PROJECT REPORT

IoT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING AND NOTIFICATION

DOMAIN	**INTERNET OF THINGS**
TOPIC	**IoT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING AND NOTIFICATION**
TEAM ID	**PNT2022TMID27063**
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ABSTRACT

In today's world children are less secure and have many issues concerning their security purpose. More family's spent their time for work and social accountability but since Children are gifts of GOD they need the care of family. The current status of our country is not habitable for monitoring children in school. With the absence of a child monitoring system, it is hard to monitor the whereabouts of children. Underage children may be impulsive in the way they act and in places to be. Most of the human behaviour is shaped in the childhood stage, in order to get morally acceptable behaviour child monitoring system is necessary. Children are prone to many accidents. The safety of children is very indispensable as children cannot protect themselves.

The main goal of this project is to create a smart wearable device for children that uses refined technology to assure their safety. The paper provides a smart solution for deflecting losing kids while going out alone or with their parents based on the Internet of Things (IoT). Our proposed strategy ensures utmost security and ensures live tracking for their kids. This paper proposes a model for child safety through smartphones that can track their children's location and give the precise coordinates of the child's location in real-time anywhere. By monitoring the activities the security state of the child is examined.

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LIST OF ABBREVIATIONS

IBM - International Business machines
IoT - Internet of Things
GIT - Global Information Tracker
SMS - short message service
GSM - Global System for Mobile communication GPS
- Global Positioning System
Wi-Fi - Wireless Fidelity
IEEE - The Institute of Electrical and Electronics Engineers GPRS -
General Packet Radio Service
AVR - Advanced Virtual RISC
OTP - One-time password
XML - Extensible Markup Language
ARM - Advanced RISC Machines
API - Application Programming Interface
HTTP – Hyper Text Transfer Protocol SSL
- Secure Sockets Layer

1. INTRODUCTION

1.1 Project Overview

The Internet of Things (IoT) plays a vital role in day-to-day life. The major difference between IoT and the embedded system is that a dedicated protocol/software is embedded in the chip in the case of an embedded system, whereas, IoT devices are smart devices, which are able to seize decisions by sensing the environment around the device. The Internet of Things is increasingly finding a place at the heart of many business automation strategies. Companies are using sensors in the logistics chain to help them track where delivery is with extraordinary accuracy.

The motivation for this wearable comes from the increasing need for safety for little children in contemporary times as there could be scenarios of the child getting adrift in a major crowded sector. This paper focuses on the key aspect that a missing child can be assisted by the people around the child and can play a remarkable role in the child's safety until reunited with the parents. If any deviant readings are disclosed by the sensor, then an SMS and phone calls are set off to the parent's mobile. Also, it overhauls the parental app through the cloud.

The technique is equipped with GSM and GPS modules for sending and receiving calls, and SMS between the safety gadget and the parental phones. The system also consists of a Wi-Fi/cellular data module used to implement IoT and send all the monitored parameters to the cloud for android app monitoring on the parental phones. The panic alert system is used during panic situations alerts are sent to the parental phone, seeking help also the alert parameters are updated to the cloud. Most of the wearables available today are focused on providing the location, and activity of the child to the parents.

1.2 Purpose

The main goal of this project is to create a smart wearable device for children that uses refined technology to assure their safety. The paper provides a smart solution for deflecting losing kids while going out alone or with their parents based on the Internet of Things(IoT). Our proposed strategy ensures utmost security and ensures live tracking for their kids. This paper proposes a model for child safety through smartphones that can track their children's location and give the precise coordinates of the child's location in real-time anywhere. By monitoring the activities the security state of the child is examined.

2. LITERATURE SURVEY

2.1 Existing problem

In today's world children are less secure and have many issues concerning their security purpose. More family's spent their time for work and social accountability but since Children are gifts of GOD they need the care of family. The current status of our country is not habitable for monitoring children in school. With the absence of a child monitoring system, it is hard to monitor the whereabouts of children. Underage children may be impulsive in the way they act and in places to be. Most of the human behaviour is shaped in the childhood stage, in order to get morally acceptable behaviour child monitoring system is necessary. Children are prone to many accidents. The safety of children is very indispensable as children cannot protect themselves.

Child abductors continually abduct children from parents/legally appointed guardians to get the ransom for their benefit. Parents have no supplementary choice but to view the exact scenario of children's intuitions. The crisis out-turn of kidnapping can be highly cynical and perpetual, more measures must be taken to protect children against abduction and its impacts.

2.2 References

{1} Authors: Zambada J,Quintero R,Isijara R,Galeana R, Santillan, L.(2015)

Using the paradigm of IoT, the proposed sensors send data about the location to the Internet through a broker, as well as billions of objects in the world are sending their own data to the Internet.

{2} Authors: M Nandini Priyanka, S Murugan.

The parent can send a message to the GSM module, according to the message information the GSM module replies back with particular details about the children. The location can be seen on Google Maps. 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.

{3} Authors: K N H Srinivas, T D S Sarveswara Rao, E Kusuma Kumari.

From the children's 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 a routine route or not can be identified by the GPS tracker, and the speed of the bus can also be extracted. Nowadays digital technology plays a major role in connecting people via the internet. For tracking the children, the android-based solution is provided to parents. Internet is the one that will connect different components through a single device and is connected to the server. Parents track their children in real time with the location tracker by GSM.

{4} Authors: Khushalsing Rajput,Ankur Chavan.

Some of the existing works done on these similar lines are for example the low-cost, lightweight Wristband Vital which senses and reports hazardous surroundings for people who need immediate assistance such as children and seniors. The major drawback of the Vital band is that it uses Bluetooth as the mode of communication between the child and the parent. Since the distance between the two in some cases could be substantial and the Bluetooth just won’t be able to establish a close link between the two. Hence this system combines both GPS and GSM

technology to provide a hand in such situations. The GPS is used for identifying the location and GSM is used for sending them a message

{5} Authors: Omkar Tanawade, Swapnil Sonawane.

The absence of an information system which could display conditions, actual activity, and annual reporting of kindergarten students in a platform which could be accessed easily anywhere and anytime has led to a major block in the coordination of students, parents, and teachers. One of the most difficult technical implementations is how to compile and display the updates of children's position in a fast (near real-time) duration while accessed from outside communication.

{6} Authors: David Hanes, Gonzalo, Patrick Grosetete, Robert, Barton, Jerome.

Title: Henry "IoT Fundamental and Networking Technologies, Protocols".

During an emergency, mobile apps alert the control room of nearby police stations or caretakers of children. The literature shows that location tracking devices are available in the market but it does not provide a complete solution to the problem. The solution to this problem is to design an IoT device, which senses the child's location and environment and during an emergency, it should send the alert to the parents automatically.

{7} Authors: K. N. H. Srinivas, T. D. S. Sarveswara Rao, E. Kusuma Kumari.

Title: Smart IoT Device for Child Safety and Tracking.

Published in: 2019 IEEE. The system is developed using Link-It ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules. The novelty of the work is that the system automatically alerts the parent/caretaker by sending SMS when immediate attention is required for the child during an emergency. Merits: The parameters such as touch, temperature & heartbeat of the child are used for parametric analysis and results are plotted for the same. Demerits: To implement the IoT device which ensures the complete solution for child safety problems

{8} Authors: Akash Moodbidri, Hamid Shahnasser.
Title: Child safety wearable device. Published in: 2017 IEEE.

