IoT - Based Safety Gadget for Child Safety Monitoring and Notification

A PROJECT REPORT

Submitted by

MOHAMED ASIF M [724019106011]

SAFEEQ R [724019106015]

AL FAYADH TB [724019106002]

FARIS MUHAMMED P [724019106005]

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ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report **"IoT - Based Safety Gadget for Child Safety Monitoring and Notification**" is the Bonafide work of

"**MOHAMED ASIF M [724019106011]**
SAFEEQ R [724019106015]
AL FAYADH TB [724019106002]
FARIS MUHAMMED P[724019106005]"

who carried out the project work under my supervision.

SIGNATURE

Dr.N.Aparna M.E., Ph.D.,

HEAD OF THE DEPARTMENT

Department of ECE

Dhaanish Ahmed Institute of Technology

Coimbatore - 641105

SIGNATURE

Mr.Karthick Chandrasekaran M.E.

SUPERVISOR

Department of ECE

Dhaanish Ahmed Institute of Technology

Coimbatore - 641105

Submitted for the ANNA UNIVERSITY examination held on_____

_____ _____

Internal Examiner External Examiner

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ABSTRACT

This paper is mainly streamed towards child safety solutions by developing a gadget which can be tracked via its GPS locations and also a panic button on gadget is provided to alert the parent via GSM module calling for help. Parental Android App is developed to manage and track the device anytime. Smart gadget device is always connected to parental phone which can receive and make phone calls and also receive SMS on gadget via GSM module, also a wireless technology is implemented on device which is useful to bound the device within a region of monitoring range, if device is moving out of monitoring range, then an alert will be triggered on binding gadget, this helps you keep a virtual eye on child. Health monitoring system on gadget checking for parameters like heart beat/pulse rate and temperature is included which can be monitored on parental app.

Gadget also monitors whether it is plugged on hand or not using contact switch and alert the parent as soon as it is unplugged.

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LIST OF ABBREVIATIONS

IoT	: INTERNET OF THINGS
GPS	: GLOBAL POSITIONING SYSTEM
FR	: FUNCTIONAL REQUIREMENTS
NFR	: NON-FUNCTIONAL REQUIREMENTS
DFD	: DATA FLOW DIAGRAM
SQL	: STRUCTURED QUERY LANGUAGES
STT	: SECURITY TRANSACTIONS TAX
DB	: DATABASE
UAT	: USER ACCEPTANCE TESTING
WIFI	: WIRELESS FIDELITY

CHAPTER 1

1. INTRODUCTION

1.1 Project Overview

A tracker that helps parents track a child's location so that the child does not get into dangerous situations.

The inspiration for this wearable comes mainly from the ever-increasing need of safety for small children in present times because there may be a chance of child lost in the major crowded areas.

This main script mainly focuses on the key features of missing child can be helped by the individuals present around the child and plays an important role in the child's safety until reunite the parent to that location.

1.2 Purpose

Now a day's Parents have more responsibility than older about their children's. Because Crimes rates are increasing day by day in our country, Crimes such as Child Amusement, Rapes, Murders, Illegal Relationship to avoid these kinds of crimes parents must watch their children every step. Eventually mobile phones cause major allegations on our society. Many teens must be noticed by their own parents; it is our duty. But sometimes children are arguing with their parents for watching their steps, to overcome these issues, we need to watch them through online.

CHAPTER 2

2. LITERATURE SURVEY

2.1 Existing Problem

Authors: M Nandini Priyanka, S Murugan, K. N. H. Srinivas, T. D. S. Sarveswararao, E. Kusuma Kumari. Title: Smart IoT Device for Child Safety and Tracking. Published in: 2019 IEEE. The system is developed using Link-It ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules. The novelty of the work is that the system automatically alerts the parent/caretaker by sending SMS, when immediate attention is required for the child during emergency.

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

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

Authors: Akash Moodbidri, Hamid Shahnasser Title: Child safety wearable device. Published in: 2017 IEEE. The purpose of this device is to help the parents to locate their children with ease. At the moment there are many wearables in the market which helps to track the daily activity of children and also helps to find the child using Wi-Fi and Bluetooth services present on the device.

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

Demerits: As, this device's battery gives short life-time.

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 smart phones that provides the option to track the location of their children as well as in case of emergency children is able to send a quick message and its current location via Short Message services.

