POLITEKNIK UNGKU OMAR

WIRELESS SMOKE DETECTION AND FIRE SYSTEM THROUGH APPLICATION

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(01DKA20F2070)

CIVIL ENGINEERING DEPARTMENT

SESSION 2: 2022/2023

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This report has been submitted to the Department of Civil Engineering as part of the conditions for awarding the Diploma in Civil Engineering

CIVIL ENGINEERING DEPARTMENT

SESSION II : 2022/2023

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APPRECIATION

We sincerely thank Allah SWT for granting us the ability and copious grace to successfully finish this folio job assignment. Here, we also like to express our gratitude to all the people who have contributed to our timely completion of this course work.

We would like to take this opportunity to express our gratitude to our project supervisor, Mrs. Ruhaizat bt Jubri, for placing her complete trust in us to finish this significant task and to our project panel, Mrs. Dayana Safra, for her guidance and education in helping us to complete this task flawlessly,

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This speech is also directed at everyone who has contributed, directly or indirectly, to the successful conclusion of this job. We are grateful for all of your assistance. Perish the memory of the service.

Thank you.

ABSTRACT

The primary aim of this project is to build a wireless smoke detector that can be used to detect little or large fires in residential areas through an application. Whether the user is in close proximity to the radar or not, this gadget is crucial in providing a fire warning. This project offers an additional option in which all device access numbers can be shared by users, irrespective of their relationships with family or close friends. This prototype was developed since the majority of home fire incidents are the result of their being no warning signs or other information regarding the fire until it breaks out without the victim's knowledge. However, this home fire incidents can be prevented using this gadget. Furthermore, the project has the potential to reduce the number of deaths related to fire incidents. Numerous mechanical and practical theories are applied in the process of creating a smoke detector through this application, depending on the user's suitability because this design project involves the use of design software, such as coding, the Blynk programme, fundamental engineering calculations, and problem identification and solving. t It offers numerous chances to expand knowledge and experience. Nonetheless, there are still areas for improvement and possibility for this project to progress in a way that aligns with the goals of this design-build. All things considered, this application's wireless smoke detector can function well and have a great impact on users.

ABSTRAK

Tujuan utama projek ini adalah untuk membina pengesan asap tanpa wayar yang boleh digunakan untuk mengesan kebakaran kecil atau besar di kawasan kediaman melalui aplikasi. Sama ada pengguna berada berdekatan dengan radar atau tidak, alat ini penting dalam memberikan amaran kebakaran. Projek ini menawarkan pilihan tambahan di mana semua nombor akses peranti boleh dikongsi oleh pengguna lain, tidak kira dengan keluarga atau rakan rapat. Prototaip ini dibangunkan memandangkan kebanyakan kejadian kebakaran rumah adalah akibat tiada tanda amaran atau maklumat lain mengenai kebakaran sehingga ia berlaku tanpa pengetahuan mangsa. Namun, kejadian kebakaran rumah ini boleh dielakkan menggunakan gajet ini. Tambahan pula, projek itu berpotensi untuk mengurangkan jumlah kematian berkaitan kejadian kebakaran. Banyak teori mekanikal dan praktikal digunakan dalam proses mencipta pengesan asap tanpa wayar melalui aplikasi ini, bergantung kepada kesesuaian pengguna kerana projek reka bentuk ini melibatkan penggunaan perisian reka bentuk, seperti pengekodan, program Blynk, pengiraan kejuruteraan asas dan pengenalpastian masalah. dan penyelesaian. Ia menawarkan banyak peluang untuk mengembangkan pengetahuan dan pengalaman. Namun begitu, masih terdapat kawasan untuk penambahbaikan dan kemungkinan untuk projek ini maju dengan cara yang sejajar dengan matlamat binaan reka bentuk ini. Setelah semua perkara dipertimbangkan, alat ini juga terbukti mampu berfungsi dengan baik dan memberi impak besar kepada pengguna.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

One of the biggest challenges abroad is fires in residential areas. In other circumstances, there are a lot of horrific fatalities which take place in residential areas. People who live in residences, especially those with overwhelming gas and electric usage, are highly at risk of this. These incidents may result in damage to the environment, structures, and humans. There are frequent fires in this area because of short circuits, gas leaks, and so on.

In March 2023, a fire incident happened at Kampung Sabak Awor, Muar. The fire chronology is due to a short circuit. Fire incidents have become a critical issue, which must be dealt with on time without any unnecessary delay to avoid the loss of lives and belongings. Fires usually occur in homes because of carelessness and changes in environmental conditions. They cause threats to the residential community and may result in human death and property damage.

Fire hazard in buildings can be defined as the potential of accidental or intentional fire to threaten a building's life, structural, and property safety. With rapid development across the globe, fire hazards in buildings have undergone significant transformation in terms of severity and versatility and have become a growing concern in recent years. [2]

Sometimes, these incidents are more destructive when the fire spreads to the surroundings. Early detection of a fire event is an effective way to save lives and reduce property damage. The fire must be detected initially to escape a fiery place and douse the fire source. The installation of a fire alarm system is the most convenient way to detect a fire early and avoid losses. fire alarms consist of different devices working together that can detect fire and alert people through visual and audio appliances. Consequently, house fires must be detected early to prevent these types of threats. The immediate notification of a fire is the most critical issue in domestic fire detection systems.

A Wireless Sensor Network consists of a huge number of sensor nodes and is a set of hundreds or thousands of micro sensor nodes that have capabilities of sensing, establishing wireless communication between each other, and doing computational and processing operations Wireless Sensor Networks (WS) consist of tiny, cheap, and low-power sensor devices that can sense the environment and can provide real-time fire detection with high accuracy. A wireless sensor network is a network in which a large number of sensors are deployed and data is collected from them and sent to a particular system for processing. [3]

Not only that, but to address this problem, this study aims to implement a smart fire detection system that would not only detect the fire using integrated sensors but also alert property owners, emergency services, and local police stations to protect lives and valuable assets simultaneously. So, the concept of the Internet of Things (loT) nowadays is applied in many applications ranging from the smart industry and smart agriculture to smart healthcare and smart home applications. Home automation is an area where loT has several advantages. For example, when the wireless sensor network detects the gas or smokes around or surrounding the house that can cause fire, the loT application will notify the owner even in outstation. Fires can spiral out of control because people install inadequate fire alarm systems to save money

1.2 BACKGROUND OF THE PROJECT

There have been numerous accidents in residential neighbourhoods over the previous few years and this year that were caused by gas leaks or short circuits, some of which have been fatal. Here are some of the occurrences that have occurred recently near residential areas across the nation. On 30 March 2023 at Kampung Sabak Awor, Muar, Neighbours were shocked when the Kampung Sabak Awor, Muar fire yesterday resulted in the tragedy of four brothers dying because they wrongly thought no one was home. [7]. Not only that, on 20 December 2021 the Flat at Sri Johor in Cheras, Residents who had lived in the region for 40 years were made homeless after a fire broke out in Cheras' Sri Johor Flats.[11] Moreover, overseas there are some cases same to Malaysia which is 16 April 2023, caused at least 16 dead, and 9 injured in an apartment fire in Dubai. The civil defense force, in a statement quoted by UAE media, said preliminary investigations showed the fire was caused by "a lack of compliance with building safety and security requirements".[12]

1.3 PROBLEM STATEMENT

The problem statement is people's ignorance is the main cause of many fires. Other than that, the other problem is when people unknowingly know about gas leaks, flammable materials, and an unintentional short circuit occurs. So, this project is to help residents to be aware of the fire. It is also very helpful because it can detect the heat of a fire as far as 5km from the house with the presence of the sensor. Furthermore, with the use of IoT technology users still can detect fires even if they are in other places. Also not forgotten, the use of this technology makes it easier for the authorities to take action. This is because the technology has given a signal to the nearest substation to assist if there are signs of fire.

1.4 OBJECTIVE

The technology of the wireless smoke detection and fire system through application objectives includes some of the following:

i. To design the actual apps or devices to control the prototype
ii. To develop this feature censor and technology
iii. To test the apps and device before the release

1.5 RESEARCH QUESTION

There are some questions after studying the matter:

i. How to make fire smoke detection through applications runs smoothly?
ii. What is the total cost to run this project?
iii. How fire smoke detection through the application will be work if the actual fire occurred?

1.6 SCOPE OF PROJECT

This model is a useful tool that could be used by households and communities. This prototype is focused more on houses, especially in neighbourhood areas and this product is using sensors and the Internet of Technology (IoT). Furthermore, this prototype provides support for the nearby substation. In our prototype, we make use of wireless sensor networks (WSNs), which consist of networks of spatially distributed and specialized sensors that monitor on and record environmental physical conditions before transmitting the information to a central point. Undeniably, this model also can save property which is it can be an alarm for people who be outstation to easily get help from the nearest substation or nearest neighbour to save their valuable things.

1.7 EXPECTED RESULT

The anticipated outcomes of the wireless smoke detector through the application project are for community households, especially neighbourhood community areas. This will improve building management operations' efficiency and cost-effectiveness, more effectively distinguish between fire and non-fire risks, and expand the amount of time available for the protection of property and life. To avoid giving building owners and fire departments deceitful fire information, Internet-based monitoring and management of building service systems will need security protection. By following that, the objective of the project can be achieved successfully.

1.8 CONCLUSION

Fire can occur either intentionally or unintentionally due to a wide range of situations, such as shorts in the electrical system or gas leaks in our situation, making it an unavoidable disaster.

In conclusion, chapter 1 discusses the basic concept of the project, the issue outline, the project's scope, and the objective that needs to be reached. Therefore, the main objective of this project is to build a prototype that can be used with applications that will assist the neighbourhood community alert themselves to fires that may be nearby and saving themselves.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Conflagration is the most prevalent form of fire that can result in burning harm to the physical body. The crucial process of fire has an impact on ecological systems all across the planet. First, fire is highly sensitive to climate change, specifically to temperature changes. We may anticipate that in fire-prone areas, fires will continue to enlarge unexpectedly, get severe, and become uncontrollable as long as dry fuel is abundant. Second, to forecast future wildfires and carbon emissions, a deeper comprehension of "slow" (interannual to multidecadal) socioecological processes is necessary.[9]

2.2 PREVIOUS RESEARCH

Every problem must have a solution. From time immemorial, humans have done research and solutions to make life easier and safer. Many past studies in fire alarm detection exist in this world.

