PROJECT

IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING & NOTIFICATION

DONE BY

TEAM ID: PNT2022TMID48543

Kumuthanayaki,

Aruna,

Jegadeesh,

Rajadurai.

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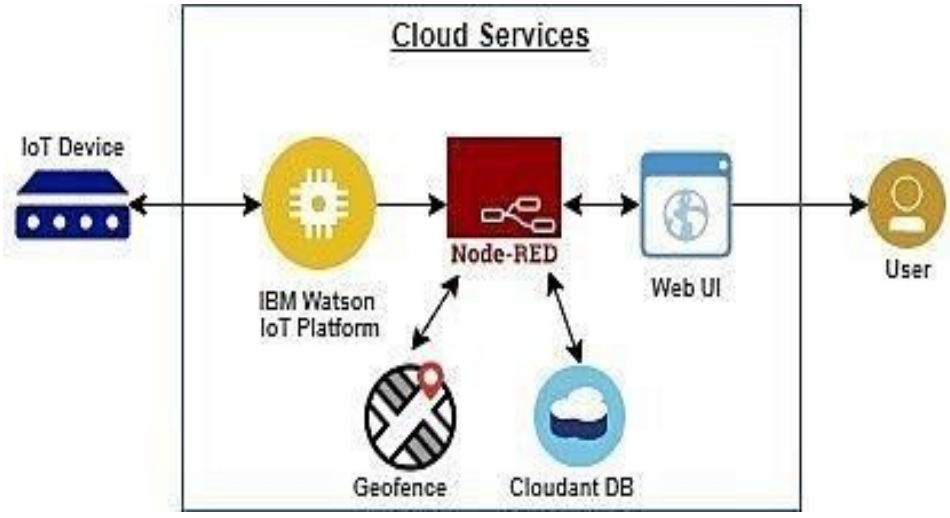
1. INTRODUCTION

i. Project Overview

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.



ii. Purpose

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.

2. LITERATURE SURVEY

1. Authors: M Nandini Priyanka, S Murugan, K. N. H. Srinivas, T. D. S. Sarveswararao, E. Kusuma Kumari.

Title: Smart IoT Device for Child Safety and Tracking.

Published in: 2019 IEEE.

The system is developed using Link-It 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.

Merits: The parameters such as touch, temperature & heartbeat of the child are used for parametric analysis and results are plotted for the same.

Demerits: To implement the IoT device which ensures the complete solution for child safety problems.

2. Authors: Akash Moodbidri, Hamid Shahnasser

Title: Child safety wearable device.

Published in: 2017 IEEE.

The purpose of this device is to help the parents to locate their children with ease. At the moment there are many wearable's in the market which helps to track the daily activity of children and also helps to find the child using Wi-Fi and Bluetooth services present on the device.

Merits: This wearable over other wearable is that it can be used in any phone and it is not necessary that an expensive smartphone is required and doesn't want to be very tech savvy individual to operate.

Demerits: As, this device's battery gives short life-time. High power efficient model will have to be used which can be capable of giving the battery life for a longer time.

3. Authors: Aditi Gupta, Vibhor Harit.

Title: Child Safety & Tracking Management System by using GPS.

Published in: 2016 IEEE.

This paper proposed a model for child safety through smart phones that provides the option to track the location of their children as well as in case of emergency children is able to send a quick message and its current location via Short Message services.

Merits: The advantages of smart phones which offers rich features like Google maps, GPS, SMS etc.

Demerits: This system is unable to sense human behavior of child.

3. IDEATION AND PROPOSED SOLUTION

PROBLEM STATEMENT

- This paper describes a method for tracking school-age children's pick-up and drop-off times to improve their safety while travelling to and from school every day.
- Children are the foundation of a country; if their future was threatened, it would have an impact on the development of the whole country. In this world, a child goes missing every 40 seconds.
- As a result of the abuse, children lose their emotional and mental stability, which has a negative impact on their career and future.
- Parents are in charge of raising their own children. However, parents are compelled to want for money because of the state of the economy and their desire to concentrate on their child's future and job. Consequently, it becomes challenging for them to constantly cling to their kids.
- The system features a created web-based database-driven application thatfacilitates its operation and gives authorized staff relevant information about the kids.
- The development of a wearable gadget for women's and girls' protection and safety is the goal of this endeavor. By examining physiological signals in conjunction with bodily position, this goal is accomplished. The body temperature and galvanic skin resistance are the physiological signs that are examined.
- Wirelessly transferring sensor data to an open-source cloud platform enables real-time data monitoring. This equipment is set up to continuously track the subject's parameters and react to any potentially hazardous circumstances. It accomplishes this by noticing changes in the signals being tracked, after which the proper action is done by sending notifications or alerts to the right parties.
- With our system, we offer a setting where this issue can be solved effectively. It enables parents to keep an eye on their kids in real time without having to intervene manually, just as they were standing next to them.

IDEATION & BRAINSTORMING

Idea 1: The device has IoT monitoring and a GSM module that allows the child to be monitored at all times. It also has numerous sensors that are connected to a CPU and are used to detect exact signals such as heart rate, temperature, and other dangers and alert the parents. In the event of a power outage, the wearable serves as a backup. On the device, there is an additional panic button.The purpose of this button is to notify parents and the police of a child's current location whenever they are in a perilous scenario. A GPS module is utilized to access their present location, and a GSM module assists in transmitting the information via SMS to designated contacts. In this approach,the device tries to provide child safety while remaining unobtrusive.

Idea 2: Our proposed system is based on the Internet of Things-based Smart Child Safety Wearable Device System designed as an efficient and low-cost IoT- based system for monitoring infants in real-time. This system plays a key role inproviding better care for the lost children until they reconvene with the parents. In this present era, most of the wearable devices today are designed based on the location, activity, temperature, pressure etc. of the child and inform the parents via GPS. Therefore, it is intended to use voice call as the way of communication between the parent mobile and child’s wearable device. The system operates on the microcontroller board and the functions of sending and receiving notifications, calls, voice messages via GPS.

Idea 3: 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 location 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 theperson 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.

PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	With the increasing rate of child kidnapping and trafficking and lack of tracking technology for child, there is limited application for child monitoring. Hence an **IoT based safety gadget** for child safety is probably the need of the hour today
2.	Idea / Solution description	A good solution to this issue would be to design a smart wearable Internet of Things sensor based device for monitoring the environment of a child along with a mechanism for tracking the child. The gadget will make use of **GPS and** a python script to publish the location details to the IBM IoT platform. The wearable also functions to send **immediate alerts** to the user throughin case if the child crosses the geofence.
3.	Novelty / Uniqueness	All the existing systems make use of GPS and a mobile app to track and receive alerts regarding the child's location, while this system make use of the IBM Watson IOT Platform and IBM Cloud Services which is reliable and efficient to maintain the database of the child's location. The parent can set geofence and receive alerts through the web application which is user friendly and secure created using the Node Red Service. .

4.	Social Impact / Customer Satisfaction	The main concern of any parent would be the safety and security of their kids. The design of this model does not mandate a lot of technical knowledge from the user to operate and it is simple. The purpose of this device is to facilitate the guardian or parents in locating their child with ease and ensuring its well-being.
5.	Business Model (Revenue Model)	The target audience of this device is majorly the parents. Considering the Tracking ability of the device, **Hardware quality, used technology and sensors,** the starting range of price would go from Rs. 6000 and above. This type of wearable safety system is of utmost importance today and would be a must buy gadget in the market today.
6.	Scalability of the Solution	With the present needs for monitoring the child, the system is designed. It has a location database to maintain the entire location history of the child and the parent can set the geofence to determine the safer boundary of the child. . If there is a need for integrating additional sensors to improve accuracy, it can be done to make the system efficient in the long run.

