POLYTECHNIC SULTAN SALAHUDDIN ABDUL AZIZ SHAH

REPORT:
3 IN 1 PORTABLE SAFETY DEVICE

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JABATAN KEJURUTERAAN MEKANIKAL

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ABSTRACT

The primary goal of creating this 3 In 1 Portable Safety Device is to decrease theft and trespassing incidents while maintaining the protection of women, the elderly, those with disabilities, often traveling alone, and students residing in hostels. This design is excellent since it is easy to carry and install. The dimensions for this design are 110mm x 60mm x 40mm and can maintain security in any location. To begin using 3 In 1 Portable Safety Device, simply flip the switch. This device has a rechargeable battery to extend its lifespan, making it simple to recharge and replace if it becomes damaged. We develop IoT and connect the device with applications that make it simple for people to access and use to make this device simple to use. In addition, it also has been improved with a gas detector (MQ7), a glass breaker, and an alert buzzer. Finally, by lowering instances of theft and infiltration, this gadget can benefit users' security.

ABSTRAK

Matlamat utama mencipta Peranti Keselamatan Mudah Alih 3 Dalam 1 ini adalah untuk mengurangkan kejadian kecurian dan pencerobohan sambil mengekalkan perlindungan wanita, warga emas, mereka yang kurang upaya, sering melancong bersendirian dan pelajar yang tinggal di asrama. Reka bentuk ini sangat baik kerana ia mudah dibawa dan dipasang. Dimensi untuk reka bentuk ini ialah 110mm x 60mm x 40mm dan boleh mengekalkan keselamatan di mana-mana lokasi. Untuk mula menggunakan Peranti Keselamatan Mudah Alih 3 Dalam 1, hanya flip suis. Peranti ini mempunyai bateri boleh dicas semula untuk memanjangkan jangka hayatnya, menjadikannya mudah untuk dicas semula dan diganti jika ia rosak. Kami membangunkan IoT dan menyambungkan peranti dengan aplikasi yang memudahkan orang ramai mengakses dan menggunakannya untuk menjadikan peranti ini mudah digunakan. Selain itu, ia juga telah ditambah baik dengan pengesan gas (MQ7), pemecah kaca dan buzzer amaran. Akhir sekali, dengan mengurangkan kejadian kecurian dan penyusupan, alat ini boleh memanfaatkan keselamatan pengguna.

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful.

All praises to Allah and His blessing for the completion of this research. We thank God for all the openings, trials and strength that have been poured on us to finish writing the research successfully. We endured so important during this process, not only from the academic aspect but also from the aspect of personality. My humblest gratefulness to the holy Prophet Muhammad (Peace shall be upon him) whose way of life has been a nonstop guidance for us.

we would like to express our special thanks of gratefulness to our supervisor (MRS. NGAI CHOOI HOONG) who gave us the golden occasion to do this awful design on the content (3- in- 1 portable safety device), which also helped us in doing a lot of Research and we came to know about so numerous new effects. we are also veritably honoured that she is willing to guide and give guidance to us throughout the perpetration of this design. She also handed numerous creative and innovative ideas and supported in the selection of design titles. she also gave easy- to- understand explanation and was willing to spend time with us during these 14 weeks. Thank you that cannot be expressed in words for her experience in guiding, tutoring and managing us patiently. she is also not shy to conduct knowledge as long as she manages the design to ensure that the design runs easily and impeccably.

Finally, thank you to the JKM Lecturer for the advice and counselling given. In addition, we would like to thank the DMP5A students who also helped us in making this project a success. Our parents who also helped us in answering the questionnaire questions that were given.

DECLARATION BY CANDIDATE

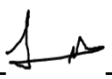
Here I will tell you what the text is to my actual work rather than the words and phrases answered. I would also say that other diplomas from Sultan Abdul Aziz Shah Polytechnic Institution or any other institution were not announced at the same time.

NUR HAZIRAH BINTI HABIB

Date: 25/6/2021

SITI ZULAIKHA

Date: 25/6/2021



SITI NURHELWANI BINTI MOHD AZALI

Date: 25/6/2021

DECLARATION BY THE SUPERVISORS

The research conducted and also the writing of this were under our supervision.

Signature: _____

Main Supervisor: MRS. NGAI CHOOI HOONG

Faculty: JABATAN KEJURUTERAAN MEKANIKAL,

POLITEKNIK SULTAN SALAHHUDDIN ABDUL AZIZ SHAH.

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CHAPTER 1: INTRODUCTION

1.1 RESEARCH BACKGROUND (PREPARED BY: SITI NURHELWANI (f1005)

In 2020, according to the Department of Statistics Malaysia Official Portal, house break-in and theft recorded the third highest of 14 040 cases. Although house break-in cases decreased by 14.9%. We still have to keep the house safe by installing some safety equipment to avoid robbers. Safety device technology has evolved in a variety of ways to keep homes safe at all times. This is because robbers have a variety of tricks to evade security devices. Not only does it happen at home, it also happens in hotels. The majority of hotel crimes are property-related, with burglary and theft being two of the most common crimes committed against hotel visitors. This -is even more frightening if you are a woman who like to travels alone. Sometimes a hotel will give a guest that's checking in a key to the wrong room or already occupied room. This usually happens in hotels. Everyone doesn't want their privacy violated but mistakes like this are very uncomfortable for both guests. It is also very easy to use by people with disabilities who have problems with blindness or mute to be more aware of the dangers around them. For people with hearing problems, this device is not recommended to them because it uses a buzzer to let them know if there is danger around.

1.2 PROJECT INTRODUCTION (PREPARED BY: SITI NURHELWANI (f1005)

House robbery cases are increasing in Malaysia. Most cases happen to people who live alone, people who like to travel and more. It greatly disturbs the safety of the occupants of a house. Although they have sophisticated security systems, but thieves have a thousand ways to enter the house without their knowledge. Carbon monoxide poisoning is the leading cause of death for people who fall asleep in cars. It is a colourless and odourless gas that is present wherever fuel is burned. Trucks and small engines, as well as certain household appliances such as gas ranges, furnaces, and stoves, are examples of CO sources. CO from these fumes can accumulate in places with poor airflow, such as cars with rolled-up windows. The most common symptoms of CO poisoning are headache, dizziness, weakness, upset stomach, vomiting, chest pain, and confusion. CO symptoms are frequently described as "flu-like." If you inhale a lot of CO, you may pass out or die. CO poisoning can kill people while they are sleeping or drunk.

1.3 PROBLEM STATEMENT (PREPARED BY: SITI NURHELWANI (f1005)

This is the shape of the problems in society. The first is that current door alarm systems are expensive and not portable. This has led to the community considering the safety of themselves and those living in the house because the current alarm system is too expensive to purchase. The person who can afford it has no salary issues, whereas the person who cannot afford it due to financial constraints does. Therefore, this problem must be taken seriously for their safety. In addition, some features of security systems are not comprehensive or all-encompassing, which means that they focus on one purpose. This is because there is no alarm system for the doors that places much emphasis on security. The latter makes certain security system technologies difficult to use. This is due to the sophistication of 4.0 technology, which has grown tremendously. Half of the community is also devoid of technical management, and therefore they do not make sure that they desperately need personal protective equipment and their homes to avoid incidents such as burglary, theft, and so on.

1.4 OBJECTIVE OF PROJECT (PREPARED BY: SITI NURHELWANI (f1005)

Objectives 3 of the project's portable safety equipment are:

The goal of this project is to create a multi-functional safety device to protect people when they live alone. This device can be used as a portable home security guard and a personal safety device. Using 3D printing technology to fabricate 3 in 1 safety device's part. Plastic is the most often used 3D printing medium, while certain metals can also be utilized. Plastics, on the other hand, have benefits since they are lighter than metal equivalents. Additionally, to analyse the function of system based on gas detection and alarm detection.

