



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**THE DEVELOPMENT OF WEB BASED ONLINE  
PARKING RESERVATION SYSTEM FOR ANDROID**

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronic Engineering Technology (Industry Electronics) with Honours.

By

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## **APPROVAL**

This report is submitted to the Faculty of Mechanical and Manufacturing Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Industry Electronics) with Honours. The member of the supervisory is as follow:

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## **ABSTRAK**

Dalam banyak situasi, mencari tempat letak kereta di pusat membeli-belah atau bangunan yang sesak adalah satu tugas yang mencabar. Sistem letak kereta pintar adalah reka bentuk untuk mendapatkan maklumat tentang tempat letak kereta yang ada di tempat tertentu dan memprosesnya secara real-time untuk memudahkan letak kenderaan di kedudukan yang tersedia. Projek ini mencadangkan sistem letak kereta pintar untuk menyelesaikan masalah yang tidak perlu dibuang masa mencari parkir banyak di kawasan tempat letak kereta tertentu. Sistem tempahan tempat letak kereta dibangunkan sedemikian rupa sehingga pengguna dapat menempah tempat letak kereta mereka melalui aplikasi berasaskan web. Aplikasi berasaskan web membolehkan penyambungan antara perkara-perkara persekitaran sekitar ke internet dan memudahkan untuk mengakses perkara-perkara dari mana-mana lokasi terpencil. Objektif projek ini adalah untuk merekabentuk, menganalisis dan melaksanakan "Sistem letak kereta tempat letak kereta yang membolehkan pengesanan berasaskan web", yang membolehkan pengguna untuk pra slot slot letak kereta dari tempat terpencil dengan bantuan aplikasi mudah alih.

## **ABSTRACT**

In many situations, finding a slot for parking a car in a shopping complex or at any car park at urban area is a challenging task. Thus, the development of a smart parking system is required. The smart parking system should be able to provide information about available parking slot in a particular area in real-time to facilitate car parking at available positions. Therefore, web based online parking reservation system is proposed in order to meet the requirement. The proposed parking reservation system is able to solve the problem of unnecessary time wasting in finding parking slot in particular car park areas. The parking reservation system is developed in such a way that users able to book their parking slot through a web based application. The advantage of the web based application is that it enables the connectivity between surrounding environmental things to internet and makes easy to access those things from any remote location. The objective of this project is to develop,analyze and implement a “ Web based sensor enabled car parking system”, that enables the user to pre reserve parking slot from remote place with the help of mobile application.

## **DEDICATION**

To my beloved parents who have been there to support me all the time and my friends who was always by my side.



## **ACKNOWLEDGEMENTS**

I would like to recognize the person who assisted me throughout the project, because without them I wouldn't have come this far. I express my sincere gratitude to Dr Fara Ashikin Binti Ali and En Imran bin Hindustan my supervisor and co supervisor who has given me the guidance to ensure that this work comes to a successful completion. I am very thankful to my family and friends, who encouraged me and ensured my progress until end.

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## **LIST OF ABBREVIATIONS**

LCD	Liquid Crystal Display
IR	Infrared sensor

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Over half of the world's population lives in citified areas, so the cities have reached their full occupation. This also increases the number of vehicles in city-based areas. A major problem that people are facing today is parking in multi-level parking lots for their vehicles. As in a mall, it is difficult to find parking slots, especially on festival season and weekends. Mostly current car parking slot does not have an organized parking arrangement. The parking area will continue to be circled until an empty parking slot is found. Therefore, a reservation-based parking system enables users to book a parking space slot prior to arriving at the site. A user can make a reservation beforehand via a smartphone using a mobile app. It might be just a week or a few minutes before arrival and therefore it will reduce the wasting time.

Generally, in each parking slot, a sensor is installed to monitor its status whether it is available or not. The sensor then collects and processes the data into the information on parking availability. However, the users still need to wait until a parking slot available. One of the advantages of this project is that drivers can save time and fuel in simply finding a parking slot available around the parking area. In addition, traffic congestion around the parking area can be reduced.

## **1.2 Problem Statement**

Increasing the number of vehicles increases traffic and parking complexity. Hans, V., Sethi, P.S. and Kinra, J., 2015, October mention that parking vehicles in day-to-day life becomes a major problem occurs, especially during weekends and public holidays. It happens because numbers of drivers are eager to find available parking spaces. Driving around the parking area to find an available space is a waste of time and fuel. All these happen because the driver does not know where exactly to park their vehicle.

