

Universiti Teknologi MARA

Wi-Fi-enabled Parcel Box Using Arduino

Ahmad Syahir Bin Shahrin

**Proposal submitted in fulfilment of the requirements for Bachelor of
Computer Science (Hons.) Data Communication and Networking.
Faculty of Computer and Mathematical Sciences**

January 2019

ACKNOWLEDGMENT

“In the Name of Allah, Most Gracious and Most Merciful”

Alhamdulillah, praises and thanks to Allah because of His Almighty and His utmost blessings, I was able to finish this research within the allocated timeframe. Firstly, I would like to thank my supervisor, Dr. Siti Arpah binti Ahmad, and Dr. Kamarularifin Abd Jalil for the ideas, patience, motivating advices, constructive criticism, morale support and willingness in guiding me throughout every phase towards the completion of this thesis.

Special appreciation also goes to my beloved parents and my whole family especially my mother, for her understanding and support both financially and morally which have helped me very much in completing the given task.

Finally, I would like to express my gratitude to all my lecturers and fellow classmates that were involved in the discussions, sharing of ideas and knowledge. The significance of their contributions is not to be understated and will always be remembered.

May Allah S.W.T bless all of you. Thank You.

ABSTRACT

Receiving parcel at home can be an inconvenience task as many would admit that having to be at home to accept a parcel in person whereby the specific time of arrival is unknown making for an overall inconvenient experience. The project, Wi-Fi-enabled Parcel Box aims to be a simple and cost-effective demonstration on one of the ways to remedy the situation. It is a standalone, special-purpose local web server that controls the parcel box door lock that can be used to receive parcel that requires acknowledgement when there is no one home to receive it. Acknowledgement is sent through SMS from the GSM module of the Parcel Box to a destination number keyed-in by the delivery person upon delivery. Wi-Fi-enabled Parcel Box also implements login to authenticate the owner to distinguish client authorized in operating the door lock. Clients are only required to have an 802.11-capabled device and modern web client, both of which are available as a standard on most phones produced today effectively lowering the barrier on utilizing this implementation.

TABLE OF CONTENTS

	Page
SUPERVISOR APPROVAL	ii
STUDENT DECLARATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENT	vi
LIST OF FIGURES	ix
LIST OF TABLES	xii
CHAPTER ONE: INTRODUCTION	1
1.1 Introduction.....	1
1.2 Background of Study.....	1
1.3 Problem Statement.....	1
1.4 Research Question.....	2
1.5 Objectives.....	2
1.6 Scope.....	3
1.7 Significance of Study.....	3
1.8 Summary.....	3
CHAPTER TWO: LITERATURE REVIEW	4
2.1 Introduction.....	4
2.2 Internet of Things.....	4
2.2.1 Concept.....	4
2.2.2 Application.....	6
2.2.2.1 Consumer Application.....	6
2.2.2.2 Infrastructure Management.....	9
2.2.3 Challenges in Adoption.....	10
2.3 Platform and Modules.....	12
2.3.1 Arduino.....	12
2.3.2 Raspberry Pi.....	14
2.3.3 BeagleBoard.....	16
2.3.4 Comparison of Platform.....	17
2.3.5 ESP8266 (Serial Wi-Fi Module).....	18
2.4 Existing Solutions and Related Works.....	19
2.4.1 Smartbox™.....	19
2.4.2 Brizebox™.....	21

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter will discuss on the background of study, problem statement, research question, objectives, scope and significance of the study.

1.2 Background of Study

Mankind has always been on the lookout for inventions that improve quality of life. One of such invention is courier service. Courier service has been around for at least a few centuries to meet the demand for transporting mails and parcels so that they can reach their destination efficiently and economically. Couriers are distinguished from ordinary mail services by features such as speed, security, tracking, signature, specialization and individualization of express services, and swift delivery times, which are optional for most everyday mail services.

Modern day parcel delivery service is unparalleled in term of timeliness, safety and reliability. Because of these reasons, courier service has become popular mean to deliver items for business and even personal purpose. Almost every conceivable item has been eligible for delivery but the most common would be small to medium-sized parcel that makes up more than half of the bulk.

Registered parcel allows for tracking of the current transit status of sent parcel. Parcel of this type requires a person at the intended destination to receive and acknowledge the transaction verbally or through other reasonable mean. With so much convenience provided by this service, it begs people to ask if there is anything more left to be desired in this area.

1.3 Problem Statement

With online shopping is all the craze, it is inevitable that demand for courier service is at its highest as online sellers ought to deliver their customers' orders using courier service as they are currently the most efficient and economical solution.