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

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

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 the parents to track their children in real time. Different devices relate to a single device through channels of internet. The concerned device is connected to server via internet. The device can be used by parents to track their children in real time or for women safety. The proposed solution takes the location services provided by 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.

2.2 REFERENCES

[1] M Nandini Priyanka, S Murugan, K. N. H. Srinivas, T. D. S. Sarveswararao, E. Kusuma Kumari, 'Smart IoT Device for Child Safety and Tracking' International Journal of Innovative Technology and Exploring Engineering, Volume 8, Issue 8, June 2019.

[2] Akash Moodbidri, Hamid Shahnasser (Jan. 2017) 'Child safety wearable device', International Journal for Research in Applied Science & Engineering Technology, Vol. 6 Issue 2, pp. 438-444.

[3] Aditi Gupta, Vibhor Harit, 'Child Safety & Tracking Management System by using GPS, GeoFencing & Android Application: An Analysis,' 2016 Second International Conference on Computational Intelligence & Communication Technology.

[4] Dheeraj Sunehera, Pottabhatini Laxmi Priya, 'Children Location Monitoring on Google Maps Using GPS and GSM,' 2016 IEEE 6th International Conference on Advanced Computing.

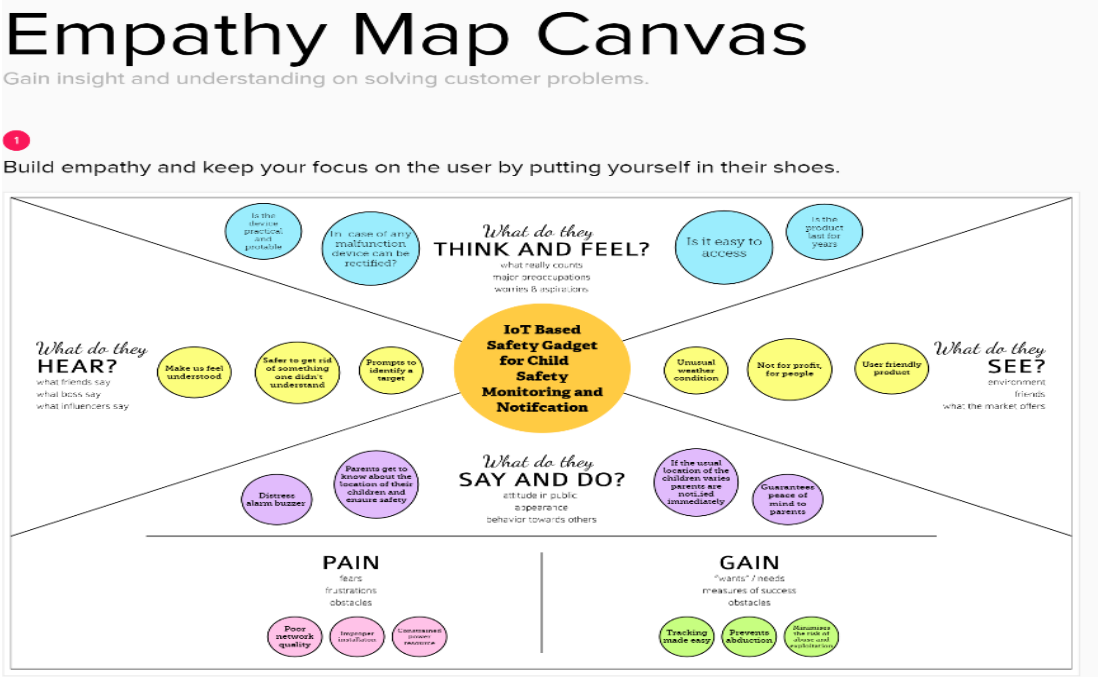
2.3 PROBLEM STATEMENT DEFINITION

Child tracker helps the parents in continuously monitoring the child's location. They can simply leave their children in school or parks and create a geofence around the particular location. By continuously checking the child's location notifications will be generated if the child crosses the geofence. Notifications will be sent according to the child's location to their parents or caretakers.

