UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF SMART CAR PARKING BY USING MONITORING SYSTEM

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

by

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I hereby, declared this report entitled DEVELOPMENT OF SMART CAR PARKING BY USING MONITORING SYSTEM is the results of my own research except as cited in references.

Signature: .....

Author : MUHAMMAD KHAIRUL HAFIZI BIN MOHD KHIR

Date: 10/01/2020

APPROVAL

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 Electronics Engineering Technology (Industrial Electronics) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Pada masa kini, istilah internet perkara (IOT) dianggap sebagai aspek teknologi yang penting dan popular. Kawalan keupayaan gaya hidup berdasarkan (IOT) telah menjadi lebih mudah dan lebih mudah, terutamanya di kalangan peranti pintar dalam pendekatan perhubungan. Pendekatan (IOT) membolehkan komputer dapat diakses dan diuruskan di mana sahaja dan bila-bila masa. Tujuan dari ciri ini adalah untuk berkomunikasi dengan modul NodeMCU ESP8266 antara peranti yang berbeza. Sistem ini juga boleh dikawal selia mengenai stesen yang digunakan oleh ESP. Projek Parking Pintar ini bertujuan untuk membangunkan peranti penjana mikropemproses Pintar yang mampu memaklumkan dan memandu pemandu ke zon letak kereta yang kosong. Tempat letak kereta yang digunakan sebagai objek penyelidikan terdiri daripada beberapa lokasi letak kereta dengan kapasiti kenderaan yang banyak, tetapi analisis ini memilih sebagai contoh hanya beberapa slot letak kereta.

ABSTRACT

Nowadays, the term internet of things (IOT) is regarded as an important and popular aspect of technology. Controllability of the lifestyle based on (IOT) has become considerably simpler and easier, particularly among smart devices in the communication approaches. The (IOT) approach enables computers to be accessed and managed anywhere and anytime. The purpose of this feature is to communicate with the ESP8266 Node MCU module between different devices. The systems can even be regulated regarding the stations used by the ESP. This Smart Parking project aims to develop a Smart Parking microcontroller device capable of informing and guiding the driver to the empty parking zone. The parking lot used as the research object consists of several parking locations with multiple vehicle capacity, but this analysis selects as samples only some parking slots.

DEDICATION

Thank you to my beloved parents, Mohd Khir bin Safie, also my wife, Nabilah Syahirah binti Elias, family, lecturers and friends.

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In the name of Allah, the Compassionate, the Merciful, Praise be to Allah, Lord of the Universe, and Peace and Prayers be upon His Prophet and Messenger. With Grace and Blessing from Allah, I am Muhammad Khairul Hafizi Bin Mohd Khir from Faculty of Electrical and Electronic Engineering Technology have succeeded in completing my final year project together with this thesis. First and foremost, I would like to thank to Allah S.W.T, because of His willing and Blessing, I have succeeded in complementing this project. High appreciate to my supportive project supervisor, Ts. Effendy Onn bin Siam for his guidance during performing this project.

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LIST OF SYMBOLS

Volt/ V	-	Voltage
A	-	Ampere
Ω	-	Ohm
m	-	Meter
1	-	Length

LIST OF ABBREVIATIONS

NS	Number of Students
PCA	Principal Component Analysis
PCB	Printed Circuit Board

CHAPTER 1

INTRODUCTION

1.1 Introduction

The purpose of this chapter is to build the structure and introduce the short concept of the project. It focused on the project overview, detailing the goals, briefly explaining the problem, scope, and providing the project outcome. The structure of the entire project can therefore be visualized precisely.

1.2 Background

Walking to the Shopping Complex or any complex with car to find the park without knowing the sign of empty park can be a hassle sometimes. Public should be ferreted where park when car too full to be sought an empty parking. Public does not have any app that they can use to seek the information for a parking at the complex. Thus, by creating an application can solve the public problems.

In this application, public can navigate an application on phone to see the location of the parking which saves a lot of time than randomly walking around the complex for an empty parking. The application will show the direction of each lots parking that available in the complex. The application will also show how many parking that available on the phone in the complex at that time. Now days, people just want to save their time without walking around on the same place and making the area is congested with vehicle. Therefore, the application can be the solution to several problem on the parking complex.

1.3 Problem Statement

In a place like the parking complex, it is very important for the people to know where the empty parking that available in the building and remember where they park their own car. Sometimes people can't remember where they're parking their own car because the parking spaces are pretty packed with too much vehicle just to search for one vehicle. Using this application, people has just scan the QR code, they can to know where empty park and the location of their car. This application also will be reducing the busyness in the parking lot and avoid accidents occurring inside the parking lot.

1.4 Objective

This project's purpose is:

i. Developing or creating a system for identifying empty parking,
ii. The project will be able to inform the public about the location of the vehicle if the vehicle owner is worried about the vehicle,
iii. Can reduce vehicle parking congestion as well as accident risk

1.5 Scope Project

This initiative is going to be focuses on development of smart car parking using monitoring system concept. The scope of the project has defined as follows:

i. Develop a hardware and software to detect the empty slot parking.
ii. This project aims to facilitate users to identify parking position by using the application on the phone.
iii. This project will use the sensor which is Passive Infrared Sensor (PIR) to detect the vehicle.

1.6 Thesis Structure

In order to attain the project goals, this project requires to be organized. This project is divided into five chapter which is:

In order to recognize the primary issue, the implementation of section 1 will start with the context of the initiative, the issue declaration, the goal and the research range will be addressed.

It starts where all information about the similar object is collected in Chapter 2, which is a literature study. The sources originate from suitable internet articles, books, and other resources. The project information will be collected from the evaluation of the literature.

