SMART AUTO-COLLECT PARCEL

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FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

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This thesis is dedicated to my beloved mother

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ABSTRACT

Nowadays, people opted to choose online shopping instead of going to the store to avoid the hassle of going through the traffic jam, finding the parking space and mall that pack with people. The problem with online shopping is when the courier sends the parcel but no one available at the house due to working or outing. The parcel then will be send back to the courier's main centre waiting for the recipient to take it there. A solution is proposed to solve this problem where the courier can deliver the parcel safely in the Smart Box by entering the tracking number ID of the parcel to unlock the door. The weight sensor will detect whether there is an item received or not. When the item is placed inside the Smart Box and the door is in a closed condition, the LCD screen will display the recipient's identity number so that the postmen can take the information. This system is designed to make a human's life easier without need to go to the main centre to pick their parcel in case they missed the receiving process of parcel.

ABSTRAK

Pada masa kini, masyarakat kini lebih cenderung untuk membeli-belah diatas talian daripada pergi ke kedai itu sendiri untuk mengelak daripada kerumitan melalui kesesakan lalu lintas, mencari ruang letak kereta dan pusat membeli-belah yang penuh dengan orang. Masalah dengan membeli-belah diatas talian adalah apabila kurier menghantar bungkusan barang tetapi tiada sesiapa yang berada di rumah kerana bekerja atau bersiar-siar. Bungkusan barang itu kemudiannya akan dihantar semula ke pusat utama kurier tersebut dan menunggu penerima untuk mengambil ianya di sana. Satu jalan penyelesaian telah dicadangkan untuk menyelesaikan masalah ini di mana kurier boleh menyampaikan bungkusan dengan selamat di dalam Peti Smart dengan memasukkan nombor jejak id bungkusan itu untuk membuka pintu Peti Smart. Sensor berat akan mengesan sama ada terdapat bungkusan barang diterima atau tidak. Apabila terdapat bungkusan yang diletakkan dalam Peti Smart dan pintu berada dalam keadaan tertutup, skrin LCD akan memaparkan nombor identiti penerima supaya kurier boleh mengambil maklumat . Sistem ini direka untuk menjadikan kehidupan manusia lebih mudah tanpa perlu pergi ke pusat utama untuk mengambil bungkusan jika mereka terlepas daripada proses penerimaan bungkusan.

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LIST OF ABBREVIATIONS

IoT	-	Internet of Thing
PHP	-	Hypertext Pre-processor
Apk	-	Android packet kit
Id	-	Identification

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CHAPTER 1

INTRODUCTION

This chapter gives an overall overview of the project which including problem statement, objectives, significance of study and scope of the project.

1.1 Background of the Project

Courier service playing an important role in sending a package of goods or item in an envelope travel around the world. Documents or goods that are sent through the postal system is usually called mail or parcel.

When the courier sends the parcel and the customer are available, the parcel will be received without any problems, and the courier can get the information needed on that time. But if the courier sends the parcel and the customer are not available, the parcel will be return to their main centre to wait for the customer to take it by their selves.

These will force the customer to spend their time, energy and money to go to the courier's main centre to pick up their parcel on their own. It is becoming worst when someone who is busy like the one who works on government or private sector. They only have a less time to go for lunch and to take the parcel and facing with the jammed.

1.2 Objectives of Project

The objectives of the study are:

(a) To create an application software of auto-collect parcel by using Android Studio.
(b) To design and create an auto-collect parcel box based on Arduino micro-controller.
(c) To implement the IoT in the system and hardware.

1.3 Scope of Project

The scope of this project is:

(a) This project is only for a prototype, to show how the system works and the material for the box will not meet the security requirement.
(b) This project will use the Arduino as the micro-controller, and Arduino Wi-fi module for wireless network and several sensors for the system to function.
(c) This project will only focus on most popular couriers in Malaysia such as Poslaju, GD Express, and DHL.
(d) Only Android Studio will be used to create the software application.
(e) It is only available for Android operating system.
(f) The Smart auto-collect box only can receive one parcel in a time.

