UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF INTELLIGENT PIGEON HOLE USING GSM

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

by

NUR SUHAIDA BINTI WAHAB

B071310425

911123115578

FACULTY OF ENGINEERING TECHNOLOGY

2016

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

TAJUK: **Development of Intelligent Pigeon Hole Using GSM**

SESI PENGAJIAN: **2016/17 Semester 1**

Saya **NUR SUHAIDA BINTI WAHAB** 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 (✓)

☐	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 organisas i/badan di mana penyelidikan dijalankan)
☐	TIDAK TERHAD	

Disahkan oleh:

_____ _____

AlamatTetap: Cop Rasmi:

No 316,PAKR Taman Sri Intan
Sungai Tong 21500 Setiu
Terengganu.

Tarikh: _____

** 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 TERHAD.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FAKULTI TEKNOLOGI KEJURUTERAAN
Tel : +606 234 6623 | Faks : +606 23406526

Rujukan Kami (Our Ref) :
Rujukan Tuan (Your Ref) :

9 DECEMBER 2016

Pustakawan
Perpustakaan UTeM
Universiti Teknikal Malaysia Melaka
Hang Tuah Jaya,
76100 Durian Tunggal,
Melaka.

Tuan/Puan,

PENGKELASAN LAPORAN PSM SEBAGAI SULIT/TERHAD LAPORAN PROJEK SARJANA MUDA TEKNOLOGI KEJURUTERAAN PEMBUATAN (BETT): NUR SUHAIDA BINTI WAHAB

Suka cita dimaklumkan bahawa Laporan PSM yang tersebut diatas bertajuk "Development of Intelligent Pigeon Hole Using GSM" mohon dikelaskan sebagai *SULIT /TERHAD untuk tempoh LIMA (5) tahun dari tarikh surat ini.

2. Hal ini adalah kerana IANYA MERUPAKAN PROJEK YANG DITAJA OLEH SYARIKAT LUAR DAWE N HASIL KAJIANNYA ADALAH SULIT.

Sekian dimaklumkan. Terima kasih.

Yang benar,

_____
Tandatangandan Cop Penyelia

* Potong yang tidakberkenaan

NOTA: BORANG INI HANYA DIISI JIKA DIKLASIFIKASIKAN SEBAGAI SULIT DAN TERHAD. JIKA LAPORAN DIKELASKAN SEBAGAI **TIDAK TERHAD**, MAKA BORANG INI **TIDAK PERLU DISERTAKAN** DALAM LAPORAN PSM.

DECLARATION

I hereby, declared this report entitled “Development of Intelligent Pigeon Hole Using GSM” is the results of my own research except as cited in references.

Signature	:	…….
Author’s Name	:	**NUR SUHAIDA BINTI WAHAB**
Date	:	……

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 of Electronic Engineering Technology (Telecommunication) with Honours. The member of the supervisory is as follow:

……

(Project Supervisor)

ABSTRAK

Zaman kini,di pejabat atau universiti mempunyai kemudahan'Pigeon Hole'untuk meletakkan apa-apa tugasan, surat atau apa-apa dokumen penting. Pigeon Hole'ini adalah alat di mana pengguna mengemukakan semua tugasan dan apa-apa dokumen di dalam. Hari ini, selular adalah salah satu sistem yang paling penting yang telah digunakan untuk menghubungkan orang ramai. Selain itu, GSM adalah rangkaian selular di mana telefon mudah alih bersambung kepadanya dengan mencari sel-sel dalam kawasan berdekatannya.Oleh itu, mewujudkan Pembangunan Pintar Pigeon Hole Menggunakan GSM.Projek ini menyediakan sistem berdasarkan memberitahu pengguna apabila apa-apa dokumen tiba di dalam lubangmerpati. Pembangunan Pintar Pigeon Hole Menggunakan GSM akan memaklumkan kepada pengguna apabila mereka mempunyai surat melalui mesej sistem pesanan ringkas (SMS) ke nombor yang telah didaftarkan. Sistem ini akan mendapat pemberitahuan apabila apa-apadokumen dalam melalui"Pigeon Hole"dan sensor infra merah akan mengesan isyarat. Setelah dipotong dokumen sensor sistem akan menghantar sistem pesanan ringkas (SMS) melalui GSM ke nombor yang telah didaftarkan kedalam sistem. Kemudian, berdasarkan LCD akan memaparkan mesej pada 'Pigeon Hole'. Oleh itu, sistem ini secara automatik akan memaklumkan kepada pengguna apabila mereka mendapat dokumen, surat atau sebarang tugasan kedalam 'Pigeon Hole'.

