

# PROJECT REPORT FORMAT

**TEAM ID: PNT2022TMID00392**

**TITLE: IoT Based Safety Gadget for Child Safety  
Monitoring & Notification**

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# INTRODUCTION

## PROJECT OVERVIEW

A child monitoring system assists parents in constantly monitoring their child's location. They can simply leave their children at school or in parks and set up a geofence around the location. Notifications will be generated if the child crosses the geofence by continuously monitoring the child's location. Notifications will be sent to the child's parents or caregivers based on their location. The database will incorporate all of the location data.

## PURPOSE

The overall percentage of child abuse cases filed nowadays in the world is about 80%, out of which 74% are girl children and the rest are boys. For every 40 seconds, a child goes missing in this world. Children are the backbone of one's nation, if the future of children was affected, it would impact the entire growth of that nation. Due to the abuse cases, the emotional and mental stability of the children gets affected which in turn ruins their career and future. These innocent children are not responsible for what happens to them. So, parents are responsible for taking care of their own children. But, due to economic condition and aims to focus on their child's future and career, parents are forced to crave for money. Hence, it becomes difficult to cling on to their children all the time. In our system, we provide an environment where this problem can be resolved in an efficient manner. It makes parents to easily monitor their children in real time just like staying beside them as well as focusing on their own career without any manual intervention. In order to address the stated issues, it is required to ensure the following objectives

- Real time monitoring
- Collection of data
- Authentication

# LITERATURE SURVEY

## EXISTING PROBLEM

**B. Gadgay, D. C. Shubhangi and C. Maheshwari** in [1] proposed that with the coming of new economically accessible purchaser grade health and well-being gadgets, it is currently conceivable and extremely normal for consumer to acquire, store, share and find out about a portion of their significant measurements, for example, steps taken, pulse, nature of rest and skin temperature. For gadgets with this wearable innovation, it is normal to discover these sensors inserted in a savvy, or committed wearable wrist groups to such an extent that among different function.

**Shannon M. Bryant, Paul Oppold, Michael Schwartz, Glenn Martin** in [2] proposed that wearable devices seem to be ubiquitous in today's world. From a runner tracking their jogging route, to the gamification of exercising by achieving steps, to keeping up with notifications from apps and calendar updates, wearables serve as multi-functional devices that attempt to track, analyze, and provide insights about wellness data in our everyday lives. Although wearables among adults have seen an increase since 2016 in usage of approximately 9%, the percent usage for children under the age 18 is largely undocumented (Liu, 2019). This article focuses on discovering parental needs for remote health monitoring in children and leveraging those needs to recommend device specifications and design guidelines for future children's wearable devices.

**Senthamilarasi, N. & Bharathi, N. & Ezhilarasi, D. & Sangavi, R.B.** in [3] proposed that the overall percentage of child abuse cases filed nowadays in the world is about 80%, out of which 74% are girl children and the rest are boys. For every 40 seconds, a child goes missing in this world. Children are the backbone of one's nation, if the future of children was affected, it would impact the entire growth of that nation. Due to the abuse cases, the emotional and mental stability of the children gets affected which in turn ruins their career and future.

**AkashMoodbidri, Hamid Shahnasser** in [4] proposed in 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 facilitates its management and provides useful information about the children to authorized personnel. A complete prototype of the proposed system was implemented and tested to validate the system functionality. The results show that the system is promising for daily transportation safety.

## REFERENCE

1. B. Gadgay, D. C. Shubhangi and C. Maheshwari, "Remote child health monitoring system and personal safety," 2021 IEEE International Conference on Computation System and

Information Technology for Sustainable Solutions (CSITSS), 2021, pp. 1-4, doi: 10.1109/CSITSS54238.2021.9683548.

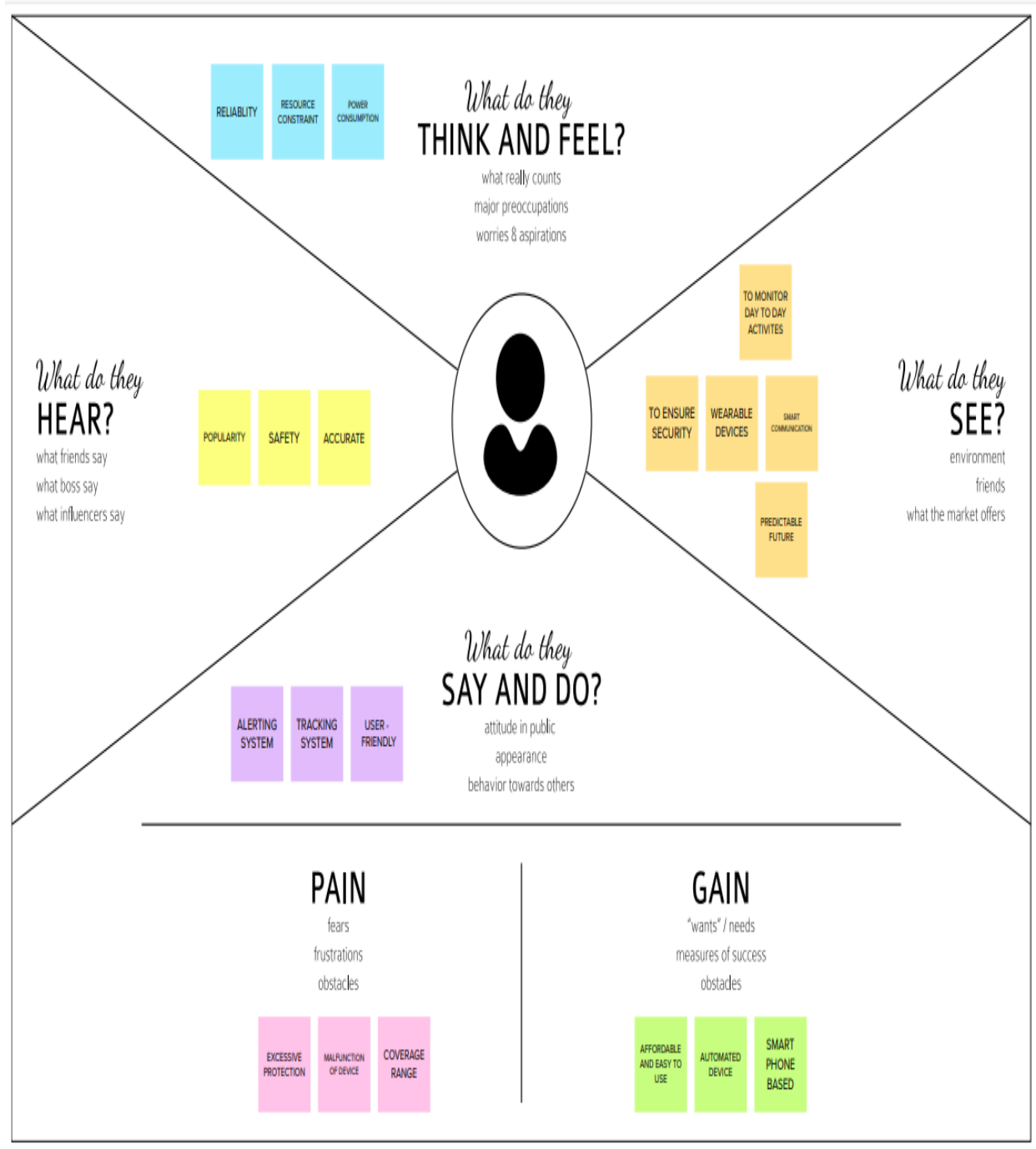
2. Shannon M. Bryant, Paul Oppold, Michael Schwartz, Glenn Martin “ Remote Health Monitoring in Children: Needfinding in Parents”, 2021 Feb.
3. Senthamilarasi, N. & Bharathi, N. & Ezhilarasi, D. & Sangavi, R.B.. (2019). Child Safety Monitoring System Based on IoT. Journal of Physics: Conference Series. 1362. 012012. 10.1088/1742-6596/1362/1/012012.
4. AkashMoodbidri, Hamid Shahnasser, ”Child Safety Wearable Device”, Department of Electrical and Computer Engineering San Francisco State University.

### **PROBLEM STATEMENT DEFINITION**

A child monitoring system assists parents in constantly monitoring their child's location. They can simply leave their children at school or in parks and set up a geofence around the location. Notifications will be generated if the child crosses the geofence by continuously monitoring the child's location. Notifications will be sent to the child's parents or caregivers based on their location. The database will incorporate all of the location data.

