IOT BASED SAFETY GADGETS FOR CHILD SAFETY MONITORING AND NOTIFICATION

PROJECT REPORT SUBMITTED

VIDYA.D (712819104030)

VAISHNAVI.S (712819104716)

SNEHA.P (712819104712)

SOWMIYA.K (712819104027)

INPARTIAL FULFILLMENT FOR THE

AWARD OF THE DEGREE

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

CONTENT

INTRODUCTION

PROJECT OVERVIEW

As we know in present era everything is based on digital technology. Human being is going to connect each other by using mobile network. This project proposes an SMS based solution to reduced parents insecurity and to track children's in real time. Different devices are connected with a single device. The concerned device is connected to mobile via SMS. Child tracker helps the parents in continuously monitoring the child's location. They can simply leave their children in school or parks and create a geo fence around the particular location. By continuously checking the child's location notifications will be generated if the child crosses the geo fence. Notifications will be sent according to the child's location to their parents or caretakers. The entire location data will be stored in the database.

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 geo fence around the particular location. By continuously checking the child's location notifications will be generated if the child crosses the geo fence. Notifications will be sent according to the child's location to their parents or caretakers. The entire location data will be stored in the database.

LITERATURE SURVEY

1. RFID based System for School Children Transportation Safety Enhancement Name of the author: Mansi Kashyap.Journal published: International Journal of

Scientific Research and Management Studies (IJSRMS) ISSN: 2349-3771 Volume 4 Issue 3.

OBJECTIVE OF THE PROJECT:

A .RFID based System for School Children Transportation Safety Enhancement:

In this paper author had presented a device to monitor pick-up and dropoff of kid to enhance the well-being during daily transportation from school and to school. In this system there are two main units, abus unit, and a school unit. The bus unit is the system which is used to determine when a child is boarding or leaving the bus. The information from bus unit is then sent to the school system that identifies the students that haven't board or leave the bus. It then issues an alert message. In this paper author has a developed a web-based and databasedriven application for controlling of the device. This application provides beneficial details about the children to caregiver's personnel.

B. Smart IoT Device for Child Safety and Tracking:

It provides guardians with the real-time tracking of location, UV radiation index, surrounding temperature, and SOS light with a Distress alarm buzzer for their kids to make people near child to know that child is in panic. It provides feature to locate their kid or alert bystanders so that they can act to comfort the child or rescue the child. In this device they have used Thing Speak, Micro Electro Mechanical Systems (MEMS), Node MCU, GPS, GSM and Various sensors. This device gives the result for the parent in two different ways.

The first one is they get an alert message (SMS) for the registered phone number. The next one is they receive a graphical representation which shows the Latitude, Longitude, MEMS Sensor and Vibration sensor of the child's activities through "Thing Speak". The disadvantage of this device that to use this device there must

be efficient flow of internet connection and it must be fullest. Then only it gives the outputs at the earliest otherwise it takes time for the result.

C. Child Safety Wearable Device:

This project focuses communication mode to be in SMS text form using GSM. The parent will send a key word in form of SMS “SOS”, “BUZZ”, “LOCATION”, “TEMPERATURE” etc., to the devices. The device will reply back the real time accurate location of the child and will also provide the surrounding temperature, or any of the data asked by the parents. It helps parents to keep track if the temperature around their kid is not proper for their kid. The secondary idea implemented was distress alarm buzzer and a bright SOS Light on the device that can be activated by the guardians via sending the keywords in the SMS. Parents can text the keywords to ON the SOS signal brightly and can also send the keyword to sound an alarm which a people near child or bystander can instantly help the child's till the parents arrive. People around could also contact the parents and help them to reunite child with his or her parents. Hence this project provides parents a sense of protection for their kid in today's unsafe environment. The drawback of this system is that parent have to remember the keywords.

D. A Smart Security for Child Safety

Child tracking is mainly based on two units GPS watch and Android monitoring unit. This wearable device unit consist of a GPS receiver, Flexi Force Sensor, Temperature Sensor and MEMS accelerometer. This security Wearable Device will keep the child safe. The parent will get the continuous update about their child temperature and various other factors, so that they not afraid about their child well-being when they are not with their kid. This would create some fear in the persons mind who are involved in child trafficking and harassment. As a wellknown proverb “Prevention is better than cure”, this application will act as a prevention for the child safety from harassment and kidnapping.

2.STUDY ON WEARABLE DEVICES FOR THE SAFETY AND SECURITY
OF A GIRL
CHILD ANDWOMEN

Name of the author : P Nandhini

Journal published: International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2320-5407

OBJECTIVE OF THE PROJECT:

In todays world women are less secure and have many issues regarding their security purpose. This paper describes about safe and secured electronic system for women which comprises of an Arduino controller and sensors such as temperature LM35, flex sensor, MEMS accelerometer, pulse rate sensor,sound sensor. A buzzer, LCD, GSM and GPS are used in this project. When the woman is in threat, the device senses the body parameters like heartbeat rate, change in temperature, the movement of victim by flex sensor,MEMS accelerometer and the voice of the victim is sensed by sound sensor. When the sensor crosses the threshold limit the device gets activated and traces the location of the victim using the GPS module. By using the GSM module, the victims location is sent to the registered contact number.

