

**IoT Based Safety gadget
For Child Safety Monitoring And Notification.**

NALAIYA THIRAN PROJECT BASED LEARNING

on

**PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY
AND ENTREPRENEURSHIP.**

Project Report Submitted

by,

912919106001- Kaviyapriya.M

912919106002- Nagarani.S

912919106003- Nandhini.R

912919106004- Ramya.P

912922106003- Dhanalakshmi.P

**BACHELOR OF ENGINEERING
IN
ELECTRONICS AND COMMUNICATION**

ABSTRACT

The project focus on a smart wearable device used for children. The main benefit of this wearable compared to other wearable is that it can be used in any of smart mobile phones and does not need a very costly mobile phone and not a highly technical human. The main idea of this wearable safety system is to aid the parents in finding their child very easily. In the current scenario, there are lot of wearable that monitors the routine child behavior and activities of children and also help to find the child using the Wireless Fidelity (Wi-Fi) and Bluetooth services that are available on the device. Both of them seems to be an secured communication in between the parent and the child. The main idea for achieving this is Global System of Mobile Communication (GSM). The wearable device sends to an ack acknowledgement in the form of a text showing the location of the child and will provide the atmospheric temperature, so that the parents can have a track if the temperature does not suit the child. Then parents can immediately react to the safety of the child till they are not come or they can try to reach parents and assist in locating the child.

Project Report

1. INTRODUCTION

1.1 Project Overview

1.2 Purpose

2. LITERATURE SURVEY

2.1 Existing problem

2.2 References

2.3 Problem Statement Definition

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

3.2 Ideation & Brainstorming

3.3 Proposed Solution

3.4 Problem Solution fit

4. REQUIREMENT ANALYSIS

4.1 Functional requirement

4.2 Non-Functional requirements

5. PROJECT DESIGN

5.1 Data Flow Diagrams

5.2 Solution A 5.3 Technical Architecture

5.4 User Stories

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

6.2 Sprint Delivery Schedule

6.3 Reports from JIRA

7. CODING & SOLUTIONING

7.1 Feature 1

7.2 Feature 2

7.3 Database Schema (if Applicable)

8. TESTING

8.1 Test Cases

8.2 User Acceptance Testing

9. RESULTS

9.1 Performance Metrics

10. ADVANTAGES & DISADVANTAGES

11. CONCLUSION

12. FUTURE SCOPE

13. APPENDIX

13.1 Source Code,

13.2 GitHub & Project Demo Link

1. INTRODUCTION:

Internet of Things(IoT) is a characterized as a forthcoming innovation that empowers us to create worldwide networked machines and also the devices that can be helped for exchanging of communication. As we all know that the real time application has been increasing day by day, the smart connection also had increased. Rapid population growth, led to the increase in global life expectancy and the advance of technology, paving the pathway for the creation of age-friendly environments. This had led to the necessity in designing new products for infants protection. Infants or toddlers need parent's attention 24*7. In this present era, the cases regarding missing children have been increasing day by day, which was the main motivation that comes for the safety of little children. However, the parents cannot continuously monitor their child's condition's either in normal or abnormal situations. Still, certain incidents like infant attacks have been reported, it is necessary to protect their child.

1.1 Project Objectives:

- ✓ Enable tracking of child's location and capturing of data.

remotely such as where the child located distance etc.

- ✓ To show the child's actual data with reference values.

- ✓ Enable sending of notification, if the child is out of location or when the device realizes abnormal conditions or situations.

- ✓ Develop a prototype of IOT wearable smart band connected to parent's Mobile apps. so, that they can monitor the actual condition of children at anytime and anyplace.

- ✓ In addition we added some sensors and actuators to monitor the child's location and their movement.

- ✓ The sensors are monitored the child's temperature using TMP36 sensor.

1.2 Purpose:

The purpose of this project is mainly focused on the child. Now a days, child abuse is main Basically, children cannot complain about abuses, which they face in their daily life to their parents. They can't even realize what actually

happens to them at their age. It is also difficult for parents to identify their children are being abused. Since to prevent children before being attacked, an autonomous real-time monitoring system is necessary for every child out there. In this system, the collected values from every sensor like temperature sensor, pulse rate sensor and the location value from GPS are used to detect the status of the child and alerts the respective guardians using GSM accordingly. The system plays a important key role in providing better case for the lost children until they reconvene with the parents. In this present era, most of the wearable devices today are designed based on the location, activity, temperature, pressure, etc of the child and inform to the parents via GPS.

2.LITERATURE SURVEY:

2.1 Existing Problem:

Now a days, crimes on children keep increasing despite actions have been taken by the government. For every 40 seconds, a child is gone missing in the world. The overall percentage of child abuses filed nowadays in the world is about 80%, out of which 74% are girl children and the rest are boys. Children's are the backbone of one's nation, if the future of children was affected, it would impact the entire growth of that nation. Due to the abuses, the emotional and mental stability of the children gets affected which in turn ruins their career and future. These innocent children are not responsible for what happens to them. So, parents are responsible for taking care of their own children. But, due to economic condition and aims to focus on their child's future and career, parents are forced to crave for money. Hence, it becomes difficult to cling on to their children all the time. In our system, we provide an environment where this problem can be resolved in an efficient manner. It makes parents to easily monitor their children in real time just like staying beside them as well as focusing on their own career without any manual intervention. In this system, the collected values from every sensor like temperature sensor, pulse rare detection sensor, metal detection sensor and location value from GPS are used to detect the status of the child and alerts the respective guardians using GSM module.

2. REFERENCES:

Paper-1:

It refers to the set of devices and system that stay interconnected with real world sensor and to the internet. During years' Child safety is under threat and it is very important to provide a technology-based solution which will help them under panic situations and monitor them using a smart gadget. The proposed system is equipped with GSM and GPS modules for sending and receiving call and SMS between safety gadget and parental phone, the proposed system also consists of Wi-Fi module used to implement IoT and send all the monitoring parameters to the cloud for android app monitoring on parental phone. Android application can be used to track the current location of safety gadget using its location coordinates on parental phone android app and also via SMS request from parent phone to safety gadget. Panic alert system is used during panic situations and automatic SMS alert and phone call is triggered from safety gadget to the parental phone seeking for help and also monitored for plug and unplug from hand, as soon the gadget is unplugged from hand a SMS is triggered to parental phone and the alert parameter is also updated to the cloud. Heart-beats, temperature is monitored and the values are updated to cloud continuously for parent app monitoring. Boundary monitoring system is implemented on safety gadget with the help of BEACON technology, as soon as the safety gadget moves far away from the binding gadget an alert is provided to parent on binding gadget. the system is used to monitor the health parameters and also used for location tracking during necessary situations in safety concern.

Paper-2:

Nowadays the synopsis of the child getting lost in the major crowded areas are increasing, which was the main motivation that comes for safety of little children. This project focuses on the aspect of the lost children who can play a remarkable role in the child's safety until reconvene with the parents. Most of the wearable devices today are focused on the location, activity, temperature, pressure etc, of the child and informs to the parents via GPS. Therefore, it is intended to use voice call as the way of communication between the parent mobile and child's wearable device. The manifesto on which this project will be running on the microcontroller board and the functions of sending and receiving notification, calls, voice msgs. Therefore, the wearable device proposed will communicate with the parent via voice call which ensures the security. Also, customization of the wearable device is possible by reprogramming the system

as per our requirements. GPS module determines the location by analyzing the signals that are received from GPS satellites which are orbiting around Earth. These satellites send signals that takes long time to reach the GPS module.

