IOT BASED SAFETY GADGETS FOR CHILD SAFETY
MONITORING AND NOTIFICATIONS

Team ID : PNT2022TMID46119

Bachelor of Engineering

Computer Science and Engineering

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

   Child safety and tracking is a major concern as the more number of crimes on the children are reported nowadays.With this motivation ,a smart IoT device for child safety and tracking is developed to help the parent tio locate and monitor their children .The system is developed using LinkIt ONE board programmed in embeeded C and interfaced with temperature ,heartbeat ,touch sensors and also GPS ,GSM and digital camera modules .The novelty of the work is that the system automatically alerts the parents/caretaker by sending SMS ,when immmediate attention is required for the child during emergency .The parameters such a touch ,temperature and heartbeat of the child are used for the parametric analysis and results are plotted for the same .The above project ensures the safety and traching of the children .

1.2 PURPOSE

    The purpose of the project is child safety .when the child is in danger,it helps the parents to track the children in real time and ease the parent worries about the children . The parent can send a message to the GSM module, according to the message information the GSM module reply back with particular details of the children. The location can be seen on the Google map. When a particular child is facing an emergency situation, device button should be pressed so that the device captures the image along with the user information to the enrolled mobile numbers. The life of the child can be saved within no time.For the children point of view GPS, GPRS and GSM are used to monitor the speed and location tracking purpose. The system is fixed on the bus or car or in any vehicle so that the vehicle is going on routine route or not can be identified by the GPS tracker, the speed of the bus can also be extracted.

Digital technology plays a major role for connecting persons via internet. For tracking the children, the android based solution is provided to parents. Internet is the one that will connects different components through a single device and is connected to server. Parents track their children in real time of the location tracker by GSM . In day to day scenario, missing child cases are increasing gradually. Child

caring is a major issue. Different types of methods are introduced to find good solutions. There have been many Methods and systems implemented to solve it. To solve child caring problem global position system (GPS) based solution with two nodes was proposed. In these two nodes, one node is child node which contains a Bluetooth module and a GPS receiver. The parent node consists of a mobile that supports Bluetooth. The location of thechild can be tracked by the GPS technology and can be displayed on the designed .

2.LITERATURE SURVEY

A . SMART IOT DEVICE FOR CHILD AFETY AND TRACKING

The review of literature for child safety and location tracking devices are discussed below. In [2], the parent can send a message to the GSM module, according to the message information the GSM module reply back with particular details of the children. The location can be seen on the Google map. When a particular child is facing an emergency situation, device button should be pressed so that the device captures the image along with the user information to the enrolled mobile numbers. The life of the child can be saved within no time. In [3], for the children point of view GPS, GPRS and GSM are used to monitor the speed and location tracking purpose. The system is fixed on the bus or car or in any vehicle so that the vehicle is going on routine route or not can be identified by the GPS tracker, the speed of the bus can also be extracted. Now-a-days the digital technology plays a major role for connecting persons via internet. For tracking the children, the android based solution is provided to parents. Internet is the one that will connects different components through a single device and is connected to server. Parents track their children in real time of the location tracker by GSM and [4] the microcontroller used is ARM-7 LPC2148. In day to day scenario, missing child cases are increasing gradually. Child caring is a major issue. Different types of methods are introduced to find good solutions. There have been many Methods and systems implemented to solve it. In [5],to solve child caring problem global position system (GPS) based solution with two nodes was proposed. In these two nodes, one node is child node which contains a Bluetooth module and a GPS receiver. The parent node consists of a mobile that supports Bluetooth. The location of thechild can be tracked by the GPS technology and can be displayed on the designed Smart IOT Device for Child Safety and Tracking 1792 Published By: Blue Eyes Intelligence Engineering Retrieval Number H6836058719/19©BEIESP & Sciences

Publication map in the mobile device, through the Bluetooth connection the distance between the child and parent can be calculated. Children below six years can not explain in words directly to their parents about the problems, hence a wearable device is developed in [6]. This device procures information such as heart rate, physical body movements and send it to the parents in real time. In [7], a wearable sensor badge is constructed from (hard) electronic components, which can sense perambulatory activities for context awareness. A wearable sensor jacket is used with latest techniques to form (soft) fabric. Stretch sensors are placed to measure upper limb and body movement. Worn as clothing, the sensors give the required information.[7]. In paper[8], wearable IoT device for the security and shielding of women and girl children was designed. The body temperature and galvanic skin resistance of the body is changed in abnormal conditions. This was used as input information and the alert signal is produced while it crosses the threshold value. This work deals with body temperature and stress, skin resistance and relationship between them. By applying these parameters activity of the person was analysed. The device [9] an analysis of skin resistance and body temperature was made. Body position is determined by a triple axis accelerometer. After acquiring raw data activity recognition is done and a specialized machine learning algorithm is employed in this process. Real-time data is achieved by sending sensor data to a Cloud Platform. Then the data is analysed using MATLAB. The jacket consists of different sensors for to detect the activity of the body. In paper [10], there are two modules namely Wi-Fi and audio play back module. The details of the baby can be sent to parents through Wi-Fi module. The audio play back module produces the recorded sound different sensors are accelerometer sensor, cry sensor, temperature sensor gas sensor, flame sensor and PIR sensor. The embedded system consists of microcontroller; accelerometer detects the angular position and movement of the baby.