ABSTRACT

Nowdays, at office or university has facilities pigeon hole to put any assignment, letter or any important document. This Pigeon Hole is a device where users submitted all assignment and any documents inside. Today, cellular phone is be the one important sytem that used to mae connection with people. Besides that, GSM is a communication network where cell phone connecting between us by pointed for cells in the direct neighbouring area. Therefore, creates Development of Intelligent Pigeon Hole Using GSM. This project provided a system based on notify the user when any document arrived inside into pigeon hole. Development of Intelligent Pigeon Hole Using GSM will notify the users when they received any item inside pigeon hole via short message system (SMS). This system will get notification when any document inside through pigeon hole and Infrared sensor will detect a signal. When the document through the sensor the system will send short message system (SMS) to owners with GSM modem to the number that been program in the system. Then, based on LCD will display the message on the pigeon hole. Therefore, this system will automatically notify the users when they got a document, letter or any assigment inside pigeon hole.

DEDICATION

Special dedicated,

To all my beloved family,

To my lovely supervisor,

To all my friends,

Thanks for your support, help and understanding

May Allah bless of all you.

ACKNOWLEDGEMENT

Alhamdulillah, the greatest thanks to Allah S.W.T because with all His Majesty, I finally finishing and completing this project successfully.

Firstly, thanks for my lovely supervisor Madam Aziean Binti Mohd Azize for her guidance, knowledge, support and also experience was his sharing throughout the progress and process to completing my final year project.

Deepest appreciation and also thanks to my parents and my friend for their cooperation, suggestion, idea and the full support from the beginning until completing of this final year project.

Lastly, thanks to all my lecturers and also to all individual who has directly and indirectly help and have give their time to help me when I need some advice on this project.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

PIC	=	Programmable Integrated Circuit
LCD	=	Liquid Crystal Display
LED	=	Light Emitter Diode
GSM	=	Global System for Mobile Communication
SMS	=	Short Messaging System
IR	=	Infrared Sensor
GND	=	Ground
GPRS	=	General Packet Radio Service
TTL	=	Transistor-transistor Logic
SCI	=	Serial Communication Interface
NRZ		Non-to-Return Zero

CHAPTER
INTRODUCTION

1.0 Introduction

This project entitled development of intelligent pigeon hole using GSM. As we know, the uses of pigeon hole are the norm for such places of learning like universities, colleges, offices and others. Upon receiving a letters, new mails or assignments submitted by the students in their respective pigeon hole, most lectures does not have notify that got a new mail. Then, it make the owners usually checking about their pigeon hole content. The state of the combination of electronic technology is integrated into these predictable post box as a answer. With this project, it will raise the standard of a pigeon hole that is already available and is intended to make it easier to use by the lecturers.

Besides, a pigeon hole commonly referred to as a pigeon hole or pidge, a cubbyhole (often shortened to "cubby") or simply as a mailbox in some academic or office setting. Then, it also an internal mail system commonly used for communication in organizations, workplace and educational institutes in the United Kingdom and other countries. By 1789, the arrangement of compartments in writing cabinets and offices used to short and file documents had come to be known as a pigeon hole because of their resemblance to the pigeon hole[1].

Development of intelligent pigeon hole using GSM is the process to upgrade the existing pigeon hole. With the combination of electronic part such as IR Sensor, PIC 16F877A microcontroller and GSM module can be built-it by alert the owners

when they got received a new mail every time. This system sending short message system (SMS) to alert the owners that they have a new mail inside their pigeon hole.

By built-it this project can make the owners of pigeon hole always alert when received a new mail. Otherwise, the owners can stay at their room then waiting any document insert into their pigeon hole.

