



POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
JABATAN KEJURUTERAAN ELEKTRIK

DEE50102

Project 2

Report Final Year Project

Title:

FIRE ALARM NAVIGATION SYSTEM (Software)

Prepared by:

NAME	MATRIC NO.
MUHAMMAD IZWAN HASHIM BIN SYAMSYUL AMRI	08DEP17F1106

Class:

DEP5A

LECTURER'S NAME:

DR MARLINA BINTI RAMLI

PUAN ROFIZAH BINTI ABDUL MUTALIB

PUAN JULAIHA BINTI OMAR

PUAN MASRIANI BINTI MANSOR

Acknowledgement

First of all, thanks to Allah SWT because given us to complete this task just in time. Even we faced with a lot of difficulties along to complete this task, our group still manage to complete it.

Then, thanks to my supervisor, Dr Marlina Binti Ramli for being such good guider for us while we doing this task. She had given us appropriate example and knowledge in order to make us understand more about this Internet of thing (IOT) project study. We take some idea from the past year's student's work. She spent her time to carry out each and every experiment related to Internet of thing (IOT) project study. She also makes sure we understand everything he told and explanation before we begin to work on these practical assessments.

We also appreciate the college authority for given us permission to carry out our task in library and college labs. We also want to thank our group members which willing to share their information about this Internet of thing (IOT) project study. They give a lot of new ideas about the task and all their information especially in transect sampling which required us to work together in order to complete this task.

Also, a great thanks to our family and friend who tried their best to give their best to give their support for us either by giving us a lot of encouragement for keep up with this task or by supporting the financial for use to pay all the cost required to complete this task.

Table of Contents

ABSTRACT.....	4
Chapter 1: Introduction.....	5
PROBLEM STATEMENT.....	5
PURPOSE OF PROJECT.....	6
PROJECT SCOPE.....	6
OBJECTIVE.....	6
CHAPTER 2: LITERATURE REVIEW.....	7
INTRODUCTION.....	7
SOFTWARE USE:.....	9
OVERVIEW OF EXISTING PRODUCT:.....	12
CHAPTER 3: METHODOLOGY.....	15
Introduction.....	15
Flow chart.....	15
Methodology used.....	16
Code Programme Project.....	17
CHAPTER 4: RESULT.....	21
Introduction.....	21
Survey (Questionnaire).....	21
PART A : (Objective 1 - To make it easy for the fire fighter to find the location of the fire.)	24
PART B: (Objective 2 - To minimize any fatal incidents during emergency situations and safety of citizens.)	26
Output Project:.....	27
1.4 Comparison of software:.....	30
Case 1: Application used in same our product.....	30
Case 2: Comparison of satellite navigation software.....	31
CHAPTER 5: CONCLUSION & RECOMMENDATION.....	33
Introduction.....	33
CONCLUSION.....	33
RECOMMENDATION.....	34
REFERRNCE:.....	34
APPENDIX:.....	35

ABSTRACT

Fire Alarm Navigation System is a safety device which are used to reduce rate of death by heading the exact location of the fire incident. The device will alert fire fighter about the fire incident by sending the location to the fire station directly. The Arduino UNO, Flame Sensor, GPS Module, GSM Module (SIM800D), Messaging application and Arduino software will be used. We set up distance detection Flame sensor in 5 cm. When Flame sensor sense fire up to 593 Celsius or 1100 Fahrenheit, the exact location coordinates of the incident will be send to nearby fire station using GPS module through Messaging application. It is easier for fire fighter to take action immediately to find the location. The safety feature of the flame sensor is expected to safeguard school or institution or any place from losses and damages caused by fire outbreak. Fire fighters get information about the location of the victim slowly and the rate of death in Malaysia is caused by fire very high. Whenever a fire happens, the firecracker gets the information and location of the victim.

Chapter 1: Introduction

One of the most common disaster which causes loss of life and property is fire. Instant alerting of fire fracture to incident location owner and also alerting fire department about incident is necessary to ensure immediate action. Using a well-equipped with latest technologies cannot avert the situation but can mitigate its impact. Every second can save many lives in such situations. This project is to reduce rate of death and to ease fire fighter to get the location of the fire eruption quickly. The apparatus that need to be used in this project are Arduino, flame sensor, GPS module, GSM module and messaging application.

PROBLEM STATEMENT

- **Fire fighters get information about the location of the victim slowly and the rate of death in Malaysia is caused by fire very high.**

Whenever a fire happens, the firecracker gets the information and location of the victim. This causes the rate of injuries to the victim to increases. Therefore, in the presence of a fire alarm navigation system, we can reduce the rate of injury and death rate. This system will provide location information to the fire when there is a fire at the scene immediately.

PURPOSE OF PROJECT

As we know the fire detection and alarm systems are designed to warn about fire outbreaks and allow proper fire fighters to be taken before conditions become regulated. Since all systems are designed primarily to protect lives, property, this gives great responsibility to designers as each building will present a wide range of issues related to the risk of fire and fire. For each fire detection and alarm system must be specifically designed to meet the requirements for each building.

Therefore, we will create a project where it will facilitate and ease firefighters to perform faster than ever. This project is used to send the location of the fire in the building to the fire station. As we know, in Malaysia we never used this kind of system. With this project, it can also reduce the time taken in emergency situations and may reduce mortality or injury to victims of the fire. We named this project entitle “FIRE ALARM NAVIGATION SYSTEM “.

PROJECT SCOPE

This system is built for fire stations and end user in Malaysia. Every buildings in Malaysia need to implement this kind of system to reduce rate of death.

OBJECTIVE

- i. To make it easy for the fire fighter to find the location of the fire.
 - With this system, it will ease fire fighters’ tasks to detect the location.
 - Can be arrive in a faster rate at designated location in case fire occurred.
- ii. To minimize any fatal incidents during emergency situations and safety of citizens.
 - To ensure that persons within a building are notified quickly of a fire so that they can be aware of the situation and escape safely.