2.2.1 Fire Safety

Fire safety is a set of practices intended to reduce the destruction caused by fire. Fire safety measures include those that are intended to prevent the ignition of an uncontrolled fire and those that are used to limit the spread and impact of a fire. In addition to being implemented in already-existing buildings or planned during construction, fire safety measures also include those that are taught to building inhabitants. Threats to fire safety are commonly referred to as fire hazards. A fire hazard may include a situation that increases the likelihood of a fire or may impede escape in the event a fire occurs. [2]

A fire-protection system is a group of connected gadgets that can detect and lessen the effects of a fire. A fire's chances of being successfully put out and the severity of its negative effects are increased the earlier it is discovered and diagnosed. In conclusion, fire prevention systems are a very valuable addition to your security alarm system because they can save both tangible objects and, more importantly, human lives.

Different fire defense measures exist. Important elements are required in various settings and circumstances to prevent, detect, and put out a fire. For fire protection systems there are two main types of fire prevention systems, and each of them is crucial for preventing fires. The first main type of fire prevention system is known as the active system. System sprinkler systems, fire extinguishers, and Amanda fire alarms are all part of an active fire system. In a "Active system," some type of action is necessary. In the case of a fire, active systems can be manually or automatically engaged. This is done in one of two ways: either manually, using a fire alarm pull station, for instance, or automatically, when smoke is detected by a smoke detector. Active systems are intended

to warn users of emergencies so they can flee. When individuals are aware of how these systems operate and are aware of what to do in an emergency, they are most successful. Fire drills are a great way for people to become familiar with how active fire systems work and learn what to do when they are activated. [14] The next main type of fire protection system is a passive system. Unlike active systems, which actively attempt to contain, control, and extinguish fires, passive fire protection extends the period for execution uppressing smoke and fire. The design of these devices enables them to automatically engage when heat or smoke is detected. Their purpose is to contain the fire in the location where it originated to slow it from spreading to other areas of the building. [14]

2.2.2 Fire Alarm System

In order to warn people before a fire consumes their homes, fire alarm systems are crucial. However, modern fire alarm systems require a significant amount of wiring and labour during installation. Users are discouraged from putting them in their houses as a result. As a result, we suggest an inexpensive, wireless fire alarm system that is based on the Internet of Things. The suggested system is an ad hoc network made up of numerous nodes scattered throughout the home. Each of these nodes is made up of an ESP8266 nodeMCU microcontroller that is coupled to smoke, temperature, humidity, flame, methane, and carbon monoxide (CO) sensors. These sensors continuously sense the environment to identify the presence of fire. The nodes build their own wireless LAN. These nodes correspond with a central node built with a Raspberry Pi microcontroller and a Bluetooth module.

The objective of a fire alarm system is to warn us of an emergency so that we can take precautions to protect ourselves, our staff members, and the public. Offices, factories, schools, and public buildings all have fire alert alarms. Although they are a common sight, they are sometimes neglected until an emergency, at which point they may just save our lives. Whatever the technique of detection, sounders will activate if an alarm is set off to alert occupants of the building to the possibility of a fire and to leave. A remote signal system that might notify the fire brigade via a central station may also be included in the fire alarm system.

The detecting devices, which can range from complex intelligent smoke detectors to straightforward manually controlled break glass units, are the heart of a fire alarm system. We can classify them into several categories, including heat detectors, smoke detectors, carbon monoxide detectors, multi-sensor detectors, and manual call points.

Figure 2.1: Types of Fire Alarm Detectors

2.2.2.1 Advantages And Disadvantages Of Fire Alarm Systems

The main benefit of installing a fire alarm system in your house or building is the peace of mind it provides. In the event of a fire, it not only gives you a head start but also enables you to take action before it's too late. Both your life and the lives of anyone else who might be in the building at the time could be saved by doing this. Additionally, having a trustworthy fire alarm system will aid in lowering insurance costs because insurers value its safety benefits. It's also not too difficult to install and maintain fire alarm systems. Since many contemporary systems are wireless, installing and configuring them is simple and doesn't require connecting cables through walls or ceilings. Once erected, they normally require little up keep despite the fact that they should be examined frequently in accordance with manufacturer guidelines.

The cost of installing a fire alarm system is its biggest drawback. Installation prices can vary from hundreds to thousands of dollars depending on the plan chosen, and this doesn't include any ongoing maintenance charges like checking or changing batteries on a regular basis. False alarms brought on by defective sensors can also be expensive (in terms of fines) and annoying for homeowners/building occupants if they happen too frequently. [15]

2.2.3 Wireless Network Sensor (WSN)

WSNs, or wireless sensor networks, are described as self-configuring, infrastructure-free wireless networks that monitor environmental or physical conditions such as temperature, pressure, motion, sound, vibration, or pollutants and transmit their data or information directly to a sink, also known as the primary location where the data is frequently monitored and analysed. Radio signals are a means of communication between the sensory nodes. The wireless sensor nodes include power supplies, processing hardware, radio transceivers, and sensors. Inherently resource-constrained, a sensor node in a wireless sensor network also has limited processing power, storage space, and communication bandwidth. After installation, the sensor nodes are in charge of self-organizing a suitable network infrastructure, frequently with many hops.[6]

2.2.3.1 Types Of Wireless Network Sensors (WSN)

i. Temperature Sensor

A temperature sensor is a sensor that will sense the temperature of its surrounding and send these details to the processing unit. In this system, our processing system will be the Arduino board which will take the readings of the sensor and then send these values to our system. We will consider a constant value of the temperature sensor, whenever the sensor value will be less than the constant value it will return zero else will return one. This combination of zero and one will be used to detect fire. [3]

ii. Gas sensor:

A gas sensor is a sensor that will detect gas. It will detect gases that are released when a fire is caused like carbon dioxide, carbon monoxide, and many more. When any gases will be detected the sensor will give a value of one, if no particular gas is detected it will give a value of zero. This combination of zero and one will be used to detect fire. The gas sensor will particularly detect the gases that are released when the fire is detected. [3]

iii. Flame sensor:

The flame sensor is a sensor that will detect the presence of flame. It will detect flame which is generated when the fire is caused. When a flame of any intensity will be detected the sensor will give a value of one, if no particular flame is detected it will give a value of zero. This combination of zero and one will be used to detect fire. Thus, the value of these three sensors will be used to form a combination that will be used to detect fire has occurred or not. If among these three if the value of two or more sensors is one then the fire will be present which means the alarm will ring as the fire will be detected. If the value of only one sensor is one then fire will not be detected. [3]

2.2.3.2 Advantages And Disadvantages Of Wireless Network Sensors

For Wireless Network Sensors (WSN) there are some advantages and also have disadvantages. The advantages are cables are not required for the process to work. Other than that, wireless networks should only be used in constructions or structures where installing cables is difficult. Moreover, it is easier to use because there are fewer strings needed for connecting one item to another. Last but not least this wireless network enables distant data communication as well. So, the disadvantages of wireless network sensors are this wireless network enables distant data communication as well. Not only that, it can be difficult to obtain because of the limited frequency range for wireless networks. Besides that, the effect of noise is considerable and the wave interference from other sources could cause network connections to break down. It is also physical obstructions like walls, trees, and things that make it difficult for signals to get across will typically interfere with wireless communications. In addition, wireless network installation and maintenance tend to be expensive to maintain and lack of guarantee of data security.

2.2.4 Internet Of Things (IoT)

The Internet of Things is an interconnection of physical devices embedded with electronics, software, and sensor which is capable of collecting data from the surrounding and sending data over the Internet is called IOT. The devices that provide the Internet of Things extend personal, household, public, business, and industrial spaces, and any area that's not affected by them now likely will be in the future. In daily life, many of us see and interact with smart gadgets to our internet-connected smartphones, which have containing accelerometers, gyroscopes, GPS, and sometimes heart rate monitors. In the personal area we have wearable devices like fitness trackers and heart monitors that use our phones to send and receive data. [2]

Applications of IOT:

i. IOT for mobile operator
ii. IOT for the manufacture of smart devices
iii. IOT for Banks and payment solution
iv. IOT for the Automobile industry
v. IOT for Airlines
vi. IOT for Health

2.2.4.1 Types Of Internets Of Things Communication Models

i. Device-to-device communications

The device-to-device communication model represents two or more devices that directly connect and communicate with one another, rather than through an intermediary application server. These devices communicate over many types of networks, including IP networks or the Internet. Often, however, these devices use protocols like Bluetooth,40Z-Wave,41, or ZigBee42 to establish direct device-to-device communications, as shown in Figure 2.2. [4]

Figure 2.2: Device-to-device communications

These device-to-device networks allow devices that adhere to a particular communication protocol to communicate and exchange messages to achieve their function. This communication model is commonly used in applications like home automation systems, which typically use small data packets of information to communicate between devices with relatively low data rate requirements. Residential IoT devices like light bulbs, light switches, thermostats, and door locks normally send small amounts of information to each other (e.g., a door lock status message or turn on light command) in a home automation scenario. [4]

ii. Device-to-cloud communications (Internet Society,2015)

In a device-to-cloud communication model, the IoT device connects directly to an Internet cloud service like an application service provider to exchange data and control message traffic. This approach frequently takes advantage of existing communications mechanisms like traditional wired Ethernet or Wi-Fi connections to establish a connection between the device and the IP network, which ultimately connects to the cloud service. This is shown in Figure 2.3:

Figure 2.3: Device-to-cloud communications

This communication model is employed by some popular consumer IoT devices like the Nest Labs Learning Thermostat44 (“Meet the Nest Thermostat | Nest.” Nest Labs. Web. 31 Aug. 2015.) and the Samsung SmartTV.45(“Samsung Privacy Policy--SmartTV Supplement.” Samsung Corp. Web. 29 Sept. 2015.) In the case of the Nest Learning Thermostat, the device transmits data to a cloud database where the data can be used to analyze home energy consumption. Further, this cloud connection enables the user to obtain remote access to their thermostat via a smartphone or Web interface, and it also supports software updates to the thermostat. Similarly, with the Samsung SmartTV technology, the television uses an Internet connection to transmit user viewing information to Samsung for analysis and to enable the interactive voice recognition features of the TV. [4]

iii. Device-To-Gateway models (Internet Society,2015)

In the device-to-gateway model or the device-to-application-layer gateway (ALG) model, the IoT device connects through an ALG service as a conduit to reach a cloud service. In simpler terms, this means that there is application software operating on a local gateway device, which acts as an intermediary between the device and the cloud service and provides security and other functionality such as data or protocol translation. The model is shown in Figure 2.4.