CHAPTER 3

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.2 IDEATION & BRAINSTORMING:

BRAINSTORMING

Mohamed Asif

it affects the safety of the child and create the panic to parents	it is important because the message has to be sent to parents when child gone to danger area .	the issue is if the GPS data doesn't pushed to dashboard due to delay in satellite communication it creates big problem
issue occuring in data doesn't reach to parents	the issue is when child crosses some safety location marked by parents ,it want to send message to parents ,if location not mapped correctly problem occurs	when the child's geofence not works due to humidity,..
the boundaries of the problem is delay in communication.	the issue will occur if the child gone over the geo fence or communication is not strong.	the boundaries and the correct mapping to the location.

Al Fayadh

The device materials can vomit hazardous rays	The health of the child to be considered	The issue was the location was not fnd
The child's current activity cannot be notifed	We concentrate on the gps and other communication devices in iot	The rays causes health issues
Parents have fear about the child	The issue occuring in pointing the location of child	We concentrate on the gps and other communication devices in iot

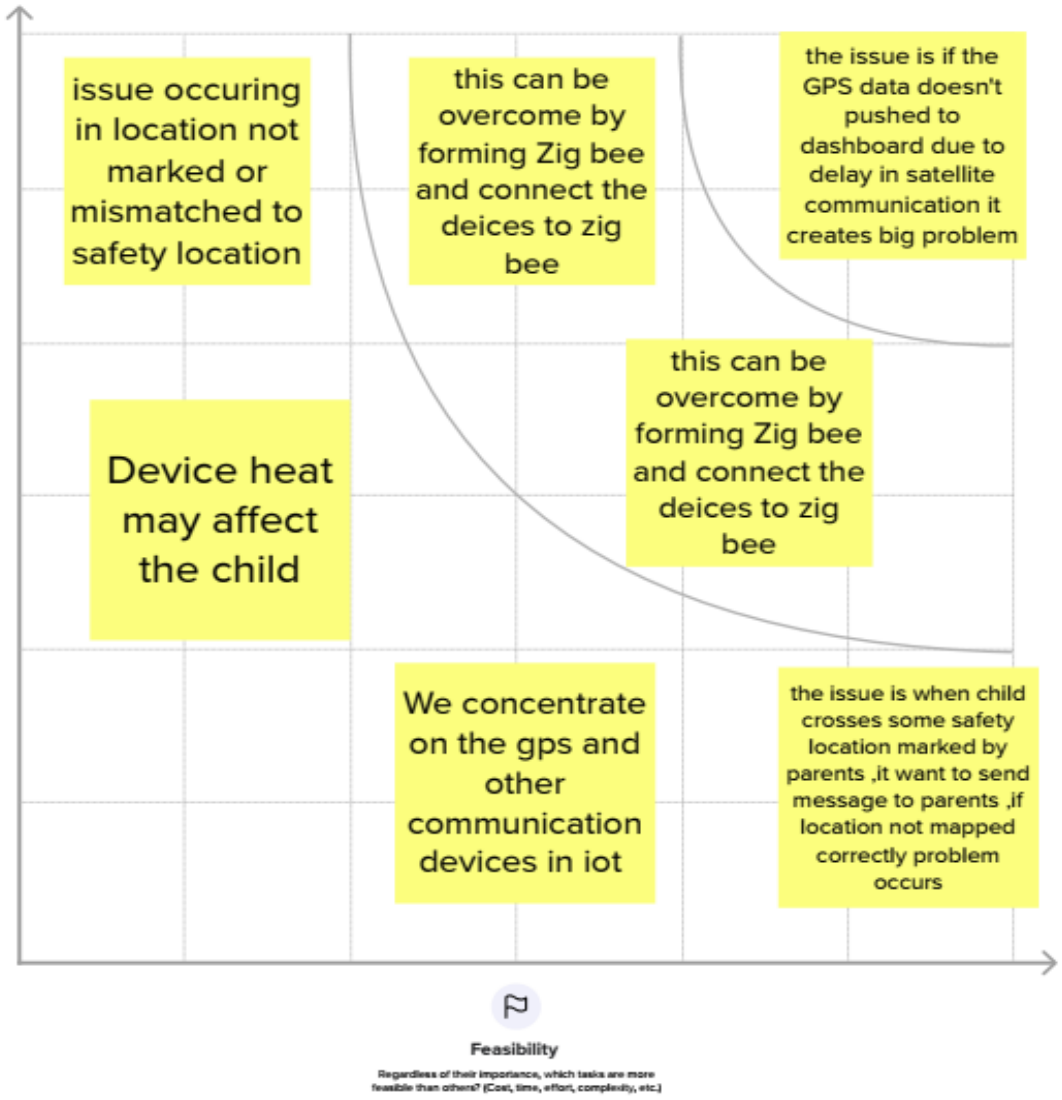
Safeeq

to know the health information of the child	When the database crashes.	to know the health information of the child
To know the childrens location if they are missing	The parents will be mentally affected and child will be lost.	Surrounding around the child.
Where the place cannot recharge the device.	In order to get the information about child safety works smoothing & accurately.	When child is unsafe.

