IOT BASED SMART HOME SECURITY SYSTEM

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled "**IOT based Smart home Security System"**, submitted by Jwel Bose, ID;171-15-8619 and Md. Obydul Islam**,** ID;171-15-8583 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 3 June,2021.

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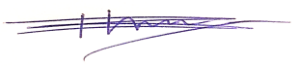

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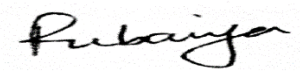

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Finally, we must appreciate and accept our parents' unwavering love and patience.

ABSTRACT

The Internet of Things (IoT) helps to create safe cities, businesses, and homes by allowing both public and private organizations to remotely and securely monitor facilities. This paper presents an embedded framework for a smart home security system that uses a variety of sensors. As it emerges from conceptual models for the creation of security at various levels, the idea of Smart Security System is becoming a reality. IOT enabled with smart security system presents security to the home and also providing a facility to the user where one can continuously monitor the surrounding parameters inside the house (like gas, fire, voltage and motion intensity) and can control them by collection and exchange of data between the things for example switching on/off devices (like circuit breaker and gas valve based on these parameters). In recent days when ever house is locked the break-ins number has been increased enormously. So, in order to provide security to the home this presented paper is helpful. When the intruders enter into the house, image of the intruder is captured by the system, even if intruder escapes Police need to caught the intruder to recover the stolen things which needs the picture of the intruder to the police. The planned system captures the picture of the intruder and sends it to the authorized mail through internet over Simple Mail Transfer Protocol (SMTP). So, security to the home is provided more effectively in the smart way of communicating the things. Home appliances are smartly automated to reduce the human effort for intelligent decisions with the help of Internet of Things (IoT). This compact and lightweight product is designed to provide security and to control home appliances in the house by the owner through IoT servers. Microcontroller used here is NodeMCU ESP8266 for all processing and controlling operations. Various sensors such as Flame a Fire sensor, Gas, fire, PIR sensor with a magnetic door switch.

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CHAPTER 1

Introduction

1.1 Introduction

In the current situation, protection and security have become an unavoidable requirement. As the dominance of digital technology reaches its peak, there is a regressive trend in the security system. The concept of a modern home is one that needs the least amount of human effort to maintain. This project aims to assist the general public in safeguarding household appliances and preventing criminal cases that are likely to occur in their area. When the occupants are not at home, or even when they are present, such incidents occur. Intruders may gain access to the house without the owner's knowledge. PIR (Passive Infrared Sensor) sensors are used in the Security System to detect such movements. This device is intended for use with home security systems. As a data processor, it employs a microcontroller. When the PIR detector senses movement, Arduino records the information and sends it to the alarm system. Simultaneously, the microcontroller will send data to users from Wi-Fi modules via applications that have been downloaded to the user's smartphone. Only homeowners can turn off the alarm system using a smartphone. Using a mobile, only homeowners can disable the alarm system. A Wi-Fi module is used to link the software to the circuit. According to current developments, the implementation of this detector system may be an appropriate protection system. Low current controls the majority of communication modules and controllers in smart homes. Overcurrent and overvoltage occur as a result of the poor current regulation. The key research topic of this paper is how to secure poor electricity.

1.2 Motivation

The project developed is called Wireless Motion Detection, Fire, Gas, and Electricity Voltage Measurement System Using Microcontroller. This computer program employs a microcontroller to defend users from crimes such as housebreaking and robbery, as well as

high or low voltage, gas leakage, and fire. In the microcontroller-based Security System, PIR (Passive Infrared Sensor) sensors detect movement, voltage sensors detect high low voltage, fire sensors detect fire, and gas sensors detect LPG gas leakage. This device was made for home security systems. It can be a suitable protection device in conjunction with current development by using microcontroller as a data processor. The data is processed by the microcontroller and an alarm is triggered when a PIR, gas, fire, or voltage detector detects movement or high low voltage. At the same time, the microcontroller can transmit data to the user via the Wi-Fi module via an application on the user's smartphone. Many criminal offences were committed, including housebreaking, invasion, and robbery. Cases like these can be seen in the news or in the internet. They happened when the house's occupants were not present or when there was a chance that occupants were present. Intruders can quickly gain access to the house without being detected. It's possible that the current alarm system would be beneficial, or vice versa. One of the benefits that can be found is that the warning system can alert users with a sound if there are any movements detected. But how can the inhabitants be notified if they are not at home? This is due to the alarm system's lack of communication with the users. This project aims to create a Wireless Motion Detection System framework using a microcontroller platform, conduct User Acceptance Testing, and incorporate an external tester beta test (end user). Homeowners can use this device program. The warning system can only be turned off by the homeowners using a mobile. A Wi-Fi module is used to connect the apps and the circuit. The Wi-Fi module is only connected over short distances. The warning system between the microcontroller circuits will be linked to a user-developed program. The Wi-Fi module connects the circuit and the device, allowing users to communicate between circuits through established applications. The remainder of this paper is structured in the following manner. Section 2 shows structures that are similar to the one suggested. The architecture technique is presented in Section 3. The prototype implementation is presented in Section 3 and the research is presented in Section 4. Section 5 ends with some suggestions for future research

1.3 Objective

The remainder of this paper is structured in the following manner. Section 2 shows structures that are similar to the one suggested. The architecture technique is presented in Section 3. The prototype implementation is presented in Section 3 and the research is presented in Section 4. Section 5 ends with some suggestions for future research.

As a result, with the aid of this unit, they can secure their home in a proper manner for the long line. With the aid of this gadget, an illiterate individual can easily understand what is happening in the best interests of this country. The aim of this project is to incorporate technology into our farming practices. This system will help us save time that we would otherwise spend reading and reviewing books. Anyone can learn about suitable crops for the land in a short amount of time by using this method. It also has the potential to save money, time, and energy.

1.4 Rationale of the Study

There is no denying that many efforts have been made to develop an IoT-based home security system. This project is unlike anything I've done before. Since we're figuring out what we'll need to keep our home secure. Everything fresh has been applied to our project in order for the previous project to function properly. We have already previously processed and tracked all data, and after reviewing all of the data, we will be notified of the situation. This project aims to design and build a system to protect our home appliances and property from burglary, fire, and gas accidents.