2.3 Problem Statement Definition:

Customer Problem Statement Template: Create a problem statement to understand your customer's point of view. The Customer Problem Statement template helps you focus on what matters to create experiences people will love. A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.



3.IDEATION AND PROPOSED SOLUTION:

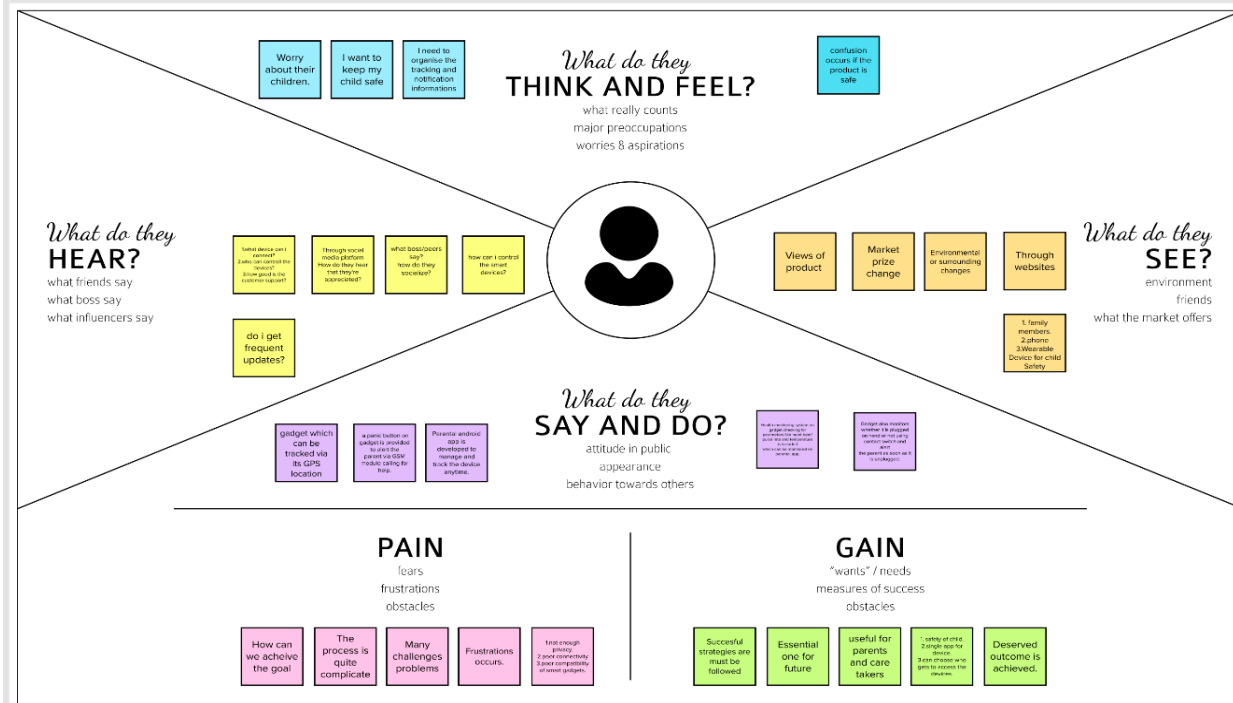
3.1 Empathy Map Canvas:

Empathy Map Canvas

Gain insight and understanding on solving customer problems.

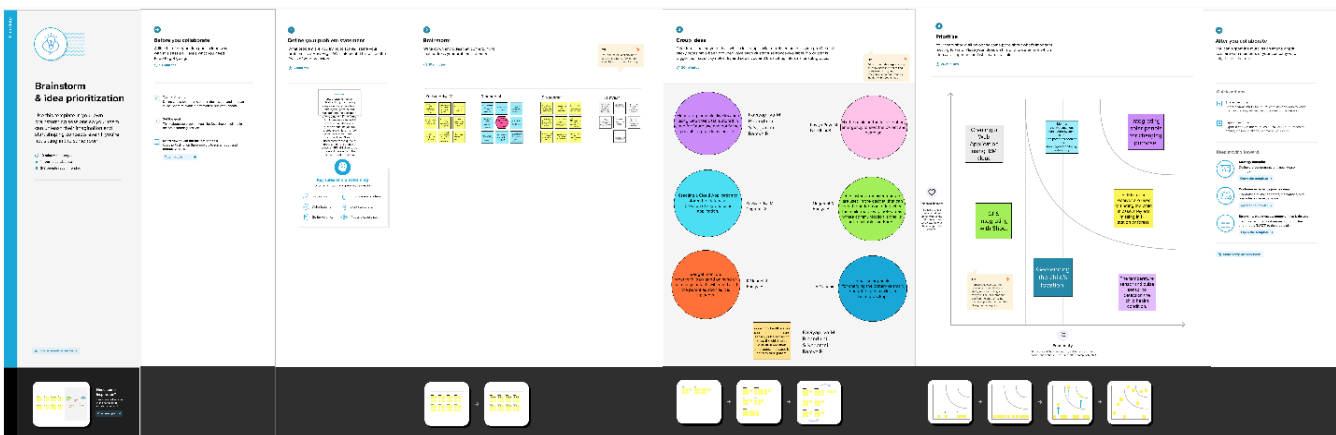
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Build empathy and keep your focus on the user by putting yourself in their shoes.



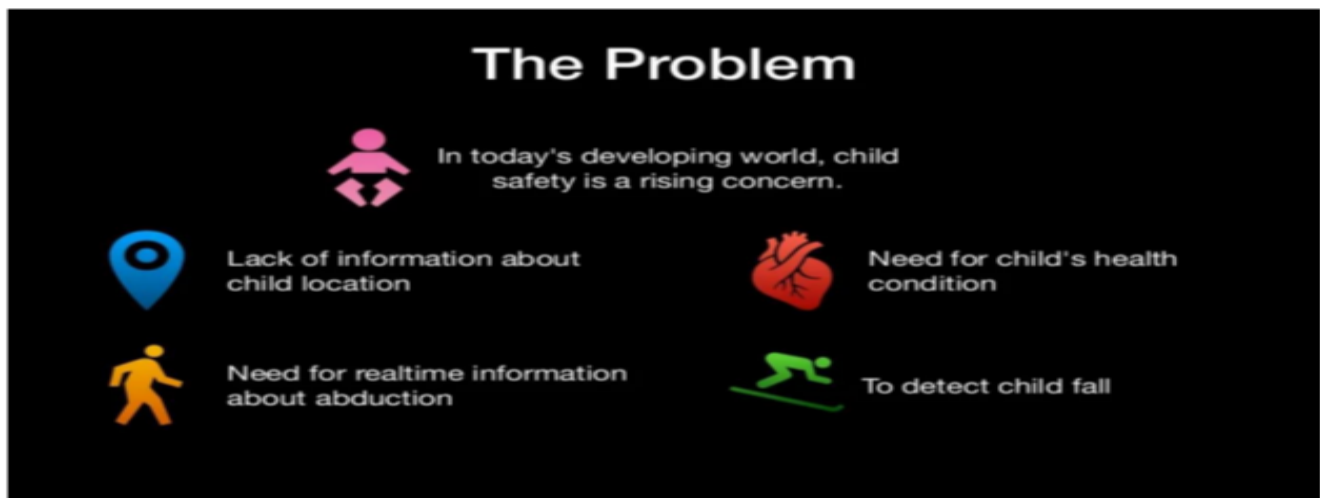
Share your feedback

3.2 Ideation And Brainstroming:



3.3 Proposed Solution:

There are various techniques to monitor the child's activities and behaviours. But there are some drawbacks to maintain the child's location continuously to the parents. In the existing system, they use a voice recognition module in which the alert commands from the child are stored and kept for further reference. If the same child delivers the same command, it will compare with the alert command which was previously stored and sets an emergency level according to the alert command. The GSM has a SIM which is used to send an alert message or an alert call to the trusted people. The server will search the respective device ID from the database.