PROBLEM SOLUTION FIT

1	CUSTOMER SEGMENT	Who is your customer? Working parents who are not able to safe their child (0-5) willing to use these .
2	JOBS-TO-BE-DONE / PROBLEMS	Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides. Parents can't able to save their child from their workplace and Over parenting tends to deprive children of bad and negative experiences, which are crucial to a child's emotional growth. One form of overparenting is excessive monitoring
3	TRIGGERS	What triggers customers to act? i.e., seeing their neighbour using the gadget, reading about a more efficient solution in the news. It's not the situation or the feeling that's the problem; it's how kids think about these things and what they say to themselves that causes problems and child (0-2) years didn't know about anything this will trigger.
4	EMOTIONS: BEFORE / AFTER	How do customers feel when they face a problem or a job and afterwards?

		i.e., lost, insecure > confident, in control - use it in your communication strategy & design. BEFORE: Divergent thinking is a style of thinking that generates a range of alternative solutions or ideas to a problem that has multiple answers. AFTER: Feeling protective of your child is often manifested in the form of 'motherly' instincts. The feeling of protecting and wanting the best for your children is the ultimate parenting goal.
5	AVAILABLE SOLUTIONS	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 The most important reason for monitoring each child's development is to determine whether a child's is on track. Looking for developmental milestones is important to understanding each child's development and behaviour.
6	CUSTOMER CONSTRAINTS	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. For predictive analytics to make the most impact on child protection practice and outcomes, it must embrace established criteria of validity, equity, reliability, and usefulness.

7	BEHAVIOUR	What does your customer do to address the problem and get the job done? The parents can monitor their child from their workplace when children have frequent emotional outbursts, it can be a sign that they haven't yet developed the skills they need to cope with feelings like frustration, anxiety and anger. Handling big emotions in a healthy, mature way requires a variety of skills, including.
8	CHANNELS of BEHAVIOUR	<u>ONLINE</u> What kind of actions do customers take online? Extract online channels <u>OFFLINE</u> What kind of actions do customers take offline? Extract offline channels and use them for customer development. Understanding how children perceive and interact with the point of sale has been the focus of various studies in the past decade. It is well documented that children have preferences in terms of shopping destinations .For working parents necessarily needed one.
9	PROBLEM ROOT CAUSE	What is the real reason that this problem exists? It's exactly what it sounds like—an exercise to determine the root cause for a failure or issue, so that the solution is based on the true problem, not just addressing the symptoms.

10	YOUR SOLUTION	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. 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 behaviour.

4. REQUIREMENT ANALYSIS

FUNCTIONAL REQUIREMENTS

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Email Registration through Mobile number Registration in person
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Notifications	Email and SMS message
FR-4	User Interface	Mobile app for parents Web interface for registrations, record tracking, information and payment

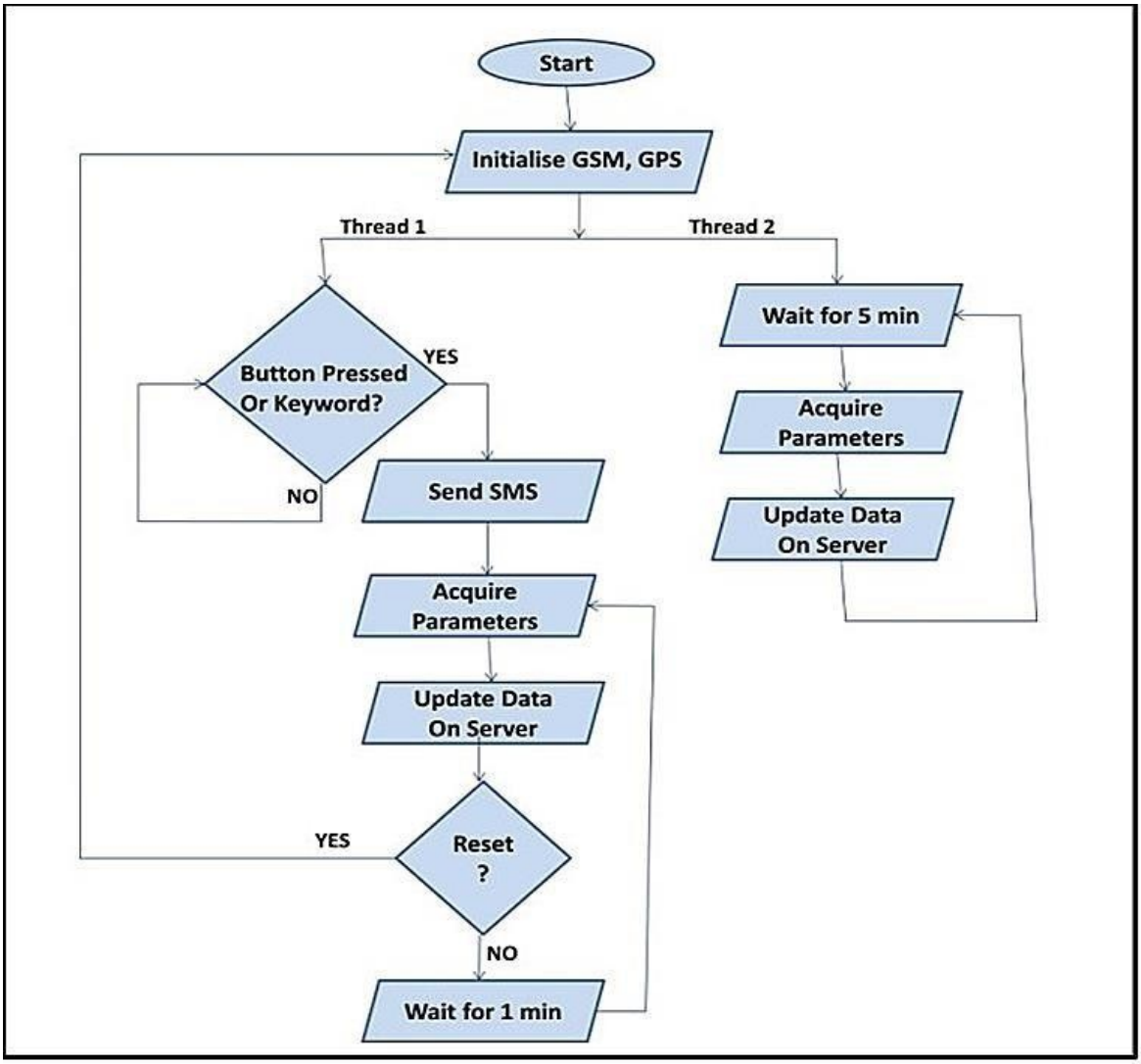
NON-FUNCTIONAL REQUIREMENTS

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	To find out whether the child crosses the geofence or not, upon which the parent/guardian of the child gets an alert.
NFR-2	**Security**	Database security must meet HIPAA requirements. Extra security protocols and measures are also in place.
NFR-3	**Reliability**	Webpage gets automatically logged out unless password has been saved in the Google account. In case of server crash data gets backed up beforehand.
NFR-4	**Performance**	Site gets updated every 1 hour. Speed per transaction depends on the internet strength.
NFR-5	**Availability**	Available world wide, and requires an internet source.
NFR-6	**Scalability**	Short term scalability where memory is stored and erased, can be scaled to keep records in the future.

5.PROJECT DESIGN

DATA FLOW DIAGRAMS



SOLUTION & TECHNICAL ARCHITECTURE

SOLUTION ARCHITECTURE

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

1. Find the best tech solution to solve existing business problems.

2. Describe the structure, characteristics, behaviour and other aspects of the software to project stakeholders.

3. Define features, development phases and solution requirements.

4. Provide specifications according to which the solution is defined, managed and delivered.

FEATURES:

Development of a safety gadget for children to ensure their protection without direct monitoring of their parents. The various features involve:

- GPS
- Geo fence
- Notify alert signal

SOLUTION:

Track current location of the child using GPS and continuous monitoring of the same is done. When the gadget detects the activity to be outside the given geo fence (as mentioned by the parent or guardian), alert messages or notifications are sent to the registered device, appropriately. Additional features such as recording of messages could be done if any kind of danger is sensed.