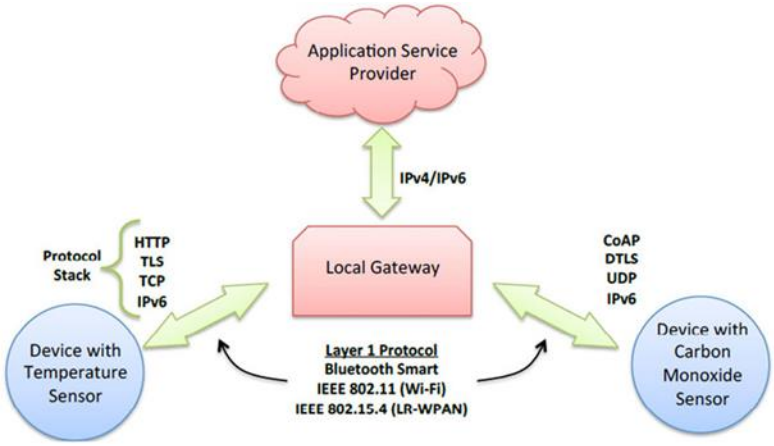


Figure 2.4: Device-To-Gateway models

Several forms of this model are found in consumer devices. In many cases, the local gateway device is a smartphone running an app to communicate with a device and relay data to a cloud service. This is often the model employed with popular consumer items like personal fitness trackers. These devices do not have the native ability to connect directly to a cloud service, so they frequently rely on smartphone app software to serve as an intermediary gateway to connect the fitness device to the cloud. [4]

Iv. Back-End-Data-Sharing model (Internet Society,2015)

The back-end data-sharing model refers to a communication architecture that enables users to export and analyse smart object data from a cloud service in combination with data from other sources. This architecture supports "the [user's] desire for granting access to the uploaded sensor data to third parties"50 (Tschofenig, H., et. al., p. 9). A back-end sharing architecture allows the data collected from single IoT device data streams to be aggregated and analysed. A graphical representation of this design is shown in Figure 2.5. [4]

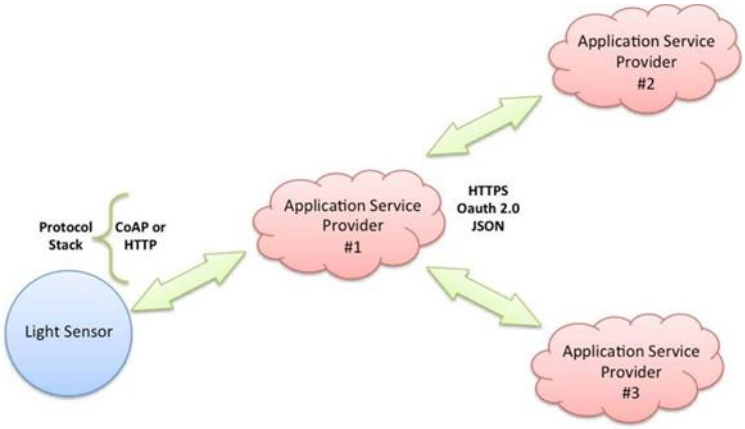


Figure 2.5: Back-End-Data-Sharing model

2.2.4.2 What issues are raised by the Internet of Things?

The range of concerns surrounding the Internet of Things is so wide that it would be impossible to address them all in one paper. However, we give a summary of five IoT-related themes that are widely discussed below. These consist of:

i. Security Issues
ii. Privacy Considerations
iii. Interoperability / Standards Issues
iv. Regulatory, Legal, and Rights Issues
v. Emerging Economy and Development Issues

2.3 SUMMARY

The chapter summary discusses the journal that was looked at, which is the use of IoT technology for fire sensor detection. The functionality of the app and the sensor are also covered in this edition. This article also discusses the benefits of the sensor, application, and fire systems. Based on research and a literature analysis that used data from prior studies, it is probable that this project will have an impact on everyone, particularly on the community and residential area. These apps' use in this project has the potential to have a big impact on the results. This project's software aids in the creation of apps that are both effective and affordable.

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

Methodology refers to the overall approach or strategy that you use to conduct research, solve a problem, or achieve a specific goal. In the context of academic research, methodology typically refers to the methods and procedures that are used to collect and analysed data. This can include techniques such as surveys, experiments, case studies, interviews, statistical analysis, and other forms of data interpretation. A clear and well-defined methodology is important for ensuring that your research is conducted rigorously and validly and that your findings are reliable and trustworthy.

3.2 DEVELOPMENT METHODOLOGY

A development methodology is a formalized approach to the software development process. It provides a set of guidelines, principles, and practices that help ensure the efficient and effective development of software systems. Software development methodologies have evolved in response to changing development needs, technology advancements, and industry trends. Each methodology has its own set of advantages and disadvantages, making it crucial to choose the most suitable methodology for a particular project.

In software development, using a methodology can help stakeholders to achieve:

i. Consistent processes and standards
ii. Effective communication
iii. Improved collaboration
iv. Reduced risk of errors or defects
v. Better productivity
vi. Faster time-to-market

Some of the well-known software development methodologies include:

i. Waterfall Model
ii. Agile Scrum
iii. Rational Unified Process (RUP)
iv. Lean Software Development
v. Extreme Programming (XP)

Choosing the most suitable methodology for a project requires considering various factors such as project complexity, available resources, project scope and timeline, and project objectives and constraint

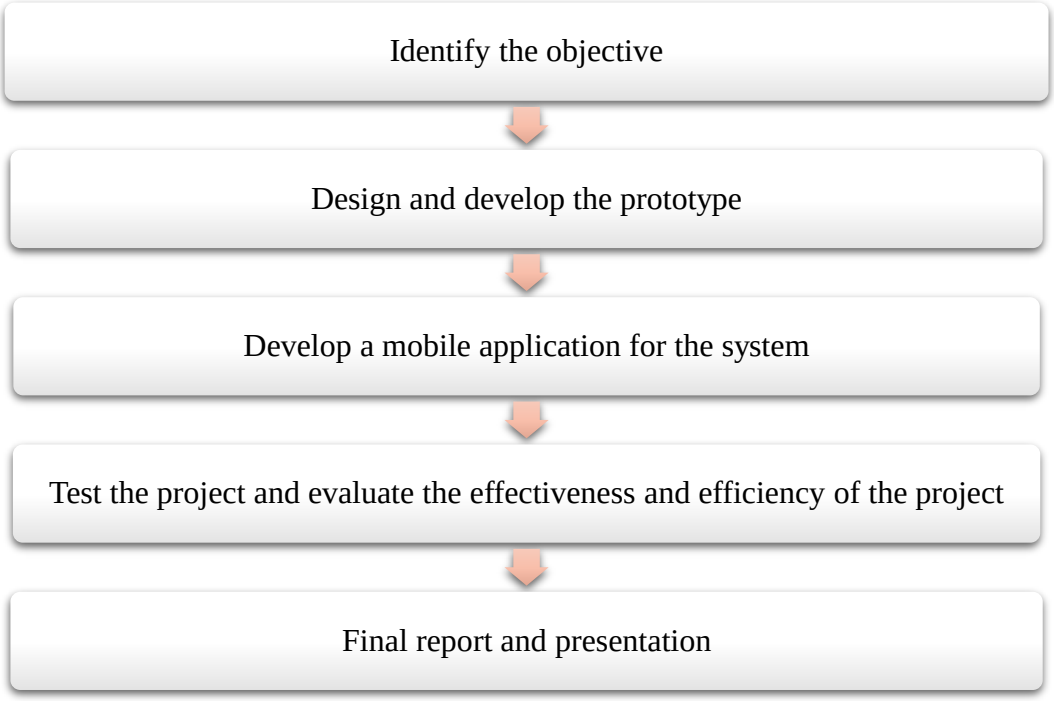


Figure 3.1: Flow chart of wireless smoke detection and fire system through the application

The waterfall methodology is a sequential development approach that involves following a linear process of steps in a specific order. Each step in the process must be completed before proceeding to the next one. When applied to web-based information systems (WIS), the waterfall methodology involves the following steps:

i. Identify the objective.
ii. Design and develop the prototype
iii. Develop a mobile application for the system.
iv. Test the project and evaluate the effectiveness and efficiency of the project.
v. Final report and presentation.

3.3 PROJECT PHASES

Phase 1: Identify the objective

i. To design the actual apps or devices to control the prototype
ii. To develop this feature sensor and technology
iii. To test the apps and devices before the release

Phases 2: Design and develop the prototype

i. Select appropriate sensors, water sprinkle and hardware components.
ii. Developing smoke detector connect with water sprinkle.
iii. Develop and test software components.
iv. Integrate all components and test the complete system.

Phases 3: Develop a mobile application for the system

i. Identify the functional requirements of the application.
ii. Application user interface design.
iii. Develop and test mobile applications.

Phases 4: Test the project and evaluate the effectiveness and efficiency of the project

i. Define test criteria and procedures. This should include both functional and non- functional requirements, such as accuracy, reliability, response time, user- friendliness, and security.
ii. Conduct unit tests to verify the functionality of each hardware and software component individually.
iii. Conduct integration testing to verify interoperability and functionality of all components as a whole system.
iv. Conduct usability testing to assess user-friendliness and intuitiveness of mobile applications, water sprinkles and the entire system.
v. Evaluate the effectiveness and efficiency of the project based on test results and original project objectives

Phases 5: Final report and presentation.

i. Introduction and overview of the project
ii. Methodological flow chart explanation
iii. Demonstration of mobile application features and working prototypes
iv. Discussion of test and evaluation results and conclusions of their implication

3.4 GANTT CHARTS

Table 3.1: The weeks of activity.