B. CHILD SAFETY WEARABLE DEVICE

Moodbidri and Shahnasser(2017)[13] discusses the concept of a smart wearable device for little children. The major advantage of this wearable over other wearable is that it can be used in any cell phone and doesn't necessarily require an expensive smartphone and not a very tech savvy individual to operate. The purpose of this device is to help parents locate their children with ISSN: 2455-2631 © October 2018 IJSDR | Volume 3, Issue 10 IJSDR1810024 International Journal of Scientific Development and Research (IJSDR) www.ijsdr.org 152 ease. At the moment there are many wearables in the market which help track the daily activity

of children and also help find the child using Wi-Fi and Bluetooth services present on the device. But Wi-Fi and Bluetooth appear to be an unreliable medium of communication between the parent and child. Therefore, the focus of this paper is to have an SMS text enabled communication medium between the child's wearable and the parent .

C. RFID-based System for School Children Transportation Safety Enhancement

This paper presents a system to monitor pick-up/drop-off of school children to enhance the safety of children during daily transportation from and to school. The system consists of two main units, a bus unit, and a school unit. The bus unit the system is used to detect when a child boards or leaves the bus. This information is communicated to the school unit that identifies which of the children did not board or leave the bus and issues an alert message accordingly. The system has a developed web-based database-driven application that facilities its management and provides useful information about the children to authorized personnel. A complete prototype of the proposed system was implemented and tested to validate the system functionality. The results show that the system is promising for daily transportation safety.

2.1 EXISTING SYSTEM

Real-Time Child Abuse and Reporting System In the existing system, we use a voice recognition module in which the alert commands from the child are stored and kept for further reference. If the same child delivers the same command, it will compare with the alert command which was previously stored and sets an emergency level according to the alert command. The GSM has a SIM which is used to send an alert message or an alert call to the trusted peoples. GPS is used to track the live location and it is used when needed. The server will search the respective device ID from the database and search for respective contacts according to that device ID and helps in alerting the registered guardians.

The disadvantage of this project are,

a. The child could not produce the exact alert command during a panic condition.

a. ii. The command produced may not match with the previously stored command. iii. This project requires manual intervention .

2.2 REFERENCE

[1] AkashMoodbidri, Hamid Shahnasser, "Child Safety Wearable Device", Department of Electrical and Computer Engineering San Francisco State University.

[2] AnandJatti, MadhviKannan , Alisha RM, Vijayalakshmi P, ShresthaSinha, " Design and Development of an IOT based wearable device forthe Safety and Security of women and girl children ", IEEE International Conference On Recent Trends In Electronics Information Communication Technology, May 20-21, 2016, India.

[3] Anwaar Al-Lawati, Shaikha Al-Jahdhami,

[4] " RFID-based System for School Children Transportation Safety Enhancement ", Proceedings of the 8th IEEE GCC Conference and Exhibition, Muscat, Oman, 1-4 February 2015.

[5] Dr. R. Kamalraj, " A Hybrid Model on Child Security and Activities Monitoring System using IoT", IEEE Xplore Compliant Part Number: CFP18N67-ART; ISBN:978-1-5386-2456-2.

[6] Pooja.K.Biradar1, Prof S.B.Jamge2," An Innovative Monitoring Application for Child Safety", DOI:10.15680/IJIRSET.2015.0409093.

[7] Prof. Sunil K Punjabi, Prof. Suvarna Chaure, "Smart Intelligent System for Women and Child Security" Department of Computer Engineering SIES Graduate School of Technology Nerul, Navi Mumbai, India.

[8]Royal Society for the Prevention of Accidents. Safe At Home – The National Home Safety Equipment Scheme. URL: www.rospa.com/home-safety/advice/child-safety/safe-at-home/ (accessed 8 January 2017).

