

PROJECT REPORT

IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING AND NOTIFICATION

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1.INTRODUCTION:

Internet of Things (IoT) plays a major role in every day to day life. The major difference between IoT and embedded system is that a dedicated protocol/software is embedded in the chip in case of embedded system, whereas, IoT devices are smart devices, which are able to take decisions by sensing the environment around the device. The development of sensors technology, availability of internet connected devices; data analysis algorithms make IoT devices to act smart in emergency situations without human interventions. So, IoT devices are applied in different fields such as agriculture, medical, industrial, security and communication applications. IoT systems are useful within a system to do deeper automation, analysis, and integration. IoT contributes to technology by advances in software, hardware and modern tools. It even uses existing and upcoming technology in the fields of sensing, networking and robotics. IoT brings global changes by its advanced elements in the social, economic, and political impact of the users.

1.1 PROJECT OVERVIEW:

Child safety and tracking is a major concern as the more number of crimes on children are reported nowadays. 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 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. The above system ensures the safety and tracking of children.

1.2 PURPOSE:

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 **W-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 4gadget is unplugged from hand a SMS is triggered to parental phone and the alert parameter is also updated to the cloud.

2. LITERATURE SURVEY:

2.1 Existing problem:

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 geo fence around the particular location. By continuously checking the child's location notifications will be generated if the child crosses the geo fence. 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.

2.2 References:

https://www.ijresm.com/Vol.3_2020/Vol3_Iss6_June20/IJRESM_V3_I6_79.pdf
https://www.academia.edu/37353956/IOT_Based_Child_Safety_Device
<https://www.ijitee.org/wp-content/uploads/papers/v8i8/H6836068819.pdf>

2.3 Problem Statement Definition:

Around the world, many children disappear each year and are not found. Runaways, parental abductions or kidnappings by others, these acts are difficult to prevent and have dire consequences on the children involved. Nowadays, crime rate associated with children keeps increasing due to which draws people attention regarding child safety.



miro

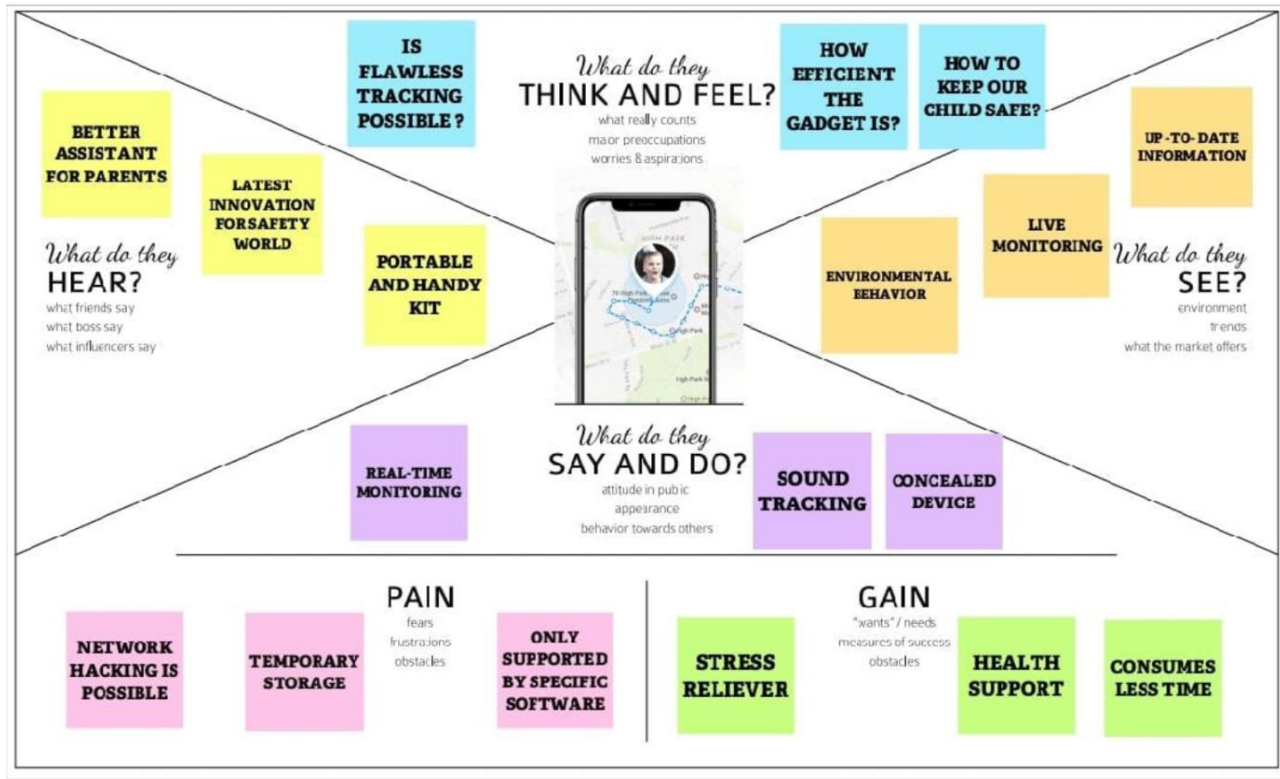
3. IDEATION & PROPOSED SOLUTION:

3.1 Empathy Map Canvas:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviors and attitudes.

It is a useful tool to help teams better understand their users.

Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.




3.2 Ideation & 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.

Step-1: Team Gathering, Collaboration and Select the ProblemStatement

Template



Brainstorm & idea prioritization

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.

10 minutes to prepare

1 hour to collaborate

2-8 people recommended

[Share template feedback](#)

2

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

1

Team gathering

Online who should participate in the session and send an invite. Share relevant information as you work ahead.

2

Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

3

Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#)

3

Define your problem statement

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

How might we find the location of the child and inform it to the parents via an application so that they can keep track of the child's location?

