UNIVERSITI TEKNIKAL MALAYSIA MELAKA

PIGEON HOLE SMART BOX FOR UNIVERSITY APPLICATION

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

by

ASMIDA BT ASRI
B071210063
900513-09-5046

FACULTY OF ENGINEERING TECHNOLOGY
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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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SESI PENGAJIAN: **2014/15 Semester 2**

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor in Electronics Engineering Technology (Telecommunication) Honours. The member of the supervisory is as follow:

…………………………………….

(Project Supervisor)

ABSTRAK

Sekarang ini, pensyarah menggunakan 'pigeon hole' sebagai medium penghantaran untuk pelajar menyerahkan tugasan/dokumen. Walaubagaimanapun, pensyarah tidak boleh mengawal dan memastikan setiap pelajar menghantar tugasan/dokumen tepat pada masanya. Fungsi 'pigeon hole' sama seperti peti surat dimana surat atau memo akan diletakkan di dalam peti surat mereka. Pengguna terpaksa memeriksa peti surat setiap kali untuk memastikan sama ada mereka menerima surat yang dikirimkan atau tidak. Namun dengan adanya teknologi moden pengguna kini tidak perlu lagi memeriksa 'pigeon hole' mereka. Projek ini akan membantu pensyarah untuk memastikan mereka mengetahui setiap kali dokumen atau tugasan dihantar. Projek ini akan membincangkan tenteng sistem pemberitahuan penerimaan dokumen/tugasan daripada 'pigeon hole' melalui telephone bimbit. Sistem ini menggunakan. Microcontroller Arduino, IR sensor dan GSM module. Sistem ini akan menghantar SMS kepada pengguna jika terdapat document/tugasan yang dihantar ke dalam 'pigeon hole'. Sistem ini lebih mudah, menjimatkan masa dan menyenangkan untuk kegunaan pensyarah kerana mereka tidak lagi perlu untuk memeriksa pigeon hole setiap hari.

ABSTRACT

Nowadays, lecturer uses pigeon hole as medium or place for student submitting the assignment/document. Even do, lecturer cannot control In order to ensure each student submit the assignment on time. Pigeon hole work similar to letterbox where letter or memo for specific person will be placed in their letter box. The method of checking document/assignment in pigeon hole has not updated until today where most lecturer still using the old method of checking the pigeon hole by them self. This project will help lecturer to ensure them know every time document/assignment sent. The electronic technology was applied to overcome this problem. In this project, Microcontroller Arduino, IR sensor and GSM module used in this system to notify the user if there is presence of new document/assignment. The system will generate notification in the form of SMS to notify the presence of new mail in the pigeon hole. The system is easier, save time and pleasant for lecturer use because they was no longer necessary to check pigeon every day.

DEDICATION

Special dedicated to my beloved parents, family members and friends

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SMS   =   Short Message System

s   =   Seconds

GSM   =   Global System for Mobile

LED   =   Light Emitting Diode

CHAPTER 1
INTRODUCTION

1.0   Introduction

In this chapter, the purpose of the project will be described generally. Start with a brief explanation about the background of the project. Then, the problem statement that lead to the idea for this project and objective that aimed to be achieved are established in order to overcome the problem statement. This chapter also explains the scope that will be discussed in the project and the project significance.

1.1   Background

The pigeon hole smart box for university application is design to overcome the problem that faced by lecturer who cannot control/monitor student in submitting the assignment on time. Pigeon hole work similar to letterbox where letter or memo for specific person will be placed in their letter box. The method of checking letter in pigeon hole has not updated until today where most people still using the old method of checking the pigeon hole by them self.

For this project, the electronic technology was applied to overcome this problem. Pigeon smart box is build up by using microcontroller Arduino and GSM module as wireless transmission. The installed sensor in that pigeon hole smart box will start function once it detect the document/assignment receive and late document receive and automatically sent alert signal via SMS notification to the lecturer"s cell phone. This project will also make easy human life by sending short message system to notify the user about the document receive and save lecturer time in checking their pigeon hole every day.

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1.2   Problem Statement

Now days, student always take for granted in submitting their assignment although given a submission date line. In this problem, lecturer is out of control in Oder to ensure each student submit the task on time. Moreover, lecturer always uses pigeon hole as medium or place for student submitting the assignment but sometimes lecturer forget to check the pigeon hole. This problem can be solve by this project where by lecturer who use pigeon hole will receive SMS notification once student put their assignment in pigeon hole.

