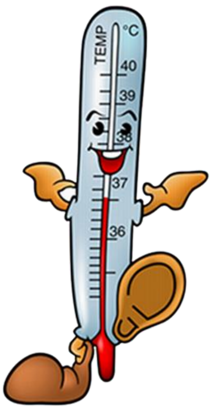
KIDS

FEVER

MONITORING



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KIDS FEVER MONITORING

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DECLARATION

I hereby declare that the work in this report is my own except for material used form other sources has been clearly identified and properly acknowledged and referenced.

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ABSTRACT

Most parents nowadays work and have limited time to manually monitor their child's body temperature. Furthermore, it is difficult for parents to monitor their child every four hours. Particularly when the child is active, especially during the day. As a result, we would like to present our project "childhood fever monitoring," which is likely to alleviate some of the problems encountered. The project can detect a child's body temperature during a fever. When a child's temperature rises, parents will be notified via the app that we will create. The project's goal was to develop an iot-based system for monitoring childhood fever. In addition, we developed an app for parents to use to monitor their child's temperature development on a regular basis.

CHAPTER 1 INTRODUCTION

1.0 INTRODUCTION

Nowadays, most parents work and have limited time to manually monitor their child's body temperature. Furthermore, monitoring the child every 4 hours is challenging, especially when the child is energetic, especially during the day. As a result, we present our "kids fever monitoring" initiative. During a fever, this project can monitor a child's body temperature. When a child's temperature rises, parents will be alerted. According to the data that we collect through need analysis via Google form, there are parents who have difficulty taking their children's temperatures during the day. Because most children are active during the day, the assertion is made. Furthermore, most parents felt that this project should take place because they can check their child's temperature using their smartphone. This project is for parents who find it difficult to constantly monitor their children's temperatures when they have a fever. We hope that by producing this initiative, we assist parents.

1.1 PROJECT BACKGROUND

Why do we need to keep an eye on children when they have a fever? One of the major risks that may be present with fever in infants and children. Temperatures that are too high or rise sharply in infants and preschool children increase the risk of seizures (pull). The occurrence of seizures (pull) is commonly seen in the paediatric ward every month. It easily happens if the body temperature rises above 40 ° C in just one or two days after the fever starts. Children who have had febrile seizures are also at risk of having similar problems in the future. The risk of seizures will disappear with increasing age as febrile seizures do not occur in adults. Seizures due to fever can cause brain retardation or death due to lack of oxygen supply to the brain. Death or brain retardation can occur due to the patient's airways become blocked when seizures occur. So, before all that happens to children, parents need to monitor the child during a fever more often. Therefore, we want to help parents to monitor their children more easily and save time with our project

1.2 PROBLEM STATEMENT

Nowadays, most parents work and time constraints to monitor the child's body temperature manually. In addition, if parents want to monitor the child every 4 hours is quite difficult especially when the child is active especially during the day. Therefore, we introduce our project called "Kids Fever Monitoring". This project can monitor a child's body temperature during a fever. Parents will be aware when the child's temperature is high.

1.3 OBJECTIVE

In addition, this project allows us to develop an app for monitoring the daily data of parents. The data carried by the Wi-Fi module is sent to the app to store the data in the app and when the temperature reaches high fever the app will issue an alarm to alert parents. Our goal is to help parents know when the last time a child has a fever and make it easier for parents to monitor their child when it reaches high fever by issuing an alarm. In addition, we also remind parents that the temperature rises during the child's fever.

1.4 SCOPE OF PROJECT

Project scope for this project is Parents who find it difficult to monitor their child's fever. In addition, the project is to monitor children with fever between the ages of one and four years. Other than that, for the safety of all chemical users do not recommend the device be used for children with chronic diseases