The purpose of this device is to help parents to locate their children with ease. At the moment there are many wearables in the market which help to track the daily activity of children and also help to find the child using Wi-Fi and Bluetooth services present on the device. Merits: This wearable over other wearables is that it can be used on any phone and it is not necessary that an expensive smartphone is required and doesn't want to be a very tech-savvy individual to operate. Demerits: This device's battery gives a short lifetime. High power efficient model will have to be used which can be capable of giving the battery life for a longer time.

{9} Authors: Aditi Gupta, Vibhor Harit. Published in: 2016 IEEE. Title:

Child Safety & Tracking Management System by using GPS.

This paper proposed a model for child safety through smartphones that provide the option to track the location of their children as well as in case of emergency children are able to send a quick message and its current location via Short Message Services. Merits: The advantages of smart phones they offer rich features like Google maps, GPS, SMS etc. Demerits: This system is unable to sense the human behaviour of children.

{10} Authors: Dheeraj Sunehera, Pottabhatini Laxmi Priya.

Title: Children.

Location Monitoring on Google Maps Using GPS and GSM. Published in: 2016 IEEE. This paper provides an Android-based solution for parents to track their children in real time. Different devices are connected with a single device through channels of the internet. The concerned device is connected to the server via the internet. The device can be used by parents to track their children in real time or for women's safety. The proposed solution takes the location services provided by the GSM module. It allows the parents to get their child's current location via SMS. Merits: A child tracking system using android terminal and hoc networks. Demerits: This device cannot be used in rural areas.

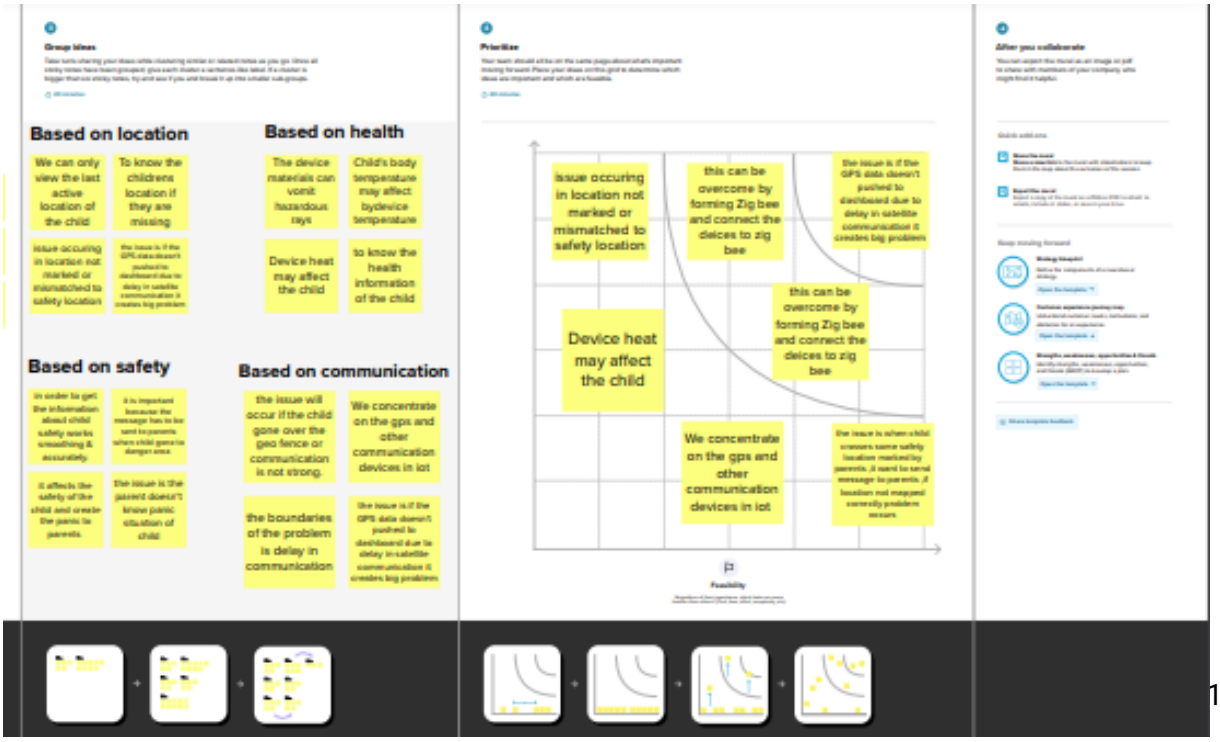
2.3 Problem Statement Definition

It has been a major threat to children from or in opposition to any perceived real danger/risk. Most of the kids have been abducted by strangers, which is a more frequent event nowadays. Child abduction continues to be a major issue and it has an utmost impact on the affected families. Child abduction is a scorching subject all over the world. It is a complex crime that can impair a child's future. Parents should ensure that their little ones are secure and are been protected from the menace of injury. Child abductors often kidnap children from legally appointed guardians to get the ransom and for their personal benefit. The out-turn of abduction can be seriously pessimistic and enduring, more actions must be taken to protect children against abduction and its effects.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

3.2 Ideation & Brainstorming



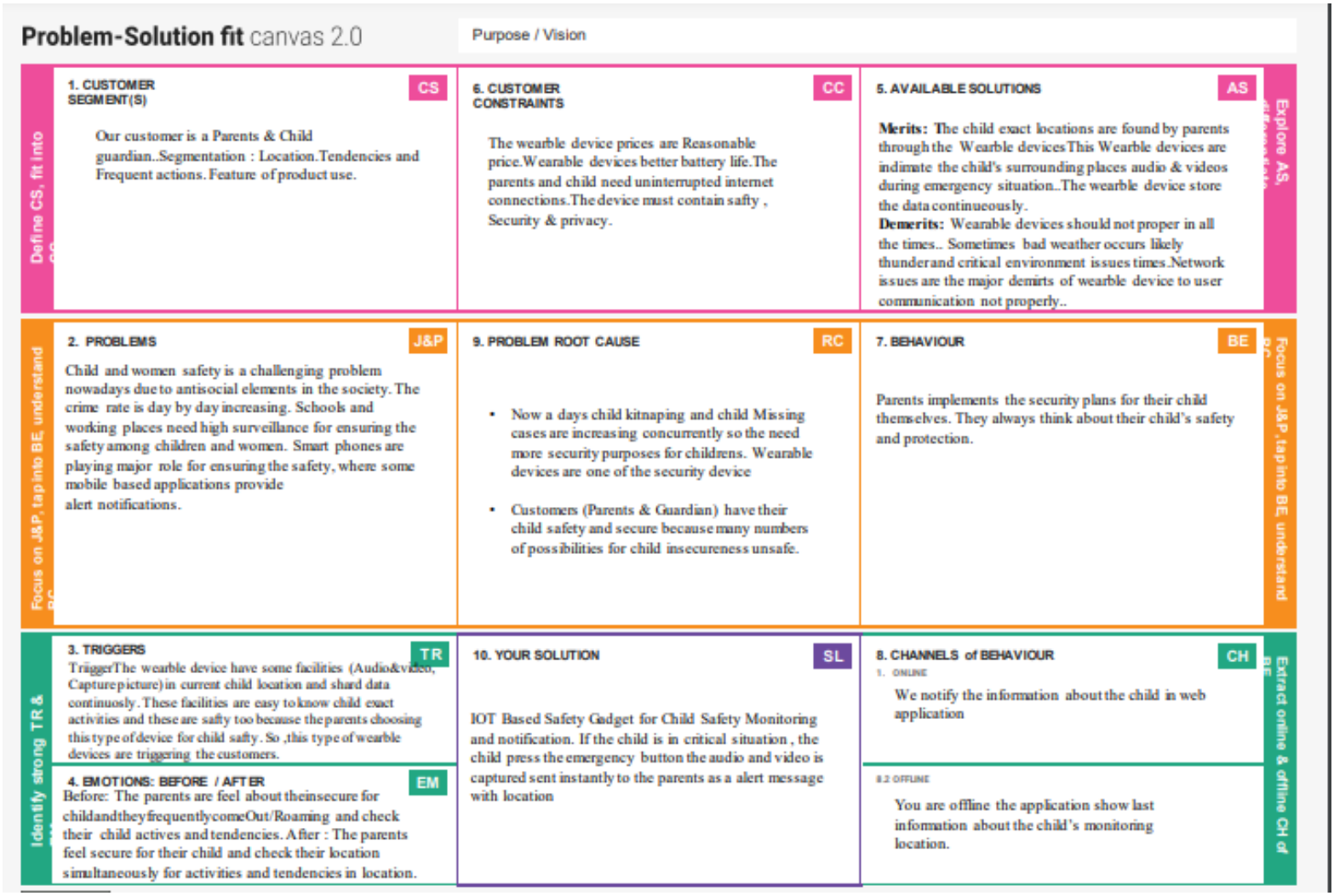
3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Child abductors continually abduct children from parents/legally appointed guardians to get the ransom for their benefit. Parents have no supplementary choice but to view the exact scenario of children's intuitions. The crisis out-turn of kidnapping can be highly cynical and perpetual, more measures must be taken to protect children against abduction and its impacts.
2.	Idea / Solution description	A Smart IoT device for tracking is developed to aid parents to detect and keep eye on their children. In this project, we are going to develop a wearable safety gadget to display the live location of a child at any time on the parent's mobile to set the seal on their safety. The application aside from conceding you to track down your children when they're within Bluetooth range, also functions when your kids go farther afield. Its competence as a tracker is outstanding if you live in densely populated areas like cities or big towns. This means you will be able to see the identity of the participating devices and It helps to diminish their vulnerability in harmful situations and also protects the children in emergency situations.