Key rules of brainstorming

To run an smooth and productive session

1

Stay in topic

2

Defer judgment

3

Go for volume

4

Encourage wild ideas

5

Listen to others

6

If possible, be visual

3

Brainstorm

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

⌚ 10 minutes

Tip
This tool is best used in a group setting and for the purpose of generating ideas (not decision-making).

DEEPENING

What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?
What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?
What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?

BROADENING

What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?
What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?
What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?

EXPLORING

What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?
What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?
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DEVELOPING

What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?
What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?
What are the underlying causes of the problem?	What are the underlying causes of the problem?	What are the underlying causes of the problem?

1

Group ideas

Take turns sharing your ideas while clustering similar or related ideas as you go. Once all sticky notes have been grouped, 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



2

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



3

After you collaborate

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

Quick add-ons

- Share the board**
Share a share link to the board with stakeholders to keep them in the loop about the collection of the board.
- Export the board**
Export a copy of the board as a PDF or PNG to share it with stakeholders to keep them in the loop about the collection of the board.

Every meeting forward

- Strategy Mapping**
Define the components of a new idea or strategy.
- Customer experience journey map**
Document customer needs, interactions, and obstacles for an experience.
- Strengths, weaknesses, opportunities & threats**
Identify strengths, weaknesses, opportunities, and threats (SWOT) for a project.

20 minutes

3.3 Proposed Solution:

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	<p>Kids are the heartbeat of parents. Today, there is an increased concern for their safety especially when crimes against children are increasing rapidly.</p> <p>Primarily special children require continuous monitoring from their parents thus restricting their freedom.</p> <p>With the lack of availability of affordable child monitoring systems, it is hard to monitor the whereabouts of children. The safety of children is very critical since they cannot protect themselves.</p>
2.	Idea / Solution description	<p>This project proposes a smart IoT Based device that can help reduce parents' insecurity with regards to their children's whereabouts in real-time. Our project assists the parents to continuously monitor their child's location. A geofence also called a "circle of safety" is created around the child within a particular location.</p> <p>This guarantees that the parent can leave their child within the geofence and the child's location is continuously monitored.</p> <p>If the child crosses the geofence by any chance notification will be generated.</p> <p>These notifications will be sent according to the child's location to their parents or caretakers.</p>
3.	Novelty / Uniqueness	<p>The novelty of this project is that immediate notifications would be sent to the parent or caretakers as soon as the child crosses the geofence.</p> <p>This can ensure that the required actions can be taken by the parent.</p> <p>Through this, child safety can be ensured and the crime rates can be reduced.</p> <p>Through this project, the location of the child can be stored in a database as well.</p>

4.	Social Impact / Customer Satisfaction	<p>According to parents, children with special needs requires to be in their sight while enjoying their own freedom. This project improves the safety index of places.</p> <p>The location of the child is being continuously monitored thus child safety can be ensured and the crime rates can be reduced.</p> <p>By this system, it is comparatively easier to keep a track of a child's current location.</p>
5.	Business Model (Revenue Model)	<p>This project can be sold to parents having special children on a monthly subscription basis. This project also has higher scope when sold to children's centres.</p> <p>As this project is very cost-efficient and affordable it can be easily purchased by people.</p>
6.	Scalability of the Solution	<p>In our system, we automatically monitor the child in real-time using the Internet of Things, and GPS. This project can be further improvised by including a panic button using which the child can alert the parent at the time of trouble.</p> <p>A heartbeat and temperature sensor can also be integrated with this project to monitor the child's health.</p>

3.4 Problem Solution fit:

Define CS, fit into CC	CUSTOMER SEGMENTS CS This helps the parents to track the daily activity of children and helps to find the child using GPS location.	CUSTOMER LIMITATION CC It is fully about safety and secured electronic system for child . Less tension to Parents.	AVAILABLE SOLUTION AS In Previous method, the model created which can be capable of handling the battery for long time. Nowadays, the system proposes a location tracking facilities and speeding monitoring using GPS, GSM with IOT technology for child safety at low cost which can be affordable by the people.	Explore AS
	PROBLEMS/PAINS PR The child safety is a complex far reaching health priority, which requires holistics ways of identifying safety issues.	PROBLEM ROOT/CAUSE RC It fears frustration obstacles and understanding the working of the system. Due to this solution, the kidnapping rate will be decreased.	BEHAVIOUR BE It mainly focus on improving parent-child interactions, home safety and child health care as well as monitoring.	Understand RC
Identify strong TR & EM	TRIGGERS TO ACT TR The parents are working with new and various technology. So, they should monitor their child's activity daily.	YOUR SOLUTION SL The parents can monitor their child each and every second. If the child is in danger, they notified by SMS through their device and their parents can save them.	CHANNELS OF BEHAVIOUR CH Children and their parents are tuning to digital solutions more than ever to support children's learning.	Extract online & offline CH of BE
	EMOTIONS EM Due to this, the emotional and mental stability of the children gets affected which in turn ruins their career and future.		While digital solutions provide huge opportunities for sustaining and promoting children's right	

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 Gmail Registration through phone number
FR-2	User Confirmation	<ul style="list-style-type: none"> Confirmation via Email

		<ul style="list-style-type: none"> ● Confirmation via OTP
FR-3	App installation	<ul style="list-style-type: none"> ● Installation through link ● Installation through play store
FR-4	Settings geo fence	<ul style="list-style-type: none"> ● Setting by user to find child location
FR-5	Detecting child location	<ul style="list-style-type: none"> ● Detecting location via app ● Detecting location via SMS
FR-6	User Interface	<ul style="list-style-type: none"> ● User Login Form. ● Admin Login Form.
FR-7	Database	<ul style="list-style-type: none"> ● Stored in cloud for seamless connectivity. ● Parents and kids link with the distance and the location values obtained from the mobile devices are stored here. ● The values include parent id, kidid, distance, longitude, latitude etc.
FR-8	Server	<ul style="list-style-type: none"> ● It connects the database and the frontend application. ● The backend server has been implemented to run as a service and is deployed in an IBM cloud instance. ● The backend server has been implemented to run as a service and is deployed in an IBM cloud instance.
FR-9	GPS tracking	<ul style="list-style-type: none"> ● The system is implemented with a GPS module, which acquires the location

