This can be very frustrating for all drivers, especially drivers who is in a hurry. Vehicle owners sometimes forget where the vehicle is parked, and the parking system is useless parking mapping or even using parking identity. This conditions can have an impact

on the time wasted from vehicle owner. In addition to other problems, parking tickets manual payment system using ticket and regular payment resulting in long queues at checkout which also takes a long time [2].

This project proposes to create an Internet of Things (IoT) based Intelligent Parking system that can book parking spaces and smart payments so as to improve parking management efficiency, save driver time, facilitate parking payments and reduce congestion.

In its application this system uses sensors to collect data. This information is transmitted across the device which extracts the relevant information and sends it to the Arduino device which gives command instructions for the data to that particular device at the same time. Then arduino sends a signal to the servo motor along with the GSM module which then gives instructions and notifications to the user. When the user enters the parking area, this RFID card allows the user to get information about the available parking spaces as well as SMS notifications to the registered user's mobile number. The drawback of this system is that the driver has not been able to check the existence of available parking slots from a remote location [3].

Seeing from the problems that exist in the previous system, therefore the author proposes to create an IoT-based Smart Parking application that utilizes Android Application technology, and ESP32CAM. This application is expected to make it easier for drivers because this application is accessed using a smartphone. to check and get information about available parking spaces at parking locations without creating congestion, wasting a lot of time searching and booking empty parking spaces.

1.2 **Problem Formulation**

Based on the background that has been described, the formulation of the problem to be studied is as follows:

1. How to apply the Internet of Things concept to smart parking applications?
2. How to make an application that can make it easier for drivers to find a parking space?
3. How to integrate the android application in order to get the available parking data?

1.3 **Objectives**

The objectives and benefits to be achieved in this research are:

1. Build an application for drivers by ordering parking spaces based on Internet of Things (IoT).
2. Create an application by combining Android Application technology and ESP32 CAM into a smart parking application.
3. Integrate android application and web database to find out available parking lot data

1.4 **Scope of the Work**

Based on the problems described above, a broad picture of the dimensions of the problem can be obtained. Time and ability limitations make the writer need to define the problem clearly and focus, including:

1. The device is located at the entrance and exit bars of the parking lot.
2. Application provides 28 parking slots.
3. Does not discuss network security.

1.5 **Research Method**

Research methodology is a technique for collecting data or facts which where be studied and finally used as material for analysis. The techniques used in this thesis research are as follows:

1. Literature Study

Collecting several references needed to obtain information and data related to smart parking. References are obtained from related research and articles.

2. Discussion with the supervisor

Discussions with lecturers were conducted to obtain solutions and additional information about the research conducted.

3. System Design

Perform system design. This stage determines the structure according to the needs of smart parking.

4. Simulation

Perform simulations on the smart parking system. It aims to find out errors or damage to the application.

5. Analysis and Evaluation

   Perform analysis and evaluation to get conclusions from the application.

1.6 **Bachelor Thesis Organization**

For the next writing systematics this final task is as follows:

- Chapter II BASIC CONCEPT FOR PAYMENT BASED SMART PARKING SYSTEM DEVELOPMENT

  This chapter provides the necessary background about the payment based smart parking system development and some reference systems.
- Chapter III SYSTEM MODEL OF THE PAYMENT BASED SMART PARKING SYSTEM DEVELOPMENT

  This chapter provides a detailed description of the simulation and experimental model developed for the payment based smart parking system development.