# IDEATION & PROPOSED SOLUTION

## EMPATHY MAP CANVAS



## **IDEATION BRAINSTORMING**

VISHALI E – 312319106177

- Present detection of your child's movements
- GPS integrated bag/watch
- Integration with Cloud services

SANDHIYA S – 312319106136

- Development of web application
- Incorporation with parent's mobile
- Creation of end user application

RACHEL A – 312319106125

- RFID based tracking
- Design of smart watches
- Integration with police in case of emergency

SONALI V – 312319106151

- RFID based home in and out tracking
- Formation of mobile application
- Call to parent in case of emergency

### **TOP 3**

- Development of web application
- Design of smart watches
- Integration with Cloud services

## **PROPOSED SOLUTION**

<b>S.No.</b>	<b>Parameter</b>	<b>Description</b>
1.	Problem Statement (Problem to be solved)	Schools and parents are concerned about their children's transportation to and from school



		and other locations. As a result, ensuring the safety and monitoring of schoolchildren is incredibly difficult.	
2.	Idea / Solution description	A child monitoring system assists parents in constantly monitoring their child's location. They can simply leave their children at school or in parks and set up a geofence around the location. Notifications will be generated if the child crosses the geofence by continuously monitoring the child's location. Notifications will be sent to the child's parents or caregivers based on their location. The database will incorporate all of the location data.	
3.	Novelty / Uniqueness	Since the IBM Watson IoT Platform is a managed cloud-hosted solution offering device connectivity, control, visualisation, and overall device visibility and management, using it in conjunction with node red and TinkerCAD simulation gives our solution an added edge. It offers a user interface (UI) where users may add and manage devices, manage access to IoT services, and utilise Node-RED to connect data flows between nodes in order to build functionality.	
4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> <li>Reasonably priced</li> <li>Simple to perceive</li> <li>Ensure security</li> <li>Timeliness</li> </ul>	
5.	Business Model (Revenue Model)	<u>KEY RESOURCES</u> <ul style="list-style-type: none"> <li>IBM Watson IoT Platform</li> <li>NODE – RED</li> <li>Tinker-CAD Simulation</li> </ul>	<u>CUSTOMER SEGMENTATION</u> <ul style="list-style-type: none"> <li>Parents</li> <li>Care Takers</li> <li>Teachers</li> </ul>
		<u>CUSTOMER RELATIONSHIPS</u> <ul style="list-style-type: none"> <li>User friendly</li> <li>Specialised care</li> <li>Efficient communication</li> </ul>	<u>MARKETING</u> <ul style="list-style-type: none"> <li>Awareness Programme</li> <li>Workshops</li> <li>Social Media</li> </ul>
6.	Scalability of the Solution	By adopting a networked information cloud through IoT, the major goal is to offer children with better and more effective security so that	

		professionals and parents may use this information. The finished product will have more features and be well-equipped. The ability of the necessary system design to address the specified problem area may be enhanced by the composition of more varied purpose equipment's.
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## PROBLEM SOLUTION FIT

### Project Design Phase-I - Solution Fit Template

<b>Define CS, fit into CC</b>	<b>1. CUSTOMER SEGMENT(S)</b> Who is your customer? I.e. working parents of 0-5 y.o. kids	<b>6. CUSTOMER CONSTRAINTS</b> What constraints prevent your customers from taking action or limit their choices of solutions? I.e. spending power, budget, no cash, network connection, available devices.	<b>5. AVAILABLE SOLUTIONS</b> Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? I.e. pen and paper is an alternative to digital notetaking	<b>Explore AS, differentiate</b>
	<ul style="list-style-type: none"> <li>Employed Parent's - IT professionals, Entrepreneurs</li> <li>Overseas Parenting</li> <li>Guardian – Caretakers, Teachers</li> </ul>	<ul style="list-style-type: none"> <li>Excessive Protection</li> <li>Malfunction of device</li> <li>Coverage range</li> <li>Power consumption</li> </ul>	<ul style="list-style-type: none"> <li>Paid Care Takers</li> <li><u>Pros:</u> Monitoring of child</li> <li><u>Cons:</u> Lack of concern</li> <li>Health trackers are readily available and often employed.</li> <li><u>Pros:</u> Basic health assessment</li> <li><u>Cons:</u> Safety is not personally observed.</li> </ul>	
<b>Focus on J&amp;P, tap into BE, understand RC</b>	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.	<b>9. PROBLEM ROOT CAUSE</b> What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.	<b>7. BEHAVIOUR</b> What does your customer do to address the problem and get the job done? I.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace)	<b>Focus on J&amp;P, tap into BE, understand RC</b>
	<ul style="list-style-type: none"> <li>To monitor day to day activities</li> <li>To ensure security</li> <li>Predictable Future</li> <li>Alerting system</li> </ul>	Schools and parents are concerned about their children's transportation to and from school and other locations. As a result, ensuring the safety and monitoring of school children is incredibly difficult.	<ul style="list-style-type: none"> <li>Arranging caretakers</li> <li>Monitoring students in school</li> <li>GPS tracking</li> <li>CCTV cameras</li> <li>Home Security systems</li> </ul>	



<div>3. TRIGGERS</div> <div>TR</div> <p>What triggers customers to act? <u>Like</u> seeing their <u>neighbour</u> installing solar panels, reading about a more efficient solution in the news.</p> <ul style="list-style-type: none"><li>• Popularity</li><li>• Accuracy</li><li>• Safety</li><li>• Reliability</li></ul>	<div>10. YOUR SOLUTION</div> <div>SL</div> <p>If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.</p> <p>If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer <u>desire</u>.</p> <p>A child tracking system helps parents stay informed of where their children are at all moments. They only need to put up a geofence around the site and leave their kids in the park or at school. By continuously tracking the child's whereabouts, alerts will be sent out if they go outside the geofence. Depending on where they are, notifications will be sent to the child's parents or guardians. All location information will be included in the database.</p>	<div>8. CHANNELS of BEHAVIOUR</div> <div>CH</div> <div>8.1 ONLINE</div> <p>What kind of actions do customers take online? Extract online channels from #7</p> <ul style="list-style-type: none"><li>• Tracking online</li><li>• Constant Monitoring</li></ul> <div>8.2 OFFLINE</div> <p>What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</p> <ul style="list-style-type: none"><li>• Continuously Following</li><li>• Communication on whereabouts</li></ul>
<div>4. EMOTIONS: BEFORE / AFTER</div> <div>EM</div> <p>How do customers feel when they face a problem or a job and afterwards?</p> <p><u>Like</u>, <u>fant</u>, <u>insecure</u> &gt; confident, in control - use it in your communication strategy &amp; design.</p> <ul style="list-style-type: none"><li>• Before – Uncertain, Lack of Security</li><li>• After – Foreseeable, Protection</li></ul>		

## REQUIREMENT ANALYSIS

### FUNCTIONAL REQUIREMENT

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	<b>Real time monitoring</b>	A strategy that makes it possible to ascertain the child's current position. It involves the zero- or low-latency delivery of continuously updated information streaming. Real-time monitoring software displays relevant data on customizable dashboards.
FR-2	<b>Collection of data</b>	Periodic data tracking with streaming and live updates. They detect and capture different kinds of data. These collections of data will then be sent to the cloud over the internet for securely process, analyze, monitor, store, access and retrieve data remotely. After that, the information indicating children's status, along with reference values will be sent to parents' devices.
FR-3	<b>Authentication</b>	IoT authentication methods, including digital certificates, two-factor or token-based authentication, hardware root of trust, and trusted execution environment. Admins who decide which IoT authentication method to use must consider the IoT device type, the data it transmits over the network and the device's location.
FR-4	<b>Geofencing</b>	The first objective is to obtain a latitude, longitude, and time information of a child's location in real-time using GPS tracker. The second objective is to develop a smartphone application that capable to track the location of children in real-time. The third objective is to evaluate the functionality of the developed smartphone application in tracking children's location. Features, advantages, and disadvantages of three commercialized application are compared to collect requirements.
FR-5	<b>Notification</b>	The sensors output data should be read from the child safety device. The counter time should be checked for time interval of 30minutes. For every 30minutes except serial camera, the data from GPS, temperature, touch, pulse rate data is pushed into the cloud. The monitoring parameters are displayed on webpage. The counter is reset to restart the timer. So as to post the data into the cloud for every 30minutes.

