



# CHRIST THE KING ENGINEERING COLLEGE

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Date	19 November 2022
Team ID	PNT2022TMID42442
Project Name	IoT Based Safety Gadget for Child Safety Monitoring & Notification

## **PROJECT REPORT**

### **1. INTRODUCTION**

#### **1.1. PROJECT OVERVIEW:**

Internet of Things (IoT) is a set of systems and devices interconnected with real-world sensors and actuators to the Internet. It is able to make decisions via detecting the surrounding environment without human interaction. In this project, IoT is applied to propose which helps parents to monitor and get known of their child's condition at anywhere and anytime even if they are not by their children side, Via the IoT, children safety is guaranteed, and crime rate is reduced as immediate actions can be taken in case the child is in danger. The use of IoT in this device is motivated by the need of child security system. Enable tracking of the child's location and capturing of data remotely such as temperature, Latitude and Longitude. 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/situations. Then, emergency notification will be sent to and display in the parents' mobile apps. Cloud computing means shared computing resources (networks, servers, storages, applications, services) are delivered as a service over the Internet from cloud to parent's. According to cloud is an interconnected network of servers providing services for people. With the help of cloud we store the entire location data.

#### **1.2. PURPOSE:**

It assists parents to monitor their children remotely. In case situations happen, notifications will be sent to parents so that actions can be taken. Through this child safety can be ensured and crime rate will be reduced. Parents concentrate to their works without worrying about their children.

## **2. LITERATURE SURVEY**

### **2.1. EXISTING PROBLEM:**

In the existing system, we 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 peoples. GPS is used to track the live location and it is used when needed. The server will search the respective device ID from the database and search for respective contacts according to that device ID and helps in alerting the registered guardians.

The disadvantage of this project are,

- i. The child could not produce the exact alert command during a panic condition.
- ii. The command produced may not match with the previously stored command.
- iii. This project requires manual intervention.

### **2.2. REFERENCES**

1. Akash Moodbidri, Hamid Shahnasser, "Child Safety Wearable Device", Department of Electrical and Computer Engineering San Francisco State University.
2. Anand Jatti, Madhvi Kannan, Alisha RM, Vijayalakshmi P, Shrestha Sinha, " Design and Development of an IOT based wearable device for the Safety and Security of women and girl children ", IEEE International Conference on Recent Trends in Electronics Information Communication Technology, May 20-21, 2016, India.
3. Anwaar Al-Lawati, Shaikha Al-Jahdhami, " RFID-based System for School Children Transportation Safety Enhancement ", Proceedings of the 8th IEEE GCC Conference and Exhibition, Muscat, Oman, 1-4 February 2015.
4. Dr. R. Kamalraj, "A Hybrid Model on Child Security and Activities Monitoring System using IoT", IEEE Xplore Compliant Part Number: CFP18N67-ART; ISBN:978-1-5386-2456-2.
5. Pooja.K. Biradar<sup>1</sup>, Prof S.B. Jamge<sup>2</sup>, "An Innovative Monitoring Application for Child Safety", DOI:10.15680/IJIRSET.2015.0409093.
6. Prof. Sunil K Punjabi, Prof. Suvarna Chaure, "Smart Intelligent System for Women and Child Security" Department of Computer Engineering SIES Graduate School of Technology Nerul, Navi Mumbai, India.

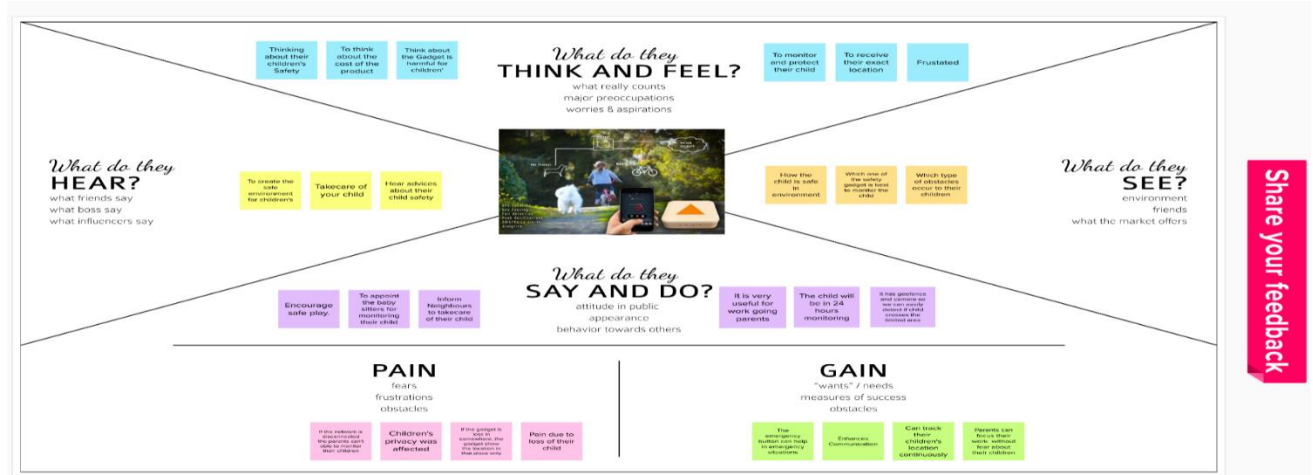
7. Sarifah Putri Raflesia, Firdaus, Dinda Lestarini, "An Integrated Child Safety using Geo-fencing Information on Mobile Devices", International conference on electrical engineering and computer science (ICECOS) 2018.
8. Zejun Huang<sup>1</sup>, Zhigang Gao, "An Mobile Safety Monitoring System for Children", 2014 10<sup>th</sup> International Conference on Mobile Ad-hoc and Sensor Networks.

