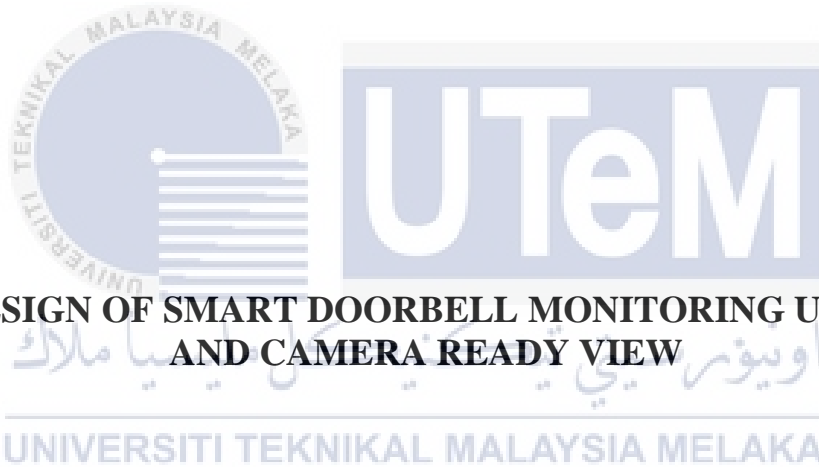




Faculty of Electrical and Electronic Engineering Technology



**THE DESIGN OF SMART DOORBELL MONITORING USING IOT
AND CAMERA READY VIEW**

MUHAMMAD HAZIQ BIN ZAINAL

Bachelor of Electronics Engineering Technology with Honours

2021

**THE DESIGN OF SMART DOORBELL MONITORING USING IOT AND
CAMERA READY VIEW**

MUHAMMAD HAZIQ BIN ZAINAL

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



Faculty of Electrical and Electronic Engineering Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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Sesi Pengajian: 2021

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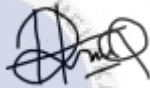
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DECLARATION

I declare that this project report entitled “Smart Doorbell Monitoring Using IoT and Camera Ready View ” 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.

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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 Computer Engineering Technology (Computer Systems) with Honours.



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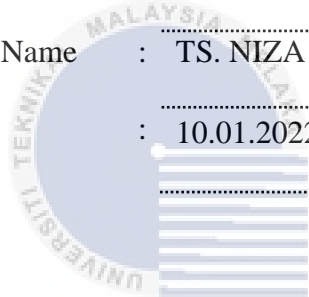
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DEDICATION

This research project was successfully completed. I dedicate this thesis to my beloved parents, supervisor, and fellow classmates. Especially for my esteemed parents who always support and pray for your child's success, may your life be blessed by Allah. For my lecturer as well as my supervisor who have contributed a lot in providing support towards this success, this is a gift for all, may Allah reward all the devotional services rendered. To my friends, housemate and classmate who have supported me all this time, your services are greatly appreciated.



ABSTRACT

Everything has changed in this era of digital technology and communications to the Internet of Things technology (IoT). Home doorbell is one of the things that may be improved to make it smart, more inventive, and secure by control it by using Internet of Things (IoT). The purpose of the project is to develop smart doorbell monitoring using Internet of Things (IoT) and camera ready view. This project will make homeowner capable of monitoring and view area front of the house by using the application for safety and to reduce their time and energy to see who in front the house. The objective of this project is to develop a smart doorbell system via vibration notification on the smartphone, design a system that monitor the doorbell with a camera to capture the image of a person outside the house and analyse a system interface such as coordination of the image captured and a notification comes out with doorbell response. The smart doorbell system used ESP32-CAM module as main component to control input and output of the system. The homeowner will receive notification that vibrates through the smartphone by use the Blynk application and see the visitor's image in front the house that display on the smartphone via Blynk application. User can unlock the door by using the Blynk application if the visitor is the known person otherwise, the user can maintain to lock the door if the visitor is unknown person. Based on the efficiency of the project, the data is recorded based on the number of notification and image captured with time. This smart doorbell offers a method that is user friendly, secure, easy, saves time energy and cost.