3.	Novelty / Uniqueness	The system software involuntarily alerts the parent/guardian by redirecting a text message where expeditious scrutinisation is essential for the child during a catastrophe. Contrary to other devices, it has plenty of characteristics such as the development of sensors technology, availability of internet-connected devices; data analysis algorithms making IoT devices act smart in emergencies without human intervention.
4.	Social Impact / Customer Satisfaction	Child abduction is a scorching subject all over the world. It is a complex crime that can impair a child's future. Parents should ensure that their little ones are secure and are been protected from the menace of injury. In case of situation arises, notifications will be consigned to the Parents so that measures can be done at the apparent time, Via this, Child Safety can be assured and will take the edge off the crime rate. The parent can keep their children Secure with tension-free minded when they are away from them. Precisely predicting the circumstances of the children and swiftly sensing the problems around children will make parents at ease. It will be great helpful to parents who are busy workers not having time to watch over their children, and easy to operate so anyone can handle

5.	Business Model (Revenue Model)	The Most desired in the contemporary market, as kids need more protection in the current times. The gadget can be acquired at an affordable rate. Our gadget possesses a lot of ingenious attributes and it will be accessible and beneficial to everyone so it is a foundation for a prominent revolution in merchandise. It is a device with numerous subscriptions for tracing and notification assistance.
6.	Scalability of the Solution	This methodology can be further enhanced by the installation of the mini camera inside a smart gadget for exemplary security and protection so that a glimpse can be caught on the live footage on the parental phone during panic circumstances. If an intricacy arises parents can see some of the attributes like the location, temperature and heartbeat of the child along with living perspective around the children without deterrence.

3.4 Problem Solution fit



4. REQUIREMENT ANALYSIS

4.1 Functional requirement

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 message ● Registration through website ● Registration through App ● Registration through Call ● Registration through Social Media
FR-2	User Confirmation	● Confirmation via Email ● Confirmation via OTP ● Confirmation via Call
FR-3	App Installation	● Installation through Link ● Installation through Play Store/App Store
FR-4	Detecting Child Location	● Detecting location via app ● Detecting location via SMS ● Detecting location through Website
FR-5	Database	● Location history is stored in the cloud ● Values include distance, latitude, longitude
FR-6	User Interface	● User login form ● Admin login form
FR-7	User Notification	● Notification through Message ● Notification through Gmail

4.2 Non-Functional requirements

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

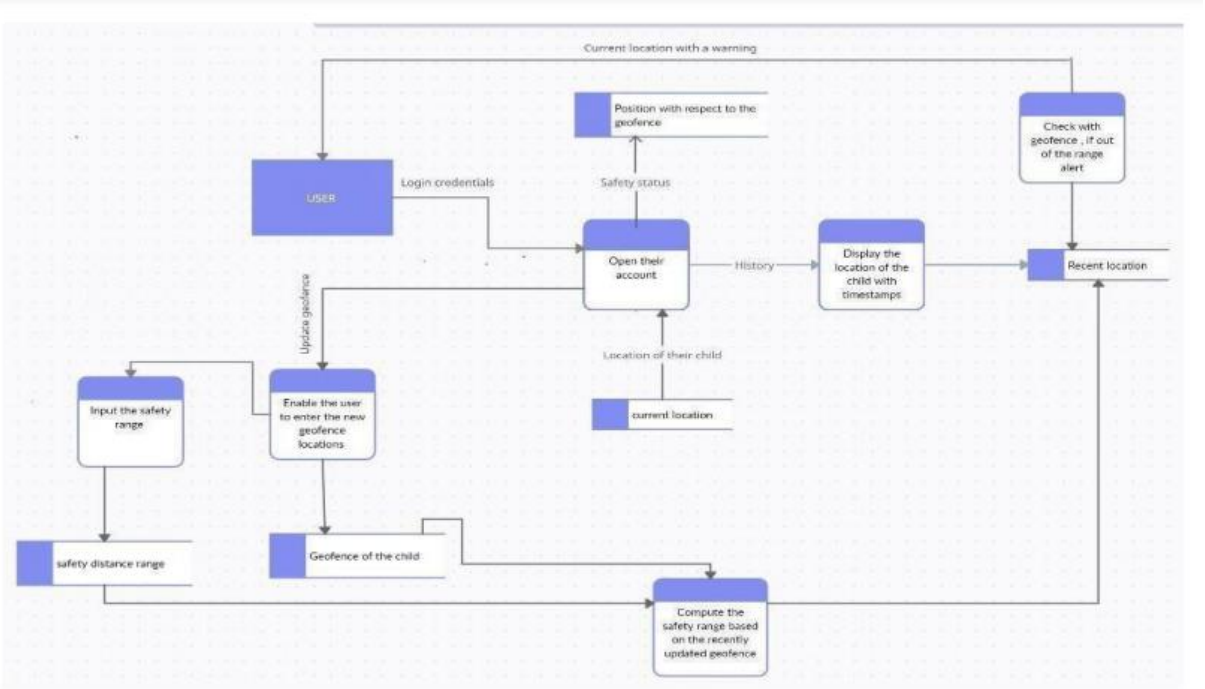
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	● A midget setup via the application is made in the mobile that helps to send SMS to parents. ● The gadget has a GSM that aids in informing the parents/guardian about the current location of their kids which in turn helps the parents/guardians take immediate action when any crisis occurs. ● The gadget is compact and effortless to operate and its applications are foolproof.
NFR-2	Security	● The device is designed in such a way that it builds a safe environment for children to go outside. ● It gives a sense of assurance to parents about their children's security as the gadget uses GPS and GSM to track their live location.

