IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING AND NOTIFICATION

TEAM ID: *PNT2022TMID18137*

BATCH NUMBER: *B7-1A3E*

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CONTENTS

1. INTRODUCTION

1.1. Project Overview:

Safety of a child in a large public event is a major concern for event organizers and parents. This paper addresses this important concern and proposes an architecture model of the IoT enable smart child safety tracking digital system. This IoT-enabled digital system architecture integrates the Cloud, Mobile and geo-fencing technology to precisely locate the geographical location of a child on an event map. The proposed architecture model describes the people, information, process, and technology architecture elements, and their relationships for the complex IoT-enable smart child safety tracking digital system. The proposed architecture model can be used as a reference or guide to assist in the safe architecture driven development of the various child tracking digital systems for different public events.

1.2. Purpose:

Basically, the security of children these days is crucial . They can't realize what actually happens to them at their age. It is also difficult for parents to identify if their children are safe and sound. To prevent children from being attacked, an autonomous real-time monitoring system is necessary for every child out there. It would be easier for working parents and guardians to monitor the activities of their children from a distant location. The purpose of the device is to track the location of the child by specifying the geofence markings. When the user moves out of the mentioned markings, the registered parent is sent an alert by GPS monitoring. Proper safety is ensured through this gadget, which works as a principle of Internet of Things (IoT).

2. LITERATURE SURVEY

2.1. Existing Problem:

As mentioned in paper Child Safety & Tracking Management System by Using GPS, Geo-Fencing & Android Application: An Analysis by Aditi Gupta and Vibhor Harit, Today's technology is developing quickly and offering all necessary and efficient answers for every need. The safety of children today is a major worry. The concept mentioned in the paper, was created to relieve parents' concerns about the safety of their children. Due to the legitimate concerns of the parents, their solution provides the highest level of protection and enables live tracking for the children in this situation. This study offered a model for child safety using smart phones that gives parents the option to track their children's whereabouts as well as the ability for kids to send a fast message and their current location in case of an emergency via Short Message Services. Testing on the Android platform verifies the suggested system.The limitations in the existing solution are:

❖ The child must be able to use an Android smartphone, hence this application is only useful for certain age groups of children.
❖ When the mobile is switched off monitoring is not possible.

2.2. References:

[1] McDowell, R, "Child Safety Tip For Busy Public Events", viewed on 7 November https://www.linkedin.com/pulse/child-safety-tip-busy-public events-robert-mcdowell , 2015

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[3] Castillejo, P., Martinez, J.F, Lopez, L., Rubio, "An Internet of Things Approach for Managing Smart Services Provided by Wearable Devices", International Journal of Distributed Sensor Networks, Vol 2013, Article ID 190813, 9pages. 2013

[4]   Lee,S., Tewolde, G., Kwon,J., "Design and Implementation of Vehicle Tracking System Using GPS/GSM/GPRS Technology and Smartphone Application", Conference Paper - 2014 World Forum on Internet of Things (WF-IoT), 2014

[5] Gies, S.V., Gainey, R., Cohen, M.I., Healey, E., Yeide, M., Bekelman, A. & Bobnis, A, 'Monitoring High-Risk Gang Offenders with GPS Technology: An Evaluation of the California Supervision Program Final Report', National Institute of Justice 810 Seventh Street NW Washington, DC 2013.

[6] Duffy, A and O'Donnel, "A Design Research Approach", in Proceedings of the AID'98 Workshop on Research Methods, Lisbon, Portugal, PP.20-27, 1998

[7] Letham, L, 'GPS Made Easy: Using Global Positioning Systems in the outdoors'. Seattle, The Mountaineers. 1998.

[8]   Mcnamee, A, "Ethical Issues arising from the Real Time Tracking and Monitoring of People Using GPS-based Location Services", Faculty of Engineering & Information Sciences - Honours Theses, University of Wollongong, Australia, 2005

[9] Brinton, T., 'Scientists use GPS signals to measure Earth's atmosphere', Tech, Space.com, 2007. viewed on 15 September 2016 http://www.space.com/4452-scientists-gps-   signals-measure-earthatmosphere.html

[10] Shimizu, K., Kawamura, K. & Yamamoto K., "Location System for Dementia Wandering", Engineering in Medicine and Biology Society 2 pp 1556 – 1559, 2000.

[11] Fjortoft,I., Kristoffersenb, B., Sageie,J, "Children in schoolyards: Tracking movement patterns and physical activity in schoolyards using global positioning system and heart rate monitoring", Landscape and Urban Planning Vol 93, Issue 3-4, pp 210-217, 2009

[12] Edgecomb, S & Norton, K., 'Comparison of global positioning and computer-based tracking systems for measuring player movement

distance during Australian Football', Journal of Science in Medicine and Sport, pp: 25- 32, 2006

[13] Kennedy, P.J., "Mobile phone Amber alert notification system and method," U.S. Patent No. 7,228,121, 2007.

[14] Goel, I & Kumar, D, "Design and Implementation of Android Based Wearable Smart Locator Band for People with Autism, Dementia, and Alzheimer", Hindawi Publishing Corporation, Vol 2015, Article ID 140762, 2014.

[15] Albino, M, 'I've Got My Eye On You', Today's Parent, November, pp 59-60, 63, 2013.

2.3. Problem Statement Definition:

With the increasing rate of child kidnapping and trafficking there is lack of tracking technology for children. Hence an IoT based safety gadget for child safety is probably the need of the hour today.

I'm **a parent**

I'm trying to keep my **child safe**

But there are cases of **kidnap and child abuse**

Because of **lack of safety measures and no proper technology**

which makes me feel **scared and insecure**

3. IDEATION AND PROPOSED SOLUTION

3.1. Empathy Map Canvas:

What do they THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations

- Parents will think that gadget is small or not
- which kind of gadget like watch or chain?
- Is the gadget have low price and affordable?
- Is it easy to wear and not harmful?

What do they HEAR?
what friends say
what boss say
what influencers say

- GPS location sensor will give precise latitude and longitude
- It provide the surrounding temperature, so that the parents can keep track .
- It act as a smart device.

What do they SEE?
environment
friends
what the market offers

- Parents will see about children's safety
- Is it user friendly gadget or not?

What do they SAY AND DO?
attitude in public
appearance
behavior towards others

- Keep family safe and protected.
- If the children crosses the partricular area ,we can detect the location
- The children will be in full day monitoring

PAIN
fears
frustrations

- It will affect the children's privacy .
- If the gadget gets lost somewhere then the location remains same
- If the gadget is damaged, it will not work

GAIN
"wants" / needs
measures of success

- It provides parents with the real-time location
- It is share the information to the nearest police stations.
- It provides a security to the children and secures the feeling of parents.

3.2. Ideation and Brainstorming:

Brainstorm

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

⏱ 10 minutes

TIP
You can select a sticky note and let the panel (switch or zoom) come to start showing!

