



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

OKU (disability) SMART PARKING

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

by

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Tajuk: OKU (disability) SMART PARKING

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

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ABSTRAK

Pada masa kini, tempat letak kenderaan untuk orang kurang upaya sering disalah guna oleh orang-orang yang tidak bertanggungjawab. Tempat letak kereta untuk orang kurang upaya yang sedia ada tidak mempunyai sensor untuk memberi amaran kepada pemandu daripada melanggar dinding. Untuk mengatasi masalah-masalah ini, tag RFID dan sensor inframerah akan digunakan dalam projek ini. Fungsi menggunakan tag RFID adalah untuk mengelakkan orang yang tidak layak menggunakan tempat letak kereta untuk orang kurang upaya dan hanya membenarkan orang yang layak sahaja untuk menggunakan tempat letak kereta tersebut. Fungsi untuk sensor inframerah adalah untuk memberi amaran untuk mengelakkan pemandu daripada melanggar dinding. Orang kurang upaya perlu lah mengimbas tag RFID sebelum menggunakan tempat letak kenderaan orang kurang upaya tersebut. Ini ada lah untuk memeberi kebenaran kepada pengguna. Data yang terdapat pada kad tersebut akan dibandingkan dengan data yang terdapat dalam pengkalan data. Jika terdapat data yang sama, maka palang akan diangkat untuk memberi kebenaran kepada pemandu untuk menggunakan tempat letak kereta tersebut. Jika pemandu hendak keluar dari tempat letak kereta tersebut, pemandu hendaklah mengimbas kad mereka terlebih dahulu untuk memastikan palang yang menutup laluan mereka itu terangkat untuk membenarkan pemandu keluar dar tempat letak kereta tersebut.

ABSTRACT

The disability parking usually wrongly used by a few irresponsible people. The standard disability parking also does not have sensor to give warning to the driver from hitting the wall at the parking space. To overcome those problems, the RFID sensor and infrared sensor will be used in this project. The function of RFID sensor is to give permission to the certain people to use the parking and the infrared sensor will be function as the warning for the driver from hitting the wall. The driver needs to scan their card at the scanner to allow them to use the parking. The card data will be match with the database information that will make the pole pull up. The pole will automatically pull down after the car enters the parking. If the disability wants to exit the parking, they need to scan their card to able the pole to go up again and the pole will automatically pull down if the car has exited the parking.

DEDICATION

Special dedication to my beloved family, my parents, sibling and friends who have supported me all the way and gives me a lot of encouragements to help me deal with all the challenges in completing my final year project successfully. Besides, special gratitude for my supportive supervisor Ts. Niza Binti Mohd Idris who also gave me lots of attention and guidance throughout the project implementation. Thank you.

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LIST OF SYMBOLS

V	-	Voltage
I	-	Currecnt
AC	-	Alternating current
DC	-	Direct current
UID	-	Unique identifier
RFID	-	Radio-frequency IDentification

LIST OF ABBREVIATIONS

PCB	Printed circuit board
USB	Universal serial bus
LCD	Liquid crystal display
LED	Light-emitting diode

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter is an overview of disability smart parking system for disability. The project background and problem statement are defined subsequently. That is followed by the useful resource of research objectives and scope which includes the improvement of irrigation tool with a low fee.

1.2 Project Background

This project is designed to prevent normal people to use parking for disability. This project basically will not allow normal people to use the disability parking space. This project will be used RFID sensor to detect the right user to use the parking and IR sensor. The data from RFID card will be matching with the data in the database to make sure the right user to use the parking area. The pole will be pull up automatically if the both data match but if the data does not match, the pole will not be pull up and the buzzer will be on. If the user wants to exit the parking, they need to scan their card to able the pole to go up again and the pole will automatically pull down if the car has exited the parking.

1.3 Problem Statement

Nowadays, people usually wrongly use the parking area that been reserved for the disability. Maybe just a few of people doing this irresponsible action. But because of this, the disability will hardly to find the parking. The disability also must use the normal parking space to park the car. The usual disability parking space do not have sensor. This sensor will function as the caution for the user from hitting the wall.

1.4 Objectives

The objectives of this project are:

- I. To develop disability parking space using RFID.
- II. To integrate several sensors for prevent car hit the wall.
- III. To analyse the stability of this disability parking system.