3. CHILD WEARABLE SAFETY MONTORING DEVICES:

Name of the author: Asghar Pasha, Bi Bi Khatija,M.Shaista Tarannum, K. R. Harris, Nida
Sayedi, Aseema Sultana.

Journal published: International Journal of Research in Engineering, Science an Management Volume-2, Issue-5.

OBJECTIVE OF THE PROJECT:

In this busy world parents have no much time to take care of their babies and women have no much time to take care about themselves so, the world is moving towards smart technology through internet of things. In our project we are implementing and developing adults and child security using IoT [6]. Here, we mainly concentrate on temperature, heartbeat, crying, alerting guardians through smart phone using IoT with the help of raspberry Pi. All IoT sensors have analogue ports and they give output as Analog. In order to interface analog values to raspberry Pi Analog to Digital conversion is used. Analog to Digital is a modulation and demodulation process. The different sensors used are Temperature sensor, Heartbeat sensor, Accelerometer and sound sensor. Temperature sensor give values in terms of voltage to IC as 0.35 etc. Heartbeat sensor gives values in terms of pulse PIC microcontroller act as a counter to count Heartbeat rate. Sound sensor gives analog values. Some threshold is set whenever the external value crosses the threshold. It will detect as child/ women is crying. Accelerometer detects position depending on the coordinates. It gives result in form of X, Y and Z values. All these values from various sensors are analog values, they cannot be interfaced directly with Raspberry pi. So, Analog to Digital microcontroller is used i.e. PIC 16F877A that converts analogue values to digital form. All these values from various sensors are sent to PIC microcontroller that does all A-D conversions. Finally, the converted values/information are sent by serial communication by single wire to Raspberry pi3. Raspberry pi3 collects all data from PIC controller and upload it to server. Server used is thing speak cloud. That could be used to monitor health and safety of child/women. The device has two modes. Child mode and women mode. One can easily set the mode to 0 or 1. 0 is child mode and 1 is women mode. The system has lithium ion battery which is used for power supply with minimum discharge rate. It also has pi camera that is used to capture image of the people in front or the situation. There is an emergency switch which can be pressed manually either by child or women. When an emergency switch is pressed buzzer is activated which is used to alert nearby people so that they can come to the child/women rescue. Depending on the conditions set parents/guardian are notified via SMS and e-mail. SMS through Twilio

could be sent along with details of temperature. Heartbeat rate and position of the ward. Email is also sent simultaneously along with the images and other data. Location is also sent in both SMS and e-mail with longitude and latitude values to parent/guardian.

4. Child A Self-Configurable New Generation Children Tracking System:

Name of the author: S. Deepa, S. Dinesh Kumar, P. Prasanth

Journal published: IJESC Research Article Volume 9 Issue 3

OBJECTIVE OF THE PROJECT:

The basic operation of the proposed child tracking system is that when a violation of child safe is detected, a specific sensor in child module will produce a signal. This signal will be sent from these sensors and GPS to microcontroller then through transmitter to parent module. The parent module will take the decision and start the violation handling procedure. the operation of the child tracking system requires certain hardware between child model and parent one. This includes a certain driving circuit that activates the sensors. The main hardware parts of child tracking system are; sensor driving circuits, GPS, PIC, Transceiver, Buzzer, LCD and Keypad. Hiroshima City Children Tracking System is a safety support system for children based on ad hoc network technologies. Field experiments have been conducted in cooperation with an elementary school in Hiroshima. In this paper, we propose a new generation children. Tracking system which is based on experiences and findings of the field experiments for Hiroshima City Children Tracking System. Our proposed system consists of Android terminals which has Wireless LAN device and Bluetooth device with the ad hoc communication function. Our system manages groups of Android terminals using Autonomous Clustering technique. Challenges with gathering data techniques using mobile and unexpected environment (mobilecontext), as well as, the privacy issues on gathering personal information from a third party applications.

IDEATION AND PROPOSED SOLUTION

EMPATHY MAP CANVAS:

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 limitedapplication for child monitoring. Hencean **IoT based safetygadget** for child safety is probably the need of the hourtoday

2.	Idea / Solutiondescription	Agood solution to this issue would be to designa smart wearableInternet of Thingssensor based devicefor monitoring the environment of a childalong with a mechanism for tracking the child. The gadget will make use of **GPS and** a python script to publish the location detailsto the IBM IoT platform. The wearable also functions to send **immediate alerts**to the user through in case if the childcrosses 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 useof the IBM Watson IOT Platform and IBM Cloud Services which is reliable and efficient to maintain the database of the child'slocation. The parent can set geofence and receive alerts through the web application which is user friendly and secure created using the Node Red Service. .