1.5 PROJECT QUESTIONS (PREPARED BY: NUR HAZIRAH (F1011)

- Do you think this 3-in-1 portable device is suitable for use as a personal safety device and also occupying a small space in your home?
- In your opinion, if this door alarm innovation is placed with gas detectors, they can help us find out if there is a gas leak, apart from ensuring the safety of our home.
- Do you agree that signal sounders can help the visually impaired be sensitive to the surrounding conditions rather than the threat of danger?

1.6 SCOPE PROJECT (PREPARED BY: SITI NURHELWANI (f1005)

This project focuses on how to protect ourselves from dangers in a small room. This safety device has a lot of functions, including an alarm buzzer, a glass breaker, and a gas detector. It's very useful for you if you live in or use a small room because you can hear the alarm clearly. The buzzer sound is estimated to be audible up to 52 m2. This safety device uses auditory sense to function, so if you are deaf, this device is not personally built for you. The equipment's service life is up to 5 to 7 hours; after that, you must charge it in order to use it continuously.

1.7 PROJECT INTEREST (PREPARED BY: SITI ZULAIKHA (F1008)

The importance of the project is that these technologies and tools can help Malaysia reduce the crime rate that has increased since the end and ensure the security of the population in the future. It can also help maintain user safety and comfort. This can reduce residents' worries about leaving their homes for a long time. Because this device is portable and easy to carry, users no longer have to worry about carrying it anywhere, and it is easy to use. This tool can help reduce the growing crime rate.

1.8 CHAPTER'S SUMMARY (PREPARED BY: NUR HAZIRAH (F1011)

In this chapter, the origins and inspirations of the studies were discussed. All the objectives were made out of all the problem statements. The objective for this project, along with its importance, is that it will be comfortable and light, making it more convenient for and even within the scope of this project alone. Thus, this new device for circumcision could be used by a physician to circumcise their patient with really good care for a longer lifetime. A 3-in-1 portable device is good for your safety when you live or travel alone. It has a lot of functions in one device, so you don't have to carry a lot of things in your bag. This device is very useful, especially for women, to always be alert to the environment. NODEMCU ESP32 (WeMos LOLIN 32), a buzzer, a gas detector, and other components are used in this device to make it more useful to the user.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION (PREPARED BY: SITI NURHELWANI (f1005)

According to Robert J. Fischer et al. (2019), burglary is defined as any type of unauthorized entry, forcible or not, into a building or property with the aim to conduct a crime or theft; the exception being entry into a vehicle, which is larceny. The various degrees of burglary have been established depending on the types of entrance, but they vary by state. Over 160 years ago, on June 21, 1853, a man named Augustus Russell Pope patented the first electromagnetic alarm system in the world. People had previously depended on the frightened chatter of their geese, the trustworthiness of their guard dogs, or mechanical bells to detect intruders on their land.

Even though Pope's prototype may seem very simple with today's technologies, it proved to be incredibly successful against invaders. The alarm could not be turned off simply by closing the windows or doors, which was a unique feature of Pope's creation. In this scenario, too, a switch spring positioned in the wall above the door kept the current from flowing so that the bell could continue to ring. Most people assume Edwin Holmes was the father of the modern alarm system. He was a businessman and the creator of the first electrical alarm system firm, which had purchased the rights to Pope's innovation in 1857. With his technology, he founded "Holmes Electric Protection Company," a company that sells electromagnetic alarm systems.

Following Holmes, a young man named Edward A. Calahan created another watershed moment in modern alarm system history.In 1867, Edward added a new fixture to the alarm system. He connected one emergency call box and one bell to fit each of the fifty neighbours in the vicinity of Andrew's house. If an alarm rang in house A, houses B and C would know that house A was probably being burgled. In 2008, ABUS Security Center combined mechanical and electronic protection in a wireless alarm system.

According to Knoema, Malaysia's burglary rate increased by 9.46 percent from 95.2 occurrences per 100,000 people in 2005 to 104.2 crimes per 100,000 people in 2006. Since a 9.46 percent increase in 2006, the burglary rate has stayed steady at 0.00 percent. A home security system's major goals are house protection and family safety. A security system detects a variety of dangers, including smoke, fire, and carbon monoxide poisoning, in addition to burglary.

The 3-in-1 portable device is designed to target people who live alone or like to travel alone. In the modern era, a lot of burglary cases happen to women, elderly people, and more. They just target weak people because they know women, elderly people, and so on don't have enough energy to fight them back.

EXAMPLES OF DOOR ALARM SYSTEMS. (PREPARED BY: NUR HAZIRAH (F1011)

1. PROLiNK Smart Security Alarm Kit Door/Window Sensor

Prolink DS-3501 Smart Alarm Security Kit devices work together to help protect your home by equipping motion detectors and door/window sensors in the system. This helps to build an intelligent security system around your house. It provides real-time notifications when someone enters a room, cracks open a window, or sets off a notification on your phone. It comes with a remote key that triggers the SOS alarm during an emergency for your elderly at home.

2. Pack Freezer Door Alarm, Window Security Alarm

This alarm has four different modes. 1. Timing alarm (sounds "Di-Di-Di" from 0 dB to 108 dB if the door remains open for 3/15/30/60s) 2. General alarm (alarm stops if door is closed); 3. Constant alarm (constant alarm even if door is closed); 4. Door opening chime (sounds "inch-ding-dong" when door is opened) Loud 108 dB alarm: Door and window alarms help effectively deter intruders and thieves with a loud 108 dB alarm. You can easily set the suitable mode according to your needs. easy to install: Simple peel-and-stick installation makes it easy to install on most freezers, refrigerators, or any door without any tools. package including 2 fridge alarms, 2 magnetic strips, a double-sided sticker, and a user manual. The electronic instruction is on the eighth picture. Installation Note: Be sure to close the alarm and the magnetic strip; the installation distance between them should not exceed 0.78 inch. The two parts must be aligned by their alignment arrow. Two AA batteries can last for two years. (Batteries are not included.) Magnetic trigger door alarm sensor is widely used to protect homes through door window entrances and is suitable for safes, cabinets, freezers, refrigerators, door sliders for swimming pools, stores, offices, apartments, and hotels, among other things. The number of pieces delivered

3. Anti-Ligature Door Alarm Kit

Anti-Ligature Door Alarm Kit Finish: Powder Coated Cylinder Type Mortise Arm Type Key Control Alarm Type Siren-style Piezo/strobe Inside Keyed Cylinder Motion Alarm Duration Constantly Activated Coverage for Manual Shut Off Door Handing Left Handed 3 ft 5-3/8 in. to 3 ft 11-3/8 in. 1 in. body thickness Body Length 42 in to 48 in Body Height 1 5/8 in Body Width 1 5/8 in Decibels 100 dB Power Source: 120V AC, 1 Amp Housing Material: Aluminum Steel for Door Thickness: 1-3/4 in.

4. DAYTECH Door Window Alarm Sensor

This sensor uses double-sided adhesive tape to secure the main unit to the side of the door or window. Install cameras at every entrance to make sure your home is protected.