		information of the user and stores it to the database.
FR-10	API	<ul style="list-style-type: none"> ● The value collected is sent to the database using an API.
FR-11	React JS	<ul style="list-style-type: none"> ● We are using react is as front end for us project. ● Node JS for the back end we are using node .
FR-12	GPS modules	<ul style="list-style-type: none"> ● It receives data directly from satellites
FR-13	Battery Life	<ul style="list-style-type: none"> ● If the child or parent forgets to charge the device for a whole day then also the device will work. That's why we aim to make this device last the whole day with one charge. ● It should be long-lasting.
FR-14	Location History	<ul style="list-style-type: none"> ● The location history will help to track the child's activity so that the aren't will be updated. Location history will be there for 30 days. ● For example if the child gets missing with the help of location history the aren't can track down their child's activity and also can find their child.

4.2 Non-Functional requirements:

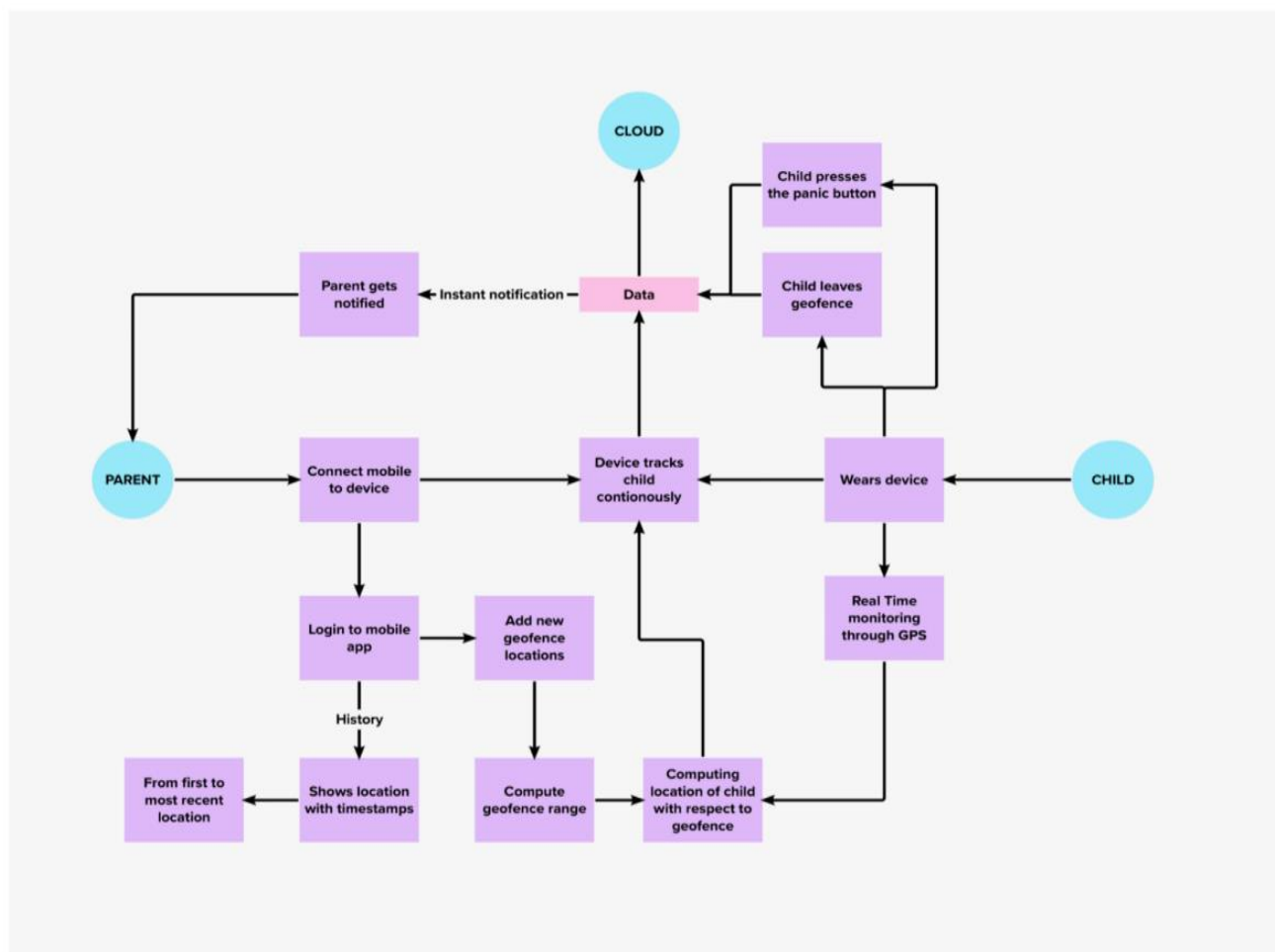
NFR NO	Non-functional Requirements	DESCRIPTION
NFR-1	Usability	<ul style="list-style-type: none"> ● Device have GSM can help to inform the parents or relatives about the current situations of the child by deliver the message immediately to save the child.
NFR-2	Security	<ul style="list-style-type: none"> ● Make children parents more assure about their kid's security, we have a feature in our device called Geo- Fence. ● Whenever your child crosses that specific area, you will get an instant notification on your phone.
NFR-3	Reliability	<ul style="list-style-type: none"> ● Portable ● Easy to use ● Flexibility
NFR-4	Performance	<ul style="list-style-type: none"> ● Create a Child tracker which helps the parents with continuously monitoring the translocation. ● The notification will be sent according to the

		<p>child's location to their parents or caretakers.</p> <ul style="list-style-type: none"> ● The entire location data will be stored in the database.
NFR-5	Availability	<ul style="list-style-type: none"> ● Track your child even in a crowd ● Get travel details of kids at any time <p>Know the current location</p>
NFR-6	Scalability	<ul style="list-style-type: none"> ● Gadget ensures the safety and tracking of the children. ● Parents need not worry about their children.
NFR-7	Availability	<ul style="list-style-type: none"> ● The system should be able to deliver promptly to the financing authority. ● In the case of non-profit organizations, the solution should be 'advancing the mission'.
NFR-8	Dynamic	<ul style="list-style-type: none"> ● IoT devices may have the capability to adapt dynamically and

		change based on their conditions
NFR-9	Desirability	<ul style="list-style-type: none"> Navigation should be made easy. The user should be able to search and find the information he needs without much hassle.