WEEK / ACTIVITY		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15
1	Student Registration															
2	Discuss and draft a project design															
3	Briefing and research references															
4	Cost and budget calculations and send the first project task report															
5	Survey for the best price and best quality materials that will be use in project															
6	Selection and purchase of items for the project															
7	Distribute questionnaires to community															
8	Develop and design an application of the project															
9	Progress presentation															
10	Improvement in progress presentation															
11	Preparation for the final presentation of the project															
12	Test and improve project for the exhibition															
13	Final project presentation															
14	Correction and submission of the final project report															

Planning Implementation

3.5 PROJECT EQUIPMENT

i. Durian UNO V2 + ESP8266 Module

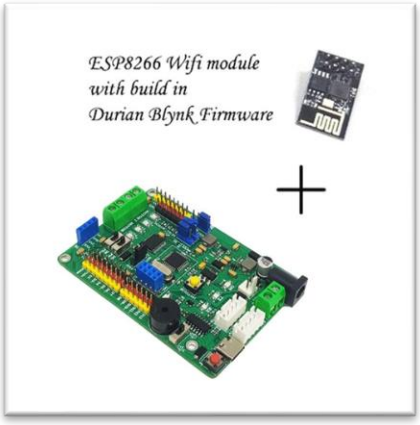


Figure 3.2: Durian UNO V2 + ESP8266 Module

The Durian UNO V2 + ESP8266 module is a versatile development board that combines the functionalities of the Arduino UNO board with the added advantage of built-in Wi-Fi capabilities provided by the ESP8266 module. The Durian UNO V2 itself is based on the ATmega328P microcontroller, which is the same microcontroller used in the popular Arduino Uno board. The ESP8266 module integrated onto the Durian UNO V2 enables wireless connectivity. The ESP8266 module provides the Durian UNO V2 with the ability to connect to the internet and interact with online services, making it ideal for IoT (Internet of Things) applications. It can interface with web servers, send and receive data over Wi-Fi, and enables remote monitoring and control of your projects via smartphone or computer.

ii. USB Type C Cable

Figure 3.3: USB Type C Cable

The USB Type-C cable is a multi-purpose cable that is used for charging and transferring data between devices. It is a reversible cable, meaning that it can be plugged in either way, and it supports high-speed data transfer and fast charging. It is commonly used to connect smartphones, laptops, tablets, and other devices to power sources, such as wall adapters, power banks, and computers. The USB Type-C cable can also be used for connecting devices to transfer files and data quickly and efficiently.

iii. Micro Submersible Water Pump Dc 3v-5v + Capacitor

Figure 3.4: Micro Submersible Water Pump Dc 3v-5v + Capacitor

The Micro Submersible Water Pump DC 3V-5V, when paired with a capacitor, is a compact and versatile device used for pumping water or other liquids in various applications. It is commonly utilized in projects such as aquariums, water fountains, hydroponic systems, and other similar setups. The water pump operates on a direct current (DC) power supply in the range of 3V to 5V. To ensure the stable and efficient operation of the pump, a capacitor is typically connected in parallel with it. The capacitor serves multiple functions in this setup.

iv. Water sprinkle

Figure 3.5: Water sprinkle

A water sprinkler, often referred to as a water sprinkle, is a device used for distributing water over a designated area, typically a lawn, garden, or agricultural field. It is an essential tool in maintaining and promoting healthy vegetation by providing the necessary hydration. Water sprinklers come in various types, including oscillating, rotary, stationary, and impact sprinklers. Each type offers different patterns and coverage options to suit specific watering needs. The choice of sprinkler depends on factors such as the size of the area to be watered, water pressure, and desired spray pattern. The primary function of a water sprinkle is to evenly disperse water over the targeted area, mimicking the natural rainfall process. By doing so, it ensures that plants and grass receive

adequate moisture for growth and sustenance. Using a water sprinkle allows for efficient and controlled watering, minimizing water wastage and preventing over or under-watering. Modern water sprinklers often feature adjustable settings, allowing users to customize the water coverage area, spray pattern, and intensity. Some advanced models have timers or sensors that automatically control the watering schedule based on predetermined settings or environmental factors like rainfall or soil moisture levels. Water sprinklers are commonly used in residential and commercial landscapes, parks, sports fields, and agricultural settings. They are designed to withstand outdoor elements, including exposure to sunlight, rain, and temperature variations. Additionally, they are easy to install, adjust, and maintain, making them accessible to both homeowners and professional landscapers. In summary, a water sprinkle is a vital tool for maintaining healthy vegetation by providing controlled and efficient irrigation. It distributes water evenly over a designated area, promoting growth and development of plants, lawns, and crops. Its adjustable settings and ease of use make it a practical and convenient solution for maintaining green spaces and optimizing water usage.

v. Jumper Wires Female To Female

Figure 3.5: Jumper Wires Female To Female

Jumper Wires Female to Female are essential electronic components used for connecting various modules, sensors, and components on a breadboard or prototyping board. These wires come with female connectors on both ends, allowing for easy and secure connections. The wires are typically made from flexible and durable materials like high-quality copper, which ensures reliable electrical conductivity and longevity. The flexibility and versatility of these jumper wires make them an indispensable tool for electronic enthusiasts, hobbyists, students, and professionals alike. They provide a convenient and reliable means of establishing connections between components, enabling the construction and testing of electronic circuits without the need for complex wiring or permanent soldering.

vi. Water Pump Pipe

Figure 3.6: Water Pump Pipe

The function of the water pump pipe is to move water from the water source to its destination. It allows the water pump to draw water and deliver it to where it is needed. Pipes must be durable and properly installed to ensure efficient water transfer.

vii. Smoke Detector

Figure 3.7: Smoke Detector

Wireless smoke detection systems utilize radio frequencies to communicate between the sensors and the control unit. These systems are very beneficial as they eliminate the need for hardwiring, making them easier and faster to install. There are two types of wireless smoke detection systems: standalone and interconnected: The first is Standalone systems function independently, meaning each detector will trigger an alarm regardless of the status of the other sensors in the area. Secondly, Interconnected systems, on the other hand, permit multiple sensors to communicate with each other wirelessly. When one detector is triggered, the system will notify all other interconnected detectors. Wireless smoke detectors can either use Ionization or Photoelectric technology. Ionization sensors use radioisotopes to detect the smoke and they are more sensitive to flaming fires. Photoelectric sensors, on the other hand, use a light beam that is interrupted when smoke enters the chamber, making them more sensitive to smoldering fires. Wireless smoke detection systems are very convenient and efficient, providing an added layer of protection in any environment.

3.6 CONCLUSION

In conclusion, methodology is a crucial aspect of any research project. It provides a framework that allows researchers to systematically collect and analyse data in a structured manner. A well-defined methodology ensures that the research is reliable and valid, and enables other researchers to replicate and build upon the findings. The methodology section should clearly describe the research design, data collection procedures, and data analysis techniques used. It should also address any limitations of the study and describe how these limitations were addressed. Overall, a well-written methodology section is essential for any research project, as it allows the reader to understand and evaluate the research process and provides confidence in the validity of the results.

CHAPTER 4

DATA AND ANALYSIS

4.1 INTRODUCTION

The objectives and processes that our group has completed will be explained in this chapter. to create the actual software or hardware that runs the computer. We were able to achieve this goal by using Blynks applications to create an application for the wireless smoke detector. The effective development of an application using state-of-the-art tools, such as Blynk apps. Our team has created an immersive and captivating way to illustrate the complexities of the Wireless Smoke Detector Through Application by utilizing the power of the Internet of Technology (IoT) in conjunction with sensor capabilities. This achievement highlights our dedication to improving educational experiences through creative methods in addition to showcasing our skills with cutting-edge digital tools.

The second objective is to develop this feature censor and technology as functional as possible. It can be difficult to fully understand, but the Wireless Smoke Detector Through Application is essential to ensuring the availability of fire warnings. We set out on a mission to reduce this complexity by utilizing the advanced tools and features of the Internet of Things (IoT). We have painstakingly created the product through applications that the community can readily use, and we have also made it possible for family members or other close contacts to use the product even when they are far away from the device.

The ultimate objective is to test the app and the application device functionality before the release for communities and homes. To accomplish this, we have taken a calculated risk by using Google Forms to collect helpful information from homes and communities. We hope to evaluate the results of our prototype project by speaking with our target directly and making sure it meets the expectations of the product and learning objectives.

4.2 TO DESIGN AN APPLICATION PARTICULARLY BUILT TO DETECT SMOKE FIRE.

When designing an application for the wireless smoke detector, it is important to consider the age range, level of usefulness and efficacy, and previous experiences of the intended audience. Content and design can be tailored with the use of surveys, interviews, and feedback sessions. According to a Google Forms poll, 60% of workers have trouble with firehouse problems, particularly when they have to go out of town.

App content should be updated to reflect current application usage guidelines to guarantee relevancy in the neighborhoods. It ought to go over the key concepts of the wireless smoke detector, like ease of use. In this project, we utilized an Arduino Uno to model and a Blynk App to construct an application that is specifically meant to detect smoke to accomplish the necessary visualization.

In conclusion, creating a prototype and application for a wireless smoke detector community facility through application necessitates a detailed audience analysis, content customization based on existing application usage, and the use of multimedia videos for clarification.