In Chapter 3, which is the strategy, it will explain the information of the method used to fix this project machinery and programming tools. This has been accomplished for this undertaking in the search of superior results.

In the resulting chapter 4 and discussion, the full outcome of the project will be discussed and discussed on the necessity for hardware and software. In addition, the result-based assessment also needs to address summarizing.

The guidance for future work will be aimed at better outcomes in Chapter 5, which is the consensus that it will concentrate on the overall project.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the literature evaluation of this initiative and provides a summary of the literature and a review of previous research related to this final year project title will be presented, and a background study related to the project will be discussed, including a fundamental study and the history of the device creation to enhance the understanding of the concept to be developed. This project is a new technology improvement for the previous composite project.

2.1 Past Related Research

Some studies and inquiring as part of the literature were taken out to make this project successful. Data and studies for this project was gathered from numerous sources such as books, articles, journal and websites. All this data was utilized in this project as a guide to ensure this project should be possible in the time given. All the surveys and data collected weighed about this project.

All data on previous research is acquired from the sources. There have a few articles and publication journals from Scopus website are explored based on the scope. This literature review focuses on educational kit that connected to the application to improve the logic circuit interpretation ability for engineering student. There have ten articles about educational kit are chosen and five from it are focusing in development of educational kit for digital subject.

2.1.1 Smart Parking Based Arduino Uno

According to (Pradana, 2015):"Smart Parking Based Arduino Uno is a system that designed to make it easier drivers to make sure the availability of parking slots and the location where the empty slot at a parking place, especially on a large parking area and not organized. Information on the parking lot's condition will be displayed on a screen at the parking lot's entrance. Making the Smart Parking system-based Arduino Uno through several phases, firstly is, identify the equipment and kit to use. Secondly, the analysis of the equipment to be used and thirdly, how the hardware should be designed. Forth is software development, hardware testing, appliance installation and implementation. To create the software, it must use the Microsoft Visual Basic 6.0. Based on the experiment outcomes, it has been shown that the Arduino Uno Smart Parking scheme can provide drivers with data about the parking spaces accessible and the location of the nearest empty parking slot."

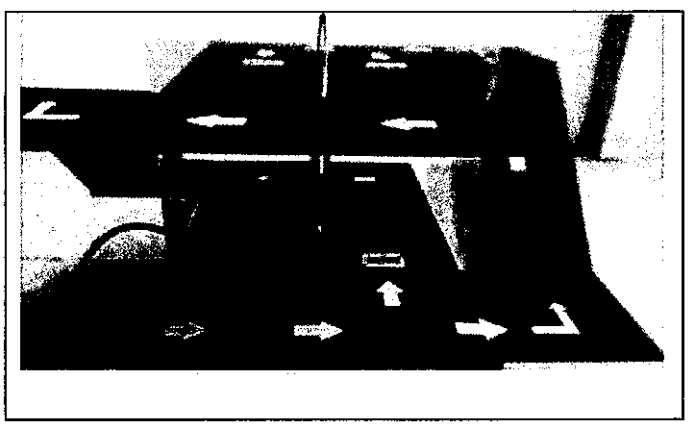

Figure 1: Prototype Slot Parking

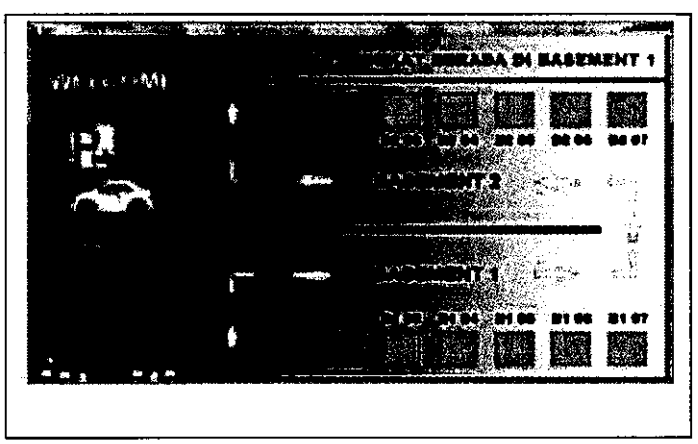

Figure 2: Example Software Slot Parking

2.1.2 Automatic Smart Car Parking System

According to (Bense, 2005):" A unique ID corresponding to the cart assigned to it was allocated by the completely automated parking scheme with customers or this kind of equipment useful in solving the limited available parking space is populated cities. The proportion of people in Malaysia who own cars and bicycles has recently stimulated the increase in Metropolitan Traffic, with reducing economic behavior and improving living standards. Therefore, parking problems will be an important job in improving traffic networks and ensuring the quality of urban life. During busy times, it is difficult for cyclists to locate parking spaces in most metropolitan areas. There are difficulties in not knowing where the space is currently located."

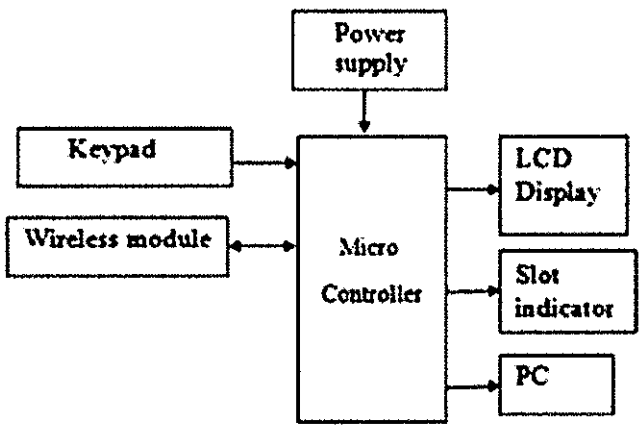

Figure 3: Block Diagram Circuit