Faculty of Electrical and Electronic Engineering Technology

DEVELOPMENT ANTI-THIEF SYSTEM IN MOSQUE 2.0 USING IOT

ABDUL WAFI BIN AZMI

Bachelor of Electronics Engineering Technology (Telecommunications) with Honours

2021

DEVELOPMENT ANTI-THIEF SYSTEM IN MOSQUE 2.0 USING IOT

ABDUL WAFI BIN AZMI

A project report submitted
in partial fulfillment of the requirements for the degree of
Bachelor of Electronics Engineering Technology (Telecommunications) with Honours

Faculty of Electrical and Electronic Engineering Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

UNIVERSITI TEKNIKAL MALAYSIA MELAKA
FAKULTI TEKNOLOGI KEJUTERAAN ELEKTRIK DAN ELEKTRONIK

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : DEVELOPMENT ANTI-THIEF SYSTEM IN MOSQUE 2.0 USING IOT

Sesi Pengajian : Semester 1 Sesi 2021/2022

Saya **ABDUL WAFI BIN AZMI** mengaku membenarkan laporan Projek Sarjana Muda ini disimpan di Perpustakaan dengan syarat-syarat kegunaan seperti berikut:

1. Laporan adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan dibenarkan membuat salinan laporan ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. Sila tandakan (✓):

☐	**SULIT***	(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)
☐	**TERHAD***	(Mengandungi maklumat terhad yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)
☑	**TIDAK TERHAD**	

Disahkan oleh:

(TANDATANGAN PENULIS)

(COP DAN TANDATANGAN PENYELIA)

DR. SURAYA BINTI ZAINUDDIN
Pensyarah
Jabatan Teknologi Kejuruteraan Elektronik & Komputer
Fakulti Teknologi Kejuruteraan Elektrik dan Elektronik
Universiti Teknikal Malaysia Melaka

Alamat Tetap:
5-3-2 Gugusan Cempaka 5 Jalan Cecawi 6/19 Kota Damansara, 47810 Petaling Jaya Selangor

Tarikh: 11 Januari 2022

Tarikh: 11 JANUARI 2022

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

DECLARATION

I declare that this project report entitled “Development Anti-Thief System In Mosque 2.0 Using IOT” is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : 

Student Name : ABDUL WAFI BIN AZMI

Date : 11 Januari 2022

APPROVAL

I hereby declare that I have checked this project report and in my opinion, this project report is adequate in terms of scope and quality for the award of the degree of Bachelor of Electronics Engineering Technology (Telecommunications) with Honours.

Signature : 

Supervisor Name : DR. SURAYA BINTI ZAINUDDIN

Date : 11 JANUARI 2022

DEDICATION

Special dedication to my beloved parents.

AZMI BIN AHAMAD

ZUHILMA BINTI ZAMZURI

My beloved sister,

NURLAILATHUL NASUHA BINTI AZMI

My soft and kind hearted supervisor,

DR. SURAYA BINTI ZAINUDDIN

ABSTRACT

Malaysia is a unique country because it is multi-racial and multi-religious, and everyone can live a life in peace and harmony. Based on the legislation that has been drafted in the Rukun Negara, Islam is the official religion in Malaysia, but other religions can be practised. By having various religions, thus, we have various worship houses. However, houses of worship are also not immune from cases of theft of property. Moreover, many people lost jobs due to Movement Control Order (MCO), which caused difficulty in living. This may lead to incremental cases of theft and robbery. Thus, this project was on developing Anti -Theft System in Mosques using IoT. It is a technology that increased the security of mosque boxes equipped with an alarm system and lock system operated by Arduino UNO Rev 3. In addition, the system employed a Servo Motor mechanism to open a mosque box controlled by the Blynk application. At the same time, the Blynk application controlled the alarm system caused by Ultrasonic sensors detection, in this case, the distance of the project from the wall. This project analysed and built a security system for the mosque funds box to reduce the risk of theft against it. Finally, the functionality of the system was verified.