CHAPTER 2: LITERATURE REVIEW

INTRODUCTION

The statistic of fire incident in Malaysia shows that this incident happen due to the unawareness of people about fire incident. It literally show increase in number of death and high rate of loss for the owner. Fire and Rescue Department (FRD) show that in every two weeks, a child might dies from fire and burn injury most of it occurs at home while there are about 6000 premises are destroyed by fire every year.

This project uses Arduino Uno where it act as microcontroller where the coding need to be uploaded into this Arduino Uno for the project to succeed .Next, GSM module is used where it is essential in establishing a communication. This GSM use sim card such as U-MOBILE to operate. It will send messages to fire station alerting about the fire. Moreover, flame sensor is used to detect fire in a specific range where the range is between 760nm-100nm.

To carry out a task to comment on the fire alarm detector, we have selected a journal and related article. Here is information about journals and selected articles:

Article title: **Fire Accident Detection and Prevention monitoring System using Wireless Sensor Network enabled Android Application.**

Writer : M. Samarasimha Reddy and K. Raghava Rao

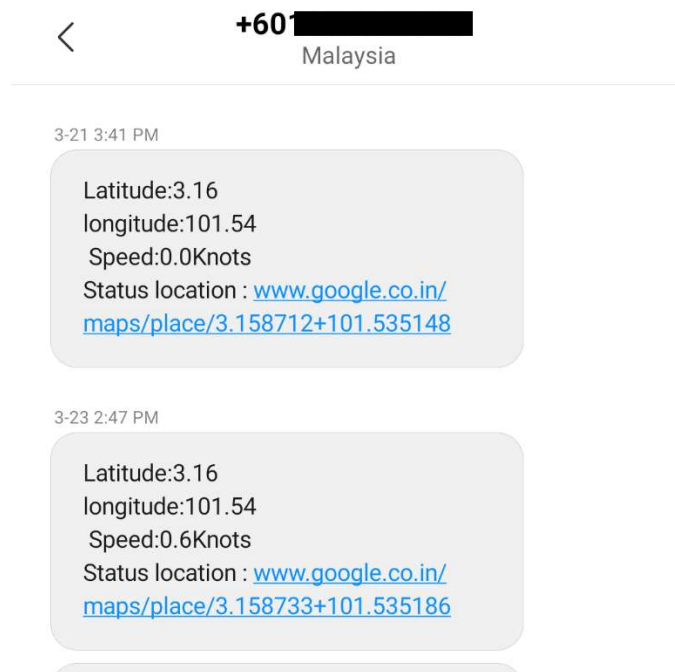
Link : www.indjst.org/index.php/indjst/article/viewFile/93097/69445

This paper gives an overview of exiting fire-detector types which can be comprehended to one hundred percent completion combined with the progress connected with economical, portable, reliable microcontroller dependent programmed open flame alert system as slightly careful almost a little flames happenings in residence as well as professional areas. The purpose of our developed system is alerting the far off property-proprietor accurately also rapidly through sending Short Message (SMS) by means of GSM network and transmitter values to the Central server using GPRS. Any linear integrated temperature sensor detects temperatures farther than the predetermined benchmark, although semiconductor sort sensor recognizes the existence of smoke or even gasoline coming from fireplace risks. On successful detection of fire, the device transmits the data to the central server with GPS co-

ordinates which helps us out to locate the exact location using the maps application in android mobile, based on the link received through the SMS. The detectors are placed parallel to each other in required amounts. Indication read through every single detector from any kind of levels can be monitored and controlled using monitoring method. The developed fire alarm system is simple but it really offers vast division of App in residence and also manufacturing basic safety, specifically in creating nations around the world. Employing this method, fast and also reputable warnings can be performed for us to trigger preventative methods to avoid risk associated with flame dangers and also reduce losses associated with life and also property. This is the alert framework less expensive fires that performs dependably to guarantee fire wellbeing way and can be introduced in homes, businesses, rehearses, home articles and so forth effectively. This can be utilized to distinguish propane burnable as methane, LPG and so on. In the meantime frameworks planned with scope up to 100 square meters, just using so as to measure area a link of classification 6 cable connection seeing that facts brand. Huge commercial or maybe non-commercial region can be administered throughout the recommended system installing several modules, each of them for one floor or maybe for unit.

SOFTWARE USE:

1. Messaging application



Messaging applications can refer to:

- Messaging apps (a.k.a. Social messaging applications) such as WeChat, WhatsApp and Facebook Messenger
- Text messaging including SMS
- Instant messaging, primarily referring to Web-based messaging before 2010
- Mobile messaging

Text messaging:

Text messaging, or texting, is the act of composing and sending electronic messages, typically consisting of alphabetic and numeric characters, between two or more users of mobile devices, desktops/laptops, or other type of compatible computer. Text messages may be sent over a cellular network, or may also be sent via an Internet connection.

The term originally referred to messages sent using the Short Message Service (SMS). It has grown beyond alphanumeric text to include multimedia messages (known as MMS) containing digital images, videos, and sound content, as well as ideograms known as emoji (happy faces, sad faces, and other icons).

Text messages are used for personal, family, business and social purposes. Governmental and non-governmental organizations use text messaging for communication between colleagues. In the 2010s, the sending of short informal messages has become an accepted part of many cultures, as happened earlier with emailing. This makes texting a quick and easy way to communicate with friends, family and colleagues, including in contexts where a call would be impolite or inappropriate (e.g., calling very late at night or when one knows the other person is busy with family or work activities). Like e-mail and voicemail, and unlike calls (in which the caller hopes to speak directly with the recipient), texting does not require the caller and recipient to both be free at the same moment; this permits communication even between busy individuals. Text messages can also be used to interact with automated systems, for example, to order products or services from e-commerce websites, or to participate in online contests. Advertisers and service providers use direct text marketing to send messages to mobile users about promotions, payment due dates, and other notifications instead of using postal mail, email, or voicemail.