ABSTRAK

Segala-galanya telah berubah dalam era teknologi digital dan komunikasi ini kepada teknologi Internet of Things (IoT). Loceng pintu rumah ialah salah satu perkara yang boleh dipertingkatkan untuk menjadikannya pintar, lebih inventif dan selamat dengan mengawalinya menggunakan Internet of Things (IoT). Tujuan projek ini adalah untuk membangunkan pemantauan loceng pintu pintar menggunakan Internet of Things (IoT) dan paparan sedia kamera. Projek ini akan menjadikan pemilik rumah mampu memantau dan melihat kawasan hadapan rumah dengan menggunakan aplikasi untuk keselamatan dan mengurangkan masa dan tenaga mereka untuk melihat siapa yang berada di hadapan rumah. Objektif projek ini adalah untuk membangunkan sistem loceng pintu pintar melalui pemberitahuan getaran pada telefon pintar mereka, mereka bentuk sistem yang memantau loceng pintu dengan kamera untuk menangkap imej seseorang di luar rumah dan menganalisis antara muka sistem seperti penyelarasan imej ditangkap dan pemberitahuan keluar dengan respons loceng pintu. Sistem loceng pintu pintar menggunakan modul ESP32-CAM sebagai komponen utama untuk mengawal input dan output sistem. Pemilik rumah akan menerima pemberitahuan yang bergetar melalui telefon pintar dengan menggunakan aplikasi Blynk dan melihat imej pengunjung di hadapan rumah yang dipaparkan pada telefon pintar melalui aplikasi Blynk. Pengguna boleh membuka kunci pintu dengan menggunakan aplikasi Blynk jika pelawat adalah orang yang dikenali sebaliknya, pengguna boleh mengekalkan untuk mengunci pintu jika pelawat adalah orang yang tidak dikenali. Berdasarkan kecekapan projek, data direkodkan berdasarkan bilangan notis dan imej yang ditangkap mengikut masa. Loceng pintu pintar ini menawarkan kaedah yang mesra pengguna, selamat, mudah, menjimatkan tenaga, masa dan kos.

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LIST OF SYMBOLS

δ	-	Voltage angle
	-	
	-	
	-	
	-	
	-	
	-	
	-	
	-	



LIST OF ABBREVIATIONS

V	-	Voltage
	-	
	-	
	-	
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CHAPTER 1

INTRODUCTION

1.1 Background

This chapter describes the idea to design Smart doorbell monitoring using IoT and camera ready view. It includes background of project, problem statements, objectives, and scope of project. The background is to know the previous history about the project. The problem statement is to summaries to provide a solution while the objective is to aim the goal and solution for the project. Lastly, the scope is to cover the functionalities provided by this project.

1.2 Background of Study

Nowadays, conventional devices or equipments like home doorbell must be replace with something more sophisticated and secure. Several intelligent doorbell systems already exist on the market, that have a varying range of features and available functions. All of these solutions make use of a smartphone app to interact with and receive notifications from the doorbell [1].

A doorbell was a signalling device that is usually installed near a building's main entrance door like a house. When a visitor touches a doorbell button in front of the house, a bell sounds to alert the owner to the visitor's presence. The doorbell is also used at the entrances to a partially enclosed area like near a gate or other gates. Mostly the homeowners were unaware of the dangers that can arise when they use their conventional doorbell without

knowing who pressed the doorbell. The owner then must approach the door and any possible threat to determine who is at the door. When a necessity arises, the owner may be forced to open the door to strangers, such as the delivery person or anybody else.

All of these things put owner in risk where all of these scenario can be avoided with the use of a smart doorbell. The smart doorbell system will improve the mechanism of the conventional doorbell by collaborating with the Internet of Things (IoT) by using application and smartphone to monitor the front area of the house, view and capture the image of the visitor who presses the doorbell button for own safety.