### 2.3. PROBLEM STATEMENT DEFINITION:



## 3. IDEATION AND PROPOSED SOLUTION

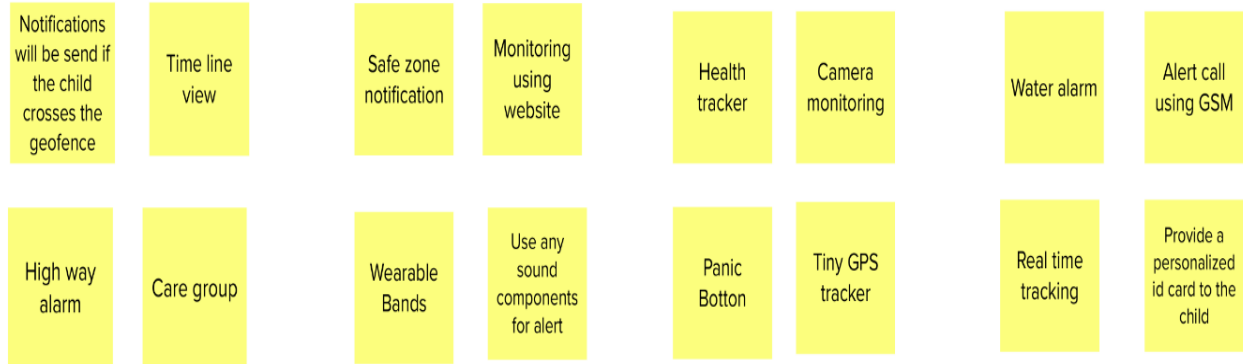
### 3.1. EMPATHY MAP CANVAS:



### 3.2.IDEATION AND BRAINSTORMING:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.



### 3.3. PROPOSED SOLUTION:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Parents who need child monitoring device because they want to keep tracking their children continuously.
2.	Idea / Solution description	Create a Child tracker which helps the parents with continuously monitoring the child's location. The notification will be sent according to the child's location to their parents or caretakers. The entire location data will be stored in the database.
3.	Novelty / Uniqueness	The novelty of the work is that the system automatically alerts the parent/caretaker by sending notification, when immediate attention is required for the child during emergency
4.	Social Impact / Customer Satisfaction	Make children parents more assure about their kid's security, we have a feature in our device called Geo-Fence. Geo-Fencing feature allows you to mark a particular area as safe-zone. Whenever your child crosses that specific area, you will get an instant notification on your phone.
5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> <li>● Easy to use</li> <li>● Low cost</li> <li>● Weightless</li> <li>● Compatible</li> </ul>
6.	Scalability of the Solution	<ul style="list-style-type: none"> <li>● Gadget ensures the safety and tracking of the children.</li> <li>● Parents need not worry about their children.</li> </ul>

### 3.4. PROBLEM SOLUTION FIT:

Define CS, fit into CC	<b>1. CUSTOMER SEGMENT</b> <b>CS</b> Working parents or busy parents of 0-10 year old kids.	<b>6. CUSTOMER CONSTRAINTS</b> <b>CC</b> Lack of affordable, reliable and hassle free technology, Lack of availability of secure and easy Ui.	<b>5. AVAILABLE SOLUTIONS</b> There are existing solutions that offer location tracking for kids but they are not very efficient, cost effective and reliable all at the same time. This trade off should be addressed.
Promote J&P, solve the BE, understand RC	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <b>J&amp;P</b> Instantaneous tracking and updation of child's location, geofencing and notifying parents of any abnormalities.	<b>9. PROBLEM ROOT CAUSE</b> <b>RC</b> Customers have to do this to protect their children from potential threats and to ensure the safety while being far away from them.	<b>7. BEHAVIOUR</b> <b>BE</b> Customers will get panic, prevent their children from going out on their own, try using easily available technologies.
IR & EM	<b>3. TRIGGERS</b> <b>TR</b> Coming across news about children being kidnapped and abducted, missing cases being reported. <hr/> <b>4. EMOTIONS: BEFORE / AFTER</b> <b>EM</b> Before : Feel insecure, worried, scared and confused. After : Relieved, calm, confident, happy.	<b>10. YOUR SOLUTION</b> <b>SL</b> Building a reliable technology that can address all the customer needs while being reliable and secure ensuring efficient functioning.	<b>8. CHANNELS of BEHAVIOUR</b> <b>CH</b> 8.1. ONLINE Tracking their kids location with their mobile phones GPS, reading news about child safety and other child missing cases. 8.2. OFFLINE Customers accompany their children to ensure safety, send them together with other reliable people, seek for protection in public places.