5. PROJECT DESIGN:

5.1 Data Flow Diagram:



5.2 Solution & Technical Architecture:

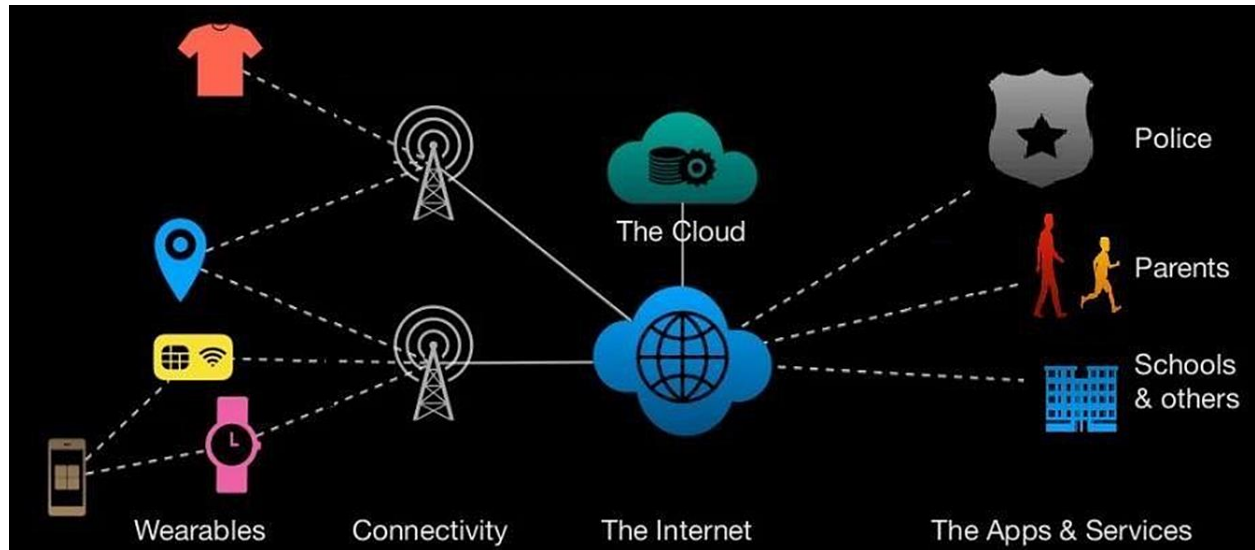


Table-1 : Components & Technologies:

Component	Description	Technology
User Interface	Web UI, Mobile App.	HTML, CSS, JavaScript
Application Logic-1	Code Development Phase	Python
Application Logic-2	Interfacing purposes	IBM WatsonAssistant
Browser-based flow editor	Visual Programming	Node Red
Cloud Database	Database Service on Cloud	IBM Cloud
File Storage	Usage of IBM Cloud Storage	IBM Block Storage
Infrastructure (Server/Cloud)	Application Deployment on Local Server	Cloud Platform

Table-2: Application Characteristics:

Characteristics	Description	Technology
Open-SourceFrameworks	A template for software development that is designed by a social network.	IBM Watson Platform, NodeRed.
Security Implementations	Each and every parent should take care of their own children, without letting them to fall into the dark world of abuses, which entirely ruin them physically, mentally and emotionally destroying our future. Hence, considering the importance of our future, our project makes it easy for parents to track their children and to visually monitor them on regular basis, which makes them ensure the safety of their children and reduces the rate of incidents of child abuse.	Notifications and Alerts
Scalable Architecture	If any abnormal values are read by the sensor, then an SMS is sent to the parents mobile and an MMS indicating an image captured by the serial camera is also sent. The future scope of the	Implementation using Software.

	work is to implement the IoT device which ensures the complete solution for child safety problems.	
Availability	The solution represented takes advantages of Open-source platforms.	NODE RED, IBM cloud, IBM IoT platform.
Performance	GPS is useful for tracking child and also provides the information where the child is currently located as well as it also informs the parents how long his child is far away from his parents. SMS services used when smart phones do not support internet connectivity in this case child is able to send a text message or exact location in the parents. This system is going to help the parents to track the location of their children without informing them because their movement is displayed on the parent's phone.	GPS

5.3 User Stories:

User Type	Functional Requirement	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user) and (Web user)	Registration	USN-1	As a user, I can register my account by entering my email, password, and confirming my password	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered myself	I can receive confirmation Email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through google account	I can register & access the dashboard with google account Login	High	Sprint-2
	Login	USN-4	As a user, I can log into the application by entering user id & password		High	Sprint-1
	Dashboard					
Customer Care Executive	Login		As I enter I can view the	I can login only with	Medium	Sprint - 3

			working of the application and scan for any glitches and monitor the operation and check if all the users are authorized	myprovided credentials		
Administrator	Login		Maintaining and making sure the database containing the locations are secure and accurate and updated constantly.	I can login only with myprovided credentials	High	sprint-3