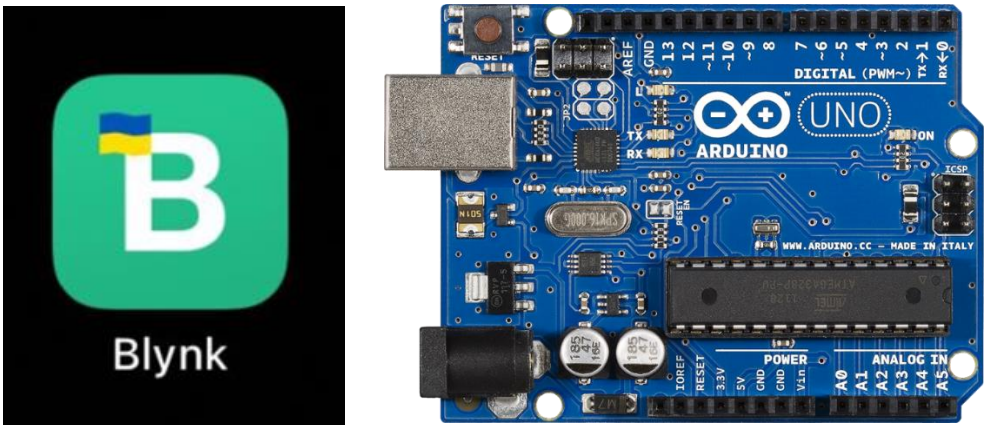


Figure 4.1 : Application and Arduino uno

4.3 TO DEVELOP THIS FEATURE CENSOR AND TECHNOLOGY AS FUNCTIONAL

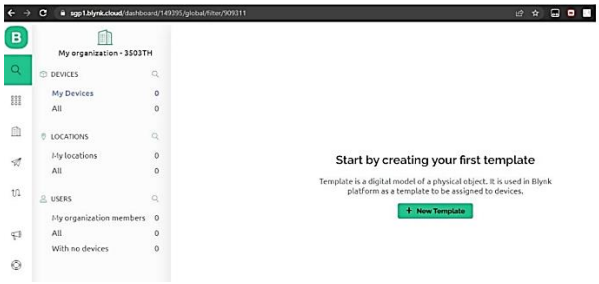
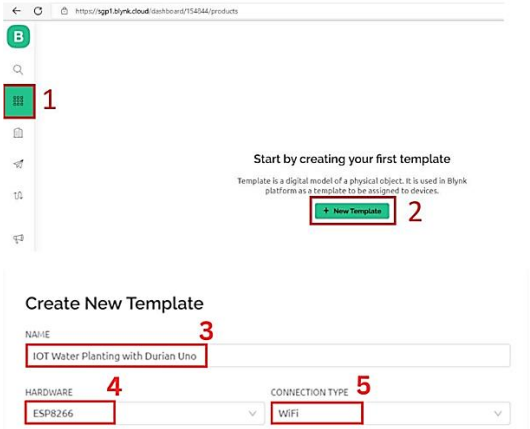
The Internet of Things (IoT), is a network of physically connected objects, including buildings, cars, and other items, that have network connectivity, software, and sensors installed. By gathering and exchanging data, these gadgets promote communication between the actual and virtual worlds. Moreover, with the help of IoT, an environment that is smarter and more connected will be possible. Important elements comprise sensors and actuators for gathering and interacting with data, networking for exchanging information, data processing for extracting information, user interfaces for presenting data, and automation for enhanced productivity. Applications for IoT are used in many different industries, such as smart homes, transportation, healthcare, and agriculture. Technology breakthroughs that make real-time data available for automation and decision-making are what are driving the Internet of Things expansion. However, as IoT develops further, issues like security and privacy must be resolved.

One popular Internet of Things (IoT) platform for creating and managing IoT projects is Blynk, which offers a smartphone application. Users can create a customized dashboard with different widgets, such as buttons, sliders, and graphs, using the Blynk app to manage and keep an eye on connected devices. Users can program well-known hardware devices like Arduino, Raspberry Pi, and ESP8266 for remote connection with the Blynk Cloud by integrating the platform with these devices. Real-time data interchange is facilitated via the Blynk Cloud, which serves as a middleman between the linked gear and the mobile app. Developers can include Blynk in their projects with ease because it offers libraries and APIs for several programming languages. Blynk is widely used in smart agriculture, industrial automation, and home automation applications. Its user-friendly interface enables users to remotely monitor and operate their Internet of Things (IoT) devices. This is the reason why Blynk app software was us in developing applications for the Wireless Smoke Detector.

Not only that in the Wireless Smoke Detector project, Arduino Uno is one of the main software that we use. Due to its simplicity and adaptability, the Arduino Uno is an open-source microcontroller board that is extensively utilized by professionals, students, and electronics hobbyists who are involved in prototyping. The ATmega328P microcontroller, which is at the heart of it all, provides a variety of digital and analog input/output pins for connecting and managing different electronic components. The board has a USB interface that makes connecting to PCs simple and makes programming and uploading sketches easier. The Arduino Uno has enough processing capability for a wide range of applications with a clock speed of 16 MHz. It has an integrated voltage regulator, so it can be powered by an external power source or USB. With its reset button, power and pin status LEDs, and other features, the Arduino Uno offers an easy-to-use platform for learning and playing with electronics. The Arduino IDE's simplicity of use in writing, compiling, and uploading code is further enhanced by its accessibility. In general, the Arduino Uno is widely used in the fields of electronics education and prototyping due to its low cost, ease of use, and strong community support.

In summary, there are many advantages and applications for product integration that use Arduino and are linked to Blynk apps. The open-source and user-friendly Arduino platform offers a flexible microcontroller basis for a wide range of electronic applications. Together with the Blynk app, these tools enable developers and end users to create mobile interfaces for Internet of Things applications more easily. Rapid prototyping is made possible by the combination, facilitating speedy iterations and development cycles. Arduino's adaptability is further enhanced by its compatibility with a wide range of sensors and actuators, as well as its extensive community support. It is feasible to connect Arduino-based devices to Blynk apps for convenient remote monitoring and control. This is useful in cases where real-time data access is required. All things considered, the combination of Arduino with Blynk offers a potent and efficient way to develop Internet of Things solutions, with advantages like quick prototyping, scalability, intuitive user interfaces, and wide availability. The overall development process is improved by this synergy, which also promotes innovation in the field of linked devices and Internet of Things applications.

4.3.1 Software

Develop	Descriptions
 **Figure 4.2.1:** Install the Arduino IDE	**Step 1: Install the Arduino IDE** 1. Download Arduino IDE from the website 2. Connect the Arduino Uno V2 board with the laptop
 **Figure 4.2.2 :** Blynk IOT setup on PC	**Step 2: Blynk IoT setup on PC** 1. Register an account at the blink cloud dashboard. 2. Login to your Blynk cloud account 3. For new users will see Blynk's new interface
 **Figure 4.2.3:** Creating first template	**Step 3: Start Creating the first Template** 1. Click [1] + New Template 2. Set the name, hardware, and connection type
	Step 4: Setup Blynk for a new device

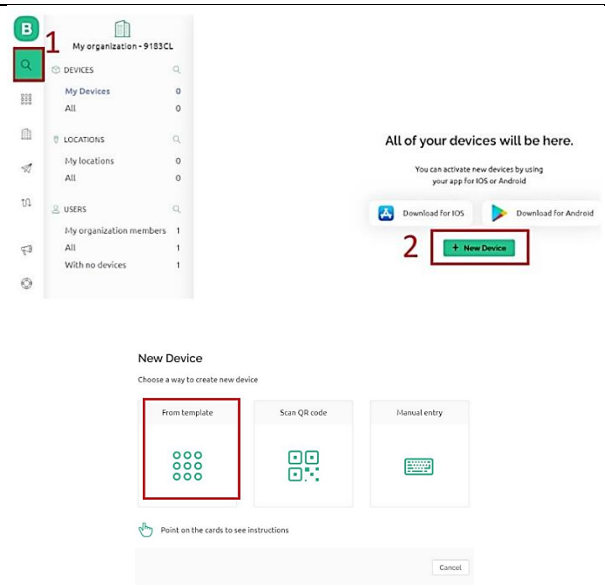


Figure 4.2.4 : Setup Blynk for a new device

1. Click the search icon
2. Click the [+New Device]
3. Click the [From Template]
4. Click save and apply

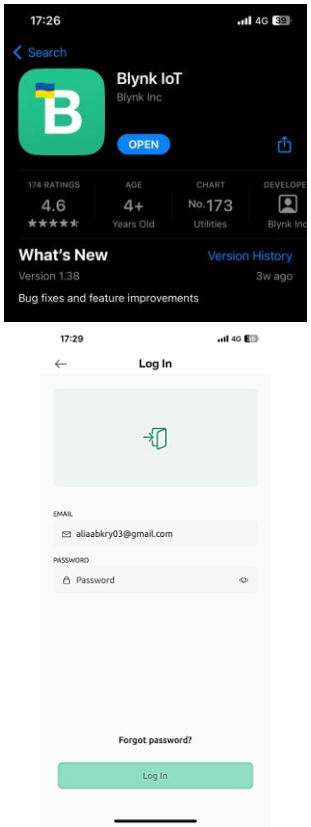


Figure 4.2.5 : Setup Blynk Iot on a Smartphone part 1

Step 5: Setup Blynk Iot on a Smartphone

1. Download the Blynk Iot application from the Google Play Store or App Store

2. Open the app and log in with the same account before

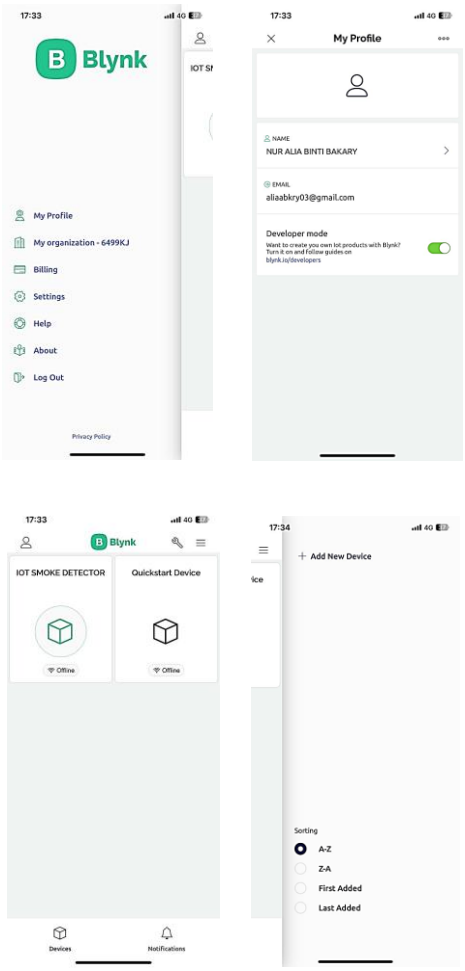


Figure 4.2.6 : Setup Blynk Iot on a Smartphone part 2

3. Click the top left Menu select [My Profile] and turn on the [Developer Mode]

4. Go to the main page
5. Click top right [=] and click [+ Add New Device].
6. You can edit the gauge system based on your project specification

Figure 4.2.7 : Setup Blynk Iot on a Smartphone part 3

7. You have successfully created a controlled button layout of the IOT Smoke Detector with Arduino Uno at smartphone Blynk apps.