1.5 IMPORTANT OF PROJECT

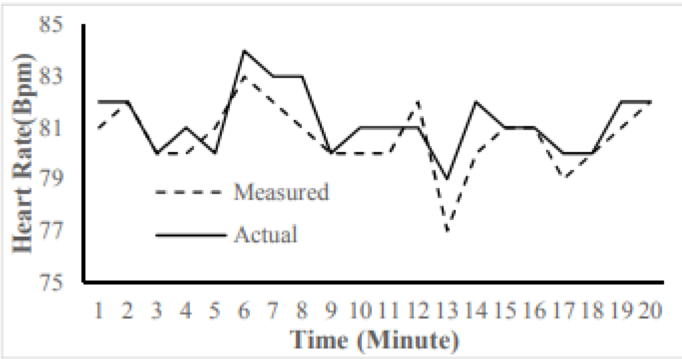
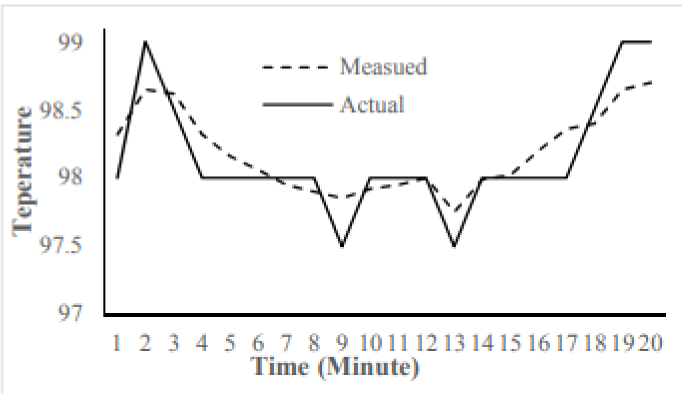
The importance of our project is to help parents facing time constraints to monitor their children's body temperature manually. So, with this system parents will be more alert when the child is infected with fever. So, with this system we can also avoid things that we do not want to happen such as a child having a sudden seizure due to a fever that is too hot. Also, the importance of this project is to remind parents that when a child has a fever parents need to be more vigilant because many unexpected things can happen. There are so many issues about children having seizures due to overheating fever and after that have side effects for the child's body. So, with this system we can overcome the problem so that parents will always keep an eye on their child through the application downloaded on their own phones.

CHAPTER 2 LITERATURE REVIEW

2.0 Introduction

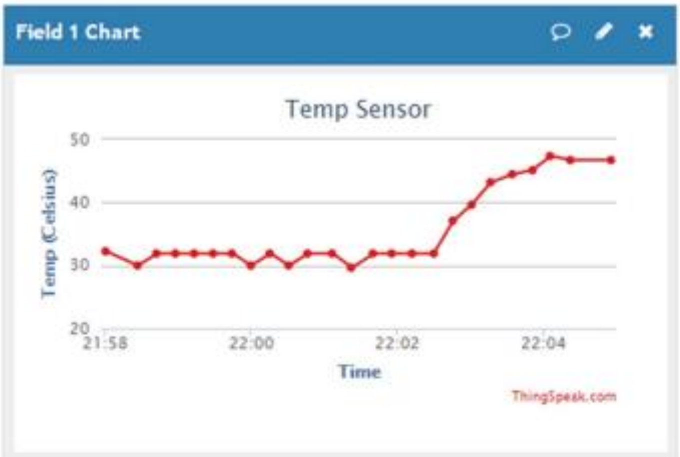
This chapter expands on the literature reviews that match the data to the project's objectives. The following information and additional features were acquired.

2.1 Literature Review Topic 1-4

TITTLE/AUTHOR	METHOD	RESULTS
Continuous Heart Rate and Body Temperature Monitoring System using Arduino UNO and Android Device Md. Asaduzzaman Miah, Mir Hussain Kabir, Md. Siddiqur Rahman Tanveer and M. A. H. Akhand - - 2015	The microcontroller of the Arduino UNO board is programmed to count the pulse rate and to measure the body temperature and to send the information to the developed "Heartmate" android application via Bluetooth module . The sensor unit consists of an IRTx and IRRx, placed side by side. An infrared light is transmitted by IRTx into the fingertip, and the IRRX senses the portion of the light which is reflected back. The intensity of the reflected light depends upon the blood volume inside the fingertip.	- android based portable heart rate and body temperature measurement system with a suitable architecture which can be applicable in medical and home appliances in patient health monitoring system  Figure 10. Actual vs. Measured Heart rate measured for 20 minutes  Figure 11. Actual vs. Measured Body Temperature for 20 minutes

Health Monitoring Systems using IoT and Raspberry Pi Vivek Pardesh Saurabh Sagar Swapnil Murmurwar Pankaj Hage -2017	This is major significance of LM-35 that it calibrate directly in Celsius and it is also suitable for remote applications. The blood pressure sensor is designed to measure human blood pressure. It also measures the systolic and diastolic pressure and pulse rate is also recorded by this sensor. It is used to measure the heartbeat of the patient. It gives a digital output of heart beat when a finger is placed on it. It is compressed in size. Electrocardiography (ECG) is the process of recording the activity of the heart for a period of time using electrodes placed on the skin.	As discussed in section III, system is divided into hardware and software section. Software is responsible for better working of the system, also for interfacing. Both sections work in parallel process. Hardware is again classified into transmitter section and receiver section. Implementation of transmitter is important part, because transmitter section is directly attached to the patient or human body. Raspberry Pi is a master device in proposed system; all the other devices like different sensors are connected to it. A DC power supply of 5V is provided for working of raspberry pi. IoT server is attached to the system; it allows the connectivity for data exchange with other devices. IoT allows connected objects to identify and control remote access across network. The output of temperature sensor and heartbeat sensor is displayed on LCD at user end too. The output of ECG is sent to the receiver or doctor end. All the information is first acquired, processed and stored at memory of raspberry pi. The stored information is then transferred to the receiver by means of IoT server. Any abnormalities in the health conditions can be known directly and are informed to the particular person through GSM technology or via internet. It acts as a connection between patient and docto

