UNIVERSITI TEKNIKAL MALAYSIA MELAKA

PARKING FOR DISABLED PEOPLE BY USING RADIO FREQEUNCY IDENTIFICATION (RFID) AND GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM)

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

by

MUHAMMAD AMIRUL BIN BASIRON

B071511003

940731-05-5153

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING

TECHNOLOGY

2019

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: **PARKING FOR DISABLED PEOPLE BY USING RADIO FREQEUNCY IDENTIFICATION (RFID) AND GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM)**

Sesi Pengajian: 2019

Saya **Muhammad Amirul bin Basiron** mengaku membenarkan Laporan PSM ini disimpan di Perpustakaan Universiti Teknikal Malaysia Melaka (UTeM) dengan syarat-syarat kegunaan seperti berikut:

1. Laporan PSM adalah hak milik Universiti Teknikal Malaysia Melaka dan penulis.
2. Perpustakaan Universiti Teknikal Malaysia Melaka dibenarkan membuat salinan untuk tujuan pengajian sahaja dengan izin penulis.
3. Perpustakaan dibenarkan membuat salinan laporan PSM ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. **Sila tandakan (X)

☐ SULIT*   Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia sebagaimana yang termaktub dalam AKTA RAHSIA RASMI 1972.

☐ TERHAD*   Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan.

☒ TIDAK TERHAD

Yang benar,   Disahkan oleh penyelia:

....
Muhammad Amirul bin Basiron   Fakhrullah bin Idris
Alamat Tetap: Cop Rasmi Penyelia
PT 667, Taman Desa Permai, Serting Tengah,
Batu Kikir, 72200, Negeri Sembilan

Tarikh: 5 DESEMBER 2018   Tarikh:5 DESEMBER 2018

*Jika Laporan PSM ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh laporan PSM ini perlu dikelaskan sebagai SULIT atau TERHAD.

DECLARATION

I hereby, declared this report entitled "Parking for Disabled People by Using Radio Frequency Identification (RFID) and Global System for Mobile Communication is the result of my own research except as cited in references

Signature   :   ………………………………………………….

Author's Name   :   MUHAMMAD AMIRUL BIN BASIRON

Date   :   16th DECEMBER 2018

APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Telecommunication) with Honours. The member of the supervisory is as follow:

………………………….

(Fakhrullah bin Idris)

ABSTRAK

Penyalahgunaan tempat letak kereta untuk Orang Kelainan Upaya (OKU) akan menyebabkan masalah kepada mereka kerana mereka perlu untuk mencari tempat meletakkan kenderaan yang laun yang tidak disediakan untuk mereka. Prototaip Tempat Letak Kereta Orang Kurang Upaya dengan Menggunakan Pengenalan Frekuensi Radio (RFID) dan Sistem Global untuk Komunikasi Bergerak (GSM) adalah untuk membantu dan membantu OKU dengan menyediakan slot letak kereta yang mempunyai teknologi pengenalan yang RFID dan sistem peringatan kepada pihak berkuasa atau keselamatan dengan menghantar mesej melalui modul GSM. Pengguna perlu memberikan pengenalan yang sah kepada RFID dalam bentuk kad untuk memasuki slot meletakkan kereta sementara pengguna tanpa pengenalan yang sah , akan menyebabkan penggera berbunyi dan mesej akan dihantar sebagai sistem peringatan melalui modul GSM kepada pihak berkuasa. Objektif projek ini adalah untuk mengkaji kajian terdahulu dan membangunkan sistem prototaip dengan menggunakan teknologi RFID dan GSM. Sistem parkir ini terdiri daripada pembaca dan tag RFID, modul GSM, Arduino Uno dan komponen-komponen sampingan yang lain. Selain itu, pemerhatian telah dia buat di sekitar Melaka Tengah, Malaysia untuk mengumpul data mengenai tempat letak kereta yang dikhaskan bagi OKU dan tempat meletakkan kereta yg mempunya halangan yang sukar bagi OKU untuk mengalihkannya terutamanya bagi pengguna berkerusi roda dan jika ada pihak yang bertanggungjawab untuk mengalihkannya.

ABSTRACT

The abused of parking for Persons with Disabilities (PWDs) will cause a difficult to PWDs which is they need to find the others parking slots that are not reserved for them. This prototype of Parking for Disabled People by Using Radio Frequency Identification (RFID) and Global System for Mobile Communication (GSM) is to help and aided PWDs by providing a parking slot that has an identification technology which is RFID and an alerting system to the authorities or security by sending a message through GSM module. The user need to provide a valid identification to the RFID reader in the shape of card to enter the parking slot while the user without a valid identification , the alarm will be switch on and a message will be send as a an alerting system through GSM module to the authorities. The objective of this project is to studies previous researchers and to develop a prototype system by implementing RFID and GSM technology to ease the PWDs. The parking system consist of RFID reader and tags, GSM module, Arduino Uno and the others side components. Observation has been made at Melaka Tengah, Malaysia in order to collect data about the abused of parking for PWDs and condition of parking which is has obstacles that would hard for PWDs to remove it especially for the wheelchair users if there is no man in charge to remove it for them.