NFR-3	Reliability	● Inflated reliability towards the mechanism and curtail reliability towards parents/guardians. ● It is transportable, Easy to access, and also tensile. ● We can use the cloud to accumulate the surveillance data of the children. ● The wifi modules are of assistance in sending the monitoring particulars, the user will be notified with an update if any errors are found, for the efficient functioning of the device.
NFR-4	Performance	● The web Page's load time should be no more than one second for the user's elevated performance concerning simple aidance and security. ● The originality of the system is that it spontaneously alerts the parents/caretaker by sending an SMS when instant attention is indispensable for the child during a crisis. ● The complete data of the children's location will be stocked in the repository and the execution of the device diminishes in a less network area

NFR-5	Availability	● The device is used to keep tabs on your child even in a horde. ● It also provides the current location along with travel details. ● This system is advanced using a board programmed in embedded C and python. ● It is a site that is available online.
NFR-6	Scalability	● This methodology can be further enhanced by the installation of the mini camera inside a smart gadget for exemplary security and protection so that a glimpse can be caught on the live footage on the parental phone during panic circumstances. ● If an intricacy arises parents can see some of the attributes like the location, temperature, and heartbeat of the child along with living perspective around the children without deterrence.

5. PROJECT DESIGN

5.1 Data Flow Diagrams



5.2 Solution & Technical Architecture

INTRODUCTION:

Solution architecture is a complex process with many data sources that bridges the void between industrial obstacles and technology solutions. Its goals are to

- Discover the finest tech solution to decipher subsisting business crises.
- Outlines the composition, attributes, behaviour, and other aspects of the software to project stakeholders.
- Define properties, development chapter, and quick fix essentials.
- Produce stipulation in accord to which the solution is interpreted, controlled, and dispatched.

Every quick fix architecture delineation holds 6 to 7 phases, these caliber should be followed by all evolution teams to secure the standard of the software, so the software is scalable, multifaceted, and metaphoric.

REQUIREMENT:

This project is done utilising the embedded C and python framework for AVR, ARM, and in addition to (based on Wiring) Device BootLoader. IBM Cloud workspace is used for depository and APIs. The front end is done using XML for android.

DESIGN:

All the requisite are used to draft the Application. The layout and architecture of the software are done in a distinctive approach so the software can be employed and developed imminently. The Arduino acquires the region from the GPS equipment and consigns it to the cloud to inspect if the end user is within the confined zone. If the user is further away from the confined zone, an alert is sent to the catalogued mobile through the cloud. When the requisition is opened, the locality is obtained from the cloud and unveiled on the mobile.

IMPLEMENTATION:

The implementation mechanism is done and execution is terminated by progressing the logic by coding. All the vital packages are imported and for each router specific logic is developed in accordance to the usage. Development of a safety device for kids to guarantee their security in the absence of an understated examination of their parents. The various aspects involve:

- GPS
- Notify alert signal

UNIT TESTING:

Each portion of the software is designed by discreet team members, and it is

tested individually by the python unit testing IoT.

INTEGRATION AND TESTING:

After unit testing, all software sections are integrated and tried out ultimately, so the flask program can be run on any platform. The testing progression encompasses Alpha testing and Beta testing.

DEPLOYMENT:

The flask application in the long run is distributed in the IAAS rostrum like IBM cloud assistance, so it can be run in HTTPS protocol alongside SSL. In the deployment process, a real-time database is fastened on the edge of real-time file storage.

MAINTENANCE:

In the wake of victorious deployment, if there is a conglomeration refurbish, it is accomplished in the software.

CATASTROPHIC FEATURES IN THE DEVICE:

ALARM RING:

The safety system redirects a warning to your phone at any occasion, it determines any pursuit. Arming methodology decides which category of alerts you get.

EMERGENCY NOTIFICATION:

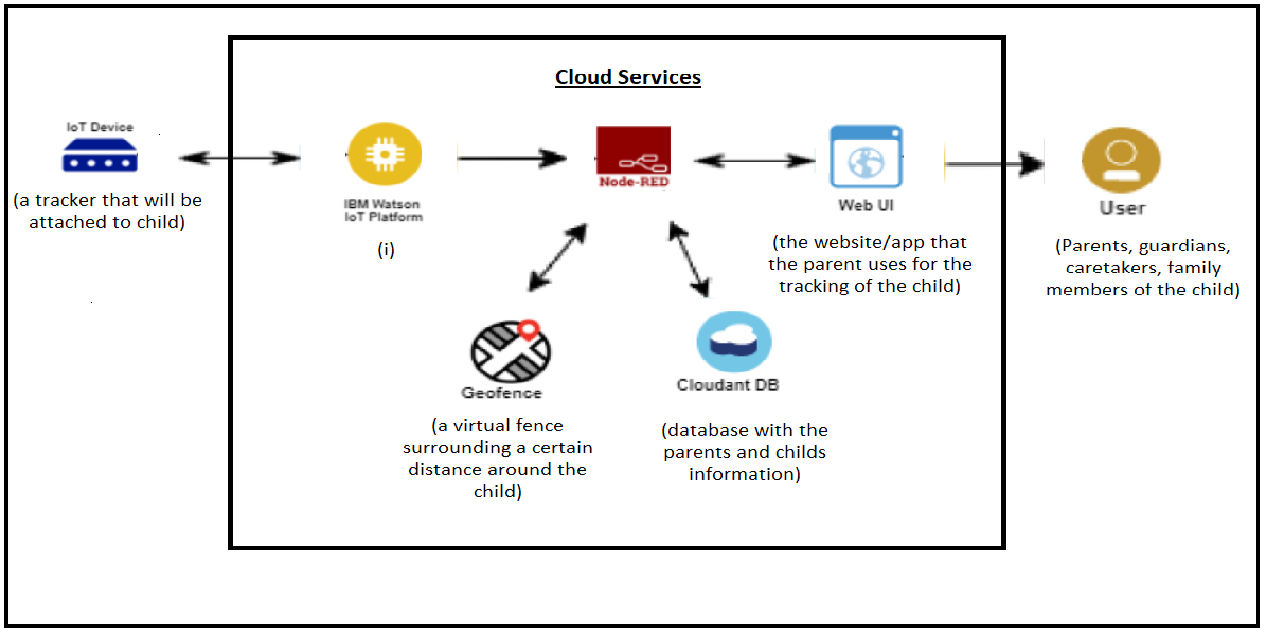
An emergency notification system is a labour saving mechanism to get in touch with a group of people within a corporation and assign salient information during a crisis.

GPS:

The GPS helps to escalate protection and fitness characteristics on the device.

Depending upon the device, it can alert parents about their child's location in case of any crisis and helps to trace their route duration and distance.