1.5 Expected Outcome

We'll use different types of sensors to automate a safety system that will secure our home from an accident or theft, extending the life of our home appliances. Voltage, gas, fire, and motion data are all collected. These data are saved in the cloud, and we created an app that displays all sensor data and includes a control and notification system that will send

notifications to the computer and applications Finally, obtain an automated correlation of such data and filter–out invalid data from the perspective of message and notification development. There are some points given in this section, and those points were our minimum expected result. The expected outcome of this research-based project is to create a system that follows an efficient protocol and produces final results using a dataset. Using wireless sensor network.

- Showing Value of Electricity Voltage, Level of LPG gas, Fire, Motion.
- Real time total system control and monitoring remotely.
- This device would help the home owner.

1.6 Research Questions

Completing this work was very difficult for us. The researchers would like to suggest the following questions to convey the feelings and outcomes of this problem in order to provide a practical, effective, and reliable answer to the problem. What are the impacts of Home Security System?

- Can a Digital Safety System based on IOT be a solution for protecting your home from accidents?
- In the long run, how effective will this project be?
- What methods can be used to improve home security?
- How is this project related to IOT?
- How precise will the solution and its consequences be?

- On a broad scale, how successful will this project be?

1.7Report Layout

This section explains the entire layout of this study. Chapter one has illustrated presentation to the project with goal, inspiration, research questions, and anticipated outcome. Chapter two provides the discussion on what already done in this domain before. Then the later section of this second chapter shows the scope arisen from their limitation of this field. And very last, the root obstacles or challenges of this research are explained.

- Third part contains the Requirement Specification, which includes business process demonstration, requirement accumulation, use case demonstration, and valid information model and plan prerequisites of IoT Based Smart Security System, all of which are quickly depicted in this section. Chapter four provides the Design Specification, Front-end, Back-end design and Implementation discussion. Some method pictures and database are presents in this chapter to make realize the project.

- The fifth chapter discusses Use and Checking, Database Execution, and Front-end and Back-end Structure Implementation. This chapter contains some concept images and a database that will help you complete the project. Chapter six discussed with a description of the research, recommendations for future work, and a conclusion This chapter is responsible for displaying the entire project report in accordance with the recommendations. The chapter concludes by demonstrating the shortcomings of our work, which may be of interest to those who wish to work in this area in the future.

CHAPTER 2

Background

2.1 Introduction

In this segment, we'll look at related works, research summaries, and challenges associated with this research-based project. In the related works section, we will address other research papers and their works, methods, and projects that are important to our work. our interconnected works. We will explore how the system will calibrate the sensor value and provide users with good decisions in the challenges segment. We will summarize our relevant works in the research review section. In the challenges segment, we'll talk about how the system calculates the sensor value and helps users decide which value is best for their home.

2.2 Related Works

This section describes some related work of smart homes security technology, how other researchers explore this problem and provide the solution, what are the merits and demerits of their solutions against security issues in smart homes system. Home Security System is applied in order to provide comfort, energy efficiency and better security. Because of the high cost and difficulty in obtaining the unit, smart home security systems are still rarely used in Bangladesh. The aim of this paper is to present a small smart home security system that was designed and built with the help of a WLAN network and an ESP8266 microcontroller. [1]

Fire, voltage level, motion, gas detectors, and other household appliances can all be monitored and regulated by the device. The system's testing revealed that proper control and control monitoring functions can be performed from a networked computer. This work implements the proposed device hardware and software. The anticipated work would aid in the construction of ubiquitous home networks. The future work will be included in our home protection framework as standard technology. [2]

2.3 Research Summary

Every sector in this digital environment is experiencing significant change as a result of the IT sector. However, the home protection device industry is not as up to date as other industries. We introduced a model for an advanced security architecture that includes IoT, cloud computing, and data mining, among other approaches. Those who have previously worked with an IoT-based home protection system. We discovered that our project is extremely beneficial to home protection systems after conducting research. Since this is the only device that protects and secures our household appliances. In this project, we will first check the voltage, then the gas level, fire, and motion using sensors. We also given such benefits as not having to pay special attention to the security and protection of one's home. This value is automatically stored in the database using this process. Then we make a decision by equating the set condition data with the current data. Furthermore, for our project, we have gathered data in a specific way that we will forward. Our machines can make decisions based on all of this information. The user can also see all of the value, so (Gas level, motion, Fire, voltage etc.). We didn't let any of these decisions affect any other project. We believe that our project will contribute to the development of something different.

2.4 Scope of the Problem

In this section, we discuss the complexity of the issue that will arise in the future.

- It is More expensive to install. These are mostly installed by professionals and it can be expensive work in installing it.

- It is more vulnerable.

- It really takes a lot of investment and time if you want to install or replace old with new one.

2.5 Challenges

The key difficulties of this project are gathering equipment and processing the data; contact with the various types of sensors was too difficult. Previously, those who worked with IOT-based protection systems were unable to make an accurate decision on how to secure home appliances from high or low voltage. A security system that includes all of these features is now available. For this home protection unit, we created a wireless notification and SMS system to inform the user about the status of our system. As a result, we have a lot of issues calibrating hardware and software. Then it's time to get used to our gadget. Experiments in the real world are a huge challenge for us. Our Research based project is not a completely device. We now use voltage detector sensors to detect high low voltage and warn the consumer so that the device can be controlled manually or automatically. We also detect gas, fire, and motion with various types of sensors and create alarms based on the sensor's value. This system would need power management in the future. Since there was insufficient data previously, we had to begin with our own inspiration.

CHAPTER 3

Requirement Specification

3.1 Introduction

We'll talk about our project's requirements in this segment. Our methodology research is also needed for our research-based project. We'll also go over some important points like data collection, processing, and the model we've suggested. Which will be explained in detail with related equations, graphs, tables, and descriptions. The section concludes with a clarification of our project's quantifiable hypotheses as well as a clear understanding of the use requirements.