6. PROJECT PLANNING & SCHEDULING:

6.1 Sprint Planning & Estimation:

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Create product backlog and sprint 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, and confirming my password.	7	High	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint-1	Confirmation	USN-2	As a user, I will receive confirmation email once I have registered for the application	7	High	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint-1	Login	USN-3	As a user, I can log into the application by entering email & password	6	Medium	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2	Dashboard	USN-4	As a user, I can monitor the child's location 24/7 and view the functions	7	High	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint-2	Notification	USN-5	As a user, I should be able to notify my parent and guardian in emergency situations	7	High	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint-2	Login	<u>USN-3</u>	As a user, I can register for the application through my Google Account	6	Low	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint-3	Application	USN-6	The App should get inputs from the user	5	High	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint-3	IOT Device – Watson Communication	USN-7	The device should be integrated with IBM Watson	5	High	Akshaya J Deepika G Dharani K Ezhilarasi S

Sprint-3	Watson – Node RED Communication	USN-8	The data from IBM Watson is sent to Node RED	5	High	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Node RED- Cloudant DB communication	USN-9	The data from Node-RED should be properly integrated with Cloudant DB	5	High	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint-4	Geofencing	USN-10	The geofencing of the child should be done based on the geographical coordinates	10	High	Akshaya J Deepika G Dharani K Ezhilarasi S
Sprint-4	Data Security	USN-11	Maintaining and making sure the database containing the locations are secure and accurate and is updated constantly.	10	High	Akshaya J Deepika G Dharani K Ezhilarasi S

6.2 Sprint Delivery Schedule:

Project Tracker, Velocity & Burndown Chart: (4 Marks)

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	On Process
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	On Process

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \text{Sprint Duration} = 20/6 = 3.33$$

Velocity

7. CODING & SOLUTIONING:

7.1 Feature 1:

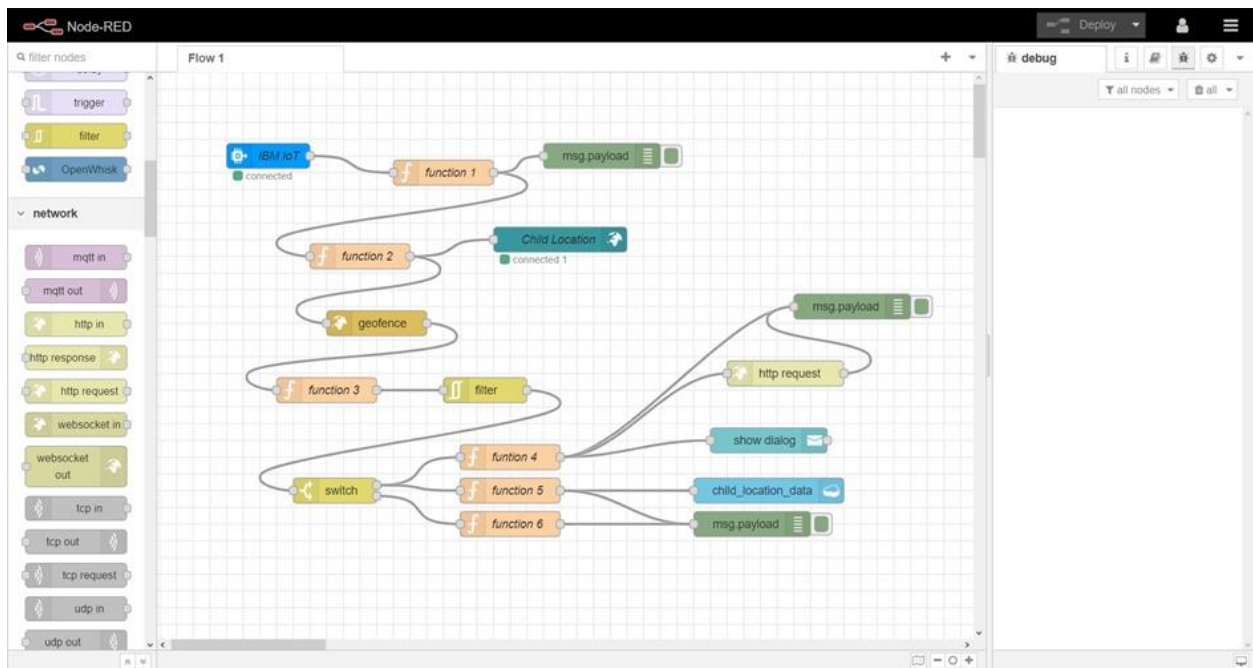
```
#include <TinyGPSPlus.h>
TinyGPSPlus GPS;
void setup()
{
  Serial.begin(9600);
  Serial2.begin(9600);
  delay(3000);
}
void loop()
{
  while (Serial2.available() > 0)
  if (gps.encode(Serial2.read()))
  displayInfo();
  if (mill is() > 5000 && gps.charsProcessed() < 10)
  {
    Serial.println(F("No GPS detected: check wiring."));
    while (true);
  }
}
void displayInfo()
{
  Serial.print(F("Location: "));
  if (gps.location.isValid())
  {
    Serial.print("Lat: ");
    Serial.print(gps.location.lat(), 6);
    Serial.print(F(", "));
    Serial.print("Lng: ");
    Serial.print(gps.location.lng(), 6);
    Serial.println();
  }
  else
  {
    Serial.print(F("INVALID"));
  }
}
```

```
}  
}  
void updateSerial()  
{  
  delay(500);  
  while (Serial.available())  
  {  
    Serial2.write(Serial.read()); //Forward what Serial received to Software Serial  
    Port  
  }  
  while (Serial2.available())  
  {  
    Serial.write(Serial2.read()); //Forward what Software Serial received to Serial  
    Port  
  }  
}
```