TAMIL ENIYAL S

- Create a mobile application
- Intimating the child's location through GPS
- Ensuring intact delivery of messages
- Integration with Cloud Services

SANGEETHA S

- Use the Child locator gadget
- Geofencing the child's movement
- Comfortable & easily wearable
- maintain a record of the child's location

VARSHA S

- Parental control features
- GPS integrated watch to keep track of their child's movements
- Water & sweat Proo
- Alerting parent when the child passes a range

VIJI PRIYA K

- Continuous tracking and updating child's location
- Send relevant text messages to parents
- Geofencing the child's movement
- compect and light in weight

SOUNDRAYA S

- Create web Application
- Addressing the parents' concern
- Setting up the safety regions of the child
- Measures temperature, pulse rate, heart beat rate of child and notify during emergency
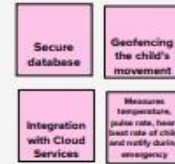
Group ideas

Take turns sharing your ideas while clustering similar or related notes 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 break it up into smaller sub-groups.
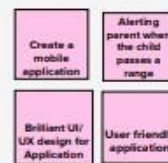
⏱ 20 minutes

Physical Features

- Low levels of radiation
- Comfortable & easily wearable
- Water & sweat Proof
- Better battery life

Database

- Secure database
- Geofencing the child's movement
- Integration with Cloud Services
- Measures temperature, pulse rate, heart beat rate of child and notify during emergency

UI

- Create a mobile application
- Alerting parent when the child passes a range
- Brilliant UI/ UX design for Application
- User friendly application

Tracking location

- GPS integrated watch to keep track of their child's movements
- Keeping parents informed of the child's location
- Alerts if the given range is exceeded
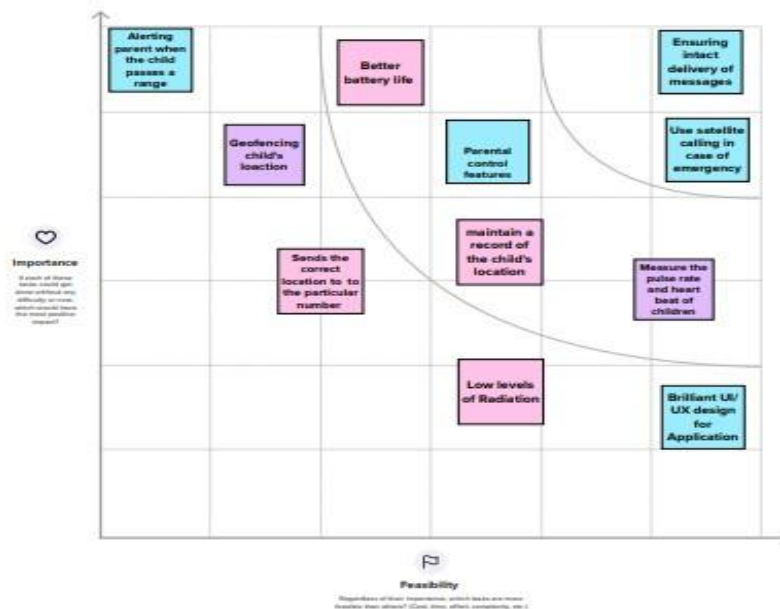- Sends the exact location of child in case of emergency

Prioritize

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

⏱ 20 minutes

Importance

- Alerting parent when the child passes a range
- Better battery life
- Ensuring intact delivery of messages
- Geofencing child's loaction
- Parental control features
- Use satellite calling in case of emergency
- Sends the correct location to to the particular number
- maintain a record of the child's location
- Measure the pulse rate and heart beat of children
- Low levels of Radiation
- Brilliant UI/ UX design for Application

Feasibility

After you collaborate

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

Quick add-ons

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

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

Keep moving forward

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

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

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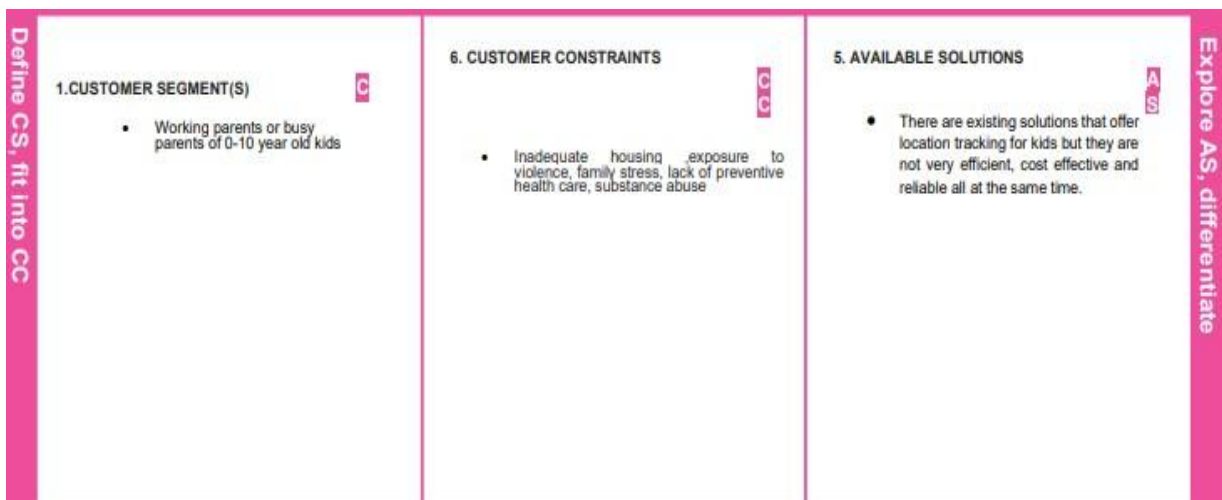Open the template →

Share template feedback

3.3. Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The increased number of recorded crimes against children nowadays raises serious concerns about kid safety and tracking. In order to assist parents in finding and keeping an eye on their children, a smart Internet of Things (IoT) device for child safety and tracking has been developed
2.	Idea / Solution description	To address this problem, it would be an excellent idea to create a smart wearable Internet of Things device. Sensor based device for monitoring the environment of a child along with an instrument 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. GPS gives the information about the latitude and longitude of the victims location when they are crossing geofence.
3.	Novelty / Uniqueness	While all currently available systems employ GPS and a mobile app to track and get notifications about the child's location, this method uses in relation to IBM's Watson IOT Platform Cloud services that are trustworthy and effective to upkeep the child's location database. By creating geofence parents get notifications through the user's web application using the Node Red, friendly and secure Service.
4.	Social Impact / Customer Satisfaction	Parent's priority is the protection and security of their children. This model's construction does not necessitate a lot of technical the user's knowledge to operate it, and it is simple. This device's objective is to assist the parent or guardian in finding with no difficulty and ensuring the health

	of it. So that the child will remain safe.
Business Model (RevenueModel)	Parents are main target for this device'sin the market. The initial pricing range would start at Rs. 4000 and above taking into account the tracking capability of the gadget, Hardware quality, technology used, and sensors. As sensors plays major role , range of sensor varies. These kinds of wearablesafety systems are essential today and would be a must-have item on the market.
Scalability of the Solution	The system is created with the current requirements for monitoring the youngster in mind. The parent can establish the geofence to decide the child's safer boundaries, and it featuresa location database to keep track of thechild's whole location history. The system can be made more effectiveover time if it needs to incorporate further sensors to increase accuracy.

