Faculty of Electrical and Electronic Engineering Technology

DEVELOPMENT OF A MAILBOX NOTIFICATION SYSTEM WITH SOLAR BATTERY CHARGING BASED ON IOT

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Bachelor of Electrical Engineering Technology (Industrial Power) with Honours

2022

DEVELOPMENT OF A MAILBOX NOTIFICATION SYSTEM WITH SOLAR BATTERY CHARGING BASED ON IOT

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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

2022

UNIVERSITI TEKNIKAL MALAYSIA MELAKA
FAKULTI TEKNOLOGI KEJUTERAAN ELEKTRIK DAN ELEKTRONIK

BORANG PENGESAHAN STATUS LAPORAN
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Tajuk Projek : DEVELOPMENT OF A MAILBOX NOTIFICATION SYSTEM WITH SOLAR BATTERY CHARGING BASED ON IOT

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DEDICATION

This project is devoted to me as an engineering student, and it is the first of my projects that I am studying and attempting to accomplish. It is also grateful to my beloved mother and father, Hazizian bt Mohd Zain and Mohd Sidek bin Mohd Hassan who taught me that even the most difficult life, inshaALLAH can be accomplished if completed one step at a time and with patience.

ABSTRACT

The Smart Mailbox, which aims to make users more aware of the presence of critical alerts and messages in their current mailboxes, particularly the centralised mailbox, was designed and studied in this study. This project's problem statement is They have lost important letters, invoices, and documents, and have even missed key deadlines, as a result of their negligence and forgetfulness in checking their email. This occurs because the citizens lack a new remedy or updated technology to address the problem. The goal of this project is to create a smart mailbox notification system, develop solar battery charging, and evaluate the efficiency of the notification system and solar battery charging. The main components used in this project are an IR sensor and a blynk application. The IR sensor detects mail or small parcels, and the blynk application function is to receive notification and a count from the blynk apps, which count how many letters are inside the mailbox. Based on the analysis data, this project will successfully achieve all of its objectives, and notifications from the Blynk apps will be received in less than 4 seconds.

ABSTRAK

Peti Mel Pintar, yang bertujuan untuk menjadikan pengguna lebih sedar tentang kehadiran makluman dan mesej kritikal dalam peti mel semasa mereka, khususnya peti mel berpusat, telah direka bentuk dan dikaji dalam kajian ini. Penyataan masalah projek ini ialah Mereka telah kehilangan surat penting, invois dan dokumen, malah telah terlepas tarikh akhir penting, akibat daripada kecuaian dan kealpaan mereka dalam menyemak e-mel mereka. Ini berlaku kerana rakyat kekurangan ubat baru atau teknologi terkini untuk menangani masalah tersebut. Matlamat projek ini adalah untuk mencipta sistem pemberitahuan peti mel pintar, membangunkan pengecasan bateri solar, dan menilai kecekapan sistem pemberitahuan dan pengecasan bateri solar. Komponen utama yang digunakan dalam projek ini ialah penderia IR dan aplikasi blynk. Penderia IR mengesan mel atau bungkusan kecil, dan fungsi aplikasi blynk adalah untuk menerima pemberitahuan dan kiraan daripada aplikasi blynk, yang mengira bilangan huruf di dalam peti mel. Berdasarkan data analisis, projek ini akan berjaya mencapai semua objektifnya dan pemberitahuan daripada aplikasi Blynk akan diterima dalam masa kurang daripada 4 saat.

ACKNOWLEDGEMENTS

First and foremost, I want to thank my supervisor,En Adam bin Samsudin, and my co-supervisor, Dr. Mohd Hatta bin Jopri, for providing me with a solid logistical guide while enforcing the assigned project. He has always been there to help me with my assignment. I'd also like to thank him for his valuable counsel, direction, and encouragement. This encouraged me to be more daring in attempting new things.

Second, I'd want to thank my family members for supporting me throughout my four years of studies at Universiti Teknologi Malaysia Melaka (UTeM). Special thanks to the FTKEE staff for their invaluable assistance in completing this project.