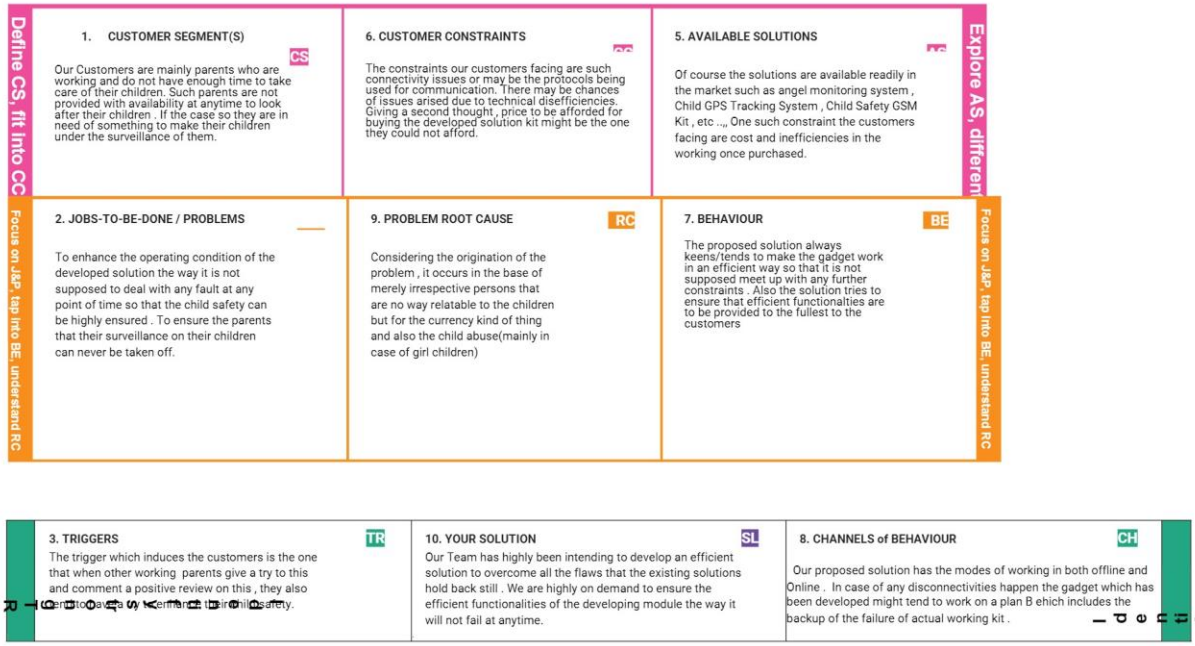
4.	Social Impact/ Customer Satisfaction	The main concern of any parentwould be the safety and security of their kids. Thedesign of this model does not mandatea lot of technical knowledge from the user to operateand it is simple. The purpose of this deviceis to facilitate the guardian or parents in locating theirchild with ease and ensuringits well-being.

PROBLEM SOLUTION FIT:

Project Title: IOT based safety gadget for child safety monitoring and notification

Project Design Phase-I - Solution Fit Template

Team ID: PNT2022TMIDxxxxxx



REQUIREMENT ANALYSIS

FUNCTIONAL REQUIREMENT:

FR NO:	FUNCTIONAL REQUIREMENT(EPIC)	SUB REQUIREMENTS(STORY/SUBTASK)
FR-1	User Registration	Registration through Gmail Registration through phone number
Fr-2	User Confirmation	Confirmation via Email Confirmation Via OTP
FR-3	App Installation	Installation through Link Installation through Play store
FR-4	Settings Geo fence	Setting by user to find child location
FR-5	Detecting Child Location	Detecting location via app Detecting location via SMS
FR-6	User Interface	User Login Form. Admin LoginForm.

FR-7	Database	Stored in cloud forseamless connectivity. Parents and kids link with the distance and the location values obtained fromthe mobile devicesare stored here. The values include parent id ,kid id,
		distance, longitude, latitude etc.

FR NO:	FUNCTIONAL REQUIREMENTS	SUB REQUIREMENTS
FR-8	Server	It connects the database and the frontend application. The backend server has been implemented to run as a serviceand is deployed in an IBMcloud instance. The backend server has been implemented to run as a service and is deployed in an IBM cloud instance.

FR-9	GPS tracking	The system is implemented with a GPS module, which acquires the location information of the userand stores it to the database.
FR-10	API	Thevalue collected is sent to the database using an API.
FR-11	React JS	We are using reactjs as front end for our project. Node JS forthe back endwe are usingnode js.
FR-12	GPS modules	It receives data directly from satellites.
FR-13	Ba ery Life	1. If the child or parent forgets to charge the device for a whole day then also the device will work. That'swhy we aim to makethis device lastthe whole daywith one charge. It shouldbe long-lasting.

FR-14	Local on History	The location history will help to track the child's activity so that the aren't will be updated. Location history will be there for 30 days. Forexample if the child getsmissing with the help of location history the aren't can trackdown their child's activity and also can find their child.

NON-FUNCTIONAL REQUIREMENTS:

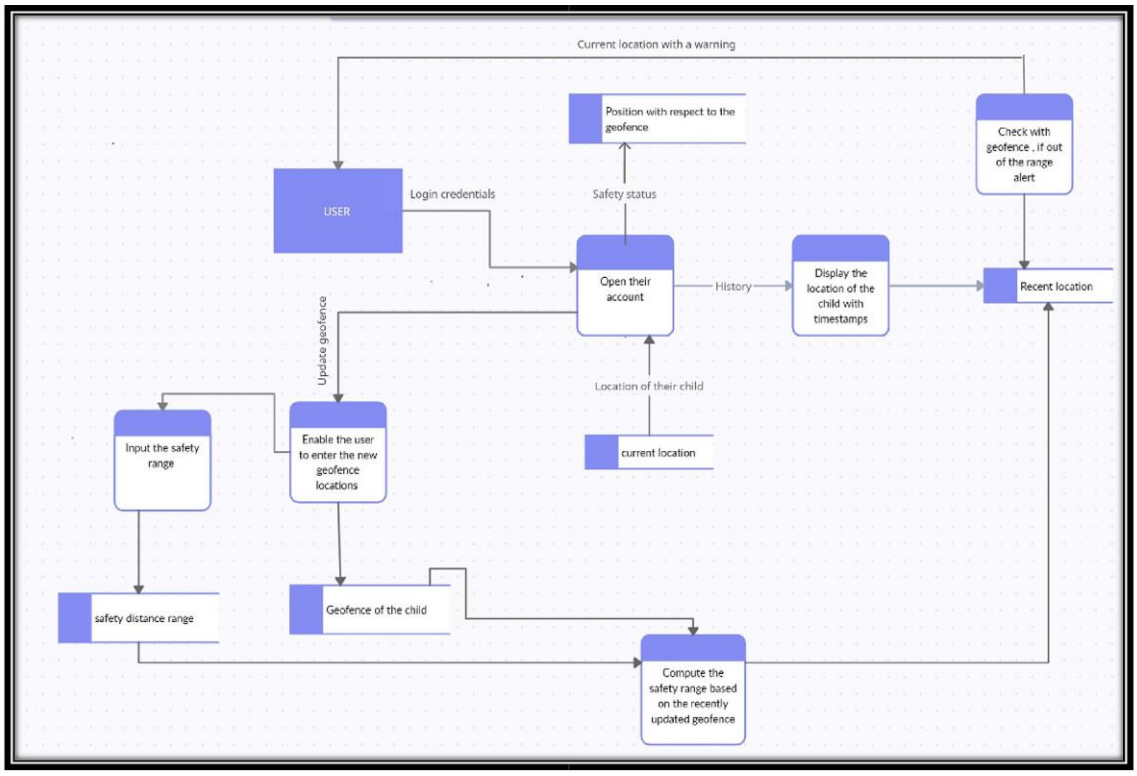
FR NO:	**NONFUNCTIONAL REQUIREMENT**	**DESCRIBE ON**

NFR-1	Usability	Device have GSM can help to inform the parents or rela ves about the current situations of the childby deliver the message immediately to save the child.
NFR-2	Security	Make children parents more assure about their kid'ssecurity, we havea feature in our devicecalled Geo-Fence. Whenever your child crosses that specific area, you will get an instant no fication on your phone.
NFR-3	Reliability	Portable Easy to useFlexibility
NFR-4	Performance	Create a Child trackerwhich helps theparents withcontinuously monitoring the child's location. The no fication willbe sent according to the child's location to their parents or caretakers. The entirelocation data willbe stored in the database.
NFR-5	Availability	Track your child even in a crowd Get traveldetails of kids at any me Knowthe current location

NFR-6	Scalability	Gadget ensures the safetyand tracking of the children. Parents need not worryabout their children.
NFR-7	Valuability	The systemshould be ableto deliver promptly to the financing authority. In the case of non-profit organizations,the solution shouldbe 'advancing the mission'.
NFR-9	Dynamicity	IoT devices may have the capability to adaptdynamically and change basedon their conditions.
NFR-10	Desirability	Navigation should be made easy. The user should be able to search and find the information he needs without much hassle.

PROJECT DESIGN:

DATA FLOW DIAGRAM



Solution & Technical Architecture

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

i. Find the best tech solution to solve existingbusiness problems.

ii. Describe the structure, characteristics, behavior, and other aspectsof the software to projectstakeholders.

iii. Define features,development phases, and solution requirements.

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

FEATURES:

Development of a safetygadget for childrento ensure their protection withoutdirect monitoring of their parents.The various featuresinvolve:

v. GPS

vi. Geo fence

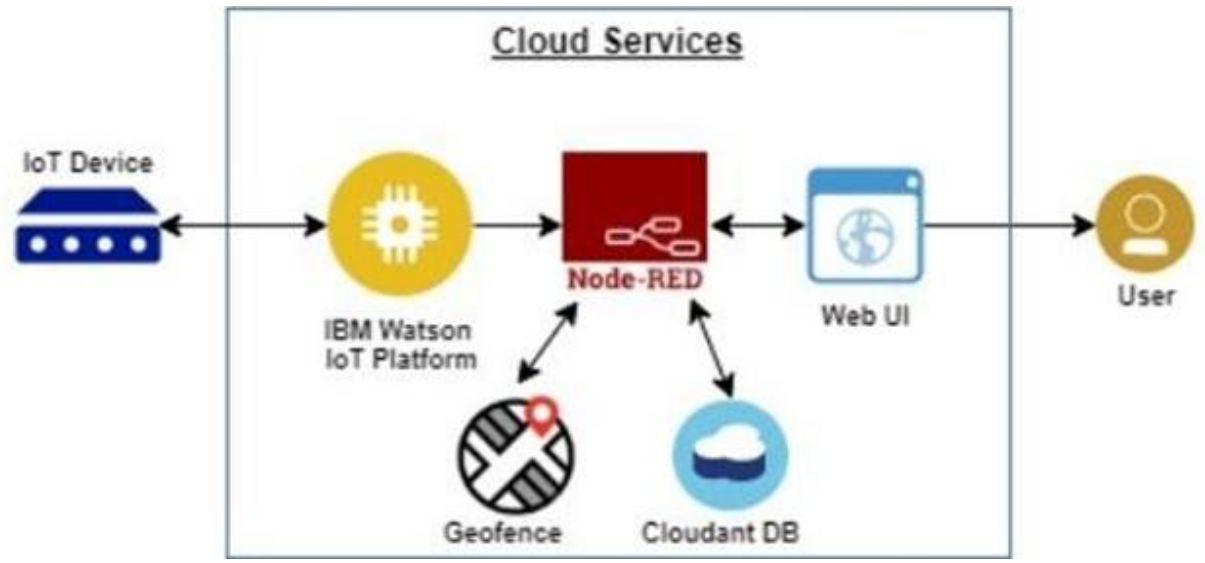
vii. Notify alert signal

SOLUTION:

viii. Track current location of the child using GPS and continuous monitoring of the same is done.

ix. When the gadget detectsthe activity to be outsidethe given geo fence (as mentioned by the parent or guardian), alert messages or notifications are sent to the registered device, appropriately.

SOLUTION ARCHITECTUREDIAGRAM:



Technical Architecture:

Project Design Phase-II
Technology Stack (Architecture & Stack)

Technical Architecture:

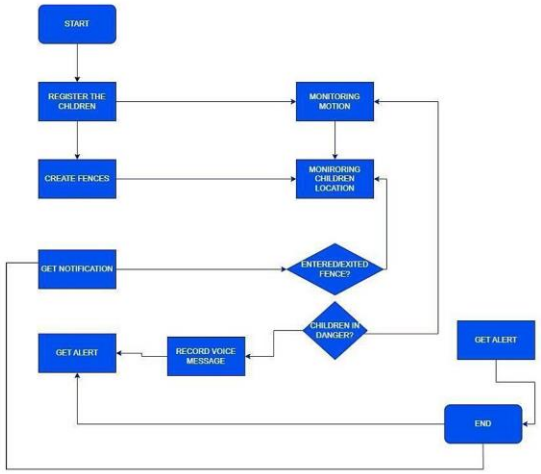


Table-1 : Components & Technologies:

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'slocation and monitoring of the same	Python
3.	Application Logic-2	Sending notifications to the registered users	Node Red

4.	Application Logic-3	Send alert whenuser crosses thegeo-fence mentioned	IBM WatsonAssistant

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

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	A software for which the original source code is made freelyavailable and may be redistributed and modified according to the requirement of the user.	WatsonIoT platform, Wokwi, Nodered.
2.	Security Implementations	Secure monitoring of the user'slocation without opensource access	IBM encryption services
3	Scalable Architecture	Presence of location sensors to quickly scale the user'scurrent location.	GPS, IBMalert notification service.

User Stories

UserType	Functional Requirement(Epic)	User Story Number	User Story / Task	Acceptancecriteria	Priority	Release
Customer (Web user)	Registration	USN-1	As a user,I can register my account by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1

Web user		US N- 2	As a user, I will receive confirm at ion email once I have	I can receiveconfir ma tion email & click confirm	High	Sprint1
			registere d myself			
Web user		USN-3	As a user, I will be notified by the application if the credentials are invalid		High	Sprint2
Web user	Login	USN-4	As a user, I can log into the application by entering email and password		High	Sprint1
Web user	Login	USN-5	As a user, I can logout of the application.	I can login only with my provided credentials	Medi um	Sprint 3

Mobile user(app)	App	USN-6	As a user I can and monitor the child's movement by clicking the monitor button on the homepage		High	Sprint 4
Web user	Web interface	USN-7	As a user, I can receive alert notifications in the webpage, if the movement of the child is beyond the geofence		High	Sprint3
Web user	Web interface	USN-8	As a user,I can check the location of the child using the app		Medi um	Sprint3

PROJECT PLANNING & SCHEDULING

Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User StoryNumber	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 phonenumber	8	High
Sprint -2		USN-2	As a user, I will receive confirmation emailonce I register	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 logoutof the application.	5	High

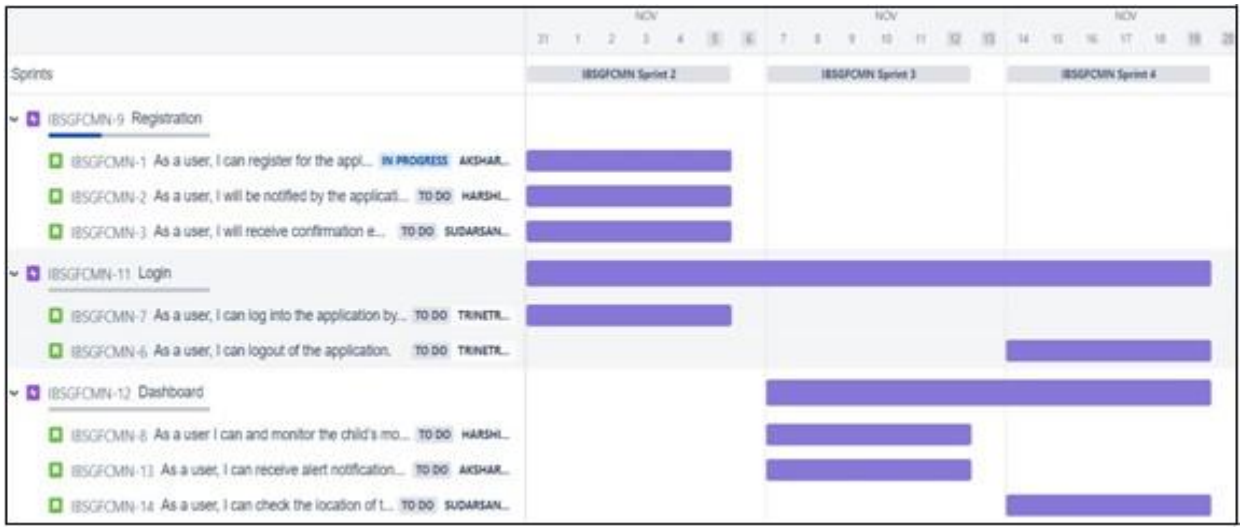
Sprint -3	Dashboard	USN-6	As a user I can and monitor the child's movement by clicking the monitor buttonon the homepage	5	High
Sprint -3		USN-7	As a user, I can receive alert notifications in the webpage, if the movement of the childis beyond the geofence	8	High
Sprint -4		USN-8	As a user, I can checkthe location of the childusing the app	8	High

Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	SprintRelease Date (Actual)

Sprint-1	13	6 Days	24 Oct2022	29 Oct 2022	13	29 Oct 2022
Sprint-2	13	6 Days	31 Oct2022	05 Nov 2022	13	05 Nov 2022
Sprint-3	13	6 Days	07 Nov2022	12 Nov 2022	13	12 Nov 2022
Sprint-4	13	6 Days	14 Nov2022	19 Nov 2022	13	19 Nov 2022

Reports from JIRA



Burndown Chart:

CODING & SOLUTIONING:

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()
```

Feature 1

JSON:

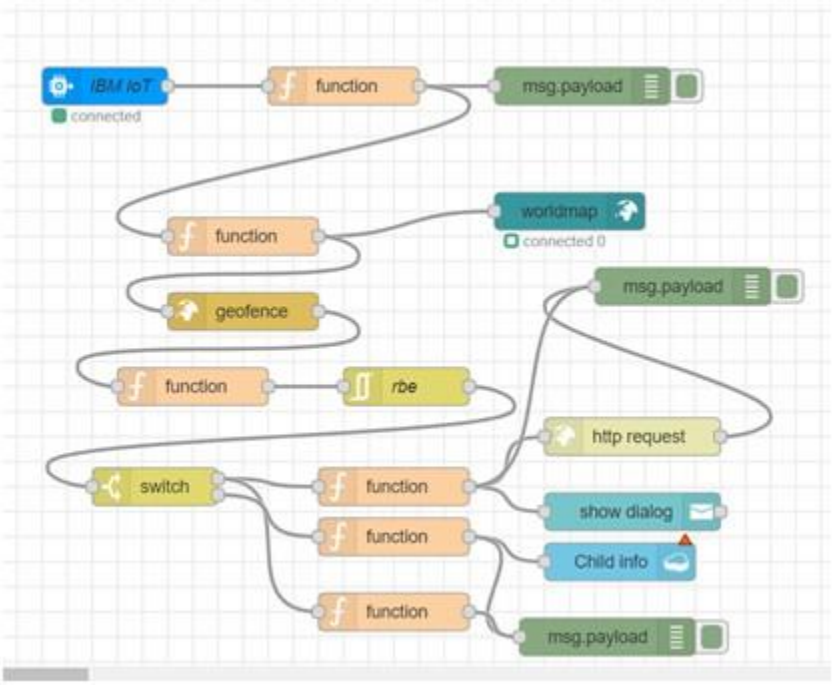
Latitudes and Longitudes of the child are sent in the form of JSON text as it is legibleby humans, it is lightweight, requires less coding, and processes data more quickly than other data formats

wiotp-sdk-device:

The latitudeand longitude valuesgenerated in the python code are sent to the

IBM WatsonIoT platform using this package.

Feature 2



worldmap:

The latitudeand longitude of the child is indicatedor plotted in the form of a marker in the world map using the worldmapnode of Node Red.

geofence:

This node of Node Red enablesto set the safe boundaryfor a child.

TESTING

Test Cases:

https://docs.google.com/spreadsheets/d/1xgylNIFBlRIC0L63r12dT_cSXpa8WiwMOdZet69EZs/edit?usp=sharing