SOLUTION ARCHITECTURE DIAGRAM:

TECHNICAL ARCHITECTURE

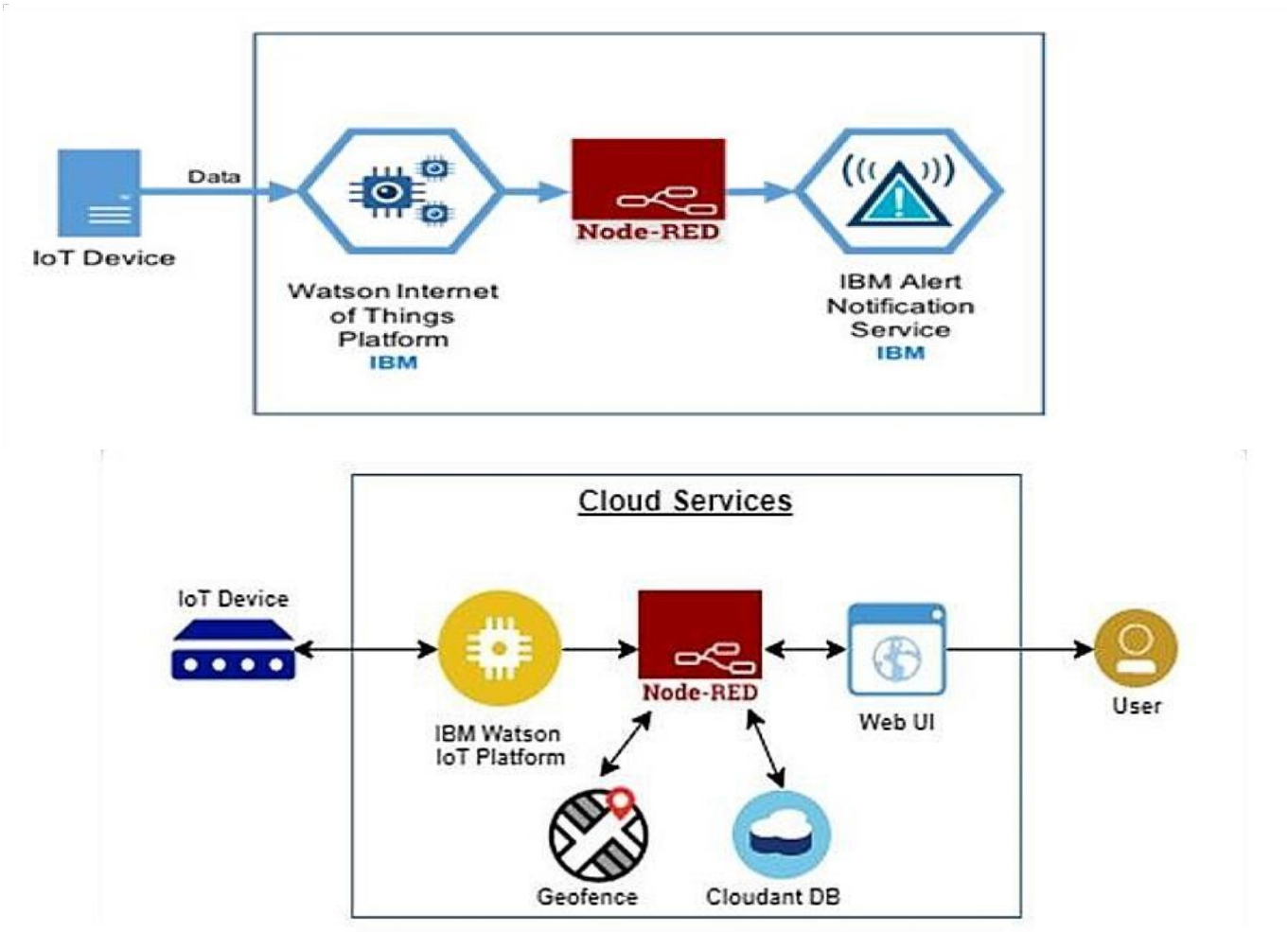


Table-1: Components & Technologies

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.

6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used

USER STORIES

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

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

		USN-2 (MOTHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a Mother.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1
		USN-3 (GUARDIAN/ CARETAKER)	As a user, I can also monitor the children's activities using a safety gadget monitoring system.	I can access my account / dashboard and receive confirmation email & click confirm	Medium	Sprint-1
	Login	USN-4	As a user, I can log into the application by entering email & password.	I can access my account / dashboard.	Medium	Sprint-2
	Dashboard	USN-5	As a user, I can fix the geofence for my child's location so that I will receive alerts if my child crosses the geofence.	I can monitor the current location of my child.	High	Sprint-2
Customer Care	Dashboard	USN-6	As a customer care service person, whenever I receive a complaint, I forward the complaint and ensure that the complaint is resolved.	I can keep track of all the complaints and the status of the complaints received.	Medium	Sprint-3
Administrator	Admin Dashboard	USN-7	As an administrator, I will take care of all the payment processes, queries and complaints and login credentials.	I can access all the customer details, payment details and complaints received.	High	Sprint-4

6. PROJECT PLANNING & SCHEDULING

Product Backlog, Sprint Schedule, and Estimation

Use the below templateto create product backlog and sprint schedule

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 loginto the application by entering email& password.	1	High	4
Sprint-4	Dashboard	USN-6	I can instantly accessall of my To Do checklists and dashboard features.	2	Medium	2
Sprint-4	Testing and Date of Demo	USN-7	If all goes as planned, I can testmy model and begin my demonstration the same day.	2	High	4
Sprint-4	Overall	USN-8	This app may helpwith costs, income, payments, trades, and many otherapplications.	2	High	4

Project Tracker, Velocity& Burndown Chart:

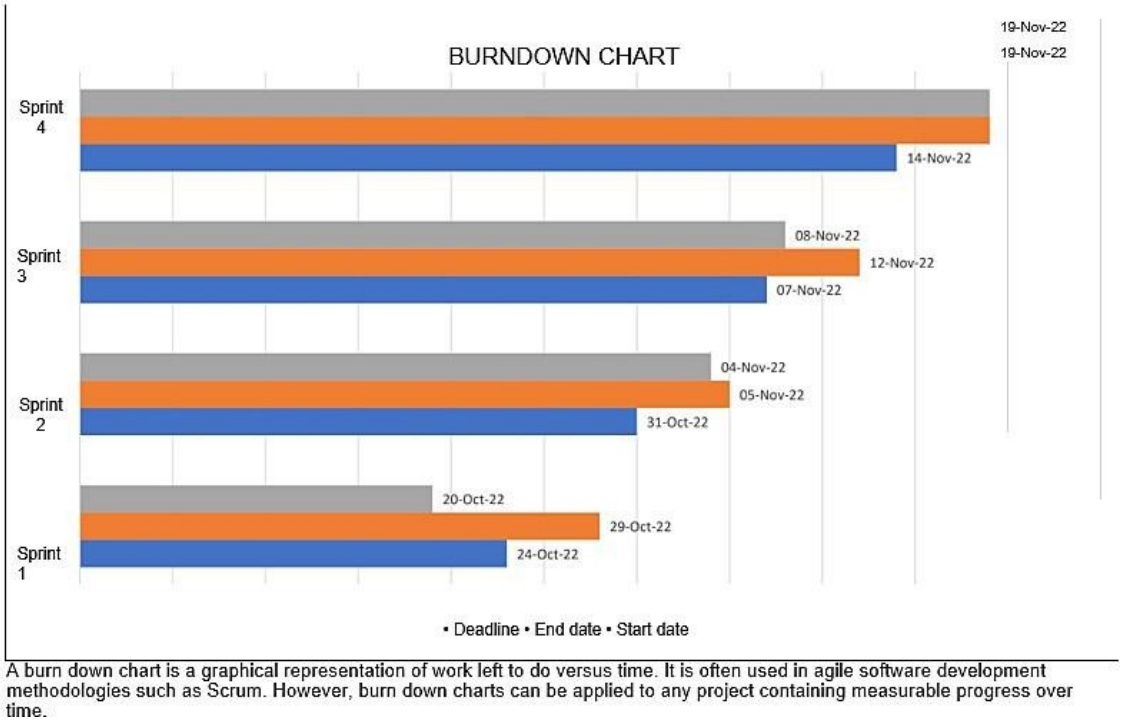
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date	Story Points Completed	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	20 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	04 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	08 Nov 2022
Sprint-4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

Velocity:

Imagine we have a 10-day sprint 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)

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

Burndown Chart:



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.