		The sensors data is continuously read by the controller. When the value of temperature read from the sensor crosses the threshold1, notification messages are sent.
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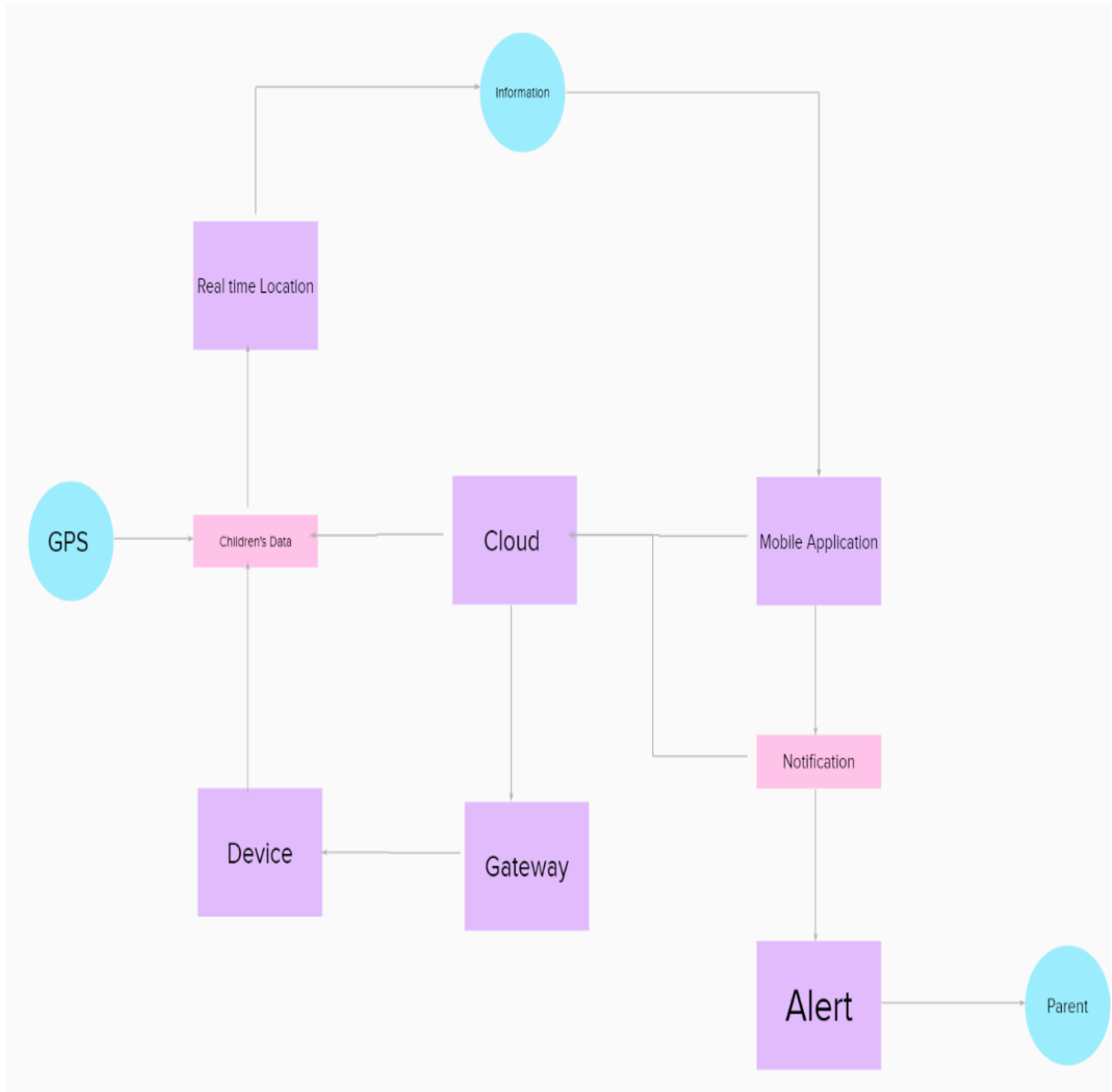
## NON-FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	The application is made to track the child's location round-the-clock. 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.
NFR-2	<b>Security</b>	Each and every parent should take care of their own children, without letting them to fall into the dark world of abuse, 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
NFR-3	<b>Reliability</b>	Schools and working places need high surveillance for ensuring the safety among children and women. Smart phones are playing major role for ensuring the safety, where some mobile based applications provide alert systems. During the emergency, mobile apps alert the control room of nearby police station or caretakers of children.
NFR-4	<b>Performance</b>	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 parents phone.
NFR-5	<b>Availability</b>	The solution represented takes advantages of NODE RED, IBM cloud, IBM IoT platform.

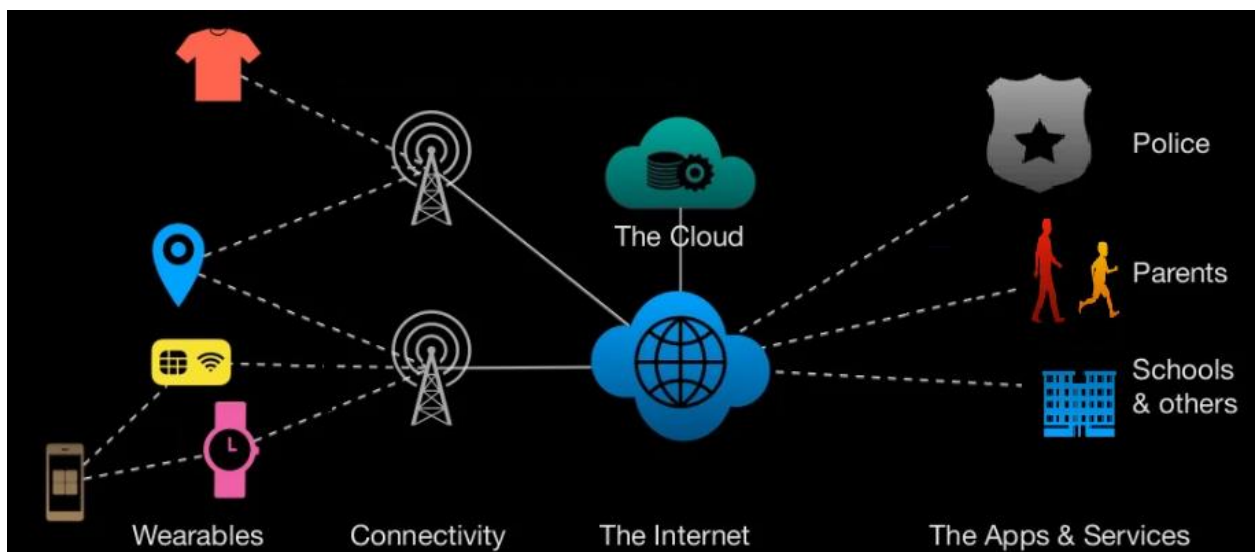
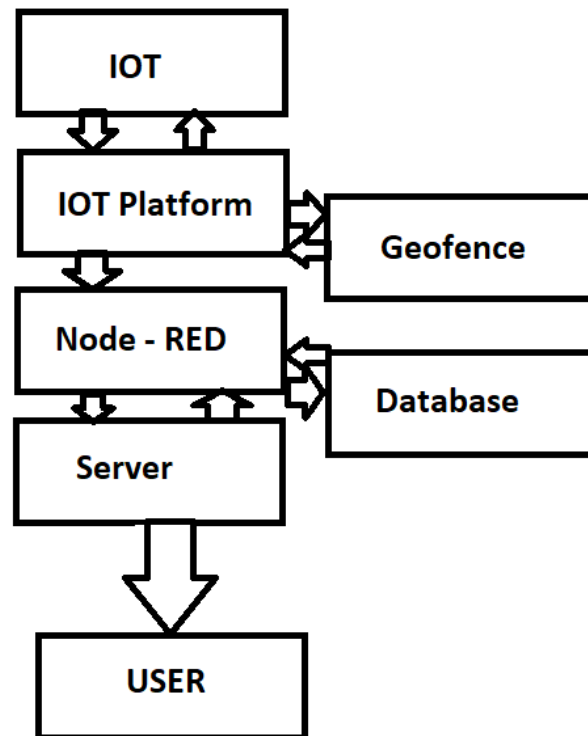
NFR-6	<b>Scalability</b>	If any abnormal values are read by the sensor, then an SMS is sent to the parents mobile and an MMS indicating an image captured by the serial camera is also sent. The future scope of the work is to implement the IoT device which ensures the complete solution for child safety problems.
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# PROJECT DESIGN