7.2 Feature 2:

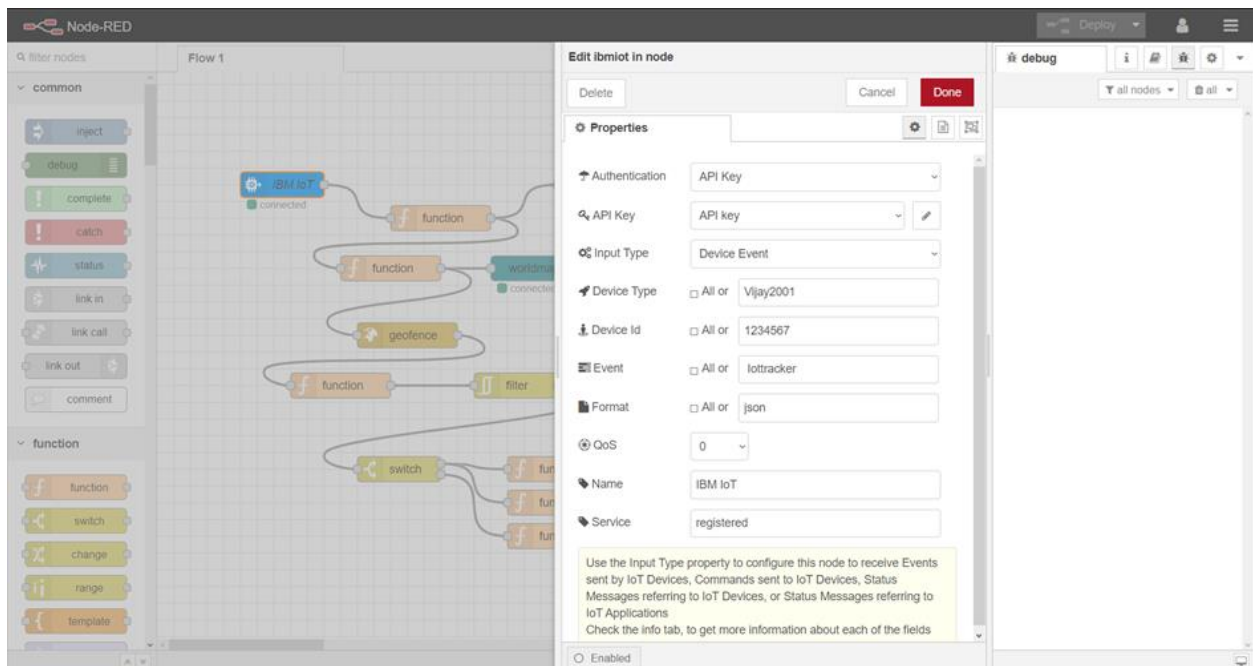
Step 1:

- Created node-red flow using worldmap, geofence, cloudant, and http request to locate the child.



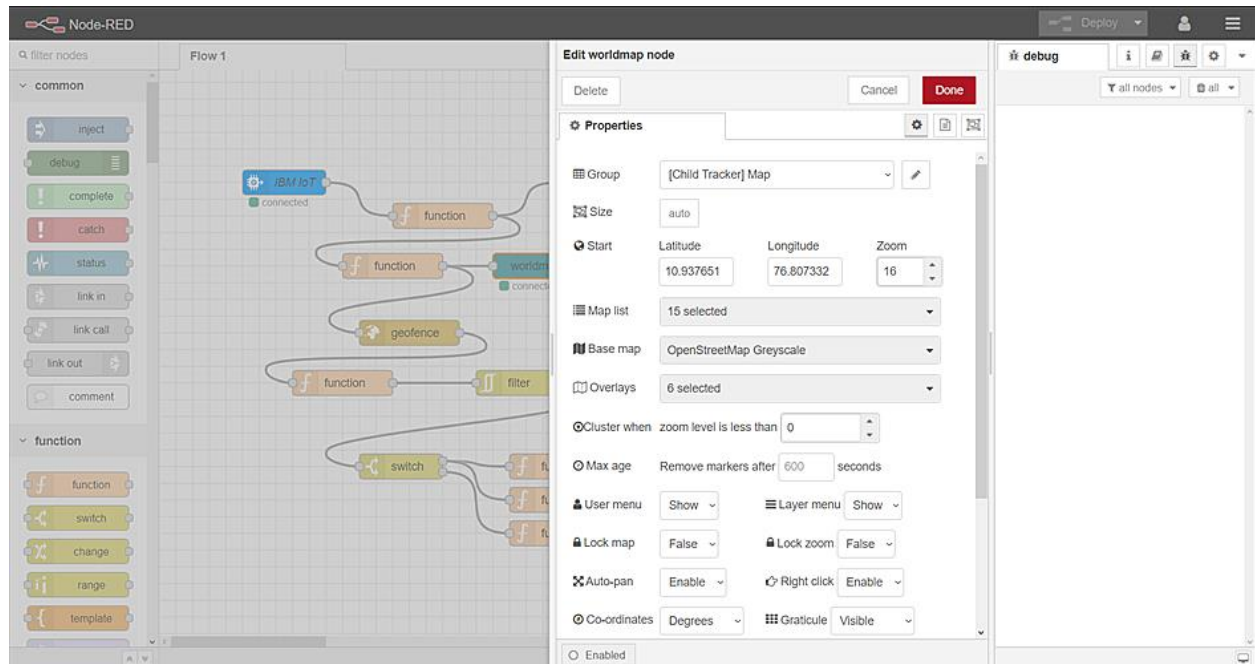
Step 2:

- Connected IBM IoT node in node-red to IBM Watson IoT using device credentials.