2.2 MATERIAL **(PREPARED BY: SITI NURHELWANI (f1005)**

PREVIOUS STUDIES/REVIEWS/INVESTIGATIONS

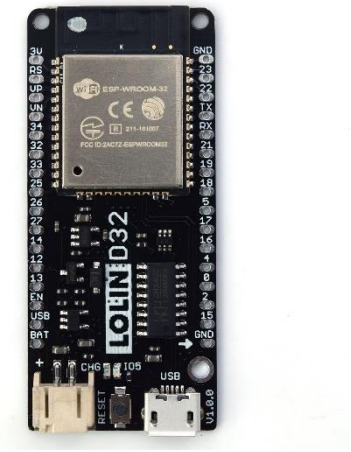
2.2.1 GAS DETECTOR

The proposed arrangement is connected to a variety of measuring heads, mounted at the measuring point, with a line of two common wires, and each measuring head provided, at its place of installation, with its intelligence (microprocessor) to process at least part of the content of flammable, explosive, and/or toxic gases or other gases, according to the article written by HP Schuldt to detect the content of flammable, explosive, and/or toxic gases or other gases. After the measuring head is addressed and electricity is delivered over a two-wire line, the electronic evaluation system and the measuring head communicate with each other via two-way digital communication. The MQ-7 sensor has sensitivity and selectivity of various natural gases such as Carbon monoxide (CO), Hydrogen (H2), Butane (LPG), Methane (CH4), Alcohol, and air.

2.2.2 PIEZO ELECTRONIC BUZZER

A buzzer, according to H AI Fani and S Sumarno's remark in their paper, is an electronic component that converts electrical oscillations into sound vibrations. Because the coil is mounted on the diaphragm, each movement of the coil causes the diaphragm to move back and forth, causing the air to vibrate.

2.2.3 NODEMCU ESP32 (WeMos LOLIN32),



The Wemos LoLin32 is a development board built around the Espressif ESP-WROOM-32 microcontroller. It boasts 4MB of memory and offers WiFi and Bluetooth connectivity. The Wemos LoLin32 has the particularity to propose a connector for LiPo battery. The connector is JST XH2-2.54mm. It has a key that prevents reverse polarity. Charging the battery and programming will be done using the usual micro-USB connector. Unlike the first ESP32 development boards, this board developed by Wemos.cc is narrower. It leaves a row of connectors on each side of the board free on the breadboard.

2.2.4 SECURITY ALARM

A security alarm system for self-employed individuals, according to TP Demuth's article, comprises a radio transmitter activated by a position-sensitive switch and a radio receiver that activates an alarm device signalling that the person has been harmed or paralyzed. The switch can be set to activate in any posture that a person would ordinarily occupy if injured or immobilized, such as the prone position. The transmitter can also be equipped with a manual switch and a position-sensitive switch, allowing it to function as an alert system even if the individual is not disabled.

2.2.5 GLASS BREAKERS

The invention, according to Z Frank, is connected to glass breakers, and more precisely to equipment for breaking glass into pieces, like glass cutters. The primary goal of this idea is to create a tool having this property that may be applied to a piece of glass at a scoring point in it by a glass cutter, allowing the glass to be shattered along the score. for isolating the glass along the cutting line, providing smooth edges along the cutting line, and ease of glass breaking.

2.3 METHOD **(PREPARED BY: SITI ZULAIKHA (F1008)**

3D PRINTING METHOD

3D printing, also known as plug-in manufacturing, is the process of creating a 3D part layer by layer using computer-aided design. 3D printing is plugins that create layers of material to create 3D parts. This is in contrast to the subtraction production process, where the final design is cut from a large block of material. As a result, 3D printing produces less material waste. 3D printing is great for creating products that are suitable for prototype speeds. The first 3D printing products were developed by Hideo Kodama of the Nagoya Industrial Research Institute when he developed two different methods for creating 3D models.

3D PRINTING TECHNOLOGIES

There are three main types of 3D printing technology; Sintering, smelting and stereolithography.

- Sintering is a technique where the material is heated but not melted, to create objects in high resolution. Metal powder is used for direct sintering of metals, while thermoplastic powder is used for specific solvent sintering.
- 3D printing involves powder melting, electron beam melting and direct energy deposition, which uses a laser, electric arc or electron beam to print objects by melting material.
- Stereolithography uses light processing to produce parts. This technology uses direct light to have an optimal interaction with the material to harden and solidify the cross section of the object in thin layers.

TIME TAKEN TO COMPLETE 3D PRINTING

The time it takes to 3D print a part depends on several factors. This includes the size, range, complexity and printing technology used. This can take from 30 minutes to several days. The larger and more complex the item, the longer it will take to print. However, smaller items can print faster.

2.4 MATERIAL SELECTION (PREPARED BY: NUR HAZIRAH (F1011)

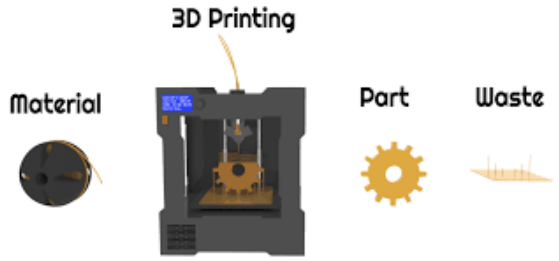


Figure 2.1 3D printing concepts

3D prints are selected to create the main body of a 3-in- 1-portable safety device. There are many advantages and disadvantages to using 3D printing.

- **Strong and robust parts** - Plastic is the main material used in 3D printing, although some metals can be used for 3D printing. Of course, plastic has advantages because it is warmer than ordinary steel. This is especially important in industries manufacturing where is an issue and where it can be fuel efficient.

- **Reduce waste** – The production of the part only requires claims made to the part itself, with very little waste compared to other methods of cutting much of the non-recyclable material. The system not only stores the equipment, but also reduces the cost of the equipment used.

- **Environmentalists** – Because this technology reduces the amount of waste used, it is an environmentally friendly material. Admittedly, the environmental benefits are greatly enhanced when it comes to factors such as fuel efficiency using lightweight 3D printing software.

- **Print as needed** – Essential printing is useful as it does not require much space for production capacity, unlike traditional production processes. This saves space and costs as multiple edits are unnecessary if not required. All 3D files are stored in a virtual library where they are printed in 3D formats such as CAD or STL files, which means that they can be printed and printed as required. You can make configuration changes at a lower cost by modifying individual files without compromising on productivity and hardware investment.

2.5 CHAPTER'S SUMMARY (PREPARED BY: NUR HAZIRAH (F1011)

The research was based on articles collected on Google Scholar and Science Direct. The major component of this project is an Arduino.

CHAPTER 3: METHODOLOGY

3.1 INTRODUCTION (PREPARED BY: NUR HAZIRAH (F1011)

This chapter will go over the progression of this final year project from start to finish. Beginning until the end of this project. The flow chart is very important to illustrate the sequence of operations to finish the work. The flowchart is generally drawn in the early stages. It will guide you to finish the work. Meanwhile, the Gantt chart shows how the project is planned and seen immediately whether it is behind or ahead of schedule. The function of the Gantt chart is to guide the project in the right direction. Plan. So, these two charts are very important to guide us in finishing up the projects. Furthermore, we will discuss concept generation in this chapter. There were four product designs. Then, list the advantages and disadvantages of each of the product design. After that, proceed to finalise the concept. This final concept is to select the good one from the four designs. The best product will proceed to another step, which is a fabrication process. Prior to that, material selection must be completed. This is to Choose the best material for the job. The material selection is also followed by the function of the product.