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7. CODING & SOLUTIONING

GEOFENCING CODE:

```
import time def
stopwatch(seconds,d,lspoin
t):
start = time.time()
time.clock()
elapsed = 0          flag =
False  num  =  0
while elapsed <
seconds:
                    elapsed = time.time() - start                    print
"%02d" % elapsed                    if elapsed > d[num] and elapsed
< d[num+1] and flag == False:
x = lspoint[num][0]
y = lspoint[num][1]
 createpoint(x,y)
flag = True print "Shot
Taken" print
point_in_poly(x,y,polygon)
if elapsed > d[num+1]:
            print "Shot Taken"
flag == False
num = num+1
x = lspoint[num][0]
y = lspoint[num][1]
createpoint(x,y)
print
point_in_poly(x,y,polygon)
time.sleep(1)
```

```
def createpoint(x,y):     crs =
"point?crs=epsg:27700&field=id:integer"     layer
=  QgsVectorLayer(crs, 'points' , "memory")     pr
= layer.dataProvider()                pt = QgsFeature()
point1 = QgsPoint(x,y)
pt.setGeometry(QgsGeometry.fromPoint(point1))
pr.addFeatures([pt])     # update extent of the
layer     layer.updateExtents()     # add the second
point     pt = QgsFeature()
QgsMapLayerRegistry.instance().addMapLayers([layer])
def  point_in_poly(x,y,poly):     n  =  len(poly)     inside  =
False  p1x,p1y = poly[0]  for i in range(n+1):
            p2x,p2y = poly[i % n]
            if y > min(p1y,p2y):
                    if y <= max(p1y,p2y):
                            if x <= max(p1x,p2x):
                                    if p1y != p2y:
                                            xints = (y-p1y)*(p2x-
p1x)/(p2y-p1y)+p1x
                                    if p1x == p2x or x <= xints:
                    inside = not inside
p1x,p1y = p2x,p2y


 return inside
#### define the polygon polygon =
[(512882.78819722467,120811.83924772343),(512960.84437170526,120809.7007223952),(512
2960.
84437170526,120809.7007223952),(512959.77510904113,120754.09906386107),(512882.788
19722 467,120756.2375891893)]


#### set how long the script will run (70 seconds will get you in and out of geofence)
time_seconds = 70 #### first coordinate x = 512915 y = 120728
#### time intervals, 10 seconds between shots / or
points intervals = int(time_seconds / 10) lspoint = []
```

build the list of coordinates to be plotted for i

in range(0,intervals+1):

y1 = y + (i*12.5) lspoint.append([x,y1])

to build the blocks of time in intervals, so we know the number of intervals (default is 7),

we need a list of time intervals [0,10,20,30 etc] to check against the clock this list is d, f is the gap ie 10 seconds, a is starting point (0)

b is the number of intervals + 1 becuase the code will check the the next in

the list f = 10 a = 0 b = intervals+1 d = [x * f for x in range(a, b)]

Run the stopwatch, or start the program!

stopwatch(time_seconds,d,lspoint)

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

Modified Version of Code according to main

project: import json import wiotp.sdk.device

import time myConfig={

"identity":{

"orgId": "zc4u6v",

"typeid": "ChildSafetyGadget",

"deviceId": "PNT2022TMID15707"

},
"auth": {

"token": "childsafety@123" }

}

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

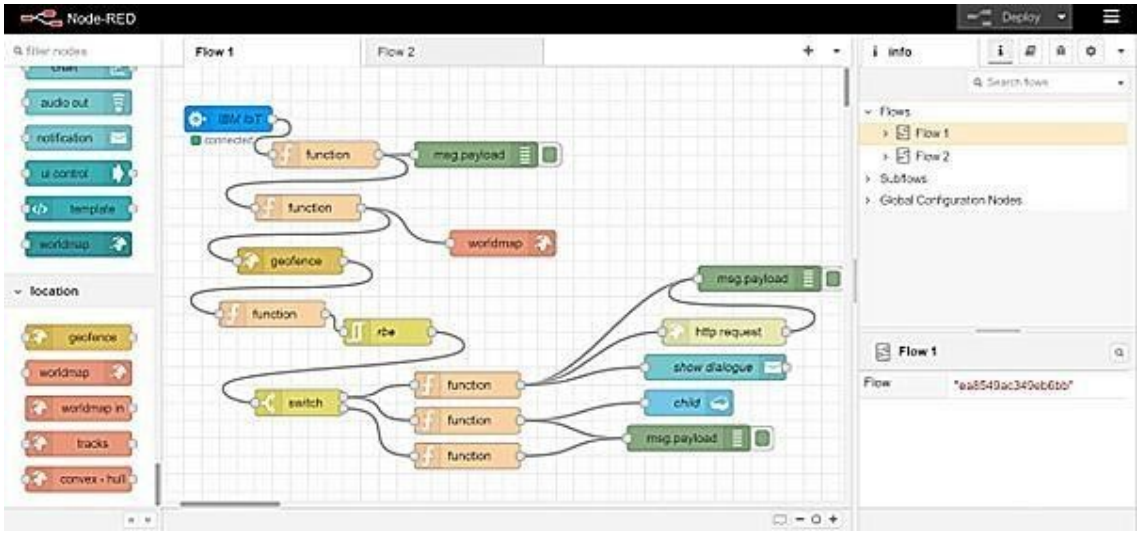
while True:

```
        name= "Smartbridge"
#in area location
        #latitude=17.4225176
          #longitude=78.5450842
          #out area location
          latitude = 17.4219272
          longitude=70.540073
        myData = {'name':name, 'lat':latitude, 'lon': longitude}
client.publishEvent (eventId="Status", msgformat="json", data=myData, qos=0,
onPublish=None)  print ("Data published to IM IoT platfrom:",myData)
          time.sleep(5)
client.disconnect()
```