Many smart watches and applications are available in the market for kids care, but most of the parents are not aware and not purchasing those items for their children security. So, awareness is to be given to all parents those who admitted their children in the school. Most important thing is the production cost has to be reduced for distributing the device to the parents. This helping device will be able to provide perfect response about the kid's physical and mental status. But, all the smart watches and innovations are not enough to secure the child from violence.

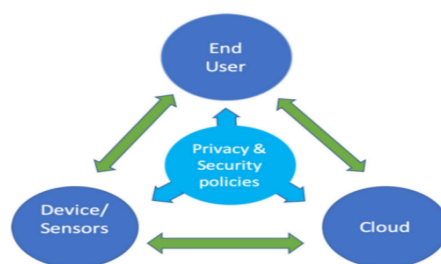
Idea/solution Description:

The perfect solution is to track the child's health issues and monitoring that whether they are fully secured or not in their living place. Here we proposed a

model to compose all IoT healthcare ideas with the sensors like Temperature, Respiratory and Heart beat sensing module to provide the best application for providing complete care for children. The child can be even tracked by the parents in remote place. It can be done by monitoring child's blood pressure to check whether it gets crossed the normal or acceptable level of a human body and even the location of the child can be reported if it's out of the school range. It can be developed the security devices using GPRS module. GPS checks the location on each and every movement. It focuses on children's safety, tracking the real-time location with the help of longitude and altitude, positioning of GPS and sending information through SMS and Voice messages. In addition the web cameras are fitted, the values of the camera is used to alert the specified guardians through SMS using GSM. When the user receives these alert messages from that device, they can turn on the web camera placed in that device, with which they can visually monitor the status of that child through the live video stream.

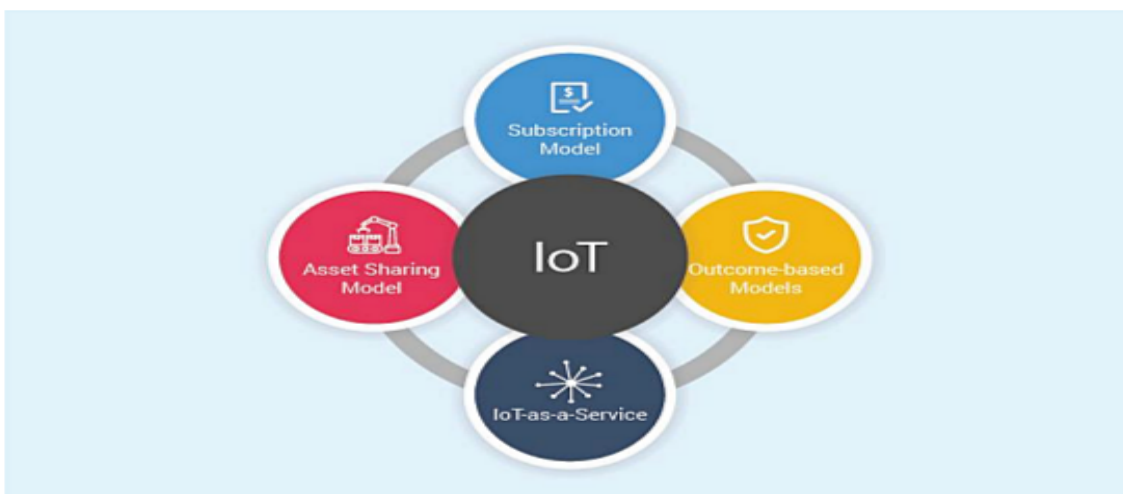
Novelty/uniquenes

The novelty of the work is that the system automatically alerts the parent/caretaker by sending SMS, when immediate attention is required for the child during emergency. The parameters such as touch, temperature & heartbeat of the child are used for parametric analysis and results are plotted for the same. This technology is used in sensors, for a real-time prediction of monitoring the child at any time. The Internet of Things may be the next industrial revolution in which interconnected physical devices will automate skills and tasks. In today's hyper-connected economy, Internet of Things can radically transform businesses and society increased transparency, optimized production processes, and decreased operating expenses. It provides effective communication using emailing and instant messaging services to any part of the world. It improves business interactions and transactions, saving on vital time.



Bussiness Module:

The one of the most important thing in a business module is giving a security and production to a end user. Provide a ability to collect data from the network and use advanced analytics to uncover business insights and opportunities, and reduce operational cost. Many of the smart watches and applications are available in the market for kids care, but most of the parents are not aware and not purchasing those items for their children security. So, awareness is to be given to all parents those who admitted their children in the school. Most important thing is the production cost has to be reduced for distributing the device to the parents. This helping device will be able to provide perfect response about the kid's physical and mental status. But, all the smart watches and innovations are not enough to secure the child from violence.



3.4 Problem Solution Fit:

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS <p>The target customer of our project is the patients who are suffering from liver disease. Especially people with the age limit 40- 60 suffers a lot</p>	6. CUSTOMER CONSTRAINTS CC <p>As we are proposing an application to analyze and predict the liver disease ,people who live in area with low quality network connection becomes unable to access the application and make use of it.</p>	5. AVAILABLE SOLUTIONS AS <p>Many people has suggested many solutions to overcome the problem of predicting the liver disease earlier with higher accuracy.</p> <ol style="list-style-type: none"> 1.logistic regression 2.SVM 3.decision tree 4.linear regression 	Explore AS, differentiate
	Focus on J&P, tap into BE, understand RC	2. JOBS-TO-BE-DONE / PROBLEMS J&P <p>The prb encountered while analyzing the solution is as follow: 1.first and the major one that is accuracy- how accurate our model predicts the output, because this ideation deals with human's life . 2.The second prb is the parameter consider for the prediction of output as different liver disease has different parameter to be considered.</p>	9. PROBLEM ROOT CAUSE RC <p>The root cause of the prb is the dataset because acquiring a proper dataset is a challenge also there are many liver disease and different parameter need to be considered for different liver disease which makes the task difficult</p>	
Define CS, fit into CL		3. TRIGGERS TR <p>Email marking is the initial way to start triggering people to use our application Now a day, mobile application are the one which is easily reachable to the people in an efficient</p> 4. EMOTIONS: BEFORE / AFTER EM <p>Before: sometimes people find it difficult to go to the hospitals especially the elderly people After: like diabetes diagnosis one can check the health of their from their home itself</p>	10. YOUR SOLUTION SL <p>the solution which we are proposing to overcome the existing prb is that. 1.Acquiring proper database for accurate prediction 2.knn algorithm with fine tuning can be performed to get higher accuracy. 3.and svm can be used to classify the type of liver disease</p>	8.1 ONLINE CHANNELS CH <p>In today's life people expect things that are easily acquirable and accessible.</p> 8.2 OFFLINE CHANNELS CH <p>The office activities that can be proided is that filling out a from in hospital and predicting the results according to the input give by the users</p>