[9] National Institute for Health and Care Excellence. Strategies to Prevent Unintentional Injuries among Children and Young People Aged under 15: Evidence Update February 2013. Manchester: NICE; 2013. URL: www.evidence.nhs.uk/search?q=ph29 (accessed 24 October 2014)
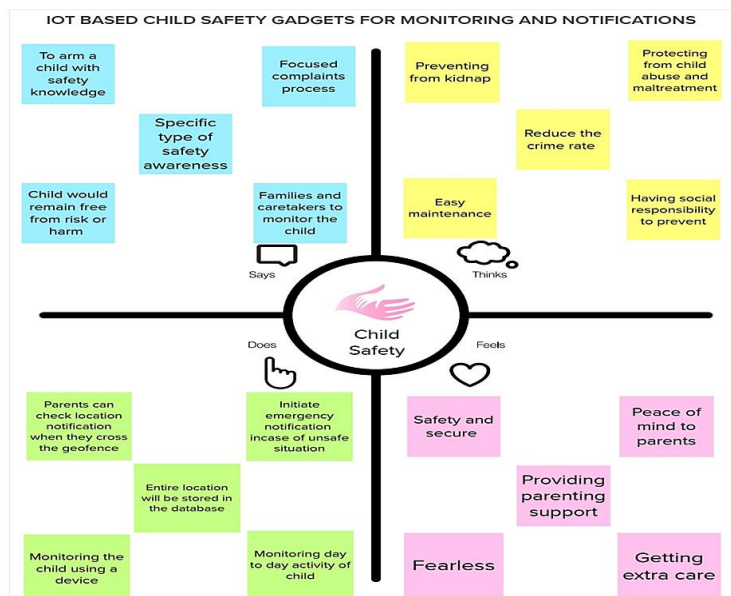
PROBLEM STATEMENT

To help the parents to locate and monitor their children. If any abnormal readings are detected by the sensor, then an SMS and phone call is triggered to the parents   mobile.   Also,   updated   to   the   parental   app

3 .IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP

3.2 IDEATION AND BRAIMSTROMING

3.3 Proposed Solution

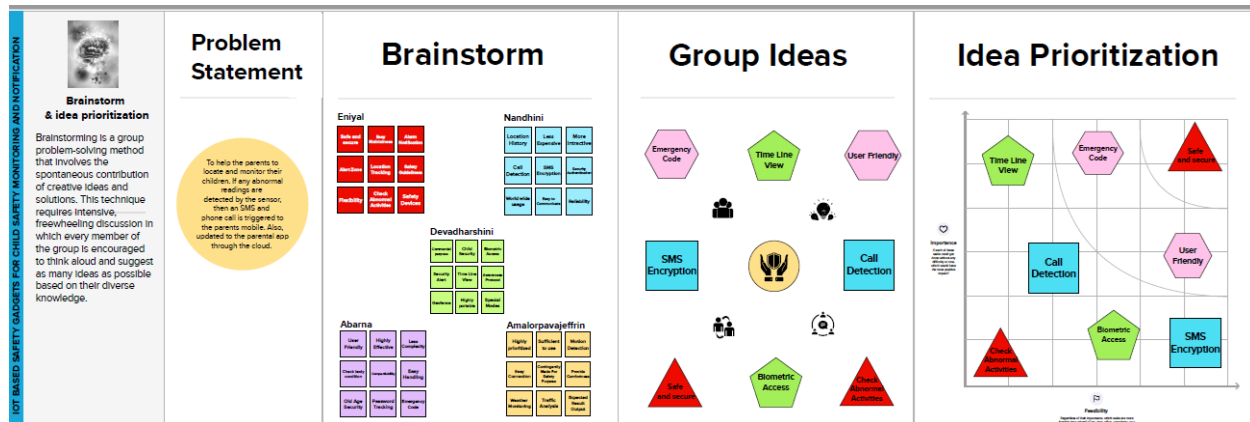| S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	To help the parents to locate and monitor their children. If any abnormal readings are detected by the sensor, then an SMS and phone call is triggered to the parents' mobile. Also, updated to the parental app through the cloud
2.	Idea / Solution description	The parent can send a message to the GSM module, according to the message information the GSM module replies back with particular details of the children. The location can be seen on the Google map. When a particular child is facing an emergency situation, the device button should be pressed so that the device captures the image along with the user information to the enrolled mobile numbers. The life of the child can be saved within no time.The children point of view GPS, GPRS

		and GSM are used to monitor the speed and location tracking purpose. The system is fixed on the bus or car or in any vehicle so that whether the bicycle is going on a routine route or not can be identified by the GPS tracker, the speed of the bus can also be extracted. Now-a-days the digital technology plays a major role in connecting people via the internet. For tracking the children, the android based solution is provided to parents.
3.	Novelty / Uniqueness	In today's developing world, child safety is a rising concern. Lack of information about child location. Need to know about the child's health condition. Need real-time information about abduction and to detect child fall.
4.	Social Impact / Customer Satisfaction	In order to track and morning the movement activities and health conditions for children who have chronic disease, Arduino microcontrollers used to integrate the important sensor kits. These sensors are connected to the Arduino to read sensing information immediately to send it through the internet layer. Information passes in three main conditions to give a decision to continue or sending health alerts to the healthcare providers and parents. This applied to reduce the workload on the healthcare providers and to satisfied parent concerns on their children.
5.	Business Model (Revenue Model)	The device will also have the emergency key (SOS).In case of any emergency, if anyone presses the key, automatic help message will be sent to any 3 registered mobile numbers on the server. Like any software product or design, there is still room for enhancement. Features can be added to enhance the system. To build these features in a IoT devices and implementation of the device would reach the customer and help in child's safety. Wearable's like Watch, spectacles, mobile, IoT Device, etc...

