FMNA SYSTEM (FORGET ME NOT ALERT SYSTEM)

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**PROJEK SARJANA MUDA II**

**Tajuk Projek :** FMNA SYSTEM (FORGET ME NOT ALERT SYSTEM)

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Dedicated to my father, Boon Yen Chu’ung and my mother, Chung Kui Hiong.
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ABSTRACT

People in today’s busy world are constantly in a rush and go about their daily life activities under a lot of pressure and stress. As a result, they get careless which can bring a lot of harm to themselves or their loved ones. There are unfortunate cases of children and pet died or seriously injuries, left in a locked cars for a long period of time without the drivers realizing or remembering. Hence, to overcome this issue, an alert system to increase the level of people’s awareness will be developed. It introduces the creation of a system to prevent or avoid any accidents caused by parents or pet owner who forget their chid or pet in an enclosed vehicles. This system is called FMNA System (Forget Me Not Alert System). It enables the user to be alerted in real time and providing safety for children and pet. Besides, the main objective of this project is to improve the existing system by developing an alert system based on combination of motion sensor, PIC microcontroller, GSM modem and mobile phone. This system is able to send a short message service (SMS) to driver or someone else like parents or relative when detected presences of living object in the vehicle.
Kesibukan dunia sekarang menyebabkan manusia sentiasa terkejar-kejar menunaikan tanggungjawab dan aktiviti harian mereka di bawah suasana yang tertekan. Hasilnya, kecuaian mereka boleh membawa padah yang buruk kepada mereka atau orang yang disayangi. Terdapat beberapa peristiwa yang pahit di mana kanak-kanak dan binatang mati atau cedera teruk kerana tertinggal dalam kereta yang terkunci bagi satu tempoh yang panjang tanpa disedari atau diingati oleh pemandu kenderaan itu. Oleh demikian, bagi mengatasi masalah ini, satu sistem amaran untuk meningkatkan tahap kesedaran pemandu telah dihasilkan. Ia memperkenalkan penciptaan satu sistem yang boleh mencegah atau mengelakkan dari kemalangan yang disebabkan oleh ibu bapa atau pemandu meninggalkan anak atau binatang dalam kenderaan mereka. Sistem ini dikenali sebagai sistem FMNA (Forget Me Not Alert System). Sistem ini boleh memberi amaran secara masa sebenar dan menyediakan keselamatan kepada kanak-kanak atau binatang. Selain itu, objektif utama projek ini adalah untuk menambahbaik sistem yang sedia ada dengan berdasarkan kombinasi penderia pergerakan, pengawal mikro PIC, modem GSM dan telefon bimbit. Sistem ini boleh menghantar SMS kepada pemandu atau orang lain seperti ibubapa atau sauadara mara sebaik sahaja sistem telah mengesan adanya benda yang hidup dan bergerak dalam kenderaan.
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<td>PIR</td>
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<tr>
<td>GSM</td>
<td>Global System for Mobile</td>
</tr>
<tr>
<td>PC</td>
<td>Personal Computer</td>
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<tr>
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<td>Programmable Integrated Circuit</td>
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CHAPTER 1

INTRODUCTION

1.1 Introduction of the project

In this fast growing society, most of the people are constantly in a rush and go about their daily life activities under a lot of stress and ended up forgetting importing things to be done for the day. This forgetfulness can be critical and detrimental at times, for example leaving a child unintentionally in an enclosed vehicle for long period of time. This could be very dangerous for the child due to the lack of oxygen in the vehicle as well as the heat, which the helpless child could do nothing about, and becomes unconscious, who would eventually die if not realized and saved in time.

Hence, this project is specifically developed to address this problem. The final project is a complete system that comprises of an alert system that helps to increase the people’s awareness after leaving their cars. This system will be able to detect the presence of human or animal life in the car once these two conditions are complied: the car engine is switched off and the car door is locked. The system will trigger an alarm once a smart detector installed in the car detects the presence of living object in the car. During the detection, the driver or someone else like the parents of the child will be notified through Short Message Service (SMS) within the shortest possible time. The alarm will keep ringing until the driver comes back to unlock the car and bring their children or pet out of the car. In this way, any
unwanted incident like forgetfully leaving children or animals in the car for long period of time can be avoided.

1.2 Project Objective

The basic objective of the project is to study and investigates the operation of this alert system. The research will look for the most an appropriate sensor to be used for the purpose, develop the system and incorporating the knowledge of employing the short Message Service (SMS) technique to achieve the outcome. Besides, the scope of this project also include the design of a reliable alert system that enables the user to be alerted in real time and immediate action can be taken to prevent mishap such as a child or pet unintentionally being locked in a car for certain duration which could bring upon death.

Apart from that, this project covers many aspects of electronic engineering where the theoretical principles and practical experience gained during the course of studies and the laboratory sessions can be applied to provide solutions towards an engineering problem as a tangible contribution to society at large. This system, once successfully developed can be recommended and applied for other scenarios.

1.3 Problem Statement

People in today’s busy world are used to following a fixed routine each day and anything needs to be done out of the routine is very likely to make them to be more forgetful. Forgetfulness and lack of concentration in adults have brought upon them some incidents or events which can be very painful such as leaving their children or pet unintentionally locked in the vehicle for long period of time. Such an incident took place in Johor Bahru a few years ago where a 5 years old boy died of heatstroke and lack of oxygen after he was left in a car for more than six hours by the mother who rushed to her class after running a bit late due to having to do some errands she had to do earlier. The mother was supposed to send his child to kindergarten before heading to work. However, she was pressed for time that day and
rushed straight to school and totally forgot his child was fast asleep at the back seat [1].