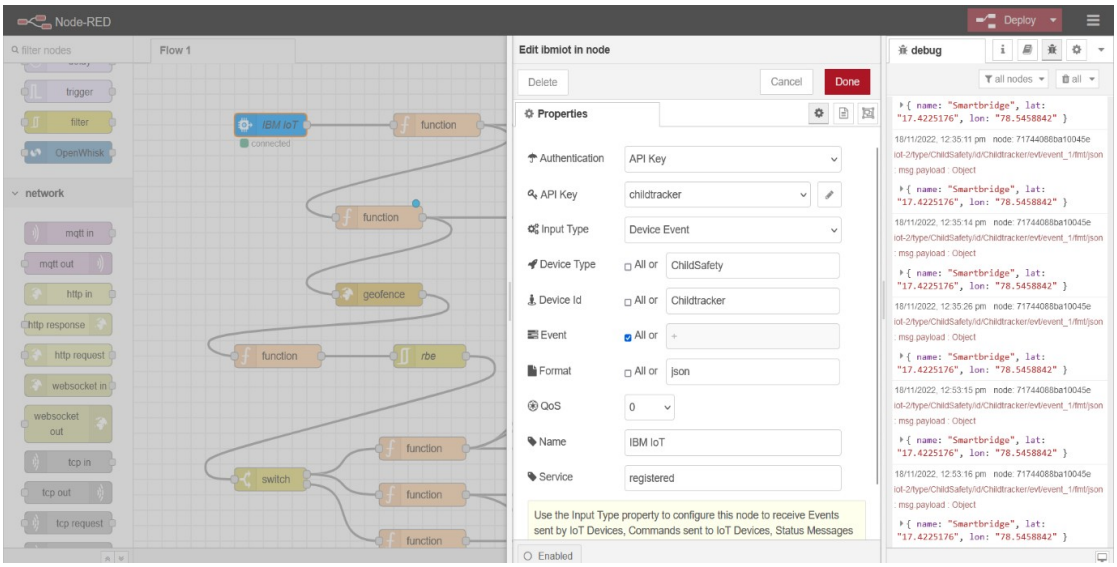
8. TESTING

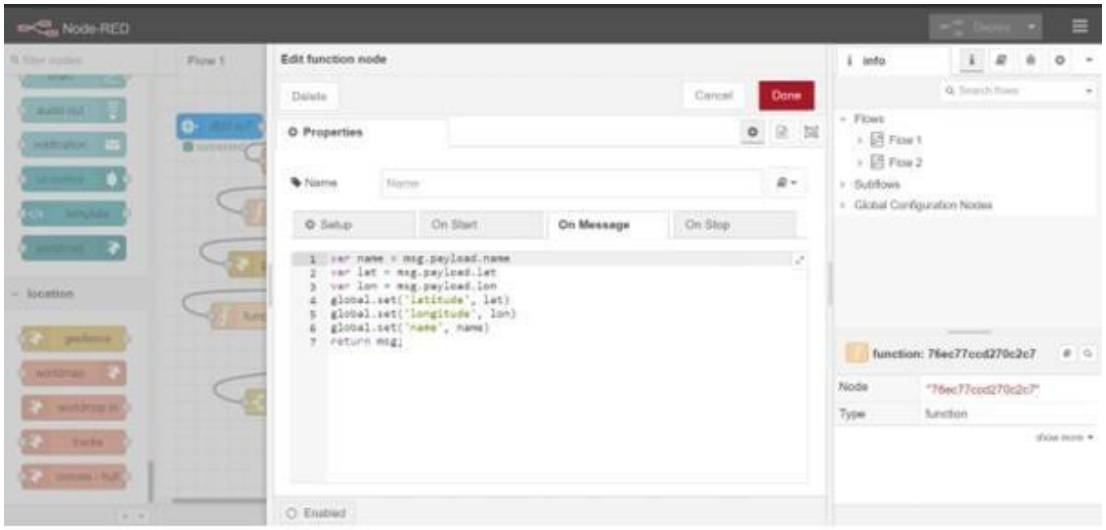
TESTING IN NODE-RED

Connections



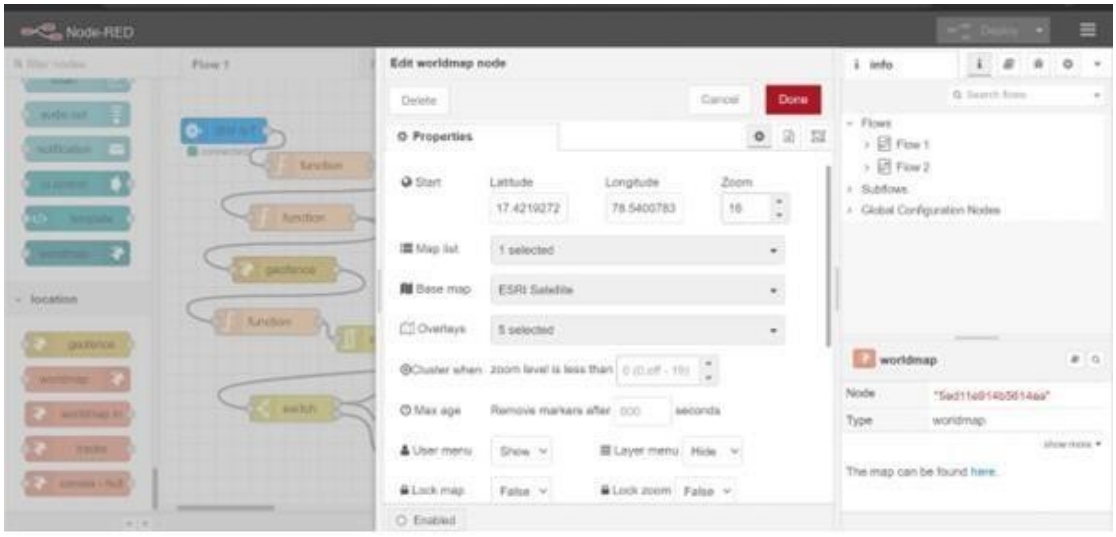
Codes in Node's

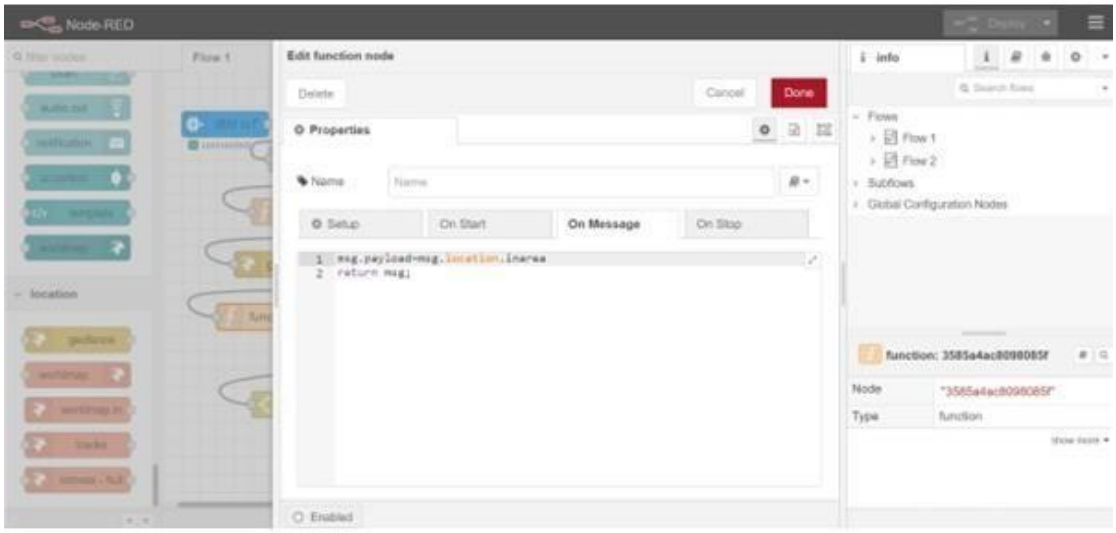


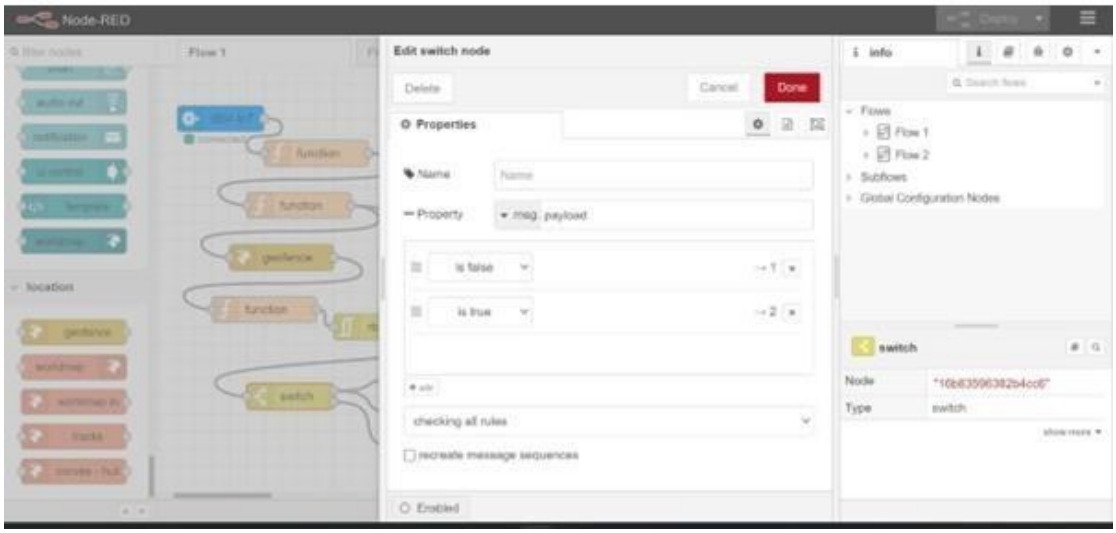

Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
Setup
On Start
On Message
On Stop
var name = msg.payload.name
var lat = msg.payload.lat
var lon = msg.payload.lon
global.set('latitude', lat)
global.set('longitude', lon)
global.set('name', name)
return msg;
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
function: 76ec77ccd270c2c7
Node
Type
function

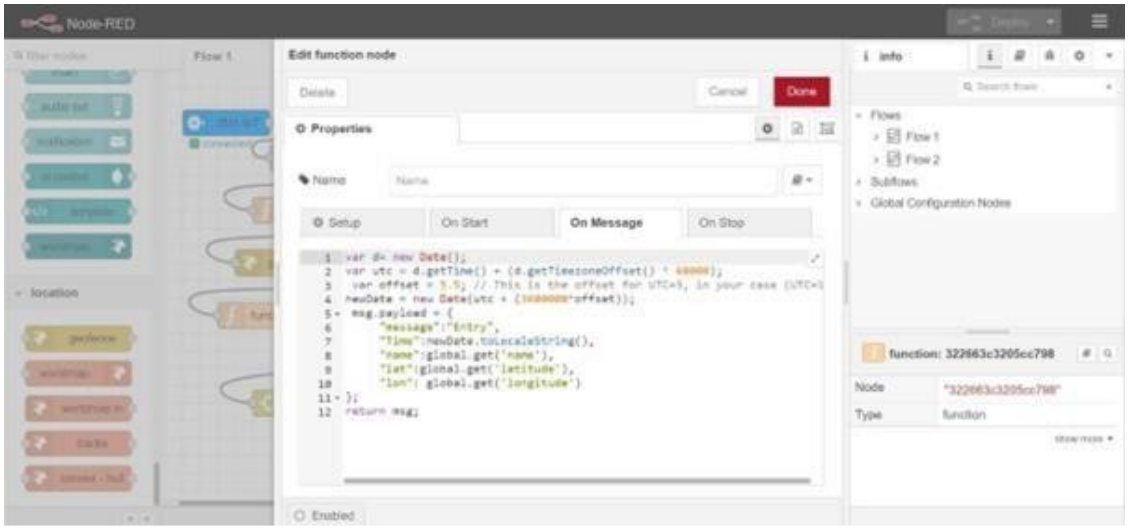

Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
Setup
On Start
On Message
On Stop
msg.payload={
'name':global.get('name'),
'lat':global.get('latitude'),