2. Arduino Software (IDE)

The Arduino integrated development environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in the programming language Java. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development boards.

The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub `main()` into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution. The Arduino IDE employs the program `avrdude` to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware.

3. Google Maps

Google Maps is a web mapping service developed by Google. It offers satellite imagery, aerial photography, street maps, 360° panoramic views of streets (Street View), real-time traffic conditions, and route planning for traveling by foot, car, bicycle and air (in beta), or public transportation.

Google Maps began as a C++ desktop program at Where 2 Technologies. In October 2004, the company was acquired by Google, which converted it into a web application. After additional acquisitions of a geospatial data visualization company and a realtime traffic analyzer, Google Maps was launched in February 2005. The service's front end utilizes JavaScript, XML, and Ajax. Google Maps offers an API that allows maps to be embedded on third-party websites, and offers a locator for businesses and other organizations in numerous countries around the world. Google Map Maker allowed users to collaboratively expand and update the service's mapping worldwide but was discontinued from March 2017. However, crowdsourced contributions to Google Maps were not discontinued as the company announced those features will be transferred to the Google Local Guides program.

Google Maps' satellite view is a "top-down" or "birds eye" view; most of the high-resolution imagery of cities is aerial photography taken from aircraft flying at 800 to 1,500 feet (240 to 460 m), while most other imagery is from satellites. Much of the available satellite imagery is no more than three years old and is updated on a regular basis. Google Maps used a variant of the Mercator projection, and therefore could not accurately show areas around the poles. However, in August 2018, the desktop version of Google Maps was updated to show a 3D globe as the default projection. It is still possible to switch back to the Mercator Projection in the settings.

Google Maps for Android and iOS devices was released in September 2008 and features GPS turn-by-turn navigation along with dedicated parking assistance features. In August 2013, it was determined to be the world's most popular app for smartphones, with over 54% of global smartphone owners using it at least once.

In 2012, Google reported having over 7,100 employees and contractors directly working in mapping.

In 2017, along with several other services including YouTube, Chrome, Gmail, Search, and Google Play, Google Maps reached over 1 billion users.

OVERVIEW OF EXISTING PRODUCT:

1. OPTICAL SMOKE DETECTOR (RM1000)



For detecting visible smoke particles

Integrated infrared light source generates a light pulse every 8 seconds

Visible smoke particles alter the signal received by a photo-diode and the sensor triggers an alarm

Self-adjusting sensitivity

Floating alarm relay

Direct connection to each alarm control unit

Recording range 40 m²

Mounted to ceiling in centre of room

Opti Heat thermo-differential sensor (RM1100)

Thermo-differential fire detector (heat detector)

Two-way detection (thermo-differential/absolute)

Floating alarm relay

Direct connection to every alarm control unit

For avoiding false alarms in smoking areas, kitchens, garages etc.

It detects an alarm if the temperature rises by more than 3°C within 1 minute or to over 60°C overall in a detection range of 40 m²

Mounted to ceiling in centre of room

2. Battery operated fire alarm



Battery powered smoke alarms offer an inexpensive and easy way to protect homes that aren't pre-wired with an interconnected system. The battery power continues to work during a power outage if they have been replaced regularly. Battery powered alarms can be installed easily and all models include a test button, power indicator light, battery locking, and low battery warning indicator.

3. Hardwired AC Operated - Smoke Alarms



A full range of 120V AC wire-in life safety products with interconnect capability to provide the most immediate and complete system available. When any one interconnected alarm is triggered by smoke, all interconnected alarms within the home sound an immediate warning. Don't have a hardwired interconnected system in your home? Now, you can enjoy the benefits of an interconnected system by installing **Kidde wireless smoke alarms**. Newer homes are required by code to have interconnected alarms. Wireless technology enables ANY home to have an interconnected system without expensive wiring.

4. Intelligent Wire-Free Alarms



Series of smoke and combination smoke & carbon monoxide alarms that can be interconnected wirelessly.

5. 10-Year Battery Powered - Smoke Alarm



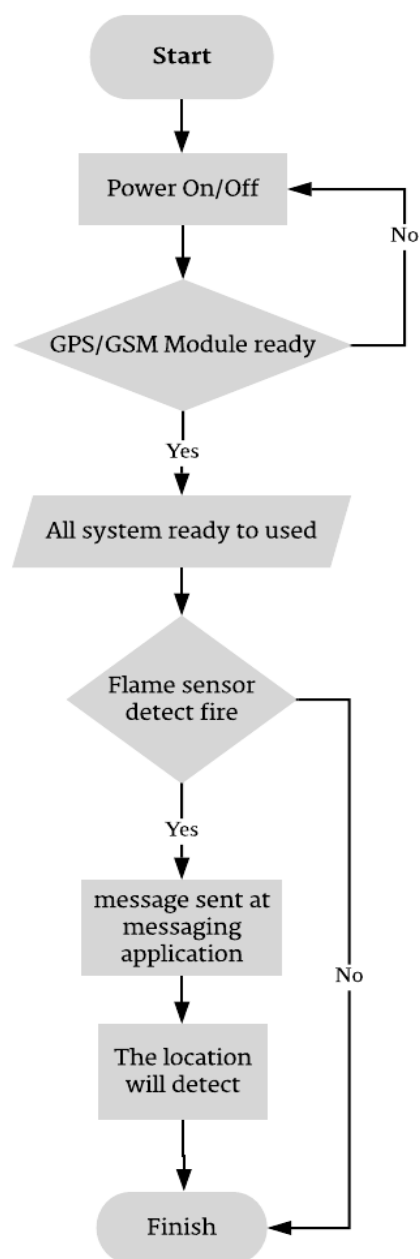
10-year sealed battery smoke alarms (sometimes called smoke detectors) offer a variety of benefits to the millions of Americans who rely on continuous battery-powered smoke and fire detection in their homes. The alarms are powered by sealed, long-life lithium batteries for 10 years (the life of the alarm), meaning they are always on. The National Fire Protection Association recommends replacing smoke alarms every 10 years.