Solution Architecture Diagram:



5.2.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile 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
	Confirmation	USN-2	As a user, I will receive a confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can register & access the dashboard with a Gmail account Login	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering my email & password	I can receive a Verification Mail and Verify it.	High	Sprint-1
	Dashboard	USN-6	As a User, I can Navigate to the Dashboard after successfully Login to the Application.	I can view the locations which are accumulated in the database and other options available on the Platform via the dashboard	High	Sprint-2
Customer (Web user)	Notification	USN-7	As a user when there is an anomalous situation with the child, a notification will be received through the fencing application.	An alert message is sent to the parent's mobile and received if the user is engaged in the fencing application.	High	Sprint-1
Customer Care Executive	Support	USN-8	As a User, I can connect with experts to clear Queries, they assist to overcome challenges by scanning for any glitches and monitoring the operation and by checking if all the users are authorized.	I can login with my given credentials to chat/call them and get clarity about any intricacies.	Medium	Sprint - 3
Administrator	Login	USN-9	As an Administrator, I can set the Geofence Location Limit and make sure the database encompassing the locations is secure, factual and updated constantly.	I can log in with my provided credentials and can exploit the prospects Open on the Dashboard.	High	Sprint - 3

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password and confirming my password.	4	High	Sanjay Anand L
Sprint-1	Confirmation	USN-2	As a user, I will receive a confirmation email once I have registered for the application	4	High	Saravanan E
Sprint-2		USN-3	As a user, I can register for the application through Facebook	10	Low	Gospel Mathew
Sprint-1		USN-4	As a user, I can register for the application through Gmail	4	Medium	Julian Thomas Peniel J
Sprint-1	Login	USN-5	As a user, I can log into the application by entering my email & password	4	High	Julian Thomas Peniel J
Sprint-2	Dashboard	USN-6	As a User, I can Navigate to the Dashboard after successfully Login to the Application.	10	High	Saravanan E

Sprint-1	Notification	USN-7	As a user when there is an anomalous situation with the child, a notification will be received through the fencing application.	4	High	Julian Thomas Peniel J
Sprint - 3	Support	USN-8	As a User, I can connect with experts to clear Queries, they assist to overcome challenges by scanning for any glitches and monitoring the operation and by checking if all the users are authorized.	10	Medium	Sanjay Anand L
Sprint - 3	Login	USN-9	As an Administrator, I can set the Geofence Location Limit and make sure the database encompassing the locations is secure, factual and updated constantly.	10	High	Gospel Mathew

Estimation:

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

Velocity:

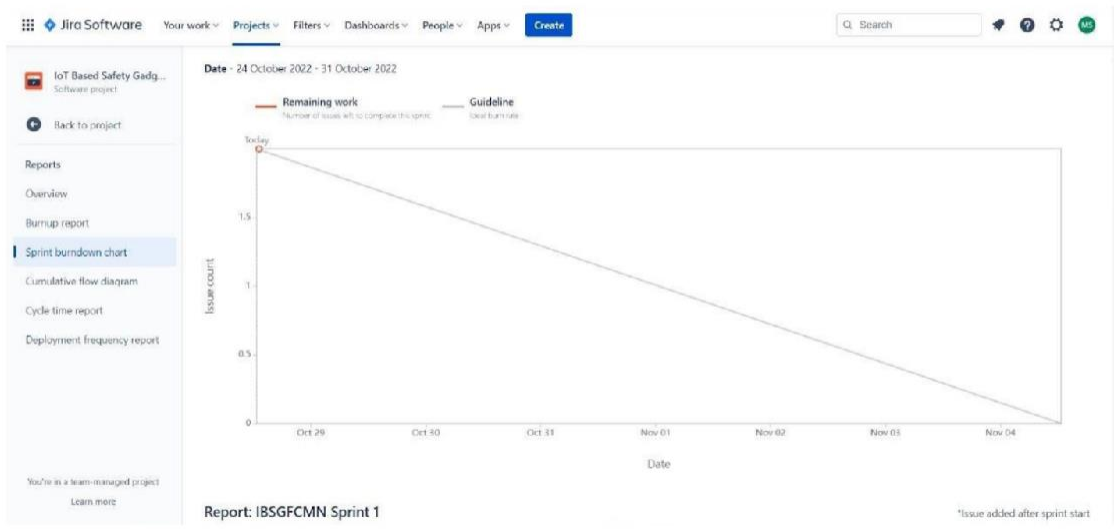
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

6.2 Sprint Delivery Schedule

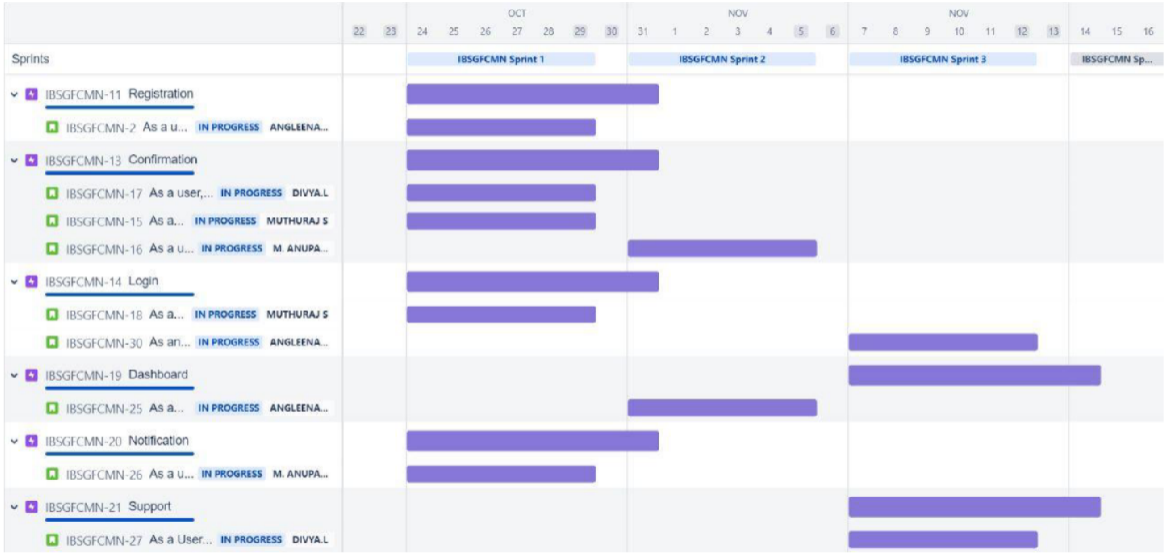
Sprint	Duration	Sprint Start Date	Sprint End Date (Planned)	Sprint Release Date (Actual)
Sprint-1	6 Days	24 Oct 2022	29 Oct 2022	29 Oct 2022
Sprint-2	6 Days	31 Oct 2022	05 Nov 2022	05 Nov 2022
Sprint-3	6 Days	07 Nov 2022	12 Nov 2022	12 Nov 2022
Sprint-4	6 Days	14 Nov 2022	19 Nov 2022	19 Nov 2022

6.3 Reports from JIRA

Burndown Chart:

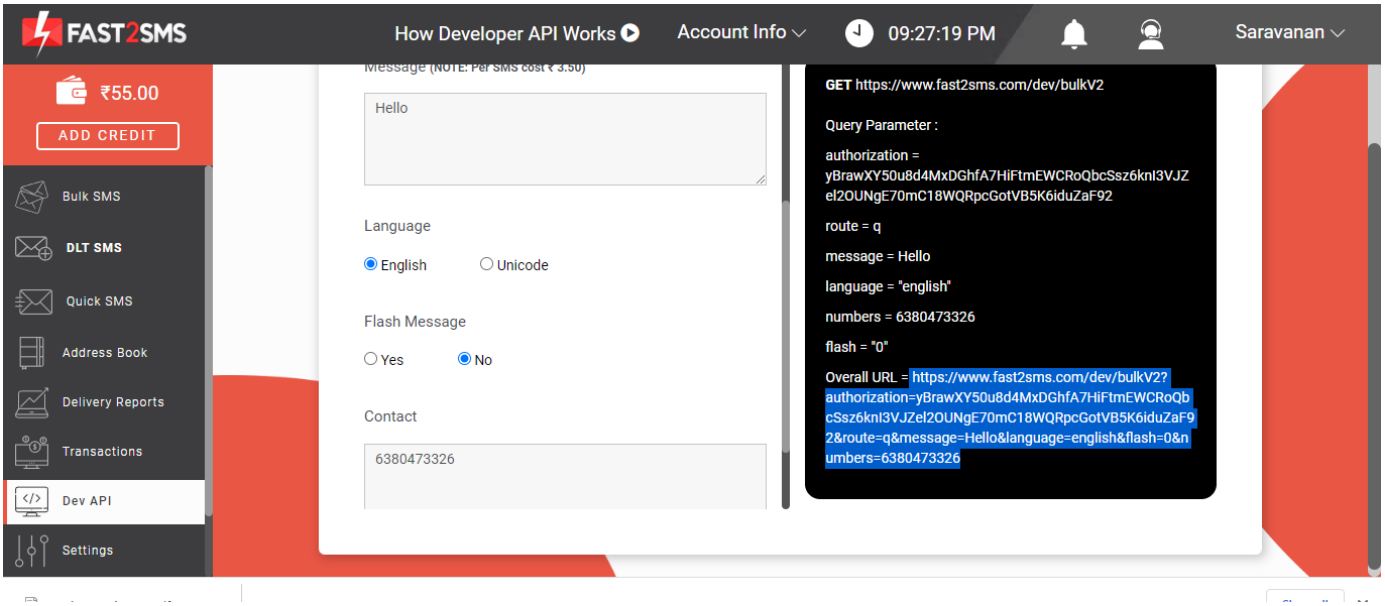


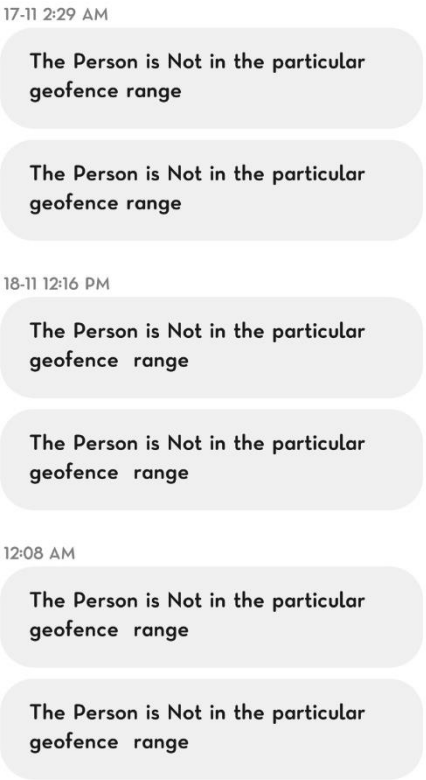
Road Map:



7. CODING & SOLUTIONING

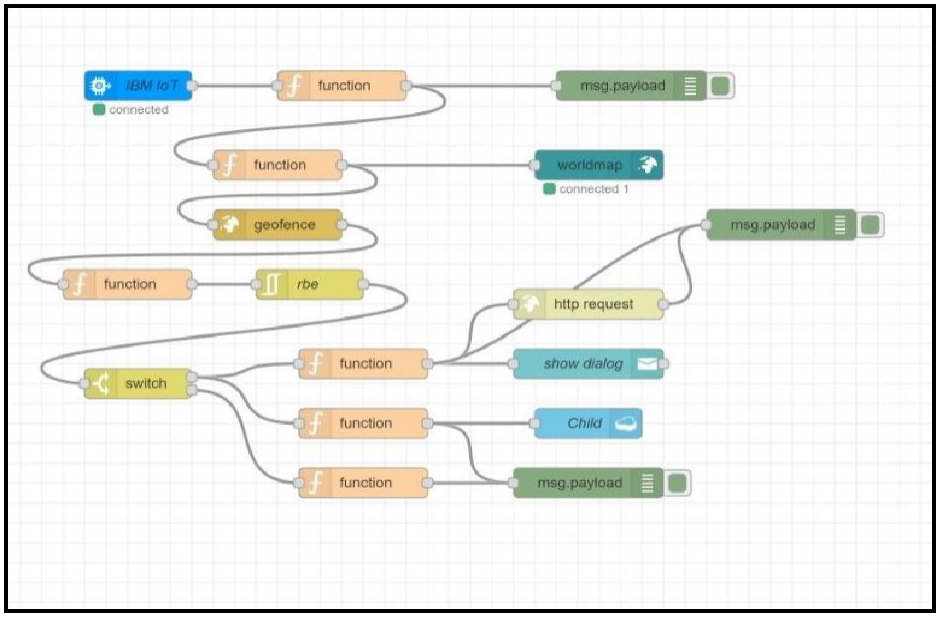
7.1 Feature 1

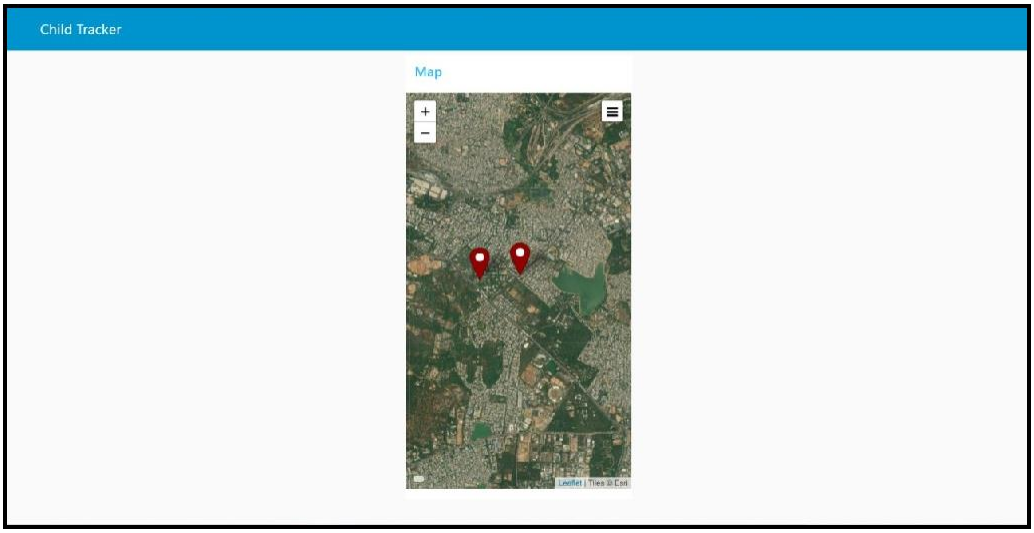




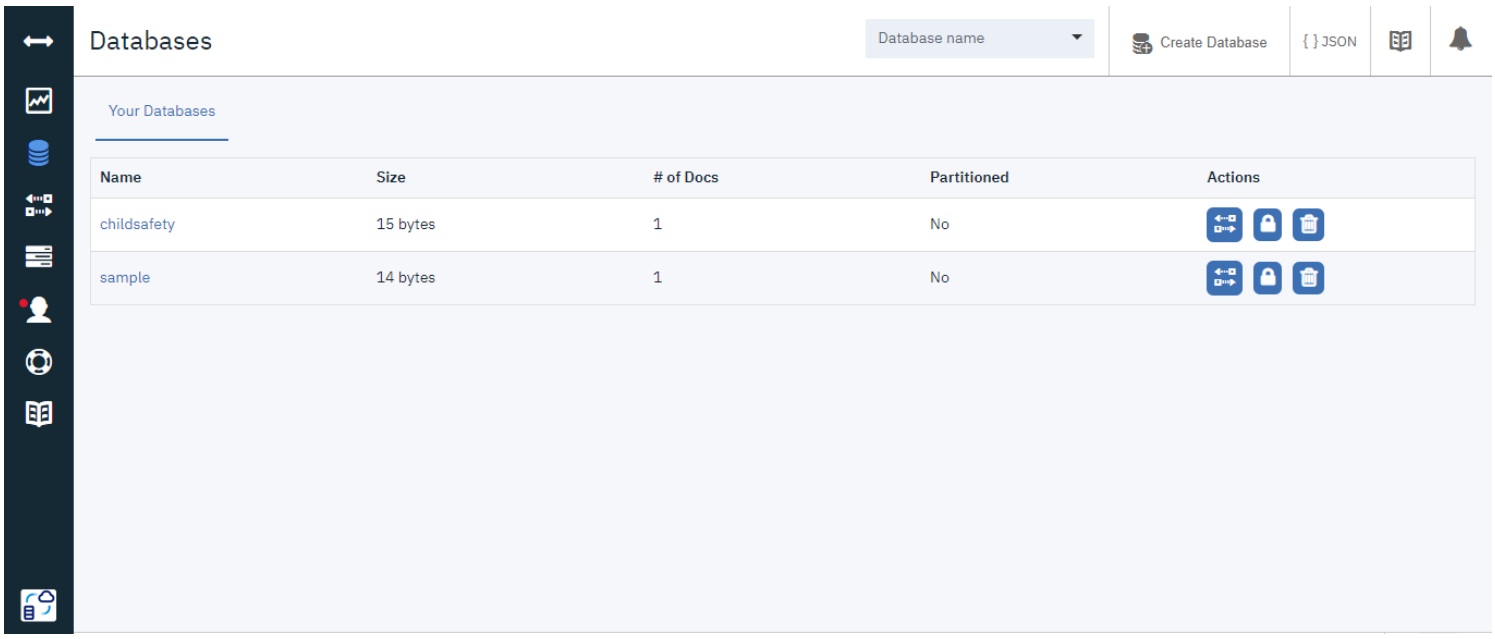
7.2 Feature 2

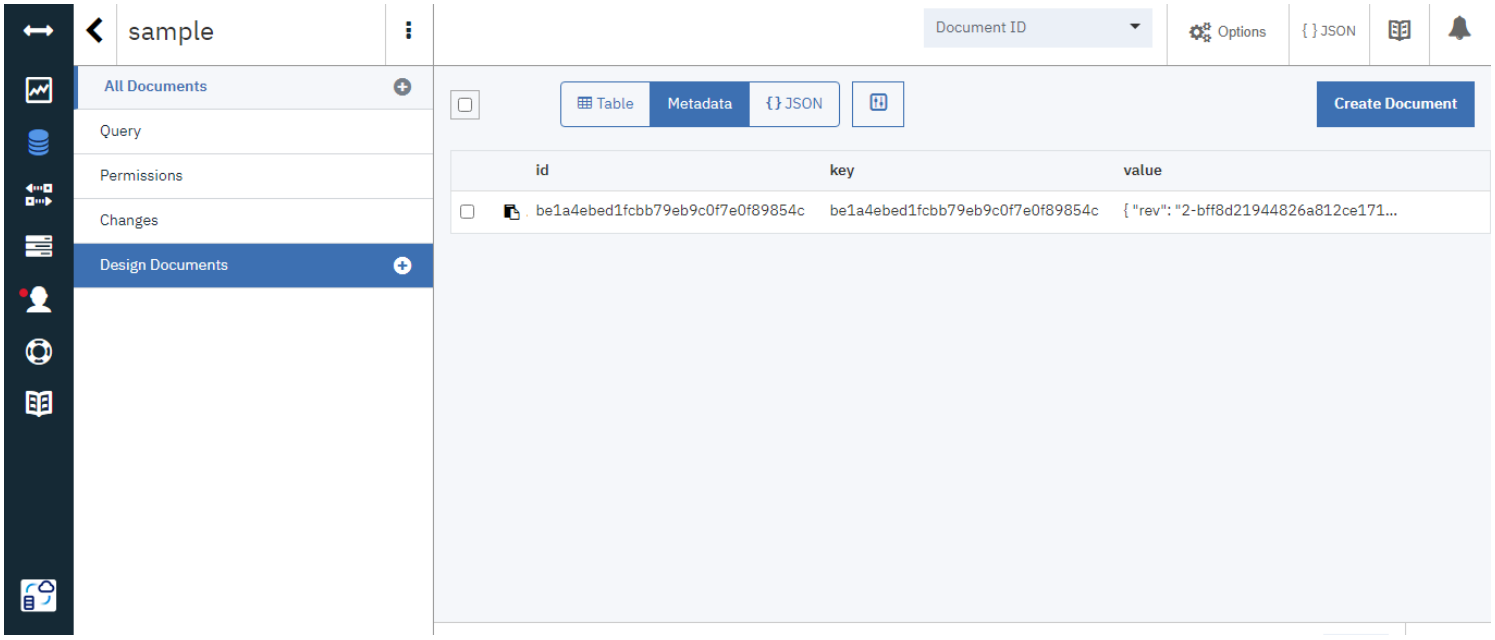
Node Red platform is where the necessary connections are made and it is deployed to acquire the desired output**.**