ABSTRAK

Malaysia adalah sebuah negara yang unik kerana berbilang kaum dan agama, dan semua orang boleh menjalani kehidupan dengan aman dan harmoni. Berdasarkan perlembagaan yang telah digubal dalam Rukun Negara, Islam adalah agama rasmi di Malaysia, tetapi agama lain boleh diamalkan. Dengan mempunyai pelbagai agama, maka kita mempunyai pelbagai rumah ibadat. Bagaimanapun, rumah ibadat juga tidak terlepas daripada kes kecurian harta benda. Lebih-lebih lagi, ramai orang kehilangan pekerjaan akibat Perintah Kawalan Pergerakan (PKP), yang menyebabkan kesukaran hidup. Ini boleh membawa kepada peningkatan kes kecurian dan rompakan. Oleh itu, projek ini adalah untuk membangunkan Sistem Anti Kecurian di Masjid menggunakan IoT. Ia adalah teknologi yang meningkatkan keselamatan kotak masjid yang dilengkapi dengan sistem penggera dan sistem kunci yang dikendalikan oleh Arduino UNO Rev 3. Selain itu, sistem ini menggunakan mekanisme Servo Motor untuk membuka kotak masjid yang dikawal oleh aplikasi Blynk. Pada masa yang sama, aplikasi Blynk mengawal sistem penggera yang disebabkan oleh pengesanan penderia Ultrasonik, dalam kes ini, ialah jarak projek dari dinding. Projek ini menganalisa dan membina sistem keselamatan untuk kotak tabung masjid bagi mengurangkan risiko kecurian terhadapnya. Akhirnya, kefungsian sistem telah disahkan..

ACKNOWLEDGEMENTS

Alhamdulillah, I am deeply grateful to Allah S.W.T for easing my path to complete this Bachelor Degree Project 2. I would also like to express my in-depth and heartfelt appreciation to my family and my fellow friends for their passion, sacrifices, prayers, and moral support for me to complete the research work. Online learning at home was quite hard for me because of this Covid-19 pandemic but I am able to accomplish my essential for the subject Bachelor Degree Project 2 BEEU 4774 of the program BEET syllabus.

I am heartily thankful to my supervisor Dr. Suraya Binti Zainuddin for her guidance and motivation to me upon the completion of this project. Not to be forgotten is the appreciation to the former supervisor, the late Sir Ahmad Sayuthi Bin Mohamad Shokri for being willing to give me guidance to complete this project. It was a great honor and privilege to learn and study under their guidance. Throughout this whole year, I have been facing many challenging moments to understand and make coherent about the needed in this project. I am also seeking an opportunity to apologize for any misunderstandings that occur during the learning process.

Lastly, I am offering my regard and blessing to all of those who are supporting me in any aspect especially to all lecturers and PSM 2 committees during the preparation and giving extensive information about the project. I am also do not take for granted to complete this project because I am thinking the completion of this project is a crucial part of this semester that everyone should be done doing it. This Bachelor Degree Project 2 Report has encouraged me to apply all the experiences studied as an undergraduate student to further my career later.

TABLE OF CONTENTS

PAGE

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

LIST OF ABBREVIATIONS

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Background

It is common knowledge that Malaysia is a unique country because it is multi-racial and multi-religious; everyone can live a life in peace and harmony. Based on the legislation that has been drafted in the Rukun Negara, Islam is the official religion in Malaysia. However, other religions can be followed as long as it does not use the sensitivity issues of each religion and race. This can also be proven when there are various houses of worship in Malaysia, such as mosques for Muslims, temples for Buddhists, temples for Hindus, churches for Christians, and so on.

In today's modern life, there is no denying that every premise, building, house of worship, or human life needs money to pay for every overhead cost such as water and electricity bills for the continuity of life. Therefore, each house of worship has created a donation fund to help reduce the costs incurred by each house of worship. Also, each house of worship can create a religious program for each of its believers. However, houses of worship are also not immune from property theft, similar to premises such as houses and offices. Therefore, in this study, this project is more focused on the security of the Mosque Fund, but it can still be applied to all other places of worship. Therefore, to solve this problem, an anti-theft system in the Mosque is proposed. The system consists of Arduino UNO, Ultrasonic Sensor, Alarm system and Blynk Apps. Arduino UNO acts as a microcontroller in this project to control every process of transmitting information involving Blynk Apps on the owner's smartphone. This system will help the management of the

Mosque find out whether someone is trying to steal the fund and indirectly know the location of the fund if it is stolen.

1.2 Problem Statement

Smart security systems on permits such as homes, valuables, and vehicles have been created by many researchers to help prevent theft from occurring. Similarly, mosques and other places of worship are also vulnerable to theft. Therefore, the anti-theft system in the mosque should also be given priority as in residential areas to protect the surrounding area from intruders. In a study conducted by Shanthini M et al. (2020), anti-theft permits can be solved, but the problem identified is that there is no two-way communication between the user and the project in the event of theft. By using the Internet of Things (IoT) feature, mosque authorities can monitor and manage its environment to take action when necessary. Therefore, to assist mosque committees in obtaining notifications of intrusions, an anti-theft system within mosques is proposed for all Mosques and other places of worship throughout Malaysia.