1.3   Objective

The objective of this project is:

1. To design the pigeon hole smart box for university application using GSM module and Arduino.
2. To develop notification that will alert lecturer via SMS regarding on time submission and late submission

1.4   Scope

This project will be completed within these scope:

i.   The wireless connection between hand phone lecturer and pigeon hole smart box using Global System for Mobile Communication (GSM) module.

ii.   The microcontroller Arduino are using in this project.

iii. The sensor that install at pigeon hole smart box for university application will be able to detect document/assignment one by one.

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iv.   The capacity of pigeon hole is limit to 1200 assignment/document which is consist 10 pages.

v.   The faculty is the first place to apply the application of pigeon hole smart box.

1.5   Conclusion

As a conclusion, at the end of this chapter, by having the microcontroller Arduino, IR sensor and GSM modem, a smart notification system can be developed to notify lecturer if there are document/assignment in their pigeon hole. Microcontroller Arduino was stored as brain system of pigeon hole smart box. It will start operated once document/ assignment have been detected by the sensor. A signal will be send to the GSM module and GSM module will transform the signal from sensor into notification via SMS to the lecturer cell phone.

CHAPTER 2
LITERATURE REVIEW

2.0   Introduction

This chapter will cover the literature review of the previous study in order to improve the pigeon hole smart box. In this chapter, it will discuss and summarize topic which it contains the information gathered to gain knowledge and ideas in completing the project.

The pigeon hole smart box for university application is design with a several key point taken as a subject studied for this research. There are several sources that have been taken as a resource such as books, thesis, journal and website. It was included the operation of the circuit, the hardware and software which is useful in the project. The aspect involved in this literature review is:

1.   Previous project research
2.   IR Sensor
3.   Arduino Microcontroller
4.   GSM Module
5.   Electromagnetic lock

2.1 Previous Project Research

Based on the research that has been done, there are the previous study and journal that related to this project. From the observation GSM and microcontroller Arduino has been implemented in many researches.

2.1.1 Real Time Mailbox Alert System Via SMS or Email

This project is design to make user easy to alert by using technologies sending short message system or email to notify about the important new mails receive in the user mailbox. The programmable logic controller, interface module and the GSM modem can be incorporated by linking the user"s mailbox with short messaging system or email facilities and this enables the user to be notified whenever a mail is delivered. This project is effective and efficiency method where user will be always alert about the new mails delivered via SMS or email. Besides that, the user are capable of checking their mailbox status by sending a SMS to the system and control system will reply base on the latest status of the mailbox to the user. In addition, the user also can choose whether the notification is done via SMS or email.(Al Subramaniam et al. 2007)

2.1.2 Remote Generator Control Using Android Application

In a research journal by (Haidar et al. 2014) microcontroller Arduino are applied in the design of Remote Generator Control Using Android Application. Arduino Uno are using in this system. This project is design to change the traditional technique of monitoring electric generators wireless by using smart phone operating system android. The implemented sensor will deliver analog signal that provide real time data about the generator status and the data are converted and program through the microcontroller Arduino. The outputs of the result in digital state will converted into a serial signal and then transmit to the android phone through a router.

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2.1.3 Arduino Based Remote Controlling for Home Power Saving, Security and Protection

The another research according to (Zeebaree & Yasin 2014)about Arduino Based on Remote Controlling For Home Power Saving, Security And Protection. In this project, microcontroller Arduino is applied to remotely control and monitors electrical devices and security operation. Besides that, by using GSM network, a mobile can be used to control sensor and getting alert on robbery and burglary. In addition, this system consists of two sides which is the microcontroller Arduino (AM-side) and the mobile phone (MP-side). The MP-side acts as a recipient to get responses from the AM-side as well as a controller for sending commands, while AM-side, is responsible for producing data and control signals to the devices or sensors.