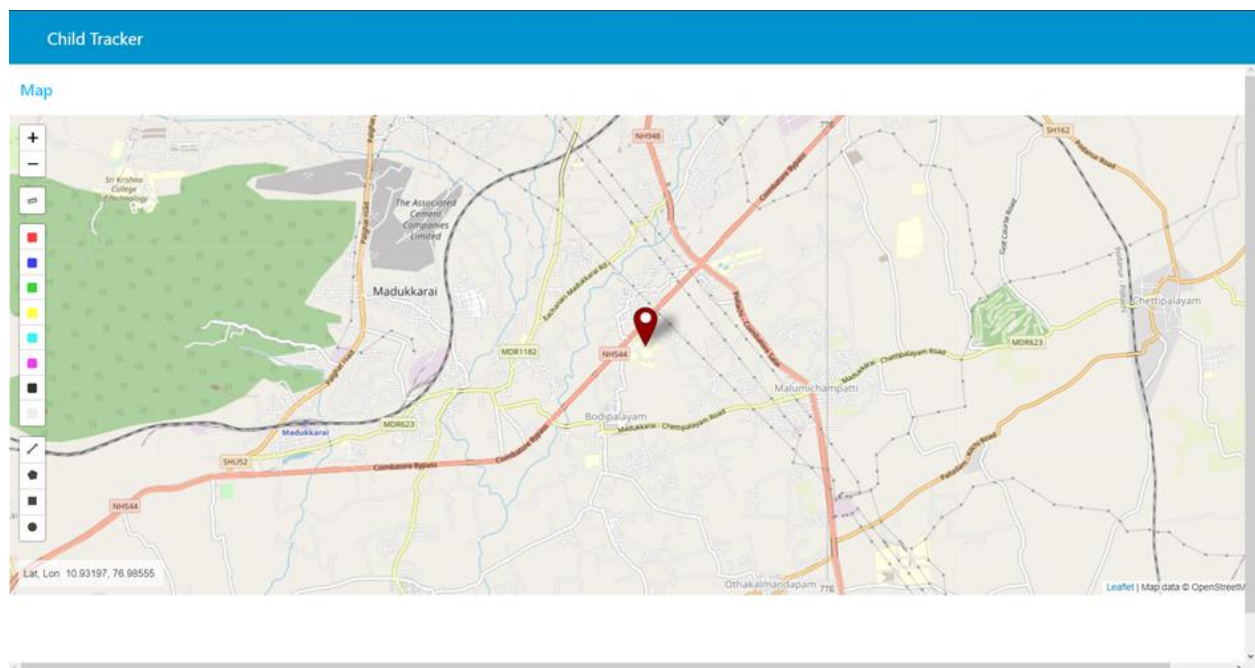
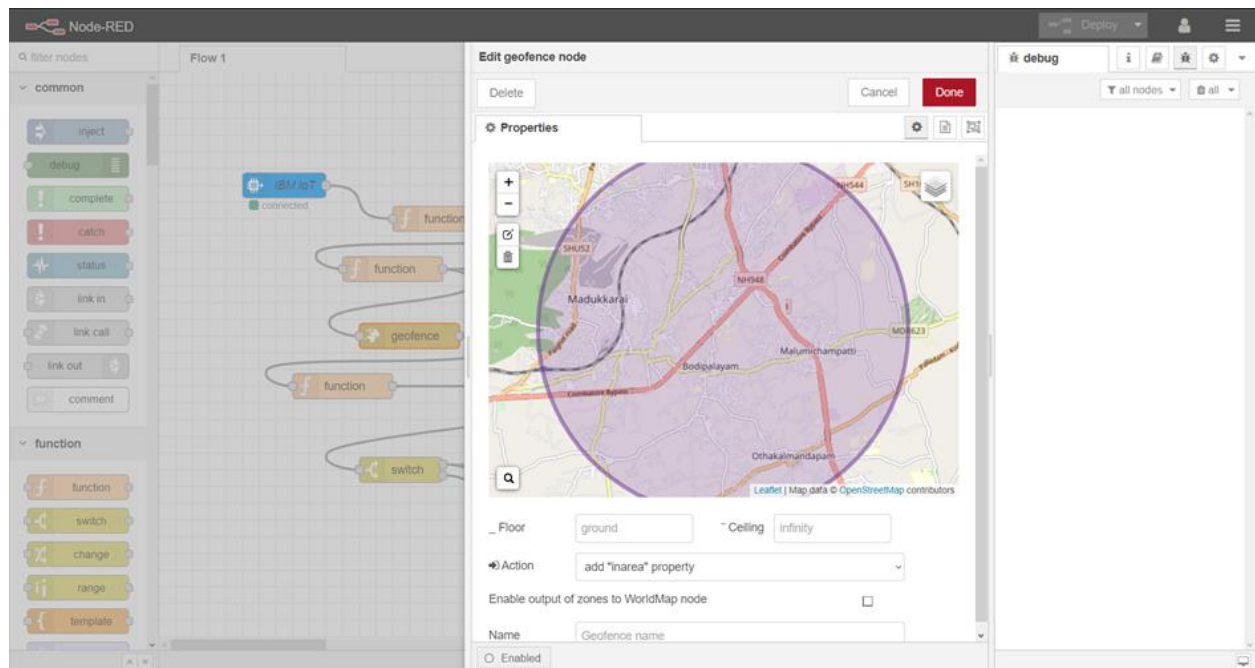
STEP 3:

- Created worldmap_ui to show the child location in user interface page of node-red



Step 4:

- Connected geofence to keep the child safe inside the parent or caretaker's monitoring



8. TESTING:

8.1 Test Cases:

8.1.1 Functional test cases:

- To verify the performance to create a Child tracker which helps the parents with continuously monitoring the translocation.

- To verify scalability testing.
- To verify security testing.
- To verify usability testing.