1.4 Project Structure

The main system of project can be divided to several main parts:

(a) Microcontroller – The brain of the system that control the input and as well the output of the system.

(b) Keypad – Sensor that to receive an input from the user to be processed through the microcontroller.
(c) Wi-fi module – Sensor to connect to the Wi-fi connection.
(d) LCD screen – For display purpose.
(e) Weight sensor – Sensor that detect a weight.
(f) Magnetic lock – A magnetic solenoid lock that function as a lock.

1.5 Problem Statement

This project is to make life much easier especially a person that loves online shopping. But, the problem comes when the courier sends the parcel and we are not available in the house due to working or even outing. This is because, when there is nobody in the house, the parcel will be send back to the courier's centre waiting for the recipient to take it there.

Due to this problem, solutions are needed to overcome or further improve the conventional method to the modern method. When the parcel reaches the customer's house and they are not available due to working or outing, the courier staff still can put the parcel safely in the smart auto-collect parcel box by entering the tracking number of the parcel or package using the keypad to open the door box. After the item has been placed, the box will sense the load to check whether there is a parcel received or not. If the parcel is received than the courier will received the customer's identification number shown in the LCD as it shows that the customers already received the item. But if it does not receive the parcel, it will not show the customer's identification number. After received the parcel, the box will send a notification to the customers that the parcel has been received.

This will make the customer's life much easier as they not need to go to the courier's main centre to pick up their parcel. It is obviously will save both staff and customer's time, liability and can avoid the package from being clutter or expired.

1.6 Design of the Project

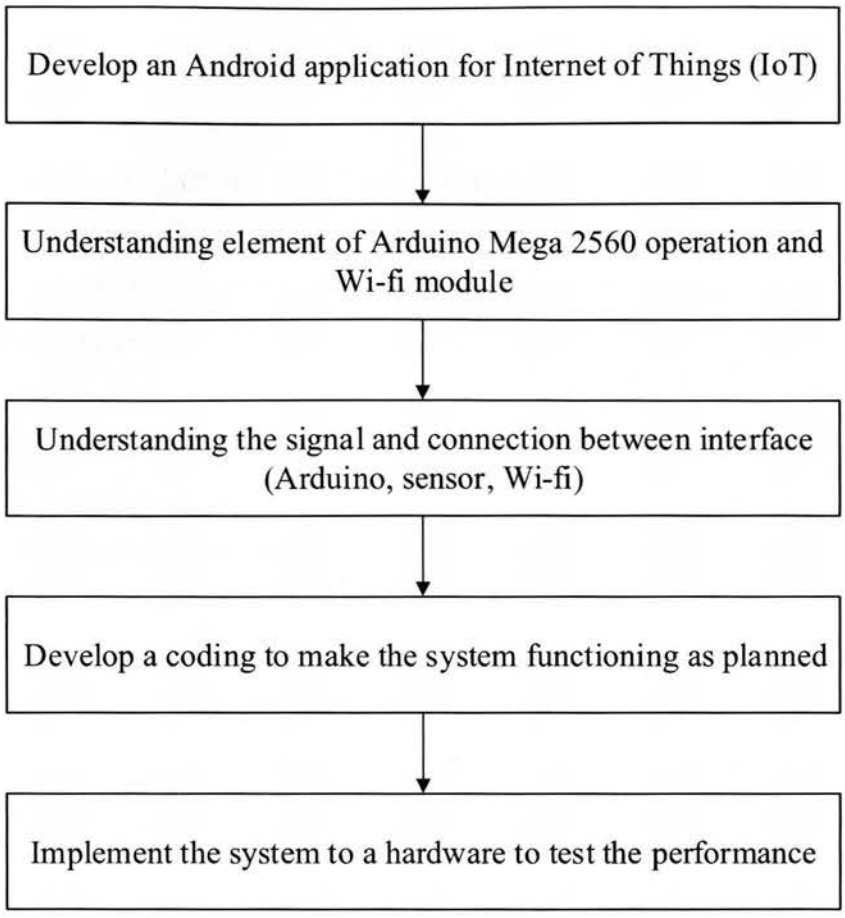

Figure 1.1: Flowchart of the project

This research is to provide an alternative way by using the technologies incorporated with the mailbox as a solution. When the courier staff already put the parcel inside the Smart Box, the system will update the server so that the customer can check whether there is a parcel received or not.