3.4 PROBLEM SOLUTION FIT

Problem-Solution fit canvas 2.0 |Child safety/to secure someone by using this smart gadget

Define CS, fit into / **1. CUSTOMER SEGMENT(S)** `CS`	**6.CUSTOMER CONSTRAINTS** `CC`	**5. AVAILABLE SOLUTIONS** `AS` / **Explore AS,**
➢ Child & ➢ Women Old age people	➢ Available devices ➢ Safe and Secure ➢ Easy maintenance ➢ Low expensive	➢ precautionary parents can instruct their children ➢ Become a braver and secure themself
Focus on J&P, tap into BE, understand / **2. JOBS-TO-BE-DONE / PROBLEMS** `J&P`	**9. PROBLEM ROOT CAUSE** `RC`	**7. BEHAVIOUR** `BE` / **Focus on J&P, tap into BE, understand**
➢ The parents are need to secure the children by using some smart devices ➢ while the woman is needed to inform their parents when they feel unsafe	➢ Safety precautions ➢ There is no proper protocol ➢ While we are in critic satiation ➢ Not to make a proper decision by the children	➢ Parents are relaxed to monitor their children when using the smart devices ➢ Easy to use everyone who needs ➢ And more safety precaution also
Identify strong TR & EM / **3. TRIGGERS** `TR` ➢ Seeking of needless content in social media **4. EMOTIONS: BEFORE / AFTER** `EM` ➢ Careless mistake increases	**10. YOUR SOLUTION** `SL` ➢ Make the system more advance compare to the previous model (Developing new features and security updates) ➢ Children have appropriate mental models of password	**8.CHANNELS OF BEHAVIOUR** `CH` ➢ online self-efficacy does not reduce risk exposure ➢ Privacy concern leads to privacy protecting behavior **Extract online & offline CH of BE**

⭐ **AMALTAMA**

4 REQUIREMENT ANALYSIS

4.1 Functional requirement

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 Phone ➢ Registration through Gmail
FR-2	User Confirmation	➢ Confirmation through Email ➢ Confirmation through Mobile Alert
FR-3	App installation	➢ Installation through website APK's ➢ Installation through play store.
FR-4	Detecting child	➢ Detecting location through SMS ➢ Detecting location through mobile app
FR-5	Set Geofence	➢ Setting by user to find child location
FR-6	User End Result	➢ Parents need not worry about their children.
FR-7	User Objective	➢ Easy to monitor the child anywhere ➢ Helps to identify the child.

4.2 : Non Functional

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	➢ The device has GSM can help to inform the parents about the current situation of the child, alert by message immediately to save the child. ➢ Seamless communication is possible between people, processes, and things.
NFR-2	Security	➢ Make children parents more assure about their kid's security, we have a feature in our device called Geo-Fence. ➢ Securing your IoT devices and network as you scale up production and deployment can be challenging one, we have a feature like storing all data in the database.