3.2 FLOW CHART (PREPARED BY: NUR HAZIRAH (F1011)

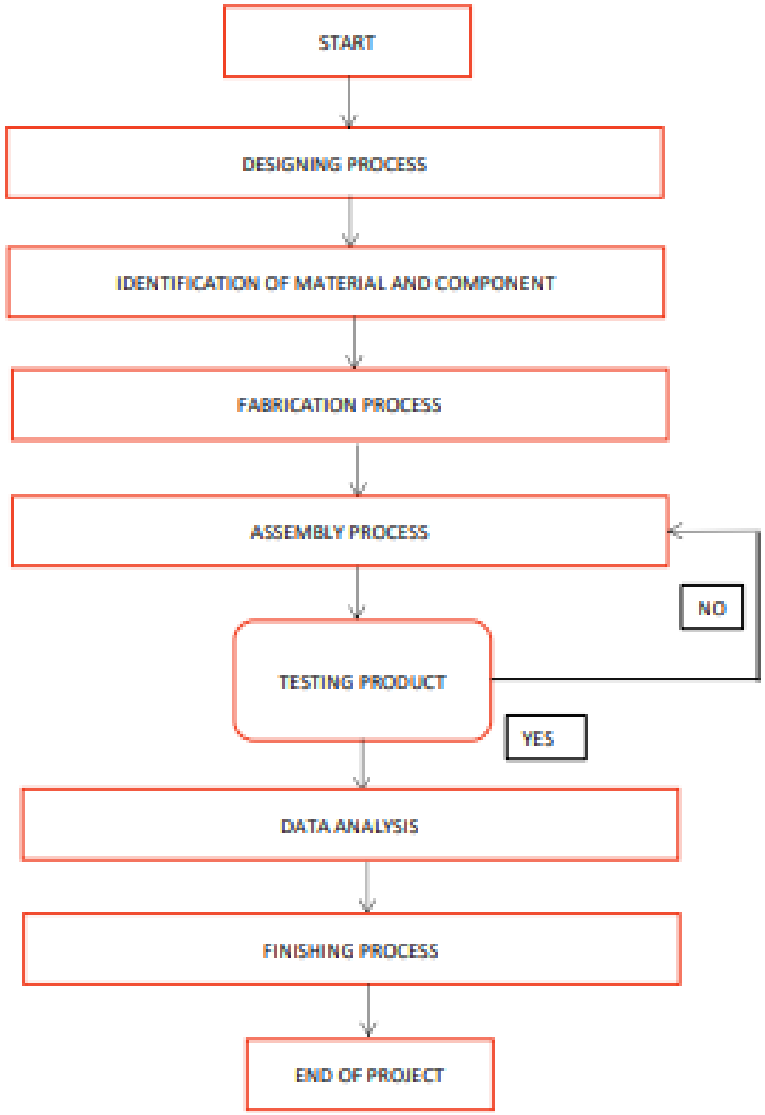
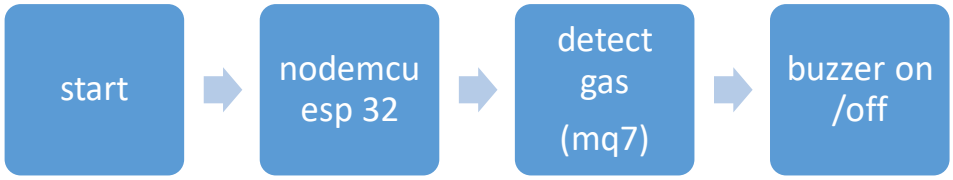


Figure 3.1 Methodology Chart

3.3 FLOW CHART EXPLENATION (PREPARED BY: SITI NURHELWANI (f1005)



This is the process about how our project works. When push button active, and it will send data and signal to the NodeMCU esp32. After NodeMCU get the data, it will send to buzzer and LED. This device has 2 functions which is it can detect if people push the door and Carbon Monoxide gas above 800 ppm.

3.4 PROJECT DESIGN

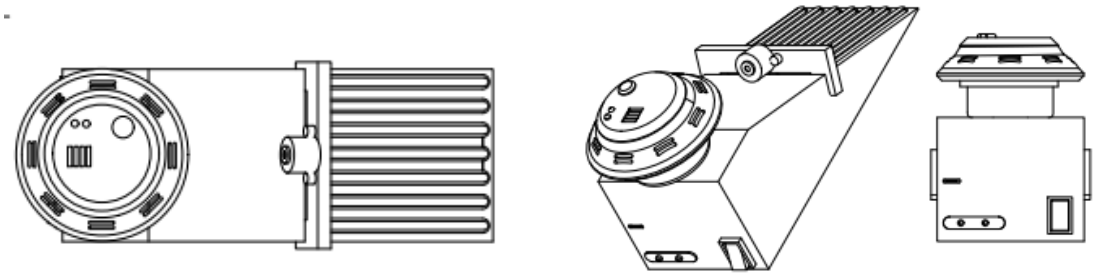


Figure 3.2 First design

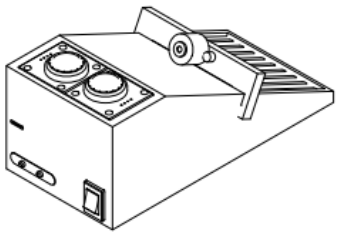


Figure 3.3 Second design

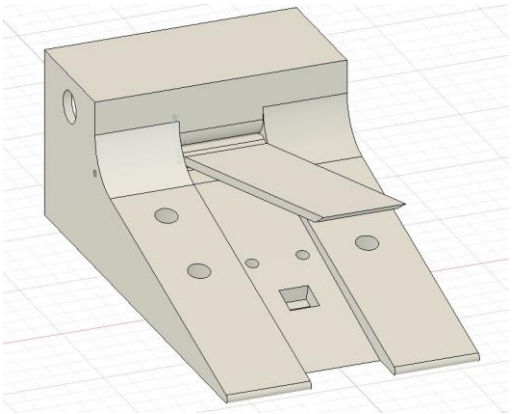


Figure 3.3 Finalized design

3.5 OPERATIONAL METHODOLOGY (PREPARED BY: NUR HAZIRAH (F1011)

When someone knocks on the door lock, a signal is sent to the sensory capabilities of the transmitter. The same is true when someone pushes the doors open, where it quickly sends a signal to the transmitter. conductor, it will send a corresponding message from the sender to the recipient. The receiver will be programmed to handle signals from sensors and will be configured to control the sensor signal for turning on the alarm clock for complete control management. When the MQ7 detects gas or not, it sends a signal to the NodeMCU esp32 if it is an arrow, and the NodeMCU esp32 sends a signal to the buzzer for sound if it is a gas. If it does not detect gas, the buzzer will not make a sound.

3.6 BUDGET CALCULATION (PREPARED BY: NUR HAZIRAH (F1011)

This is a total of the budget estimate that has been calculated to purchase the equipment needed to build this project.

MATERIALS	QUANTITY	PRICE PER (RM)	PRICE (RM)
NODEMCU ESP32	1	43.99	43.99
MQ7 carbon monoxide gas	1	6.50	6.50
Relay 5v	1	3.90	3.90
Breadboard small	1	2.50	2.50
Piezo electronic buzzers	1	0.89	0.89
Glass breakers	1	2.50	2.50
3D printing		0.70 per/gram	33.00
Led	2	0.90	0.90
Some jumper wire: 1. Male to male	1	2.00	2.00
2. Female to female	1	2.00	2.00
TOTAL		RM 99.08	

Table 4: Material Cost

3.7 TOOLS AND EQUIPMENT REQUIRED (PREPARED BY: NUR HAZIRAH (F1011)

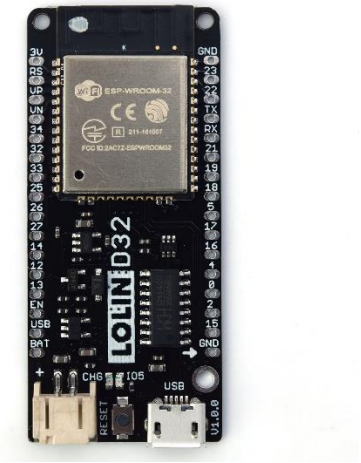
In this section the software and hardware being used to construct the system is being mentioned. The software and hardware widely used in educational environments.

