POLITEKNIK MELAKA

SMART IOT EMERGENCY ASSISTANCE FOR ELDERLY USING ESP32

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JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2025

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This report submitted to the Electrical Engineering Department in fulfillment of the requirement for a Diploma in Electronic Engineering (Control)

JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2025

CONFIRMATION OF THE PROJECT

The project report titled "Design a Fingers Exergame to Improve Fine Motor Skill for Autistic Children Using Arduino" has been submitted, reviewed, and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

Checked by:

Supervisor's name : M CHANDRAN A/L MARUTHAN

Supervisor's signature:

Date :

Verified by:

Project Coordinator name : Dr. ROSNANI BINTI AFFANDI

Signature of Coordinator :

Date :

"I acknowledge this work is my own work except the excerpts I have already explained to our source"

1. Signature :

Name : **DHANESH MUTHALIAR A/L ARUMUGAM MUDALIAR**

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Date :23/10/2025

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : SMART IOT EMERGENCY ASSISTANCE FOR ELDERLY USING ESP32

SESSION: 1 2024/2025

1. I, **1. DHANESH MUTHALIAR A/L ARUMUGAM MUDALIAR[11DJK23F1007]**.

   is a final year student of **Diploma in Electronic Engineering (Control), Department of Electrical, Politeknik Melaka**, which is located at **No 2 Jalan PPM 10, Plaza Pandan Malim , 75250, Melaka**. (Hereinafter referred to as 'the Polytechnic').

2. I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.

3. I agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the **Diploma in Electronic Engineering (Control)** to me.

Made and in truth that is recognized by;

a) **DHANESH MUTHALIAR A/L ARUMUGAM MUDALIAR**) .
(Identification card No: - [redacted]) ....…….
) **DHANESH MUTHALIA A/L ARUMUGAM MUDALIAR**

In front of me, M CHANDRAN A/L MARUTHAN [redacted]) .....……
As a project supervisor, on the date:) M CHANDRAN A/L MARUTHAN

ACKNOWLEDGEMENTS

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ABSTRACT

As the elderly population continues to grows , many individuals live alone ,increasing their risk during emergencies such as sudden illness, medical complications or other critical situations. Traditional emergency systems often require manual operation, which may be difficult for elder users in urgent moments. This project come up with the development of an Smart IoT Emergency Assistance System for the Elderly using ESP32, designed to provide a simple and efficient way for elderly individuals to call for help. The system uses a remote button that, when pressed, triggers the ESP32 to send an instant emergency alert message via Telegram to caregivers or family members. Additionally, the system integrates a DHT11 temperature sensor to monitor room temperature and display the readings on both an LCD display and the Blynk IoT application. When a high temperature is detected, the buzzer is activated and a warning message “Keep Hydrated” appears on the display. Furthermore, a push button feature is added to enhance communication feedback, when the user presses the button once, a “ Message Acknowledged” notification is sent to the Telegram bot, and when the button is held for three seconds, a “I’m Not Feeling Well” alert is sent. The proposed system aims to improve safety, enable faster response in emergencies, and provide comfort and peace of mind to both the elderly and their families by utilizing IoT technology in a practical and user-friendly way.

ABSTRAK

Ketika populasi warga emas terus berkembang, ramai individu tinggal bersendirian, meningkatkan risiko mereka semasa kecemasan seperti sakit secara tiba-tiba, komplikasi perubatan atau situasi kritikal yang lain. Sistem kecemasan tradisional sering memerlukan operasi manual, yang mungkin sukar bagi pengguna warga emas dalam saat-saat mendesak. Projek ini menghasilkan pembangunan Sistem Bantuan Kecemasan IoT Pintar untuk Warga Emas menggunakan ESP32, yang direka untuk menyediakan cara yang mudah dan cekap untuk warga emas meminta bantuan. Sistem ini menggunakan butang jauh yang, apabila ditekan, mencetuskan ESP32 untuk menghantar mesej amaran kecemasan segera melalui Telegram kepada penjaga atau ahli keluarga. Di samping itu, sistem ini mengintegrasikan sensor suhu DHT11 untuk memantau suhu bilik dan memaparkan bacaan pada paparan LCD dan aplikasi Blynk IoT. Apabila suhu tinggi dikesan, loceng diaktifkan dan mesej amaran "Kekal Terhidrat" muncul pada paparan. Tambahan pula, ciri butang tekan ditambah untuk meningkatkan maklum balas komunikasi, apabila pengguna menekan butang sekali, pemberitahuan "Mesej Diakui" dihantar ke bot Telegram, dan apabila butang ditahan selama tiga saat, amaran "Saya Tidak Rasa Sihat" dihantar. Sistem yang dicadangkan ini bertujuan untuk meningkatkan keselamatan, membolehkan tindak balas yang lebih pantas dalam kecemasan, dan memberikan keselesaan dan ketenangan fikiran kepada warga emas dan keluarga mereka dengan menggunakan teknologi IoT secara praktikal dan mesra pengguna.