Faris Muhammed

may be the child informations are inerrupted	Data & information are not able to read/write	To know the childrens location if they are missing
Child's body temperature may affect bydevice temperature	When the database crashes.	The health of the child to be considered
If the tracking is lost the childs place is unidentifed. So,we focus on other way.	The child's current activity cannot be notifed	does they get an incorrect information

IDEATION PRIORITIZATION:



PROPOSED SOLUTION

S. No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Risks and hazards involving infants and children while alone at home
2.	Idea / Solution description	Use IoT enabled devices to check and ensure the safety of toddlers and kids
3.	Novelty / Uniqueness	Hassle-free operation mode. Efficient functioning with user friendly interface
4.	Social Impact / Customer Satisfaction	Safety and well-being of children can be made sure of by their parents who may go for work or be busy in work
5.	Business Model (Revenue Model)	Currently, there are no devices in the market that can carry out the function of providing child safety in an easy manner
6.	Scalability of the Solution	It can be further extended to provide safety for aged persons as well

PROBLEM SOLUTION FIT

CHAPTER 4

4. REQUIREMENT ANALYSIS

4.1FUNCTIONAL 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 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

Non-functional Requirements:

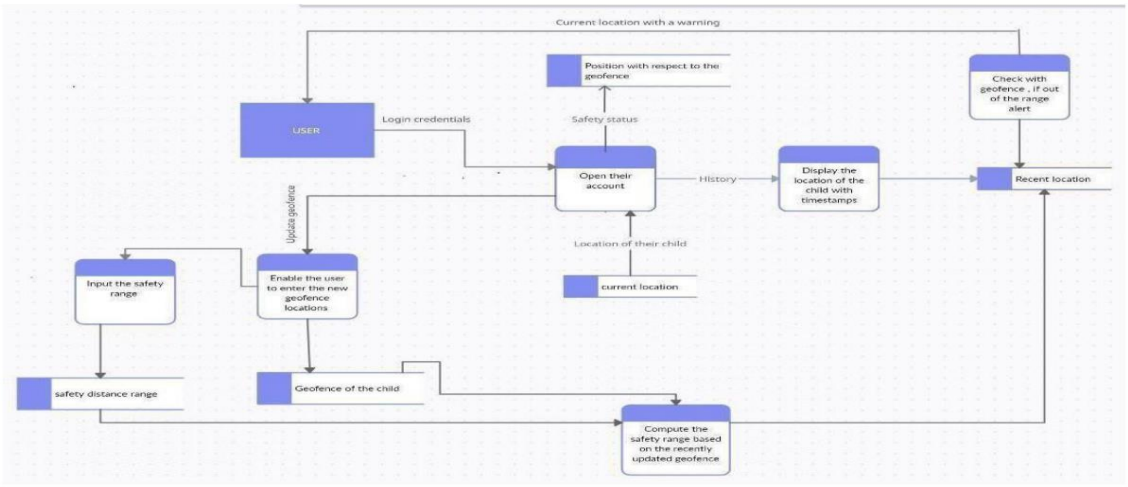
Following are the non-functional requirements of the proposed solution.

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.