Software

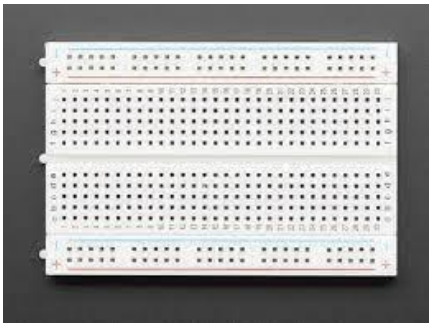
Arduino is an easy opensource electronic hardware and software platform. Arduino tablets will be able to read input such as light on a sensor, finger on a button or Twitter message, turn it into an output or turn on a motor, turn on an LED and publish something online.

This project uses ARDUINO to program the project, in ARDUINO IDE it can guide Arduino Nano signals to the hum and also smoke and gas detectors to operate in the mode you want and the function you want. ARDUINO IDE software is important in my project if it has a cycle that works if it does not have ARDUINO IDE applications.

Hardware

NAME OF EQUIPMENTS	*DESCRIPTION*
1. ***ESPRESSIF OFFICIAL ESP32-WROOM-32 MODULE*** 	using the ESP32 microcontroller. By default, the board comes with MicroPython firmware and includes headers (which require soldering). Features: Espressif's official ESP32-WROOM-32 moduleLastest ESP32 Version: REV14MB FLASH Lithium battery interface, 500 mA maximum charging current Compatible with Arduino and MicroPythonDefault firmware: latest MicroPython Specifications: Hardware version: 1.0.0Operating voltage: 3.3 volts Digital I/O pins: 19Size: 50mm x 25.4mmWeight: 6.1g
2. ***MQ7 gas monoxide sensor*** 	The carbon monoxide (CO) gas sensor measures the amount of carbon dioxide in the air and emits the reading as a parallel voltage. The sensor can detect amounts between 10 and 10,000 ppm. The sensor can operate between -10 and 50 ° C and consumes less than 150 mA at 5 V. The high temperature (H) is intended to operate in two circuits. and so on. 5V for pin takes 60 seconds to warm up the sensor and 1.5V for 90 seconds to check the sensor. 5V connection to pin A or B causes the sensor to emit an analogue voltage to one pin. The charge between the fruit pin and the ground determines the sensitivity of the sensor. The resistance level for a specific application can be used by calibrating the data, but the optimal initial value for the resistance is usually 10 kΩ.

3. Piezo electronic buzzers 	Piezoelectric sound effects have an independent design. No magnetic field and no coil were used in construction. The use of a piezoelectric electric field changes its size, i.e. the diaphragm increases/ decreases as the charge is taken. Ordinary things at the event are just that. Piezo output bells have a wide range from 3 - 250V and a frequency with a normal average voltage <10mA. ISL piezoelectric buzzers have a particularly slim design because they have less visibility and are good for small applications. When the right neck is attached to the piezoceramic piece, the piece expands and shrinks. This feature is used by piezoelectric devices to move the clay surface rapidly to create sound waves.
4. Jumper wire 	Jumper wires are simply wires that have a connecting pin at each end that they can use to connect two points at no cost. Slingshot wires along with blade strings and other tools are used to easily attach the ring as needed

5. *Breadboard small* 	Distribution Strips are two. Wire Size is 21 to 26 AWG wire. Tie Points are two hundred. Withstanding Voltage is 1,000V AC. Tie points within IC are 630. Insulation Resistance is DC500V or 500MΩ. Dimension is 6.5*4.4*0.3 inch. Rating is 5Amps. ABS plastic through colour legend. ABS heat Distortion Temperature is 183° F (84° C) Hole or Pitch Style is 2.54mm.
6. *Glass breakers* 	A piece of glass at a scoring point and shattered along the score by a glass cutter. for glass isolation along the cutting line, clean edges along the cutting line, and glass breaking ease.

3.8 DESIGN DRAWING USING FUSION 360 SOFTWARE

To design the diagram as below. This design was drawn using Fusion 360 software according to the measurements discussed in the group and also referred to standard measurements of house door size.

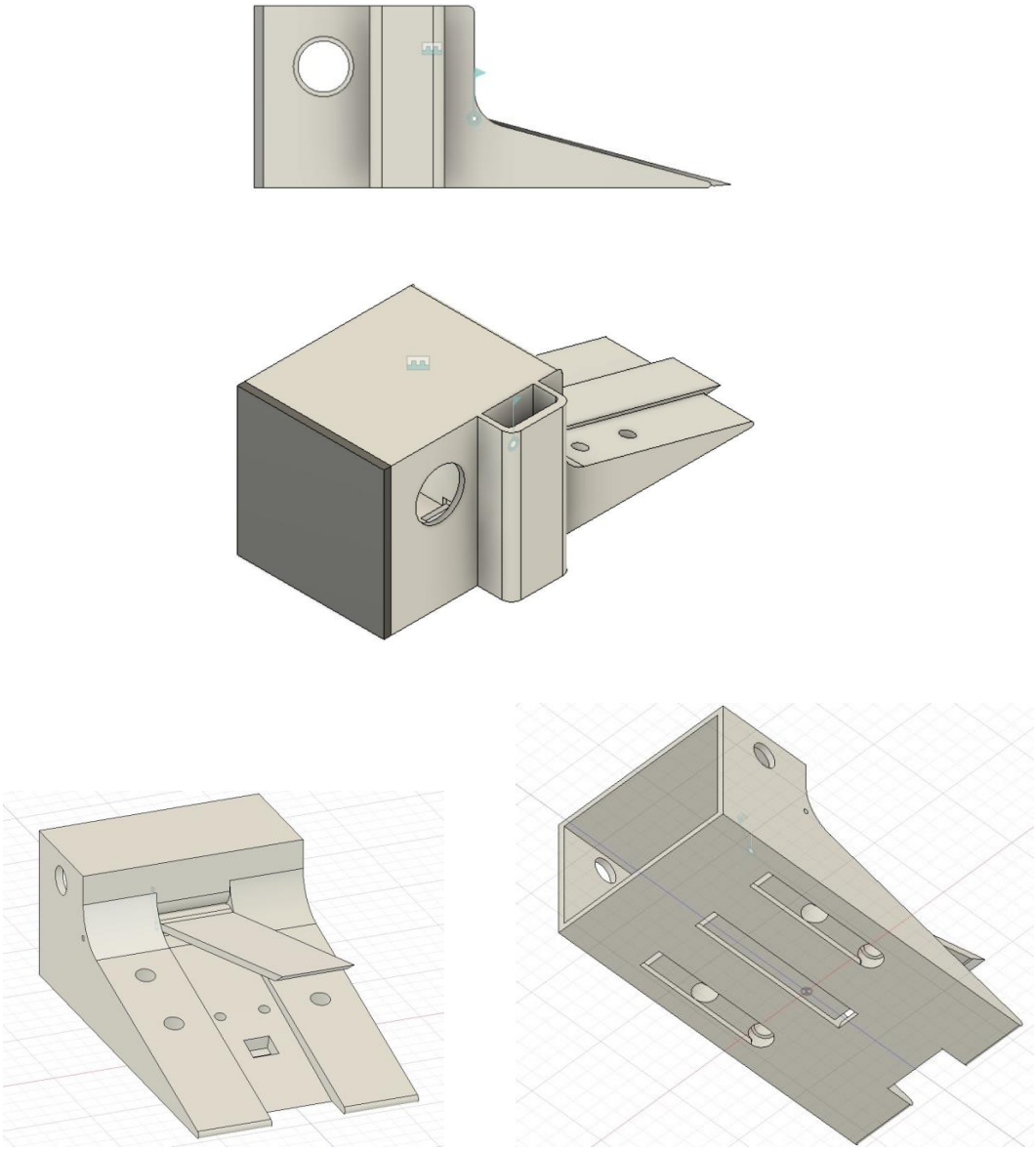
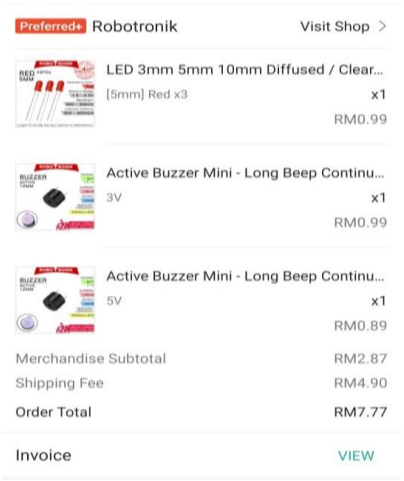