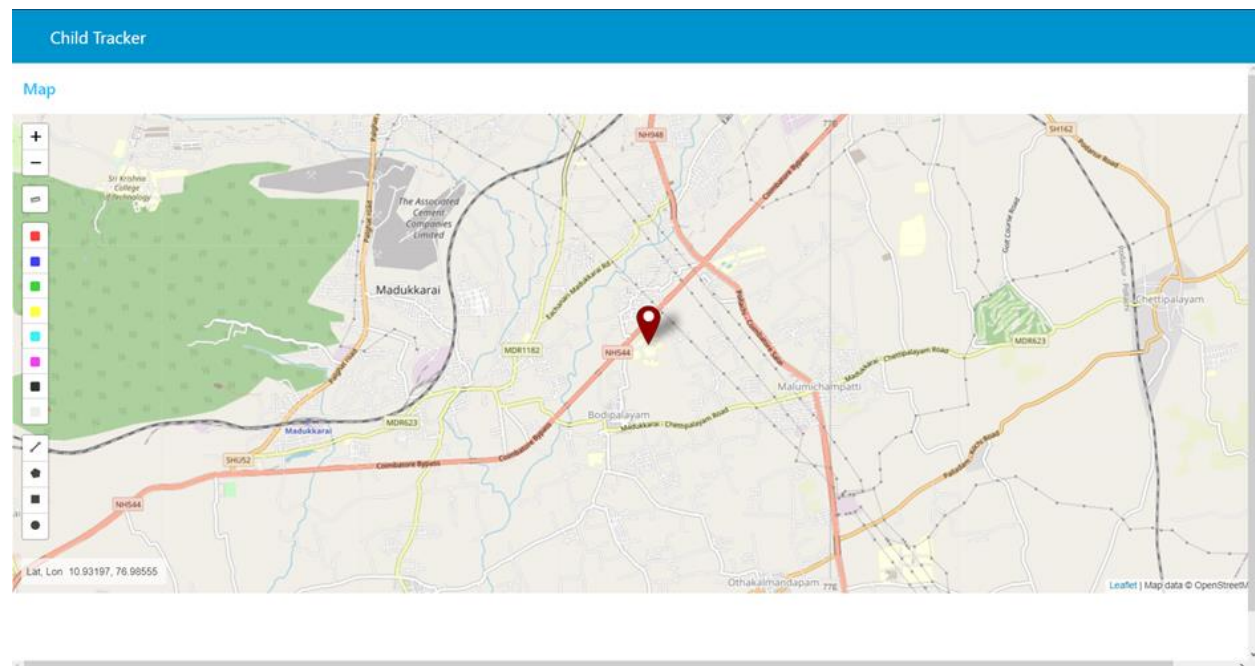
8.2 User Acceptance Testing:

8.2.1 Performance Testing:

- To verify the settings for geo fence.
- To verify the user interface.
- To verify detecting child location.
- To verify API key is correct or not.

9. RESULTS:

9.1 Performance Metrics:



- Store the location coordinates in database

child_location_data

Document ID

Options

{ } JSON

All Documents

Query

Permissions

Changes

Design Documents

Table

Metadata

{ } JSON

Create Document

	_id	deviceId	deviceType	eventType	format
<input type="checkbox"/>	0868d74e98d7df1304e...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	0e969041ae8c8270d3e...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	157ac8402bfb1ac16f4e...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	3adc73c6976026de939...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	4091267391f2effd2c49...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	614090b2566fce401c...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	6a2704e478a02b6d7ca...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	6a80894819b94d31a94...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	85eb9cafd6373bd0670...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	9ed31bd378c7e01a9c8...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	bd327c90bb303f02890...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	bf8d0ec61d74dc3f53a7...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	c327345e7901f08e4f41...	1234567	Vijay2001	Iottracker	json
<input type="checkbox"/>	d6483b57fff8aa6c7a17...	1234567	Vijay2001	Iottracker	json

Showing 5 of 9 columns. ☐ Show all columns.

Showing document 1 - 15. Documents per page: 20

child_location_data

Document ID

Options

{ } JSON

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Table

Metadata

{ } JSON

Create Document

id "0868d74e98d7df1304efe9d5eda8e5cb"

```

{
  "id": "0868d74e98d7df1304efe9d5eda8e5cb",
  "key": "0868d74e98d7df1304efe9d5eda8e5cb",
  "value": {
    "rev": "1-296b426c3354c72acf8368201fb331ff"
  },
  "doc": {
    "_id": "0868d74e98d7df1304efe9d5eda8e5cb",
    "_rev": "1-296b426c3354c72acf8368201fb331ff",
    "topic": "iot-2/type/Vijay2001/id/1234567/evt/Iottracker/fmt/json",
    "payload": {
      "message": "Exit",
      "Time": "11/17/2022, 8:28:49 PM",
      "name": "Child Location",
      "lat": 10.952114,
      "lon": 76.956643
    },
    "deviceId": "1234567",
    "deviceType": "Vijay2001",
    "eventType": "Iottracker",
    "format": "json",
    "location": {
      "inarea": false
    }
  }
}

```

id "0e969041ae8c8270d3e7d4b08a725e2c"

Showing document 1 - 15. Documents per page: 20

- Child tracking
- Location history

10. ADVANTAGES & DISADVANTAGES:

ADVANTAGES:

- The parameters such as touch, temperature & heartbeat of the child are used for parametric analysis and results are plotted for the same.
- The advantages of smart phones which offers rich features like Google maps, GPS, SMS etc.

DISADVANTAGES:

- This system is unable to sense human behavior of child.
- To implement the IoT device which ensures the complete solution for child safety problems.

11. CONCLUSION:

The 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 parents 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:

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.

13. APPENDIX:

Source Code:

```
import random as rand
import time
import ibmiotf.application
import ibmiotf.device
```

```

import sys
import imdb

#defining credentials of device
organization = "aa13kc"
deviceType = "Vijay2001"
deviceId = "1234567"
authMethod = "token"
authToken = "Yd-6ozY-S6BLhM0vkw"

def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    try:
        deviceOptions = {"org" : organization, "type": deviceType, "id" : deviceId, "auth-
            method" : authMethod, "auth-token" : authToken}
        deviceCli = ibmiotf.device.Client(deviceOptions)

    except Exception as e:
        print("Caught exception connecting device: %s" %str(e))
        sys.exit()
        deviceCli.connect()
        while True:
            name= "Child Location"
            #latitude= 10.908532
            #longitude= 76.979312

            latitude= 10.952114
            longitude= 76.956643

            data = {'name':name,'lat' : latitude,
                'lon': longitude}
            def myOnPublishCallback():
                print("Published all data to IBM Watson :",latitude," ",longitude)
                success =
                deviceCli.publishEvent("Iottracker","json",data,qos=0,on_publish=myOnPublishC
                    allback)
                if not success:
                    print("Not connected to IoT Device")
                    time.sleep(10)

```

```
deviceCli.commandCallback = myCommandCallback
```

```
deviceCli.disconnect()
```