4.REQUIREMENT ANALYSIS:

4.1 Functional Requirement:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	<ul style="list-style-type: none">➤ Registration through Phone➤ Registration through Gmail
FR-2	User Confirmation	<ul style="list-style-type: none">➤ Confirmation through Email➤ Confirmation through Mobile Alert
FR-3	App installing	<ul style="list-style-type: none">➤ Installation through website APK's.➤ Installation through play store.
FR-4	Detecting child	<ul style="list-style-type: none">➤ Detecting location through SMS➤ Detecting location through mobile app
FR-5	Set Geofence	<ul style="list-style-type: none">➤ Setting by user to find child location
FR-6	User End Result	<ul style="list-style-type: none">➤ Parents need not worry about their children.
FR-7	User Objective	<ul style="list-style-type: none">➤ Easy to monitor the child anywhere➤ Helps to identify the child

4.2 Non-Functional Requirement:

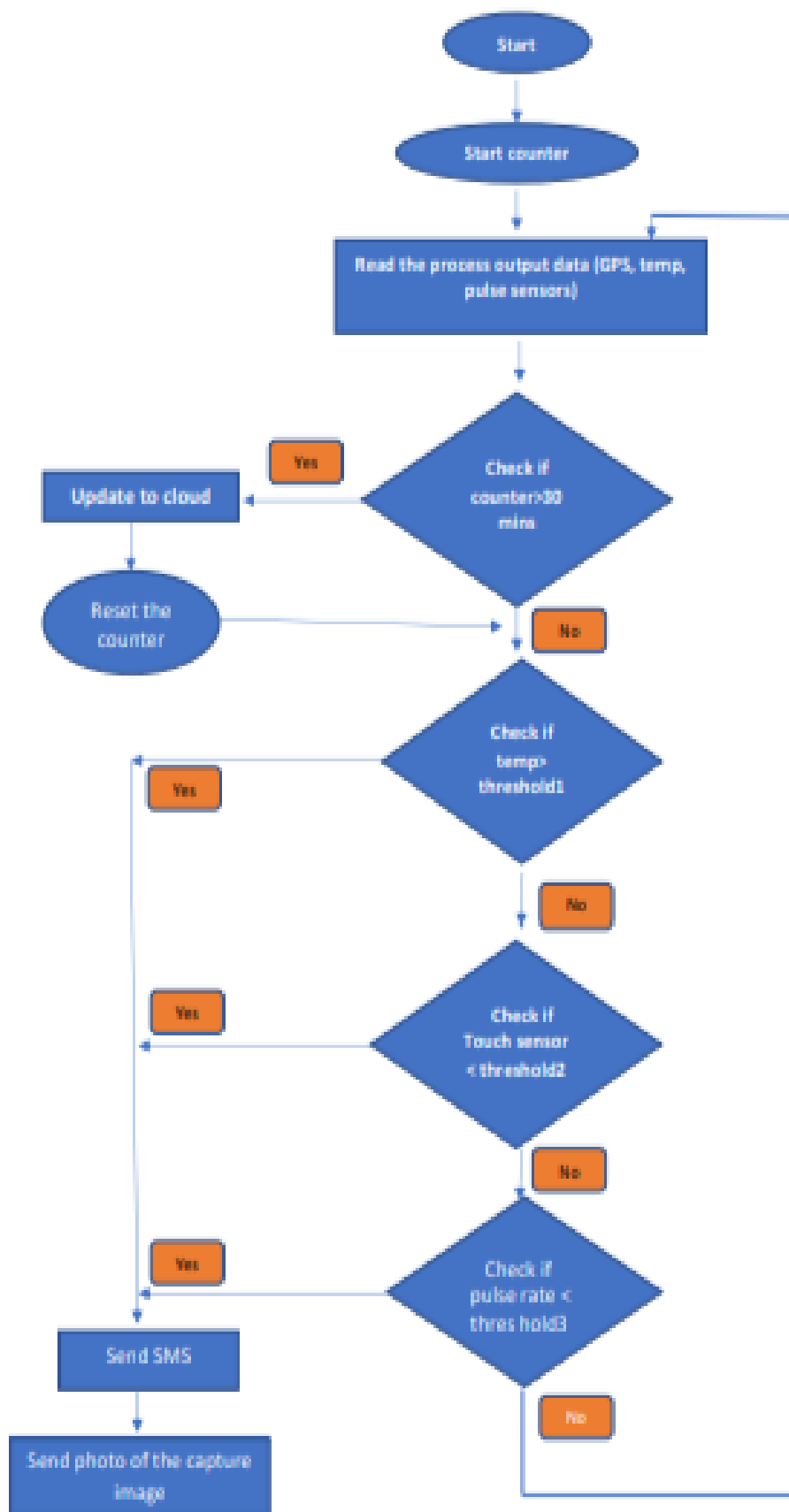
FR.No	Non-Functional Requirement	Description
FR-1	Usability	<ul style="list-style-type: none">➤ The device has GSM can help to inform the parents about the current situation of the child, alert by message immediately to save the child.➤ Seamless communication is possible between people, processes, and things.
FR-2	Security	<ul style="list-style-type: none">➤ Make children parents more assure about their kid's security, we have a feature in our device called Geo-Fence.➤ Securing your IoT devices and network as you scale up production and deployment can be challenging one, we have a feature like storing all data in the database.

FR-3	Reliability	<ul style="list-style-type: none"> ➤ The reliability of an item is to perform a required function in a correct manner. ➤ It is easy to use and more flexible.
FR-4	Performance	<ul style="list-style-type: none"> ➤ Create a Child tracker which helps the parents with continuously monitoring the child's location. ➤ The website's load time should not be more than one second for users. ➤ The notification will be sent according to the child's location to their parents. The overall data collection is stored in the database.
FR-5	Availability	<ul style="list-style-type: none"> ➤ The system is accessible to a user at a given point in time.

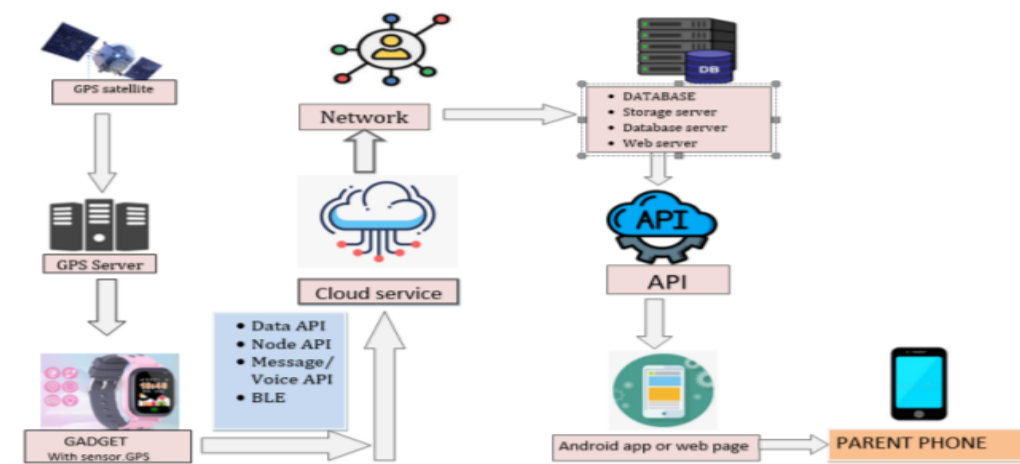
5.PROJECT DESIGN:

5.1 Data Flow Diagram:

A Data Flow Diagram is a traditional visual representation of the information flows within a system. A neat and clear data flow diagram can depict the right amount of the system requirement graphically. The counter should be started for counting time. The sensors output data should be read from the child safety device. The counter time should be checked for time interval of 30minutes. For every 30minutes except serial camera, the data from GPS, temperature, touch, pulse rate data is pushed into the cloud. The monitoring parameters are displayed on webpage. The counter is reset to restart the timer. So as to post the data into the cloud for every 30minutes. The sensors data is continuously read by the controller. When the value of temperature read from the sensor crosses the threshold-1, notification messages are sent. The threshold value of the temperature is considered here is 38°C. Similarly, when the touch sensor value is crosses threshold-2, notification messages are sent. Threshold of the touch sensor is considered here is 100. The Pulse rate interval is analog value from the sensor, it is converted into the beats per minute (BPM) by formulae. Three threshold are used threshold1 is 38°C for Temperature sensor, threshold2 is 100 for Touch sensor and threshold3 is 400 for Heartbeat sensor.