3.4. Problem Fit Solution:

2. JOBS-TO-BE-DONE / PROBLEMS **J&P**

- Child tracker helps the parents in continuously monitoring the child's 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.

9. PROBLEM ROOT CAUSE **RC**

- The busy schedule and hectic working lives of the parent are causing them not able to monitor the safety of their children.

7. BEHAVIOUR **BE**

Customers panic, preventtheir children from going out on their own , tryusing easily available technologies.

3. TRIGGERS **TR**

- Coming across news about children being kidnapped and abducted, missing cases being reported.

4. EMOTIONS: BEFORE / AFTER **EM**

- Before:A sense of shock, disbelief, panic, fear, helplessness, or anger.
- After:Relieved , calm , confident , happy

10. YOUR SOLUTION **SL**

Building a reliable technology that can address all the customer needs while being reliable and secure ensuring efficient functioning.

8. CHANNELS of BEHAVIOUR **CH**

8.1 ONLINE

The android app uses global positioning system (GPS) and mobile services to find the child location. Programs and apps are available that can monitor kids' social media accounts and alert parents to any inappropriate language or photos.

8.2 OFFLINE

Customers accompany their children to ensure safety,send them together with other reliable people, seek for protection in public places.

4. REQUIREMENT ANALYSIS

4.1. 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	Enlistment through account and through Gmail
FR - 2	User Confirmation	Email confirmation and confirmation by OTP
FR - 3	User Notification	Notification to registered mobile number via message
FR - 4	User location check	Location check through account

4.2. Non-Functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR – 1	Usability	Allows parents to track and assist their child's location. Sound the alarmin an emergency. .
NFR – 2	Security	Creates a secure environment when the child moves around.
NFR – 3	Reliability	Increased reliability towards technology and reduced reliability towards guardians.

NFR – 4	**Performance**	High performance in the sense usage and security.
NFR – 5	**Availability**	Reliable use of electricity and all time delivery.
NFR - 6	**Scalability**	High stage with growth in performance.

5. PROJECT DESIGN

5.1. Data Flow Diagrams:
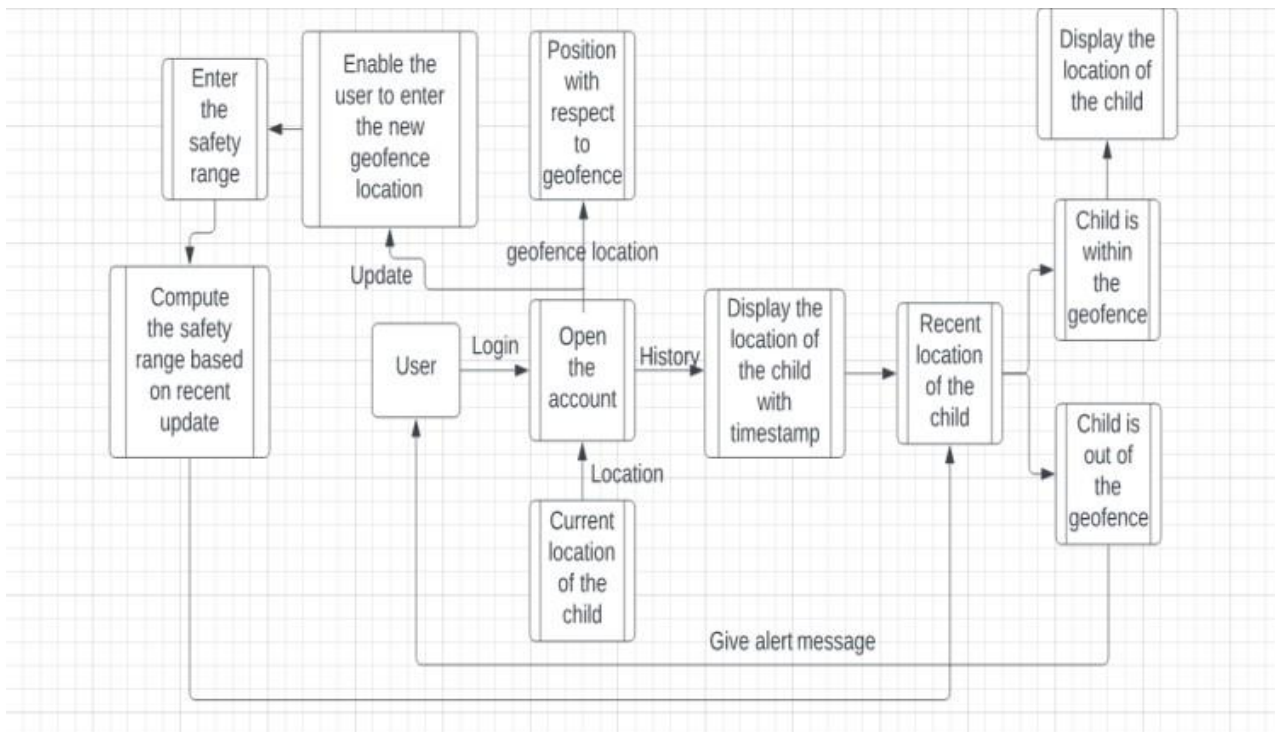
5.2. Solution and Technical Architecture:

In order to connect business issues with technological solutions, solution architecture is a complicated process with numerous sub-processes. Its goals are to:

• Track down the most effective technological remedy for current business issues.

• Explain to project stakeholders the structure, traits, behaviour, and other features of the software.

• Specify the features, stages of development, and requirements for the solution.

• Offer guidelines for how the solution is created, 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:

- ➢ GPS is used to track the child's current location, and the same is continuously observed. The enrolled device will get alert messages or alerts when the device detects activities outside the specified geo fence (as specified by the parent or guardian). If any risk is felt, additional features like message recording could be performed.
- ➢ GPS is used to track the child's current location, and the same is continuously observed. The enrolled device will get alert messages or alerts when the device detects activities outside the specified geo fence (as specified by the parent or guardian). If any risk is felt, additional features like message recording could be performed.

