UNIVERSITI TEKNIKAL MALAYSIA MELAKA

AN IOT BASED MOSQUE DONATION BOX FOR MONEY COLLECTION MONITORING

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 & Roobotics) with Honours.

by

SITI NUR'AQILAH BINTI ISMAIL

B071710828

960408-01-5782

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING TECHNOLOGY

2020

AN IOT BASED MOSQUE DONATION BOX FOR MONEY COLLECTION MONITORING

SITI NUR' AQILAH BINTI ISMAIL

A thesis submitted in fulfilment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Industrial Automation & Robotic) With Honours

Faculty of Electrical and Electronic Engineering Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2020

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: AN IOT BASED MOSQUE DONATION BOX FOR MONEY COLLECTION MONITORING

Sesi Pengajian: 2020

Saya **SITI NUR'AQILAH BINTI ISMAIL** 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,

.....
SITI NUR'AQILAH BINTI ISMAIL
Alamat Tetap:
No.4, Jalan Bacang 2, Taman Kota Masai,
81700 Pasir Gudang, Johor.

Tarikh: 12 / FEBRUARY / 2021

Disahkan oleh penyelia:

.....
TS. DR. ALIZA BINTI CHE AMRAN
Cop Rasmi Penyelia

TS DR ALIZA BINTI CHE AMRAN
Pensyarah Kanan
Jabatan Teknologi Kejuruteraan Elektrik,
Fakulti Teknologi Kejuruteraan
Elektrik dan Elektronik,
UTeM

Tarikh: **12** / FEBRUARY / 2021

*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

DECLARATION

I hereby, declared this report entitled AN IOT BASED MOSQUE DONATION BOX FOR MONEY COLLECTION MONITORING is the results of my own research except as cited in references.

Signature: ……

Author : SITI NUR'AQILAH BINTI ISMAIL

Date: 12 / FEBRUARY / 2021

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 Eleectrical Engineering Technology (Industrial Automation & Roobotics) with Honours. The member of the supervisory is as follow:

Signature: .....

Supervisor : TS. DR. ALIZA BINTI CHE AMRAN

Date: 12 / FEBRUARY / 2021

DEDICATION

To my beloved mother and father:

ASIAH BINTI HJ ANUAR

&

ISMAIL ABD HAMID

ABSTRACT

The purpose of this project is to produce a donation box that uses IoT applications. Nowadays, the use of the internet is a feature. It can compare a transition from an old fashioned donation box into a more technology advance model. In the past, many mosques used old fashioned donation box. The money inside old fashioned donation box is calculated manually. It can be tough when calculated manually because the mosque committee members consist of senior citizens. The main things to focus on this project to design a smart IoT operating mosque donation box prototype. The donation box will be connecting the Arduino system with a Blynk application. Based on the scope of the project, the donation box can calculate banknotes and coins in Ringgit Malaysia currency. This project will use banknotes and coins as inputs for the donation box. The data collected will use the Nodemcu ESP 8266 component, which acts as a transmitter between the donation box and Blynk. The coins will then be calculated directly using an IR sensor. By using the Blynk app, it will update and display the exact amount of paper money and coins.

ABSTRAK

Tujuan projek ini dihasilkan adalah untuk menghasilkan sebuah kotak tabung derma yang menggunakan aplikasi IoT. Pada masa kini, penggunaan internet semakin berkembang luas. Ia juga dapat membezakan dari kotak tabung derma dahulu ke model yang lebih canggih dari segi teknologi untuk zaman kini. Oleh kerana itu, pengiraan manual bagi wang boleh dikirakan agak sukar terutama kepada ahli jawatankuasa masjid yang terdiri daripada warga emas. Perkara yang harus difokuskan pada projek ini adalah untuk menghasilkan tabung masjid prototaip pintar yang menggunakan sistem Internet of Things (IoT). Untuk membangunkan model IoT kotak tabung derma, projek ini perlu menghubungkan sistem Arduino dengan aplikasi Blynk. Berdasarkan skop projek, jumlah wang di dalam kotak tabung derma dapat dikenalpasti dalam tempoh seminggu. Sistem tersebut akan mengenalpasti wang kertas dan wang syiling dalam matawang Ringgit Malaysia. Kotak ini mampu menerima wang kertas dan wang syiling sebagai input. Komponen Nodemcu ESP 8266 akan bertindak sebagai pemancar dan penghubung antara kotak tabung derma dan aplikasi Blynk. Jumlah atau nilai setiap wang kertas dan wang syiling akan dihantar ke aplikasi Blynk dengan menggunakan Nodemcu ESP 8266. Duit syiling akan dikira dengan menggunakan sensor tiga unit IR sensor. Manakala wang kertas pula akan menggunakan sensor satu IR sensor dan satu kamera RGB. Sistem ini akan mampu mengemaskini dan memaparkan jumlah wang kertas dan syiling yang tepat.