Last but not least, I would like to thank all my classmates and all who have offered me their helping hand for millions of items.
Thank you.

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LIST OF SYMBOLS

Pm	-	Maximum power in watt
G	-	Irradiance
Ac	-	Surface area of solar in meter square

LIST OF ABBREVIATIONS

V	-	Voltage
W	-	Power
A	-	Ampere

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This study designed and studied the Smart Mailbox, which aims to make users more aware of the presence of vital alerts and messages in their current mailboxes, particularly the centralized mailbox. The project's goals are to produce, help users, and evaluate the project's success in resolving problems. The emergence of electronic mail has resulted in people forgetting to inspect their physical mailboxes owing to their busy schedules (e-mail). These conditions have been one of the key reasons of the loss of critical notifications or messages, as well as other concerns, due to their insensitivity to the existence of such warnings un the first place. Residents in residential areas near the city, notably in flats, condos, and shopping Centre lots, often lose mail and are unaware of its existence in the mailbox, according to the results of a study done on them [1]. The Smart Mailbox is fitted with a high-sensitivity sensor and an Esp 8266 to address these problems.

1.2 Background

As time passes, people get preoccupied with everyday issues because of their own distinct reasons and responsibilities, but some of them are unable to relax at all, resulting in stress. Stress has a higher impact on focus and attention than memory, according to the study. This, however, may hamper men's ability to recall new information. Other issues and thoughts will distract the mind, which it will then forget. As a result, people are badly impacted, with the risk of harmful side effects on other things. Males need regular reminders due to their penchant for forgetting, and most individuals require a lot of prodding at first, but gradually gain enough momentum that finishing what has to be done becomes a habit, not an exception.

People like simple things because technology has become so engrained in society that it is impossible to disconnect from it. According to Rescue Time, an iOS and Android app that tracks phone use, individuals spend an average of three hours and fifteen minutes on their phones every day, with the top 20% spending upwards of four and a half hours [1]. Every person checks their phone 58 times a day to send or receive text messages or to check email. Consumer productivity may be boosted by using applications on mobile phones (apps).

1.3 Problem Statement

According to surveys and research done mostly in targeted areas such as flats, condos, and shopping Centre lots, most inhabitants (80%) have encountered the same issue [1]. Due to their negligence and forgetfulness in checking their email, they have lost crucial letters, invoices, and documents, and have even missed key deadlines. This occurs because the citizens lack a fresh remedy or updated technology to address the issue they are experiencing.

Delivering mail door-to-door caused the postman to stand and wait for long periods of time, which exposed delivery companies' inefficiencies. Traditional mailboxes are prone to weather patterns that may cause mail damage or shredding, which is a problem with traditional mailboxes. Most notably in Malaysia, where the climate is tropical, hot, muggy, and wet all year round. When it comes to rainfall, it's hard to find a place with less than 2000 millimeters (79 inches) every year or fewer than 100 millimeters (mm) per month (4 inches). Postal deliveries have been halted because of the present situation.

Furthermore, conventional mailboxes were not built to accommodate today's delivery requirements. As e-commerce has grown in popularity, more pricey things are being delivered to your doorstep. It may be inconvenient if mail, papers, and other items go missing or are stolen. Couriers waste time and money on failed delivery efforts, and merchants must deal with irate customers or replace stolen items, as well as deal with extra delivery vehicles on the road, which adds to traffic congestion in the city. Some folks find that traditional mailboxes are sufficient for their purposes.

Regardless of the issue, it stimulates researchers to do study to build a Smart Mailbox or system. This mailbox is ideal for people who have a hectic work schedule that prevents them from being home during deliveries, who often forget to check their mailbox, and who are interested in high-tech gadgets.

1.4 Project Objective

The objective of conducting this project is to determine the difficulty that people in Malaysia are having with their present mailbox. After determining the source of the issues, strive to come up with a solution that will assist consumers increase their productivity throughout the day.

a) To design a smart mailbox notification system.

b) To develop solar battery charging system.

c) To analyze the efficiency of the notification system and solar battery charging.