Solution Architecture Diagram:
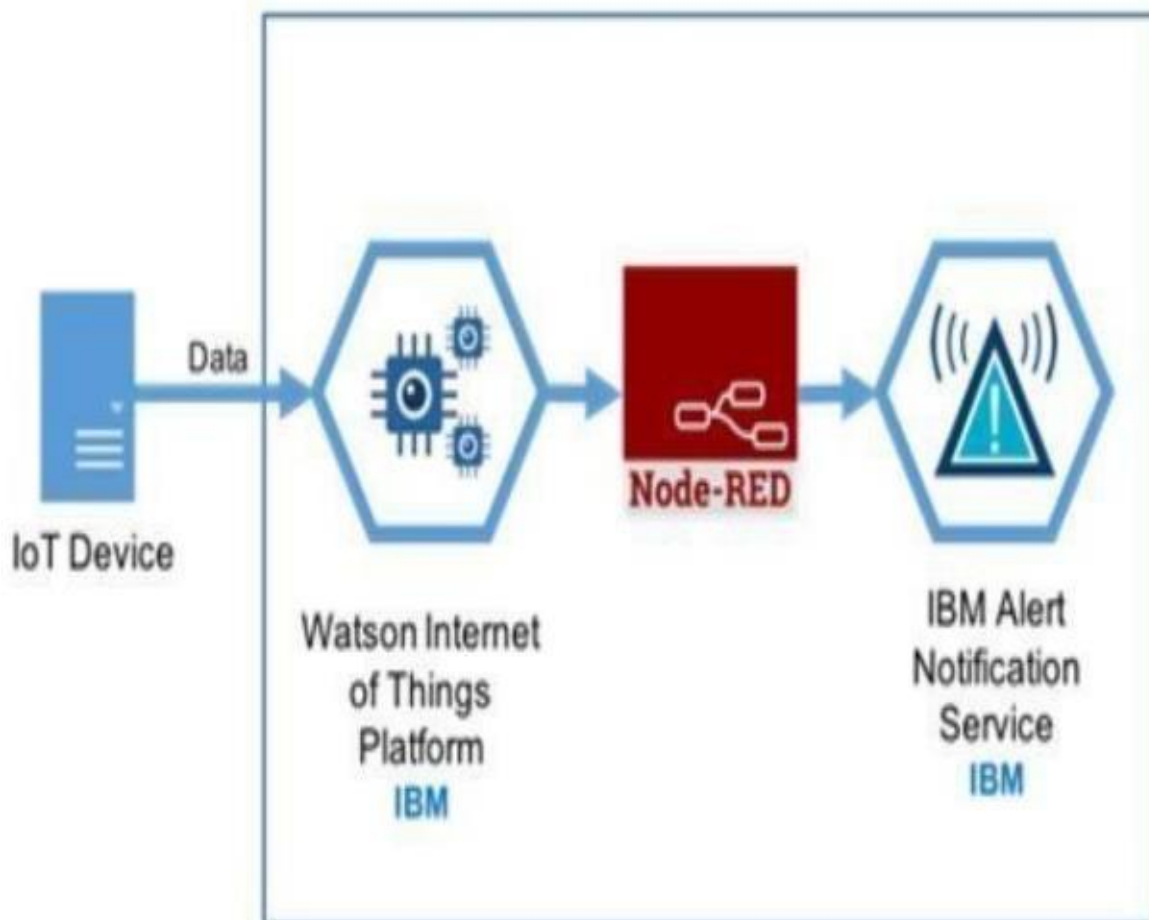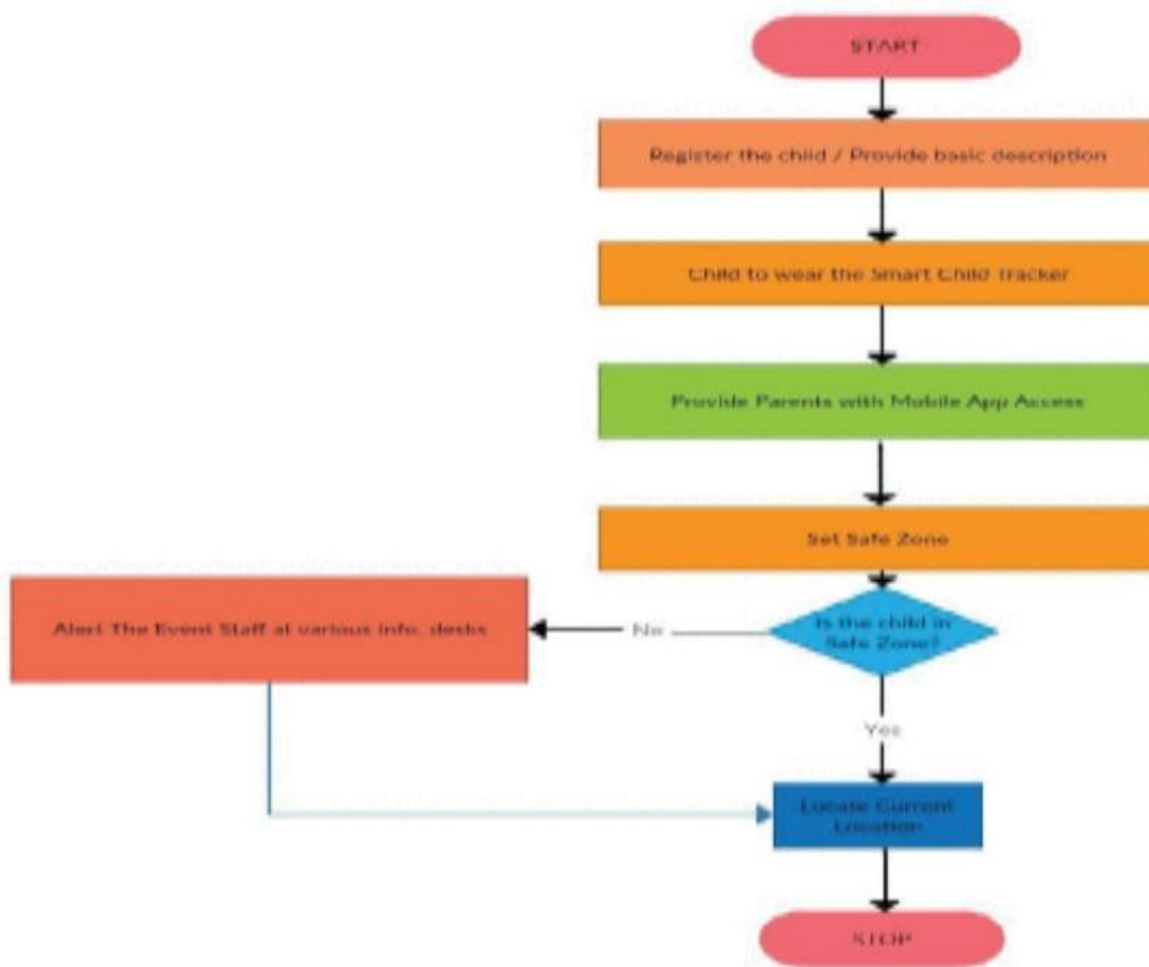
Component Technologies:

S.No	Component	Description	Technology
1.	User Interface	Interaction of the user with the application using Web UI	Node Red
2.	Application Logic-1	Tracking of user's location and monitoring of thesame	Python
3.	Application Logic-2	Sending notifications to the registered users	Node Red
4.	Application Logic-3	Send alert when user crossesthe geo-fence mentioned	IBM Watson Assistant

5.	Cloud Database	Handles software and hardware provisioning, management and scaling and support.	IBM Cloudant
7	External API	Easy user interface.	MIT App inventor
8.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration	Kubernetes

Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	A software for which the original source code is made freely available and may be redistributed and modified according to therequirement of the user.	Watson IoT platform, Wokwi,Node red.
2.	Security Implementations	Secure monitoring of the user's location without open-source access	IBM encryption services
3	Scalable Architecture	Presence of location sensors to quickly scale the user's current location.	GPS, IBM alert notification service.