1.1 Project Background

This project "Development of Intelligent Pigeon Hole using GSM" is a pigeon hole hardware that was designed to facilitate the lectures to know if the letters is in without having trouble to check manually their pigeon hole. It does operate by sending Short Message System (SMS) to inform the user arriving any document. This system is more efficient where it also send alert if the users pigeon hole is full. Then, the system will send a notification to a user to take out the letter. This part will be using IR sensor where it can detect the range in the pigeon hole. It operates when paper insert into pigeon hole and trace the IR sensor. Lastly, the system automatically notify the owner by sending SMS through GSM modem to the number that had been record to the system, so that react when receiving detection in the pigeon hole. so, the owner will automatically alert when they get a letter.

1.2 Objective

There are several objectives that will be the goal need to achieve which are:

i. To improvise the pigeon hole system in aspects of monitoring system.
ii. To develop an intelligent pigeon hole which uses Global System for Mobile Communication modem to send SMS to the owners
iii. To interface the GSM modem with the programmable Interface Controller (PIC) and IR sensor.

1.3 Problem Statement

Mostly, at offices, colleagues and universities have pigeon hole. The owners must regularly checking about content inside their pigeon hole. So, there are several problems that have been identifying in these projects. Firstly, the owners regularly checking their pigeon hole to know about the content inside where received any mail or not.

Next, wasting users time of pigeon hole far it might be take time to users collect new item received inside. Lastly, inconvenience if the users forgot the mail inside the pigeonhole, the mail will be there as long as the users remember to check it. It will lead to inconvenience if the mail is an important one. Besides that, always the owner forget and ignoring about important letter they received in their pigeon hole then may this situation complicated later on such as students claim to have submitted their assignments but the truth they did not. In order to reduce this dilemma, this project is built to replace the conventional post box as the solution to notify user through Short Messaging System (SMS).

1.4 Scope of Project

Development of Intelligent Pigeon Hole using GSM is an innovation of monitoring the mail in the office or house. The scopes of this project consist of hardware and software. The basic idea is to monitoring software and the main part of the hardware is the SIM900A GSM Modem, PIC 16F877A and infrared sensor (IR) system.

The development of the alert notification system utilizes the programming of the control system, in this case was used Microcontroller PIC16F877A acts as the main process that it control the system when the input gives signal until it produce an output. The microcontroller will decide what information will be send to the user.

A two way transmission between users and PC16F877A Microcontroller will be established. The GSM Modem will sending notification via short messaging service (SMS) to user about the mail arrived. The hardware sensor circuit that is developed consists of IR sensor to detects a mail is presence in the pigeon hole or not.

1.5 Project Limitation

There are a few limitations regarding this project. First of all, development of intelligent pigeon hole using GSM does not provide the database for the data, so it just can get the message from the Infrared sensor (IR) in pigeon hole when it received the mail or any document. Second, this system just covers when the letter received at the pigeon hole. Moreover, because the limit of budget and time to executed this project perfectly, the project may have some weakness or lacking.

CHAPTER 2
LITERATURE REVIEW

2.0 Introduction

The chapter are refer on information that obtained from various sources, articles, technical reports, general reports, websites, books and personal communication. It will also review the concepts of this project as to assist its overall implementation. In developing the current system, some researchers are required. This is to get some information and to find what the existing system can do and to know the weakness. From the weakness, some enhancement can be done to make the project more effective in solve the user's problem.

2.1 Mailing History

Mail is part of a postal system wherein written documents, typically enclosed in envelopes, and also small packages, are delivered to destinations around the world. So, anything sent through the postal system called mail or post. In today's world mailing system not only consisting of conventional mail system or postal system but also electronic mail or known as email.

History had shown that the earliest day of postal mail service had in Egypt (2000 BC), China (1000BC), Persia (500 BC) and India (300 BC) [2]. However, it is believed that the first well documented postal service is that of Rome. Besides, in late 1990's the email has dominant the mailing system which always faster than postal system and also cheaper for users to communicate thought the world. In

addition, ancient people were using pigeon as their messenger. They were using homing pigeons for pigeon post. This bird has the quality to able to find his way home due to a particularly developed sense of orientation whenever it taken far from its nest. So that, the revolutions on mails have been drastic yet the usage of the conventional mailing system is widely practice thought out the world. Most of our important and official documents are sending by the conventional way. The centralize mailbox system is as shown in figure 2.1 below.