DEDICATION

First and foremost, a special thanks to my father and mother, Mr. Basiron bin Sulaiman and Mrs. Zaedah binti Yunos and my fellow friends who are giving me the support and encouragement in order to finish this project in time. Thank you for my supervisor, Encik Fakhrullah bin Idris who is giving me advices and a guidance to complete the tasks.

ACKNOWLEDGEMENTS

Thank to Allah, the Almighty God, my parents and my friends for giving me a strength to complete the task given. Not to forget my supervisor, Mr. Fakhrullah bin Idris because give me guidance, advice and sharing the expertise about the matters that related to the project. I would like to express my gratitude to my parents because giving me encouragement and support the thing that I do in order to complete the task given and to the others that involved indirectly and directly, a special thanks to all of you that help me finished the task given.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

RFID   Radio Frequency Identification

GSM   Global System for Mobile Communication

PWDs   Persons with disabilities

PCB   Circuit Board (PCB)

GND   Ground

Tx   Transmitter

Rx   Receiver

USB   Universal Serial Bus

JKM   Jabatan Kebajikan Masyarakat

SMS   Short Message Service

LCD   Liquid Crystal Display

LED   Light Emitting Diode

CHAPTER 1

INTRODUCTION

1.0   Background

In the recent years, misused of parking for Persons with Disabilities (PWDs) by normal people is high and there are few types of abuse that may happen to the PWDs which is a parking without appropriate identification for PWDs and also a misused of the identification by normal people. PWDs can be refer as a person that have a long-term problem with physical abilities and mentality that will be a disadvantage for them to going through their life because they are not same as the normal person which is has a limited boundary in their life. Next, there will be implementation of Radio Frequency Identification (RFID) in this prototype which is will acts as an authentication for a valid user and a Global System for Mobile Telecommunication (GSM) as an alerting system to alert the authorities by sending a message.

In this chapter, it would provide an overview of the project which is contain the problem statement, objective and scope of project. The objective has been obtained in order to solve the problems that occur for misused parking for Persons with Disabilities (PWDs). The scope of the project is focused to the PWDs and only the prototype of the parking system will be developed. This project is a Parking for Disabled People by Using Radio Frequency Identification (RFID) and Global System for Mobile Communication (GSM). The Arduino Uno will be used to execute the program and infrared sensor will be used to detect the presence of the vehicle that park inside the

1

parking system. The system will be switch on the alarm and the message will send to specific authorities for further action when the user cannot provide a valid identification to the parking system or enter the parking illegally.

1.1 Problem Statement of the Project

The idea for providing this parking system for PWDs is based on a problem that occurs which is the misused of parking for PWDs by a normal person. There are three problem statements which are misused of parking for PWDs by a normal person. The misused of parking will affected the PWDs because it will hard for them to find the others parking. Besides that, the obstruction at the entrance of the parking that will be troublesome for the PWDs to remove it if there is no security guard or person in charge to remove it for them. Next, there is no alerting system such as an alarm that can alert the driver or the security near the parking slot to take the further action if the misused of parking happen.

1.2 Objective of the Project

The objective of this project which is Parking for Disabled People by Using RFID and GSM in order to solve the problem that has been occurs among PWDs are:

i. To study the previous researches about parking system

ii. To design and develop a prototype system by implementing RFID and GSM technology to ease the user

iii. To provide analysis of data from the parking system for PWDs about the usage and possibility of its implementation in the parking industry

1.3   Scope of Project

The parking system which is Parking for Disabled People by using RFID and GSM is hope to solve the problem that occurs among PWDs which is the misused of parking, hard for removing the obstruction at the entrance of parking for PWDs and no alerting system for misused parking. Therefore, RFID and GSM technology will be implemented in this project as an identification system and the message service. The scope of project is for particular user which is PWDs who are the minority group in Malaysia and the project is limited only the prototype that will be develop with one parking slot. The prototype will only include a hardware and a mobile phone to receive a message from the parking system about the misused of parking.

1.4   Summary of the Chapter

This chapter provided important things which are the background of the project, problem statement, objective and the scope of the project. The background of this project is related to the misused of parking for the PWDs by a normal person and there is no alerting system that can alert the security to take further action if the misused of parking happen. The project is designed to alert the security by using GSM technology in order to send a message to the authorities and the uses of RFID as an identification for user to parking inside the parking lot.

1.5   Thesis outline

This thesis contains a three chapter which is introduction of the project, literature review and the methodology of the project which is:

i.   Chapter 1 (Introduction): Chapter 1 will provide an introduction about the project that contains problem statement, objective of the project, scope of the project and also summary of the chapter.

ii.   Chapter 2 (Literature Review): Chapter 2 is all about literature review from the previous researchers in order to obtain the useful information about the parking system.

iii.   Chapter 3 (Methodology): Chapter 3 contains a methodology of the project which is included the hardware that can be use and the process of the project.