CHAPTER 3: METHODOLOGY

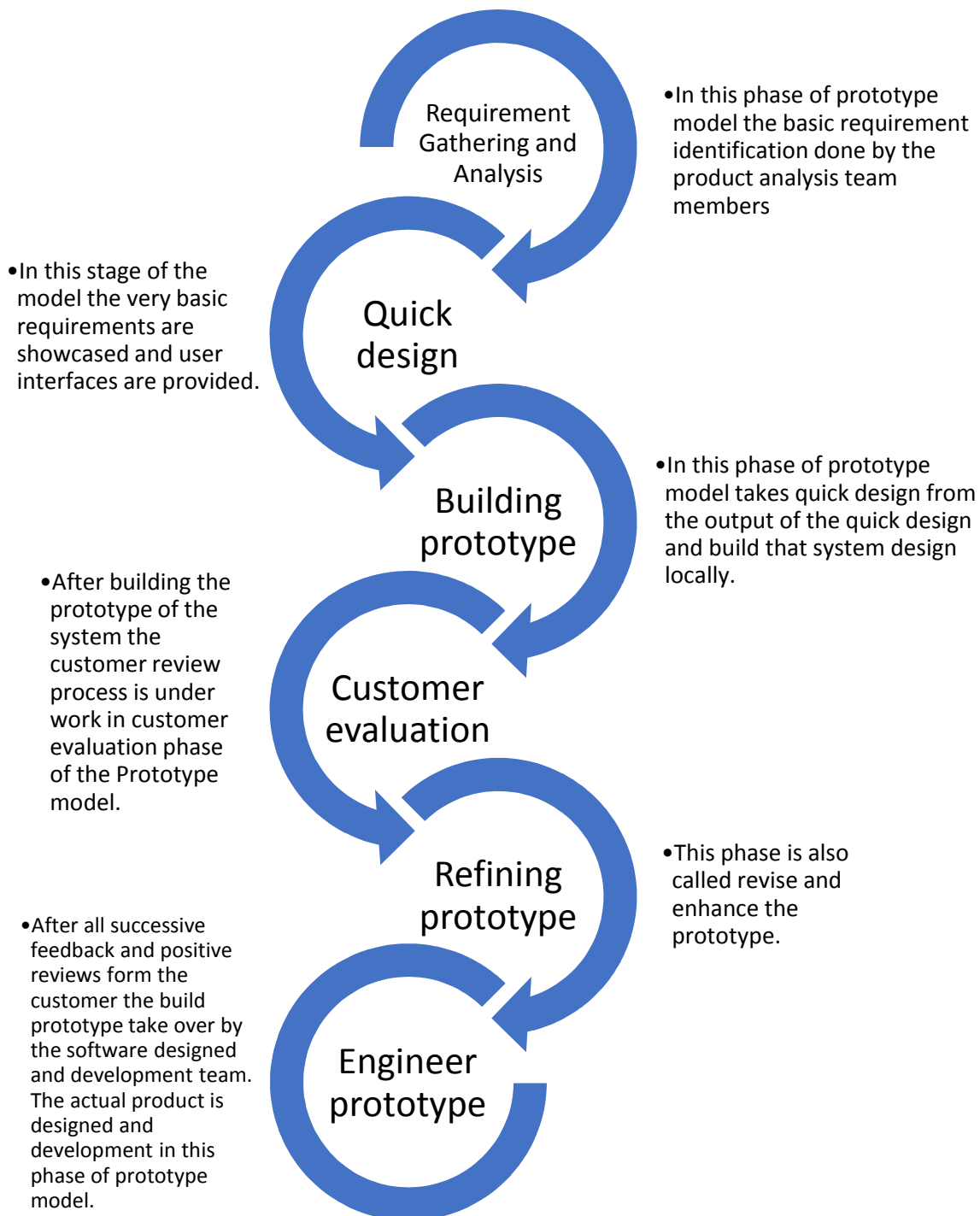
Introduction

This chapter explain on the methodology that implement in this project. There are several methods or procedures that available to create project formulation. The methodology will explains the flow chart, project layout, and code program.

Flow chart



Methodology used



Code Programme Project

```
//Pin 2 Arduino ----> TXD GSM
//Pin 3 Arduino ----> RXD GSM
//Pin 10 Arduino ----> TXD GPS
//Pin 11 Arduino ----> RXD GPS

#include<SoftwareSerial.h>
SoftwareSerial Serial1(2,3);
SoftwareSerial gps(10,11);
#define flame_sensor 4 // Jadikan pin 10 untuk IR1
#define LED_ON 12

int sensor_detect = 0; // variable for reading the pushbutton status
int i=0,k=0;
int gps_status=0;
float latitude=0;
float logitude=0;
String Speed="";
String gpsString="";
char *test="$GPRMC";

void initModule(String cmd, char *res, int t)
{
  while(1)
  {
    Serial.println(cmd);
    Serial1.println(cmd);
    delay(100);
    while(Serial1.available(>0)
    {
      if(Serial1.find(res))
      {
        Serial.println(res);
        delay(t);
        return;
      }

      else
      {
        Serial.println("Error");
      }
    }
    delay(t);
  }
}

void setup()
{
  Serial1.begin(9600);
  Serial.begin(9600);

  pinMode(LED_ON, OUTPUT);
  pinMode(flame_sensor, INPUT); // arahan flame sensor adalah kemasukkan

  delay(3000);
  digitalWrite(LED_ON,LOW);
  Serial.println("Initializing...");
  initModule("AT","OK",1000);
  initModule("ATE1","OK",1000);
```

```

initModule("AT+CPIN?","READY",1000);
initModule("AT+CMGF=1","OK",1000);
initModule("AT+CNMI=2,2,0,0,0","OK",1000);
Serial.println("Initialized Successfully");

gps.begin(9600);
get_gps();
show_coordinate();
delay(2000);
digitalWrite (LED_ON,HIGH);
delay(2000);
Serial.println("System Ready..");
}
void loop()
{
sensor_detect =digitalRead(flame_sensor);
if (sensor_detect== 0){

    get_gps();
    show_coordinate();
    Serial.println("Sending SMS");
    Send();
    Serial.println("SMS Sent");
    delay(2000);
    digitalWrite (LED_ON,HIGH);

} else {
}
}

void gpsEvent()
{
gpsString="";
while(1)
{
while (gps.available(>0) //Serial incoming data from GPS
{
char inChar = (char)gps.read();
gpsString+= inChar; //store incoming data from GPS to temporary string str[]
i++;
// Serial.print(inChar);
if (i < 7)
{
if(gpsString[i-1] != test[i-1]) //check for right string
{
i=0;
gpsString="";
}
}
}
if(inChar=='\r')
{
if(i>60)
{
gps_status=1;
break;
}
else
{
i=0;
}
}
}
}