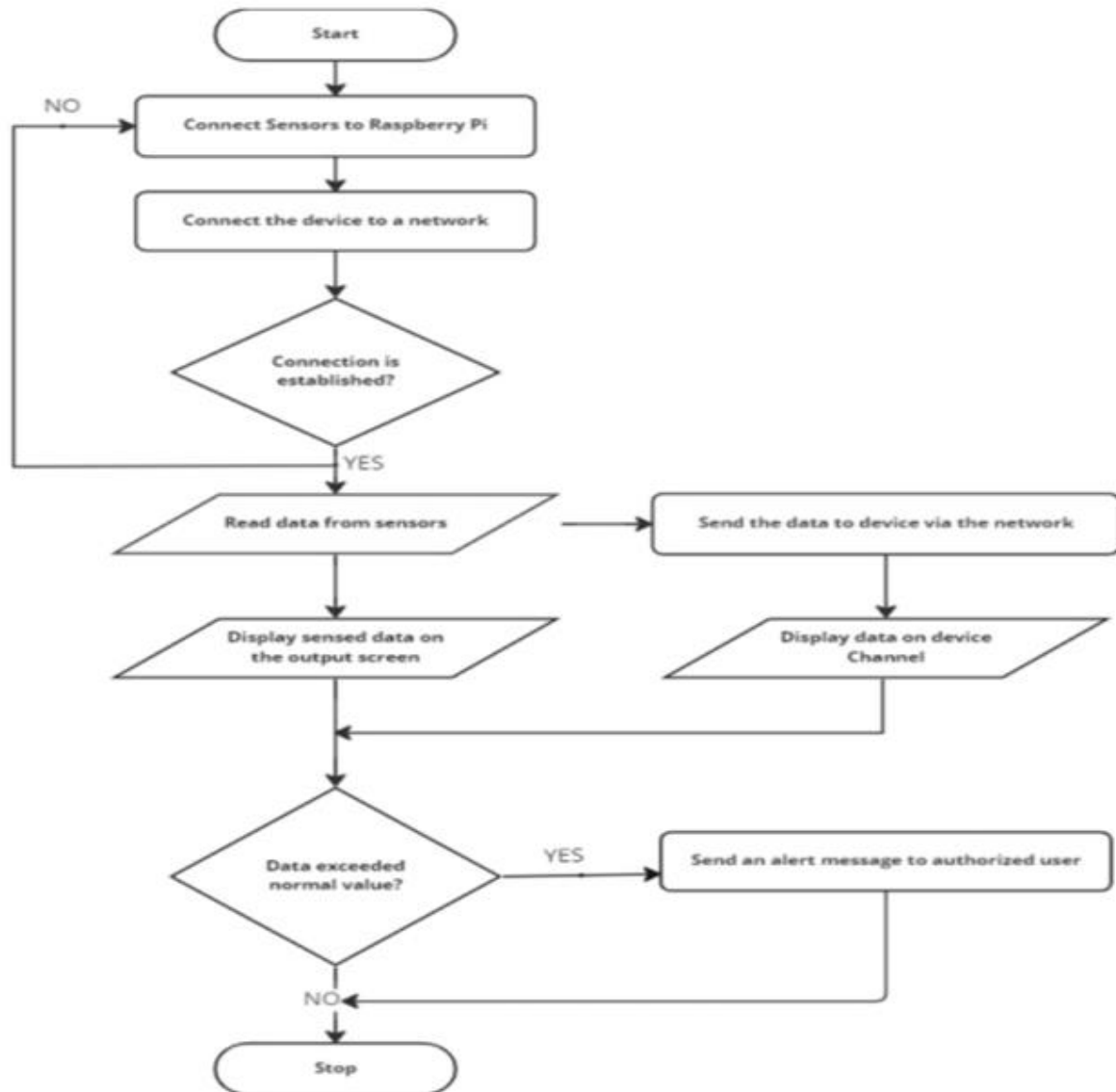# 5 .PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	The communication protocol being used in the proposed solution might act as an interface the way like WiFi, Bluetooth and ZigBee	MIT app
2.	Application Logic	The data to be collected and sent to the authenticator's(parent) via GSM providing the GPS coordinates to easily locate access and monitor the child	IBM Watson STT service, python etc.
3.	Database	Data to be segregated and secured in the form of relational DBMS	MySQL
4.	Cloud Database	IBM	IBM Cloudant
5.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
6.	External API	To access the children location	GPS location monitoring etc.
7.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration	Cloud Foundry

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	The proposed solution being framed in the form an android application providing the end user an easy surveillance of their children (preferably users are parents)	UI/UX design developement
2.	Security Implementations	The developed application should be accessible in the way it can only respond to the comments of the relevant users.	Encryptions, IAM Controls.
3.	Scalable Architecture	The app format comes the way easier to handle and operate.	Not yet determined
4.	Availability	The developed solution tends to be available in the market at any time	Not yet determined
5.	Performance	Highly proper and betterment functionalities are to be ensured in the designed solution	Not yet determined