1.3 Project Objective

a) This project's main aim is to utilise Internet-of-Things (IoT) as an alternative to solve and help the theft incident focusing on the Mosque. The objectives are as follows:

b) To develop a Mosq Anti-theft system in mosques equipped with an alarm system using Arduino UNO.

c) To develop a security system equipped with an Alarm System that can be controlled using Blynk Apps.

d) To develop a project that has two-way communication between the user and the project in the event of theft.

1.4 Scope of Project

The scope of a project is established based on the objectives mentioned above. The main objective is to create a security system equipped with an Alarm System that can be controlled using Blynk Apps. The scope of this project is as follows:

a) This project used existing software in android and iOS applications which is Blynk Apps. This application is reliable for making it easier for users to monitor this project by smartphone.

b) Arduino UNO as a control device to communicate with Ultrasonic Sensor, Servo Motor, Buzzer, and a smartphone to alert the Mosque Committee if there were intruders or thieves.

c) A buzzer will be activated to raise awareness in the community regarding ongoing theft cases.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will discuss the information related to the project to be developed in more detail based on important information that has been obtained through reading and research from previous studies. In this chapter, there will be several discussions to strengthen further the information related to the project to be built. Discussions began on the concept and features of smart security of a premise, focusing on the mosque. These concepts and features are very important as a reference for developing the project. Next, in this project, Internet of Things (IoT) technology will be used, and it is essential to learn the concept of IoT to have a clear conceptual vision.

2.2 Previous Related Research on Security Improvement using IoT

2.2.1 An Efficient Key Management Technique for the Internet of Things

According to [1], the research mentioned that human life would become more optimal with the help of Internet of Things technology. This is because every sector, such as industrial workers, customers, and the general public, benefits from the Internet of Things, especially from the aspect of security. In this article, the author states that it is necessary to improve the security features of the data generated by each IoT device. Therefore, the author proposes to use efficient key management techniques as a result of a combination of symmetrical and asymmetric cryptosystems to improve security in the IoT environment. The system will ensure that the data received by the IoT has been controlled by a group of Smart

Objects capable of registering using the open Message Queue Telemetry Transport protocol. This chapter will discuss the information related to the project to be developed in more detail based on important information that has been obtained through reading and research from previous studies. In this chapter, there will be several discussions to strengthen further the information related to the project to be built. Discussions began on the concept and features of smart security of a premise, focusing on the mosque. These concepts and features are very important as a reference for developing the project. Next, in this project, Internet of Things (IoT) technology will be used, and it is essential to learn the concept of IoT to have a clear conceptual vision.

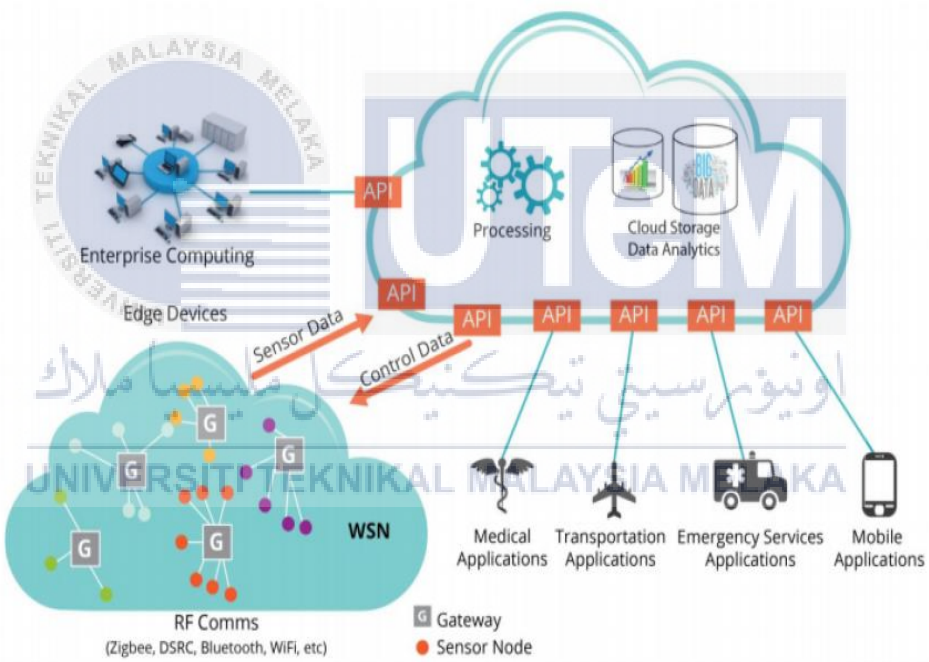

Figure 2.1 Internet of Things (Tabassum et al., 2020)