Health Monitoring system using IOT Yedukondalu Udara1 |Srinivasarao Udara2 | Harish H M3 | Hadimani H C4 - 2018	The Arduino Mega 2560 is a microcontroller board based on the AT mega 2560 (datasheet).It has 54 digital input/output pins (of which 14 can be used as PWM outputs),16 analog inputs,4 UARTs (hardware serial ports),a 16 MHz crystal oscillator,a USB connection,a power jack,an ICSP header,and are set button.It contains everything needed to support the microcontroller. Simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.The Mega is compatible with most shields designed for the Arduino Duemilanoveor Diecimil	- We can observe parameters like BP, HB, ECG of a patient through LCD board. BP & HB can be observed in LCD and ECG(graph) in system .The continuous monitoring can also be observed in IoT by logging into particular account which was created in the IoT server - - ECG values cannot be found in IoT server due to high bit rate.If the values of BP, HB exceeds the reference value it alerts the caretaker of the patient.

IOT (Internet of Things) Based Infant Body Temperature Monitoring Nor Aini Zakaria, Fatin Nadia Binti Mohd Saleh, Mohd Azhar Abdul Razak Faculty of Electrical Engineering Universiti Teknologi Malaysia- July 2018	The architecture of the overall system is shown in the Fig. 1. It consists of both hardware and software. A sensor of LM35 are controlled by the Arduino ESPresso lite 2.0 microcontroller, to sense the body temperature. An Arduino microcontroller is commonly used in designing devices because it is open source electronics prototyping platform. The ESPresso microcontroller will send a data to server. The data will be stored on the cloud server. In this project, data are stored on the thingspeak.com and also the blynk.com. The processed biological information (human body temperature) then will be sent to android on a mother cell phone through a Wi-Fi interface. For Wi-Fi interface, ESP8266 module is used as a medium to create a connection wirelessly. An application is developed on android for the mothers to view the data. Blynk Apps is preferable due to it user friendly device. Fig. 2 is showing the application that will be used in this project to display body temperature of the baby.	For testing purposed, ESPresso board was connecting to a laptop by Wi-Fi to ensure the consistency data transfer and the wireless communication. The ESPresso lite 2.0 had to be programmed by using an Arduino IDE software to read the data from the wearable sensor and send the data through connected Wi-Fi to the laptop. The data will be stored on the thingspeak.com and then it will gives result on twitter account immediately. For every one second delay, the data from the ESPresso microcontroller will transfer data to blynk cloud and display on the mobile android. The result shows the reading of body temperature measurement at different placement of sensor to measure the accuracy. By referring the experimental results on table 2 below, the digital thermometer and DNT thermometer was used as a reference for the calibration and verification of LM35 sensor and MCP9700 (Lilypad temperature sensor). 

2.2 SUMMARY

According to the research paper, we will use LM35 for the temperature sensor to be placed under the child's armpit for fever monitoring. When inserted under the armpit, this type of sensor can measure surface temperature of skin temperature. Aside from that, most of the study papers we studied utilised Arduino because it is easier to use, although some of them used a pic microcontroller and raspberry pi. So, we choose Arduino Uno because it is more up to date and the source code that needs to be built is simpler. Finally, for output, the majority of the papers I researched used the IOT platform. For our project, we decided to use an app to notify parents via smartphone. The application will be easier for parents to use because it can retain data for the child's temperature, which will be essential when referring to a doctor.

CHAPTER 3 METHODOLOGY

3.0 Introduction

This section consists of six subsections which are the project design where the technologies required for the development of the system are presented, the project hardware showing the devices that were used for the implementation, the project software which consists of a description of the functionality, prototype development where the product develop and finally summary of this methodology.