Mobile phone is a device that will be used to communicate with the Smart Box as the IoT is implemented. It can be used to manage the number tracking ID's, to check whether parcel has been received or not, and open close the Smart Box door.

The monitoring can be done in unlimited range of distance as long there is an Internet connection available for both mobile phone and Smart Box.

1.7 Thesis Outline

This report contains five chapters that will elaborate more details about the project Smart Auto-collect Parcel. The first chapter is about the introduction where overview of the project which is project background, objectives, scope, structure and summary of the project.

The second chapter is about the literature review. This chapter will discuss about the information from various source of references before proceeding with the project. Besides that, this part also discusses about the current study of the project.

The third chapter is about methodology. Methodology is chapter that will explain more detail about the methods and techniques that have been used in this project. In other words, this chapter will give detail information about the hardware, software, and experimental procedures that will be used.

The fourth chapter is about the results and discussion. This chapter will discuss more details on the results acquired from the project.

The fifth chapter is about the conclusion and recommendation. This chapter will briefly explain about the recommendation for future work of the project and the conclusion of the project.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Before proceeds with the project, a knowledge of existing technologies is very important. There are many projects related to mine can be found through various sources such as Internet, book, journal, paperwork and Magazine about the Auto-collect Parcel. This chapter focusses on the existing technologies and knowledge to complete the project.

2.2 Related Project

Below is a several projects that related to mine that has been build and developed worldwide.

2.2.1 Multi-functional Parcel Delivery Locker System

This project is using both combination of *RFID* card and *password* based for the security. When the proximity sensor detects the card nearby, it will signal and light up the indicator. This is because the user can't unlock the locker if there is no matching RFID card nearby. Besides that, the messaging technology is based on GSM when there is a case someone else unlock the locker. What happen is, the lock will automatically send the unlock test message to the cell phone of the owners, and the cell phone owners forward this text message to GSM which completes the phone number identification and verification. This method requires the sending of message from cell phone to GSM again, causing unnecessary troubles and SMS charges. [1]

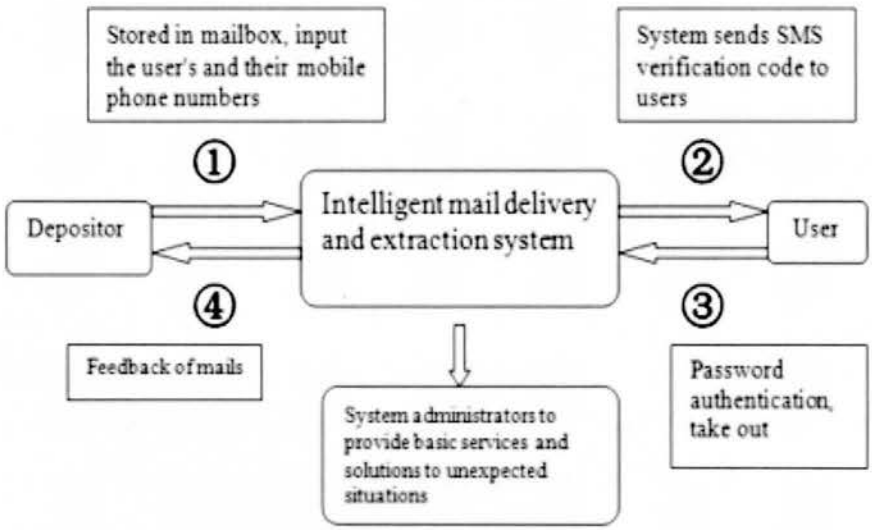

Figure 2.1: Flowchart of the Multi-functional Parcel Delivery Locker System [1]

This system requires a user ID. The size of boxes appears on the screen. After choosing the size, one can open a box randomly, then scan the bar code of the parcels on the LCD screen, and the generated password is immediately sent to the recipient