2.2.2 Assessment of security threats on IoT based applications

In contrast, this author [2] stated that IoT systems allow hackers and cybercriminals to attack public privacy information. Therefore, the authors would like to suggest an application system that can enhance the security features of IoT. However, this author also

agrees with the statement made by author [1] that IoT can provide many benefits to human life. Undoubtedly, many factors cause a premise or place to be vulnerable to cases of theft of property, valuables, or private information. Thus, author [2] states that private information is hacked due to a lack of practising the IoT System in daily human life. Having a place of residence, valuables, vehicles, and others connected with IoT Technology will change a place, goods, and environment to be smart. For example, it can be a smart city, smart metering, smart hospital, smart car, smart surveillance, smart retail, and smart mosque.

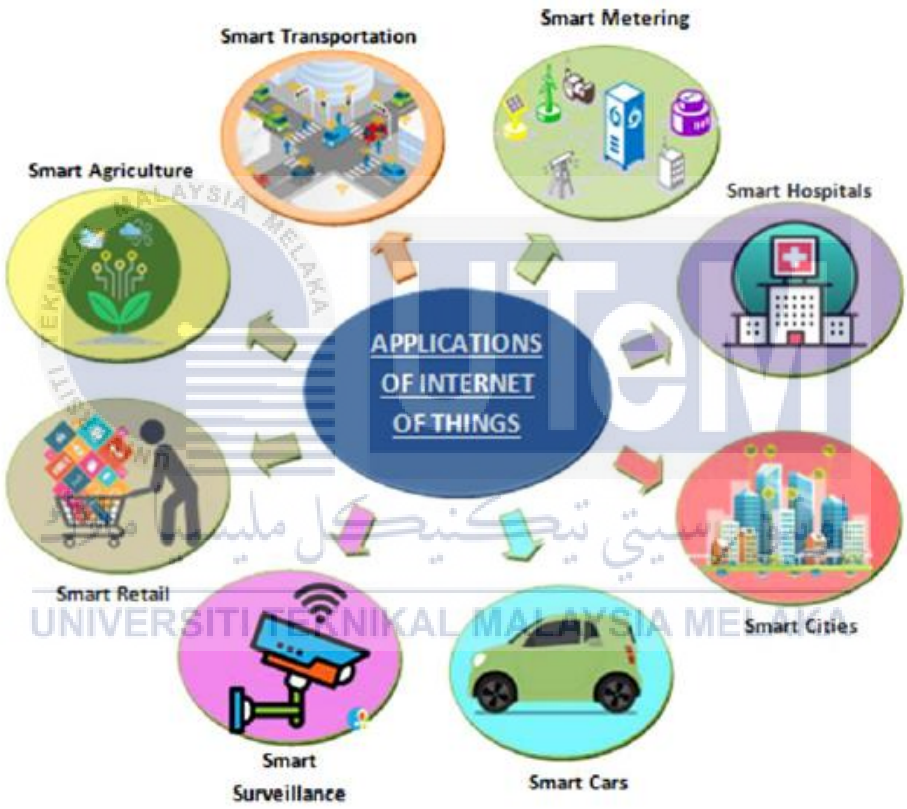

Figure 2.2 Group of Smart Facalicity using Internet Of Things (Anand and Sharma, 2020)

2.2.3 Internet of Things (IOT) Based Ambulance Tracking System Using GPS and GSM Modules

The creation of the Facility Group using the Internet Of Things system can help reduce theft cases inclusive in mosques. To explain in more detail about the group of smart facilities, the author [3] gives an example of smart hospitals connected to the IoT system. It can be proven that the IoT system improves security features against theft and can also help increase the level of effectiveness of hospitality operations. Furthermore, the IoT system operates to control every movement of the ambulance to avoid going through the congested road; thus, the shortest distance to the location can be made.

Figure 2.3 Routes are indicated via the Google Map Web Portal

From the information presented from the literature, it can be concluded that with the help of IoT systems, the mosque environment also is saved from unwanted incidents. This can be justified by previous studies that IoT systems increase the rate of security to the environment applied.