2.1.4 Intelligent Home Security Using GSM Module

These projects focus on developing low cost and intelligent security system using the Arduino Uno, SIM300 GSM and three sensor LM35 temperature sensor, passive infrared sensor and a hall-effect. Arduino Uno microcontroller is used to process and control system that receives and processes data from all the sensors. GSM unit acts as an interface between Arduino and the mobile user and is responsible for communication between them and thus allow cell phone users to control it from anywhere in the world where GSM network is available to turn on and turn off the system and receive warnings messages. (Nadu & Uno 2015)

2.1.5 GSM Based Security System

Refer to (Shah & Gharge 2012), the main focuses of this project is the security of a home when the user is away from the place. This project is developed and launch up-to-date, reliable and user friendly security system to automate home security system by using circuitry synchronized with GSM module. In addition, this

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system contain sensor ATmega81 microcontroller, SIm300 GSM module, buzzer and relay. The operation will start when the IR sensor sense the presence of any human being within its range and then send signal to the microcontroller Arduino.

2.1.6 GSM Based Electrical Control System for Smart Home Application

According to (Wahab et al. 2010) , GSM based Electrical Control System for Smart Home Application, the purpose of this project is to reduced electricity wastage. The GSM module was used for receiving short message services from the user to the mobile phone which is automatically enable to control and take any further action. The system was integrated with microcontroller and GSM network interface by using assembly language. The system will activated when the user send the SMs to microcontroller at home. When SMS command has been receive, the microcontroller unit automatically control the electrical home application by switching ON or OFF the devices according to the user order.

2.1.7 SMS Supported Password Door Security control System

The another research according to (Derecha et al. 2013) , the major of this project is to develop a password door security control system. The system will open the door when the right password is entered and an SMS text will be sent for the person who is responsible for the room. The system use microcontroller ad the heart of the system and GSM module as a notify devices. The microcontroller will operate when the user enter the password to active the electromagnetic relay of the door which lock or unlocks the door. After that, the GSM module will send the SMS notify someone who is responsible for the door.

2.2   Hardware Overview of the System

Hardware overview is analysis of the component that should be considered in design of pigeon hole smart box. The main components that were discussed in this section consist of IR sensor, microcontroller Arduino, and GSM module.
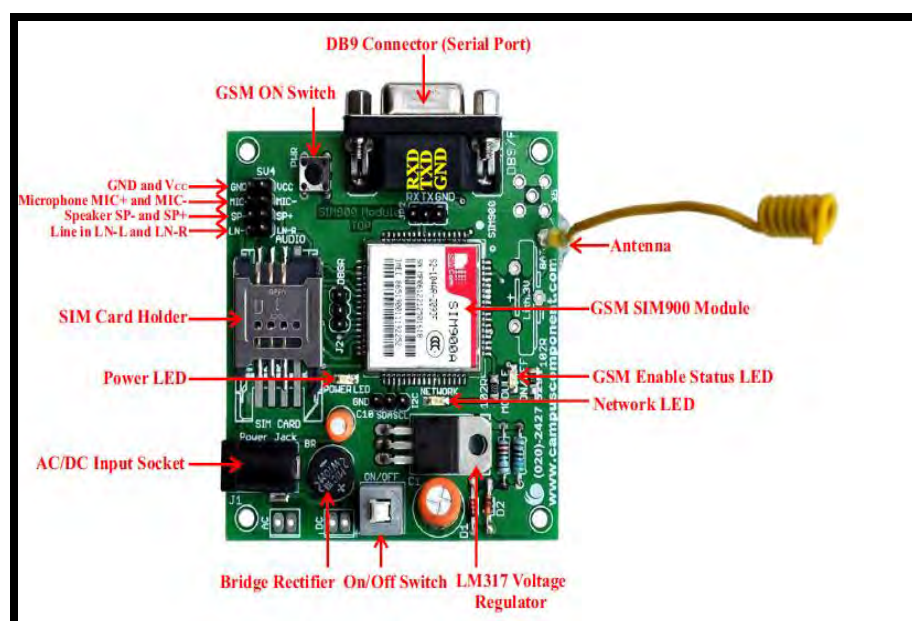
2.3   GSM Module

Figure 2.1: GSM Module

Short Message Services (SMS) has become more attractive than ever before. SMS was created to produce widest coverage at minimum cost. In addition, by using SMS user can realize the function of data bidirectional transmission, and its performance is stable. In addition, it also provides powerful platform for remote data transmission. Some previous research had been done a research to get more information and knowledge of the current existing GSM control system that was implemented previously. Besides that, it is significant to know and understand how the software and hardware were used in the SMS controlled system development. This is to make sure that the research that currently being conducted contribute at a

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