Figure 3.7 3-in-1 Portable Safety Device Design

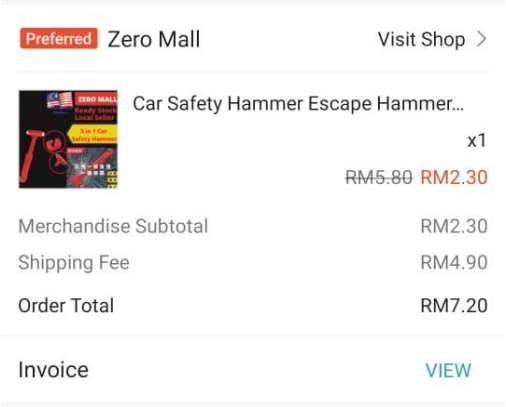
3.9 THE PROCESS OF PURCHASING MATERIALS AND COMPONENTS

(PREPARED BY: SITI NURHELWANI (f1005)

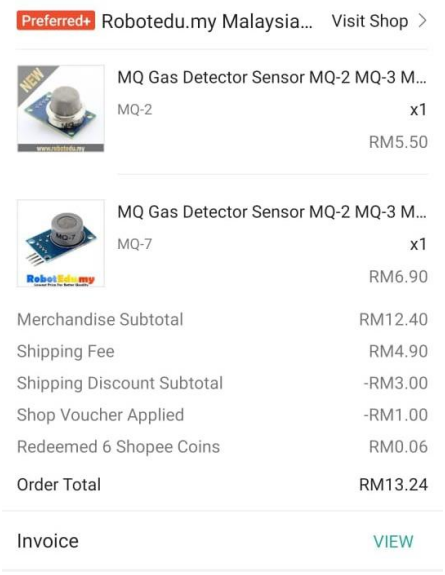
1. Leds and buzzers



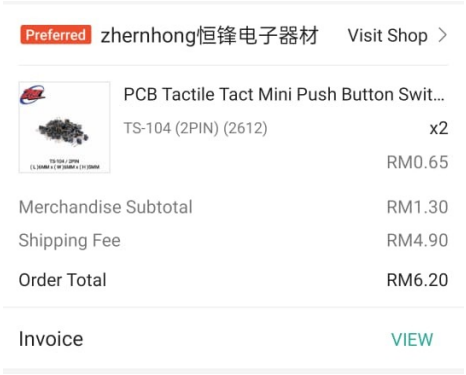
2. Glass breakers



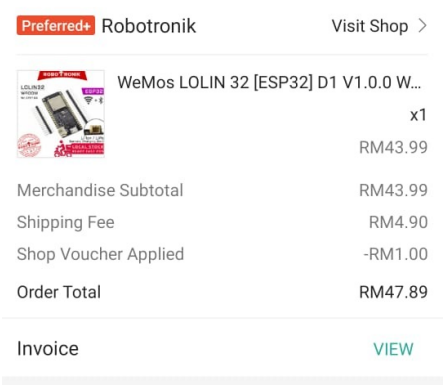
3. MQ7 gas detector



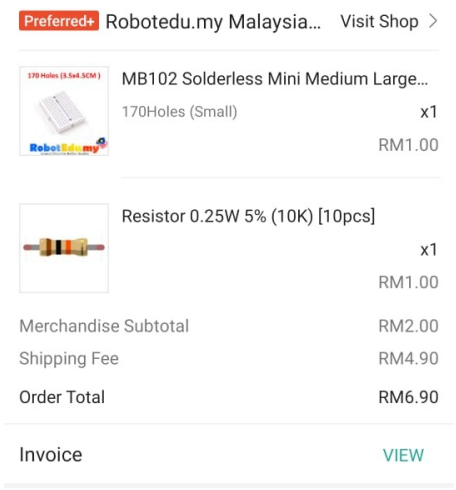
4. Push button



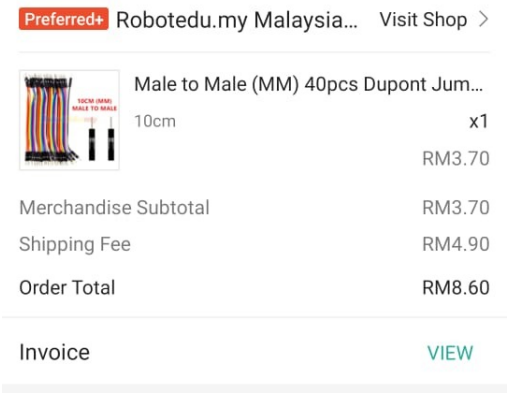
5. NodeMCU esp32



6. Breadboard small and resistor

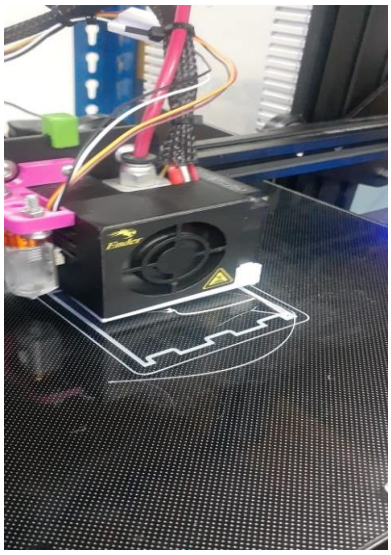


7. Male to male jumper



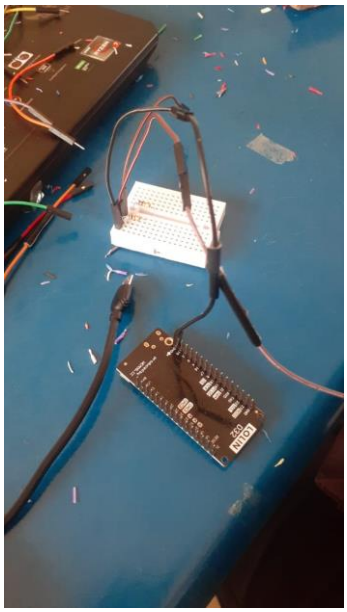
3.10 WORK PROCESS (PREPARED BY: SITI NURHELWANI (f1005)

1. The 3D printing process is carried out to build the base, cover, and lever.



2. The process of painting the base, cover, and lever

3. Component installation process



4. Project that has been completed with the body and components installed.

3.11 CHAPTER'S SUMMARY (PREPARED BY: NUR HAZIRAH (F1011)

This section lists the methods and techniques used to achieve the goals discussion papers. Some steps are given as a guide complete the project management process. Also, the tools and equipment that will be used for Product installation is included in this category. This review needs to be reviewed first to get the idea are looking for about this study. the study of this project shows a theoretical framework and method, data collection, choose the best ideas and products to use while running this task. next, the project will also use the best system and module design to attract attention. Finally, the study of this project should reveal its reasons care should be taken when choosing a particular product method and approach about this project.