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LIST OF ABBREVIATIONS

ESP32 : Espressif Systems 32-bit Microcontroller

IoT : Internet of Things

LED : Light Emitting Diode

LCD : Liquid Crystal Display

DHT11 : Digital Humidity and Temperature Sensor

CHAPTER 1

INTRODUCTION

1.1 Introduction

Elderly people who live alone are more susceptible to emergencies. A prompt and easily available response system is necessary since ageing raises the risk of health problems, falls, and panic attacks. In dire circumstances, traditional techniques like phoning for assistance may not always be practical. The Smart IoT Emergency Assistance for Elderly using ESP32 aims to address this issue by providing an efficient and reliable emergency alert system. The system uses a remote button that, when pressed, triggers the ESP32 to send an instant Telegram aler**t** to caregivers. Additionally, it monitors room temperature through a DHT11 sensor, displaying the data on an LCD screen and the Blynk app **.** Furthermore, a push button feature is added to enhance communication feedback, when the user presses the button once, a " Message Acknowledged" notification is sent to the Telegram bot, and when the button is held for three seconds, a "I'm Not Feeling Well" alert is sent .By utilising modern IoT technology, this project enhances elderly safety, ensures faster response during emergencies, and promotes independent living.

1.2 Background Research

Elderly individuals who live alone are often at higher risk during emergencies. As ageing increases the likelihood of health issues, falls, and panic attacks, a fast and reliable response system is crucial. Traditional methods such as phone calls for assistance may not always be effective, especially when the elderly person is unable to communicate or reach a device. To overcome these challenges, the Smart IoT Emergency Assistance for Elderly using ESP32 introduces a remote-based emergency alert system. When the button is pressed, it instantly.

1.3 Problem Statement

Older people living on their own run into real problems when it comes to getting fast help in emergencies. Things like a sudden sickness or a fall or even a panic attack can hit hard. Current alert systems out there tend to cost a lot. They can be tricky to figure out. Plus they often do not fit what elderly folks really need. During those tough moments, reaching for a phone or even talking to someone for assistance gets difficult. That delay means medical care takes longer to arrive. So there really is a push for something straightforward and cheap. It should be dependable too. An IoT setup that lets older individuals trigger alerts without hassle. It could also keep tabs on their health with temperature checks and ways to connect remotely.

1.4 Research Objectives

The main objective of this project is aims to develop a Smart IoT Emergency Assistance System designed for elderly people. The system works to improve their overall safety and help them maintain independence. It does this by providing fast and dependable communication options whenever emergencies arise. More specifically the principle objective of this research are:

1. To design an ESP32 based elderly emergency system with remote button ,DHT11 sensor ,buzzer, push button and lcd display for real time monitoring.
2. To implement an alert system that sends instant notifications through Telegram and Blynk IoT when emergencies or high temperatures occur.
3. To develop a simple interface displaying temperature and alert status on an LCD and Blynk dashboard.

1.5 Scope of Research

1. This project is focusing to create a Smart IoT Emergency Assistance System that will enable elderly people who live alone to receive prompt aid in times of need.
2. The emphasis is on creating a simple and reliable system that allows the elderly to trigger an emergency alert using a remote button, while temperature data and notifications are monitored through Telegram and the Blynk IoT application.
3. The main controller is using ESP32 microcontroller serves as the project's primary controller, handling data transmission to the Blynk and Telegram platforms, buzzer control, and remote button input.

1.6 Project Significance

This project greatly improves the safety, security, and quality of life for older adults, especially those who live alone. In the event of a panic attack, medical emergency, or fall, it guarantees that senior users can quickly notify their loved ones or caretakers. The concept offers older people and their family peace of mind and quicker emergency response by combining IoT technology with a straightforward remote-triggered system. By lessening their dependence on others for prompt assistance in times of need, the approach also encourages independence in senior citizens.

1.7 Chapter Summary

This chapter covered the project's history as well as the growing dangers that elderly people living alone face, particularly in times of emergency. The limitations of conventional emergency response techniques were emphasized in the problem statement. The design, development, and deployment of an intelligent Internet of Things-based emergency call system for senior citizens were the primary goals of the project. The system's functionality, target users and the ESP32 microcontroller's role as the primary controller were all described in the research scope. Lastly, the project's importance highlighted how the system improves senior citizens' and their families'

safety, independence and peace of mind. The literature and current systems that are pertinent to this project will be reviewed in the upcoming chapter.