5.2 Solution Architecture:



Overview of Architecture:

An IoT system is interconnected with sensors, computing devices, and machines that are connected through a network to form one complete operation. Therefore, an IoT solution architecture is a design of the step-by-step data flow from collecting raw data to obtaining predictions or results. There is no universal standard for an IoT solution architecture, but typically this technology requires four major components, consisting of Sensors, Gateways and Network, Cloud or Data Server, Applications Layer.

GPS Satellite:

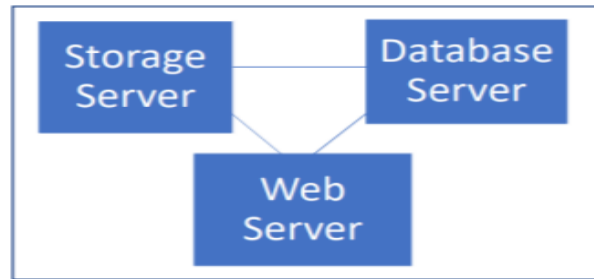
When a device uses GPS, it finds an exact location through what's called triangulation. That's how your smartwatch can know where you are at all times. Triangulation determines the difference between two signals. One is the signal that watch receives, and the other is the signal that was sent to your watch.

Application Programming Interface:

The most important in IoT devices is to connect the API application. Application Programming Interface (API) is an interfacing software platform that allows the exchange of any information or data and supports the interaction among different applications or any such intermediaries. There are such API's are used in this application is node API, data API and message/voice API.

Cloud Service:

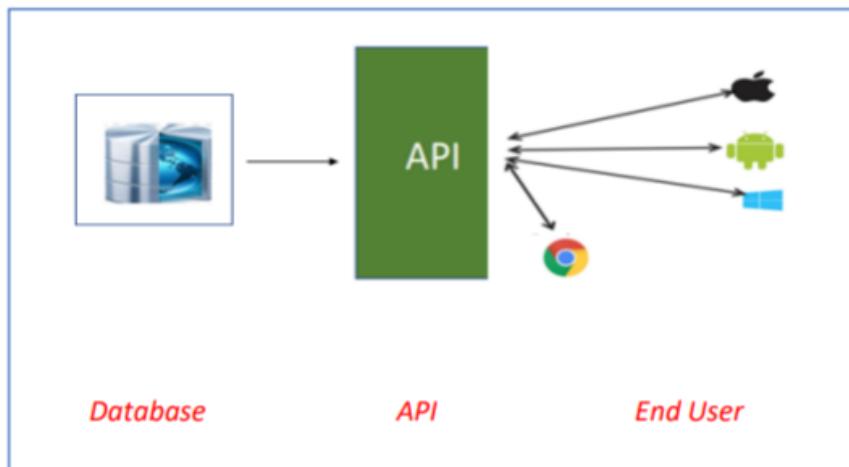
An IoT cloud is a massive network that supports IoT devices and applications. This includes the underlying infrastructure, servers and storage, needed for real time operations and processing. The IBM cloud services are mainly used in the connection of device over the cloud. It is mainly used in the mediator between the gadget's information and the internet in the form of database.



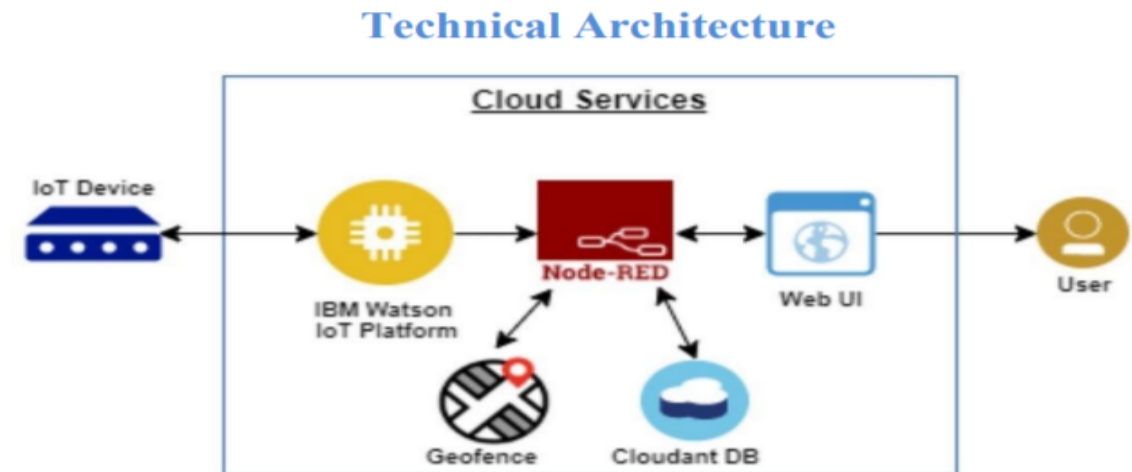
DATABASE

End user:

Database is stored for the future use and the web application is for fetching the information, the user wants in the client side. It acts as a server client configuration through the API.



5.3 Technical Architecture:



Overview of Technical Architecture:

An IoT system is interconnected with sensors, computing devices, and machines that are connected through a network to form one complete operation. An IoT solution architecture is a design of the step-by-step data flow from collecting raw data to obtaining predictions or results. There is no universal standard for an IoT solution architecture, but typically this technology requires four major components, consisting of, Sensors, Gateways and Network, Cloud or Data Server, Applications Layer, Node-Red, Watson IOT platform, Geofence.

GPS Satellite:

When a device uses GPS, it finds an exact location through what's called triangulation. That's how your smartwatch can know where you are at all times. Triangulation determines the difference between two signals. One is the signal that watch receives, and the other is the signal that was sent to your watch.

Programming Interface:

The most important in IoT devices is to connect the API application. Application Programming Interface (API) is an interfacing software platform that allows the exchange of any information or data and supports the interaction among different applications or any such intermediaries. There are such API's

are used in this application is node API, data API and msg/voice API.

Cloud Service:

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DATABASE End user:

The database is stored for the future use and the web application is for fetching the information, the user wants in the client side. It acts as a server client configuration through the API.

Node Red:

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways. It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single-click. Node-RED provides a browser-based flow editor that makes it easy to wire together flows using the wide range of nodes in the palette. Flows can be then deployed to the runtime in a single-click. Java functions can be created within the editor using a rich text editor. A built-in library allows you to save useful functions, templates or flows for re-use.