User stories:

User Type	Functional Requirement (Epic)	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 for the application 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	I can receive confirmatio	High	Sprint-1

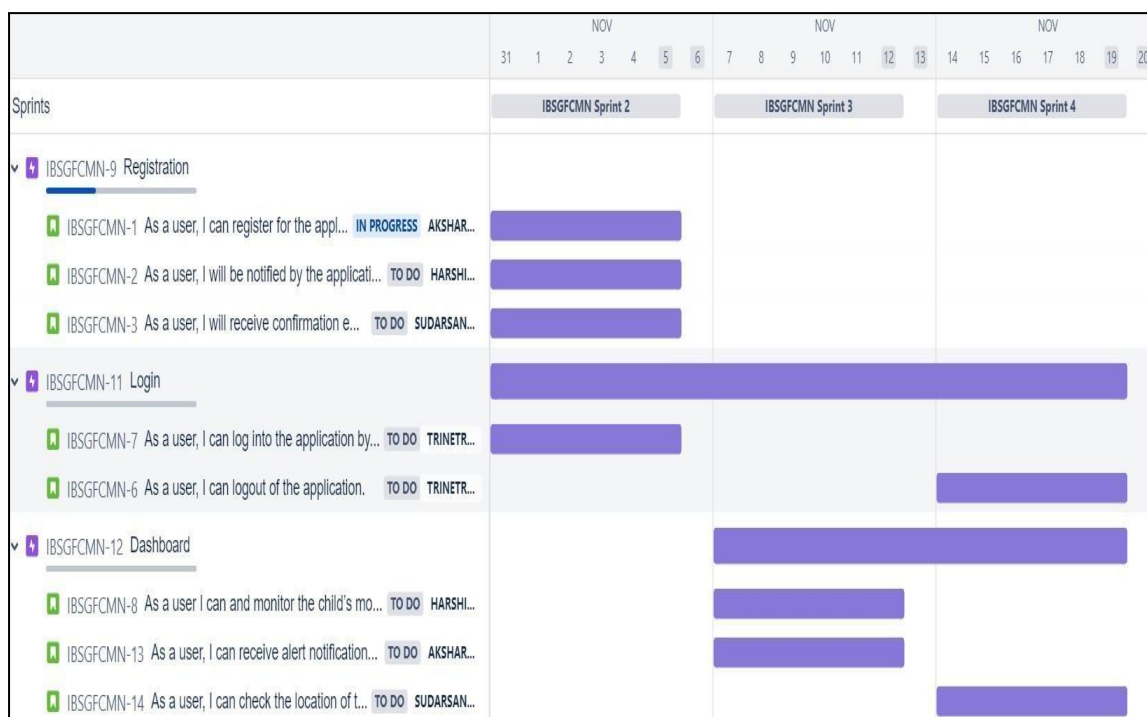| Role	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
			for the application	n email & click confirm		
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	High	Sprint-2
	Login	USN-4	As a user, I can log into the application by entering email & password		High	Sprint-1
Customer Care Executive	Login		To address customer issues and resolve them in a timely and efficient manner.	I can login only with my provided credentials	Medium	Sprint - 3
Administrator	Login		Maintaining and making sure the database containing the locations are secure and accurate and updated constantly.	I can login only with my provided credentials	High	Sprint - 3

6. PROJECT PLANNING AND SCHEDULING

6.1. Sprint Planning and Estimation:

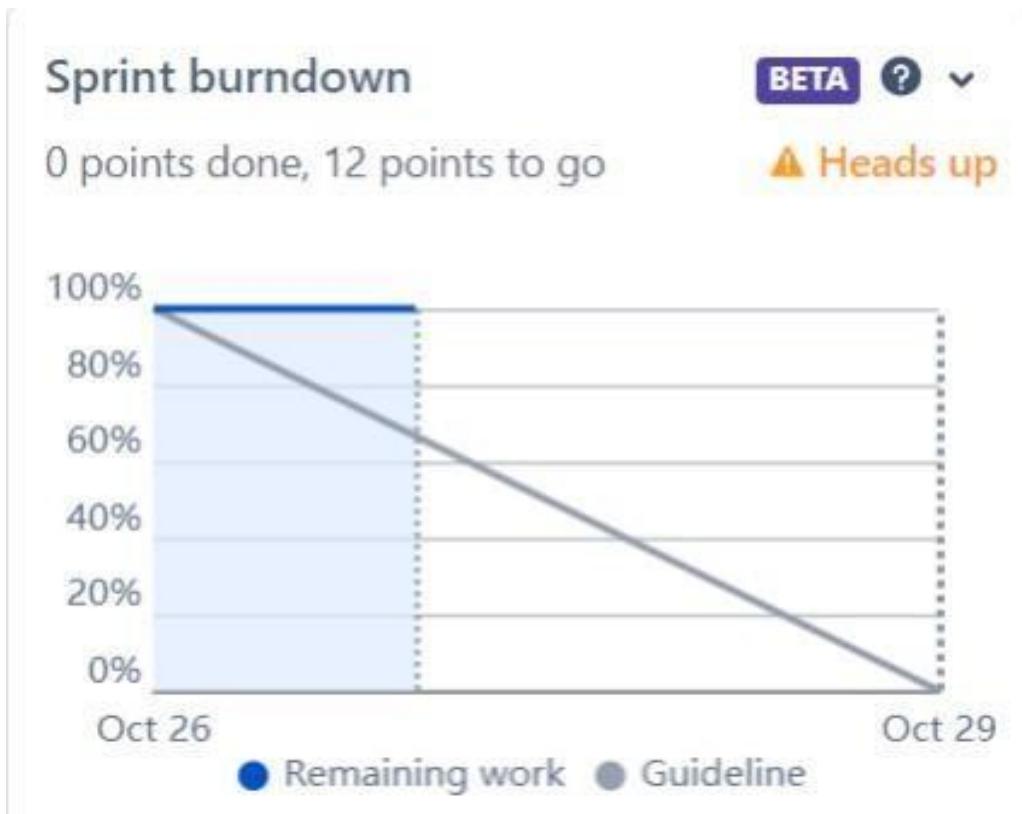| Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority
Sprint -1	Registration	USN-1	As a user , i can register to the application by entering my email, password, name and phone number	8	High
Sprint -2		USN-2	As a user, I will receive confirmation email once Iregister	5	Medium
Sprint -1		USN-3	As a user, I will be notified by the application if the credentials are invalid	5	Medium
Sprint -2	Login	USN-4	As a user, I can log into the application by entering email and password	8	High
Sprint -4		USN-5	As a user, I can logout of theapplication.	5	High
Sprint -3	Dashboard	USN-6	As a user I can and monitor the child's movement by clicking the monitor button on the homepage	5	High
Sprint -3		USN-7	As a user, I can receive alert notifications in the webpage, if the movement of the child is beyond the geofence	8	High
Sprint -4		USN-8	As a user, I can check the location of the child using the app	8	High