## DATA FLOW DIAGRAMS



## SOLUTION & TECHNICAL ARCHITECTURE





# USER STORIES



# PROJECT PLANNING & SCHEDULING

## SPRINT PLANNING & ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Enrolment	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	4
Sprint-2	IBM cloud	USN-2	As a user, I will receive confirmation email once I have registered for the application.	1	High	4
Sprint-2	Installing required software	USN-3	As a user, I can register for the application through Facebook.	2	Low	1
Sprint-3	Integration of IBM cloud and NODE-RED	USN-4	As a user, I can register for the application through Gmail.	2	Medium	2
Sprint-4	Account Creation	USN-5	As a user, I can log into the application by entering email & password.	1	High	4
Sprint-4	Dashboard	USN-6	I can instantly access all of my TO DO checklists and dashboard features.	2	Medium	2
Sprint-5	Testing and Date of Demo	USN-7	If all goes as planned, I can test my model and begin my demonstration the same day.	2	High	4
Sprint-6	Overall	USN-8	This app may help with costs, income, payments, trades, and many other applications.	2	High	4

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

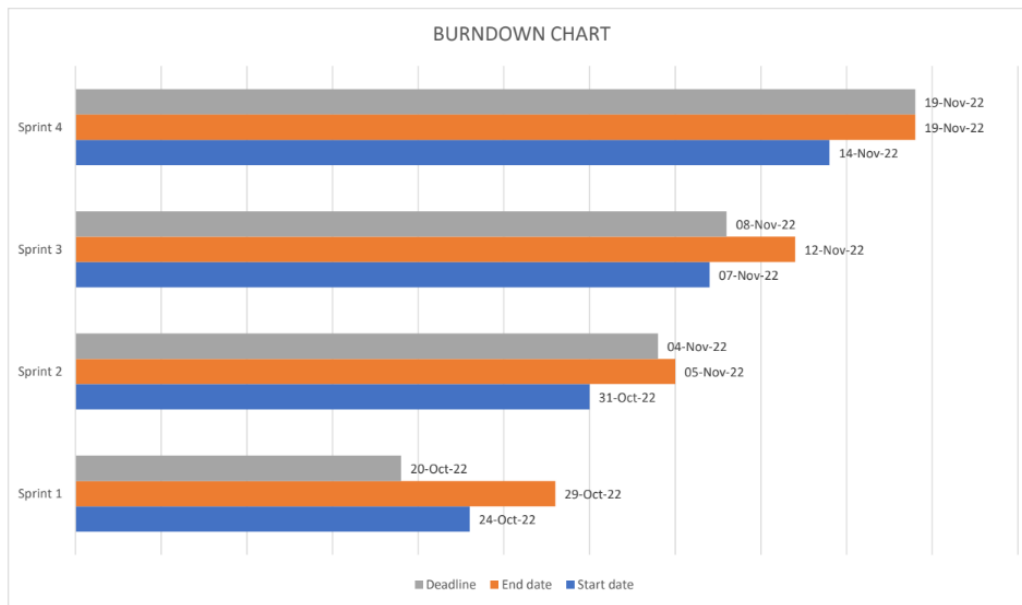
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	20 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	04 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022		08 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022		19 Nov 2022

### 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)

$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

## SPRINT DELIVERY SCHEDULE



A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.

## CODING & SOLUTIONING

### FEATURE 1

#### Algorithm

- Import Packages
- Create 'myConfig' location
- Implement the wiotp.sdk.device.DeviceClient
- Run a while Loop
- Finally set the latitude and longitude range
- Desired result Obtained

#### Python code

```
import json

import wiotp.sdk.device

import time

myConfig={

    "identity":{

        "orgId": "90t0p8",

        "typeId": "ChildSafetyGadget",

        "deviceId": "PNT2022TMID00392"

    },

    "auth": {

        "token": "2zdfvRDye5(b1qFQpb"

    }

}

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

client.connect()

while True:
```

```

name= "Smartbridge"

latitude = 17.4219272

longitude =78.5400783

myData = {'name':name, 'lat':latitude, 'lon': longitude}

client.publishEvent (eventId="status", msgFormat="json", data=myData, qos=0,
onPublish=None)

print ("Data published to IBM IoT platfrom: ",myData)

time.sleep(5)

client.disconnect()

```

```

import json
import wiotp.sdk.device
import time
myConfig={
    "identity":{
        "orgId": "90t0p8",
        "typeId": "ChildSafetyGadget",
        "deviceId": "PNT2022TMID00392"
    },
    "auth": {
        "token": "2zdfvRDye5(b1qFQpb"
    }
}
client = wiotp.sdk.device.DeviceClient (config=myConfig, logHandlers=None)
client.connect()

while True:
    name= "Smartbridge"
    latitude = 17.4219272
    longitude =78.5400783
    myData = {'name':name, 'lat':latitude, 'lon': longitude}
    client.publishEvent (eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)

    client.publishEvent (eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)
    print ("Data published to IBM IoT platfrom: ",myData)
    time.sleep(5)

client.disconnect()

```

## FEATURE 2

## Interfacing

The screenshot displays the IBM Watson IoT Platform interface. On the left is a dark sidebar with navigation icons. The main content area has tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. Below the tabs is a table of devices:

Device ID	Status	Device Type	Class ID	Date Added
868292	Disconnected	Sandhiyasivakumar	Device	Nov 8, 2022 10:31 AM
PNT2022TMID00392	Disconnected	ChildSafetyGadget	Device	Nov 8, 2022 11:58 AM

The second device is selected, and a modal window shows its details:

Identity	Device Information	Recent Events	State	Logs
Device ID	PNT2022TMID00392			
Device Type	ChildSafetyGadget			
Date Added	Nov 8, 2022 11:58 AM			
Added By	sandhiyasivakumar2001@gmail.com			
Connection Status	Disconnected			

At the bottom, it says 'Items per page 50 | 1-2 of 2 items' and '2 Simulations running'.

## IBM Watson Code

The screenshot shows the IBM Watson IoT Platform interface with a modal window open for configuring an event for the device 'ChildSafetyGadget PNT2022TMID00392'. The modal has tabs for 'Events' and 'Payload'. The 'Events' tab is active, showing the following configuration:

Event type name	Frequency
event_1	20 x Every Minute

There is a 'Send' button next to the frequency. Below the event configuration, the 'Payload' section shows a JSON structure:

```
{
  "name": "Smartbridge",
  "lat": 17.4219272,
  "lon": 78.5400783
}
```

At the bottom of the modal, there is a link: 'What functions can I apply?'. The background shows the same device list as the previous screenshot.

## IBM Watson Output

The screenshot shows the 'Identity' tab of a device page in the IBM Watson IoT Platform. The device is 'PNT2022TMID00392', a 'ChildSafetyGadget', added on 'Nov 8, 2022 11:58 AM' by 'sandhiyasivakumar2001@gmail.com'. Its connection status is 'Connected', with a connection time of 'Nov 8, 2022 6:41 PM' and a client address of '49.37.217.46'. The status is further detailed as 'SecureToken'.

Property	Value
Device ID	PNT2022TMID00392
Device Type	ChildSafetyGadget
Date Added	Nov 8, 2022 11:58 AM
Added By	sandhiyasivakumar2001@gmail.com
Connection Status	<b>Connected</b> Connection Time: Nov 8, 2022 6:41 PM Client Address: 49.37.217.46 SecureToken