Watson IOT Platform:

In this platform is a managed, cloud-hosted service designed to make it simple to derive value from your Internet of Things devices. STMicroelectronics is an IBM Partner and provides development platforms allowing users to develop applications with direct connection to the Watson IoT platform. The cloud-based digital representation of your device is connected to Watson IoT Platform service. Once it is defined and instantiated, the device twin provides a consistent means of interacting with your device from the IoT hub. Within your Watson IoT Platform, select Devices tab and click on Add Device button.

Geofence:

Geo-fencing (geofencing) is a feature in a software program that uses the

global positioning system (GPS) or radio frequency identification (RFID) to define geographical boundaries. It is a technology that uses GPS, RFID, or other location Tracking or object detection technology to define geographical boundaries. It allows administrators to set up triggers such as push notifications, email alerts, kill switch when a device crosses a “geofence” and enters or exits an area.

5.4 User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (only in Mobile & Gadget Users)	Pairing a child gadget to their parents mobile phone	USN-1	As a user, there could pairing gadget to their phone app by entering them bluetooth or wi-fi, password, and confirming my password.	There could select their child gadget to pairing their mobile.	High	Sprint-1
	Accepting Notification	USN-2	As a user, they child gadget receive accepting notification their parent has	The child gadget receive accepting notification & click accept.	High	Sprint-1

			accepting for the application via gadget.			
	Confirmation Notification	USN-3	As a user, the parent would receive confirmation notification to their phone	The parent receive confirmation notification and click confirm.	Low	Sprint-2
	Keep Monitoring System	USN-4	As a user, if once pairing their device to their child device, they would monitoring continuous their child, if child near by the parents are not.	The parent can monitor the child anywhere.	High	Sprint-2
	Display System	USN-5	The child standing location is visualised to their application	The gprs, gsm, gps are keep track the child and notifying the correct location to their parent.	High	Sprint-1

6.PROJECT PLANNING & SCHEDULE:

Sprint Planning:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	5	High	Kaviyapriya.M, Ramya.P
Sprint-1	Confirmation Email	USN-2	As a user, I will receive confirmation email once I have registered for the application.	4	High	Nandhini.R, Nagarani.S
Sprint-1	Authentication	USN-3	As a user, I can register for the application through Gmail.	4	Medium	Ramya.P, Nagarani.S
Sprint-1	Login	USN-4	As a user, I can log into the application by entering email & password.	4	High	Kaviyapriya.M, Nandhini.R
Sprint-1	Dashboard	USN-5	As a user, I need to be able to view the functions that I can perform.	3	Medium	Ramya.P
Sprint-2	Notification	USN-1	As a user, I should be able to notify my parent and guardian in emergency situations	10	High	Kaviyapriya.M
Sprint-2	Store data	USN-2	As a user, I need to continuously store my location data into the database.	10	High	Nandhini.R

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Communication	USN-1	I should be able to communicate with my parents.	5	High	Nandhini.R, Nagarani.S
Sprint-3	Sensors	USN-2	As a user, I can sensing the temperature, humidity and some values through gadget.	5	Medium	Kaviyapriya.M
Sprint-3	IoT Device – Watson communication	USN-3	The data from IoT device should reach IBM Cloud	5	High	Nandhini.R
Sprint-3	Node RED- Cloudant DB communication	USN-4	The data stored in IBM Cloud should be properly integrated with Cloudant database	5	Low	Ramya.P
Sprint-4	Web UI interface	USN-1	The Web UI should get the inputs from the user.	10	High	Kaviyapriya.M
Sprint-4	Geofencing	USN-2	The geofencing of the child should be done based on the geographical coordinates.	10	High	Nagarani.S

Sprint Estimation:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	07 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

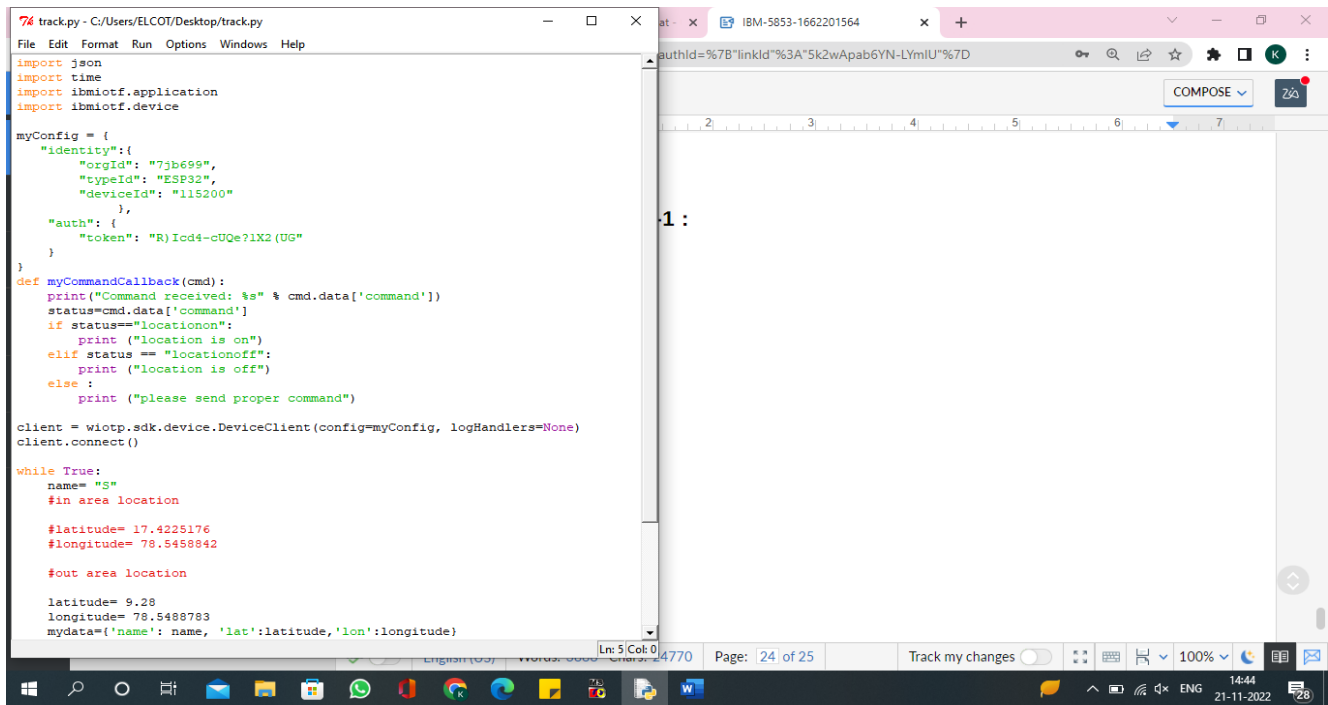
Burndown Chart:



7. CODING AND SOLUTION:

7.1 Feature-1:

The feature-1 is to estimate the python code into the IBM Watson Account. The code will be shown below,