1.6   Preliminary Observations

In order to obtain and find out the information about PWDs parking the observation of misused parking for PWDs has been made around public place such as Mydin Mall and Aeon Bandaraya Melaka at Melaka Tengah, Malaysia which is to investigate the abused of parking, the condition of parking that has been reserved whether it has any obstructions and the security to guard the parking. Observation method will be discussed further in chapter 2 and chapter 3.

As a conclusion, based on the information that has been obtained from the observation that has been made, the PWDs would need a solution to overcome or avoid this problem which is the abused and obstruction at the reserved parking for them. The project of Parking for Disabled People by Using RFID and GSM can help and secure a parking slot for PWDs.

CHAPTER 2

LITERATURE REVIEW

2.0   Chapter Overview

Nowadays, the parking lot for Persons with Disabilities (PWDs) has been misused by citizen around the Malaysia. With the increasing of using vehicles around the world and lacks of parking lot for PWDs, they have been discriminated by non-disabled people. There are a few types of abused parking for Persons with Disabilities (PWDs) which is parking without an appropriate approval and misused PWDs permit by a normal citizen. In this chapter, it will provide an overview of previous research to help finding a solution about parking problem for PWDs by using Radio Frequency Identification (RFID) and Global System for Mobile Communication (GSM) that will be implemented in the parking system for them. This project will help and ease the PWDs to park their vehicles at the right park without worries it would be taken by normal person and the increasing of vehicles will make it hard to find the parking when needed. Next, the utilization of this technology can be used to avoid the misused parking for PWDs by a normal person.

2.1   Revolution of Parking System

An innovation of parking system and the invention of the vehicles keep coming in the recent years. In previous years, the demanding of the parking for vehicles was quite high due to the innovation and production of cars and before the modern era,

there were no management and arrangement for parking. The citizen parked their vehicles on the street and will only use it when they need it and this will cause to a massive traffic congestion problem in the cities. The improvement has been made which is a parking lot will be available around the shopping mall and the others public places in every city.

During recent years, there are many innovations of parking system such as parking inside the building, multilevel parking and many more. This invention will save more space around the building as well as to avoided traffic congestion. Moreover, with the improvement that has been made in producing of vehicles will cause an abuse of parking Persons with Disabilities (PWDs). The research that has been made by previous researches (Kadar Hamsa, Syed Adnan and Khalid, 2014) stated that there are lot of newly-registered vehicles that increase in every years which is from 115,661 total vehicles in Years 2000 up to 208,560 total of vehicles in Years 2010.

Besides that, in Malaysia there are parking that has been provided to the PWDs but in a few slots. The development of parking has been discovered by previous research (Kadar Hamsa, Syed Adnan and Khalid, 2014) find out that the parking for people with disabilities (PWDS) also has been made for that particular person but in a few slots. In Malaysia, at Putrajaya Sentral was provided multi-storey parking that consist of three level of parking which is Level P1 that has 476 parking space, level P2 that consist of 411 parking space and 514 parking space for basement. However, from the total of parking that has been provided, only 20 parking are reserved for PWDs and it will caused a trouble for disabled people if the parking slot has been taken by someone else. Besides that, in Malaysia there are no fully enforcement about the facility for PWDs and the previous researches stated that (Kamarudin et al., 2012)

Malaysia is included for not fully provide the facilities for Person with Disabilities (PWDs).

2.2   Misused Parking for Person with Disabilities (PWDs)

Person with disabilities (PWDs) is a person that have a long or short term of physical, intellectual or mental which is will make them are different from the other normal person. There are many people with disabilities that has been affected by people who are misused the parking for PWDs at a big country like United State of America. The researches that has been made by previous researcher (Tierney, 2002) found out that there are almost 72% from 43 million of people in Americans has been affected by the abused of handicapped parking which is has been a major problem in that stated. In Malaysia, there are no specific researches about the misused parking for PWDs and Malaysia has almost 2.6 million of people with disability and there are only a few of them that are registered to Jabatan Kebajikan Masyarakat (JKM).

The researches that has been made by previous researcher (Mohd Hussain *et al.*, 2015) find out that there are 1.3 to 2.6 million of PWDs in Malaysia and there is only 359,203 PWDs that has been registered with Jabatan Kebajikan Masyarakat. This numbers shows that there will be a high possibilities of PWDs in Malaysia that maybe will affected from the abused of parking. In recent past, the parking for PWDs has been abused frequently based on the report that has been made (Tierney, 2002).This may happen due lack of education about the right of disability people and also the increasing of the vehicles that has been produced with the numbers of parking that are not equal to the numbers of vehicles. As a human being, we should consider the other

7