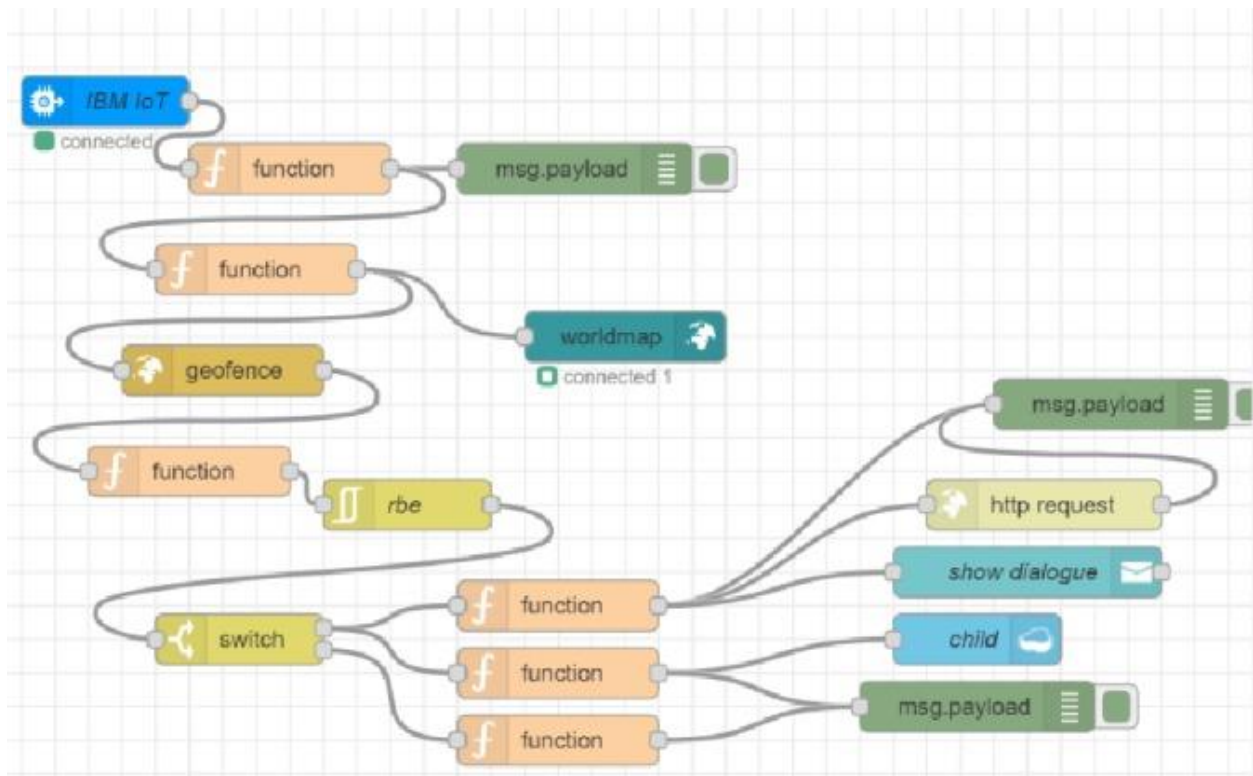
The screenshot displays the 'Recent Events' tab for the same device. It shows a live stream of data events. The events listed are all 'status' updates, each containing a JSON object with 'name', 'lat', and 'lon' fields. The format is 'json' and they were received 'a few seconds ago'.

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
status	{"name":"Smartbridge","lat":17.4219272,"lon":7...	json	a few seconds ago
status	{"name":"Smartbridge","lat":17.4219272,"lon":7...	json	a few seconds ago
status	{"name":"Smartbridge","lat":17.4219272,"lon":7...	json	a few seconds ago
status	{"name":"Smartbridge","lat":17.4219272,"lon":7...	json	a few seconds ago
status	{"name":"Smartbridge","lat":17.4219272,"lon":7...	json	a few seconds ago

## DATABASE SCHEMA

### Node – Red Schema



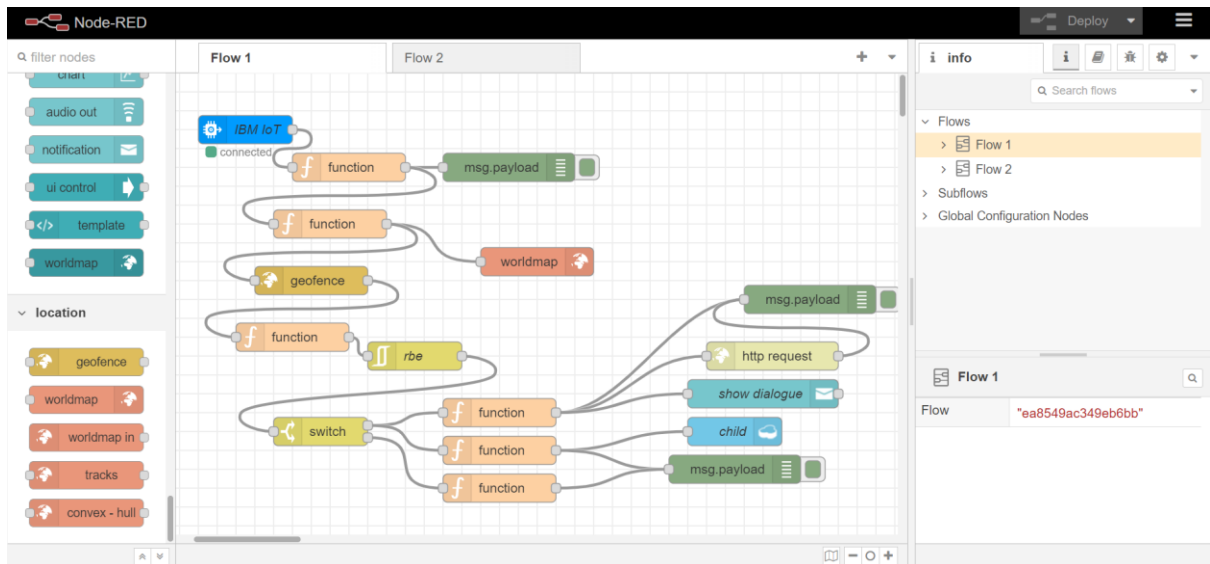
## IBM Cloud

IBM Cloud				
Search resources and products...				
Catalog Manage Sandhiya Sivakumar's ...				
Learn more about logs View in Log Analysis with LogDNA				
Logs				
API Management				
Autoscaling				
Log type				
Type	Instance	Logs		Time
RTR	14	node-red-apqzh-2022-11-08.eu-gb.mybluemix.net - [2022-11-11T17:01:37.259724503Z] "GET /ui/socket.io/?EIO=4&transport=websocket&sid=3EV2o6iLReB1efC3AAAQ HTTP/1.1" 101 0 0 "-" Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.0.0 Safari/537.36 "10.72.112.194:58808" "158.176.68.97:61293" x_forwarded_for:"49.37.217.46, 10.72.112.194" x_forwarded_proto:"https" vcap_request_id:"c61b01f0-1c38-473e-756f-b0be881e5158" response_time:264.999782 gorouter_time:264.999782 app_id:"5c2fe3f7-0e83-4a05-a34f-ab43d12252a6" app_index:"0" instance_id:"36cea1f0-ee7f-4ae3-6459-ad24" x_cf_routererror:"" x_global_transaction_id:"fdd8562c636e7ff10057740b" true_client_ip:"" x_b3_traceid:"46c7322c2b34cd9d1b8220deca274329" x_b3_spanid:"1b8220deca274329" x_b3_parentspanid:"" b3:"46c7322c2b34cd9d1b8220deca274329-1b8220deca274329"		Nov 11, 2022, 10:36:02 PM
		node-red-apqzh-2022-11-08.eu-gb.mybluemix.net - [2022-11-11T17:01:41.715634330Z] "GET /worldmap/socket/511/wsiyc3ut/websocket HTTP/1.1" 101 0 0 "-" Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.0.0 Safari/537.36" "10.72.112.195:47361" "158.176.68.97:61293" x_forwarded_for:"49.37.217.46, 10.72.112.195"		

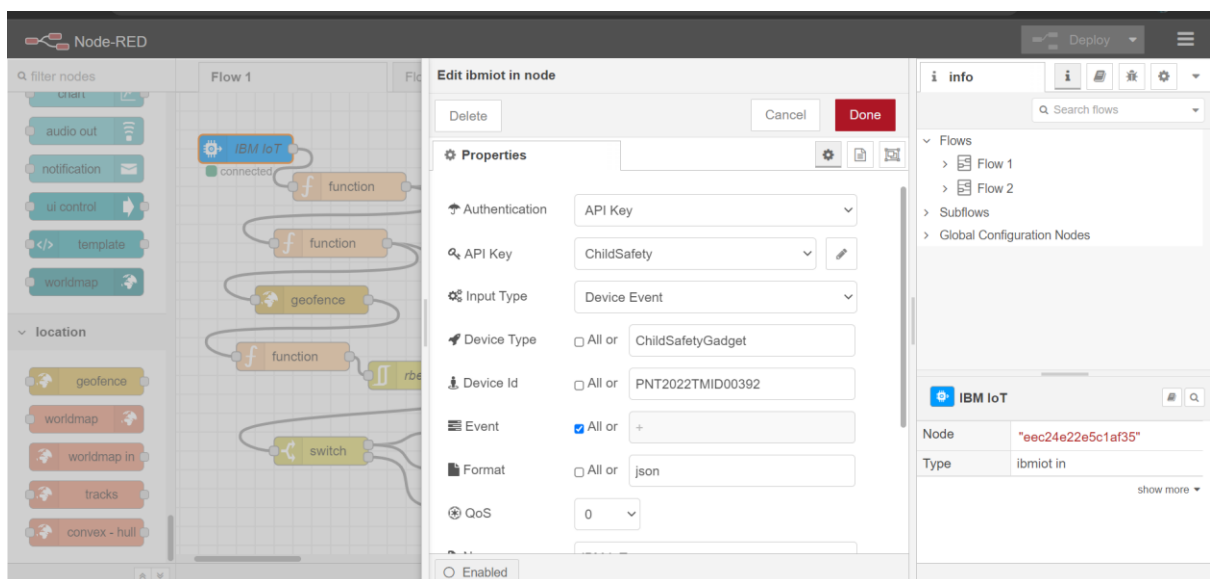
## NODE – RED



## Connections



## Codes in Node's



Node-RED

filter nodes

audio out

notification

ui control

template

worldmap

location

geofence

worldmap

worldmap in

tracks

convex - hull

Flow 1

IBM IoT

connected

function

Edit function node

Delete Cancel Done

Properties

Name

Setup On Start On Message On Stop

```
1 var name = msg.payload.name
2 var lat = msg.payload.lat
3 var lon = msg.payload.lon
4 global.set('latitude', lat)
5 global.set('longitude', lon)
6 global.set('name', name)
7 return msg;
```