```

```

}
}
if(gps_status)
break;
}
}
void get_gps()
{
gps_status=0;
int x=0;
while(gps_status==0)
{
gpsEvent();
int str_lenth=i;
coordinate2dec();
i=0;x=0;
str_lenth=0;
}
}
void show_coordinate()
{

Serial.print("Latitude:");
Serial.println(latitude);
Serial.print("Longitude:");
Serial.println(logitude);
Serial.print("Speed(in knots)=");
Serial.println(Speed);
delay(2000);
}

void coordinate2dec()
{
String lat_degree="";
for(i=20;i<=21;i++)
lat_degree+=gpsString[i];

String lat_minut="";
for(i=22;i<=28;i++)
lat_minut+=gpsString[i];

String log_degree="";
for(i=32;i<=34;i++)
log_degree+=gpsString[i];

String log_minut="";
for(i=35;i<=41;i++)
log_minut+=gpsString[i];

Speed="";
for(i=45;i<48;i++) //extract longitude from string
Speed+=gpsString[i];
float minut= lat_minut.toFloat();
minut=minut/60;
float degree=lat_degree.toFloat();
latitude=degree+minut;
minut= log_minut.toFloat();
minut=minut/60;
degree=log_degree.toFloat();
logitude=degree+minut;
}

```

```

}
void Send()
{
  Serial1.println("AT");
  delay(500);
  serialPrint();
  Serial1.println("AT+CMGF=1");
  delay(500);
  serialPrint();
  Serial1.print("AT+CMGS=");
  Serial1.print("");
  Serial1.print("0132046644"); // SET TELEFON NOMBOR ANDA DISINI
  Serial1.println("");
  delay(500);
  serialPrint();
  Serial1.print("Latitude:");
  Serial1.println(latitude);
  delay(500);
  serialPrint();
  Serial1.print("longitude:");
  Serial1.println(logitude);
  delay(500);
  serialPrint();
  Serial1.print(" Speed:");
  Serial1.print(Speed);
  Serial1.println("Knots");
  delay(500);
  serialPrint();
  Serial1.print("Status location : www.google.co.in/maps/place/");

  Serial1.print(latitude,6);
  Serial1.print("+");
  Serial1.print(logitude,6);
  Serial1.write(26);
  delay(2000);
  serialPrint();
}

void serialPrint()
{
  while(Serial1.available()>0)
  {
    Serial.print(Serial1.read());
  }
}

```

CHAPTER 4: RESULT

Introduction

This chapter discuss and explained on what is the post-test and pre-test result of this project. This FIRE ALARM NAVIGATION SYSTEM provide fire station the location of the fire incident.

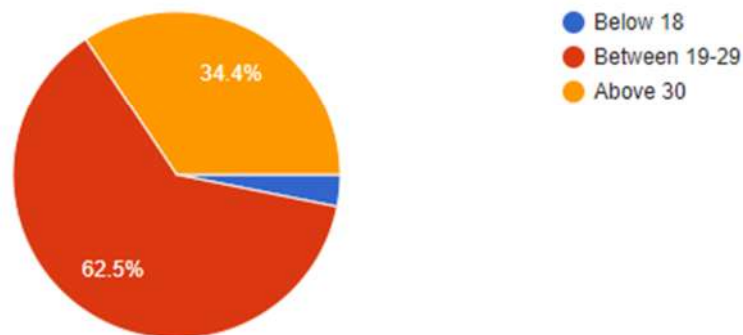
This chapter will conclude fire fighter for the evaluation by providing suitable questionnaire that will help complete the test.

Survey (Questionnaire)

Question 1: What is your age?

What is your age?

64 responses

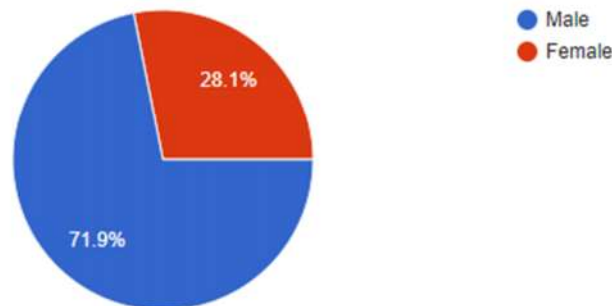


The pie chart shows that 64 peoples have respond this question. 3.1% (which is 2 respondents) have answered this question are from below 18 years old. 62.5% (which is 40 respondents) have answered this question are from 19 until 29 years old. 34.4% (which is 22 respondents) have answered this question are above 30 years old.

Question 2: What is your gender?

What is your gender?