3.1 PROJECT DESIGN AND OVERVIEW

3.1.1 BLOCK DIAGRAM OF THE PROJECT

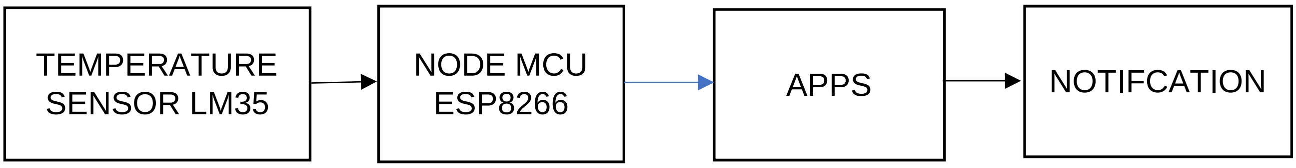


Figure 3.1: Block diagram for software of the project

3.1.2 FLOWCHART OF THE PROJECT 1

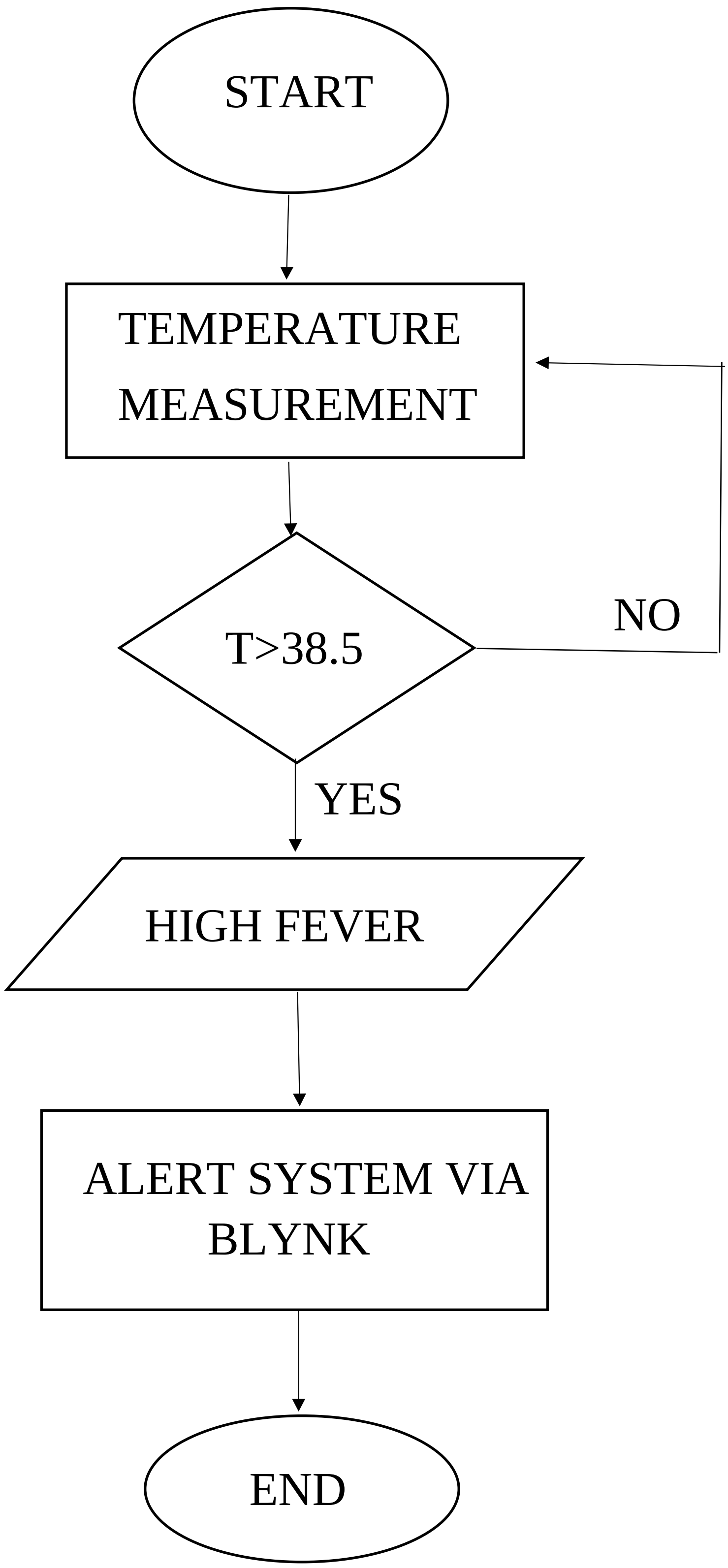


Figure 3.2: Flowchart of the project

3.1.3 PROJECT DESCRIPTION

The thing we can see from the block diagram is that the temperature sensor is the inputs from this project. Which is where the sensor will detect the child's temperature and send it to the process section. In the process part there is a Node MCU ESP8266 that will process the data. After that, it will be sent to the app which is the output in this project. In the app there will only be two things that is if it is normal fever, then it will update as usual but if it is high fever, then it will send a notification via blynk parents by issuing an alarm.