info

Search flows

Flows

- Flow 1
- Flow 2
- Subflows
- Global Configuration Nodes

function: 76ec77ccd270c2c7

Node "76ec77ccd270c2c7"

Type function

show more

Enabled

Node-RED

filter nodes

audio out

notification

ui control

template

worldmap

location

geofence

worldmap

worldmap in

tracks

convex - hull

Flow 1

IBM IoT

connected

function

Edit function node

Delete Cancel Done

Properties

Name

Setup On Start On Message On Stop

```
1 = msg.payload={
2   'name':global.get('name'),
3   'lat':global.get('latitude'),
4   'lon': global.get('longitude')
5 }
6 return msg;
```

info

Search flows

Flows

- Flow 1
- Flow 2
- Subflows
- Global Configuration Nodes

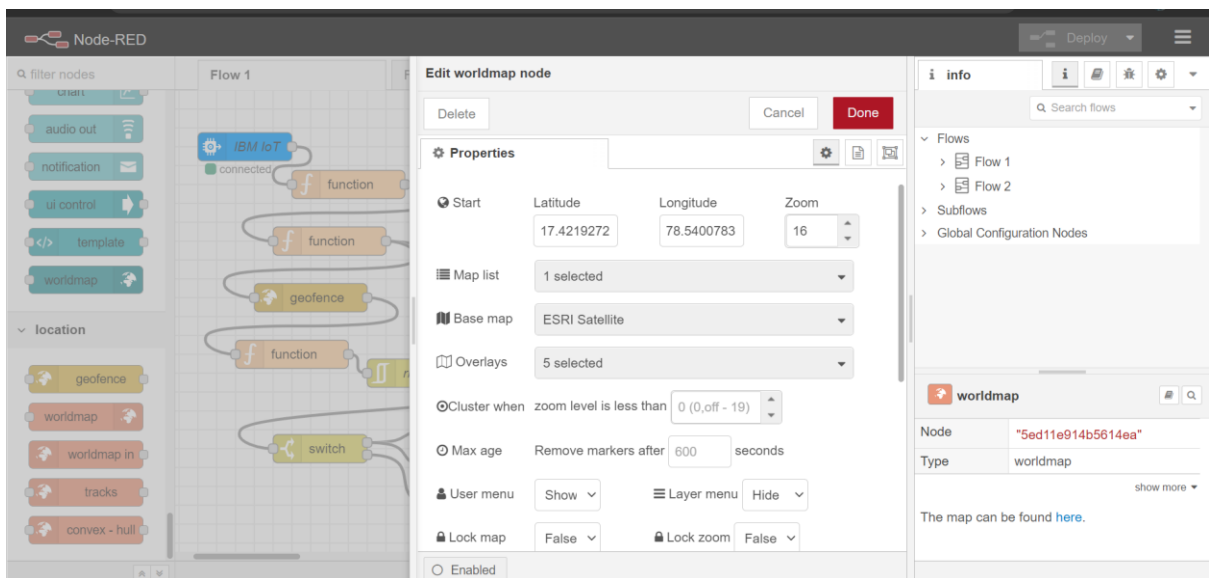
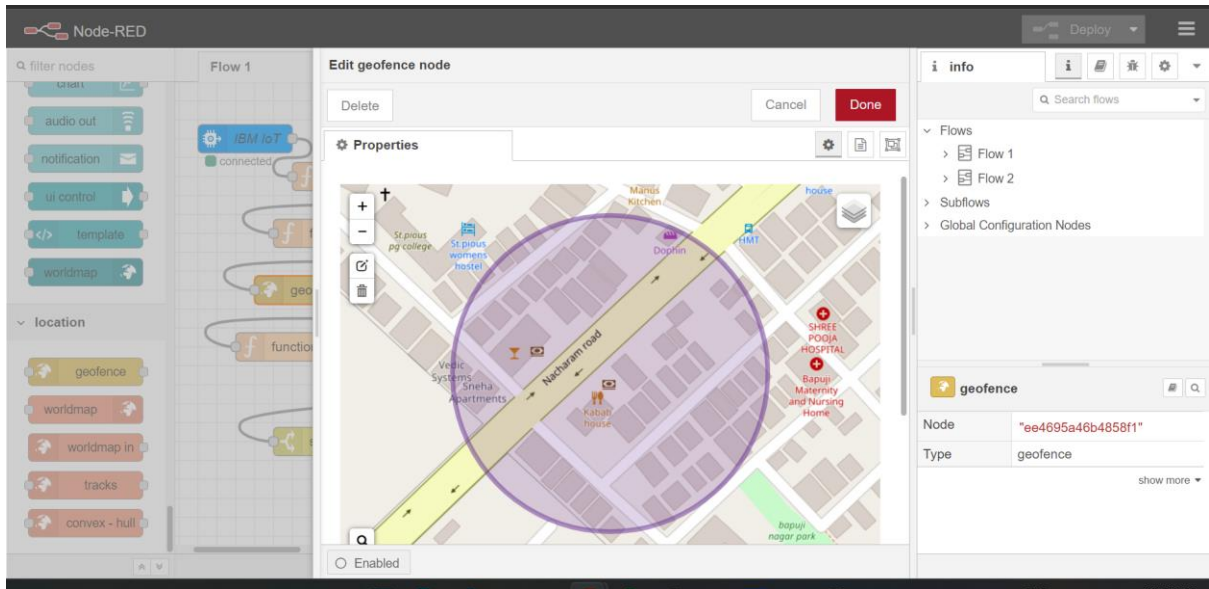
function: 77b707bf262aa6f4