CHAPTER 4: FINDINGS AND ANALYSIS

4.1 INTRODUCTION (PREPARED BY: SITI NURHELWANI (f1005)

This section contains information on "3-in-1 portable safety device" interpretation and evaluation of materials. This information and analysis are important to the success of the project in achieving its goals and benefits. The quality selection of materials has been successful. We collected this information and made an audit to make every detail perfect. We do it. Description, analysis, and conclusion, which are usually what the reader expects to see, appear on both sides. We use different models to improve the performance of our software program. We use software like Google Forms to refer to the comment form that has been given to society.

4.2 ADVANTAGES AND DISADVANTAGES (PREPARED BY: NUR HAZIRAH (F1011)

- **It is easy to carry**: it is designed to fit into a purse or pouch. If you don't feel comfortable leaving valuables at home, you can take them with you if you don't have to stay long. You don't have to worry about thieves stealing your valuables because they are safely on you.
- **Prevent theft or home invasion**: burglary impact studies show that many homes without security systems are more than 300 times more likely to be burglarized. In short, your family is reserved to protect your property.
- **Coverage Against Fires and Carbon Monoxide Poisoning**: Burglar warnings do not only protect you from the inconvenience of burglaries and home invasions. A smoke detector and a gas monoxide detector sensor are included in our safety alarm system. They can also cover you against fire and carbon monoxide.
- **Reasonable Price**: Price does not seem to be a good thing, as it is expensive. Of course, there are many strategies for cutting costs, but they are not easy to implement. That's why we provide and plan to integrate our safety alarm for an affordable price that's easy to use.

4.3 ANALYSIS (PREPARED BY: SITI NURHELWANI (f1005)

The data analytics method we use to collect data is to create queries in Google Forms and ask them to fill them out to make it easier for us to get the data and suggestions they came up with to analyse and document the project. We analyse the manufacture of 3-in-1-specific portable safety devices designed for specific products. Customers are often at the heart of our thinking, requiring us to come up with something new and creative so that this 3-in-1 portable safety device responds immediately to supply and demand from the outset. Our ability is to keep up with all requests at all times, recognising the needs and requirements of this well-designed tool according to the needs of the customers. Therefore, it is important to begin a thorough evaluation of the production process and precision during the manufacturing process that will be used, as well as support for operation and maintenance, again as a learning environment.

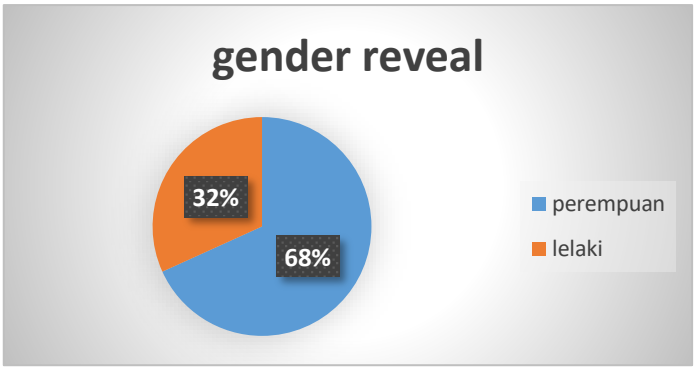


Table 4.1: Questions related to customer satisfaction with our product that will be launched

The pie chart shows that of the 65 respondents to my questionnaire, 32% were men and 68% were women. This is very similar, so it should not have a big impact on my overall results.

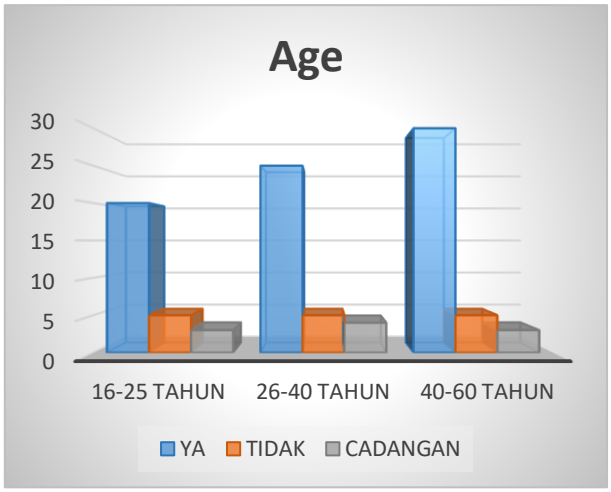


Table 4.2: The age rating answering interview questions

The purpose of this questionnaire is to obtain feedback from the public on "3-in-1 portable safety devices." This graph shows the results of the survey where it started: people aged 16 and over were asked about the range of safety equipment in their homes as well as safety equipment on the market. As you can see, most of them are perfect. The questionnaire starts at 16 years of age and older. A total of 20% of the questions were answered yes for the age group 16-25 years, 25% for the age group 26-40 years, and 30% for the age group 41-60 years, for a total of 30%. This will be shown by the results of a timed survey.

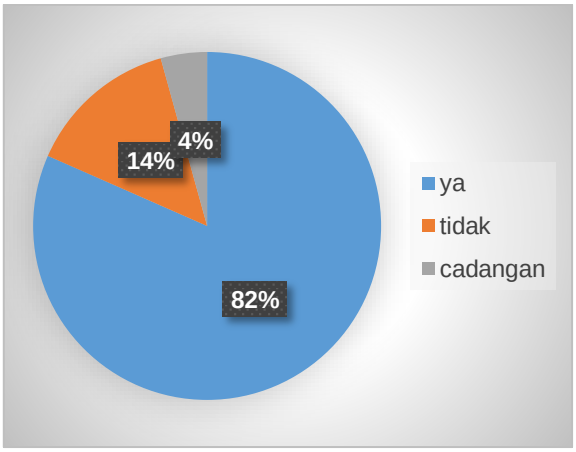


Table 4.4: requires a 3-in-1 portable security device

This pie chart shows that 82% of those who want to use this have responded when they want to implement this project.

Our goal in running this questionnaire is to determine the most important features for using a 3-in-1 portable security device: a smoke detector, a monoxide gas detector, and a breaker glass. while using an audible signal to guide the user at an event in a position. The most important criteria are the type of security equipment and the size of the equipment used in that device. According to the interviewees, size is one of the most important factors they want, because, according to them, if it is small, it will be easier to carry anywhere. According to respondents, the smaller size makes it easier for them to save. Over the years, nearly 82% have responded to a request that these portable security devices be marketed as a precautionary measure to protect the security against theft, theft, and even theft. Also, 68% of women really need this clothing compared to 32% of men. For example, price, accessibility, content and sustainability are closely linked. An affordable extra price for this portable security tool will help users to be reliable. Equipment delivery can also be combined with long-term sustainability. For example, the material choice for this portable safety device was chosen from waterproof plastic because it is heavyweight, cannot be easily damaged when exposed to water, and can withstand heat if the temperature higher.