3.2 PROJECT SOFTWARE

3.2.1 FLOWCHART OF THE SYSTEM

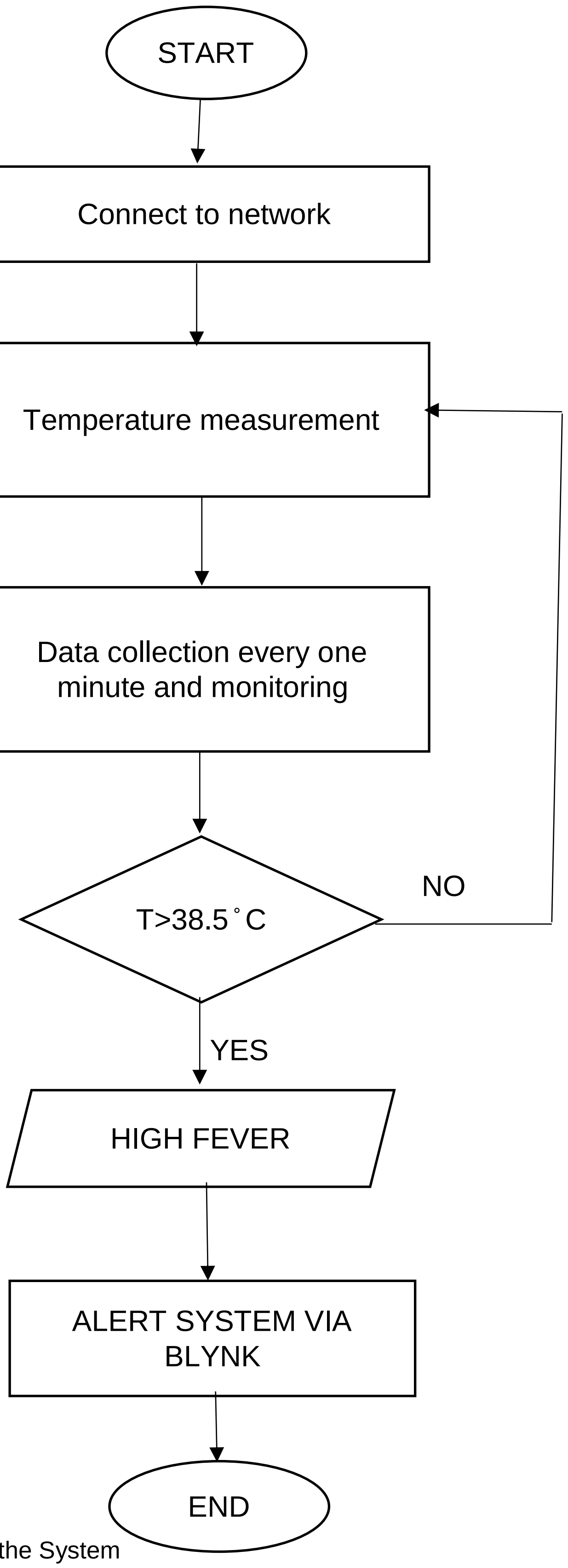


Figure 3.3.1 Flowchart of the System

3.2.2 DESCRIPTION OF FLOWCHART

From this flow chart, we can see that the first thing that happens in this system is that it will connect to the network that has been set in the source code. After that, the temperature will be taken and sent to the Node MCU ESP8266. Then the data will be sent to the apps that are blynk and the data collection will do its job, which will save the data every minute and will always monitor the child's temperature. When the temperature taken exceeds the normal temperature, i.e. high grade fever is 38.5, then blynk will alert the system using notification. However, if the temperature does not exceed the level of high grade fever, it will return to continue collecting data for one week only and the data will be deleted.

3.4 SUMMARY

We only did a mini project last semester, so we didn't finish the whole project. So, we have completed the project this semester. Only the components that will be used in the final project are ready. As a result, we will mainly use the temperature sensor i.e. LM35 and Node MCU ESP 8266 for the hardware part of this project. LEDs, adapters and resistors are the other components we use. In addition, we have also prepared software that is apps. We have used blynk for our apps. What we can conclude is that the apps we created have achieved the objective of being able to collect data and provide notifications.