Figure 2.1: Centralize mailbox

This research has found a new revolution in using newer technologies to alert the users on the event a mail is delivered, especially through the short message service (SMS) and email.

2.2 Previous project GSM-SMS Based Monitoring

With the wide spread use of cellular networks, this approach is also popular when small amount of data is to be transferred through the network. In this part, it involve in finding information about fundamental related to this project. This includes materials such as text books, journal, manual, websites and catalogs.

2.2.1 Intelligent Mailbox System with Automatic Deliver Notification

Bindu Sebastian, Mashitha, Meghana, 2015. The project aims in designing an intelligent mailbox system which is capable of automatically sending information about mail to user and delivery notification to courier officials using GSM and RFID technology. The efficient use of dc motor for opening and closing of mailbox can provide security to the system. To design the entire system we require a microcontroller which acts as a medium of communication between the RF reader and the GSM modem.

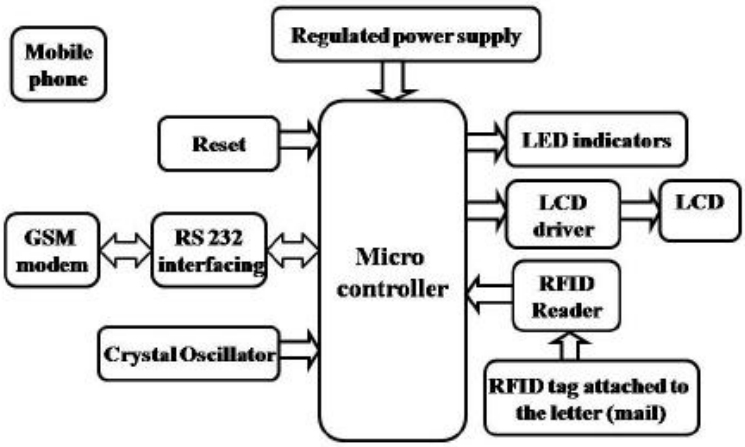

Figure 2.2: Block diagram of Intelligent Mailbox System with Automatic Deliver Notification

Based on figure 2.2, shown the block diagram of Intelligent Mailbox System with Automatic Deliver Notification. The advantage of this system is the presence of the GSM modem enables the device to communicate with the receiver no matter where ever he was present on the globe (GSM availability). Mailbox is a hardware system managing the mail inside the box itself. It is designed with sensor equipped inside to detect all the mail that goes in and from the sensor it will send the information into the panel display inside the house to notify resident about the mail availability [3].

2.2.2 Analysis on RFID - GSM Enabled Intelligent Transfer System

NareshVurukonda, Dr.B.ThirumalaRao and Dr.N.SambasivaRao, 2014. RFID is the future technology for postal, courier and high volume light logistics. Though the percentage of mail delivery errors in postal services is relatively small, most of us have encountered them now and then. Mail arrives late, to the wrong address or does not show up at all. The Finnish national post office "Itella" reports that their delivery error rate is about 1%. Customers make about 18,000 missing item inquires annually of which about half can be solved. To design the entire system we require a microcontroller which acts as a medium of communication between the RF reader and the GSM modem. The major advantage of this system is the presence of the GSM modem enables the device to communicate with the receiver no matter where ever he was present on the globe [4].

2.3 Existing System Review

There are three systems that have been chosen during this research. There are notifications system for pigeonhole using online telegram messenger and Smart Mailbox.

2.3.1 Notification system for pigeonhole using online Telegram messenger

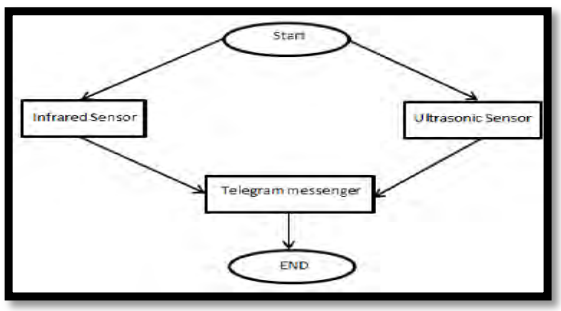

Figure 2.3: General system flowchart