6.2. Sprint Delivery Schedule:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	13	6 Days	24 Oct 2022	29 Oct 2022	13	29 Oct 2022
Sprint-2	13	6 Days	31 Oct 2022	05 Nov 2022	13	05 Nov 2022
Sprint-3	13	6 Days	07 Nov 2022	12 Nov 2022	13	12 Nov 2022
Sprint-4	13	6 Days	14 Nov 2022	19 Nov 2022	13	19 Nov 2022

6.3. Reports from JIRA:

Burn-down Chart:

Sprint burndown   BETA ? ⌄

0 points done, 12 points to go   ⚠ Heads up

Oct 26   Oct 29

● Remaining work ● Guideline

7. CODING AND SOLUTION

```python
proj code.py - D:\Python\Python codes - IBM\proj code.py (3.7.6)
File  Edit  Format  Run  Options  Window  Help

import json
import wiotp.sdk.device
import time

myConfig ={
    "identity":{
        "orgId": "6ni2t5",
        "typeId": "device1",
        "deviceId": "deviceid1"
        },
    "auth": {
        "token":"deviceauth1"
        }
    }


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

while True:

    name="Smartbridge"
    #in area location

    latitude=11.664325
    longitude=78.146011

    #out area location

    #latitude= 17.421927
    #longitude=78.548878
    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 platform: ",myData)
    time.sleep(5)

client.disconnect()
```
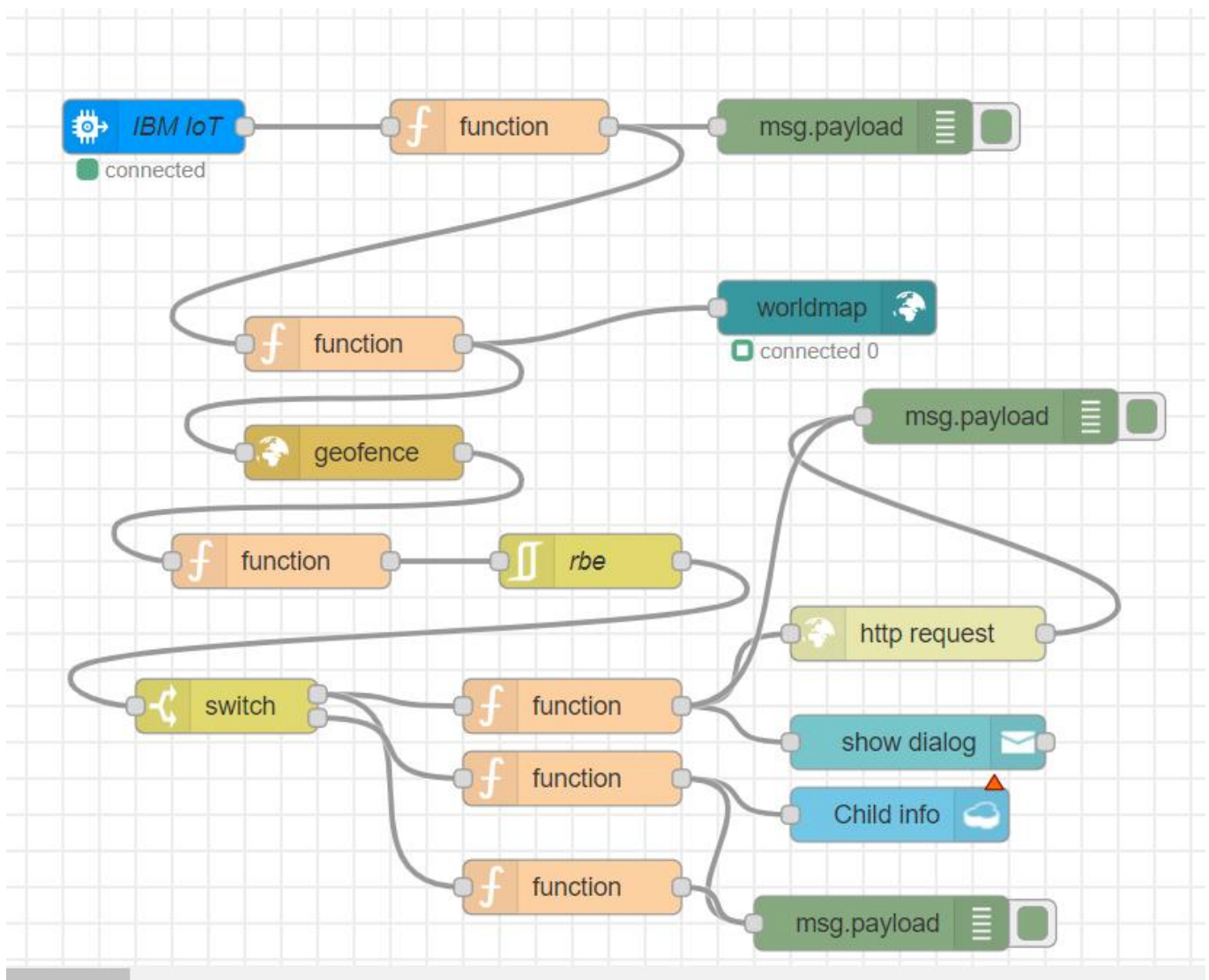
7.1. Feature 1:

JSON:

Latitudes and Longitudes of the child are sent in the form of JSON text as it is legibleby humans, it is lightweight, requires less coding, and processes data more quickly than other data formats

Wiotp - sdk - device:

The latitude and longitude values generated in the python code are sent to the IBMWatson IoT platform using this package.

World map:

The latitude and longitude of the child is indicated or plotted in the form of a markerin the world map using the worldmap node of Node Red.

Geo-fence:

This node of Node Red enables to set the safe boundary for a child.