64 responses

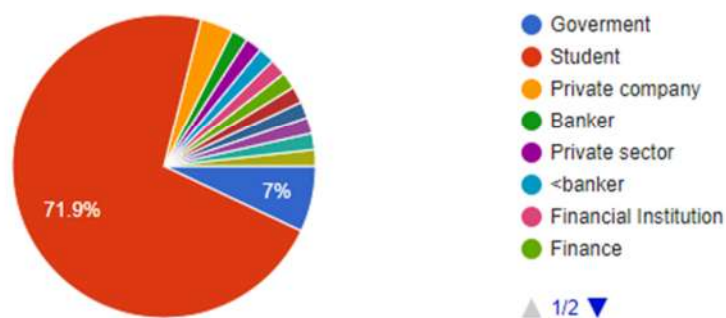


The pie chart shows that 64 people have responded to this question. 28.1% (which is 18 respondents) have answered this question as female. 71.9% (which is 46 respondents) have answered this question as male.

Question 3: Your occupation?

Your occupation?

57 responses

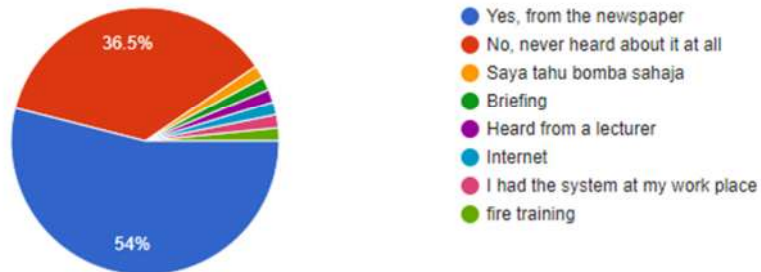


The pie chart shows that 57 people have responded to this question. 7% (which is 4 respondents) have answered this question as Government. 71.9% (which is 41 respondents) have answered this question as student. 21.1% (which is 12 respondents) have answered this question as from others.

Question 4: Do you ever heard about Fire Alarm Navigation System?

Do you ever heard about Fire Alarm Navigation System?

63 responses

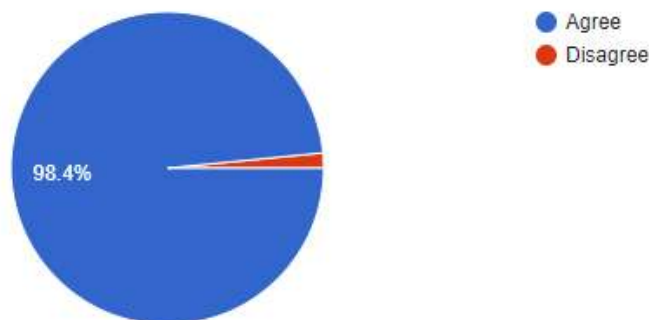


The pie chart shows that 63 people have responded to this question. 54% (which is 34 respondents) have answered this question as 'Yes, from the newspaper'. 36.5% (which is 23 respondents) have answered this question as 'No, never heard about it at all'. 9.5% (which is 6 respondents) have answered this question as 'others'.

Question 5: Do you agree if we create this system?

Do you agree if we create this system?

64 responses



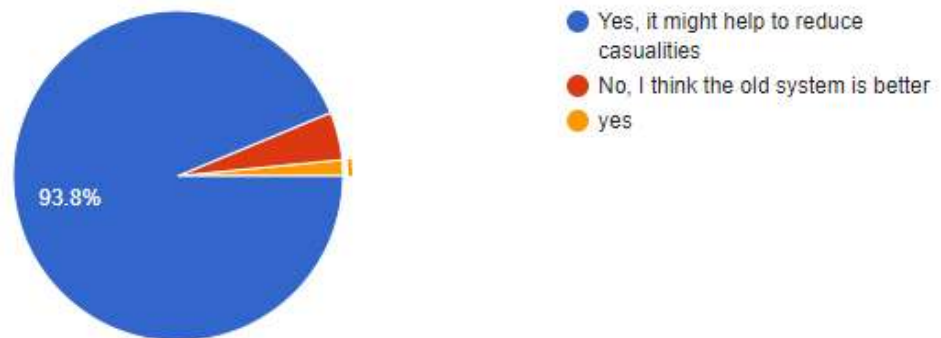
The pie chart shows that 64 people have responded to this question. 98.4% (which is 63 respondents) have answered this question as 'Agree'. 1.6% (which is 1 respondent) has answered this question as 'Disagree'.

PART A : (Objective 1 - To make it easy for the fire fighter to find the location of the fire.)

Question 6: Do you prefer to install this system in your house for safety purposes?

Do you prefer to install this system in your house for safety purposes?

64 responses

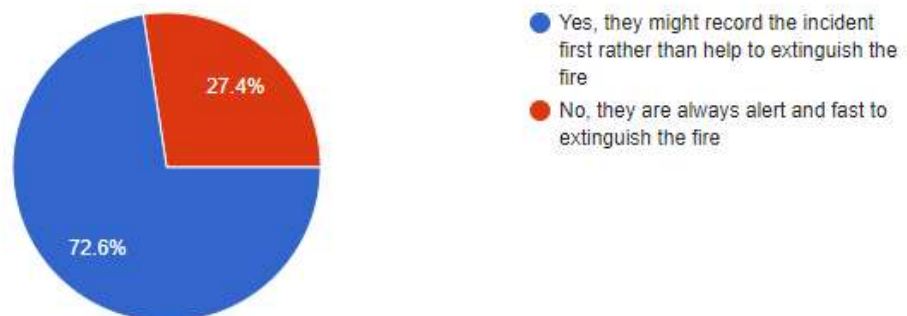


The pie chart shows that 64 people have responded to this question. 95.3% (which is 61 respondents) have answered this question are from Yes. 4.7% (which is 3 respondents) have answered this question are from No, I think the old system is better.

Question 7: Do you think that nearby residents are slow to react when fire happens?

Do you think that nearby residents are slow to react when fire happens?

