UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BIDIRECTIONAL VISITOR COUNTER FOR SHOPPING COMPLEX BY USING ARDUINO

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

by

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Tajuk: **BIDIRECTIONAL VISITOR COUNTER FOR SHOPPING COMPLEX BY USING ARDUINO**

Sesi Pengajian: 2019

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I hereby, declared this report entitled BIDIRECTIONAL VISITOR COUNTER FOR SHOPPING COMPLEX BY USING ARDUINO is the results of my own research except as cited in references.

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APPROVAL

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

Signature: …….

Supervisor : AB WAFI BIN AB AZIZ

ABSTRAK

"Bidirectional Visitor Counter" digunakan untuk Kompleks Beli-belah dengan menggunakan NodeMCU Arduino yang direka bertujuan mengira jumlah pengunjung yang masuk dan keluar dari kompleks membeli-belah sebagai langkah keselamatan jika berlaku perkara yang tidak diingini. Projek ini adalah gabungan reka bentuk elektronik, mekanikal dan perisian komputer. Pada bahagian elektronik, arduino NodeMCU digunakan dalam projek ini dan sensor IR sebagai pengesan dan menghantar signal untuk pengiraan. Untuk hanya satu sistem menggunakan dua buah sensor jarak IR bagi mengira dan arduino NodeMCU untuk menghantar data melalui ThinkSpeak yang disambung pada wifi. Bagi bahagian mekanikal, idea utama adalah mengikuti pengesan barcode anti-kecurian dan kompleks membeli-belah untuk projek ini. Untuk bahagian perisian, terdapat program serupa pada perisian IDE arduino yang digunakan sama ada untuk sistem1 atau sistem2 proses pengiraan. ThinkSpeak IOT digunakan dalam projek ini untuk menyimpan data dan menyediakan pelayanan percuma. ThinkSpeak juga digunakan dalam projek ini kerana ia memaparkan nilai dalam grafik untuk analisis projek. Pencipta system aplikasi MIT yang digunakan dalam projek ini adalah untuk mereka bentuk aplikasi yang boleh memaparkan nilai pengiraan di skrin telefon bimbit android.

ABSTRACT

The Bidirectional Visitor Counter for Shopping Complex by using NodeMCU Arduino is designed with a purpose of counting visitor entering and exit the shopping complex for safety precaution. This project is a combination of electronic, mechanical and software design. For the electronic part, NodeMCU arduino are used in this project and proximity IR sensor as a sensing and counting part. For one system being used, two proximity IR sensor are used for counting and NodeMCU arduino for sending the data through the ThinkSpeak using wifi. For the mechanical part, the main idea is to follow the anti-theft barcode detector at shopping complex for this project. For the software part, there are similar program at arduino IDE software being used either for system1 or system2 counting process. ThinkSpeak IOT are used in this project for storing data and provided a free server. ThinkSpeak also used in this project because it display the counting value in graph for analysis the project. MIT app inventor are used in this project is to design an app that can displays the counting value at android mobile phone.

DEDICATION

I acknowledge my sincere dedication, honors and gratitude to both of my parents for their love, encouragement, supports and sacrifices throughout whole of my life. Without their sacrifices and encouragement, I cannot possibly reach this stage. Special gratitude also dedication to all my sister which always support and advise me in whatever I do in my life. Very special thanks to my supervisor and all of lecturers who has though and guided me throughout my studies. Not be forgotten, all of my friends who always been with me and help me to complete every task along the studies and throughout this joyful journey. There is no words can express my sincere appreciation to all of you.

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d	-	Diameter
m	-	Meter
cm	-	Centimetre
h	-	Height

LIST OF ABBREVIATIONS

IR	Infrared
IDE	Integrated Development Environment
IOT	Internet of Thing
USB	Universal Serial Bus
3D	Three Dimension
MIT	Massachusetts Institute of Technology
OS	Android operating system

CHAPTER 1

INTRODUCTION

1.1 Introduction

First of all, there is a relentless need for automatic appliances in nowadays world. With the increase in customary of living, there is a way of urgency for developing circuit that will ease the complexness of life. Besides that, many times we want to observe and measure the individual visiting some place like shopping complex. In this chapter, we will review about the objectives of the project, project background and the project problem statement. This project is based on a work scope which is at shopping complex. But, this system can be economically implemented in all the place where the visitors have to be counted.

1.2 Project Background

Furthermore, we are going to implement a project called development of bidirectional visitor counter for shopping complex by using arduino with IOT (internet of things) system and MIT app inventor for display the counting data. However, basic idea behind this project is to counting and show the quantity of person getting into the shopping complex. This project add a two manner which implies counter are going to be incremented if person enters the shopping complex and also can be decremented if someone leaves the shopping complex. Depending upon the interrupt from the sensors, the system identifies the entry and exit of the visitant of the shopping complex.

On the successful implementation of the system, it will display the number of visitor present in the shopping complex. Moreover, by doing this project we can reduce the number people being losses inside the shopping complex when the emergency occurs. This happened as a result of the safety unit were unaware of total range of individuals within the looking complicated in the shopping complex.

1.3 Problem Statement

Nowadays, all shopping complex has a high security measures to prevent loss of life inside the shopping complex. But, these security measures does not include counting the people inside the shopping complex. This is a serious problem when emergency happened, the security unit of the shopping complex doesn‟t know how many people is still inside the shopping complex and how many is already left the shopping complex when an emergency is taking place. By neglecting the visitor‟s counting in the shopping complex, many lives that could have been saved would be lost if emergency occurs. By taking a step further than this, the IR sensors and arduino will sense and count the person entering and out of the shopping complex. Moreover, the arduino will store the counting data and send it to the computer using a wireless network which is IOT (internet of thing) system. Before this, there is no used of IOT (internet of thing) at shopping complex counting system. Furthermore, when there is IOT (internet of thing) used in visitor counting system at shopping complex. The security unit will be easy to determine and counting the person entering the shopping complex with using Android operating system (OS) for MIT app inventor display at android mobile phone when there is emergency has occurs.

1.4 Objective

The main objective of this project is to counting the number of a person entering the shopping complex. This project also will counting data all the time and stored it at the web browser in the computer. This project concentrated on the aspect as listed below:

I. To develop the prototype of a bidirectional visitor counter for shopping complex by using arduino.

II. To analyze the accuracy of the mechanical structure and the electronic circuit of the sensing and counting system.

1.5 Work Scope

- The scope of this project is to design a prototype of the bidirectional visitor counter for shopping complex, arduino-based circuit with attached to a computer.

- The idea of this project is based on a small scope which is in a shopping complex. This project aim is to make an alert to security unit when the shopping complex have an emergency alert.

- The mechanical structure of this project is smaller with the actual anti-theft detector at the shopping complex. This project can only sensing one person entering the shopping complex at a time. This project only work with single line person.