5.2 SOLUTION ARCHITECTURE
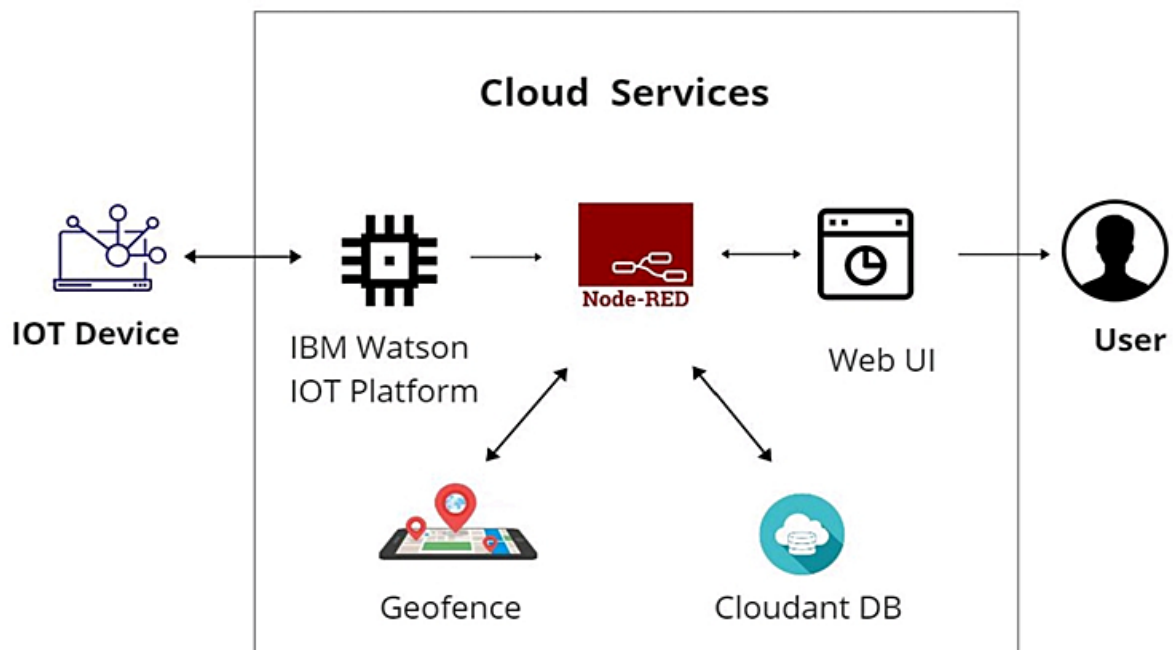
IOT BASED SAFETY GADGETS FOR CHILD SAFETY MONITORING AND NOTIFICATIONS
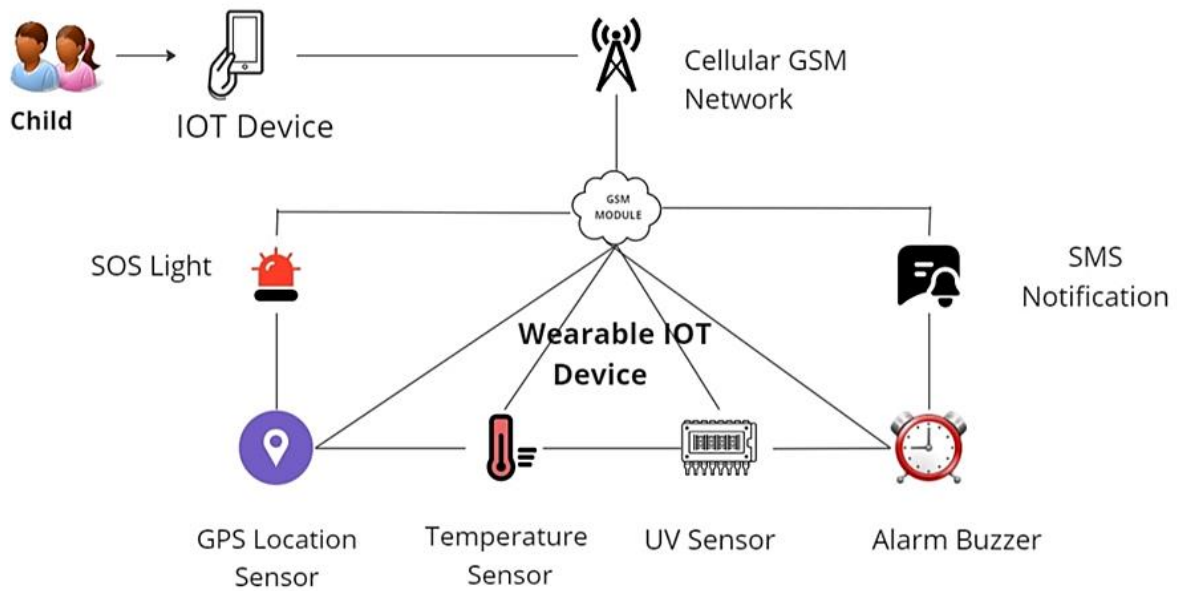
5.3 TECHNICAL ARCHITECTURE

IOT BASED SAFETY GADGETS FOR CHILD MONITORING AND NOTIFICATIONS

5.3 USER STORIES

User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Parents Mobile user)	Registration	USN-1 (FATHER)	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)	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)	I too can monitor the children's activities using safety gadget monitoring system.	I can access my account / dashboard and receive confirmation email & click confirm	Medium	Sprint-2
	Login	USN-4 (If required)	Same function to be performed as in previous cases.	Same function to be performed as in previous cases.	Not Yet Determined	----
	Dashboard	USN-5 (If required)	Same function to be performed as in previous cases	Same function to be performed as in previous cases.	Not Yet Determined	----

6 .PROJECT PLANNING AND SCHEDULING

6.1 Sprint Planning and Milestone

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Create and Configure IBMCloud Services	USN-1	As a user I need to enroll the cloud registration	3	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-1		USN-2	As a user, I will create IBM cloud account.	2	MEDIUM	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna

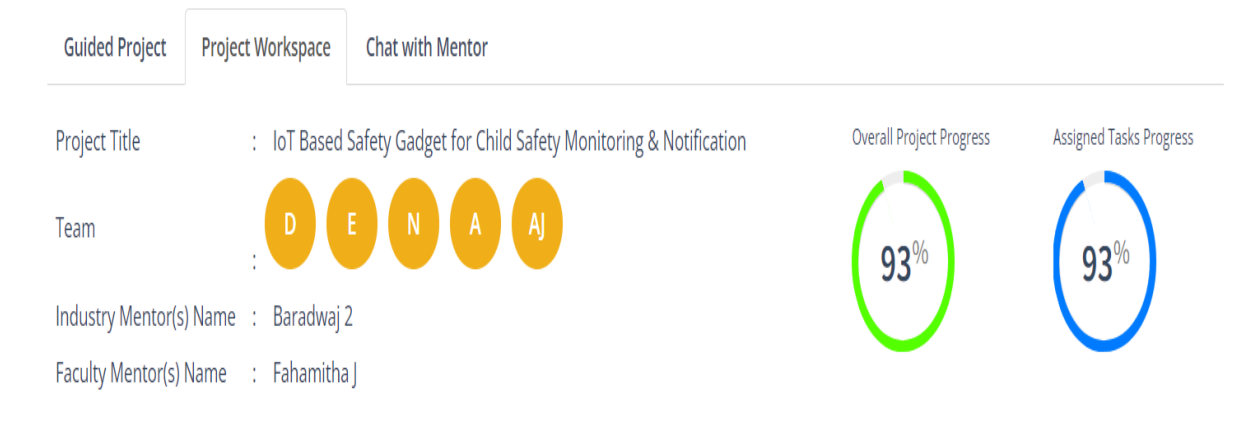| Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
						A.Amalorpavajeffrin
Sprint-1		USN-3	After creating cloud account launch IBMWatson IOT platform by accessing cloud account	5	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-1		USN-4	Create the node in IBM Watson platform	7	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-1		USN-5	After Creating node get device Type and id	1	LOW	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-1		USN-6	Simulate the node created	3	MEDIUM	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-2	Create and access Node-Red	USN-7	As a user, I can create Node-red by appdeployment	5	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-2		USN-8	Connect IBM Watson with node red throughAPI key	2	LOW	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-2		USN-9	Design the project flow using Node-Red	7	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-2		USN-10	Check for the proper connections and theoutput in the node red application	3	MEDIUM	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Create A Database in Cloudant DB	USN-11	Launch the Cloudant DB and Create databaseto store the location data	4	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-3	Develop the Python script	USN-12	Install the python software	2	LOW	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-3		USN-13	Develop the python scripts to publish details to IBM IoT Platform	6	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-3		USN-14	Integrate the device id, authentication token in python script	2	LOW	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-3		USN-15	Develop the python code for publishing the location (latitude & longitude) to IBM IoT Platform	8	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-4	Create the Web applicationusing Node Red	USN-16	Develop the Web application using Node red	5	HIGH	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-4		USN-17	Connect to the IBM IoT Platform and get the location and Store the data in the Cloudant	2	MEDIUM	H.C.Devadharshini B.Eniyal M.Nandhini S.Abarna A.Amalorpavajeffrin
Sprint-4		USN-18	Create the geofence and Google map for location identification	8	HIGH	H.C.Devadharshini B.Eniyal

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	21	6 Days	24 Oct 2022	29 Oct 2022	21	29 Oct 2022
Sprint-2	17	6 Days	31 Oct 2022	05 Nov 2022	17	05 Nov 2022
Sprint-3	22	6 Days	07 Nov 2022	12 Nov 2022	22	12 Nov 2022
Sprint-4	30	6 Days	14 Nov 2022	19 Nov 2022	30	19 Nov 2022

6.3 REPORT FROM JIRA

Guided Project   Project Workspace   Chat with Mentor

Project Title   : IoT Based Safety Gadget for Child Safety Monitoring & Notification

Team   : D E N A AJ

Industry Mentor(s) Name   : Baradwaj 2

Faculty Mentor(s) Name   : Fahamitha J

Overall Project Progress   **93**%

Assigned Tasks Progress   **93**%

CODING AND SOLUTION

```python
import json
import wiotp.sdk.device
import time

myconfig = {
        "identity": {
                "orgId": "94kx6e",
                "typeId": "Safety_Device",
                "deviceId": "Device_1"
        },
        "auth": {
                "token": "IOT_2804"
        }
}
client = wiotp.sdk.device.DeviceClient(config=myconfig, logHandlers=None)
client.connect()

while True:
        name= "India"
        #in area location

        latitude= 20.5937
        longitude= 78.9629

        #out area location

        #latitude= 17.4219272
        #longitude= 78.5488783
        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(10)

client.disconnect()
```

8 .TESTING

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	6	2	2	3	12
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	14	32
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	20	12	13	20	65

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	43	0	0	43
Security	2	0	0	2

Outsource Shipping	3	0	0	3
Exception Reporting	8	0	0	8
Final Report Output	4	0	0	4
Version Control	2	0	0	2

9 .RESULTS

 One of the module in our project is temperature sensor which is used to detect the temperature of the child as well as the surrounding temperature. If there occurs any abnormal rise or fall in temperature in the body of the child or in the surrounding it will notify the user as per the coded time delay as shown in the picture. It will show the temperature and humidity values notifies the user based on the predefined value abnormal fall or rise scenarios.