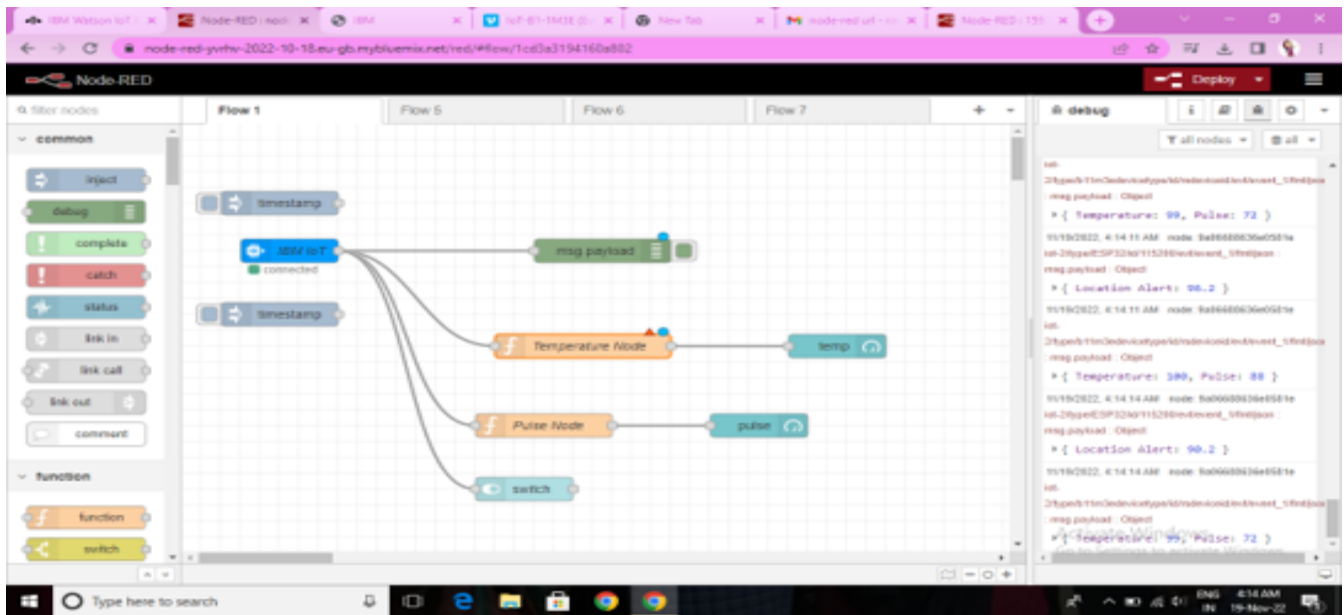
Feature-2:

Node-RED Services:

~ Once we get the location details in the IBM Watson IoT Platform, we are extracting the data into the Node-RED Service.

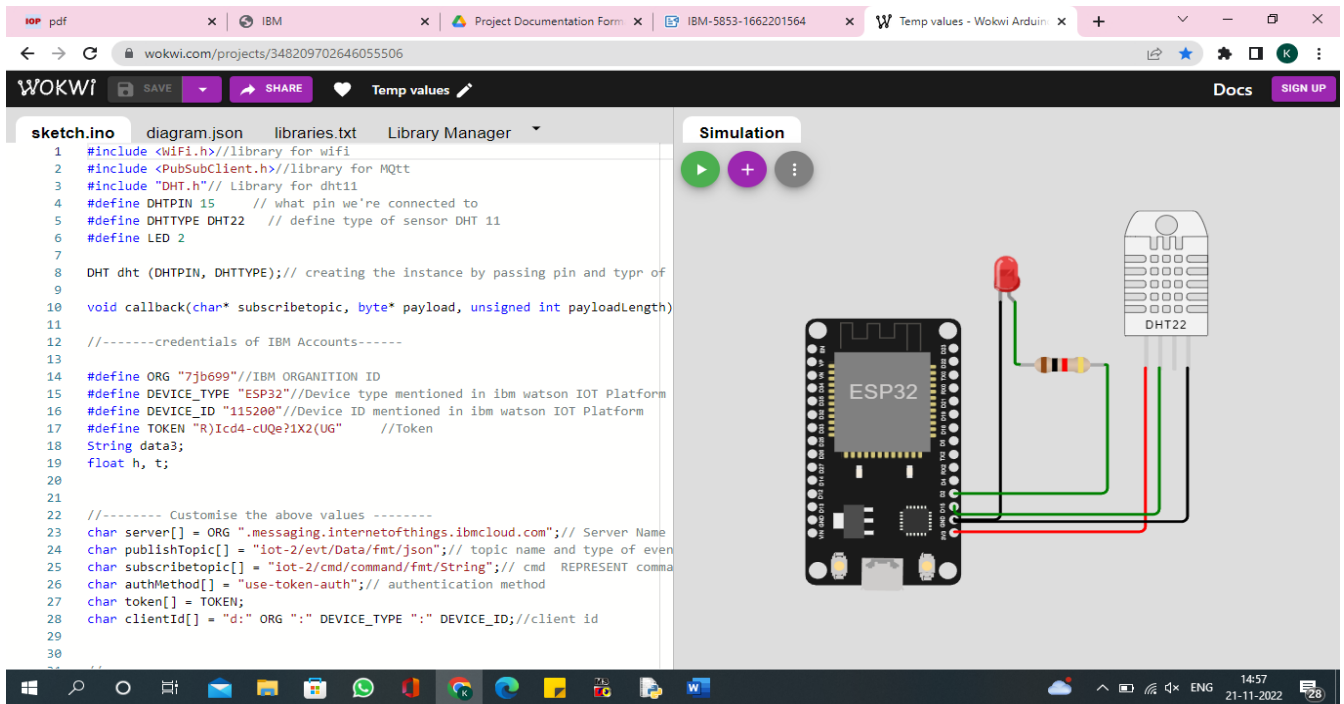
~ We are going to pass the data to geofence node it is going to check whether that particular person is in that area or not.

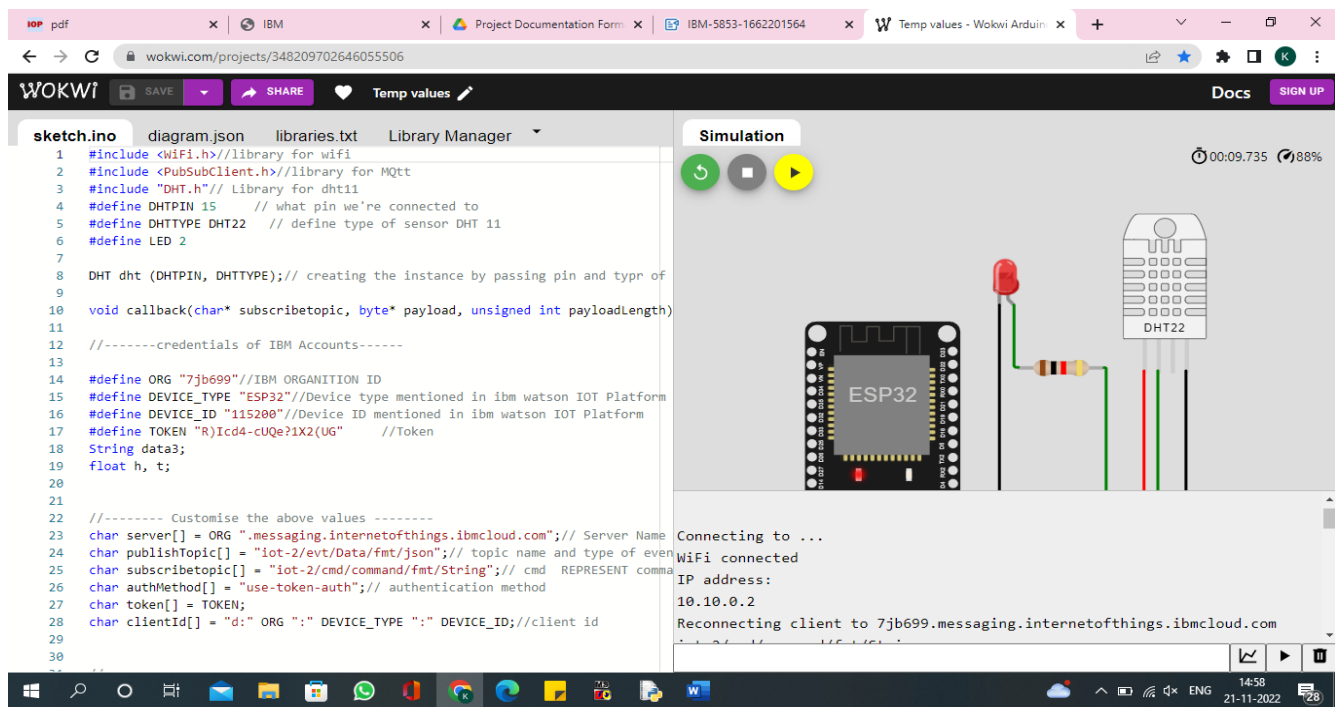
~ Along with the entire data, we are storing the location details in the Cloudant database. If the child crosses the location, we are showing a web UI pop-up alert.