'lon':global.get('longitude')
}
return msg;
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
function: 77b707bf262aa6f4
Node
Type
function

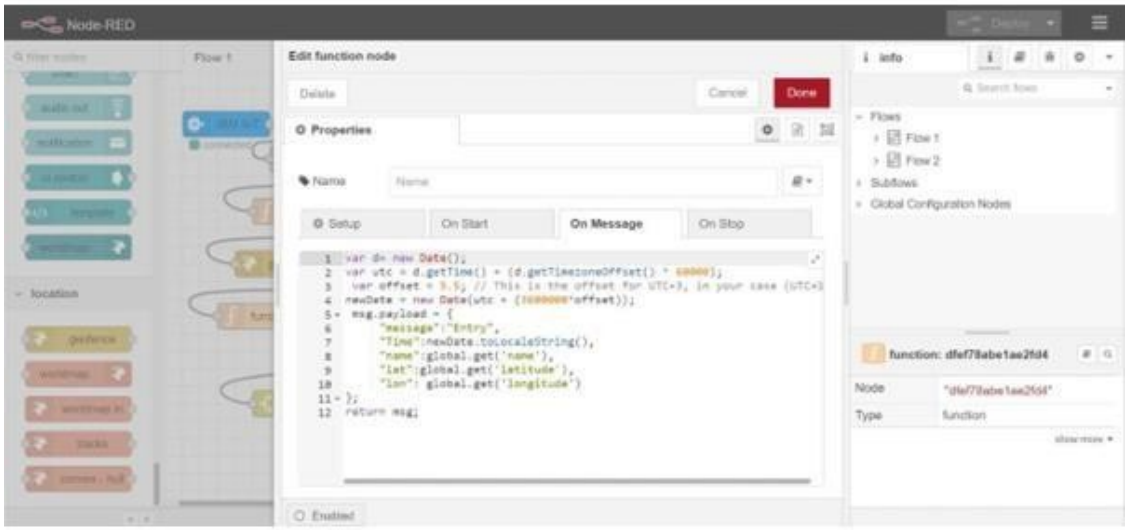

Node-RED
Edit geofence node
Delete
Cancel
Done
Properties
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
geofence
Node
Type
geofence

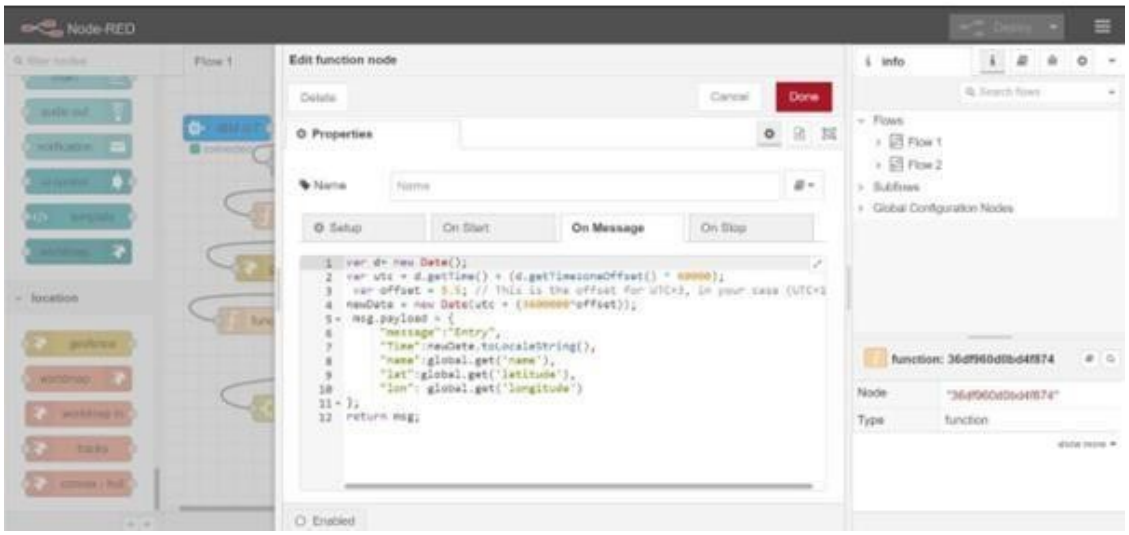

Node-RED
Edit worldmap node
Delete
Cancel
Done
Properties
Start
Latitude
17.4219272
Longitude
78.5400783
Zoom
16
Map list
1 selected
Base map
ESRI Satellite
Overlays
5 selected
Cluster when
zoom level is less than
Max age
Remove markers after
seconds
User menu
Show
Layer menu
Hide
Lock map
False
Lock zoom
False
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
worldmap
Node
"5ed11e814b5614ea"
Type
worldmap
The map can be found here.