7.3 Database Schema





8. TESTING

8.1 Test Cases

				Date	16 November 2022						
				Team ID	PNT2022TMID27063						
				Project Name	Project - IoT Based Safety Gadget for Child Safety Monitoring & Notification						
				Maximum Marks	4 marks						
Test case ID	**Feature Type**	**Component**	**Test Scenario**	**Pre-Requisite**	**Steps To Execute**	**Test Data**	**Expected Result**	**Actual Result**	**Status**	**TC for Automation (Y/N)**	**BUG ID**	**Executed By**
IBM CLOUD _TC_001	Functional	IBM Cloud Service	Verify the login cloud services	Software	1. Login in usingcloud.ibm.com 2. Obtain promocode in ICT 3. Then apply code the andLogin 4. The page will be directed to the IBM cloudaccount	email: julianthomaspeniel16@gmail .com Password: *Mdse16102001	Successfully created the IBM account	Working as expected	Pass	YES	NIL	1. Julian Thomas Peniel J 2. Saravanan E 3. Sanjay Anand L 4. Gospel Mathew
IBM Watson IoT Platform_TC_OO2	Functional	IBM Cloud Service	Verify create a device in the IBM Watson IoT platform and get the device credentials.	IBM Cloud Service	1. In IBM Cloud Service go to catalog 2. Create and launch the IBM Watson IoT Platform 3. Login to the Platform by clicking organization ID 4.Create a device & configure the device type and ID 5.Generate the APIKey	Create a device & integrate with code	{'name': 'Smartbridge', 'lat': 17.4219272, 'lon': 78.5488783}	Working as expected	Pass	YES	NIL	1. Julian Thomas Peniel J 2. Saravanan E 3. Sanjay Anand L 4. Gospel Mathew
PythonCode_TC_OO3	Code	Python 3.9	Verify wheather the python code is without error by running it	Software	1. Download the python version3.9 2. Type the program and save it with the extention .py 3. Verify it by compiling the code	importjson importwiotp.sdk.device import time importrandom myConfig ={ "identity":{ "orgId": "jgryfix ",	022-11-18 12:25:57,235 wiotp.sdk.device.client. DeviceClient INFO Connected successfully: id: jgryfix MyDeviceType:12345	Working as expected	Pass	YES	NIL	1. Julian Thomas Peniel J 2. Saravanan E 3. Sanjay Anand L 4. Gospel Mathew
Node_Red_TC_004	Non-Functional	IBM Cloud Service	Verify to create a node-red services	IBM cloud services	1. In IBM cloud go tocatalog 2. To create a Node-Red app 3. Click onto Deploy App 4. Visit the app URL 5. We need to connect the Node-Red with the IBMwatson	We use a geofence node to form a circle shaped range whether the child is present in the circle or not.	Successfully created the node-red	Working as expected	Pass	NO	NIL	1. Julian Thomas Peniel J 2. Saravanan E 3. Sanjay Anand L 4. Gospel Mathew
CloundantDB_TC_OO5	Dataset	IBM Cloud Service	Verify the events is stored in the database	IBM Cloud Service	1. Go to IBM Cloud Services 2. In resources list, click onto cloudant 3. Click onto the launch dashboard to redirect to the cloud DB 4. Click onto create DB.	Document: tracker	Successfully created the Database	Working as expected	Pass	NO	NIL	1. Julian Thomas Peniel J 2. Saravanan E 3. Sanjay Anand L 4. Gospel Mathew
Web UI_TC_006	Functional	Node-Red Service	To create a web UI to interact with user	Node-Red Service	1. Go to Node-Red Dashboard 2. Make the necessary connection and deployit. 3. Copy the URL and paste it in the new tab with "/ui" extention. 4. Display the child and geofencelocation.	Shows the locaion of parent and child	And as expected it displays the Position of the child and parent	Working as expected	Pass	NO	NIL	1. Julian Thomas Peniel J 2. Saravanan E 3. Sanjay Anand L 4. Gospel Mathew
FastSMS Service_TC_OO7	Functional	Fast2SMS Service	To send SMS to the particular child's guardian	Software	1. Login to Fast2SMS Service 2. GO to Dev API and select quick API 3. SMS will be sent using Flash SMS option to the registered number	Show the popup SMS	Alert: The person is not in the particular geofence area	Working as expected	Pass	NO	NIL	1. Julian Thomas Peniel J 2. Saravanan E 3. Sanjay Anand L 4. Gospel Mathew

Test Scenarios

1.) Verify the login cloud services

2.)Verify create a device in the IBM Watson IoT platform and get the device credentials.

3.) Verify wheather the python code is without error by running it

4.) Verify to create a node-red services

5.) Verify the events is stored in the database

6.) To create a web UI to interact with user

7.) To send SMS to the particular child's guardian

8.2 User Acceptance Testing

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

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

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	4	4	2	0	10
Duplicate	0	0	0	1	1
External	2	0	0	1	3
Fixed	7	2	0	0	9
Not Reproduced	0	1	1	0	2
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	13	7	3	2	25

3. Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	1	0	0	1
Client Application	1	0	0	1
Security	1	0	0	1
Outsource Shipping	1	0	0	1
Exception Reporting	1	0	0	1
Final Report Output	1	0	0	1
Version Control	1	0	0	1

9. RESULTS

9.1 Performance Metrics

			NFT - Risk Assessment			
S No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Risk Score	Justification
1	IoT Based Safety Gadget for Child Safety Monitoring & Notification	New	No Changes	No Changes	GREEN	As we have completed the project successfully

NFT - Detailed Test Plan		
S No	Project Overview	NFT Test Approach
1	This project proposes a model for child safety through smartphones that can track their children's location and give the precise coordinates of the child's location in real-time anywhere.	Load Test

			End Of Test Report		
S No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	Approvals/SignOff
1	The application aside from conceding you to track cover your children when they're within Geofence range, also functions when your kids go further afield. It is cooperative as a tracker is outstanding if you live in densely populated areas like cities or big towns.	Load Test	Nil	Respone time meet the actual Result	Approved

NFT Test approach	
Load Test	
Scenario Name	Load Test - Location Tracker SAMPLE PROJECT
Scenario Type	Load Test - Duration 15 minutes
Scenario Objectives	To Stimulate Python Code(Location Details) and to monitor the performance of Location Tracker SAMPLE PROJECT
Steps	1. We have integrate IBM Watson IoT Platform in order to get this Location details from python program. 2. We also integrate fast SMS service in order to send an alert to guardian or parent
Entry Criteria	Test data is set-up. All the Components(software & hardware) is set-up. It is completed successfully.
Exit Criteria	Response time meets the actual Result. Test completion report is agreed upon by mentors

10. ADVANTAGES

1.) Trace whereabouts and minimise the Tragedy

2.) Create unassailable environment

3.) Toddlers in hamlet and metropolis can be saved

4.) ceaseless Surveillance and instantaneous notification regime

5.) High dependability and data accuracy

6.) Eradicates ambiguity and Pays way for a tech-driven community

DISADVANTAGES

1.) Inadequate battery supply leads to switching off the device

2.) Impractical to use the device forever

3.) Improper weather condition

4.) Improper connectivity

5.) Misplacement or losing the tag

6.) Over usage of data

11. CONCLUSION

The System put forward this paper to ensure the safety of children and increase their confidence. Many experimenters are operating in this area and have formulated different technologies to aid children. The key represented in this paper takes the advantage of smartphones which proposes affluent elements like Google maps, SMS, etc. The child safety and protection device is proficient in acting as a smart IoT device. It equips parents with real-time location, the surrounding temperature, and along with an alarm buzzer for their child's circumstances and the capability to locate their child. This paper depicts the fundamental design concept and functionality along with the anticipated consequences.

The application aside from conceding you to track down your children when they're within Bluetooth range, it also functions when your kids go farther afield. Its competence as a tracker is outstanding and if you live in densely populated areas like cities or big towns. This means you will be able to see the identity of the participating devices and It helps to diminish their vulnerability in harmful situations and also protects the children in emergency situations.

Parents take measures both at home and outdoors to safeguard their kids from hurting themselves. But sometimes, it's impossible to pre-empt what can cause a treacherous encounter. However, it's possible to prevent such hazards with some forethought and simple measures using these safety gadgets.

12. FUTURE SCOPE

Ceaseless Surveillance:

If any deviant readings are disclosed by the sensor, then an SMS and phone calls are set off to the parent's mobile.

Create unassailable environment:

Precisely predicting the circumstances of the children and swiftly sensing the problems around children will make parents at ease. It helps to diminish their vulnerability in harmful situations and also protects the children in emergency situations.

Pays way for a tech-driven community:

Children and their parents are veering around to digital solutions more than ever to support children's cognition and it notifies the information about the child in a web application

13. APPENDIX

Source Code:

```
import json
import wiotp.sdk.device
import time
myConfig = {

    "identity":{
        "orgId": "jgry6x",
         "typeId": "MyDeviceType",
        "deviceId": "12345"
    },
    "auth": {
        "token":" *eB+Vs5Pb3m6f79Vnn"
    }
}
client= wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

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

        #latitude = 17.4225176
        #longitude = 78.5456842

        #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 platfrom: ",myData)
            time.sleep(5)

      client.disconnect()
```

GitHub: https://github.com/IBM-EPBL/IBM-Project-718-1658317113

Project Demo Link:

https://drive.google.com/file/d/1AfBxEgoknUCntmmVisbAj86a0X5QpL03/view?usp=drivesdk