CHAPTER 4

4.0 EXPECTED RESULT

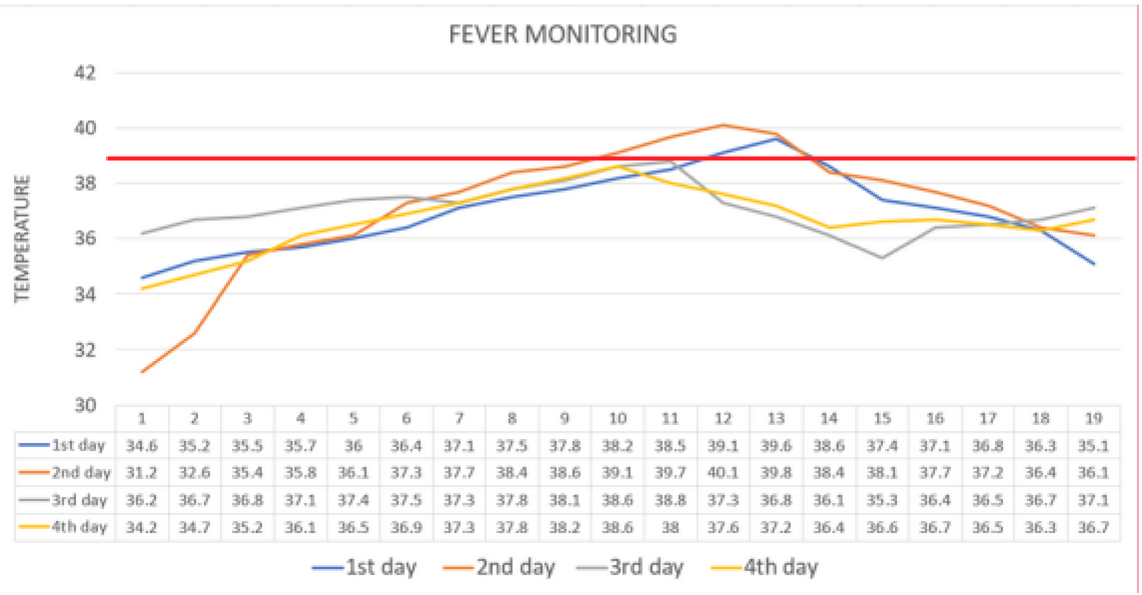
We discovered an appropriate implementation model that incorporates a variety of sensor devices and other modules. We used the LM 35 and the Node MCU ESP 8266 in this implementation model. Sensors under the armpit and a cable to the casing, which contains a circuit. The sensed data will be sent to the apps automatically. The ability to identify children's fever temperatures is the expected outcome of this project. We placed the LM35 temperature sensor under the armpit to measure the temperature. The apps will save all temperature data and send alerts if it becomes too high. In this way, parents can use these apps to alert doctors if anything out of the ordinary occurs. When the doctor asks when the child's temperature has reached a dangerous level, for example, the parents may forget. In the apps also display the graph of the temperature. They might also be able to see their progress visually. This enhancement will make temperature detection easier and faster.

Figure 4 shows the data of monitoring that been taking from Blynk apps. The temperature that has been collected in the apps. We have been taking temperature from the same baby that have fever.

1st day	2nd day	3rd day	4th day
34.6	31.2	36.2	34.2
35.2	32.6	36.7	34.7
35.5	35.4	36.8	35.2
35.7	35.8	37.1	36.1
36	36.1	37.4	36.5
36.4	37.3	37.5	36.9
37.1	37.7	37.3	37.3
37.5	38.4	37.8	37.8
37.8	38.6	38.1	38.2
38.2	39.1	38.6	38.6
38.5	39.7	38.8	38
39.1	40.1	37.3	37.6
39.6	39.8	36.8	37.2
38.6	38.4	36.1	36.4
37.4	38.1	35.3	36.6
37.1	37.7	36.4	36.7
36.8	37.2	36.5	36.5
36.3	36.4	36.7	36.3
35.1	36.1	37.1	36.7

FIGURE 4.0: DATA MONITORING

Figure 4.1 shows the line graph based on data. The red line shows the temperature have exceed 38.5 Celsius.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1st day	34.6	35.2	35.5	35.7	36	36.4	37.1	37.5	37.8	38.2	38.5	39.1	39.6	38.6	37.4	37.1	36.8	36.3	35.1
2nd day	31.2	32.6	35.4	35.8	36.1	37.3	37.7	38.4	38.6	39.1	39.7	40.1	39.8	38.4	38.1	37.7	37.2	36.4	36.1
3rd day	36.2	36.7	36.8	37.1	37.4	37.5	37.3	37.8	38.1	38.6	38.8	37.3	36.8	36.1	35.3	36.4	36.5	36.7	37.1
4th day	34.2	34.7	35.2	36.1	36.5	36.9	37.3	37.8	38.2	38.6	38	37.6	37.2	36.4	36.6	36.7	36.5	36.3	36.7

FIGURE 4.1: GRAPH OF DATA MONITORING

Figure 4.2, The figure displays the resulting sensed temperature in Celsius. It continuously sensed the values of temperature and display through mobile app in real-time.