ACKNOWLEDGEMENTS

First and foremost, I would like to praises to Allah for all His blessing, strength and guidance in order to complete my Bachelor Degree Project 1.

I would like to express my deepest gratitude to those who have contributed to the completion of this project. A great appreciation goes to my supervisor, Madam Ts. Dr. Aliza Binti Che Amran for her supervision, guidance, support, motivation that given to me in completing this project as well as for my future.

Besides that, I would like to forward my thankfulness, endless love and support to my beloved mother, Asiah, father, Ismail and the rest of my family members for their support, motivation, and love from the day I started the project until it was completely done.

.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF EQUATION

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provides an introduction to this project that includes this project's background, problems statements, objective and scope of work. The chapter also will elaborate on the purpose of this project and indicate the importance of this project.

1.2 Project Background

Basically, this project focus on developing a donation that are place at mosques. This donation box will use the internet as its main component. Using the internet means Internet of Things (IoT). It is a network of devices, materials or equipments, where software, sensors and communication network are embedded in the devices that enables data collection and sharing. IoT allows remote sensing of objects and provides incentives for direct integration across existing network infrastructure between physical and computer-based and effective system, precision and economic benefits. In the IoT context, items can refer to a range of devices, including heart monitoring devices, farm animal biochip transponders, electrical clams in coastal waters, sensor-built vehicles, environmental or food pathogen detection or field tracking devices to assist search and rescue fireman on the web mentioned (Efraim Turben et alt.,2017).

According to Miller (2015) and Didyala and Busu, (2014), the key benefits of IoT are that it will increase the efficiency of worers, people can made better decisions, have more precision, and by having instant access to knowledge and automating processes, it can cut costs.

It may not be necessary to introduce internet of things for certain systems. Some may say that there is no need for to feature a donation box with an IoT enhancement, as fundamental function of a donation box is only for collecting money from the public. However, by doing some critical observations with the intention to innovate current systems, it is time to improvise the donation box to change it to be more relevant in today's context.

1.3 Problem Statement

Donation boxes are placed in strategic places inside the mosque to collect money from the mosque visitors. Usually, the mosque will assign one of their committee members to be responsible of the box. They will apply conventional approach in managing and administering the donation box. A box will be properly designed to collect money and also to avoid theft problems. Some use a plain donation box and chained it to a fixed structure like a heavy table or mosques' post. Some will design the box to be permanently fixed to a heavy structure. There will be a schedule where the money inside the donation box will be collected, counted, and then deposited into the designated bank account.

The actual fund box or donation box does not have any details on number or total amount of money contained inside it. A person will have to open the box and this is the only way to know exactly what the amount of money is collected inside the donation box. This is time consuming and it is prone to error because the operator must manually count the money. Furthermore, most of the members of the mosque committee are senior citizens.

As we know, majority of local mosques are led by the elders in an organization or maybe appointed companies. Counting money earned from donation box can be tiring. When the elderly to focus on counting money, they may have visual problem. When a human operator feels tired and not comfortable, they will make mistakes. Then the next problem will come in. Wrongly counted amount will lead to inefficient institutions. Some with unethical thinking will take this opportunity to take away some

amount of the collected money, and only declared to the committee the remainders. No one will notice this misact, if the money inside the donation boxes are counted manually and there are no other methods to crosscheck it.

These issues and problems could be solved by developing a donation box that will record all money that are inserted inside the box by donators. The IoT based donation box solution will save time spent on money counting and the box can record the money that were inserted accurately. This initiative also will be able to identify the type of banknotes that pass through the sensor because the project aims to integrate the box with good colour sensors for the banknotes recognition. To count coins, a set of three IR sensors will be used.

To realize this prototype, the box will need to use the internet for the IoT feature. The money currency detection mechanism adds significant value to the prototype. When money is inserted through the provided slots equipped with a built-in colours sensor, device will be able to know the amount accumulated inside the box. The box operator will be able to monitor the box from a distance. All the data collected will be made available to the responsible person just through an online application. This is what a very powerful role the Internet of Things has played.