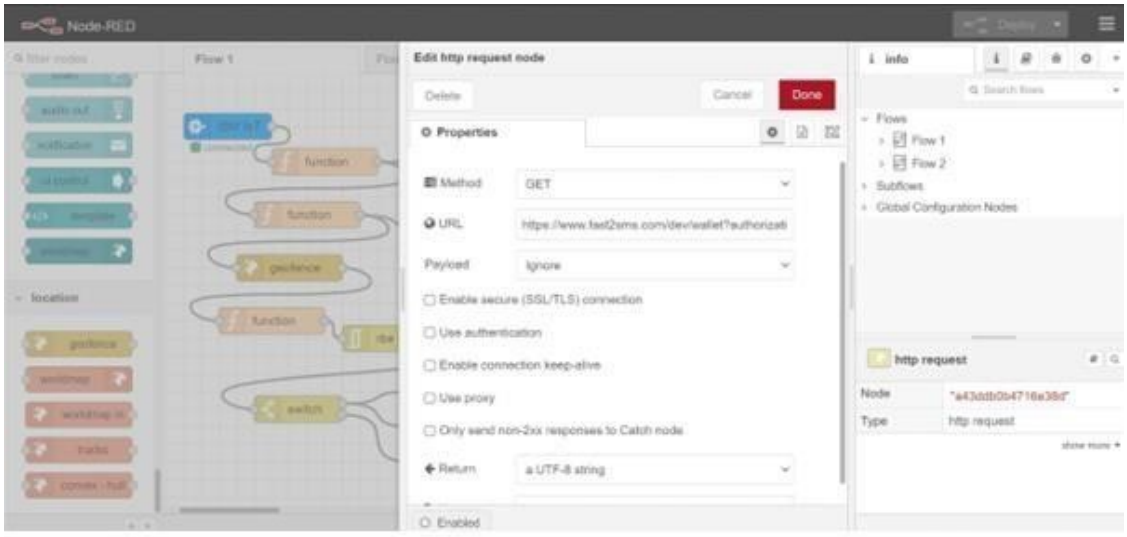

Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
Setup
On Start
On Message
On Stop
1 msg.payload=msg.location.lnarea
2 return msg;
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
function: 3585a4ac8098085f
Node
"3585a4ac8098085f"
Type
function

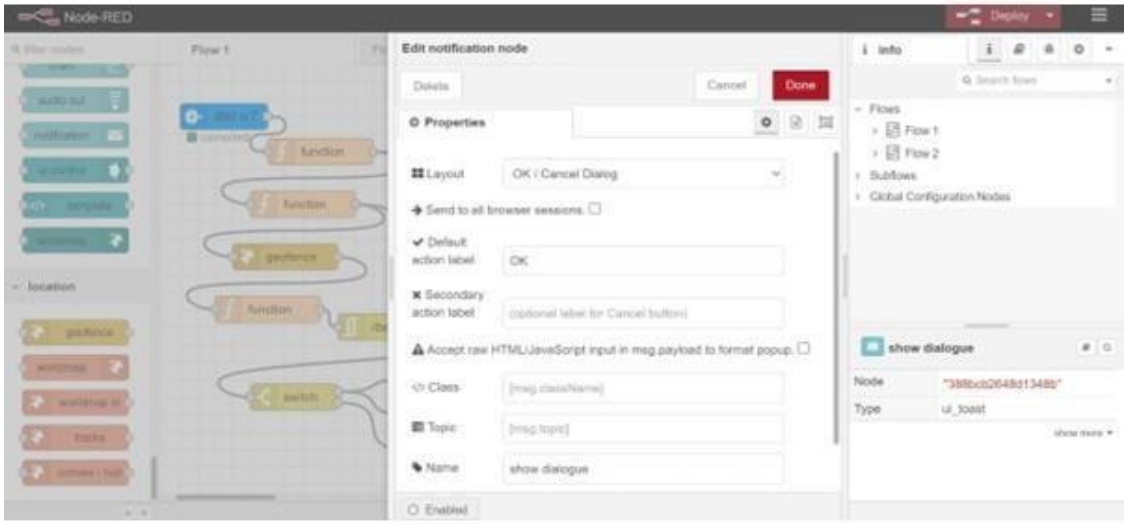

Node-RED
Edit switch node
Delete
Cancel
Done
Properties
Name
Property
msg. payload
is false
is true
checking all rules
recreate message sequences
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
switch
Node
"10b835963824b4cc6"
Type
switch

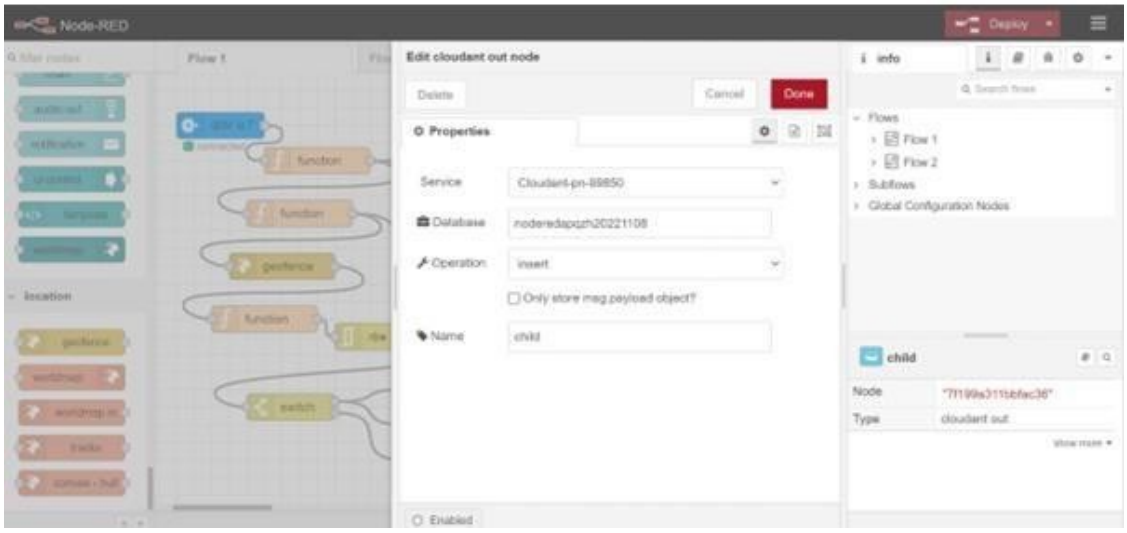

Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
Setup
On Start
On Message
On Stop
var d= new Date();
var utc = d.getTime() + (d.getTimezoneOffset() * 60000);
var offset = 5.5; // This is the offset for UTC+5, in your case (UTC+1
newData = new Date(utc + (3600000*offset));
msg.payload = {
"message":"Entry",
"Time":newData.toLocaleString(),
"name":global.get('name'),
"lat":global.get('latitude'),
"lon": global.get('longitude')
};
return msg;
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
function: 322663c3205cc798
Node
"322663c3205cc798"
Type
function


Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
Setup
On Start
On Message
On Stop
var d= new Date();
var utc = d.getTime() + (d.getTimezoneOffset() * 60000);
var offset = 5.5; // This is the offset for UTC+5, in your case (UTC+1
newData = new Date(utc + (3600000*offset));
msg.payload = {
"message":"Entry",
"Time":newData.toLocaleString(),
"name":global.get('name'),
"lat":global.get('latitude'),
"lon": global.get('longitude')
};
return msg;
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
function: dfef78abe1ae2fd4
Node
"dfef78abe1ae2fd4"
Type
function


Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
Setup
On Start
On Message
On Stop
var d= new Date();
var utc = d.getTime() + (d.getTimezoneOffset() * 60000);
var offset = 5.5; // This is the offset for UTC+5, in your case (UTC+1
newData = new Date(utc + (3600000*offset));
msg.payload = {
"message":"Entry",
"Time":newData.toLocaleString(),
"name":global.get('name'),
"lat":global.get('latitude'),
"lon": global.get('longitude')
};
return msg;
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
function: 36df960d0bd4f874
Node
"36df960d0bd4f874"
Type
function

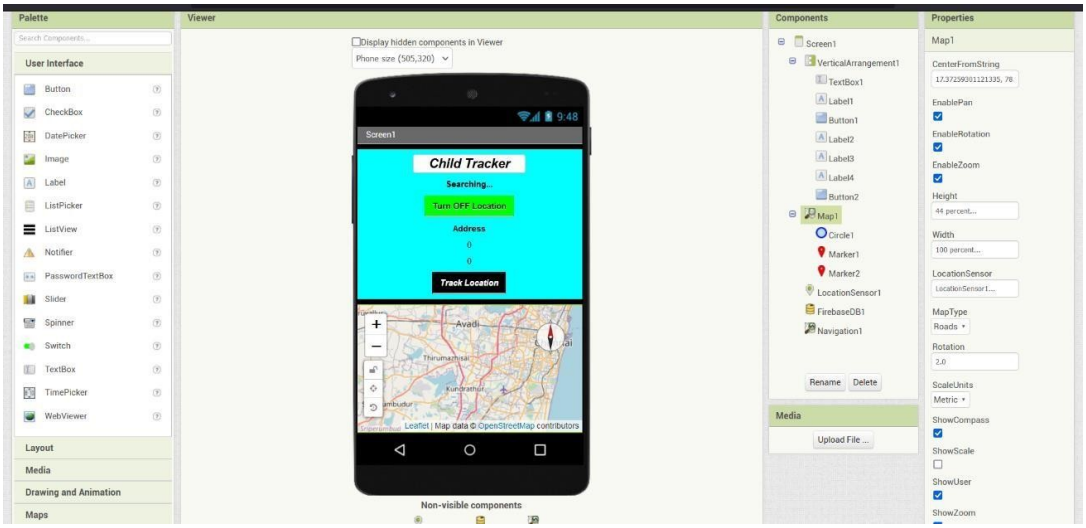

Node-RED
Edit http request node
Delete
Cancel
Done
Properties
Method
GET
URL
https://www.fast2sms.com/dev/wallet?authorizati
Payload
ignore
Enable secure (SSL/TLS) connection
Use authentication
Enable connection keep-alive
Use proxy
Only send non-2xx responses to Catch node
Return
a UTF-8 string
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
http request
Node
Type
http request


Node-RED
Deploy
Edit notification node
Delete
Cancel
Done
Properties
Layout
OK / Cancel Dialog
Send to all browser sessions
Default action label
OK
Secondary action label
Accept raw HTML/JavaScript input in msg.payload to format popup
Class
Topic
Name
show dialogue
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
show dialogue
Node
Type
ui_toast

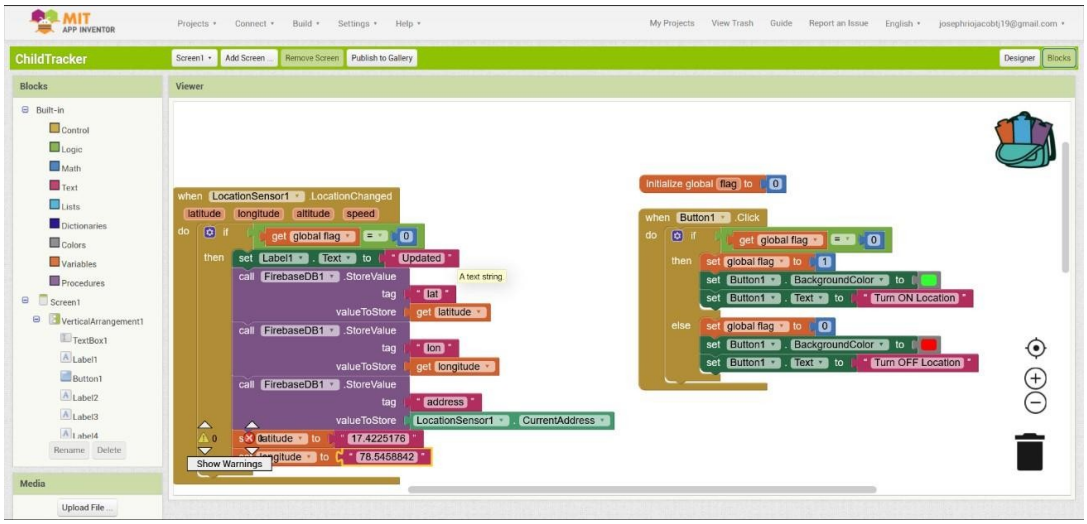

Node-RED
Deploy
Edit cloudant out node
Delete
Cancel
Done
Properties
Service
Cloudant-pn-69850
Database
noderedapqzh20221108
Operation
insert
Only store msg.payload object?
Name
child
Enabled
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
child
Node
Type
cloudant out

9. RESULTS

MIT App inventor:



Block Configuration:



Output(App inventor):

Child Location Status: Child live location founded

10. ADVANTAGES & DISADVANTAGES

ADVANTAGES

1. The parameters such as touch, temperature & heartbeat of the child are used for parametric analysis and results are plotted for the same.
2. This wearable over other wearable is that it can be used in any phone and it is not necessary that an expensive smartphone is required and doesn't want to be very tech savvy individual to operate.
3. The advantages of smart phones which offers rich features like Google maps, GPS, SMS etc.
4. A child tracking system using android terminal and hoc networks.

DISADVANTAGES

1.To implement the IoT device which ensures the complete solution for child safety problems. 2.As, this device's battery gives short life-time. High power efficient model will have to be used which can be capable of giving the battery life for a longer time.

3.This system is unable to sense human behaviour of child.

4.This device cannot be used in rural areas.

11. CONCLUSION

This project demonstrates Smart IoT device for child safety and tracking helping the parents to locate and monitor their children.To save time and reduce crimeshappening we are developing smart child and adult security system which is wearable. This helps guardians to locate their children and women faster and precisely using internetof things. The present work reduces the human effortand particularly mother'sstresses in workingtimes about child. The device affords above scope for modifications for further improvements and operational efficiency, which should make it commercially available and attractive.

12. FUTURE SCOPE

1. The size of components used in the project can be decreased by a processcalled micro fabrication, so that it can be transformed into a wristwatch.
2. Emergency calling featurecan be incorporated wherein women or child under panic circumstances can contact police for assistance.
3. SMS can be sent to more than one individual.
4. The future scope of the work is to implement the IoT device which ensures the complete solution for child safety problems.

13. APPENDIX

SOURCE CODE

```
import json import
wiotp.sdk.device  import
time  myConfig={
        "identity":{
        "orgId": "zc4u6v",
        "typeid": "ChildSafetyGadget",
        "deviceId": "PNT2022TMID15707"
        },
"auth": {
       "token": "childsafety@123"
 }
}
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()  while True:
        name= "Smartbridge"  latitude =
          17.4219272
          longitude=70.540073
        myData = {'name':name, 'lat':latitude, 'lon': longitude}            client.publishEvent
(eventId="Status", msgformat="json", data=myData, qos=0, onPublish=None)  print ("Data
published to IM IoT platfrom:",myData)
          time.sleep(5)
client.disconnect
```