62 responses

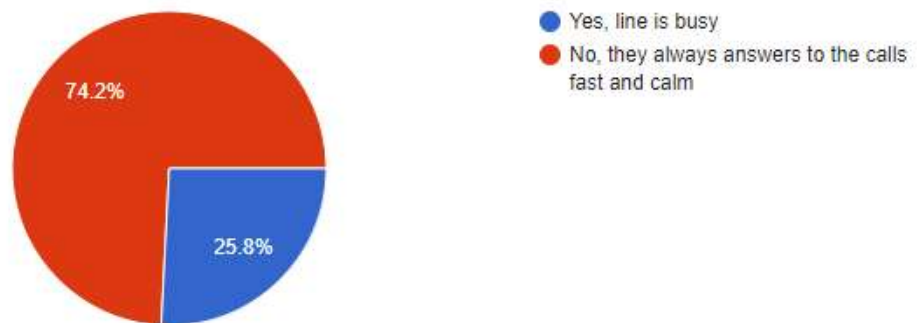


The pie chart shows that 62 peoples have respond this question. 72.6% (which is 45 respondents) have answered this question are from Yes, they might record the incident first rather than help to extinguish the fire. 27.4% (which is 17 respondents) have answered this question are from No, they are always alert and fast to extinguish the fire.

Question 8: Do you have any problem when you call fire station?

Do you have any problem when you call fire station?

62 responses



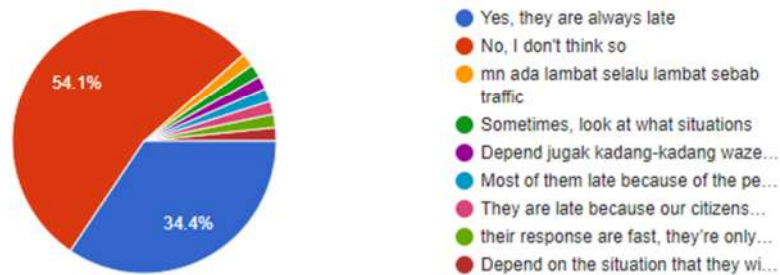
The pie chart shows that 62 peoples have respond this question. 74.2% (which is 46 respondents) have answered this question are from No, they always answers to the calls fast and calm. 25.8% (which is 16 respondents) have answered this question are from Yes, line is busy.

PART B: (Objective 2 - To minimize any fatal incidents during emergency situations and safety of citizens.)

Question 9: Do you agree that Fire Fighters arrived late at the fire incident location and hence cause casualties?

Do you agree that Fire Fighters arrived late at the fire incident location and hence cause casualties?

61 responses



The pie chart shows that 61 people have responded to this question. 54.1% (which is 33 respondents) have answered this question as 'No, I don't think so'. 34.4% (which is 21 respondents) have answered this question as 'Yes, they are always late'. 11.5% (which is 7 respondents) have answered this question as 'others'.

Question 10: Is this Fire Alarm Navigation System useful towards the community?

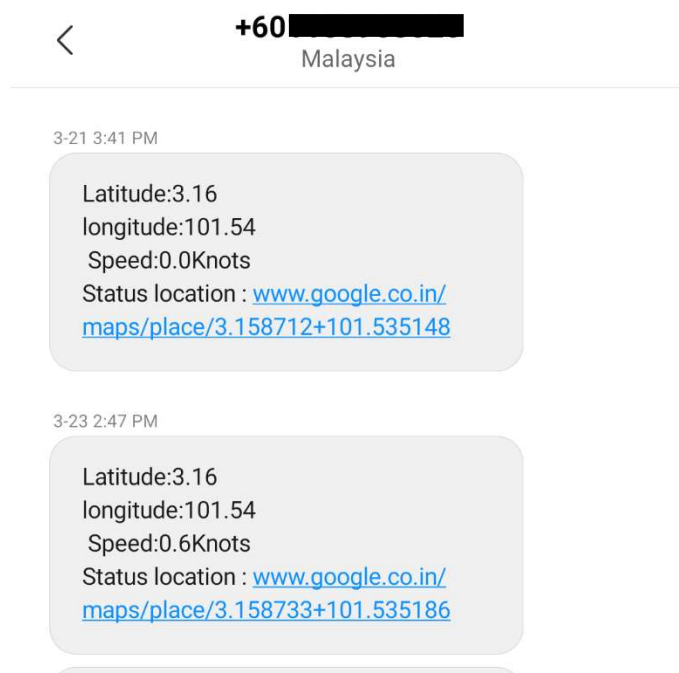
Is this Fire Alarm Navigation System useful towards the community?

63 responses



The pie chart shows that 63 people have responded to this question. 100% (which is 63 respondents) have answered this question as 'Yes, Absolutely'.

Step 3: the message will get the latitude, longitude, speed and status location (google map).then click the link at the status location.



Step 4: After that, the location incident will be appear in google map. Then click Directions at bottom right.


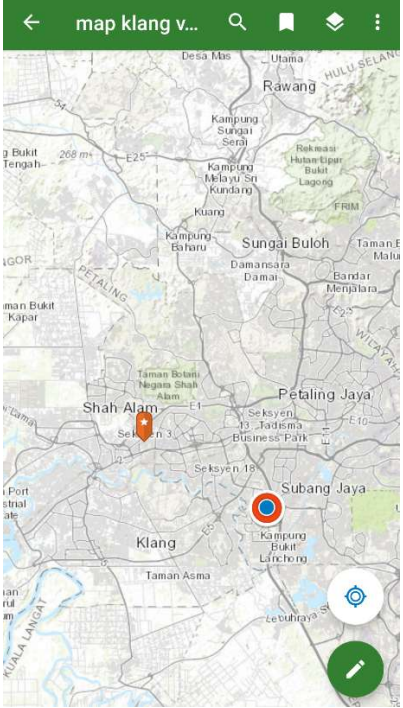


Step 5: Then the navigation will be appear.