Identify str

## 4. REQUIREMENT ANALYSIS

### 4.1. FUNCTIONAL REQUIREMENT:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story/Sub-Task)
FR - 1	User Registration	Registration through account Registration through Gmail
FR - 2	User Confirmation	Confirmation via Email Confirmation via OTP
FR - 3	User Notification	Notification to registered mobile number Notification via SMS
FR - 4	User Interface	Mobile app – MIT App inventor able to see location of children when they are out of geofence

### 4.2. NON-FUNCTIONAL REQUIREMENT:

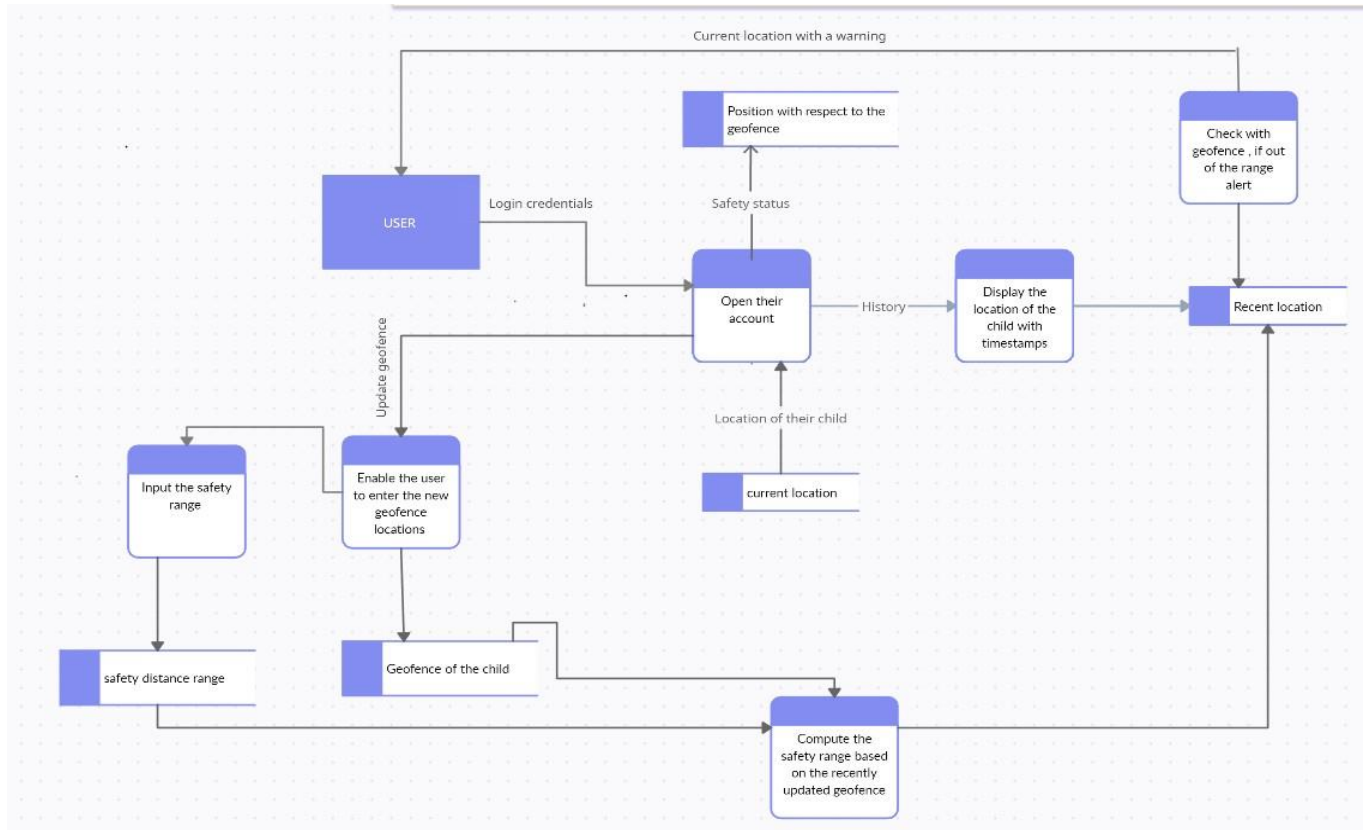
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR – 1	Usability	Allows parents to keep a track of their child's location and also, help them raise an alarm in case of an emergency.
NFR – 2	Security	Creates a secure environment for children to move around.
NFR – 3	Reliability	Increased reliability towards technology and reduced reliability towards guardians.
NFR – 4	Performance	High performance in terms of simple usage and security.
NFR – 5	Availability	Any time usage backed up by power supply.
NFR - 6	Scalability	High level with increase in performance.

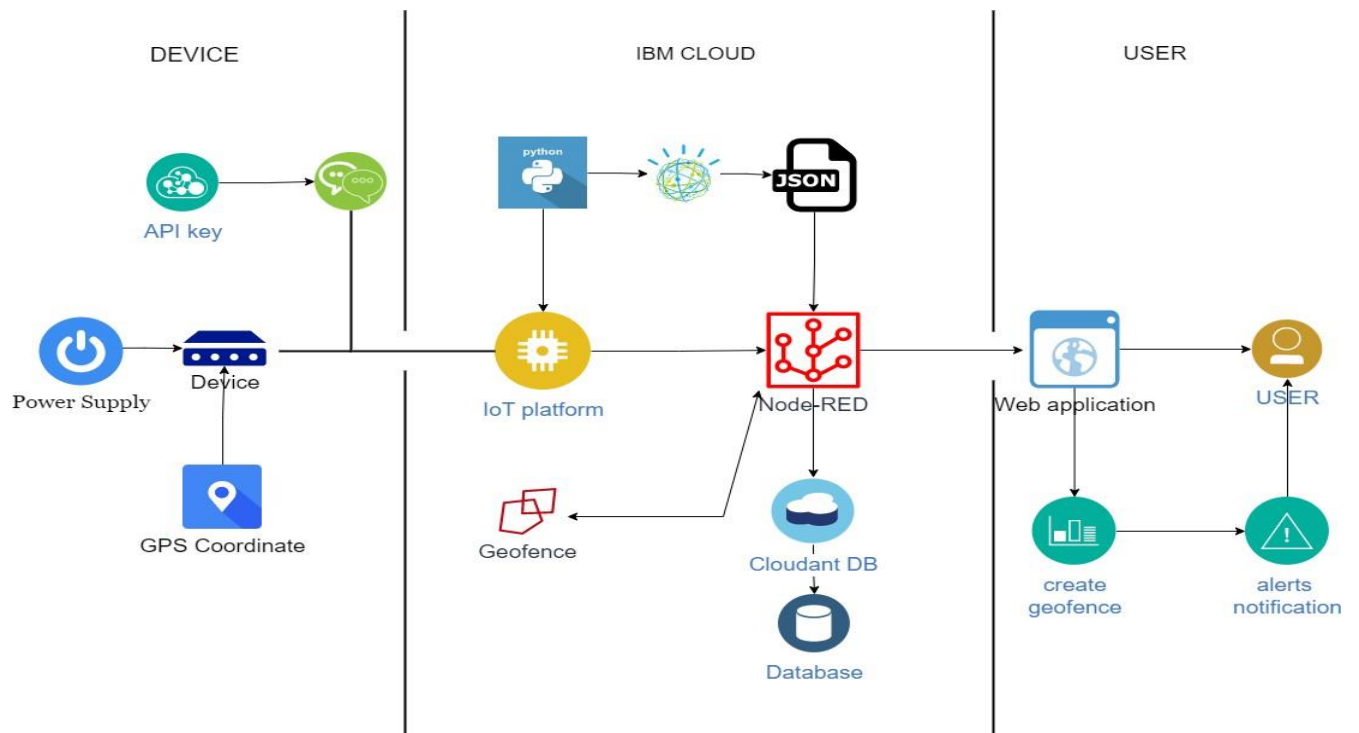
## 5. PROJECT DESIGN

### 5.1. DATA FLOW DIAGRAM:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



## 5.2. SOLUTION AND TECHNICAL ARCHITECTURE:



### 5.3. USER STORIES:

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1 (FATHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a father.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1
		USN-2 (MOTHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a mother.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1
		USN-3 (GUARDIAN/CARETAKER)	As a user, I can also monitor the children's activities using a safety gadget monitoring system.	I can access my account / dashboard and receive confirmation email & click confirm	Medium	Sprint-1
	Login	USN-4	As a user, I can log into the application by entering email & password.	I can access my account / dashboard.	Medium	Sprint-2
	Dashboard	USN-5	As a user, I can fix the geofence for my child's location so that I will receive alerts if my child crosses the geofence.	I can monitor the current location of my child.	High	Sprint-2
Customer (Web user)	Registration	USN-1 (FATHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a father.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1
		USN-2 (MOTHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a mother.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1



		USN-3 (GUARD IAN/ CARETA KER)	As a user, I can also monitor the children's activities using a safety gadget monitoring system.	I can access my account / dashboard and receive confirmation email & click confirm	Medium	Sprint-1
--	--	---	--	--	--------	----------

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
	Login	USN-4	As a user, I can log into the application by entering email & password.	I can access my account / dashboard.	Medium	Sprint-2
	Dashboard	USN-5	As a user, I can fix the geofence for my child's location so that I will receive alerts if my child crosses the geofence.	I can monitor the current location of my child.	High	Sprint-2
Customer Care	Dashboard	USN-6	As a customer care service person, whenever I receive a complaint, I forward the complaint and ensure that the complaint is resolved.	I can keep track of all the complaints and the status of the complaints received.	Medium	Sprint-3
Administrator	Admin Dashboard	USN-7	As an administrator, I will take care of all the payment processes, queries and complaints and login credentials.	I can access all the customer details, payment details and complaints received.	High	Sprint-4

## 6. PROJECT PLANNING & SCHEDULING

### 6.1. SPRINT PLANNING & ESTIMATION:

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, and password, and confirming my password.	4	High	MANIKANDAN.R

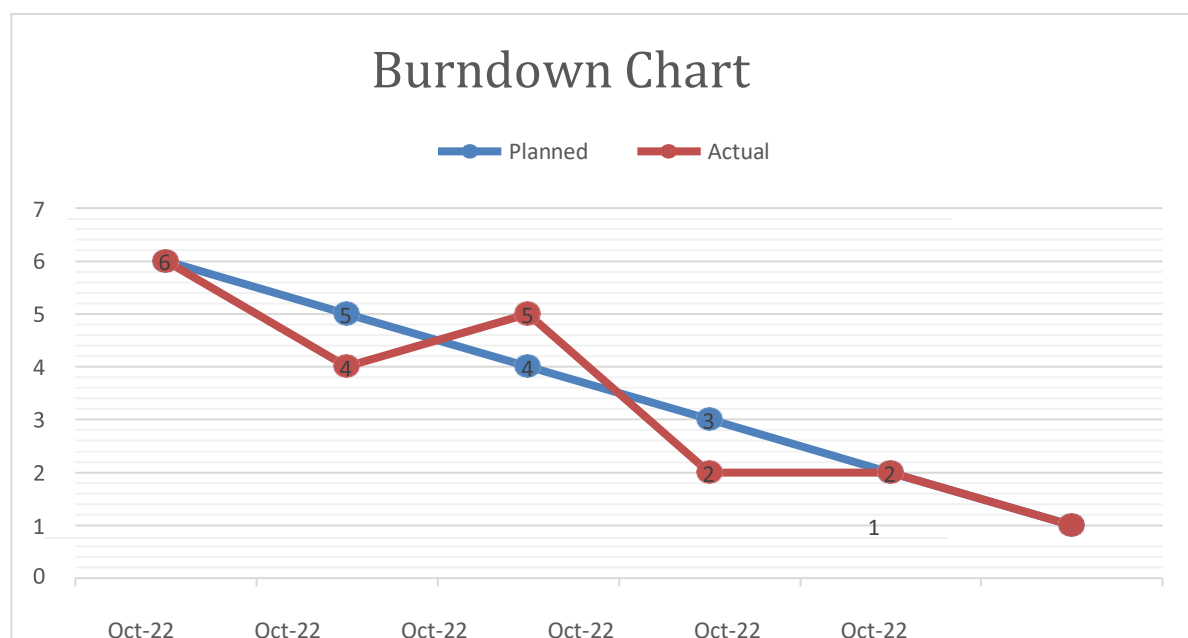
Sprint-1	Confirmation Email	USN-2	As a user, I will receive a confirmation email once I have registered for the application	4	High	VASANTHAKUMAR.K
Sprint-1	Authentication	USN-3	As a user, I can register for the application through Gmail and mobile app.	4	Medium	MANIKANDAN.R VASANTHAKUMAR.K
Sprint-1	Login	USN-4	As a user, I can log into the application by entering email & password	4	High	MANIKANDAN.R VASANTHAKUMAR.K SOWBARNIKA.V SOWMIYA.M
Sprint-1	Dashboard	USN-5	As a user, I need to be able to view the functions that I can perform	4	High	MANIKANDAN.R VASANTHAKUMAR.K
Sprint-2	Notification	USN-1	As a user, I should be able to notify my parent and guardian in emergency situations	10	High	SOWBARNIKA.V SOWMIYA.M
Sprint-2	Store data	USN-2	As a user, I need to continuously store my location data into the database.	10	Medium	SOWBARNIKA.V SOWMIYA.M
Sprint-3	Communication	USN-3,1	I should be able to communicate with my parents	6	Low	MANIKANDAN.R SOWBARNIKA.V

Sprint-3	IoT Device – Watson communication	USN-1,4	The data from IoT device should reach IBM Cloud	7	Medium	MANIKANDAN.R
Sprint-3	Node RED- Cloudant DB communication	USN-5,2	The data stored in IBM Cloud should be properly integrated with Cloudant DB	7	High	SOWBARNIKA.V
Sprint-4	User – WebUI interface	USN-1,4	The Web UI should get inputs from the user	6	High	SOWMIYA.M

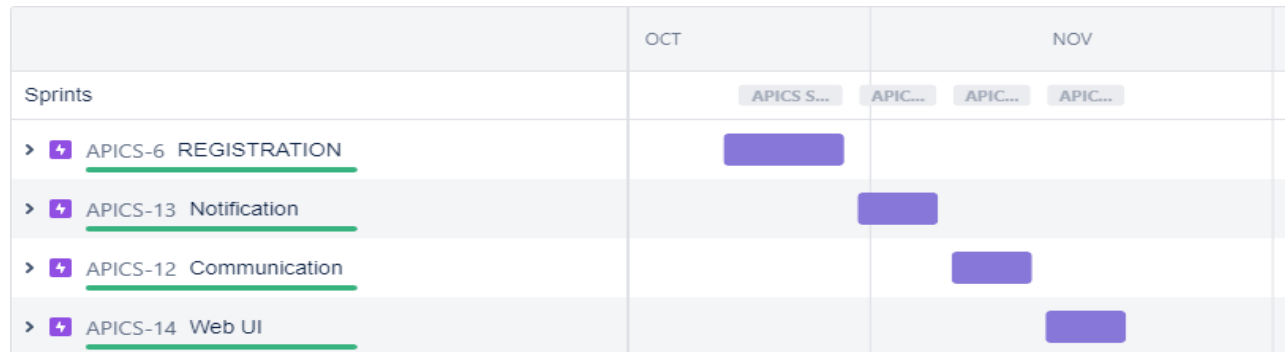
						VASANTHAKUMAR.K
Sprint-4	Geofencing	USN-2,3,5	The geofencing of the child should be done based on the geographical coordinates	7	High	SOWMIYA.M VASANTHAKUMAR.K MANIKANDAN.R SOWBARNIKA.V

## 6.2. SPRINT DELIVERY SCHEDULE:

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	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022



### 6.3.REPORTS FROM JIRA:



## 7. CODING & SOLUTIONING :

### 7.1. FEATURE 1:

```
import json
```

```
import wiotp.sdk.device
```

```
import time
```

```
myConfig = {  
    "identity": {  
        "orgId": "9o069i",  
        "typeId": "manimd",  
        "deviceId": "manimd12"  
    },  
    "auth": {  
        "token": "manimd07"  
    }  
}
```

```
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
```

```
client.connect()
```

```
while True:
```

```
    name = "mani"
```

```
    #in area location
```

```
    latitude=11.225894
```

```
    longitude=76.980855
```

```
    #out area location
```

```
    #latitude = 11.226767
```

```
    #longitude = 76.988299
```

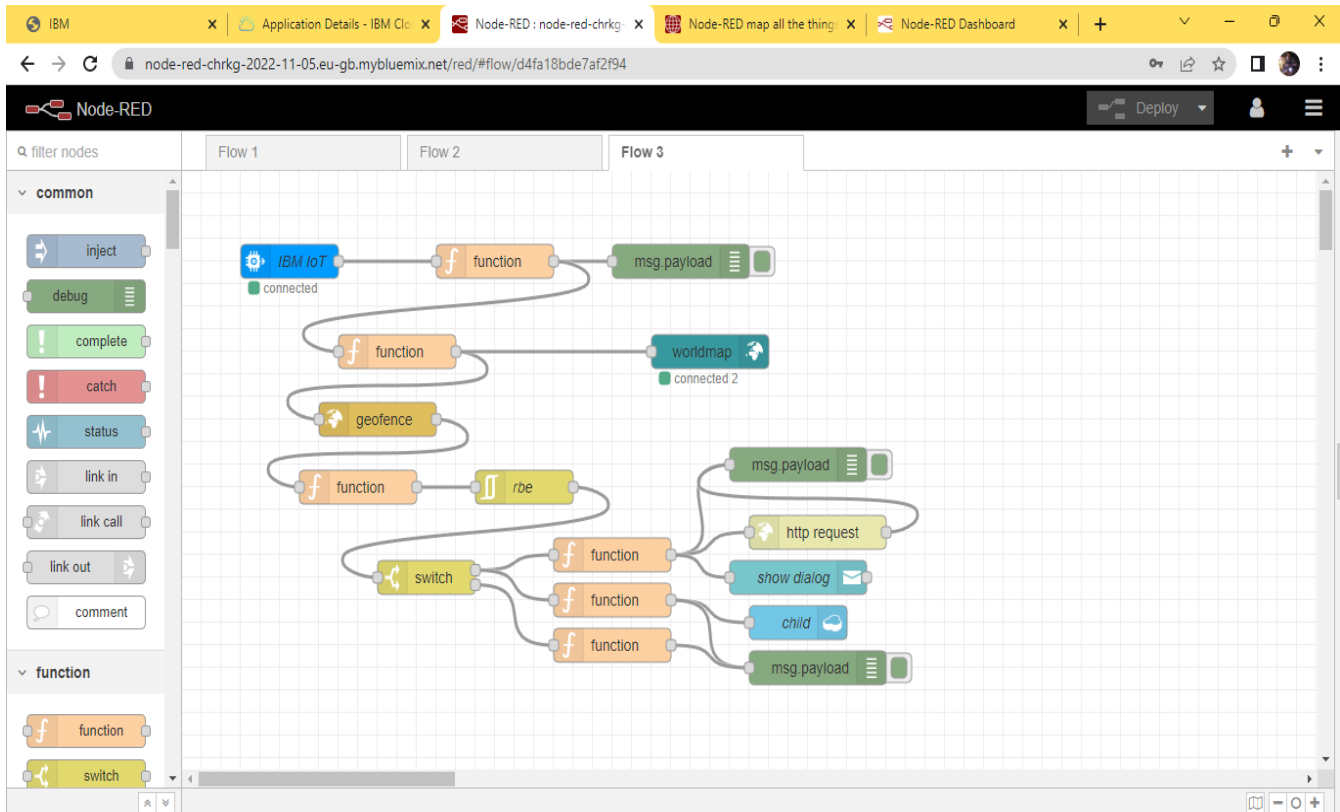
```

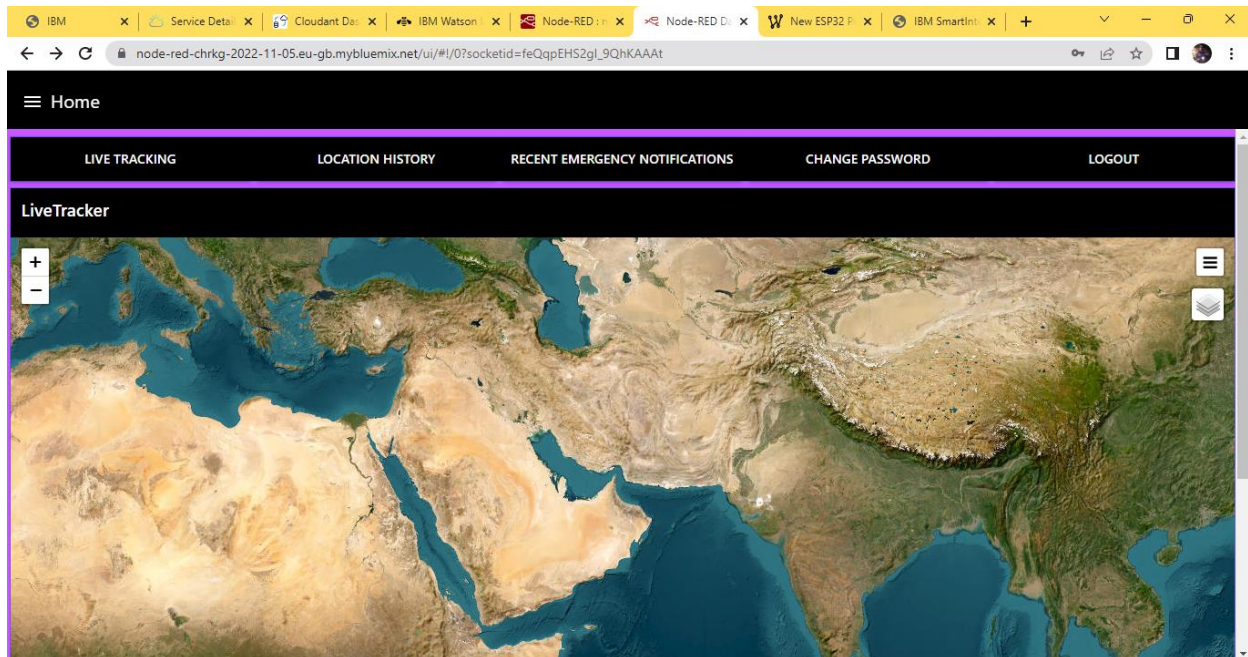
mydata = {'name': name, 'lat': latitude, 'lon': longitude}
client.publishEvent("Status", "json", data=mydata, qos=0, onPublish=None)
print("Data published to IBM IOT platform :", mydata)
time.sleep(5)

client.disconnect()

```

## 7.2.FEATURE 2:





### 7.3.DATABASE SCHEMA:

child\_tracker

Document ID

Options

{ } JSON

Create Document

id	key	value
cebbe2dabdb5cafaa060828a0ddb5a04	cebbe2dabdb5cafaa060828a0ddb5a04	{ "rev": "3-f183a0696c8cc0c76f9bd5..." }

Showing document 1 - 1. Documents per page: 20

## 8.TESTING

### 8.1. TEST CASES:

TestCase ID	Feature Type	Component	Test Scenario	Pre-Requirement	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
Home Page_TC_01	Functional	Home Page	Used to take the user into register page		1.Click on Sign Up Button (If Not Registered)	-	Application should show below UI elements: a.Name text box b.email text box c.DOB test box d.password text box e.Sign UP button f.Reset button	Working as expected	Pass				Beta Tester
Home Page_TC_02	Functional	Home Page	Used to take the user into Login page		1.Click on Log In Button (If Registered)	-	Application should show below UI elements: a.email text box b.password text box c.login button d.Reset button	Working as expected	Pass	Steps are clear to follow		BUG-1234	Beta Tester
Register Page_TC_01	Functional	Register page	Used to register the user in the application	Username & Password	1.Enter Username & Password 2.Click on Sing UP button	Username: mkmkmani12@gmail.com password:manimd07	Redirect to login page after register	Working as expected	Pass				Beta Tester
Register Page_TC_02	Functional	Register page	Used to go back to Home Page		1.Click on Back button		Redirect to home page	Working as expected	Pass				Beta Tester
LoginPage_TC_01	Functional	Login page	Used to Login into the Application	Username & Password	1.Enter Username & Password 2.Click on Login button	Username: mkmkmani12@gmail.com password:manimd07	Application should show 'Incorrect email or password ' validation message(If not Registered), and redirect to user page 1(If Registered)	Working as expected	Pass				Beta Tester
LoginPage_TC_02	Functional	Login page	Used to go back to Home Page		1.Click on Back button		Redirect to home page	Working as expected	Pass				Beta Tester
User Page1_TC_01	Functional	User Page1	Used to view the map		1.Enter Username & Password 2.Click on Login button	Username: mkmkmani12@gmail.com password:manimd07	Application should show below UI elements: a.It Shows the Location	Working as expected	Pass				Beta Tester
User Page2_TC_01	Functional	User Page2	Used to store the Location History		1.Click on Location History button		Store the values in database	Working as expected	Pass				Beta Tester
User Page3_TC_01	Functional	User Page3	Used to see the Emergency notification		1.Click on Recent Emergency Notification button		Redirect to the user page 3	Working as expected	Pass				Beta Tester
User Page4_TC_01	Functional	User Page4	Used to change the password		1.Click on Change Password button		It will change the password	Working as expected	Pass				Beta Tester
Log in Page_TC_01	Functional	Home Page	Used to go back to Log in page		1.Click on Logout button		Redirect to the Log in page	Working as expected	Pass				Beta Tester

## 8.2. USER ACCEPTANCE TESTING:

### 1. Purpose of Document

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	3	13
Duplicate	1	0	0	0	1
External	2	2	0	1	5
Fixed	6	5	3	10	24
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	0	2	1	3
Totals	14	10	9	16	49



### 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	7	0	0	7
Client Application	30	0	0	30
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

## 9. RESULTS

### 9.1. PERFORMANCE METRICS:

S. NO	Parameter	Performance
1.	Response Time	0.2s (Average of 10 trials)
2.	Workload	500 users (Calculated based on Cloud Space)
3.	Revenue	Individual users who have child
4.	Efficiency	Simple and straightforward workflow, which makes the process efficient.
5.	Down Time	Almost no down time due to IBM Cloud enabled solution.

## **10. ADVANTAGES & DISADVANTAGES**

### **10.1. ADVANRAGES:**

1. Save the life of the children.
2. Parent's do their work peacefully without worrying about their children.
3. Continously monitoring the children.
4. Saves time.
5. Recovery of the children is easy,if the children lost.