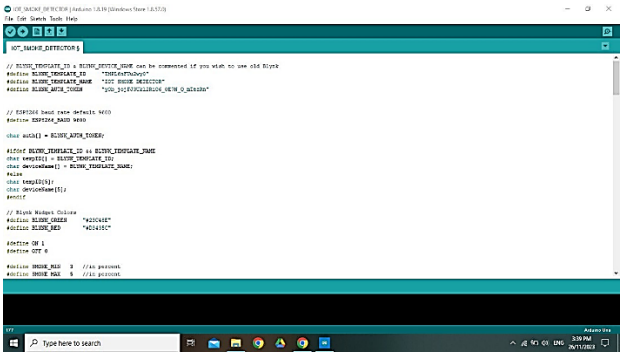


Figure 4.2.8 : Coding for IOT Smoke Detector with Arduino Uno part 1

Step 6: Coding for IOT Smoke Detector with Arduino Uno

1. Download the code that has been set up for Iot Smoke Detector.
2. After that open the Arduino IDE
3. Go to [Blynk Cloud] again. Click [Search] and select device [IOT

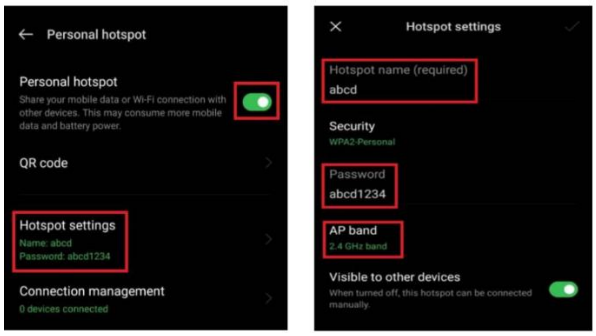


Figure 4.2.9 : Coding for IOT Smoke Detector with Arduino Uno part 2

Smoke Detector With Arduino Uno]

4. Go to Arduino IDE, and replace it with the new [FIRMWARE CONFIGURATION]
5. Sketch in Arduino IDE, find and replace the "ssid[]" and "pass[]" with your own wifi/hotspot name and password.
6. After the connection is already established, your Blynk and ESP8266 already can be used.

4.4 TO TEST THE APPS AND DEVICES BEFORE THE RELEASE

This testing project aims to evaluate in-depth the features and advantages provided by this specific Wireless Smoke Detector application. Our goal is to give the community, particularly the local neighborhood, a comprehensive platform that not only makes things easier but also involves and empowers them in addressing neighborhood fire issues. We want to assess the application's efficacy in raising public awareness of fire safety and its uses in practical settings through rigorous testing and user input.

We will examine several aspects of the program throughout this review, such as its user interface, the veracity of the information it offers, and the general user experience. We will also look at how the app fits in with the most recent application usage and whether or not it helps consumers.

Not only do we want to find possible applications, but we also want to highlight and define the application's advantages. By carrying out this thorough assessment, we hope to guarantee that the application turns into a vital tool for the neighborhood, supporting people during difficult times. We hope that this testing procedure will greatly benefit users, particularly the community, by educating them about our product and easing their load.

4.4.1 TAM Model

A popular theoretical framework for comprehending consumer technology acceptance and application is the TAM (Technology Acceptance Model). Fred Davis created it first in the 1980s, and other academics have since added to and changed it. The TAM model, which focuses on the psychological elements of technology usage, contends that attitudes towards technology use as well as perceptions of its perceived ease of use and usefulness influence users' behavioural intents to use it.

We have developed a TAM-based questionnaire based on the survey we conducted to make sure we address all the crucial elements that affect users' acceptance of new technologies. We created a series of questions for each construct while organizing the questionnaire according to the TAM model. To precisely gauge participants' opinions and attitudes, responses to these questions were gathered using a Likert scale (strongly agree, agree, disagree, disagree, strongly disagree).

We then divided the questions into two categories, section A which is for the perceived utility of the product, and each section comprises five questions. The degree to which consumers think that utilizing particular technologies will enhance their productivity at work or make their duties simpler and more efficient is discussed in this section. Section B of an application we employ measures how users evaluate how easy it is to utilize the technology and how much they believe it takes no effort at all. Perception of ease-of-use questions assess how user-friendly and straightforward technology is. Lastly, we also requested input regarding the necessity of the product, which entails comprehending the viewpoints, preferences, and requirements of possible users.

4.4.2 Frequency Analysis And Mean Analysis

Graph Mean Pre-Questionnaire

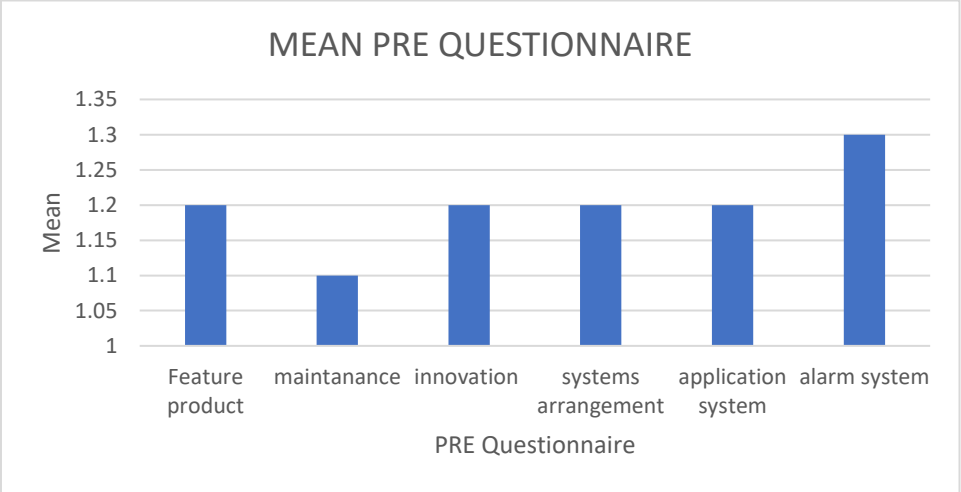


Figure 4.3: Graph Mean Pre-Questionnaire

The graph shows the average results of a survey given to workers, households, and other participants of the community at Taman Cempaka regarding their opinions of wireless smoke detectors that use application technology. The participants' response was quite favorable, as seen by their mean ratings, which ranged from 1.2 to 1.3 on a scale where lower values indicated stronger agreement.

The uniformity across all aspects evaluated in the Pre-Questionnaire is the first noteworthy pattern. Participants (mean: 1.2) believe that this feature product is good. They also state that they find this product to be user-friendly (mean: 1.1). Additionally, according to the responders (mean: 1.2), this product is superior to the current tools. Additionally, the data indicates that a mean score of 1.2 indicates the value of harmful temperature in the dwelling. The mean score of 1.2 also indicates a solid consensus that the information provided by this application system is accurate and straightforward. Not

to mention, among the homes with a mean score of 1.3, participants also firmly believe that this product application may be employed as an alarm system. To summarize, the graph illustrates the community neighborhood's overall positive opinion of the Wireless Smoke Detector Through Application.

GRAPH MEAN POST-QUESTIONNAIRE

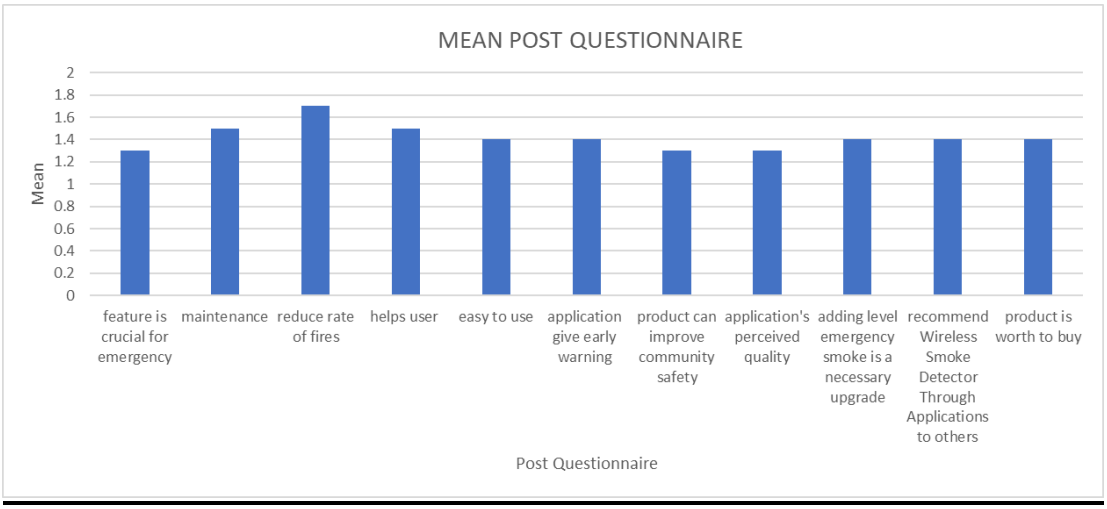


Figure 4.4: Graph Mean Post-Questionnaire

The graph shows the average responses to a questionnaire given to workers, households, and the community; it focuses on how beneficial people believe a wireless smoke detector to be. The participant's response was particularly favorable, as seen by the mean scores, which range from 1.3 to 1.7. The higher agreement is indicated by lower values.

The mean score of 1.7 Indicates that the application Is highly regarded as a feature that is essential in lowering the rate of fires. Participants agree that the application makes things easier for them (mean: 1.5), which suggests that it works to lower the fire rate. Furthermore, the product consistently receives mean scores of 1.3, indicating that it is

seen as boosting community safety. This implies that the wireless smoke detector is effective in improving several facets of community life and adding to a more thorough knowledge of fire-related concerns through applications.

To summarize, the graph illustrates the community neighborhood's overall positive opinion of the Wireless Smoke Detector Through Application.