9.1 PERFORMANCE METRICS
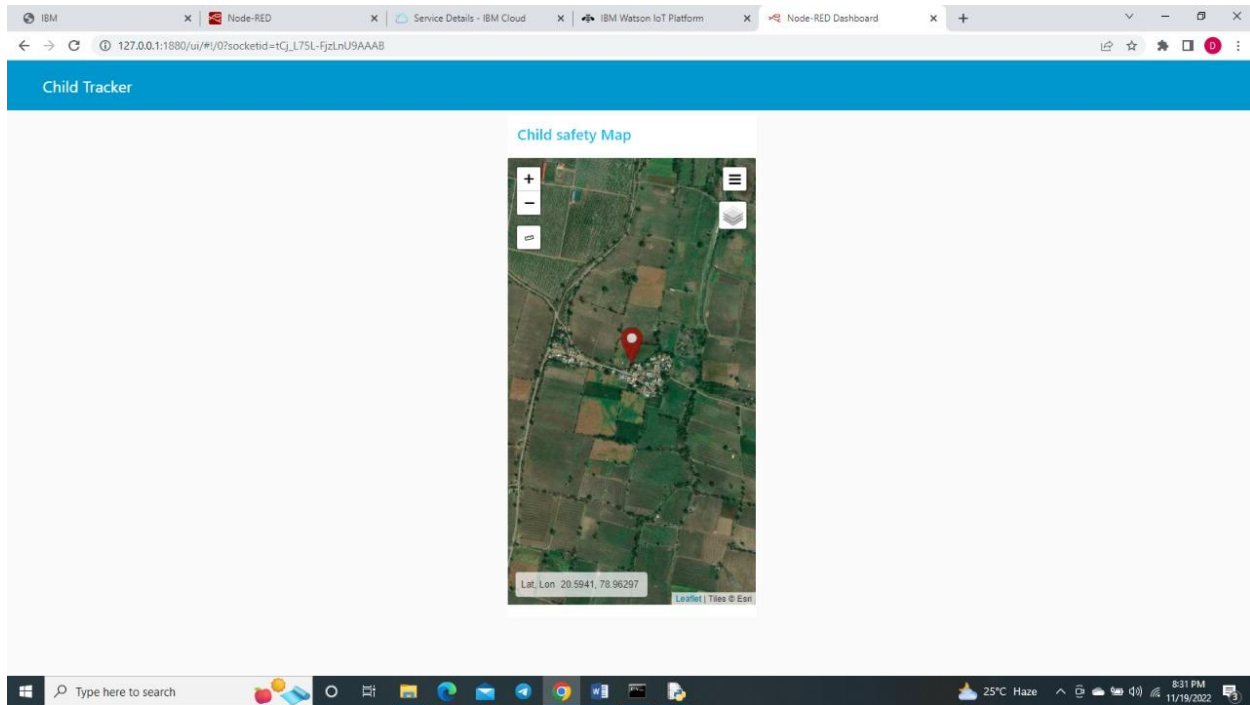
10 .ADVANTAGES AND DISADVANTAGES

ADVANTAGES

The advantages of this project is limited to develop SMS platform and Hardware implementation prototype. The project contribution is sensing the children status and displaying the output. This system also provides the real time data to be available on mobile phone, so that it can send text message all the sensors data gathered from the children.It assists Parents to monitor their children remotely.

12 .FUTURE SCOPE

In our system, we automatically monitor the child in real time using Internet of Things, with the help of GPS, GSM, and Raspberry Pi. This system requires

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network connectivity, satellite communication, and high-speed data connection when we use web camera and GPS to lively monitor. It is difficult to monitor when there occurs any hindrance to satellite communication or any network issue. There also occurs time delay in video streaming through the server. Hence in the future, these issues can be overcome by using Zigbee concept or accessing the system without internet and using high-speed server transmission.

This research demonstrates Smart IoT device for child safety and tracking helping the parents to locate and monitor their children. If any abnormal values are read by the sensor then an SMS is sent to the parents mobile and an MMS indicating an image captured by the serial camera is also sent. The future scope of the work is to implement the IoT device which ensures thecomplete solution for child safety problems.

13. APPENDIX

SOURCE CODE

```
import json
import wiotp.sdk.device
import time

myconfig = {
    "identity": {
        "orgId": "94kx6e",
        "typeId": "Safety_Device",
        "deviceId": "Device_1"
    },
    "auth": {
        "token": "IOT_2804"
    }
}
client = wiotp.sdk.device.DeviceClient(config=myconfig, logHandlers=None)
client.connect()

while True:
    name= "India"
```

```
#in area location

latitude= 20.5937
longitude= 78.9629

#out area location

#latitude= 17.4219272
#longitude= 78.5488783
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(10)


client.disconnect()
```

Github and Project Demo Link

GitHub Repo : https://github.com/IBM-EPBL/IBM-Project-349-1658297092

Project DemoLink:

https://drive.google.com/file/d/1lviMKDUPX6_jKiRtCHub416mYPczfwwX/view?usp=drivesdk