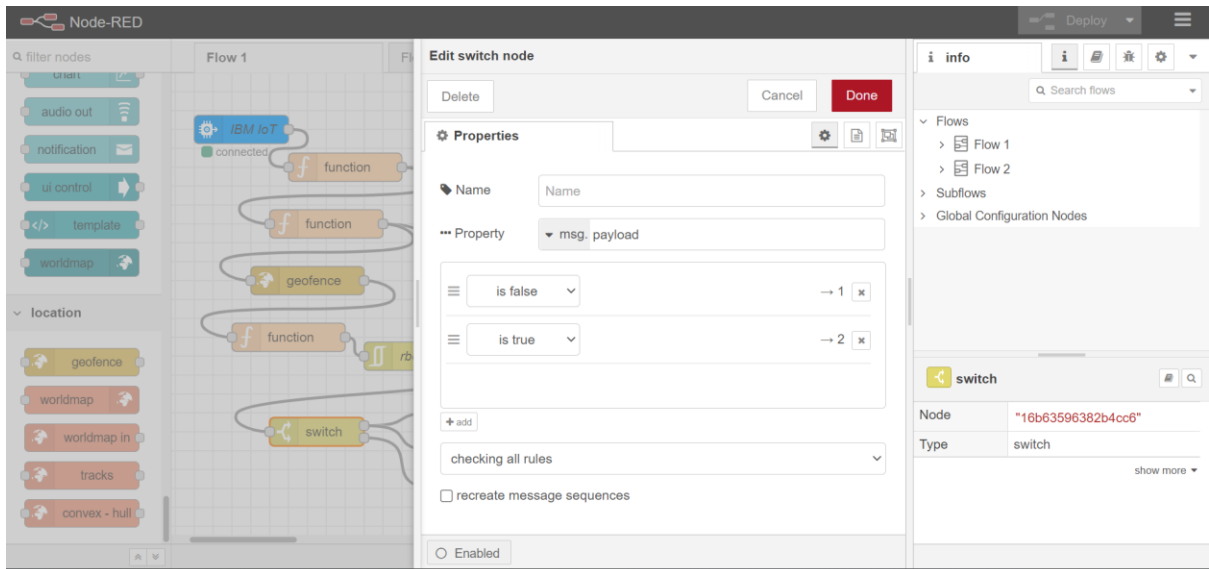
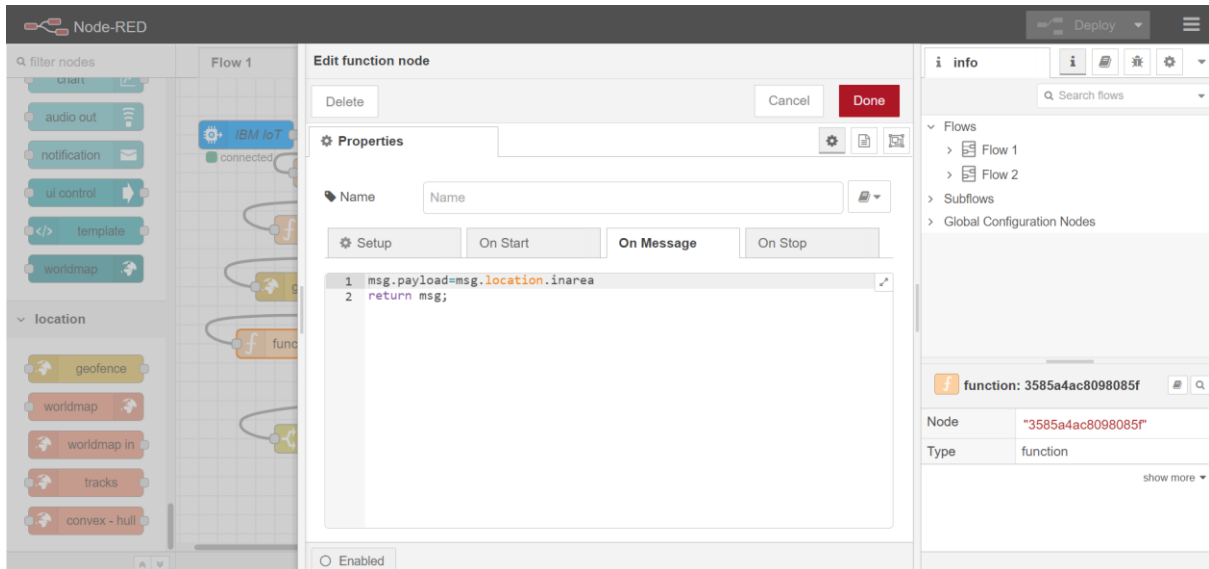
Node "77b707bf262aa6f4"

Type function

show more

Enabled





Node-RED interface showing a function node being edited. The node is named "function: 322663c3205cc798". The code in the node is:

```
1 var d = new Date();
2 var utc = d.getTime() + (d.getTimezoneOffset() * 60000);
3 var offset = 5.5; // This is the offset for UTC+3, in your case (UTC+1
4 newDate = new Date(utc + (3600000*offset));
5 msg.payload = {
6   "message": "Entry",
7   "Time": newDate.toLocaleString(),
8   "name": global.get('name'),
9   "lat": global.get('latitude'),
10  "lon": global.get('longitude')
11 };
12 return msg;
```

The right sidebar shows the "info" tab with a search bar and a list of flows: Flow 1, Flow 2, Subflows, and Global Configuration Nodes. The node type is "function".

Node-RED interface showing a function node being edited. The node is named "function: dfef78abe1ae2fd4". The code in the node is:

```
1 var d = new Date();
2 var utc = d.getTime() + (d.getTimezoneOffset() * 60000);
3 var offset = 5.5; // This is the offset for UTC+3, in your case (UTC+1
4 newDate = new Date(utc + (3600000*offset));
5 msg.payload = {
6   "message": "Entry",
7   "Time": newDate.toLocaleString(),
8   "name": global.get('name'),
9   "lat": global.get('latitude'),
10  "lon": global.get('longitude')
11 };
12 return msg;
```

The right sidebar shows the "info" tab with a search bar and a list of flows: Flow 1, Flow 2, Subflows, and Global Configuration Nodes. The node type is "function".

Node-RED interface showing the "Edit function node" configuration. The node is named "function" and is configured to execute JavaScript code on a message.

**Properties:**

- Name: function
- Setup: ☐ On Start: ☐ **On Message: ☒** On Stop: ☐

**JavaScript Code:**

```
1 var d = new Date();
2 var utc = d.getTime() + (d.getTimezoneOffset() * 60000);
3 var offset = 5.5; // This is the offset for UTC+3, in your case (UTC+1)
4 newDate = new Date(utc + (3600000*offset));
5 msg.payload = {
6   "message": "Entry",
7   "time": newDate.toLocaleString(),
8   "name": global.get('name'),
9   "lat": global.get('latitude'),
10  "lon": global.get('longitude')
11 };
12 return msg;
```

**Info Panel:**

- Node: "36df960d0bd4f874"
- Type: function

Node-RED interface showing the "Edit http request node" configuration. The node is named "http request" and is configured to execute an HTTP GET request.

**Properties:**

- Method: GET
- URL: <https://www.fast2sms.com/dev/wallet?authorizati>
- Payload: Ignore
- ☐ Enable secure (SSL/TLS) connection
- ☐ Use authentication
- ☐ Enable connection keep-alive
- ☐ Use proxy
- ☐ Only send non-2xx responses to Catch node
- Return: a UTF-8 string

**Info Panel:**

- Node: "a43ddb0b4716e38d"
- Type: http request

Node-RED interface showing a flow editor and the "Edit notification node" configuration panel.

**Flow 1:** The flow starts with an "IBM IoT" node (connected), followed by a "function" node, another "function" node, a "geofence" node, a third "function" node, and finally a "switch" node.

**Edit notification node configuration:**

- Layout:** OK / Cancel Dialog
- Send to all browser sessions:** ☐
- Default action label:** OK
- Secondary action label:** (optional label for Cancel button)
- Accept raw HTML/JavaScript input in msg.payload to format popup:** ☐
- Class:** [msg.className]
- Topic:** [msg.topic]
- Name:** show dialogue
- Enabled:** ☐

**Info panel:**

- Node:** "388bcb2648d1348b"
- Type:** ui\_toast

Node-RED interface showing a flow editor and the "Edit cloudant out node" configuration panel.

**Flow 1:** The flow starts with an "IBM IoT" node (connected), followed by a "function" node, another "function" node, a "geofence" node, a third "function" node, and finally a "switch" node.

**Edit cloudant out node configuration:**

- Service:** Cloudant-pn-99850
- Database:** noderedapqzh20221108
- Operation:** insert
- Only store msg.payload object?:** ☐
- Name:** child
- Enabled:** ☐