3.2 Business Process Model:

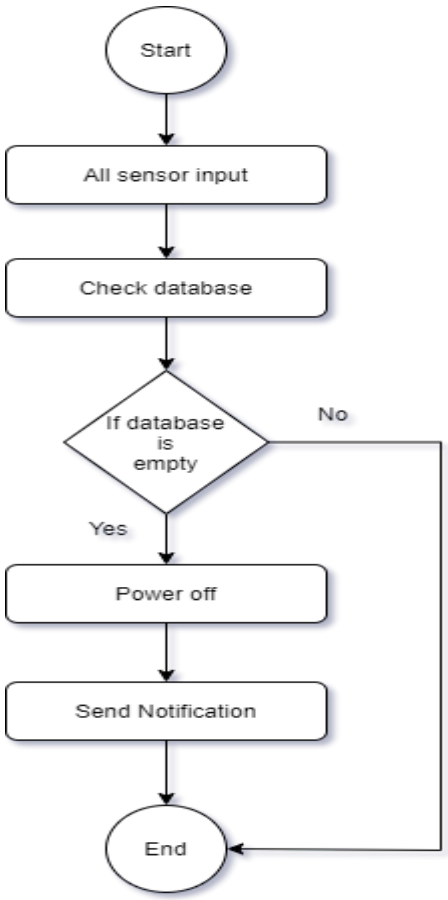

Fig 3.2.1: Business process model

3.3 Equipment List

Table 3.3.1 contains a list of components that we used in our project.

TABLE 3.3.1: EQUIPMENT LIST OF PROPOSED SYSTEM

SL. NO.	NAME OF EQUIPMENT	QTY.
1.	Project Board	1
2.	Node MCU 1.0 (ESP8266 12E Wi-Fi D1 Module	1
3.	Motion Sensor	1
4.	Fire Sensor	1
5.	Voltage Sensor	1
6.	Gas Sensor	1
7.	LCD Module	1
8.	USB cable	1
9.	Jumper wire	20
10.	Battery	1

3.3.1 Motion Sensor

Our methodology research is also needed for our research-based project. We'll go over some key points in depth, such as data collection, processing, and the proposed model, complete with equations, graphs, charts, and explanations. The section ends with a good understanding of our project's quantifiable hypotheses as well as the usage criteria. If there is an intruder, an additional object detection and alarm system is necessary. NodeMCU is used to execute the proposed design. When the motion detect level in the earth is high, it produces a 5V electronic output, and when the sogginess level is low, it produces a 0V electronic output. Vcc, GND, and Digital Data Pins are all present on the amplifier. This means that the attributes can be obtained in digital systems. [3]

Fig 3.3.1.1: Motion Sensor

3.3.2: NodeMCU ESP8266 D1 Mini

It's a chip that runs first on a device and has an improved version of the famous Esp8266 Wi-Fi system. A 32-bit ten-silica processor, an antenna, switches, RF balloon, power amplifiers, filters, and power control modules, as well as a basic optical peripheral controller, are all included in the Esp8266 EX. It runs at a clock speed of 160 MHz and consumes very little power. With power sparing engineering, it has three modes of operation: rest mode, dynamic mode, and profound rest mode. Because of the ongoing

working framework (RTOS) and Wi-Fi stack, approximately 80% of the planning capacity will be usable for client application programming and development. [4]

Fig 3.3.2.1: NodeMCU ESP8266 D1 Mini

3.3.3: Voltage Sensor- ZMPT101B

The voltage sensor circuit is intended to detect maximum AC voltages of less than 250 VAC. After a 230 VACrms with a tolerance of less than 5 VACpp, this circuit uses a differential attenuator. The circuit's output waveform (5 VAC) is offset by DC voltage (about 2.5 V), and the amplitude can be changed with a potentiometer but not higher than 5 V. The circuit's output is connected directly to the Arduino microcontroller's ADC pin. A ZMPT101B current transformer with low impedance load (Interplus Industry Co. Ltd., Shenzhen, China). (R2). For voltage measurements, the ZMPT101B is a small current transformer with strong consistency and isolation. Figure 4a shows the relationship between the RMS input current and RMS output voltage, the relationship between the RMS input current and phase angle error of the output signal, all of which are dependent on the input resistance of the ZMPT101B. (the input resistance R1 is connected in series with the transformer). [5]

Fig 3.3.3.1: Voltage Sensor ZMPT101B

3.3.4: Gas Sensor – MQ4

The MQ4 Gas Sensor is a basic computerized gas detect sensor that is extremely low-cost. This is an ideal sensor for detecting dangerous LPG leaks at home or at work, in storage equipment, and in vehicles that use LPG as a fuel. This section is simple to integrate into an alarm circuit, start an alarm sound, or even display a visual representation of the gas concentration. This sensor has a strong sensitivity as well as a fast response time. When input gas is present, the sensor's conductivity increases, and the concentration rises with it. [6]

Fig 3.3.4.1: Gas Sensor -MQ4

3.3.5: Project Board

On platform serves, issues, pull requests, and responses are arranged as cards in the columns of your choosing. By dragging and falling or using keyboard shortcuts, we can reorder cards within a column, move cards from one column to another, and change the order of columns. On venture board cards for problems and drag requests, names, assigners, the status, and who opened it are all included. You will see and make small modifications to issues and drag requests in your expand board by clicking on the title of the issue or drag request.[7]

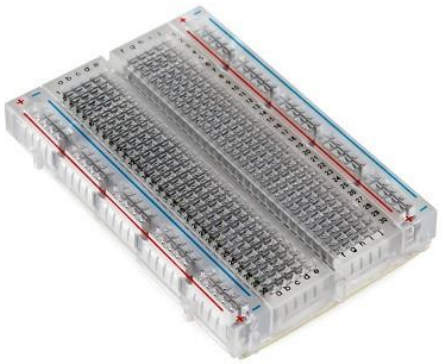

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Fig 3.3.5.1: Project Board

3.3.6: Relay Module

An electromagnet operates a power relay module, which is an electrical switch. A separate low-power signal from a microcontroller activates the electromagnet. The electromagnet pulls to open or close an electrical circuit when triggered. A simple relay is made up of a wire coil wrapped around a soft iron heart, known as a solenoid, an iron yoke that provides a low reluctance path for magnetic flux, a movable iron armature, and one or more sets of contacts. The relay module is used to power home appliances in this project.[8]