1.3 Problem Statement

Nowadays, the conventional doorbells or the old mechanism of the home doorbell are very easy to connect and use but does not provide personal safety to homeowners who have disabled people in the house. Moreover, disabled people needs time and the ability to determine who rang the home doorbell where any potential threat may occur. In addition, the front door is one of the most often used entrances in the house, so it is easy to overlook locking it where intruders can easily enter the house and will pose a danger if there are disabled people in the house. By design this smart doorbell system by using Internet of Things (IoT) and camera ready view, it is helpful for the disable people who are alone at home to checking who was outside the house. When someone press the smart doorbell, the system will send notification alert with vibration to the user's smartphone and can view image of the visitors. Meanwhile, to rise the disabled people safety, user can allow the known visitor to enter the house by control the door lock by using smartphone and at the same time will reduce the movement, time and energy for the disabled people due to lack of self-efficacy.

1.4 Project Objective

The objectives of this research work are:

- 1) To develop a smart doorbell system via vibration notification on the smartphones.
- 2) To design a system that monitor the doorbell with a camera to capture the image of a person outside the house.
- 3) To analyse a system interface such as coordination of the image captured and a notification comes out with doorbell response.

1.5 Scope of Project

This project is to design smart doorbell system that will assist disabled people via notification and vibration on their smartphones to help them to see and check who was outside the house for their safety while they are alone at home. The disabled person may have a problem about time where they going to take times to do something because their energy and ability not as normal person. Meanwhile, this project has limitations as follows which is this project can display the camera by using one device only and will only capture visitor image by pressing the doorbell. Then, the application is used to give notifications, capture visitor image and control the door lock. Lastly, captured image and notification need internet connection to send on user smartphone.

1.6 Summary

This section discuss the introduction for this project. Therefore, this project is to design a Smart doorbell monitoring using Iot and camera ready view so the system can start to design based on the background researched, problem statement, objective and the scope.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature review is a collection of text used to review crucial points of current knowledge for any related material in order to better understand the concept and language used in the project.. The resources are obtained from the journals, books and websites which provide more information on IoT applications in house security, researches about building security measures and notification system. The aims of this chapter are to find knowledge, important information and any related thesis that are in line with the concept of Smart doorbell control using IoT and camera ready view. Furthermore, theoretical, methodical and hypothetical researches about security as well as notification system using ESP32 CAM and IoT are emphasize and analysed.

2.2 Internet of Things (IoT): Genesis, Challenges and Applications

The Internet of Things (IoT) was the network of the physical objects. Devices, vehicles, buildings and others were the example where all the objects integrated with electronics, softwares, sensors and network connectivity that allow to grab and share information [2]. IoT was an extension interaction between people and application. The “Things” can be clarify as the combination of hardware, software data and service. Nowadays, Internet of Things (IoT) will be the next big thing in the field of information technology

2.2.1 Genesis of IoT

The development and expansion of the Internet of Things (IoT) were dependent on the development of new technologies and the enhancement of current ones. Wired networks, wireless networks, sensor networks, Radio-Frequency Identification (RFID), embedded software, communication protocols and others are all examples of these technologies. IoT connects every object transforming it into a smart device. By incorporating sensing, transmitting, and processing capabilities inside things, a thing can become a smart thing, an object may become a smart object, and an appliance can become a smart appliance. Due to the availability of all of these technologies as well as electronic equipment such as sensors and actuators, technological phase had came in which every object is considered to be sensed and to have some computer capabilities leading in the IoT era. Figure 2.1 shown the genesis of IoT.