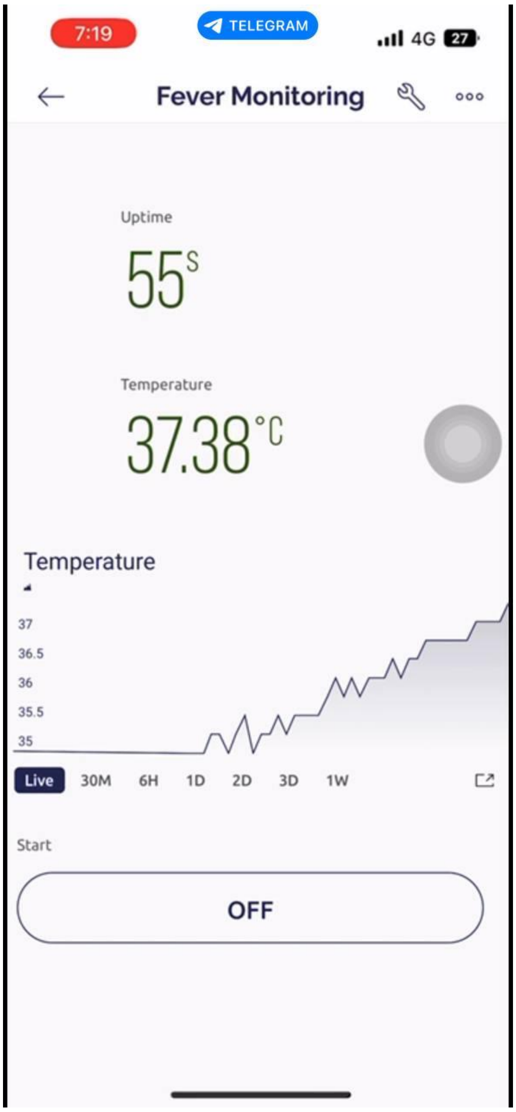


FIGURE 4.2: DATA MONITORING FROM APP BLYNK

5.0 APPENDICES

5.1 Appendix 1: Gantt Chart

5.2 Appendix 2: Program Coding

```
#define BLYNK_PRINT Serial

/* Fill-in your Template ID (only if using Blynk.Cloud) */
//#define BLYNK_TEMPLATE_ID   "YourTemplateID"
#define BLYNK_TEMPLATE_ID "TMPLfGd7G6hQ"
#define BLYNK_DEVICE_NAME "Test Template"
#define BLYNK_AUTH_TOKEN "6dXLHiA9-LKy0Ah6_q1RdLqiVPFL37cF"

#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

// You should get Auth Token in the Blynk App.
// Go to the Project Settings (nut icon).
char auth[] = BLYNK_AUTH_TOKEN;

// Your WiFi credentials.
// Set password to "" for open networks.
char ssid[] = "Aiskepal";
char pass[] = "oraoraora";

BlynkTimer timer;
int outputpin= A0;
int x = 0;
bool y;
float z = 0;
float celsius = 0;

// This function will run every time Blynk connection is established
BLYNK_CONNECTED() {
  // Request Blynk server to re-send latest values for all pins
  Blynk.syncAll();
}
```

```
BLYNK_WRITE(V1)
{
  int pinValue = param.asInt(); // assigning incoming value from pin V1 to a variable

  x = pinValue;
}

BLYNK_WRITE(V5)
{
  float pinValue = param.asFloat(); // assigning incoming value from pin V1 to a variable

  z = pinValue;
}

void setup()
{
  // Debug console
  Serial.begin(9600);

  pinMode(5, INPUT_PULLUP);
  pinMode(13, OUTPUT);
  timer.setInterval(1000L, blinkLED);

  int analogValue = analogRead(outputpin);
  float millivolts = (analogValue/1024.0) * 3300; //3300 is the voltage provided by
NodeMCU
  celsius = millivolts/10;

  Blynk.begin(auth, ssid, pass);
}

void loop()
{
```

```
  timer.run();
  Blynk.run();

  //if (x <= 50) digitalWrite(13, LOW);
  //else digitalWrite(13, HIGH);
  y = !digitalRead(5);
  digitalWrite(13, y);
}

void blinkLED(){
  if (z == 1){
    /*Serial.print("Temperature Limit: ");
    Serial.println(z);*/

    Serial.print("Temperature: ");
    Serial.println(celsius);

    unsigned long hi = millis() / 1000;
    Blynk.virtualWrite(V2, hi);

    int analogValue = analogRead(outputpin);
    float millivolts = (analogValue/1024.0) * 3300; //3300 is the voltage provided by
NodeMCU
    celsius = millivolts/10;


    if (hi % 1 == 0){
      Blynk.virtualWrite(V4, celsius);
    }
  }
}
```

5.3 Appendix 3: Questionnaire

NEED ANALYSIS / MARKET ANALYSIS

The questionnaires were distribute through a link that will show all the questions in a website which is Google Form. In total there are 82 respondent in different group of age.