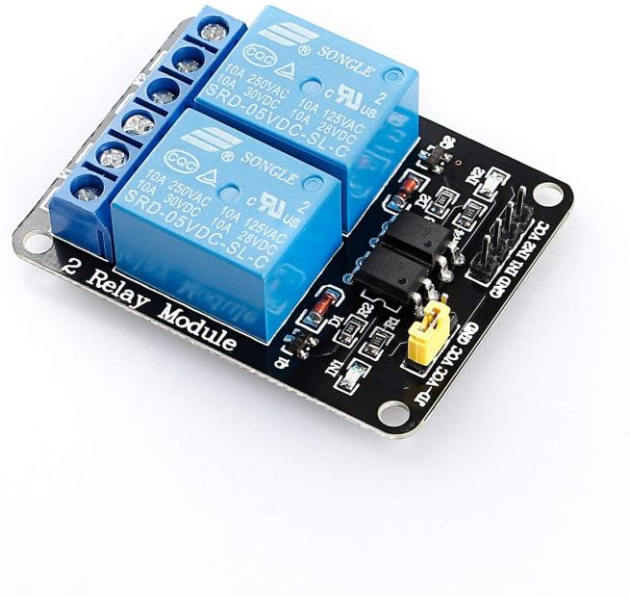

Fig 3.3.6.1: Relay Module

3.3.7: Buzzer Module

A buzzer or beeper is an audio signaling device that is electronic, electromechanical, or piezoelectric. Buzzers and beepers are often used for alarm clocks, timers, and acknowledgement of user input. This project employs the use of an alarm buzzer module. If the voltage is high or low, or if motion, fire, or gas is detected, the buzzer will turn on or off depending on the user's condition. This buzzer has two pins, one positive and one negative.[9]

Fig 3.3.7.1: Buzzer

3.3.8 Battery

In PV systems, batteries are primarily used to account for the energy produced by the PV display during the day and to supply it to electrical loads as required (during the night and times of obscure atmosphere). display at its highest power point, monitoring electrical problems at steady voltages, and providing flood streams to electrical weights and inverters. Where in question, a battery charge controller is used to shield the battery from cheating and over-discharge on a very basic level in these devices.

Fig 3.3.8.1: Battery

3.4 Block Diagram

Our smart Security technology is a computerized version of a conventional embedded security framework. The ESP8266 is connected to the server and app, creating a cycle. If the sensor receives any unqualified data, it will send a message that will cause an alert to be triggered.

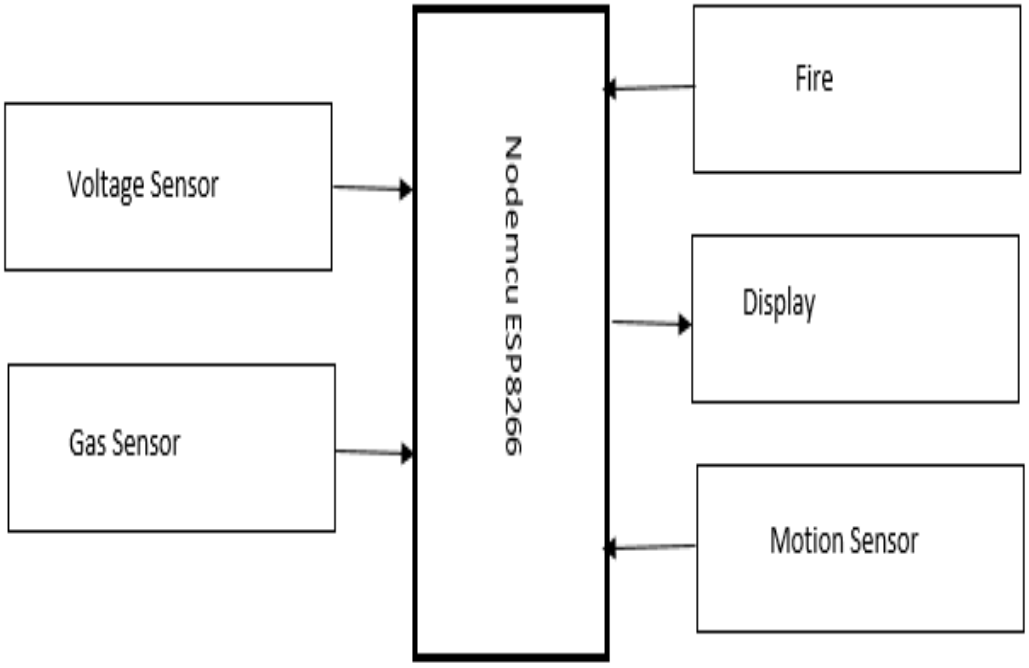

Fig 3.4.1: Block Diagram

3.5 Circuit Diagram

Our project's circuit diagram is fairly simple. The power source is a battery, which is connected to the Vcc and Gnd pins of the Esp8266, and all sensor data lines are connected to the Gpio pin in the correct order.