## **1.3 Objectives**

The objectives of this project are:

- a) To develop a system for parking reservations.
- b) To design a web-based car parking reservation application for android user.
- c) To demonstrate the interaction of the parking reservation system with Wi-Fi module and Arduino.

## **1.5 Scopes**

- A reservation system for car parking should enable drivers to find and reserve empty parking slot.
- The Infrared Sensor (IR) is used to detect the parking slot available.
- The circuit construction consist of the Arduino Mega as a control unit help to control all the process of the system.
- Web based application are used to reserve the parking slot through online. It is used because it is free and user friendly.
- The prototype consists of 5 parking slot.

## **1.5 Thesis outline**

Introduction to explain in detail some parts of the entire project such as project objective, problem statement, and project scope was included. Chapter 2 discusses the literature review that studies related article, conferences paper, book and other resources regarding to the car parking reservation system. A discussion on the component is described in Chapter 3. The result and discussion about the software and the prototype are discussed in Chapter 4. Lastly, conclusion is described in Chapter 5.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

The focus of this chapter is on the scope of this project's hypothesis and information. In addition, the knowledge and technique used in earlier investigation are surveyed. According to the project, this chapter is related to car parking reservation beforehand at a certain location using Arduino Mega and Wi-fi module which connected to web-based application. Much past research used different sensors and "IoT" to design a parking reservation system.

#### 2.2 Needs of car parking reservation system

The increase in population number caused an increase in vehicle count. Because of this problem, parking in multi-level parking lots is difficult for most people. Whether it's a shopping mall at the airport or a multinational business. People spend their time in in looking for empty parking slot to park their vehicles.

## 2.3 Microcontroller

Microcontroller is a single board with self-contained system with peripherals, memory and a processor that can be used as an embedded system. Most programmable microcontrollers that are used today are embedded in other consumer products or machinery including phones, peripherals, automobiles and household appliances for computer systems. Thus , another name for a microcontroller is "embedded controller." Moreover, Microcontroller categorized by several parameters including Bits, Flash size, RAM size, number of input/output lines, packaging type, supply voltage and speed. There are some example of microcotroller.

### 2.3.1 Raspberry Pi

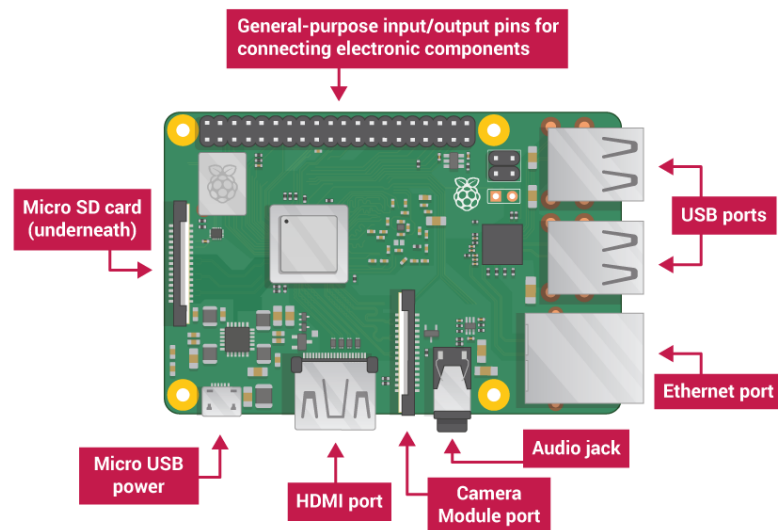


Figure 2.1 : Labelled diagram of Raspberry Pi

Figure 2.1 shows the pin configuration of Raspberry Pi. Mahendra, B.M., Sonoli, S., Bhat, N. and Raghu, T., 2017, May design a mobile application, the "IoT-based sensor enabled car parking system" helps the user to pre-reserve parking slots from anywhere. This system is designed for data collection using Raspberry-Pi mobile application for E-Parking. The Raspberry Pi is easy to use. MasterCard-measured computer connecting to a computer screen or television and using a keyboard and mouse. It is a competent little gadget that empowers people from any age to explore computing and how to program in computer languages. It can do everything a personal computer might expect from perusing the web and playing high-definition videos, making spreadsheets, word processing, and playing games. The Raspberry Pi can also be associated with the outside world and has been used in a wide range of digital maker projects, ranging from music machines and parent detectors to climate stations.