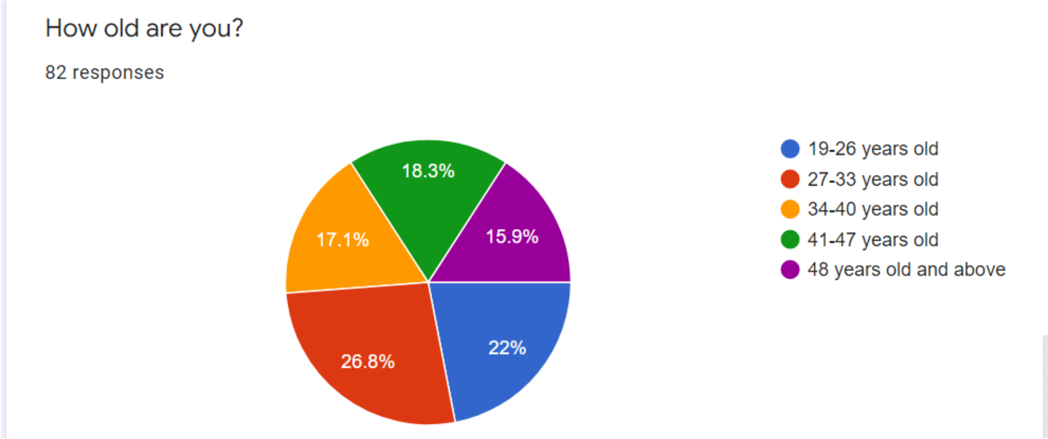


Figure 1.0

Figure 1.0 The majority of people who answered were between the ages of 27-33 years by 26.8 % which is a total of 22 people..

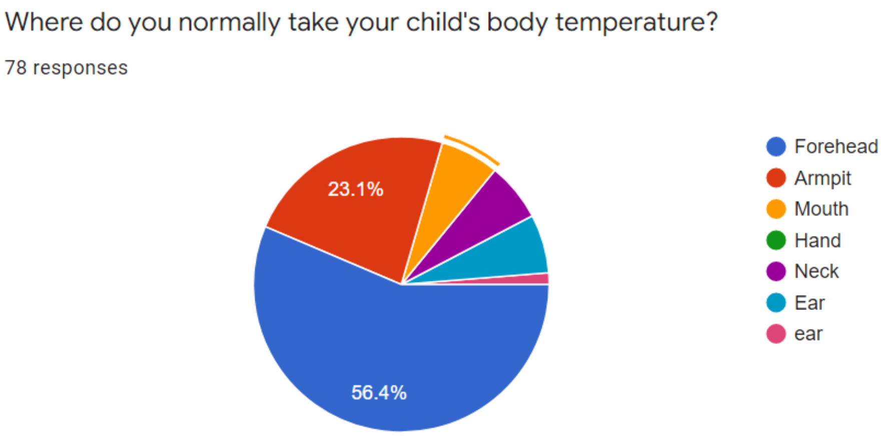


Figure 1.1

According to our analysis, the majority of people answered forehead. The armpit is the second highest percentage for taking a temperature on their child. As a result, we chose the armpit in this project for the children's comfort.

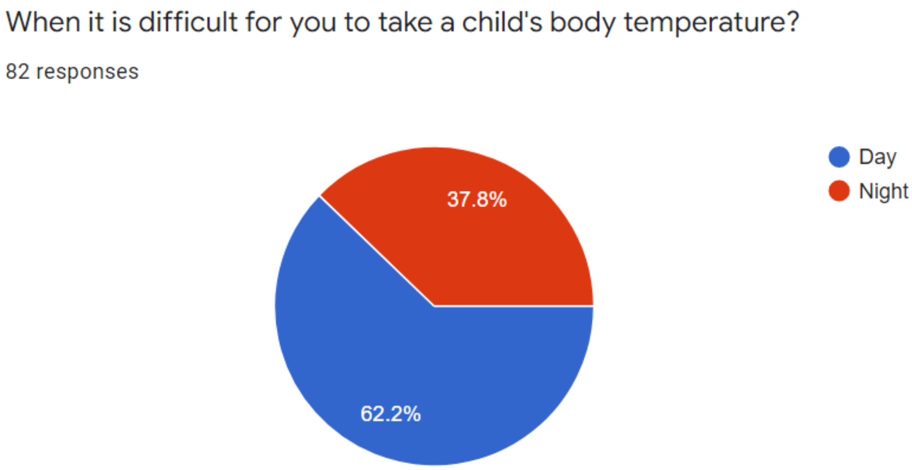


Figure 1.2

Other than that, parents stated that taking their child's temperature during the day was difficult because they were more active at that time. The percentage who answered the night was less because the child was less active.

6.0 REFERENCES

[1] Md. Asaduzzaman Miah, Mir Hussain Kabir, Md. Siddiqur Rahman Tanveer and M. A. H. Akhand “Continuous Heart Rate and Body Temperature Monitoring System using Arduino UNO and Android Device”, 2015.

[2] V.Akhila1 , Y.Vasavi2 , K.Nissie3 , P.Venkat Rao “An IoT based Patient Health Monitoring System using Arduino Uno”, 2017.

[3] Vikramsingh R. Parihar1 , Akesh Y. Tonge2 , Pooja D. Ganorka “Heartbeat and Temperature Monitoring System for Remote Patients using Arduino”, 2017.

[4] Vivek Pardesh, Saurabh Sagar, Swapnil Murmurwar, Pankaj Hage “Health Monitoring Systems using IoT and Raspberry Pi”, 2017.

[5] Nor Aini Zakaria, Mohd azhar abdul Razak, Mohd azhar abdul razak ‘IoT (Internet of Things) Based Infant Body Temperature Monitoring’, July 2018