8. TESTING

8.1. Test Cases:

Test case ID	Feature Type		Test Scenario
LoginPage_TC_OO1	Functional	Signup Page	Verify user is directed to the correctsignuppage on entering the URL
LoginPage_TC_OO2	UI	Signup Page	Verify the UI elements inLogin/Signup page
LoginPage_TC_OO3	Functional	Signup Page	Verify user is able to register in theapplication with Valid credentials
HomePage_TC_008	Functional	Home Page	Verify user is able to view the child'slocation in the form of marker
HomePage_TC_009	Functional	Home Page	Verify user receives a notificationwhen child is not within the Geofence

HomePage_TC_010	Functional	Home Page	Verify user is able to logout of theapplication
App_TC_011	Functional	App	Verify in the MIT App inventor if thechild is inside the area
App_TC_012	Functional	App	Verify in the MIT App inventor if thechild is outside the area

Date	23-Nov-22	
Team ID	PNT2022TMID18137	
Project Name	IoT based safety gadget for child m	
Maximum Marks	4 marks	

Pre-Requisite	Steps To Execute	Test Data
Internet connection, Browser	1.Type the URL and click enter 2.Verify login/Singup page is displayed or not	https://node-red-cdaue-2022-11-17.eu-de.mybluemix.net/signup
Internet connection, Browser	1.Type the URL and click enter 2.Verify login/Singup popup with below UI elements: a.email text box b.password text box c. Username text box d.phone number text box e.submit button f. Existing user? Login	https://node-red-cdaue-2022-11-17.eu-de.mybluemix.net/signup
Internet connection, Browser	1.Type the URL and click enter2.Enter the following details: a.email text box b.password text box c. Username text box d.phone number text box e.submit button f. Existing user? Login	https://node-red-cdaue-2022-11-17.eu-de.mybluemix.net/signup
Internet connection, Browser	1.Type the URL and click enter 2.Enter Valid username/email in Email text box 3.Enter valid password in password text box 4.Click on submit button 5.Click monitor button	https://node-red-cdaue-2022-11-17.eu-de.mybluemix.net/home
Internet connection, Browser	1.Type the URL and click enter 2. Enter Valid Username/email in Email text box 3. Enter valid password in password text box 4. Click on submit button 5. Click on monitor button	https://node-red-cdaue-2022-11-17.eu-de.mybluemix.net/home
Internet connection, Browser	1.Type the URL and click enter 2. Enter Valid Username/email in Email text box 3. Enter valid password in password text box 4. Click on submit button 5.Click Logout	https://node-red-cdaue-2022-11-17.eu-de.mybluemix.net/home

Internet connection, MIT AI2 Companion	1. Open MIT AI2 Companion 2. Download the apk file 3. Open the app 4. Click on check location button	http://ai2.appinventor.mit.edu/b/4p63n
Internet connection, MIT AI2 Companion	1. Open MIT AI2 Companion 2. Download the apk file 3. Open the app 4. Click on check location button	http://ai2.appinventor.mit.edu/b/4p63n

Expected Result	Actual Result	Status	Comments
Login/Signup page should display	Working as expected	Pass	–
Application should show below UIelements: a.Email text box b.Password text box c. Username text box d.Phone number text boxe.Submit button f. Existing user? Login	Working as expected	Pass	–
Application should show below UIelements: a.Email text box b.Password text box c. Username text box d.Phone number text boxe.Submit button f. Existing user? Login	Working as expected	Pass	–
Application should display Monitor option after logging into the account	Working as expected	Pass	–
Application should display Monitor option after logging into the account, sends notification when child is out ofgeofence	Working as expected	Pass	–
User is able to logout of the applicationsuccessfully	Working as expected	Pass	--

User is able to open the app and checkif the child is inside the area	Working as expected	Pass	–
User is able to open the app and checkif the child is outside the area	Working as expected	Pass	–

TC for Automation(Y/N)	BUG ID	Executed By
No	_	Sangeetha S,Tamil Eniyal S,Viji Priya K,Soundarya S,Varsha S
No	_	Sangeetha S,Tamil EniyalS,Viji Priya K,Soundarya S,Varsha S
No	_	Akshara R T, Harshini A,Sudarsana Samhita S, Trinetra J
No	_	Sangeetha S,Tamil EniyalS,Viji Priya K,Soundarya S,Varsha S
No	_	Sangeetha S,Tamil EniyalS,Viji Priya K,Soundarya S,Varsha S
No	_	Sangeetha S,Tamil EniyalS,Viji Priya K,Soundarya S,Varsha S

No	_	Sangeetha S,Tamil Eniyal S,Viji Priya K,Soundarya S,Varsha S
No	_	Sangeetha S,Tamil Eniyal S,Viji Priya K,Soundarya S,Varsha S

8 .2 User Acceptance Testing:

- ## Purpose of Document:

    The purpose of this document is to briefly explain the test coverage and open issuesof the [IoT Based Safety Gadget For Child Safety Monitoring & Notification] project at the time of the release to User Acceptance Testing (UAT).

- ## 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	2	1	3	2	8
Duplicate	1	0	3	0	4
External	3	2	1	1	7
Fixed	6	1	6	3	16
Not Reproduced	0	0	0	0	0
Skipped	0	1	1	0	2
Won't Fix	0	1	0	0	1
Totals	11	4	14	6	35

• <u>Test Case Analysis</u>

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

Section	Total Cases	Not Tested	Fail	Pass
Signup Page	3	0	0	3
Login Page	4	0	0	4
Home Page	3	0	0	3
App	2	0	0	2

9.RESULTS

9.1Performance Metrics:

S.No	Project Name	Scope/feature	NFT - Risk Assessment				Risk Score	Justification
			Functional Changes	Hardware Changes	Software Changes	Load/Volume Changes		
1	IoT Based Safety Gadget for Child Safety Monitoring and Notification	New	Low	Moderate	Low	>5 to 10%	ORANGE	The minor functional modifications and software changes has let to low level risks. Hence testing is not necessary.

10.ADVANTAGES & DISADVANTAGES

Advantages:

- ➢ A tracking device can be useful in case the parent feels that his/her child is in danger.
- ➢ Not only does the device provide the real-time location.
- ➢ These devices help parents set a perimeter for their children when they leave the house. The moment they step beyond the defined area, the tracking software will alert the parent.

Disadvantages:

- ➢ If you're using GPS on a battery operated device, there could also be a battery failure and you'll need an external power supply which isn't always possible.
- ➢ GPS chips are hungry for power which drains battery in 8 to 12 hours. This needs replacement or recharge of the battery quite frequently.

11.CONCLUSION

The design of this model does not mandate a lot of technical knowledge from the user to operate and it is simple. This gadget facilitates the guardian or parents in locating their child with ease and ensuring its well-being 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. Hence, considering the importance, our project makes it easy for parents to track their children and to monitor them on regular basis, which makes them ensure the safety of their children and reduces the rate of incidents of child abuse.

12.FUTURE SCOPE

In our system, we automatically monitor the child in real time using Internet of Things, with the help of GPS. This system requires network connectivity, satellite communication, and high-speed data connection with GPS to monitor. It is difficult to do so when there occurs any hindrance to satellite communication or any network issue. Hence in the future, the project will aim to include additional features like facilitate automatic emergency calls and to perform these actions with comparatively less battery usage.