**Info panel:**

- Node:** "7f199a311bbfac36"
- Type:** cloudant out

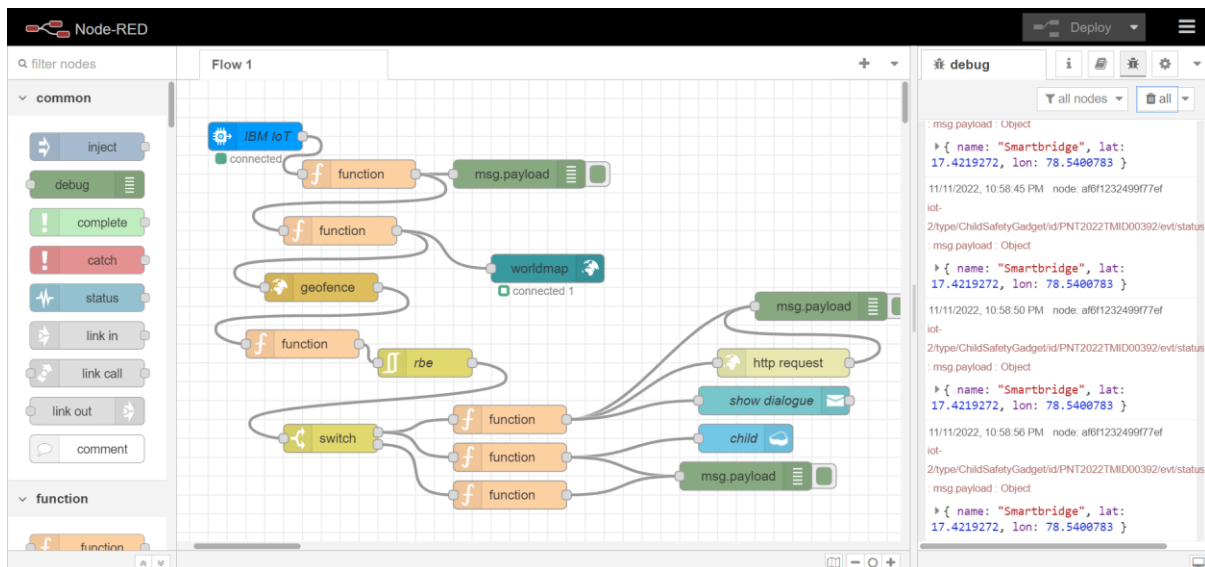
# TESTING

## TEST CASES

## PYTHON SHELL

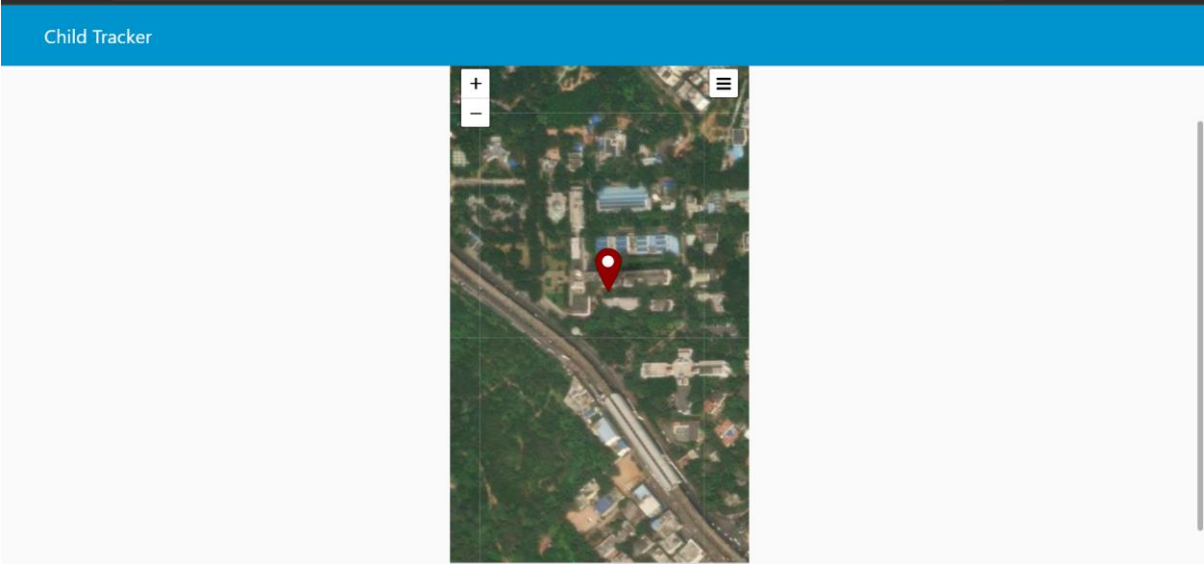
```
*Python 3.7.4 Shell*
File Edit Shell Debug Options Window Help
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 20:34:20) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\sandh\Downloads\ibm\python code\trailcode.py =====
2022-11-08 18:41:08,142 wiotp.sdk.device.client.DeviceClient INFO Connected successfully: d:90t0p8:ChildSafetyGadget:P
NT2022TMID00392
Data published to IBM IoT platform: {'name': 'Smartbridge', 'lat': 17.4219272, 'lon': 78.5400783}
Data published to IBM IoT platform: {'name': 'Smartbridge', 'lat': 17.4219272, 'lon': 78.5400783}
Data published to IBM IoT platform: {'name': 'Smartbridge', 'lat': 17.4219272, 'lon': 78.5400783}
```

## NODE – RED:



## NODE – RED UI:





## 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	8	3	4	20
Duplicate	0	0	1	3	4
External	1	3	0	2	6

Fixed	12	3	9	12	37
Not Reproduced	1	0	0	0	1
Skipped	1	0	0	1	2
Won't Fix	4	0	0	4	8
Totals	24	14	13	26	77

### 3. *Test Case Analysis*

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	51	2	0	49
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	1	0	8
Final Report Output	4	0	0	4
Version Control	2	0	0	2

# RESULTS

## PERFORMANCE METRICS

NFT - Risk Assessment									
S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Impact of Downtime	Load/Volume Changes	Risk Score	Justification
1	CHILD SAFETY MONITORING	New	Moderate	No Changes	Moderate	MODERATE	>5 to 10%	ORANGE	RESPONSE TIME

NFT - Detailed Test Plan				
S.No	Project Overview	NFT Test approach	Assumptions/Dependencies/Risks	Approvals/SignOff
1	CHILD SAFETY MONITORING	PERFORMANCE	GEOFENCE	DONE

End Of Test Report								
S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	GO/NO-GO decision	Recommendations	Identified Defects (Detected/Closed/Open)	Approvals/SignOff
1	TO ENSURE SAFETY OF THE USER	PERFORMANCE	RELIABILITY	LOCATION OF THE USER	GO	ADVANCED APPLICATIONS ARE RECOMMENDABLE	NETWORK DEPENDENCIES	DONE

## **ADVANTAGES & DISADVANTAGES**

### **ADVANTAGES:**

- It can assist in the smarter control of homes and cities via mobile phones. It enhances security and offers personal protection.
- By automating activities, it saves us a lot of time.
- Information is easily accessible, even if we are far away from our actual location, and it is updated frequently in real time.
- Electric Devices are directly connected and communicate with a controller computer, such as a cell phone, resulting in efficient electricity use. As a result, there will be no unnecessary use of electricity equipment.
- Personal assistance can be provided by IoT apps, which can alert you to your regular plans.
- It minimizes human effort because IoT devices connect and communicate with one another and perform a variety of tasks without the need for human intervention.
- Asset tracking, traffic or transportation tracking, inventory control, delivery, surveillance, individual order tracking, and customer management can all be made more cost-effective with the right tracking system.

### **DISADVANTAGES**

- Hackers may gain access to the system and steal personal information. Since we add so many devices to the internet, there is a risk that our information as it can be misused.
- They rely heavily on the internet and are unable to function effectively without it.
- With the complexity of systems, there are many ways for them to fail.
- We lose control of our lives—our lives will be fully controlled and reliant on technology.
- It is very difficult to plan, build, manage, and enable a broad technology to IoT framework.
- Deploying IoT devices is very costly and time-consuming.

## **CONCLUSION**

Abuse completely destroys children's physical, mental, and emotional well-being and threatens to damage our future, every parent should take care of their own children. In light of the significance of future, our invention will make it simple for parents to keep tabs on their kids and regularly visually monitor them, helping them to assure their safety and lowering the incidence of child abuse.

## **FUTURE SCOPE**

The future enhancements will be adding more features, software, applications, hardware to make the proposed system capable of working more intelligently, meanwhile guarantee the safety of children. Technology can then be used for monitoring and maintaining a safe work environment, especially through effective record keeping. In this particular case, records of compliance training are reviewed and management makes sure all employees have had adequate training, especially in safety etiquette.

## APPENDIX

### SOURCE CODE

```
import json

import wiotp.sdk.device

import time

myConfig={

    "identity":{

        "orgId": "90t0p8",

        "typeId": "ChildSafetyGadget",

        "deviceId": "PNT2022TMID00392"

    },

    "auth": {

        "token": "2zdfvRDye5(b1qFQpb"

    }

}

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

client.connect()


while True:

    name= "Smartbridge"

    latitude = 17.4219272

    longitude =78.5400783

    myData = {'name':name, 'lat':latitude, 'lon': longitude}

    client.publishEvent    (eventId="status",    msgFormat="json",    data=myData,    qos=0,

onPublish=None)

    print ("Data published to IBM IoT platfrom: ",myData)
```

```
time.sleep(5)  
client.disconnect()
```

### **GITHUB LINK**

<https://github.com/IBM-EPBL/IBM-Project-13602-1659523492.git>

### **PROJECT DEMO LINK**

<https://github.com/IBM-EPBL/IBM-Project-13602-1659523492/blob/main/FINAL%20DELIVERABLES/video%20final.mp4>