4.4 CHAPTER'S SUMMARY **(PREPARED BY: NUR HAZIRAH (F1011)**

The conclusion and evaluation of this chapter are complete. Every job has its advantages and disadvantages for the benefit of society. However, we may need to modify or modify performance reduction in the future, approximately to the point where we have a large and effective product that will inevitably reduce performance. Therefore, this challenge is seen as a way to improve, strengthen, and deepen our understanding of our work for future generations. This section shows how the model is constructed. This chapter also discusses the purposes for which the products are used. We briefly describe how to assess the nature of this work. How to make it better for others We also discussed ways to keep the public aware of what is happening. Finally, we report the amount of money we spent on the project and discuss the various results.

CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION (PREPARED BY: NUR HAZIRAH (F1011)

As we all know, there are people all over the world who use personal safety equipment and home safety equipment to protect us and our homes. Returning to our topic, our goal is to extend the old power of the home security producer to the new power of the home security maker. The purpose of this program is to prevent or reduce the risk of robbery, theft and even incidents that can affect a person's life around the world due to their own negligence. In addition, we offer glass breakers as a safety device that can help if someone is in danger. In addition, we install smoke detectors and gas detectors to detect smoke and gas detectors in the area. As such, this 3-in-1 security technology application is designed to be easy to carry and easy to use for users.

5.2 DISCUSSION (PREPARED BY: NUR HAZIRAH (F1011)

We learn how to use engineering efficiently and effectively to design in fusion 360 application equipment and implement product design systems for efficient operation. Good communication with our supervisor that help us resolve work issues and improve our ability to communicate quickly. Finally, we can use 3-in-1 storage devices that access our system. Our goal is to reduce the risk of theft, fraud, fire and even poisoning from the ingestion of dangerous smoke and carbon monoxide.

5.3 RECOMMENDATION (PREPARED BY: NUR HAZIRAH (F1011)

This chapter contains suggestions for future developments to work. While this project has achieved the goal that includes build transmission and disposal systems, design applications for microcontrollers to achieve project goals and objectives, long visit. In this article, we have not yet tested and administered the system properly. The design element is incomplete. Some of the following works. Our plan is to connect the system to a USB or serial computer port to allow users to recover broken data. We also arrange to add an LCD screen as it provides clear screen functionality to the user. For future work, the system must be connected to a computer using a serial port or USB port.

The LCD monitor should be included in the next function as expected clear screensaver for the user. LCD screen made by this laptop the security system will be more secure for future users. We also want to add a wireless spy camera to record what happened. With the images from this wireless spy camera, it will be easier for users to find evidence and get justice and compensative for themselves. Our belief in our product is that we can meet the needs of customers today and we expect the product to continue to improve with increasing success. and so on. In addition, we encourage other users to use our user base for our product as we conduct a Google Form search to gather public opinion. Finally, we hope to use this product in the future and achieve our goals.

(PREPARED BY: SITI NURHELWANI (f1005)

CONCLUSION

The development of a portable security system was considered the first part. The main aim of this project is to build a sustainable, small, fast, and easy-to-install portable security system that can be easily downloaded and accessed over the phone over long distances. Among other things, system development requires the ability to decide what sensors, microcontrollers, and input and output components are appropriate for a given system. Plus, more knowledge of the software an application uses is available. In our work, our 3-in-1 portable safety device is very useful for our users, especially women, the visually impaired, the elderly, others with special needs, and so on. This will reduce the number of frequent thefts and robberies in the country. So, this 3-in-1 security strongly encourages users to use our product. This enables messenger control as it is integrated with the setup, which can handle any power consumption. So, we are looking forward to working hard to improve the product and fill in the gap. As we know, our products are simple, easy, and convenient for our customers.

(PREPARED BY: SITI NURHELWANI (f1005)

PROJECT ACTIVITY PLANNER (project 1 session II 2021/2022)

AKTIVITI PROJEK / MINGGU	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Introduction to project course guidelines														
Discussion for project selection														
Make a project drawing chosen by each member.														
Presentation for project selection														
Project selection decision and project title														
Doing research about the project														
Provide project materials and components.														
Make a project proposal.														
Complete the project with existing materials.														
Doing research in the field of the IKS industry.														
Prepare proposal presentation slides.														
Proposal presentation														

Plan **annual**

(PREPARED BY: NUR HAZIRAH (F1011)

REFERENCES

1. TE Connectivity, Date published January 05, 2022 https://www.te.com/usa-en/products/relays-contactors-switches/contactors.html

2. ElProCus, July 26, 2021, Buzzer: Working, Types, Circuit, Advantages & Disadvantages, https://www.elprocus.com/buzzer-working-applications/

3. Help Desk, June 15, 2022, https://helpdesk.latech.edu/services/3d-printing/

4. Investopedia, February 08, 2022, How 3D Printing Works https://www.investopedia.com/terms/1/3d-printing.asp

5. The Engineering Projects. December 13, 2021, Introduction to Arduino Nano https://www.theengineeringprojects.com/2018/06/introduction-to-arduino-nano.html#:~:text=Arduino%20Nano%20is%20a%20small,Reset%20Pins%20%26%206%20Power%20Pins.\

6. Wikipedia, May 10, 2022. Glass breaker. https://en.wikipedia.org/wiki/Glass_breaker#:~:text=A%20glass%20breaker%20is%20a,well%20as%20in%20some%20buildings.

7. "Security. 2010 "[retrieved 17 October 2022, 10.13 am]. http://www.businessdictionary.com/definition/ security.html

APPENDICES

Questionnaire Items

Part A -Background of The Respondent

1. UMUR

2. JANTINA
- LELAKI
- PEREMPUAN

3. BANGSA
- MELAYU
- CHINA
- INDIA
- LAIN-LAIN

4. PEKERJAAN
- KERAJAAN
- SWASTA
- PELAJAR
- SURI RUMAH
- LAIN-LAIN

PART B - please mark "/" in the answer choices in the box provided.

No	questions	Yes	No
1	Adakah anda rasa 3 in 1 portable device ini sesuai digunakan sebagai alat keselamatan diri dan juga ruangan kecil di rumah anda.		
2	Adakah anda selalu berasa terancam dengan keadaan sekeliling apabila pulang dari sesuatu tempat pada lewat malam.		
3	Pada pendapat anda jika inovasi penggera pintu ini diletakkan dengan pengesan asap dan juga pengesan gas dapat membantu kita bagi mengetahui jika terjadinya kebocoran gas, selain daripada keselamatan rumah kita.		
4	Pembunyi isyarat dapat membantu orang kurang upaya penglihatan peka dengan keadaan sekeliling daripada ancaman bahaya, adakah anda bersetuju?		
5	Pada pendapat anda,produk inovasi ini mampu menjimatkan penggunaan tenaga elektrik.		
6	Adakah produk inovasi ini dapat menembusi pasaran ekonomi negara.		
7	Adakah anda rasa produk inovasi ini dapat memenuhi cita rasa pengguna.		

Structured question

8. Apakah ciri – ciri keselamatan yang terdapat di rumah anda?

_____

9. Apakah pandangan anda mengenai projek kami yang mempunyai 3 ciri keselamatan dalam satu projek? (Penggera keselamatan, pengesan asap & pemecah kaca).

_____

10. Apakah penambahbaikan yang boleh kami tambah di dalam produk kami?

_____