As we are well aware, the temperature inside the car is a lot much higher than the temperature outside if the car left under the sun for few hours. Children or pet that are left in the vehicle are at high risk to die due to the heat or suffocation. This more so for children, as their bodies tend to get heated up faster than adults. This is because their skin is thinner than adult skin and very vascular, so it both loses heat rapidly and absorbs heat rapidly [2].

With such an alert system developed which can be easily installed in the car, it will provide that extra safety feature to attract the awareness of the user of the car. This alert system, once the presence of human or animals is being detected upon the car’s engine being turn-off and locked will trigger an alarm and at the same time send a SMS to the driver or other relevant parties such as the parents.

1.4 Scope of work

This project is to install an appropriate sensor in the car that will detect the presence of a child or pet in the car once it complies with these two conditions: the car engine is switched OFF and the car door is locked. Upon detection of a living being in the car, the sensor will relay a message to the system where it will send a notification message to the owner of the car. As a precaution, another person like relative or close friend can also be notified and receive this message just in case the owner’s hand phone is switched off. There are few of considerations to be taken such as the limitations and facilities available during the project implementation.

a) Detection System

Study the background of the best possible sensors and detection systems. Then, analyse the functions and specifications of the motion sensors. To detect the presence of human or animal life in an enclose vehicle, a smart sensor will be used in this project. This sensor is able to detect the moving object in a locked vehicle.
b) **Control System**

Study and understand the function of the PIC microcontroller. Then, analyse the specifications of each PIC microcontroller (PIC 16F873A, PIC 16F874A, PIC 16F876A, PIC 16F877A). The PIC microcontroller device will be used in this project in order to control the whole system. It is commonly used in educational programming. The PICs are popular due to their low cost, wide availability, large user base and has serial programming and re-programming capability.

c) **Notification System**

Study the background of the notification system. Then, understand and analyse the function of each notification system, for example Bluetooth or GSM modem.

### 1.5 Project’s Methodology

a) **Project Planning**

- Study and understand the concept and theory of the project
- Prepare Gantt Chart for guidelines and progress of the project

b) **Literature Review**

- Background reading and references
- Search for the suitable sensor that able to detect living object
- Identify and understand the functions of the equipment and components that will be used in this project
- Design and construct the prototype
- Simulate and analysis of the prototype

C) **Finalize**

- Testing and troubleshooting of the prototype and record the result
- Present the outcome of this project
- Prepare final report
Figure 1.5.1: Flow Chart of the Methodology

1. **Start**
2. **Study the theory and principle of the project**
3. **Literature Review**
4. **Analyse and identify the suitable sensor and understand the function of the components used**
5. **Understand the function of program software (C programming)**
6. **Write/design the program coding and do the simulation**
7. **Construct the prototype**
8. **Do testing and record the output data from the prototype**
9. **Fulfil Desired?**
   - **No**: **Redesign and do troubleshooting**
   - **Yes**: **Finalize**
10. **Project presentation**
11. **Preparing Final Report**
12. **End**
LITERATURE REVIEW

2.1 Introduction

The technologies for alert system nowadays are evolving very fast each year. The purposes for the alert systems are controlling and managing appliances where the safety issues are the top priority. The developments for alert system evolve harmony to the advancement of technology. This chapter will include the research findings from observing, reading and information seeking to further the knowledge about the tools being used. Besides that, this chapter also covers the previous project and existing products; the theory used in developing the alert system in the vehicle. During the time while doing this project, the study will focus on the criteria that are needed to be considered in order to design a reliable alert system via SMS. With the SMS feature incorporated, it relates to current trend which bring the better outcome and enhances commercial values to the product.

2.2 Introduction of Motion Detectors

A motion sensor is a device for motion detection which is able detects the presence of moving object within the field of view. Motion sensors are work based on a wide variety of conceptual ideas. Some operate in much same way as a military
radar scanner, while others work based upon vibration, infrared radiation and even sound. There are few types of sensors which are common used in motion detectors spectrum.

a) Passive Infrared Sensor (PIR)
- Passive infrared sensor (PIR) is detects abrupt changes in temperature at a given point. It does not emit an infrared beam but passively accepts the incoming infrared radiation. It is used to sense the movements of an object in its sensing area [3]. For example, a human is passes in front of the background such as wall, the temperature at that point will rise from room temperature to body temperature, and this changes will triggers the detection with quickly.

![SN-PIR Sensor](image)

Figure 2.2.1: SN-PIR Sensor

b) Ultrasonic Sensor
- Ultrasonic motion detectors operate by tracking changes in sound frequency. The detector emits a sound frequency in waves that sweep across the space that the detector is monitoring. When the wave encounters an object, its frequency is disrupted and the alarm in set off. It is used to detect the presence of targets and measure the distance to target. These detectors are commonly used in automatic doors and security alarms.
c) Continuous Wave Radar Motion Detector

- Continuous wave radar (CW) motion detector is work through the use of microwave signals. This signal emits frequencies that bounce off of the objects in the surrounding area. It can be used for auto-door opening and vehicles speed measurement.

Figure 2.2.3: Doppler radar Microwave Motion Sensor

d) Vibration Sensor

- Vibration sensor use piezoelectric technology in order to detect the movements of object around them. It able to detect shock intensity caused by sudden knocks or hits and continuous vibration.

Figure 2.2.4: Vibration Sensor