1.5 Scope of work

The scope of this project is made to inform the features and components used in this project. The user needs to register as the legal user. User will get a RFID card. The card will act as the pass to use the parking. The card will be scan by the reader and the information will be sent to the NodeMCU microcontroller. It acts as a brain to control all the components used in this project. The data NodeMCU receive from the card will be sent to the database and then send the data to application to show the UID number and status user. As the status is confirms, the NodeMCU will send signal to motor and the motor (Anusooya et al.,2017) will open the gate.

The sensor use is RFID sensor, infrared sensor and ultra-sonic sensor. the infrared sensor and ultra-sonic sensor will be at the parking slot. The sensors are connected to Arduino UNO. Infrared is used for detecting the present of the car on parking slot and on the exit gate. As for ultra-sonic sensor, the function is to prevent car from hits the wall.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review on this project will be discussed in this chapter. Literature review is discussion about all the data that have been gather. This chapter will discuss about the past projects that has been done. This section has been reviewed by journals, articles, and the Internet from the various sources.

2.2 Previous study.

This part will discuss about the previous project that have been made.

2.1.1 RFID Based Smart Car Parking System

Referring to a study by (Anusooya,2017) stated that the main problem to find the parking in public places is there are too many parking slots. This will make the driver to look for every slot to find the parking. This has waste many of the time to find the parking and can cause the traffic stuck in the parking lot.

The infrared sensor used will be the starter to the project and it is connected to the raspberry pi. The function of infrared is to determine the empty slot parking. Raspberry pi will receive the result through the database. At the entrance, the updated result will be display on the video monitor. For every 5 seconds, the result is updated and displayed using website URL. CPMS is the other module for payment gateway using RFID. Every vehicle will be attached with RFID tag.

This parking slot will have an IR sensor in front of each slot. The IR sensor is known as infrared sensor. This sensor will detect the presents of a car that have enters the empty parking slot as shown in Figure 2.1. The IR sensor will update the database about the parking slot that still empty or been occupied. The result of the database will be display at the screen that located after the entrance gate of the parking. The user can easily find their parking based on the screen that display the parking slot either it still available or not.

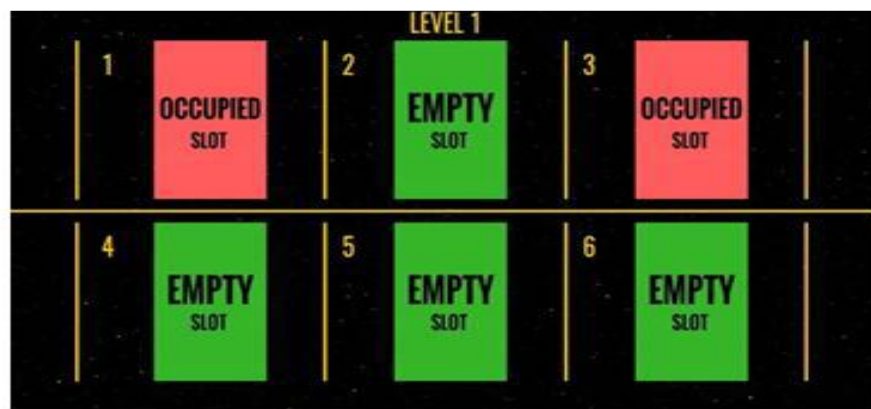


Figure 2.1: Slot availability module software design.

This parking system also using RFID tag as the replacement for parking ticket(Bhattacharjee et al. 2016). Vehicle windshield will be attached with RFID tag. As the car passed the entrance, the timestamp for the entry will be scan by the RFID scanner and when the car is exit, the tag is read again. The total calculated based on the entry and exit time and shown in the user account. RFID is used for identification and transaction.

2.1.2 Automatic Car Parking System Using RFID

The parking system used is layer parking lot. This make only a few space needed for big number of car(Padiachy et al. 2016). Forklift system was applied to access the parking(More et al. 2017). An automated car parking has mechanized lifts which transport

the car to the different levels at a certain position. The car was transported to different layer at a certain place by mechanized lifts.

DC motor was used to move the pallet either to right or left and another DC motor used to move the pallet up and down by using string gears with string attached, extending in vertical position. Motors and gears or linear actuators can be used to move pallet up and down. For the smooth movement of the fork, the gears are being used. The gears will be received instruction to move the forklift to upper level when the car is parks at the second floor. The rotational sensor that was built-in the gears have made them move precisely. The Sensor will measure motor rotations in degrees or full rotations.