Feature-3:

This feature about the arduino coding using ESP32.





Coding:

```

#include <WiFi.h> //library for wifi
#include <PubSubClient.h> //library for MQTT
#include "DHT.h" // Library for dht11
#define DHTPIN 15 // what pin we're connected to
#define DHTTYPE DHT22 // define type of sensor DHT 11
#define LED 2

```

```

DHT dht (DHTPIN, DHTTYPE); // creating the instance by passing pin and type of dht
connected

```

```

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

```

```

//-----credentials of IBM Accounts-----

```

```

#define ORG "7jb699" //IBM ORGANITION ID
#define DEVICE_TYPE "ESP32" //Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "115200" //Device ID mentioned in ibm watson IOT Platform
#define TOKEN "R)Icd4-cUQe?1X2(UG" //Token
String data3;
float h, t;

```

```

//----- Customise the above values -----
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event
perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd REPRESENT command
type AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id

//-----

WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined
client id by passing parameter like server id,portand wificredential

void setup()// configureing the ESP32
{
    Serial.begin(115200);
    dht.begin();
    pinMode(LED,OUTPUT);
    delay(10);
    Serial.println();
    wificonnect();
    mqttconnect();
}

void loop()// Recursive Function
{

    h = dht.readHumidity();
    t = dht.readTemperature();

    Serial.print("temp:");
    Serial.println(t);
    Serial.print("Humid:");
    Serial.println(h);
}

```

```

PublishData(t, h);
delay(1000);
if (!client.loop()) {
    mqttconnect();
}
}

void PublishData(float temp, float humid) {
    mqttconnect();//function call for connecting to ibm
    /*
        creating the String in in form JSon to update the data to ibm cloud
    */
    String payload = "{\"temp\":\"";
    payload += temp;
    payload += "\", \"Humid\":\"";
    payload += humid;
    payload += "\"}";

    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish ok");// if it sucessfully upload data on the cloud
        then it will print publish ok in Serial monitor or else it will print publish
        failed
    } else {
        Serial.println("Publish failed");
    }
}

void mqttconnect() {
    if (!client.connected()) {
        Serial.print("Reconnecting client to ");
        Serial.println(server);
        while (!client.connect(clientId, authMethod, token)) {
            Serial.print(".");
            delay(500);
        }

        initManagedDevice();
        Serial.println();
    }
}

```

```

}

void wificonnect() //function defination for wificonnect
{
    Serial.println();
    Serial.print("Connecting to ");

    WiFi.begin("Wokwi-GUEST", "", 6); //passing the wifi credentials to establish the
connection
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }

    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
}

void initManagedDevice() {
    if (client.subscribe(subscribetopic)) {
        Serial.println((subscribetopic));
        Serial.println("subscribe to cmd OK");
    } else {
        Serial.println("subscribe to cmd FAILED");
    }
}

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
    Serial.print("callback invoked for topic: ");
    Serial.println(subscribetopic);
    for (int i = 0; i < payloadLength; i++) {
        //Serial.print((char)payload[i]);
        data3 += (char)payload[i];
    }

    Serial.println("data: "+ data3);
    if(data3=="lighton")
    {

```

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis:

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved.

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	5	3	2	0	10
Duplicate	0	0	0	1	1
External	2	0	0	1	3
Fixed	6	2	0	0	8
Not Reproduced	0	1	1	0	2
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	13	6	3	2	77

3. Test Case Analysis:

This report shows the number of test cases that have passed, failed, and untested,

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	1	0	0	1
Client Application	2	0	0	2
Security	1	0	0	1
Outsource Shipping	1	0	0	1
Exception Reporting	1	0	0	1
Final Report Output	2	0	0	2
Version Control	2	0	0	2

9. RESULT:

9.1 Performance Metrics:

PERFORMANCE TESTING						
			Team Id :	PNT2022TMID48274		
			Project Name:	for Child Safety Monitoring and Notification.		
NFT - Risk Assessment						
S.No	Project Name	Scope/feature	Hardware Changes	Software Changes	Risk score	Justification
1	IoT Based Safety Gadget for Child Safety Monitoring & Notification	Existing	No Changes	No Changes	Green	As we have seen the changes.
NFT - Detailed Test Plan						
Project Overview			NFT Test approach			
Track the location and some health monitoring values are send, and alert			Load test			
End of Test Report						
Project Overview			NFT Test approach	Approvals/SignOff		
we need to track the location of particular child suppose, If the child crosses the geofence. It send's an alert to that parents/guardian then we			Load test	Mentor		

10. ADVANTAGES & DISADVANTAGES:

Advantages:

1. Guarantees Peace of Mind to Parents:

Parents, whether at home or office, are always worried about the safety of their kids. The fear of losing your child to avoidable circumstances is the concern area for all mommies and daddies.

2. Get geofence details of child at any time:

Send alert notification to the parents if their child crossing the geofence area.

3. Gives kids more freedom:

It gives child more freedom because when parents know where the child are, it means they're more relaxed about letting them go further a field.

Disadvantages:

1.Kids may become more secretive:

Young people may respond to being tracked by becoming increasingly secretive, the surveillance by the parents.

2. They don't become streetwise:

Now a days children doesn't know the risk of not learning to be independent and safe on their own.

10. CONCLUSION:

The child safety wearable device is capable of acting as a smart IoT device. It provides parents with the real-time location, surrounding temperature and geofence for their child's surroundings and the ability to locate their child or alert by standers in acting to rescue or comfort the child. In additional we have used IBM Watson to send a information and stored in the Cloudant database for the future use.

11. FUTURE SCOPE:

Future Scope The child safety wearable system acts as a smart device. Child's surroundings can be located with the help of accurate and precise real-time location. Surrounding environment temperature, SOS light along with Distress buzzers are provided in this system .This helps in locating their child .This also aids the bystanders to rescue the child. The smart child safety wearable can be boosted considerably in the future by using extremely squeezed Arduino modules like Lily Pad Arduino which can be embroidered into fabrics. Also as a future scope, more power efficient model can be created that holds the battery for a longer time.

12. APPENDIX:

Github & Project demo link:

Github: <https://github.com/IBM-EPBL/IBM-Project-5853-1658817915>

Video link:

