IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING AND NOTIFICATION

PROJECT REPORT

Submitted by

Mr.S.GNANA SAMPATH	**Reg.No.422719104012**
MR.V.KAMESH	**Reg.No.422719104014**
Mr.M.MUTHUKUMAR	**Reg.No.422719104018**
Mr.N.NOORUDEEN	**Reg.No.422719104021**
Mr.S.SURENDHAR	**Reg.No.422719104034**

in partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

V.R.S. COLLEGE OF ENGINEERING AND TECHNOLOGY ARASUR – 607107, VILUPPURAM DISTRICT

ANNA UNIVERSITY: CHENNAI 600 025

NOVEMBER 2022

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report "**IoT Based Safety Gadget for Child Safety Monitoring and Notification**" is the Bonafede work of "Mr.S.GNANA SAMPATH [Reg.No.422719104012], MR.V.KAMESH [Reg.No.422719104014] and Mr.M.MUTHUKUMAR [Reg.No.422719104018] Mr.N.NOORUDEEN [Reg.No.422719104021] Mr.S.SURENDHAR [Reg.No.422719104034]"who carried out the project work under our supervision.

.

<table>
<tr><td>SIGNATURE</td><td>SIGNATURE</td></tr>
<tr><td>Mr. K. RAMESH, M.E.,</td><td>Mr.N. GOBINATHAM, M.E.,</td></tr>
<tr><td>HEAD OF THE DEPARTMENT</td><td>SUPERVISOR</td></tr>
<tr><td>Department of Computer Science and Engineering,</td><td>Department of Computer Science and Engineering,</td></tr>
<tr><td>V.R.S. College of Engineering and Technology, Arasur-607107, Villupuram.</td><td>V.R.S. College of Engineering and Technology, Arasur-607107, Villupuram.</td></tr>
</table>

Project viva-voce examination held on ……………….

INTERNAL EXAMINER   **EXTERNAL EXAMINER**

TABLE OF CONTENT

1. INTRODUCTION

1.1 Project Overview

Basically, children cannot complain about abusements 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 detection sensor, metal detection sensor, and the location value from GPS are used to detect the status of the child and alerts the respective guardians using GSM accordingly

1.2 Purpose

IoT smart band, children safety is guaranteed, and crime rate is reduced as immediate actions can be taken in case the child is in danger. Besides, unlike existing smart band, which is less focusing on child security aspect, the proposed system emphasizes in getting as much data as possible so that actual situation can be identified. The use of IoT in this device is motivated by the need of child security system in Malaysia due to child safety issues resulting from increasing cases on child related crime.

2. LITERATURE SURVEY

❖ *RFID-based System for School Children Transportation Safety Enhancement*

This paper presents a system to monitor pick-up/drop-off of school children to enhance the safety of children during daily transportation from and to school. The system consists of two main units, a bus unit, and a school unit. The bus unit the system is used to detect when a child boards or leaves the bus. This information is communicated to the school unit that identifies which of the children did not board or leave the bus and issues an alert message accordingly. The system has a developed web-based database-driven application that facilities its management and provides useful information about the children to authorized personnel. A complete prototype of the proposed system was implemented a tested to validate the system functionality. The results show that the system is promising for daily transportation safety.

❖ *Design and Development of an IOT based wearable device for the Safety and Security of women and girl children*

The aim of this work is to develop a wearable device for the safety and protection of women and girls.
This objective is achieved by the analysis of physiological signals in conjunction with body position.
The physiological signals that are analysed are galvanic skin resistance and body temperature. Body position is determined by acquiring raw accelerometer data from a triple axis accelerometer.

❖ *C. Child Safety Wearable Device*

Parents need not have a smart mobile. Set of keywords are used to gain information from the kit.
LOCATION keyword is used to obtain the location of the child. UV keyword is used to obtain the temperature of the surroundings. BUZZ keyword is used to turn on the buzzer which is fixed in that device. SOS is used to send a signal to the device.

❖ *D. Smart Intelligent System for Women and Child Security*

A portable device which will have a pressure switch. As soon as an assailant is about to attack the person or when the person senses any insecurity from a stranger, he/she can then put pressure on the device by squeezing or compressing it. Instantly the pressure sensor senses this pressure and a conventional SMS, with the victim's lo
cation will be sent to their parents/guardian cell phone numbers

stored in the device while purchasing it, followed by a call. If the call is unanswered for a prolonged time, a call will be redirected to the police and the same message will be sent. Additionally, if the person crosses some area which is usually not accessed by the person then a message with the real-time location is sent to the parent/guardian's phone via conventional SMS

2.1 Existing problem

Real-Time Child Abuse and Reporting System 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 is,
- ❖ The child could not produce the exact alert command during a panic condition.

- ❖ The command produced may not match with the previously stored command.

- ❖ This project requires manual intervention.

2.2 References

- ❖ AkashMoodbidri, Hamid Shahnasser," Child Safety Wearable Device", Department of Electrical and Computer Engineering San Francisco State University.

- ❖ AnandJatti, MadhviKannan, Alisha RM, Vijayalakshmi P, ShresthaSinha, " 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
.
- ❖ 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.

2.3 Problem Statement Definition

Child tracker helps the parents in continuously monitoring the child's location. They can simply leave their children in school or parks and create a geofence around the particular location. By continuously checking the child's location notifications will be generated if the child crosses the geofence. Notifications will be sent according to the child's location to their parents or caretakers. The entire location data will be stored in the database.

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	IoT Device	Help parents to locate their children	Message can't alert	Due to network issue	Nervousness
PS-2	IoT Device	Help parents to monitor their children	Message can't alert	Due to network issue	Tension

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas
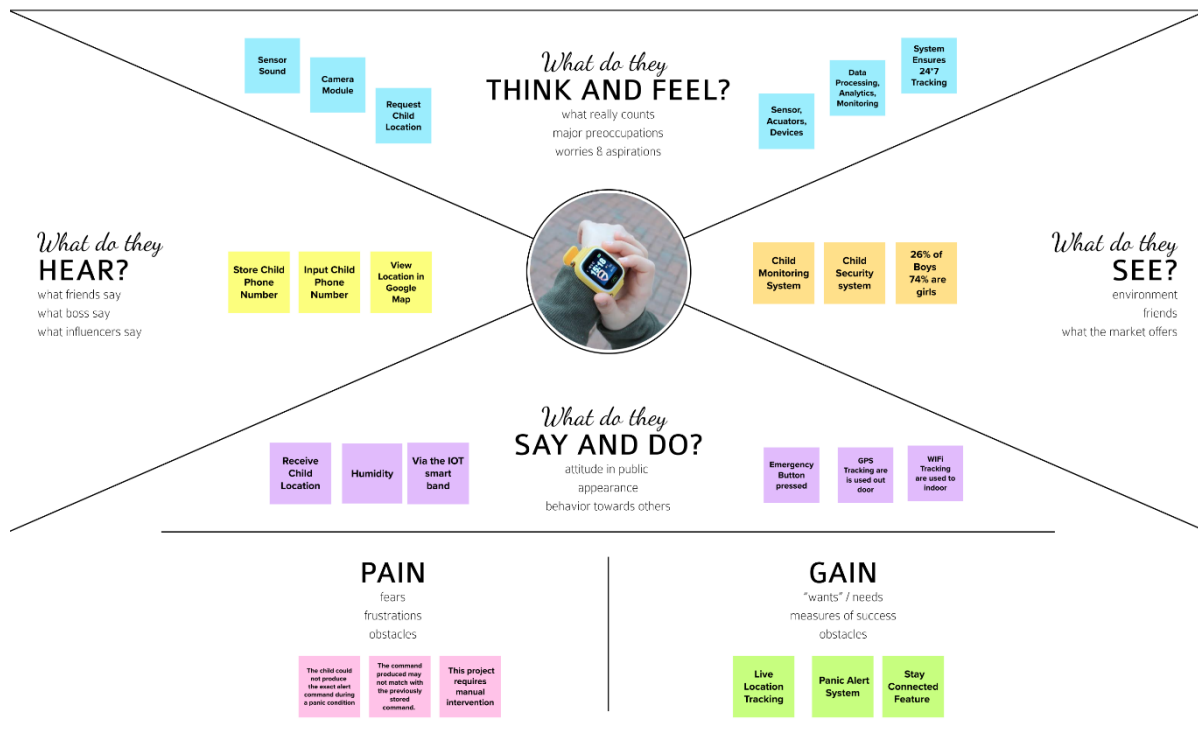
3.2 Ideation & Brainstorming

Brainstorm

Write down any ideas that come to mind that address your problem statement.

⏱ 10 minutes

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go.
In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

⏱ 20 minutes

TIP
You can select a sticky note and, at the pencil, switch to sketch icon to start drawing!

TIP
Add a colorful tags to sticky notes to color to make to find, browse, organize, and recognize important ideas or themes within your mural.

Muthukumar M

How a day stands or child or by standing on an unprocessed time and the efforts which emergency monitoring where they are not allowed to notice the ready members.

The key idea planned in this research work is an advanced technology that offers "smart child safety" for the children.

Therefore, the awareness of this method is to send an SMS from children's wear tool to their parent or guardian.

In addition, there is no aware device for the child's protection, it must be completed by hand only.

In such case, Heartbeat Sensor track the best rate for children are sends the emergency message by using the GSM to save contacts.

Thus, the planned method will be highly effective when compared to the other existing techniques in helping the victims

Noorudeen J

With this motivation, a smart IoT device for child safety and tracking is developed to help the parents to locate and monitor their children. The system is developed using Linkit ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules.

This same story serves a mentioned sensor such as touch type and Rest of RGM program collector to receive GPS locations it is where it where the parents an SMS

Moreover, it doesn't need any manual operation.

The problem prepared here using Arduino UNO, GSM sensors, NFMS, temperature and panic button by using IOT

The key idea planned in this research work is an advanced technology

In such case, I continue Sensor track the best rate for children and sends the emergency message by using the GSM to save contacts.

Surendhar S

Text should display the SOS signal brightly and sound an alarm when a bystander can easily spot as a sign of distress.

The main idea of this wearable safety system is to aid the parents in finding their child very easily.

This utilizes a Arduino system along with a Sensor system and Bluetooth 4.1 module

Kamesh V

Therefore, the wearable device implemented in this paper will be effectively communicating the parent an SMS through GSM

This research here is an analogical technology for Child protection as every Child as that he discreet will to the standby too while a simple amount problems

The one alike system uses standing it implicit much that runs this unmeasures. When it spot comparison is not, it was it active it on the SGC systems.

This Is new method us a surgeon when the

to get discrete together the mention unit, into, it implies dispute until a way of communication.

In between parent and the and also in this

Therefore, the awareness of this method is to send an SMS from children's wear tool to their parent or guardian.

Hence this paper aims at providing parents with a sense of security for their child in today's time

This paper is a very analogical technology for Child protection as every Child as that he discreet will to the standby too while a simple amount problems

With this motivation, a smart IoT device for child safety and tracking is developed to help the parents to locate and monitor their children. The system is developed using Linkit ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules

The Linkit One is a longitude coordinate receives are occurs in our actions is that "anhela." and Thus we can on it come there which open.

Gnanasampath S

This paper focuses on a small wearable device such as hidden "behind laced.

The parent can find out the location of the child by alarm sound in a very loud alarm using this wearable device.

With this motivation, a smart IoT device for child safety and tracking is developed to help the parents to locate and monitor their children. The system is developed using Linkit ONE board programmed in embedded C and interfaced with

The wearable device accurate collector of clear from the various modules that are connected to it.

Hence this paper aims at providing parents with a sense of security for their child in today's time

In the reading chapters, there is no remaining method, so did it, forced considering problems on the main, so to a solution "mechanism" to provide the child for the wider save

---

In such case, Heartbeat Sensor track the best rate for children and sends the emergency message by using the GSM to save contacts.

With this motivation, a smart IoT device for child safety and tracking is developed to help the parents to locate and monitor their children. The system is developed using Linkit ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules

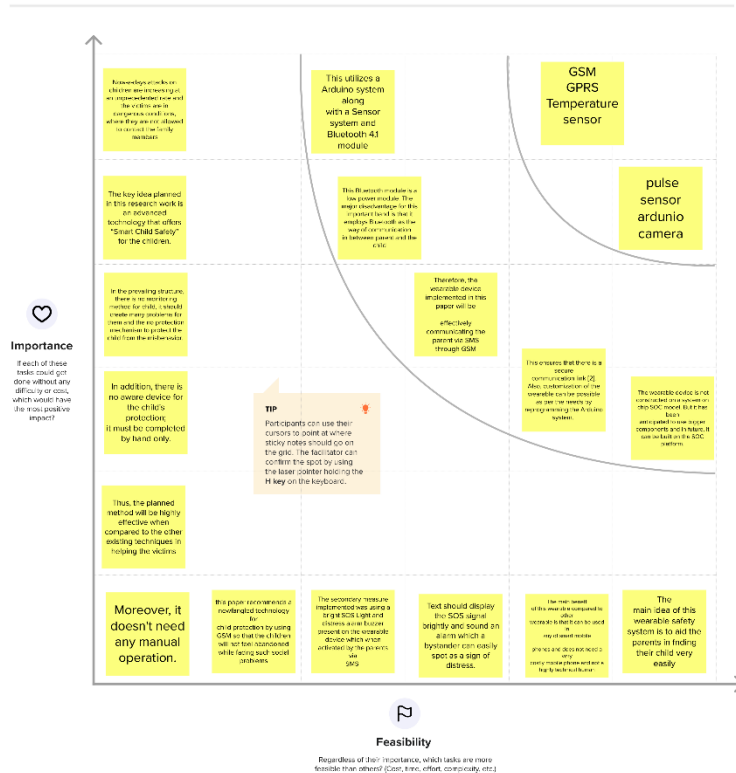Hence this paper aims at providing parents with a sense of security for their child in today's time

Therefore, the awareness of this method is to send an SMS from children's wear tool to their parent or guardian.

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⏱ 20 minutes

♡ **Importance**

If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

Feasibility

Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

Sticky notes on grid:

- Nowadays attacks on children are increasing at an unprecedented rate and the victims are in dangerous conditions, where they are not allowed to contact the family members

- This utilizes a Arduino system along with a Sensor system and Bluetooth 4.1 module

- GSM GPRS Temperature sensor

- The key idea planned in this research work is an advanced technology that offers "Smart Child Safely" for the children.

- This Bluetooth module is a low power module. The major disadvantage for this important task is that it employs Bluetooth as the way of communication in between parent and the child.

- pulse sensor ardunio camera

- In the prevailing structure, there is no monitoring motive for child, it would create many problems for them and the protection mechanism to protect the child from the intervention

- Therefore, the wearable device implemented in this paper will be effectively communicating the parent via SMS through GSM

- This ensures that there is a secure communication link [2]. Also, customization of the wearable can be possible as per the needs by reprogramming the Arduino system.

- In addition, there is no aware device for the child's protection; it must be completed by hand only.

- The wearable device is not connected over a system so that the SOC need. But it has been anticipated to use copper components and in future, it can be built on the SOC platform.

- **TIP** 💡 Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the H key on the keyboard.

- Thus, the planned method will be highly effective when compared to the other existing techniques in helping the victims

- Moreover, it doesn't need any manual operation.

- this paper narrates about a newfangled technology for child protection by using GSM so that the children will not be abandoned while facing such social problems

- The secondary measure implemented was using a bright SOS Light and distress alarm buzzer present on the wearable device which when activated by the parent via SMS

- Text should display the SOS signal brightly and sound an alarm which a bystander can easily spot as a sign of distress.

- the main benefit of this wearable compared to other obstacle is that it can be used in any situated mobile phones and does not need a very costly mobile phone and is a highly technical theme

- The main idea of this wearable safety system is to aid the parents in finding their child very easily

🚩

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

🅰 **Share the mural**
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

🅱 **Export the mural**
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.
Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

💬 Share template feedback

3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	a smart IoT device for child safety and tracking is developed to help the parents to locate and monitor their children. The system is developed using LinkIt ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules.
2.	Idea / Solution description	For location services is GPS and telephony services is SMS, call logs and contact.
3.	Novelty / Uniqueness	This utilizes an Arduino system Along with a Sensor system and Bluetooth 4.1 Module. This Bluetooth module is allowed power module. The major disadvantage for this important band is that it employs Bluetooth as the way of communication in between parent and the child.
4.	Social Impact / Customer Satisfaction	Quality, Efficiency, Delightful services, best value, on time delivery
5.	Business Model (Revenue Model)	Membership fee, featured listing, commission on product order, advertisements
6.	Scalability of the Solution	The system can be scaled down to village level a can also be scaled for implementation at other status

3.4 Problem Solution fit

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Working parents of

6. CUSTOMER CONSTRAINTS C

Spending power, budget, lowest cost, Network connection, WIFI or Bluetooth connection, available devices.

5. AVAILABLE SOLUTIONS A

This method is to send an SMS from children wear tool to their parent or guardian.

PROS: - (1) Live location tracking.

(2) panic alert system.

(3) Stay connected feature.

CONS: - (1) The child could not produce the exact alert command during a panic condition.

(2) The command produced may

Focus on J&P, tap into BE

2. JOBS-TO-BE-DONE / PROBLEMS

Now-a-days attacks on children are increasing at an unprecedented rate and the victims are in dangerous conditions, where they are not allowed to contact the family Members and there is no Protection mechanism to protect the child from the misbehaviour.

9. PROBLEM ROOT CAUSE RC

In the prevailing structure, there is no monitoring method for child, it should create many problems for them. device for child safety and tracking is developed to help the parents to locate and monitor their children.

7. BEHAVIOUER BE

It is intended to use the SMS as the communication type between the parent and child's wearable device, as this has fewer chances of failing when compared to Wi-Fi and Bluetooth.

Focus on J&P, tap into BE

4. REQUIREMENT ANALYSIS

4.1 Functional requirement

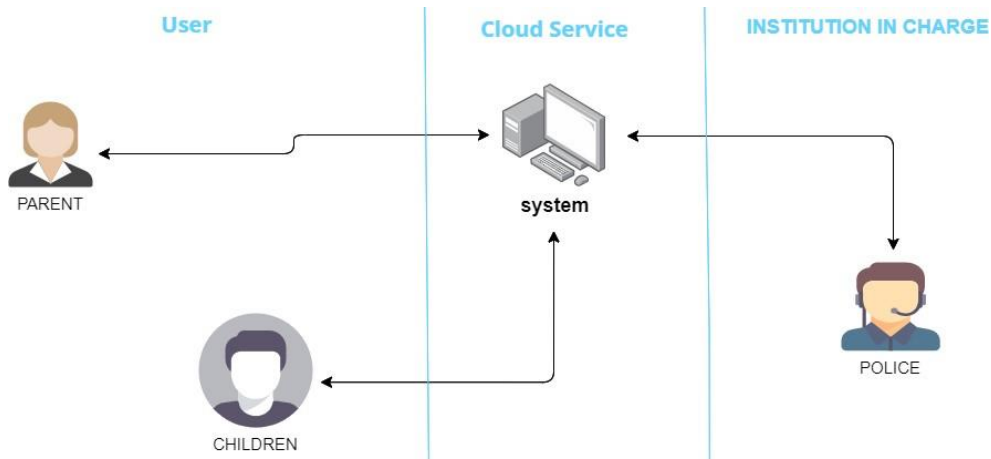| FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Detect Position	It should be able to detect continuously the current position of the user inside Politecnico di Torino hallways
FR-4	Update Route	It is able to update the route (shortest) continuously according to detected position of user and dead ends. If encountered with a dead end the system can recalibrate a new route to the end destination.
FR-5	Route Guidance	The mobile application communicates the route to the user through voice commands. It notifies of upcoming turns through hallways, doors, and upon arrival to end destination.
FR-6	Generating Route	According to the detected position of user inside a hallway and the specified end destination by the user (inputted as text or voice), the system generates a route between the 2 points according to the shortest path.
FR-7	Switch My Guide Cane ON/OFF	User is able to activate/deactivate the vibrating cane anytime during the usage of the system depending on the personal preference of the user

4.2 Non-Functional requirements

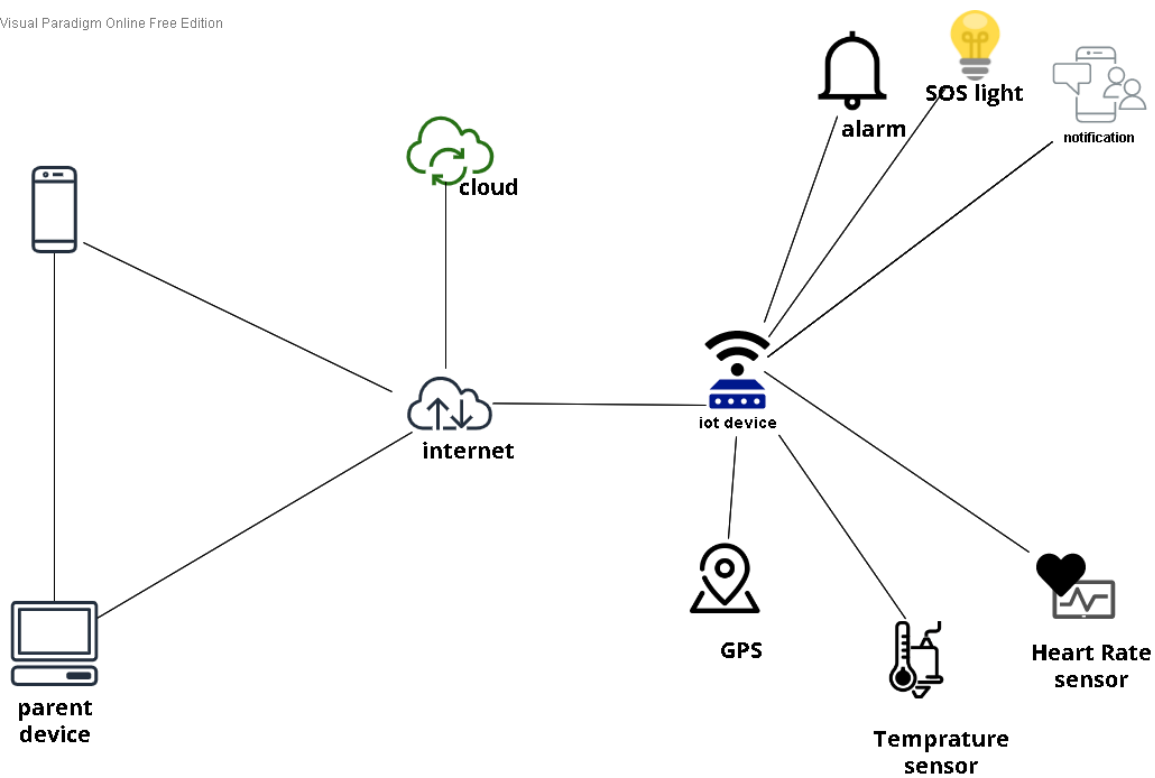| FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	My Guide implementation should be feasible using technologies that are accessible to the end-users.
NFR-2	**Portability**	The mobile interfaces must be compatible with Android
NFR-3	**Space Efficiency**	The system allows for obstacle detection within the range of 1 meter.
NFR-4	**Delivery**	The language should be localized to the preference of the user
NFR-5	**Performance Efficiency**	My Guide must perform in a proper time constraint that reflects average walking speed, motion and obstacles in the environment.
NFR-6	**Multi User System**	My Guide is able to consider the presence of more than one user in the same environment. All the features of the system should operate properly for all users.

5 PROJECT DESIGN

5.1 Data Flow Diagrams

```
┌─────────┐
│  Start  │
└─────────┘
     │
     ▼
┌──────────────┐                                    ┌──────────────┐
│ Register the │───────────────────────────────────▶│  Monitoring  │◀──────┐
│   Children   │                                    │    motion    │       │
└──────────────┘                                    └──────────────┘       │
     │                                                     │                │
     ▼                                                     ▼                │
┌──────────────┐                                    ┌──────────────┐       │
│ Create fences│───────────────────────────────────▶│  Monitoring  │◀──┐   │
└──────────────┘                                    │children      │   │   │
                                                    │location      │   │   │
                                                    └──────────────┘   │   │
┌──────────────┐                                          │            │   │
│      Get     │◀──────────────────────────────────  Entered/Exited    │   │
│ notification │                                         the fence      │   │
└──────────────┘                                                        │   │
                                                                        │   │
                                                    Children in ────────┘   │
                                                      danger?               │
                                                                            │
┌──────────┐     ┌──────────────┐                              ┌──────────┐ │
│ Get alert│◀────│ Record voice │◀─────────────────────────   │ Get alert│ │
└──────────┘     │   message    │                              └──────────┘
     │           └──────────────┘                                    │
     │                  │          ┌─────────┐                       │
     └─────────────────────────────▶│   End  │◀─────────────────────┘
                                    └─────────┘
```

PARENT

system

CHILDREN

POLICE
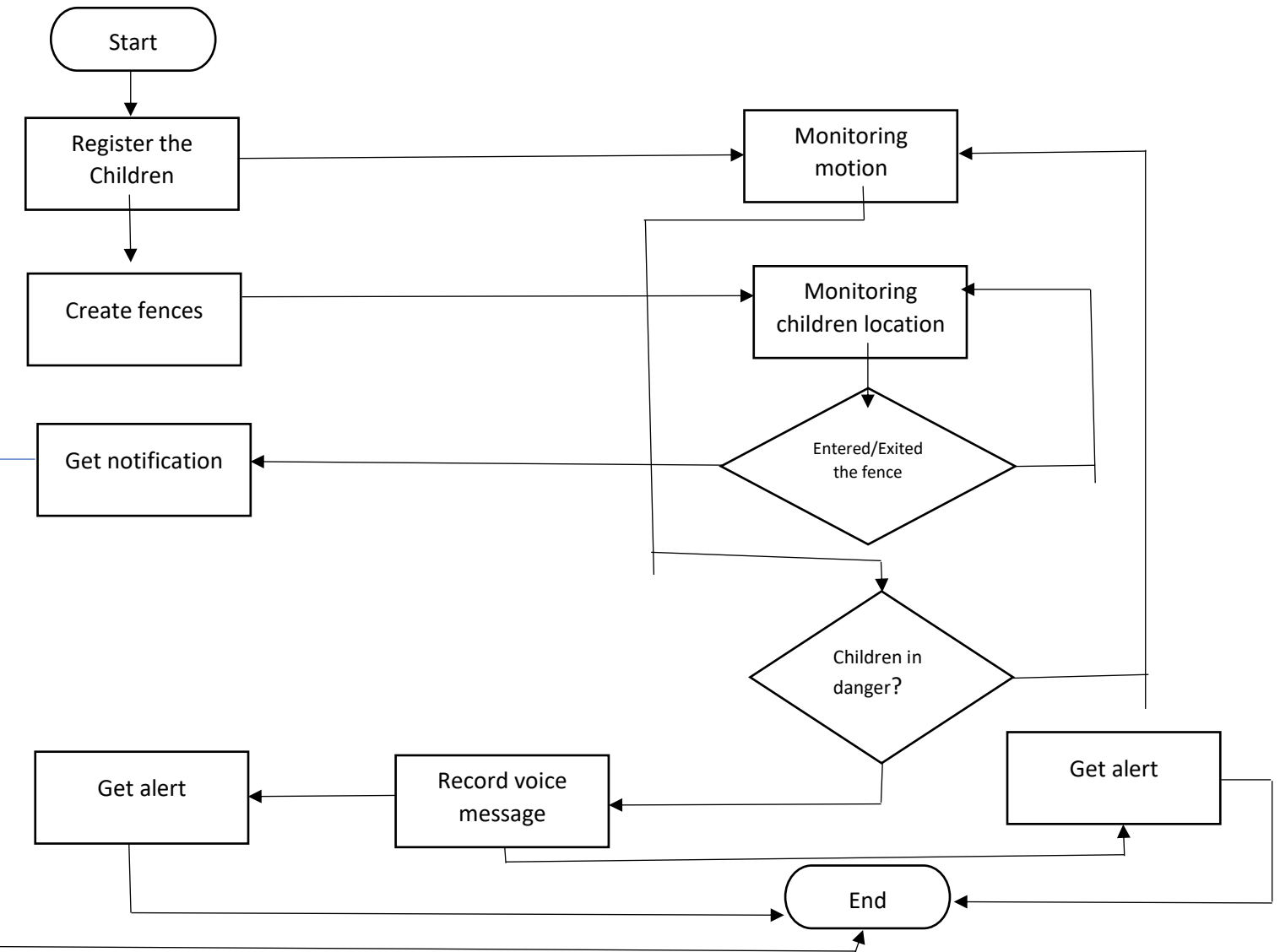
5.2 Solution & Technical Architecture

5.2.1 Solution Architecture

Visual Paradigm Online Free Edition

alarm

SOS light

notification

cloud

internet

iot device

GPS

Temprature sensor

Heart Rate sensor

parent device

https://aws.amazon.com/solutions/case-studies/icrar/ Visual Paradigm Online Free Edition

Technical Architecture

Cloud services

NODE RED

IBM
PLATFORM

HEART RATE SENSOR

Cloud DB

IoT device

GPS

TEMP SENSOR

WEB

USER / PARENT
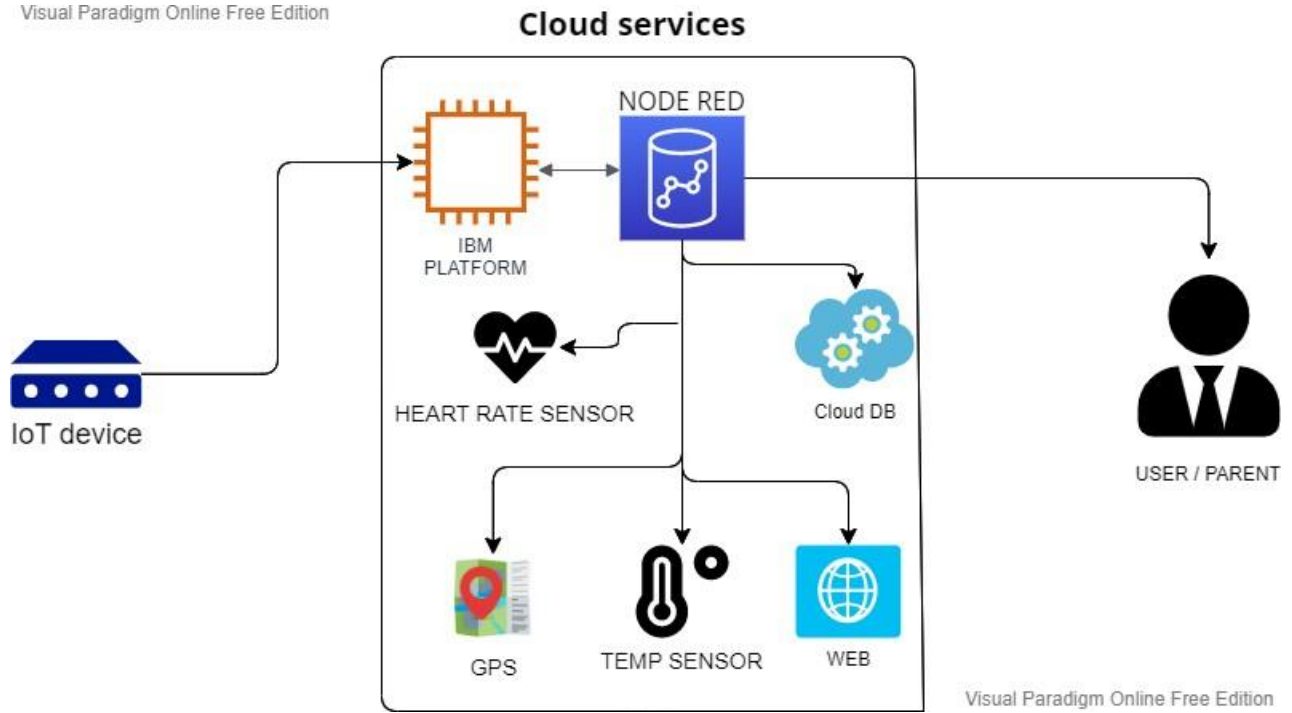
5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobileuser)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirmingmy password.	I can access my account /dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation emailonce I have registered for the application	I can receive confirmationemail & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the applicationthrough Facebook	I can register & access thedashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the applicationthrough Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application byentering email & password		High	Sprint-1
	Detect Position	USN-6	As a user, I should be able to detect continuously the current position of the userinside Politecnico di Torino hallways.	I can detect the currentposition	High	Sprint-1
Customer (Webuser)	Switch My Guide Cane ON/OFF	USN-7	As a user, I will able to activate/deactivate the vibrating cane anytime during the usageof the system depending on the personal preference of the user.	I can to activate/ deactivate the vibratingcane	High	Sprint-1
Customer Care Executive	Generating Route	USN-8	According to the detected position of user inside a hallway and the specified end destination by the user (inputted as text or voice), the system generates a route between the 2 points according to the shortest path.	I can receive the shortest path of route between the2 points.	medium	Sprint-1
Administrator	Route Guidance	USN-9	The mobile application communicates the route to the user through voice commands. Itnotifies of upcoming turns through hallways, doors, and upon arrival to end destination.	I can receive the Routeguidance.	medium	Sprint-1
	Update Route	USN-10	It is able to update the route (shortest) continuously according to detected position of user and dead ends. If encountered with adead end the system can re-calibrate a new	I can update when if it isavailable	High	Sprint-1

6 PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & 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	5 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

6.2 Sprint Delivery Schedule

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.	1	High	Gnana Sampath
Sprint-1		USN-2	As a user, I will receive verification email once Ihave registered for the application	2	High	Muthukumar
Sprint-1	Login	USN-3	As a user, I can log into the application by entering email & password.	1	High	Muthukumar surrender
Sprint-2	Integrate and code	USN-4	Integrating the IBM Watson IoT Platform, cloud ant DB and application with the node red	2	High	Gnana Sampath Kamesh Noorudeen
Sprint – 2		USN- 5	Developing the code for connecting with IBM Watson IoT platform.	1	High	Kamesh Noorudeen
Sprint-3	Cloud	USN- 6	The child locations are stored in cloud	1	Medium	Kamesh Noorudeen surrender
Sprint-4	Notification	USN- 7	Allowing the parent or guardian to see the current location status of the children.	1	High	Gnana Sampath Muthukumar
Sprint-4		USN-8	Notification message is sent to the parent orguardian if the child crosses the geofence.	1	High	Kamesh Noorudeen surrender

7 CODING & SOLUTIONING (Explain the features added in the project along with code)

7.1 Feature 1

➢ Geofence is like a round wall covering the given location. So, parents can usethem to mark the location where their children are going.

➢ Multiple Geofence can be added.

```python
import json
import pycountry
from tkinter import Tk, Label, Button, Entry
from phone_iso3166.country import phone_country


class Location_Tracker:
    def _init_(self, App):
        self.window = App
        self.window.title("Phone number Tracker")
        self.window.geometry("500x400")
        self.window.configure(bg="#3f5efb")
        self.window.resizable(False, False)

        #_____Application menu_____
        Label(App, text="Enter a phone number",fg="white", font=("Times", 20),
                    bg="#3f5efb").place(x=150,y= 30)
        self.phone_number = Entry(App, width=16,
                    font=("Arial", 15), relief="flat")
        self.track_button =       Button(App,              text="Track
                                Country",bg="#22c1c3", relief="sunken")
        self.country_label = Label(App,fg="white",
                    font=("Times", 20), bg="#3f5efb")

        #_____Place widgets on the window_____ self.phone_number.place(x=170, y=120)
        self.track_button.place(x=200, y=200)
        self.country_label.place(x=100, y=280)
    #____Linking button with countries _____
        self.track_button.bind("<Button-1>", self.Track_location)
        #255757294146


    def Track_location(self,event): phone_number
        = self.phone_number.get()country ="Country
        is Unknown"
        if phone_number:
            tracked                                                       =
    pycountry.countries.get(alpha_2=phone_country(phone_number))print(tracked)if tracked:
                if hasattr(tracked, "official_name"):country
                    = tracked.official_name
                else:
                    country = tracked.name
```

```
            self.country_label.configure(text=country)
    PhoneTracker = Thk()
      MyApp = Location_Tracker(PhoneTracker)PhoneTracker.mainloop
```

7.2 Feature 2

➤ Once geofence is added, when the child enters the geofence a notification will be S

➤ When the child leaves the geofence a notification will be sent.

```
# python script for sending message updateimport time
from time import sleep
from sinchsms import SinchSMS#
function for sending SMS
def sendSMS():
```
```
# enter all the details
# get app_key and app_secret by registering# a app on
sinchSMS
number = 'your_mobile_number'app_key =
'your_app_key' app_secret =
'your_app_secret'
# enter the message to be sentmessage =
'Hello Message!!!'
client = SinchSMS(app_key, app_secret) print("Sending '%s' to %s"
% (message, number)) response = client.send_message(number,
message)message_id = response['messageId']
```
```
response = client.check_status(message_id)
# keep trying unless the status returned is Successfulwhile
response['status'] != 'Successful':
        print(response['status'])
        time.sleep(1)
        response = client.check_status(message_id)
```
```
    print(response['status'])
if_____name_____== "____main____":
    sendSMS()
```

8. TESTING

8.1 Test Cases

Test case ID	Feature Type	Compon ent	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Stat us	Comments	TC for Automation(Y/N)	BUG ID	Executed By
LoginPage_TC_0 01	Functional	Home Page	Verify user is able to see the Login/Signup popup when user clicked on App		1.Enter App 3.Verify login/Signup popup displayed or not		Login/Signup popup should display	Working as expected	Pass		Y		SnehaShri , Swetha
LoginPage_TC_0 02	UI	Home Page	Verify the UI elements in Login/Signup popup		1.Enter App 2.Verify login/Signup popup with below UI elements: a.email text box b.password text box c.Login button d.New customer? Register		Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Register	Working as expected	Pass		Y		Shanmugapriya , Shwetha
LoginPage_TC_0 03	Functional	Home page	Verify user is able to log into application with Valid credentials		1.Enter App 2..Enter Valid username/email in Email text box 3.Enter valid password in password text box 4..Click on login button	Username: abcd@gmail.com password:Testing123	User should navigate to user account homepage	Working as expected	Pass		Y		Shakthi
LoginPage_TC_0 04	Functional	Login page	Verify user is able to log into application with InValid credentials		1.Enter App 2..Enter InValid username/email in Email text box 3.Enter valid password in password text box 4..Click on login button	Username:abcd@gmail password:Testing123	Application should show "Login error. There is no user record corresponding to the identifier"	Working as expected	pass		Y		Shakthi , Shanmugapriya
LoginPage_TC_0 04	Functional	Login page	Verify user is able to log into application with Valid credentials		1.Enter App 2..Enter Valid username/email in Email text box 3.Enter invalid password in password text box 4..Click on login button	Username: sac19sc020@sairamtap.ed u.in password: Testing123678686786876 876	Application should show "the Password is invalid "	Working as expected	Pass		Y		Shwetha D, SnehaShri
LoginPage_TC_0 05	Functional	Login page	Verify user is able to log into application with InValid credentials		1.Enter App 2..Enter InValid username/email in Email text box 3.Enter invalid password in password text box 4..Click on login button	Username:abcd password: Testing123678686786876 876	Application should show "Login error. There is no user record corresponding to the identifier"	Working as expected	Pass		Y		Swetha
Dashboard	Functional	Dashboard	Adding geofence in the location need		1.Enter App 2.Enter the valid username and password		Application show a red circle around the location	Working as expected	Pass		Y		Sneha Shri
Alert Notification	Functional	Notification	Notification when the user entered the geofence		1.Enter App 2.Enter the valid username and password 3.Add the Geofence		Application sent the notification " Entered the location"	Working as expected	Pass		Y		Shanmugapriya , Shwetha
Alert Notification	Functional	Notification	Notification when the user exited the geofence		1.Enter App 2.Enter the valid username and password		Application sent the notification " Exited the location"	Working as expected	Pass		Y		Shakthi , Swetha

8.2 User Acceptance Testing

| Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	11	4	2	2	19
Duplicate	1	1	2	0	4
External	2	3	0	1	6
Fixed	10	2	3	20	35
Not Reproduce	0	0	2	0	2
Skipped	0	0	2	1	3
Won't Fix	0	5	2	1	8
Totals	24	15	13	25	77

9. RESULTS

User Registration

Users get registered to the app using their mail and create their password. On the user is registered a verification mail will be sent to the user mailid. The user needs to verify the account. All user details are stored in the firebaseand verification mail is sent by firebase authentication.
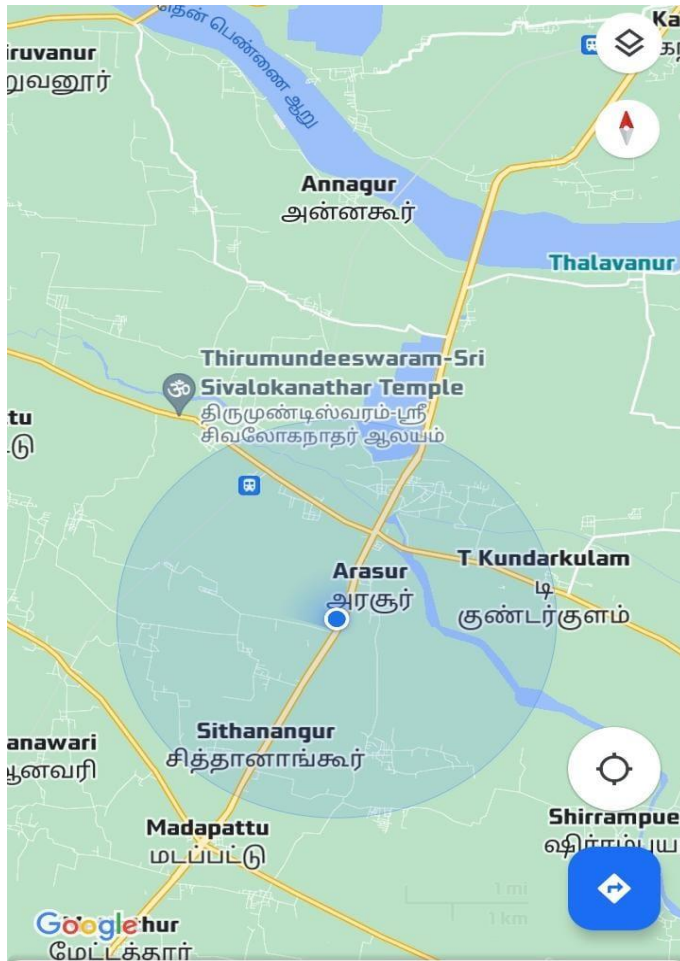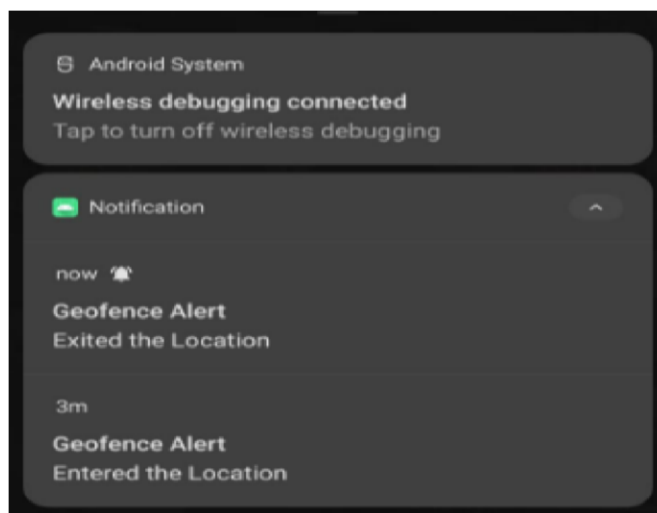
Registration Page:
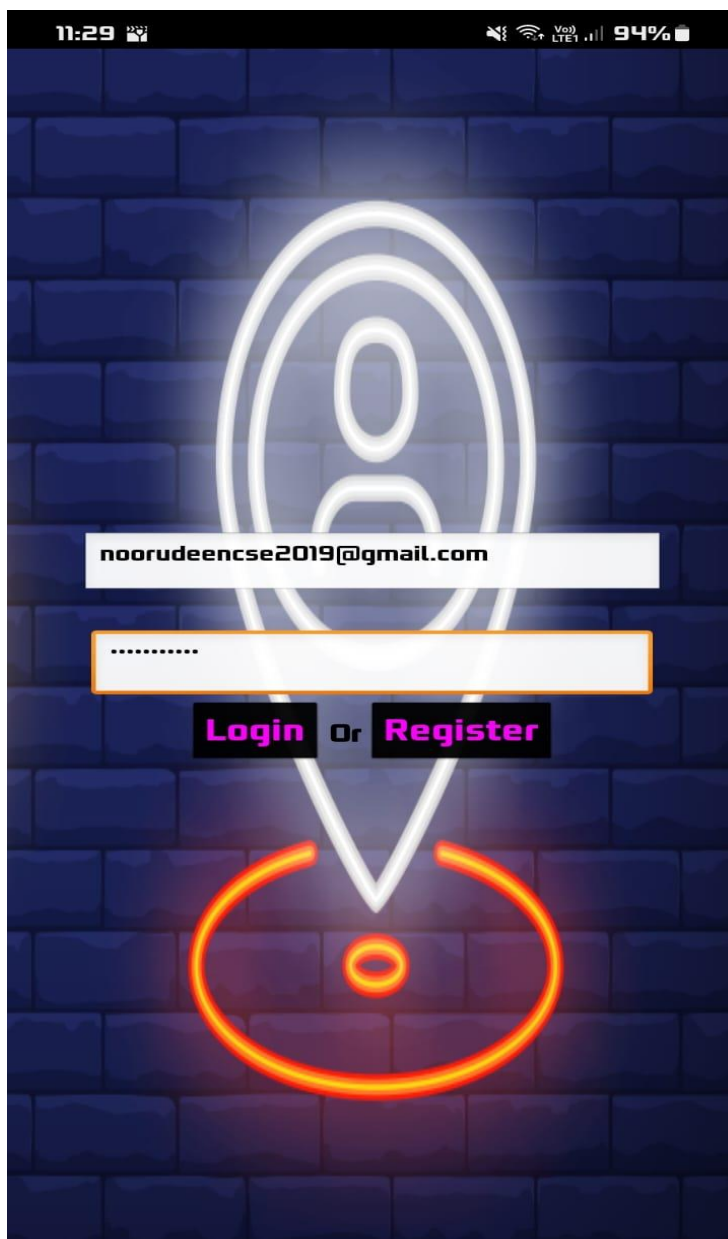
Verification mail:
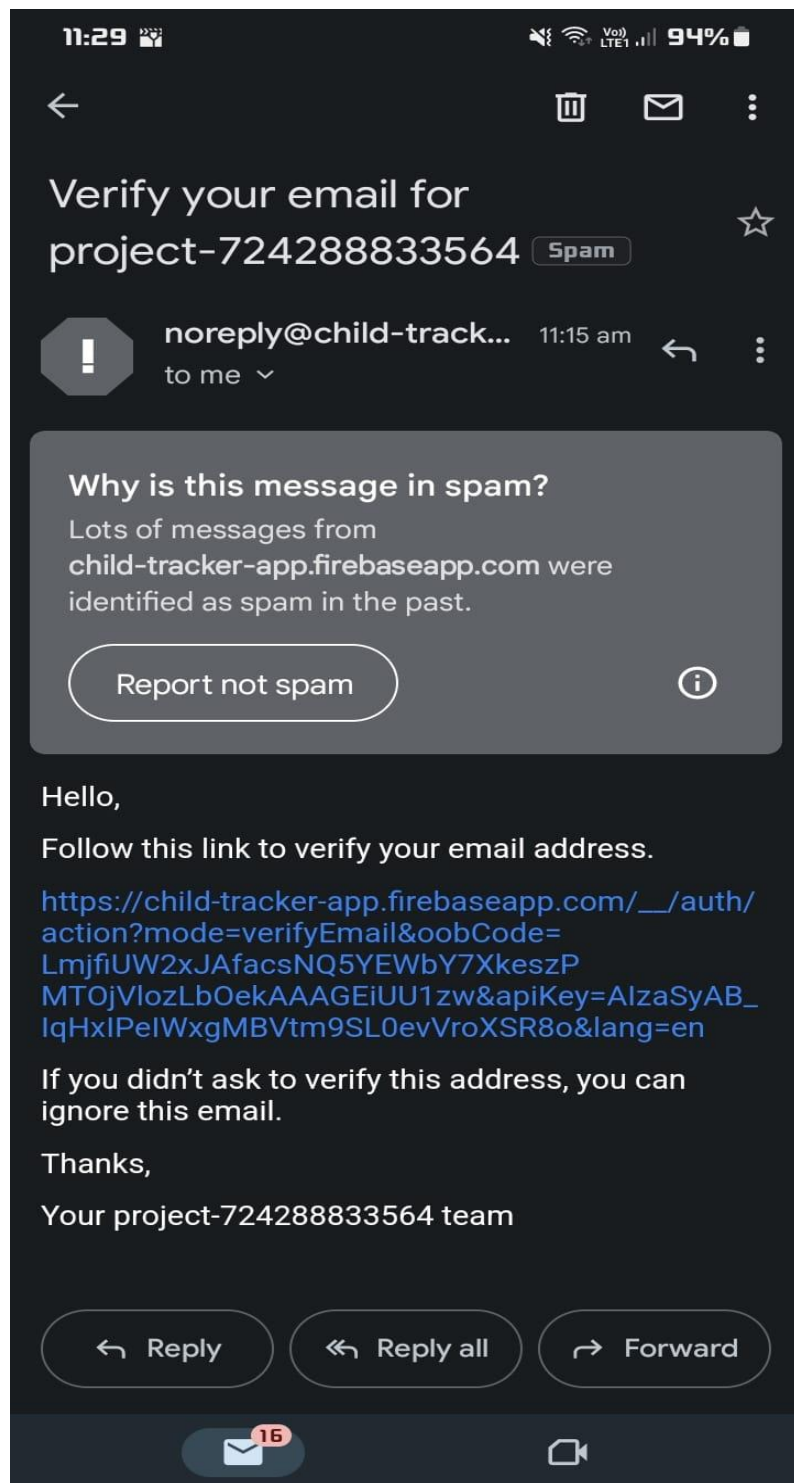
Geofence:

Notification

10 ADVANTAGES & DISADVANTAGE

10.1 ADVANTAGES

- ❖ Live Location Tracking
- ❖ Panic Alert System
- ❖ Stay Connected Feature

10.2 DISADVANTAGES

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

11 CONCLUSION

This research demonstrates Smart IoT device for child safety and tracking, to help the parents to locate and monitor their children. If any abnormal readings are detected by the sensor, then an SMS and phone call is triggered to the parent's mobile. Also, updated to the parental app through the cloud. The system is equipped with GSM and GPS modules for sending and receiving call, SMS between safety gadget and parental phone. The system also consists of Wi-Fi module used to implement IoT and send all the monitored parameters to the cloud for android app monitoring on parental phone. Panic alert system is used during panic situations alerts are sent to the parental phone, seeking for help also the alert parameters are updated to the cloud. 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 BLE listener gadget an alert is provided to itself.

12 FUTURE SCOPE

In our system, we automatically monitor the child in real time using Internet of Things, with the help of GPS, GSM, and Raspberry Pi. This system requires network connectivity, satellite communication, and high-speed data connection when we use web camera and GPS to lively monitor. It is difficult to monitor when there occurs any hindrance to satellite communication or any network issue. There also occurs time delay in video streaming through the server. Hence in the future, these issues can be overcome by using Zigbee concept or accessing the system without internet and using high-speed server transmission.

This system can be further enhanced by installation of minicamera inside smart gadget for better security so that live footage can be seen on parental phone during panic situations. The system can be modified by installation of small solar panels for charging the battery of smart gadget to gain maximum battery backup.

I3 Appendix

13.1 Source Code link

https://github.com/IBM-EPBL/IBM-Project-43380-1660716436.git

13.2 Demo Link

https://drive.google.com/file/d/1VgoZ0PMMxvNMobUGRMtGkvOLkev_zzm7/view?usp=drivesdk

13.3 app demo link

https://drive.google.com/file/d/1VmkmBhbhutVSyGMCcZM09rpnBs6-EAc4/view?usp=drivesdk