Graph Mean Pre And Post-Questionnaire

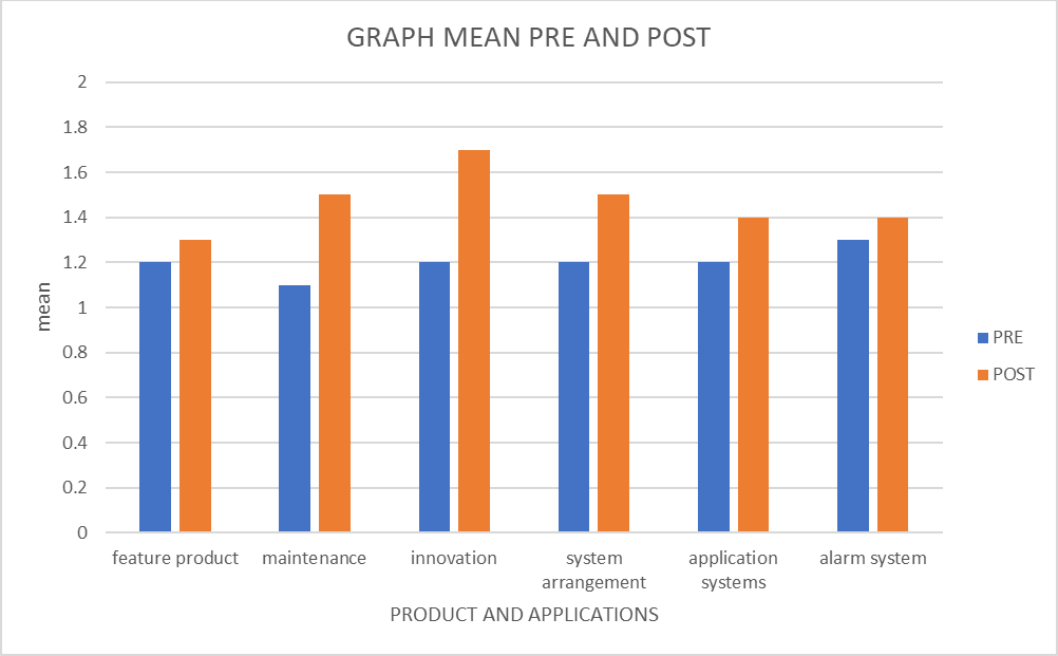


Figure 4.5: Graph Mean Pre And Post-Questionnaire

The mean scores from a questionnaire assessing community, family, and workplace impressions of a wireless smoke detector through application before (PRE) and after (POST) usage are displayed in the graph. The findings indicate a favorable

change in the opinions of the communities, indicating a general improvement in the product's perceived utility.

Interestingly, there has been a steady improvement in all important dimensions. The mean score increased from 1.2 (PRE) to 1.7 (POST), showing a positive influence on the community's adoption of Wireless Smoke Detector Through Application. This product application innovation proved to be extremely beneficial in the community area. Furthermore, with a sustained mean score of 1.1 for Pre and 1.5 for Post, participants found this product application to be easy to maintain, which increased their desire to possess it. The layout of the system is also positively impacted, as shown by mean scores of 1.5 in Post and 1.2 in Pre. Furthermore, with the mean score rising from 1.3 (PRE) to 1.4 (POST), the application is successful in being referred to as an alert system under the most recent technical advancements. In addition, the application systems continuously improve user ease, as seen by an increasing mean score of 1.2 before and 1.4 following usage.

In conclusion, the graph illustrates the general consensus among the communities that wireless smoke detectors are valuable and should be used in industry, particularly in areas that are prone to fire.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

The development of a wireless smoke detector system with water sprinkler control through a mobile application presents a significant advancement in fire safety technology. This innovative project holds the potential to revolutionize the way fire detection and suppression are managed, offering remote accessibility and proactive response to fire incidents. The advancement of a wireless smoke detector system coupled with water sprinkler control through a mobile application represents a significant leap in modern fire safety technology. This integration offers the convenience of remote monitoring and control, potentially revolutionizing how early fire detection and suppression are managed in residential, commercial, and industrial environments.

5.2 CONCLUSION

A wireless smoke detection system through an app with water sprinklers is an innovation that represents a revolutionary advance in fire safety technology. The system integrates wireless connectivity and smart capabilities, allowing users to monitor and control smoke detectors and sprinklers remotely via a mobile app. By enabling early

detection and rapid response to fire incidents, these systems have the potential to transform fire safety measures in residential, commercial and industrial environments.

5.3 RECOMMENDATION

Following the successful development and testing of a wireless smoke detector system with water sprinkler control via a mobile application, it is recommended to explore potential partnerships with smart home technology providers, building contractors and fire safety regulatory authorities. Collaboration with these stakeholders can facilitate seamless integration and widespread use of systems in multiple settings, ensuring compliance with security standards and regulations. In addition, further research and development efforts should be directed towards refining the functionality, reliability and compatibility of the system with different mobile platforms. This will involve conducting real-world simulations and user feedback sessions to optimize user experience and ensure system effectiveness in diverse environments. Additionally, continuous innovation and improvement to the system based on evolving fire safety standards and technological advances will be critical to its long-term success.

5.4 PROJECT LIMITATION

i. Reliance on Power and Internet: The system may be dependent on a consistent power supply and internet connectivity for smooth operation, raising concerns about functionality during power outages or internet disruptions.
ii. Compatibility Challenges: Compatibility issues may arise when integrating the system with different mobile devices, operating systems, or home automation platforms, potentially limiting its widespread adoption and usability.
iii. Maintenance Requirements: Regular maintenance and upkeep of the system's components, including the smoke detectors, water sprinklers, and mobile application, may be necessary to ensure optimal performance, adding to the overall cost and effort involved.
iv. Regulatory Compliance: The system must meet fire safety regulations and building codes, posing potential challenges in ensuring its compliance with regional guidelines and standards.
v. Cost Consideration: The initial implementation and ongoing operational costs of the system, including installation, monitoring, and upkeep, may pose financial barriers for certain users or organizations.

Addressing these limitations through thorough testing, user feedback, and ongoing research and development efforts will be essential for enhancing the effectiveness and practicality of the wireless smoke detector through application with water sprinkler system.

5.5 SUMMARY

App-enabled wireless smoke detectors with sprinkler systems offer many advantages for fire safety but also present some limitations. Its dependence on power and internet connection, potential compatibility challenges are among the issues to consider. In addition, system maintenance requirements, regulatory compliance and cost implications need to be taken into account. Overcoming these limitations through rigorous testing, user feedback, and ongoing research and development efforts will be critical to optimizing the system's effectiveness and practicality in real-world scenarios. Wireless smoke detection systems with water sprinkler control via mobile applications can face potential limitations related to their compatibility with existing infrastructure, such as building design and construction. Integration with older structures or complex building layouts may present challenges in ensuring smooth installation and functionality. Additionally, the system's response time in the event of a fire and its wireless range can also present limitations, especially in larger or more complex building environments. Furthermore, the reliability and robustness of wireless communications and data security for mobile applications need to be comprehensively addressed to protect against possible breaches or disruptions that could affect the operation and integrity of the system. Addressing these technical and operational challenges is essential to ensure that a wireless smoke detector system with sprinkler control via a mobile application can provide a reliable, responsive and safe solution to improve fire safety. Continuous monitoring, testing and updates to the system will be required to address and mitigate these limitations and to further improve its overall performance and effectiveness.

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APPENDIX 1

Gant chart

WEEK / ACTIVITY		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15
1	Student Registration															
2	Discuss and draft a project design															
3	Briefing and research references															
4	Cost and budget calculations and send the first project task report															
5	Survey for the best price and best quality materials that will be use in project															
6	Selection and purchase of items for the project															
7	Distribute questionnaires to community															
8	Develop and design an application of the project															
9	Progress presentation															
10	Improvement in progress presentation															
11	Preparation for the final presentation of the project															
12	Test and improve project for the exhibition															
13	Final project presentation															
14	Correction and submission of the final project report															

Planning Implementation

APPENDIX 2

Estimated Cost

NO.	EQUIPMENT	COST
1	Durian UNO V2 + ESP8266 Module	RM73.00
2	USB Type C Cable	RM5.00
3	Micro Submersible Water Pump Dc 3v-5v + Capacitor	RM3.90
4	Water sprinkle	RM6.90
5	Jumper Wires Female To Female	RM1.35
6	Water Pump Pipe	RM1.00
7	Smoke Detector	RM6.49
TOTAL		RM97.64

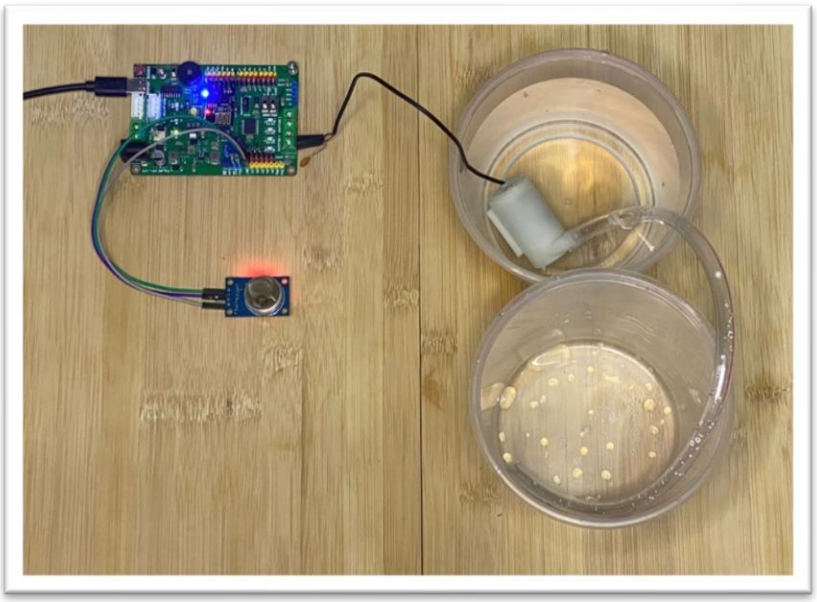
APPENDIX 3

Specifications And List of Equipment

NO.	EQUIPMENT	FUNCTION
1	Durian UNO V2 + ESP8266 Module	Facilitate user to do wiring installation without using breadboard
2	USB Type C Cable	to effectively, quickly and properly gather or transfer data from one device to another
3	Micro Submersible Water Pump Dc 3v-5v + Capacitor	drains the water through its inlet and released it through the outlet
4	Water sprinkle	use water to suppress fires in buildings
5	Jumper Wires Female To Female	used to connect two points to each other
6	Water Pump Pipe	move water from the water source to its destination
7	Smoke Detector	detect fires by sensing small particles in the air