### **10.2. DISADVANTAGES:**

1. Young Children may refuse to cooperate unless allowed to play with their gadgets.
2. Easily misusing the device.
3. No water proof.

## **11. CONCLUSION**

The child tracking system that helps parents track the movements of children with the help of GPS technology. The entire location data is stored in database. This proposed app can show the whether the children inside the geofence or outside the geofence to the parent's mobile . Even if the software is not running, the details are shown. It is because location access is available in the background and the software performs well on the mobile device. Based on the availability of the parent user, additional geofences may be required. Performance Requirements are summarized as follows: login, Location status, temperature ,Live on map etc. The system shall allow the user to create and/or log in to an account. The system shall allow the user to find the exact location of the children using GPS. The system shall allow the user to track the current location of the children using GPS.

## **12. FUTURE SCOPE**

1. Childs surrounding can be located with the help of accurate and precise real time location.
2. Surrounding environment temperature, SOS light along with Distress buzzers are provided in this system.
3. If child crosses the geofence ,call goes to the registered mobile number's.
4. This gadgets will be modified that has been suitable for all environments.

## 13. APPENDIX

### SOURCE CODE:

#### Python coding

```
import json
import wiotp.sdk.device
import time

myConfig = {
    "identity": {
        "orgId": "9o069i",
        "typeId": "manimd",
        "deviceId": "manimd12"
    },
    "auth": {
        "token": "manimd07"
    }
}

client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

while True:
    name = "mani"
    #in area location

    latitude=11.225894
    longitude=76.980855
    #out area location
    #latitude = 11.226767
    #longitude = 76.988299
    mydata = {'name': name, 'lat': latitude, 'lon': longitude}
    client.publishEvent("Status", "json", data=mydata, qos=0, onPublish=None)
    print("Data published to IBM IOT platform :", mydata)
    time.sleep(5)

client.disconnect()
```

#### ARDUINO CODING

```
#include <WiFi.h>
```

```
#include <WiFiClient.h>

#include <PubSubClient.h>

#include <ArduinoJson.h>

#include<TinyGPS++.h>

#define RXD2 16

#define TXD2 17

HardwareSerial neogps(1);

TinyGPSPPlus gps;

char arr[100];

const char* ssid = "MD";

const char* password = "manimd07";

#define ID "9o069i"

#define DEVICE_TYPE "manimd"

#define DEVICE_ID "manimd12"

#define TOKEN "manimd07"

char server[] = ID ".messaging.internetofthings.ibmcloud.com";

char publish_Topic1[] = "iot-2/evt/Data1/fmt/json";

char publish_Topic2[] = "iot-2/evt/Data2/fmt/json";

char authMethod[] = "use-token-auth";

char token[] = TOKEN;

char clientId[] = "d:" ID ":" DEVICE_TYPE ":" DEVICE_ID;

WiFiClient wifiClient;

PubSubClient client(server, 1883, NULL, wifiClient);

void setup() {

    Serial.begin(115200);

    Serial.println();
```

```
wifi_init();

}

long previous_message = 0;

void loop() {

    client.loop();

    String payload = getLocationPayload();

    if(payload==""){

        return;

    }

    Serial.print("Sending payload: ");

    Serial.println(payload);

    if (client.publish(publish_Topic1, arr)) {

        Serial.println("Published successfully");

    } else {

        Serial.println("Failed");

    }

    delay(2000);

}

void wifi_init(){

    WiFi.begin(ssid, password);

    neogps.begin(9600,SERIAL_8N1,RXD2,TXD2);

    while (WiFi.status() != WL_CONNECTED) {

        delay(500);

        Serial.print(".");

    }

    Serial.println("");
```

```

Serial.println(WiFi.localIP());

if (!client.connected()) {

    Serial.print("Reconnecting client to ");

    Serial.println(server);

    while (!client.connect(clientId, authMethod, token)) {

        Serial.print(".");

        delay(500);

    }

    Serial.println("Connected TO IBM IoT cloud!");

}

}

String getLocationPayload(){

    boolean newData = false;

    for(unsigned long start = millis();millis()-start<1000;){

        while(neogps.available()){

            if(gps.encode(neogps.read())){

                newData = true;

            }

        }

    }

    String payload;

    if(newData == true){

        newData = false;

        payload = locationPayloadGenerator();

    }

    else{

```

```

        Serial.println("No data");

        payload = "{}";

    }

    return payload;

}

String locationPayloadGenerator(){

    String payload = "{}";

    if(gps.location.isValid()){

        float lat = gps.location.lat();

        float lon = gps.location.lng();

        payload = "{\"latitude\" : "+String(lat)+" ,\"longitude\" : "+String(lon)+"}";

        create_json(lat,lon);

    }

    return payload;

}

void create_json(float lat,float lon){

    StaticJsonDocument<100> doc;

    JsonObject root = doc.to<JsonObject>();

    root["name"]="Child";

    root["latitude"] = lat;

    root["longitude"] = lon;

    serializeJsonPretty(doc,arr);

}

```

**GitHub :** <https://github.com/IBM-EPBL/IBM-Project-7877-1658901565/tree/main/CHILD%20SAFETY%20MONITORING>

**Project Demo Link :** <https://drive.google.com/file/d/1mzKLvh5Vhpylk89SankZkH7bqMWg6ZAt/view?usp=sharing>