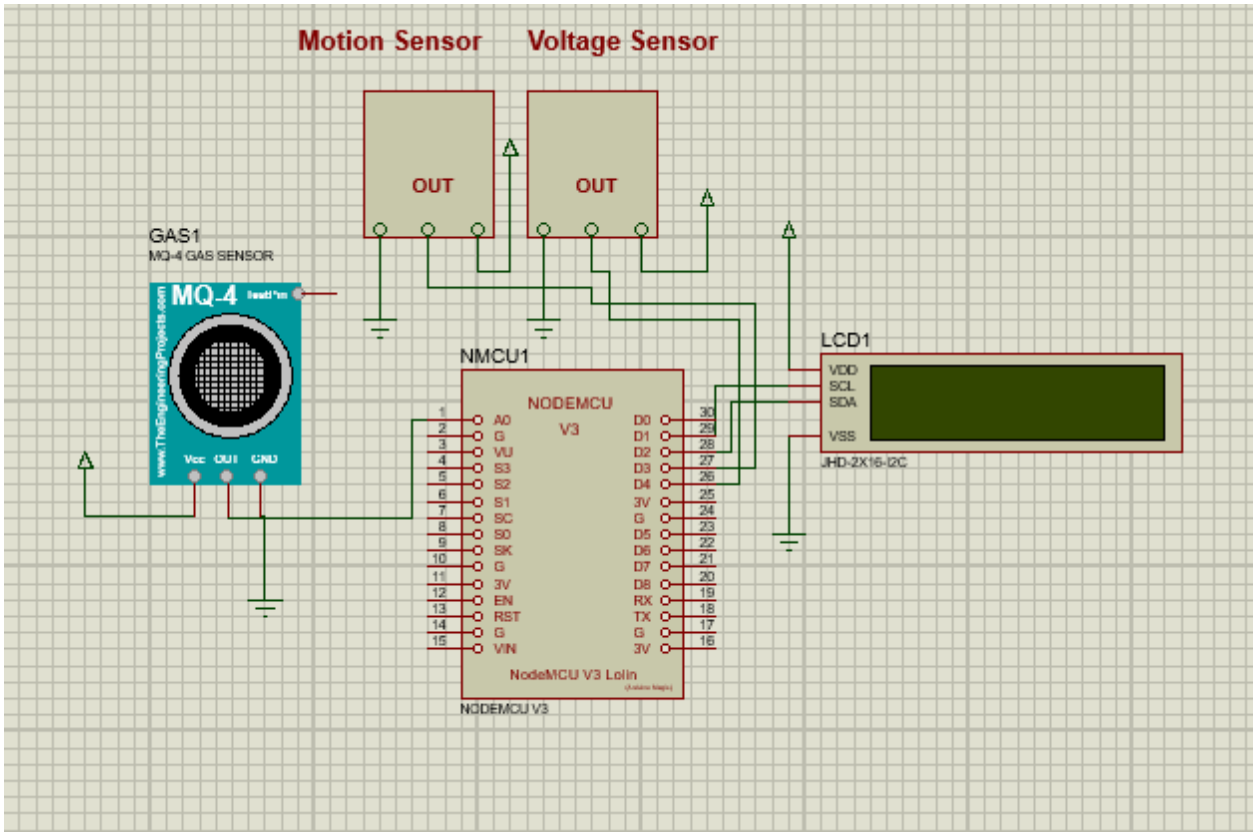

Fig 3.5.1: Circuit Diagram

CHAPTER 4

Design and Specification

4.1 Front-End Design

The front end is a platform that lies on top of the back end and collects all customer-facing PC services or appliances. Customers were closely concerned with different points of a program's front judgment, such as reviewing client-entered results, captures, projects, websites, and other functions, whether they were human or automatic.

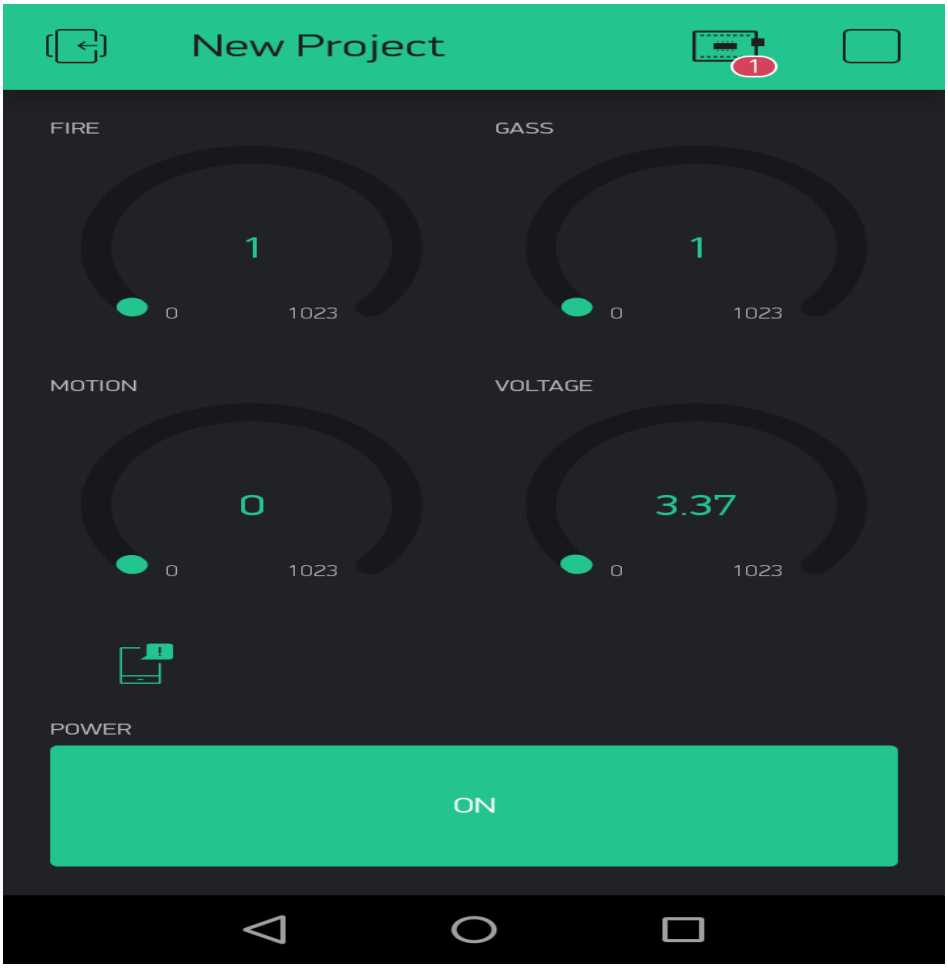

Fig 4.1.1: Front end Design (Apps)

This system's planning philosophy is not overly complicated. Many of the sensors in this area detect values associated with various activities. This model includes a voltage sensor,

a gas sensor, and a fire sensor. The sensors send the values to the microcontroller when they detect them. The data is sent to a database, and the microcontroller makes a decision and displays the result on an LCD display and Android Apps that are appropriate for this security location.

4.2 Back-end Design

A back-end configuration is a form of programming that creates a logical data structure for a website, programming, or some other data framework. Back-end development refers to the server side of development, where you are mostly concerned with how the web functions. The database knowledge is passed on to the software via code written by back-end designers. A back-end developer creates something that can't be seen by the naked eye, such as databases and servers. The following people are in charge of our back end:

- Firebase Database

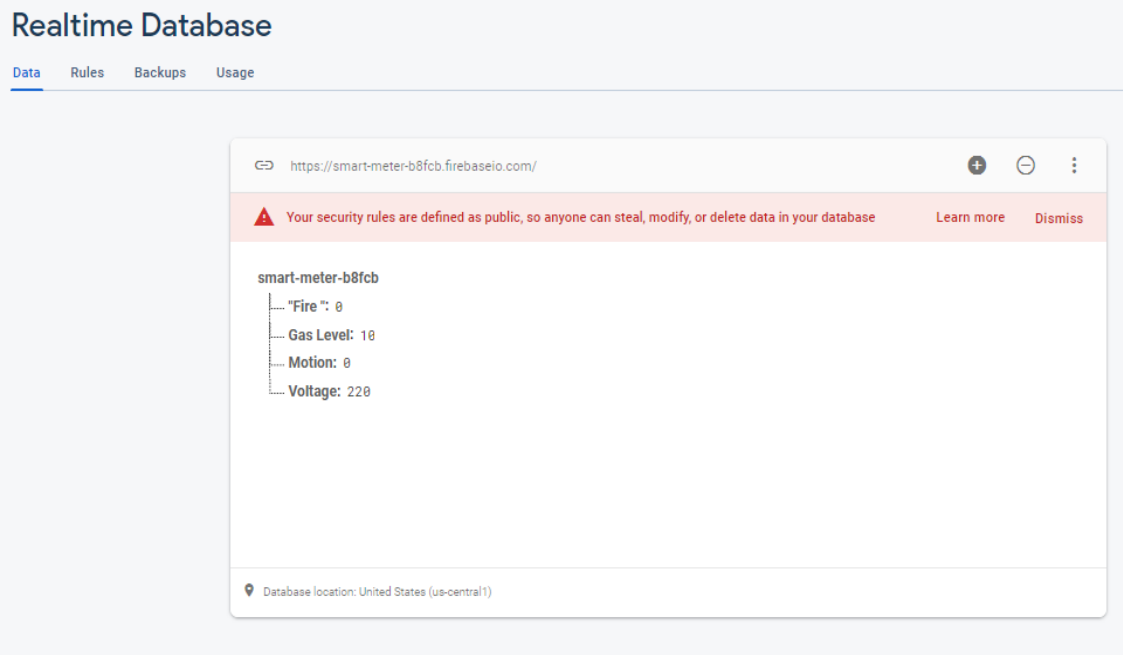

Fig 4.2.1: Firebase Database

Firebase is a professionally controlled framework for building iOS, Android, and mobile apps that includes features including automatic data synchronization, validation

administrations, informing, record capability, analytics, and more. Building or modeling modular backend administrations with Firebase is a good place to start. We use our project Firebase database for both saved and real-time data.

4.3 Implementation Design and UX System

In basic (but not rearranged) language, the schedule of interaction between clients and items is: it is the plan of interaction between clients and items.

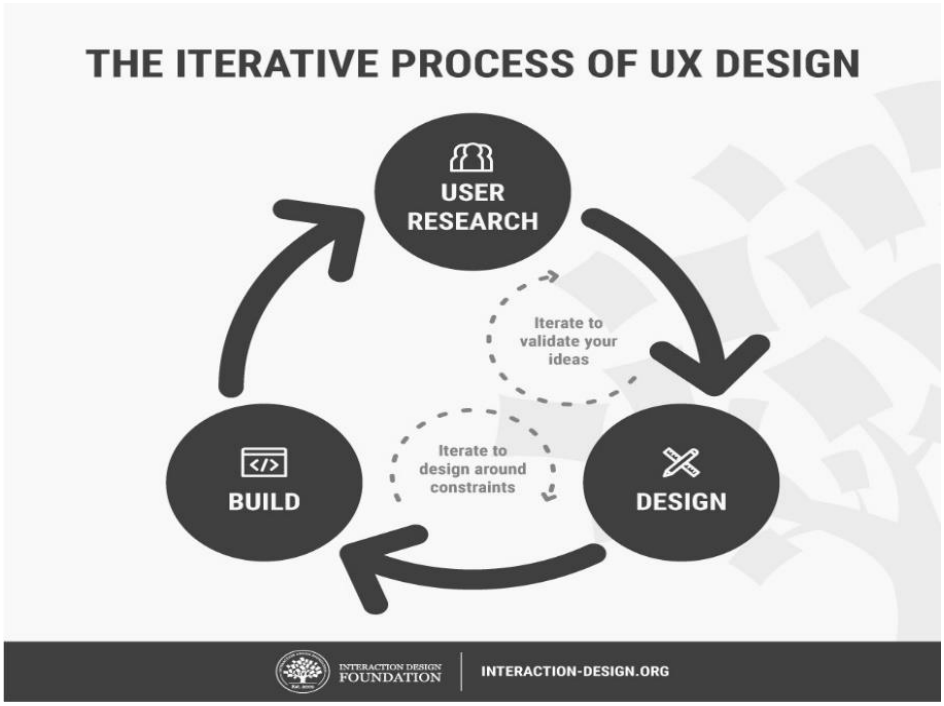

Fig 4.3.1: The iterative process

Assisting Our Projects: To begin, we needed to gather all of the necessary sensors. as an illustration (voltage sensor, fire sensor, motion sensor). Finally, we had to contend with an absurd problem: calculating voltage correctly. [10]

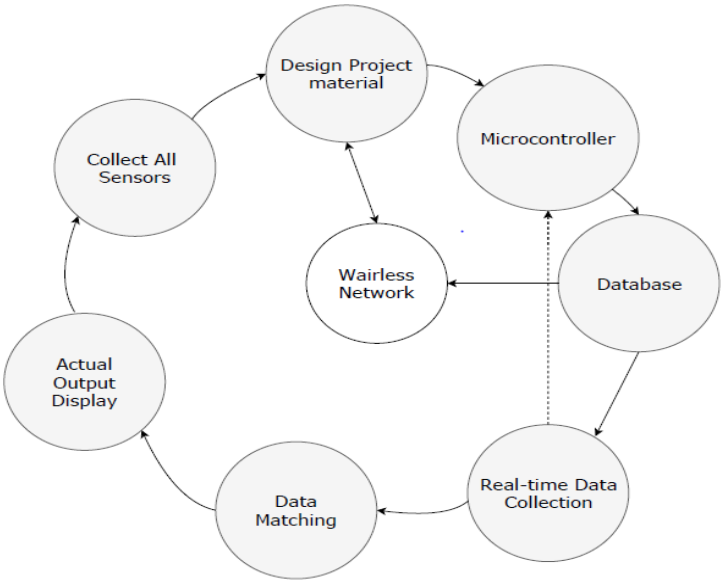

Fig 4.3.2: Interaction Design

Then we had to build our system in a simulation. Circuit diagrams, use case diagrams, and business process models are examples. This procedure is reliant on wireless networking. The data is then stored in the cloud using a microcontroller. A microcontroller's memory can also be used to store data and data processes. We do, however, require real-time data. As a consequence, the Firebase database is used. The data from all of the sensors was then fitted to the database values. Finally, we can note that all of the circles in this UX style are related.

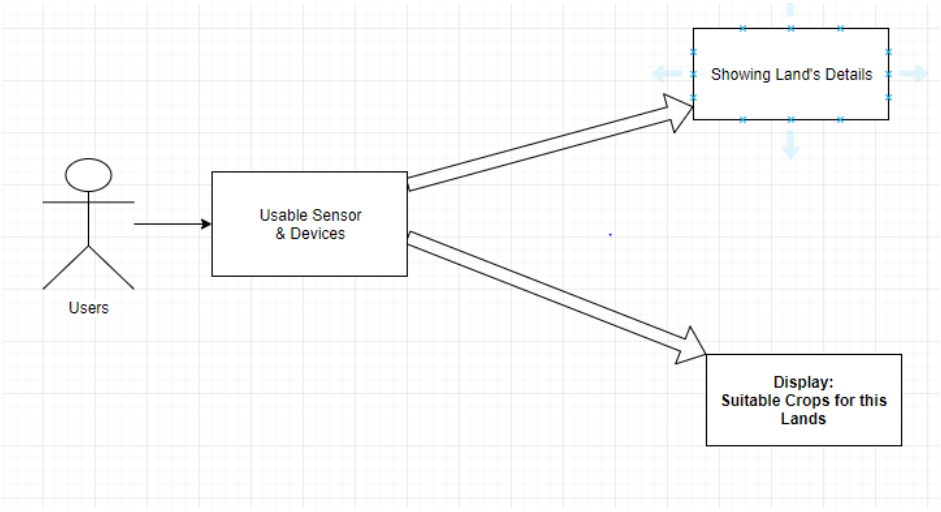

Fig 4.3.3: User's Interface

4.4 Implementation Requirements

We use four different types of sensors in the implementation. as follows:

- Voltage Sensor.
- Motion Sensor.
- Gas Sensor.
- Fire Sensor.

For implementation, this sensor is needed. The most significant area for promoting research is the design and improvement of new sensors appropriate for Home Security applications. In developing nations, where small-scale ranchers cannot afford the high prices of available sensors, low-cost voltage, heat, motion, and gas sensors are critical. Despite their widespread availability, voltage sensors are uncommon and expensive. Those that are less costly aren't digital and can't be synchronized with ICT networks on time. A microcontroller is then used to store the data in the cloud. Data and data processes can be stored in the memory of a microcontroller. We do, however, need real-time data in order to provide performance.

CHAPTER 5

Implementation and Testing

5.1 Introduction

The task of converting methodologies and strategies into actions in order to accomplish particular goals and targets is known as implementation. The process of evaluating the use of specialized data in general is called execution analysis. Quality research materials also aid in the advancement of usage conformance by including methods for consistently testing conformance to well-defined parameters. Implementation is the task of turning methodologies and plans into practice in order to accomplish specific goals and objectives. Execution analysis is the method of analyzing the use of specialized data in general. Quality research materials also help to advance usage conformance by offering procedures for measuring conformance to well-defined parameters on a standardized basis.

5.2 Implementation of Database

The execution stage involves presenting the database management system (DBMS) on the right machine, upgrading the database to function at its best on that platform, and programming the database to weight the results. The primary data may be either previously unused data or existing data imported from any database management system. In this way, designers frequently establish database security and provide different customers with services that architects deemed to be fair to their needs.
The taking after are the steps within the usage stage:

- Let a FIREBASE database.

- Adjust the configuration variables based on the equipment, programming, and use conditions.

- Make a storage table.

- Obtain data from sensors and load it.

- Set up the surveillance system.

5.3 Implementation of Interactions

To make our computer (IOT BASED SMART SECURITY SYSTEM) interactive, we use the large display to show context and final effects. For a hassle-free experience, we also build a well-fortified server. The interface has a user-friendly architecture. When any of the sensors are properly positioned, the user will be able to see all of the sensor data as well as a clear prediction result.

5.4 Testing Implementation and Report

The most critical aspect of a construction project is the implementation testing and study. In this way, we can ensure that the performance is as intended. When we run the method, the results of the tests will become clearer. It will provide us with unique results for specific sensors. The results of each sensor's testing will be used to generate output for various objects, which is a continuous operation. Various objects, that is a continuous operation.

TABLE 5.4.1: Testing Sheet

Test No	Test Input	Expected Outcome	Obtained Outcome	Status	Date
Test 1	• Voltage • Motion • Gas • Fire	• Receive data from Sensor • Successful database storage • According to the outcome of the situation	• Yes • Successfully stored • In Range	Pass	10 April, 2021
Test 2	• Voltage • Motion • Gas • Fire	• Receive data from Sensor • Successful database storage • According to the outcome of the situation	• Yes • Successfully stored • In Range	Pass	11 April, 2021
Test 3	• Voltage • Motion • Gas • Fire	• Receive data from Sensor • Successful database storage • According to the outcome of the situation	• Yes • Successfully stored • LOW	Fail	13 April, 2021
Test 4	• Voltage • Motion • Gas • Fire	• Receive data from Sensor • Successful database storage • According to the outcome of the situation	• Yes • Successfully stored • In Range	No	12 April, 2021
Test 5	• Voltage • Motion • Gas • Fire	• Receive data from Sensor • Successful database storage • According to the outcome of the situation	• No • Successfully stored • HIGH	Fail	16 April, 2021
Test 6	• Voltage • Motion • Gas • Fire	• Receive data from Sensor • Successful database storage • According to the outcome of the situation	• Yes • Successfully stored • In Range	No	18 April 2021

5.5 Summary

After conducting all of the tests, we discovered that the sensors play a significant role in this segment. It's nearly impossible to get production in this device without a sensor. For example, if the voltage sensor does not receive an input, it will not store the data in the database and will not be able to determine what the actuator should do. The most critical and initial component of this device is not only the voltage sensor, but also all of the sensors. If the sensor detects values, it sends them to a wireless computer, which then stores them in a database. If an error occurs when attempting to store data in the database, the data will not be saved. We would not be able to locate it in the database if there is no data store. After all of the steps have been completed, the final stage is prediction. If the values are right, the result is acceptable. The forecast would be inaccurate if the sensor range exceeds the code section's specified range. As a consequence, the device's most fragile goal is to position the sensor.

CHAPTER 6

Conclusion and Future Scope

6.1 Introduction

We can address the output obtained from this method, as well as the study's conclusion, recommendation, and implications for future research in the field of home security, at this level At this stage, we will discuss the findings of this process, as well as the study's conclusion, recommendations, and implications for potential home security research.

6.2 Summary of the Study

I The aim of this project is to use sensors and artificial intelligence to improve security in our homes and offices. We obtain values from the sensors and make decisions on our own. The values are obtained by sensors from the inverment. Via the microcontroller, values are stored in a database, and performance is predicted and displayed on an LCD Module and in Android Application.

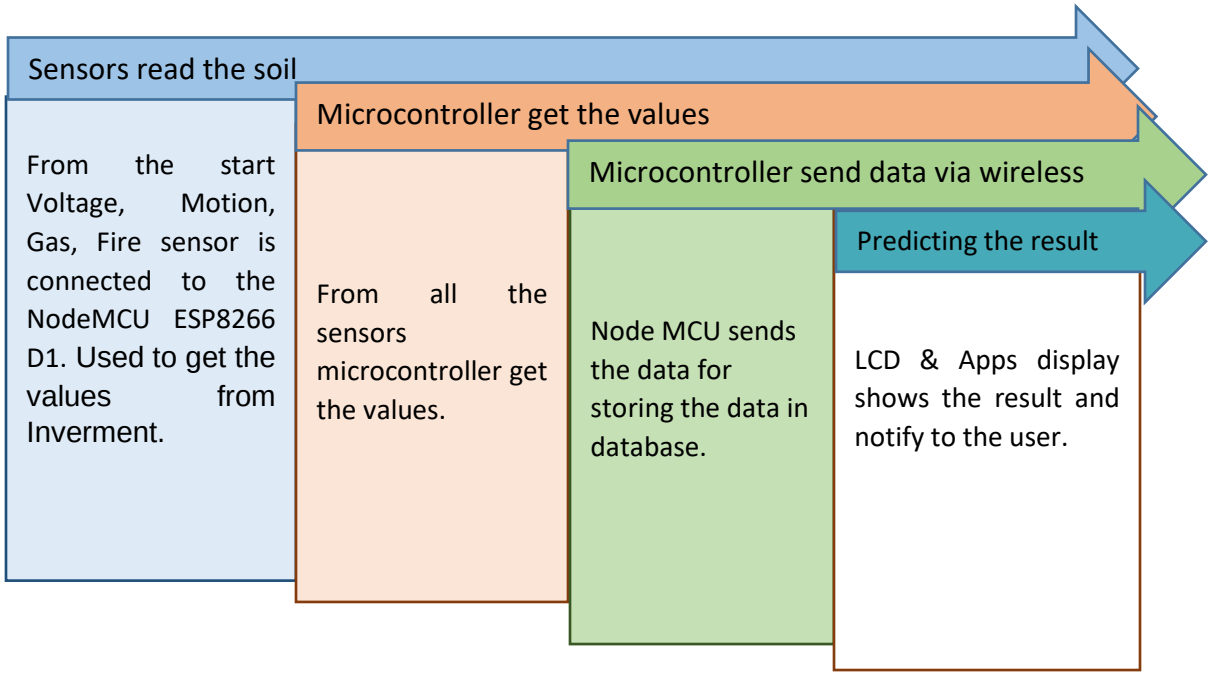

Fig 6.2.1: Work flow of the stud

6.3 Scope for the Further Developments

There are many opportunities to improve the security framework. This system's functionality will be updated on a daily basis to provide a better experience. Based on client reviews, the highlights that were not used will be included. If necessary, a new User Interface may be used to implement the system. We'll use an LCD display and Apps as an example of production. We can use prediction here, as well as add a web page to display. For the User Interface, we can also use the.net framework. We can also add some sensors to this device, such as gestor control, vision system, and motion control sensor, which gives us a high level of protection.

6.4 Conclusion

In this paper, we present a method for designing a particular home protection device that will extend the life of the product and keep it protected from accidents. We used three sensors, each of which outputs three different values. The sensors provide an input to the microcontroller. Microcontroller makes a decision based on the circumstances and sets off an alarm, notifying the user, and turning it off in an emergency. The result we've achieved is extremely promising. Hopefully, as part of potential contributions to home protection systems, this strategy will be pursued and improved, and will play an important role in increasing safety and making our lives more colorful.

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APPENDIX

Appendix:

Beginning in the Fall of 2019, we began our journey to develop a security system that would alert us to our home's security level and protect our home appliances from high voltage. This device can be beneficial to a customer. We also considered a simple and painless system that would allow us to save time. We started working on a protection system that would alert us to our home's security level and protect our home appliances from high voltage in the fall of 2019. A customer can benefit from this device. We also thought about a quick and painless device that would save us time.

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