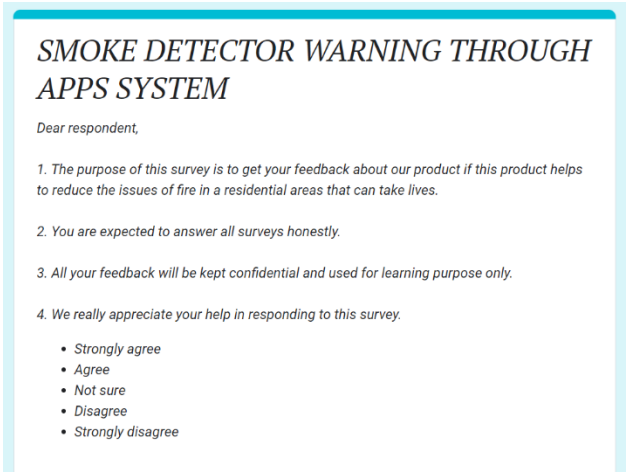
APPENDIX 4

Design



APPENDIX 5

Questionnaire Google Form



SMOKE DETECTOR WARNING THROUGH APPS SYSTEM

Dear respondent,

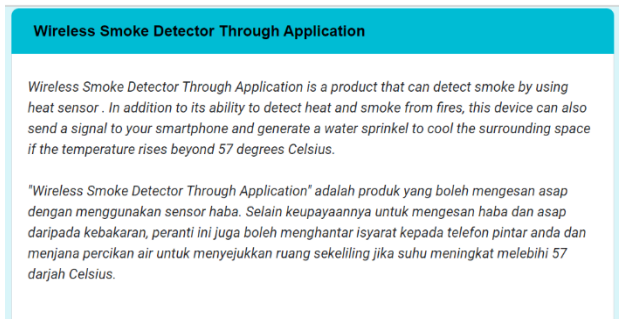
1. The purpose of this survey is to get your feedback about our product if this product helps to reduce the issues of fire in a residential areas that can take lives.

2. You are expected to answer all surveys honestly.

3. All your feedback will be kept confidential and used for learning purpose only.

4. We really appreciate your help in responding to this survey.

- *Strongly agree*
- *Agree*
- *Not sure*
- *Disagree*
- *Strongly disagree*



Wireless Smoke Detector Through Application

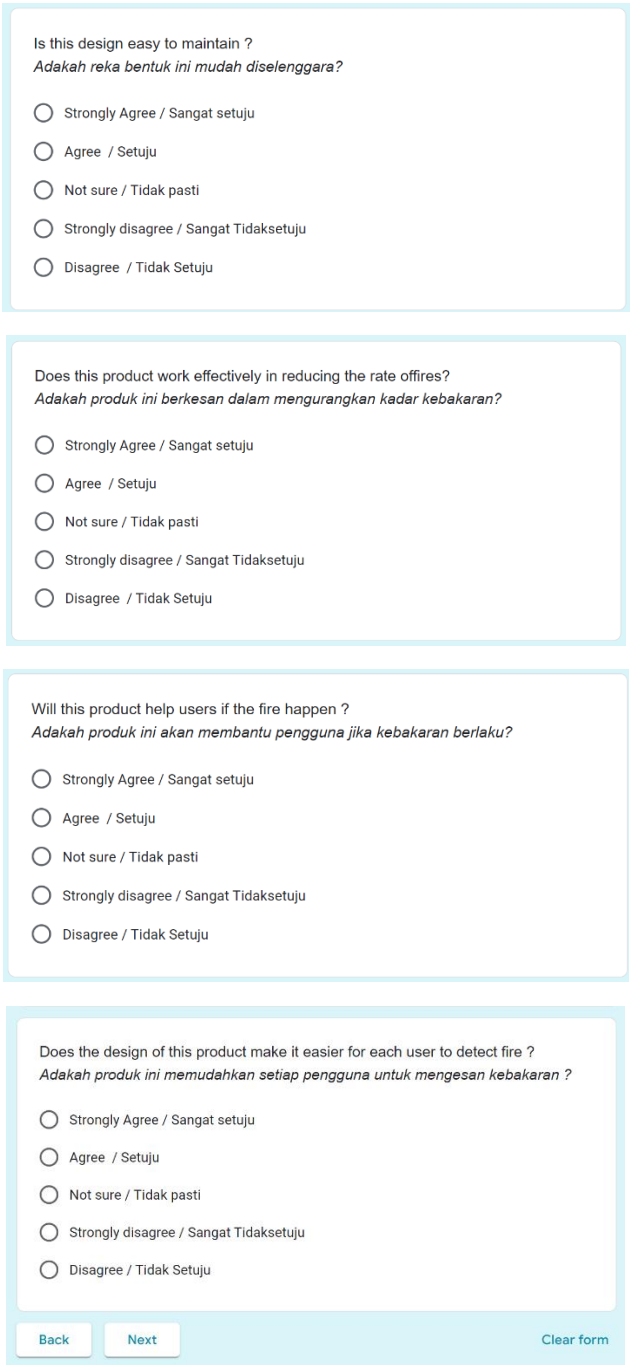
Wireless Smoke Detector Through Application is a product that can detect smoke by using heat sensor . In addition to its ability to detect heat and smoke from fires, this device can also send a signal to your smartphone and generate a water sprinkel to cool the surrounding space if the temperature rises beyond 57 degrees Celsius.

"Wireless Smoke Detector Through Application" adalah produk yang boleh mengesan asap dengan menggunakan sensor haba. Selain keupayaannya untuk mengesan haba dan asap daripada kebakaran, peranti ini juga boleh menghantar isyarat kepada telefon pintar anda dan menjana percikan air untuk menyejukkan ruang sekeliling jika suhu meningkat melebihi 57 darjah Celsius.

PRODUCT CATEGORY

Do you think this product is worth to buy ?
Adakah anda rasa produk ini berbaloi untuk dibeli ?

- ◯ Strongly Agree / Sangat setuju
- ◯ Agree / Setuju
- ◯ Not sure / Tidak pasti
- ◯ Strongly disagree
- ◯ Disagree / Tidak Setuju


Is this design easy to maintain ?
Adakah reka bentuk ini mudah diselenggara?
Strongly Agree / Sangat setuju
Agree / Setuju
Not sure / Tidak pasti
Strongly disagree / Sangat Tidaksetuju
Disagree / Tidak Setuju
Does this product work effectively in reducing the rate offires?
Adakah produk ini berkesan dalam mengurangkan kadar kebakaran?
Strongly Agree / Sangat setuju
Agree / Setuju
Not sure / Tidak pasti
Strongly disagree / Sangat Tidaksetuju
Disagree / Tidak Setuju
Will this product help users if the fire happen ?
Adakah produk ini akan membantu pengguna jika kebakaran berlaku?
Strongly Agree / Sangat setuju
Agree / Setuju
Not sure / Tidak pasti
Strongly disagree / Sangat Tidaksetuju
Disagree / Tidak Setuju
Does the design of this product make it easier for each user to detect fire ?
Adakah produk ini memudahkan setiap pengguna untuk mengesan kebakaran ?
Strongly Agree / Sangat setuju
Agree / Setuju
Not sure / Tidak pasti
Strongly disagree / Sangat Tidaksetuju
Disagree / Tidak Setuju
Back
Next
Clear form

APPLICATION CATEGORY

Do you agree that this product can give early warning to users ?
Adakah anda bersetuju bahawa produk ini boleh memberi amaran awal kepada pengguna ?

- ◯ Strongly Agree / Sangat setuju
- ◯ Agree / Setuju
- ◯ Not sure / Tidak pasti
- ◯ Strongly disagree / Sangat Tidaksetuju
- ◯ Disagree / Tidak Setuju

Do you agree with the potential impact of Wireless Smoke Detector Through Application can improve community safety ?
Adakah anda bersetuju dengan potensi kesan Pengesan Asap Tanpa Wayar Melalui Aplikasi boleh meningkatkan keselamatan komuniti ?

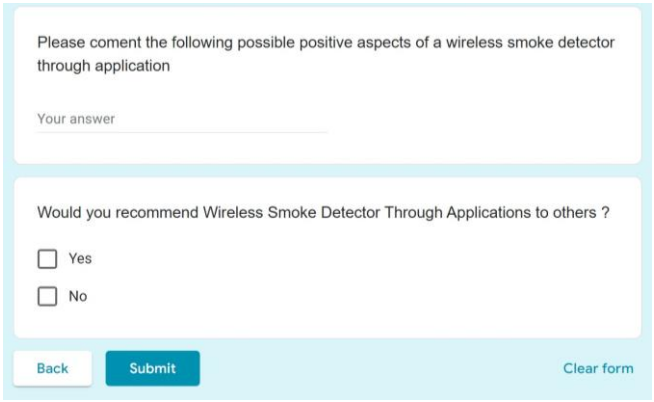
- ◯ Strongly Agree / Sangat setuju
- ◯ Agree / Setuju
- ◯ Not sure / Tidak pasti
- ◯ Strongly disagree / Sangat Tidaksetuju
- ◯ Disagree / Tidak Setuju

Do you believe the application is easy to use ?
Adakah anda percaya aplikasi itu mudah digunakan?

- ◯ Strongly Agree / Sangat setuju
- ◯ Agree / Setuju
- ◯ Not sure / Tidak pasti
- ◯ Strongly disagree / Sangat Tidaksetuju
- ◯ Disagree / Tidak Setuju

Do you believe that adding level emergency smoke to the wireless smoke detector is a necessary upgrade?
Adakah anda percaya bahawa menambah tahap asap kecemasan pada pengesan asap wayarles adalah peningkatan yang diperlukan ?

- ◯ Strongly Agree / Sangat setuju
- ◯ Agree / Setuju
- ◯ Not sure / Tidak pasti
- ◯ Strongly disagree / Sangat Tidaksetuju
- ◯ Disagree / Tidak Setuju


Please coment the following possible positive aspects of a wireless smoke detector through application
Your answer
Would you recommend Wireless Smoke Detector Through Applications to others ?
Yes
No
Back
Submit
Clear form