User need to choose either to park or retrieved the car as the starting of the system. When user choose to retrieve car, user need to touch RFID card to RFID reader(Icc and Kadam 2015). The flow of retrieved the car is shown in figure 2.2. The system checks in the database(H.Hamdoon and Soleit 2013) that lists all the parked cars. For retrieving the car, the listed car is identified, and microcontroller is ordered to retrieve the car. The car is delivered to driver by the forklift taking the car from the designated parking spot. Error message was displayed when the car is not parked. A programme algorithm was created for the forklift to retrieve the car. The car can't reached the driver if the driver not pay the payment by using RFID card (Rajbhandari et al. 2018).

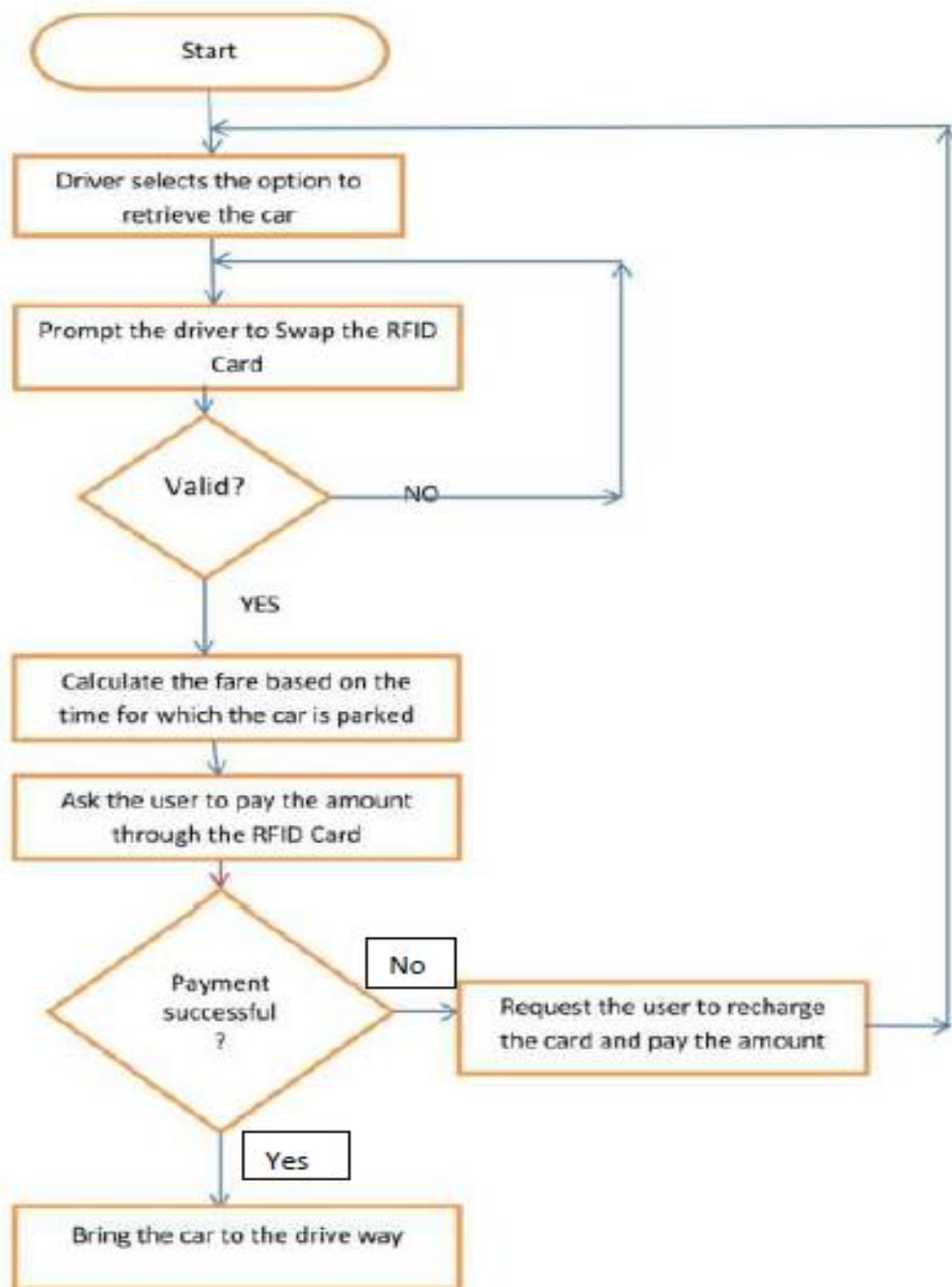


Figure 2.2: Flowchart to retrieve car

2.1.3 IoT based Prototype for Smart Vehicle and Parking Management System.

(Pareek and Vinay 2018) stated that a few problems always occurred during driver finding the parking. For example, roaming around parking to search parking space

is waiting time and can cause traffic stuck. A driver should know in advance about the empty parking slot. This project will overcome the problems faced by the driver to find parking.