1.4 Comparison of software:

Case 1: Application used in same our product

		Characteristic	
Type of Application	Massaging application	Fire case application	
Map Network	<p>Google Map</p> 	<p>ESRI ArcGIS map</p> 	
Send Location	Sending in latitude, longitude, speed and status location (google map)	Only status location	
Difficulty	Easy to used	Hard to used	

Case 2: Comparison of satellite navigation software

Name of application	Maps source	Operating platform	Software license	Cost	Maps can be preloaded (and stored)
Yandex Maps	Yandex.Map editor	Android, iOS, Windows Phone	Non-free proprietary	Free	Yes
Windows Maps	HERE Maps B.V.	Windows 10 Mobile, Windows 10, Xbox One, Microsoft HoloLens	Non-free proprietary	Free	Yes
Waze	<ul style="list-style-type: none"> • open basemaps • drives of the users • Community additions (Waze Map Editor) 	Android, iOS, Windows Phone ^[8]	Non-free proprietary	Free	<ul style="list-style-type: none"> • Limited control over stored data • can be used for off-line navigation
TomTom	TomTom	Android, iOS	Non-free proprietary	<ul style="list-style-type: none"> • Free for 75km/month • Paid subscription 	Yes

Sygie: GPS navigation	TomTom, Navteq, HERE Maps, others	Android, iOS, Windows Phone	Non-free proprietary	Freemium	Yes
Ovi Maps	Nokia / Navteq	Symbian OS S60, Maemo	-	<ul style="list-style-type: none"> Free: Last Nokia & Navigator phones Paid: Other phones 	Yes
OsmAnd	OpenStreetMap	Android, iOS	GNU GPLv2 (except some 3rd party libs and resources)	Free	Yes
Navmii	OpenStreetMap	Android, iOS	Non-free proprietary	Freemium	Yes
Navigon	Navteq	Android, iOS, Windows Phone	-	Paid	Yes
Moovit	OpenStreetMap	Android, iOS	Non-free proprietary	Free	No
Maps.me	OpenStreetMap	Android, iOS, BlackBerry	Apache 2.0 (except some 3rd party libs and resources)	Free	Yes
MapFactor	OpenStreetMap, TomTom	Android, Windows, Windows Phone	Non-free proprietary	Freemium	Yes

CHAPTER 5: CONCLUSION & RECOMMENDATION

Introduction

In general, fire alarm is a devices working together to detect and warn people through visual and audio appliances when smoke, fire, carbon monoxide or other emergencies are present while navigation system is a (usually electronic) system that aids in navigation. Fire Alarm Navigation System is a combination of both device where it will directly send the location to fire fighter using GSM Module.

This project can be access from phones. It will ease fire fighter to get the location without any problems. This is because messages will directly send longitude and latitude to fire station. GSM is important for this process because if there are no line or coverage presence, it will not be able to send direction to fire station especially in rural area.

Nowadays, fire incident happened due to human error or system malfunction. Fire Alarm Navigation System is a device that helps fire fighter arrived at location faster. It helps fire fighter by reducing the time taken to reach the fire incident location without even need to search and find the location. It also might decreases the casualties and fatalities of the owner's. It works when it detects fire in a specific range where location of the fire incident is directly send to the fire station.

CONCLUSION

Based on the Google form questionnaire, people agreed that this device will help the communities. Some of them believe that this device might be able to reduce causalities and fatalities due to the fire incident. Next, this device will ease fire fighter to locate the fire incident because they will arrive faster and able to put out the fire before it start to spread.

RECOMMENDATION

In the future, improvement can be made by changing the coding where the owner's of the house will get notification or warning about the fire incident. More sensors also can be added because the original device only have 1 sensor and with this added sensors, it can detect many fire in any ways such as presence of smoke, change in temperature and many mores. Changing the GSM will improve the device. Bigger coverage area is important for location in rural area.

REFFERNCE:

1. Reddy, M. S., & Rao, K. R. (2016). Fire Accident Detection and Prevention monitoring System using Wireless Sensor Network enabled Android Application. *Indian Journal of Science and Technology*, 9(17). doi: 10.17485/ijst/2016/v9i17/93097
2. "Opti Smoke - Optical Smoke Detector." *RM1000 | Opti Smoke - Optical Smoke Detector | RS Components*, https://my.rs-online.com/web/p/products/5245898/?grossPrice=Y&cm_mmc=MY-PLA-DS3A-_-google-_-PLA_MY_EN_Catch_All-_-Fusion-_-PRODUCT_GROUP.
3. "7 Best Smoke Detectors in Malaysia 2019 - Top Brands & Reviews." *Malaysia (EN)*, <https://productnation.co/my/appliances/small/23297/best-smoke-detector-malaysia/>.
4. "Messaging Application." Wikipedia, Wikimedia Foundation, 19 Sept. 2019, https://en.wikipedia.org/wiki/Messaging_application.
5. "Text Messaging." Wikipedia, Wikimedia Foundation, 28 Sept. 2019, https://en.wikipedia.org/wiki/Text_messaging.
6. "Arduino IDE." Wikipedia, Wikimedia Foundation, 25 Sept. 2019, https://en.wikipedia.org/wiki/Arduino_IDE.

APPENDIX:

Gant chart for project 1

	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15
What is research	■														
	■														
Propose suitable topic and submit project proposal form		■	■	■											
		■	■	■	■	■									
Prepared proposal report					■	■									
					■	■	■								
Research writing							■	■	■						
							■	■	■						
Prepare literature review								■	■	■					
								■	■	■					
Research methodology and design											■	■	■		
											■	■			
Presentation													■	■	
													■	■	
Submit report															■
															■



• Schedule



• Actual

Gant chart for project 2

	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15
Buying component															
Project design															
Producing project															
Work in progress															
Run and testing project															
Modification of project															
Data analysis project															
Report preparation															
Presentation															
Submit report															



• Schedule



• Actual