13.APPENDIX Source Code

Child safetycode.py - C:\SANGEETHA IMPT\Sangi\SEM 7\IBM Project\Child safetycode.py (3.7.1)
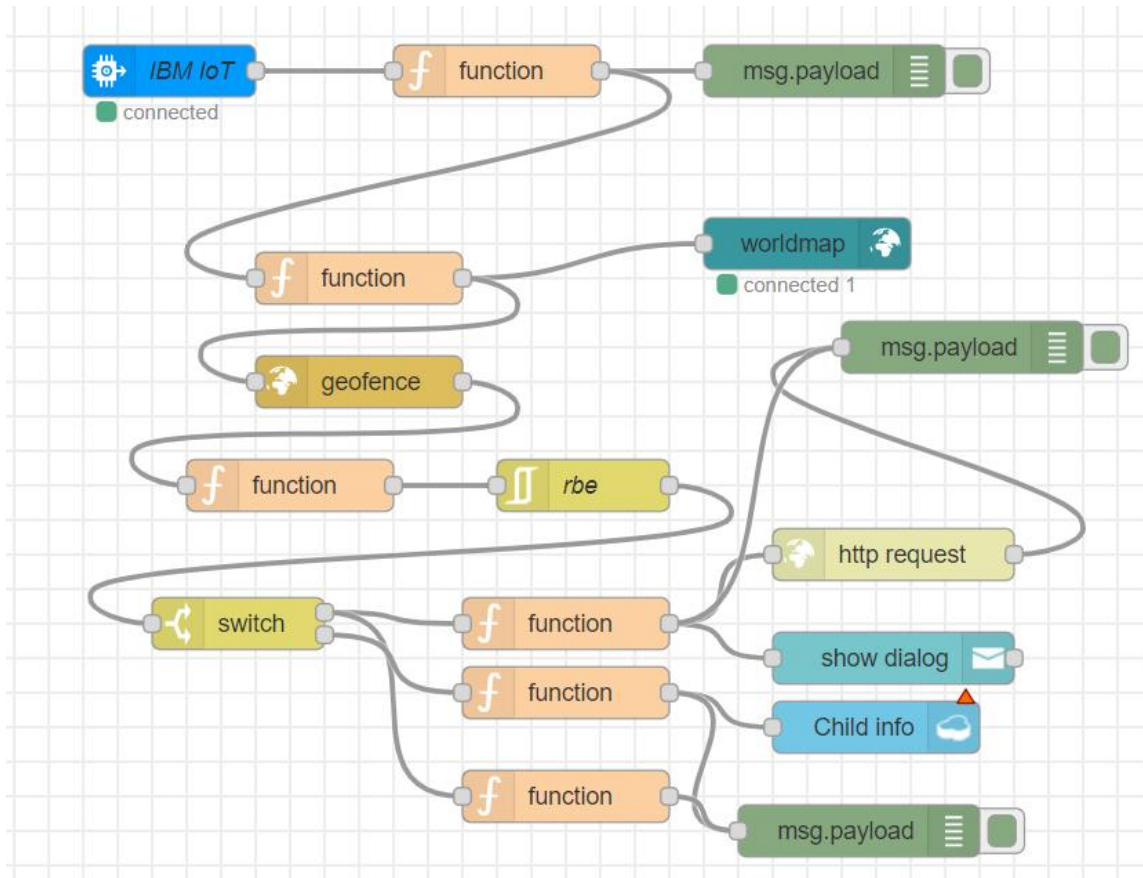
File Edit Format Run Options Window Help

```python
import json
import wiotp.sdk.device
import time
myConfig = {
 "identity": {
 "orgId": "t7fqot",
 "typeId": "NodeMCU",
 "deviceId":"12345"
 },
 "auth": {
 "token": "12345678"
 }
}
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()
while True:
 name ="smartbridge"
 #in area location

 latitude=17.4219272
 longitude=78.5488783

 #out area location
 #latitude=17.4219272
 #longitude=78.5488783
 myData={'name':name,'lat':latitude,'log':longitude}
 client.publishEvent(eventId="status",msgFormat="json", data=myData,qos=0,onpublish=None)
 print("Data published to IBM IOT platform:",myData)
 time.sleep(5)

client.disconnect()
```
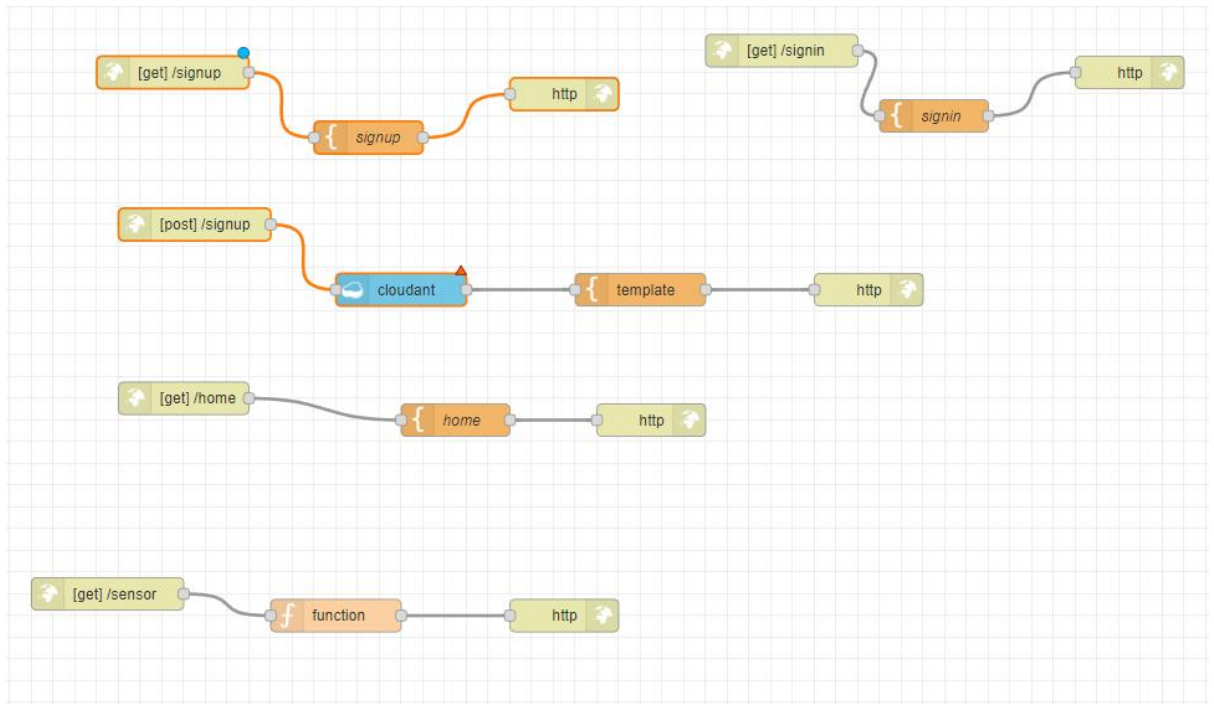
Node Red connection

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