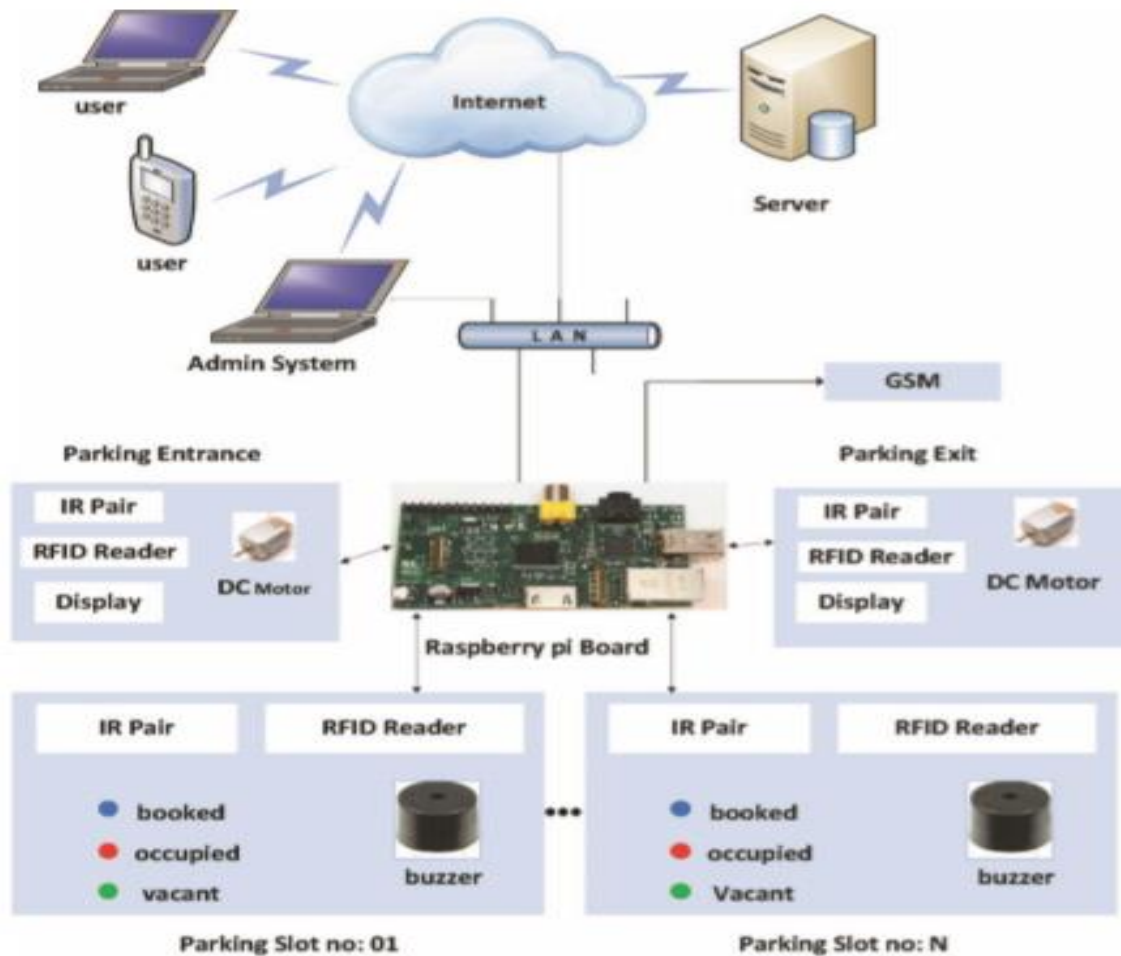


Figure 2.3: Prototype model for vehicle parking.

The board with green colour in Figure 2.3 is a raspberry pi. The raspberry pi will be shared server. It is a smart card sized computing model that can be plugged into PC, laptop or TV. The coding that used is done in python and stored inside it. It uses an OS just like Linux and capable of performing any complex mathematical problem.

This project was divided into four different parts. Each of the parts has its own role for this project. The first part is described such as book car slot online using any