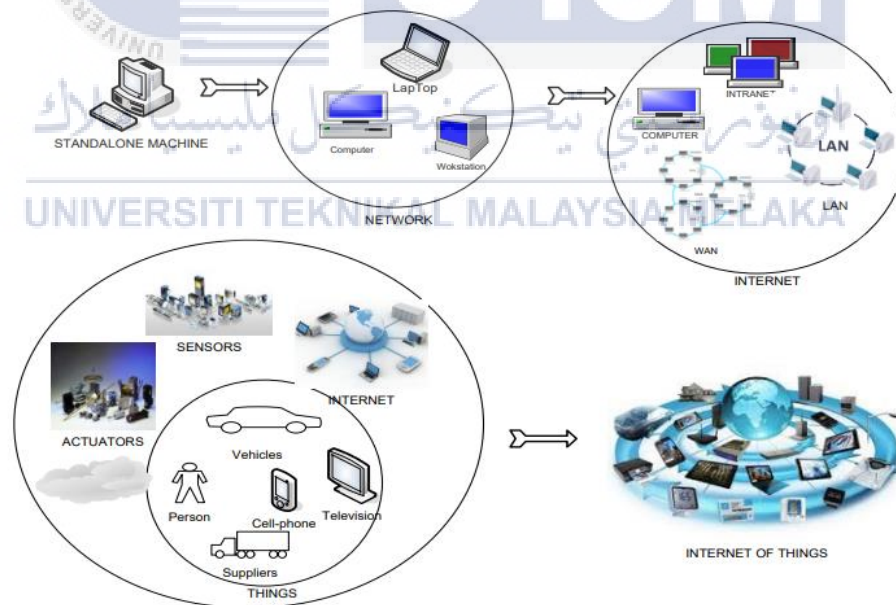


Figure 2.1 Genesis of IoT [2]

2.2.2 Application Domains of IoT

Internet of Things (IoT) had established as a platform whose implementation can encompass a wide variety of application areas due to its presence in every sector of the physical world. As a result of the ability to connect embedded devices with limited CPU, memory, and power resources, the Internet of Things can now find applications in practically every field. The smart door opens and closes in response to the arrival of an authenticated person. It can be programmed to operate in a variety of ways such as sending a message to a selected person's mobile phone if the time is after midnight. The term "smart elderly support" refers to specific care for the elderly. Elderly people as well as youngsters living in the home required extra attention. If the house was smart home, they can also be monitored and given support.

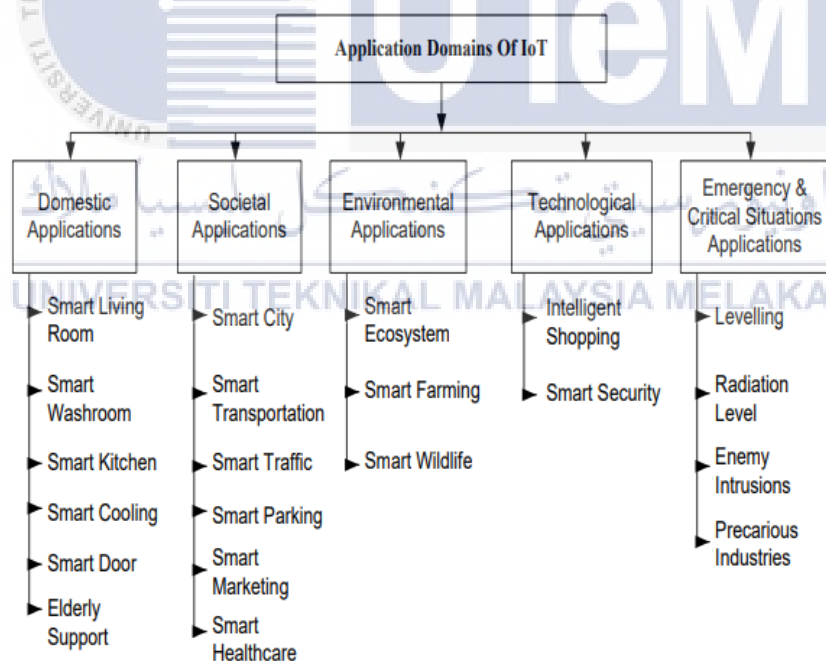


Figure 2.2 Application domains of IoT [2]