User Acceptance Testing

1. **Purpose of Document**

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

2. **Defect Analysis**

This report shows the numberof resolved or closed bugs at each severity level,and how they were resolved

Resolution	Severity1	Severity2	Severity3	Severity4	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

3. Test Case Analysis

This reportshows the numberof 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

RESULTS

Performance Metrics

			NFT - Risk Assessment					
S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Load/Volume Changes	Risk Score	Justification
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.

ADVANTAGES & DISADVANTAGES

Advantages

i. A tracking device can be useful in case the parent feels that his/her child is in danger.

ii. Not only does the device providethe real-time location.

iii. These devices help parents set a perimeter for their children when they leave the house. The momentthey step beyondthe defined area, the trackingsoftware will alertthe parent.

Disadvantages

1. If you're using GPS on a battery operated device, there could also be a battery failureand you'll need an externalpower supply which isn't alwayspossible.
2. GPS chips are hungry for power which drains batteryin 8 to 12 hours.This needs replacement or recharge of the batteryquite frequently.

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 geofenceto determine the safer boundaryof 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.

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.

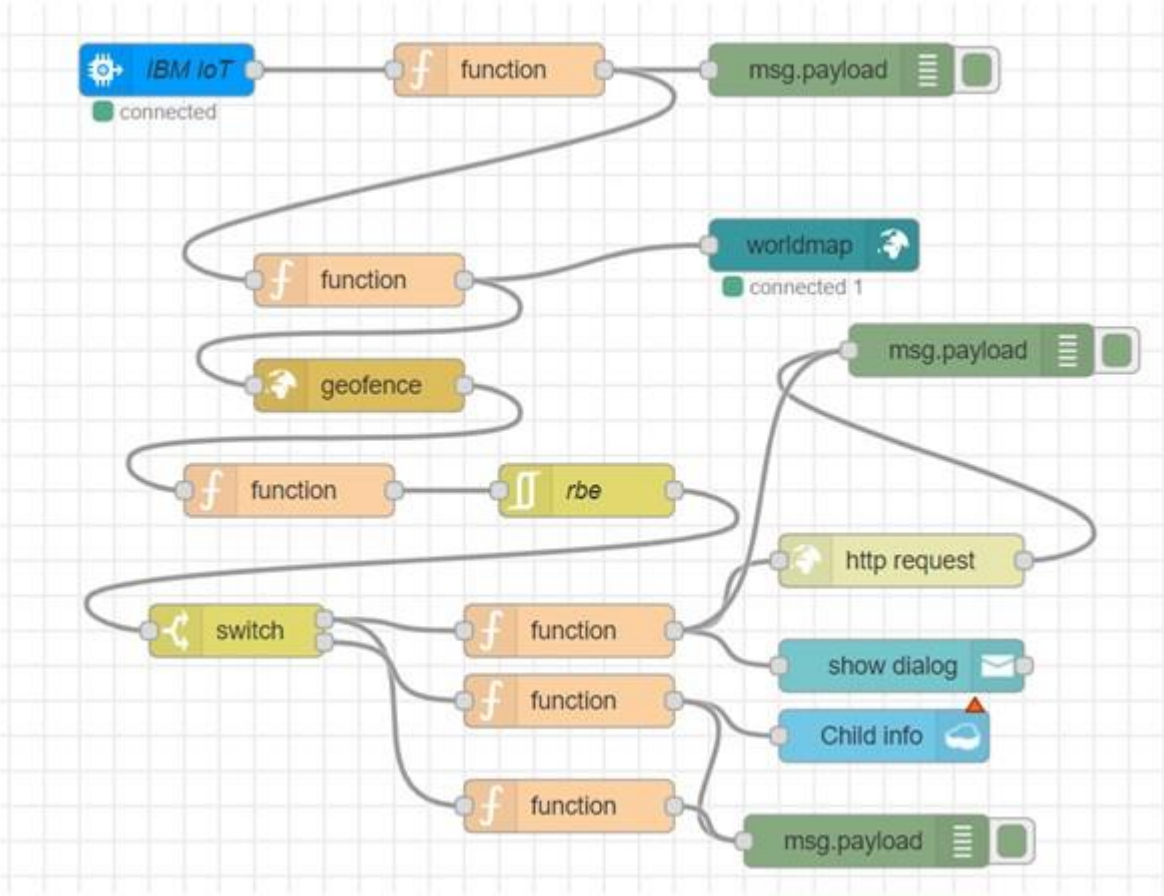
APPENDIX

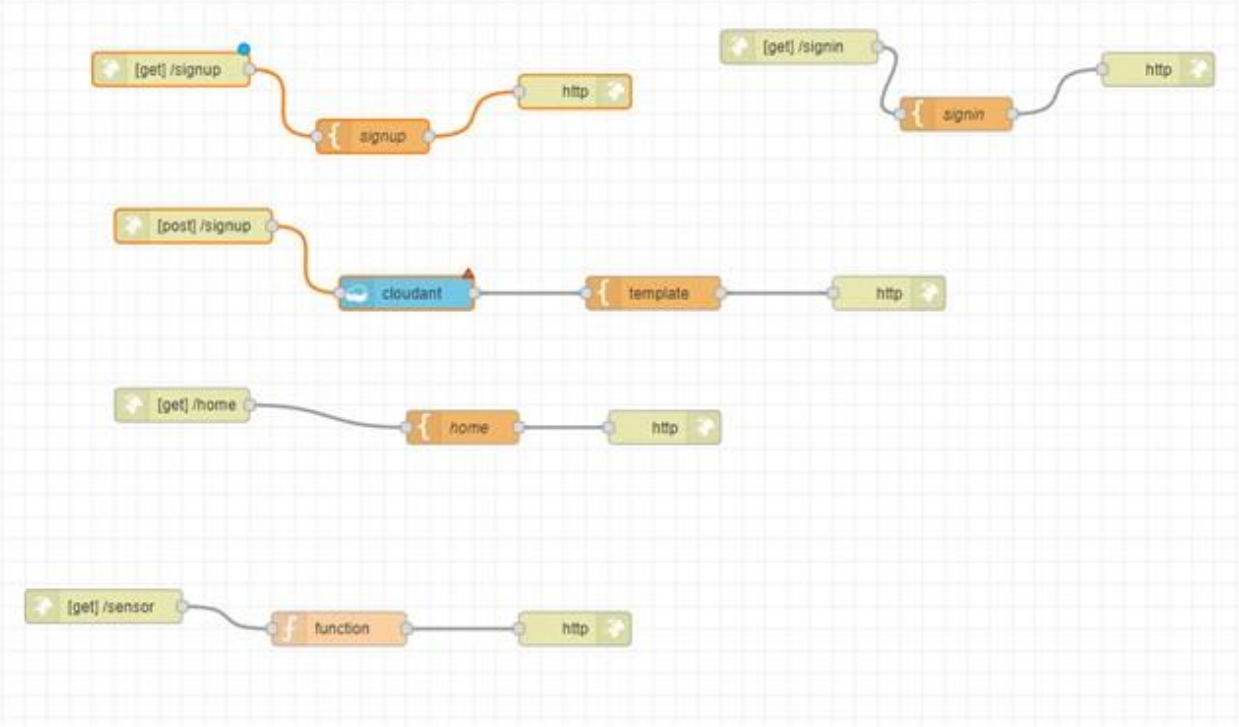
Source Code

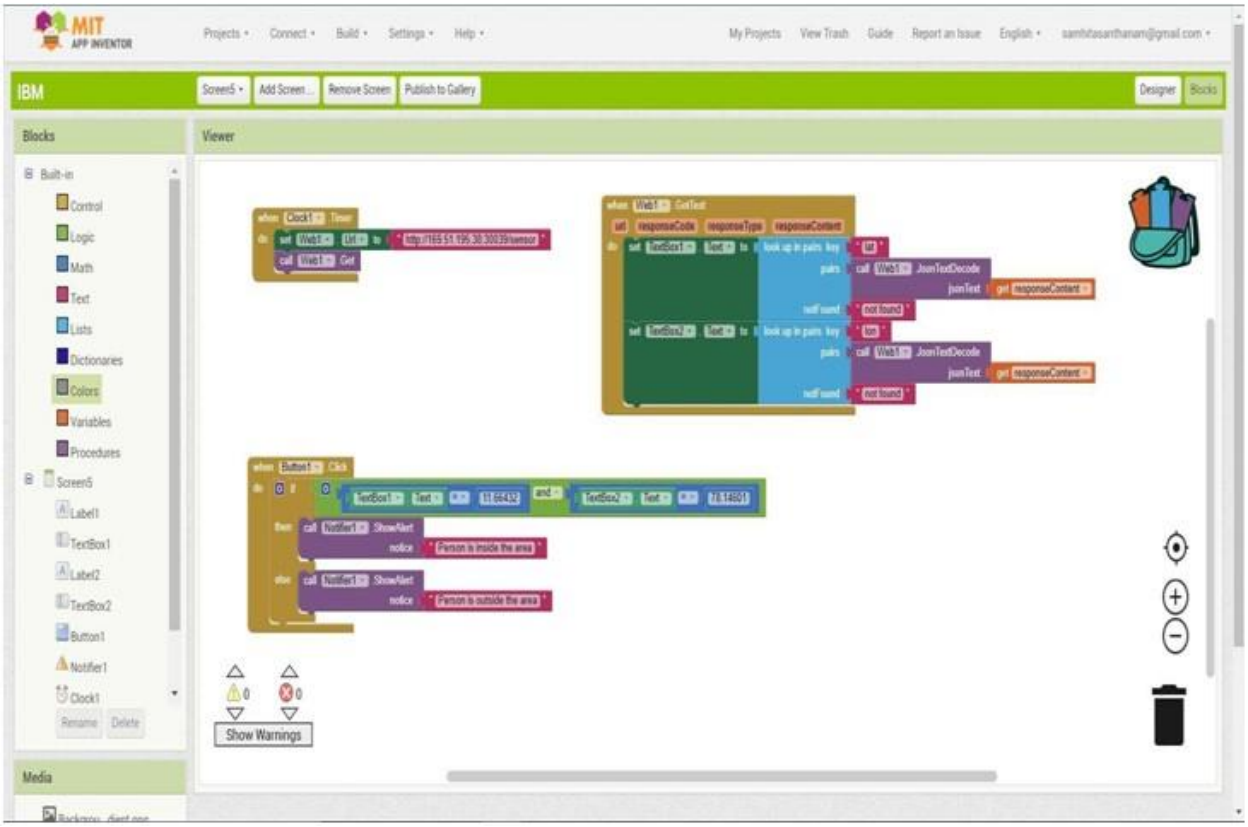
proj code.py - D:\Python\Python codes - IBM\proj code.py (3.7.6)

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()
```


IBM IoT
connected
function
msg.payload
function
worldmap
connected 1
geofence
msg.payload
function
rbe
http request
switch
function
show dialog
function
Child info
function
msg.payload


[get] /signup
signup
http
[get] /signin
signin
http
[post] /signup
cloudant
template
http
[get] /home
home
http
[get] /sensor
function
http



GitHub & Project Demo Link

GitHub Link: https://github.com/IBM-EPBL/IBM-Project-46157-1660739979

Project Demo Link: https://youtu.be/IllLiEJS_tg