CHAPTER 5

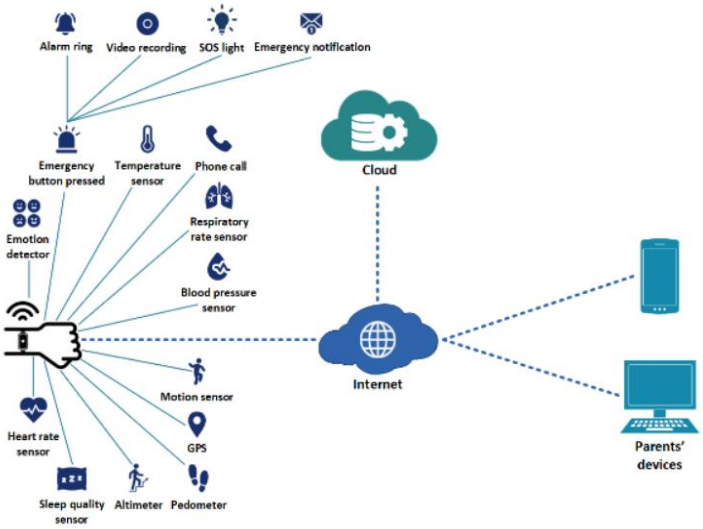
5 PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS



5.2 Solution & Technical Architecture

Solution Architecture



Technical Architecture

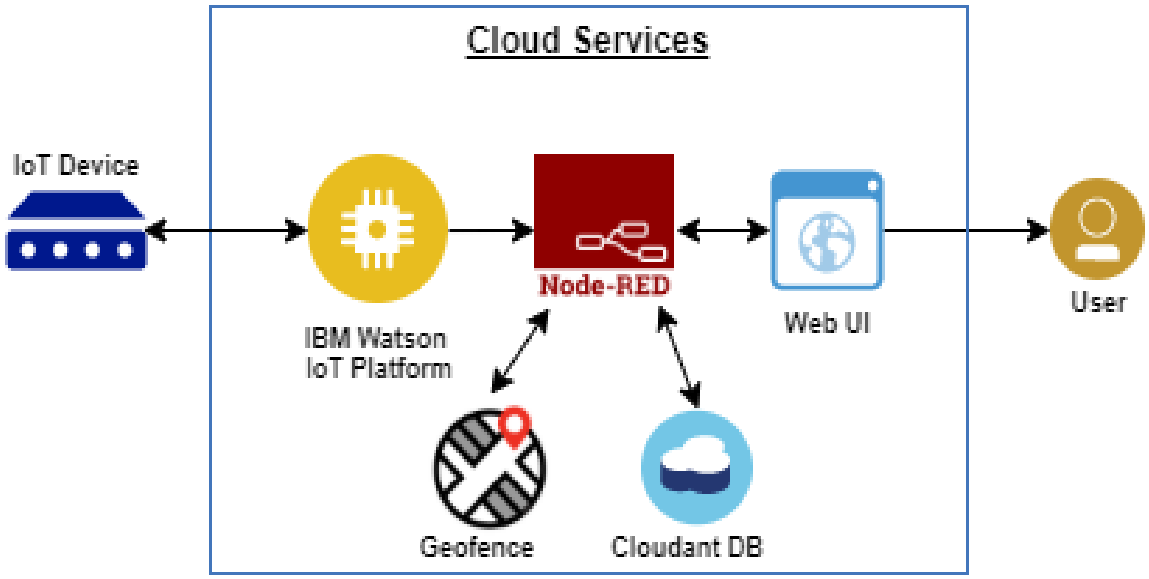


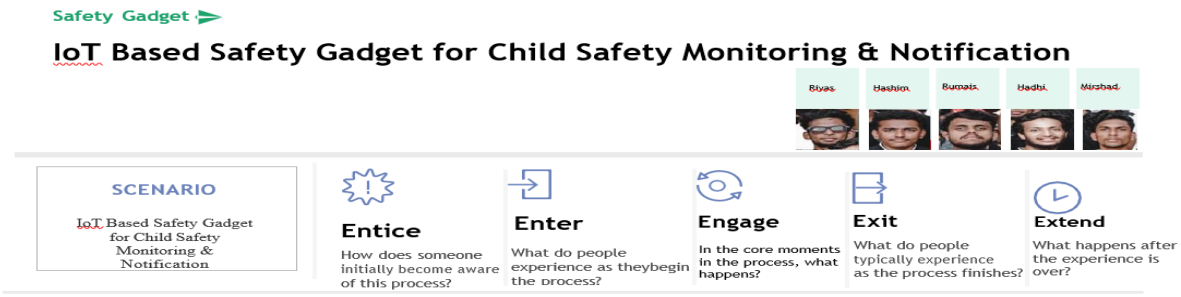
TABLE-1: COMPONENTS & TECHNOLOGIES:

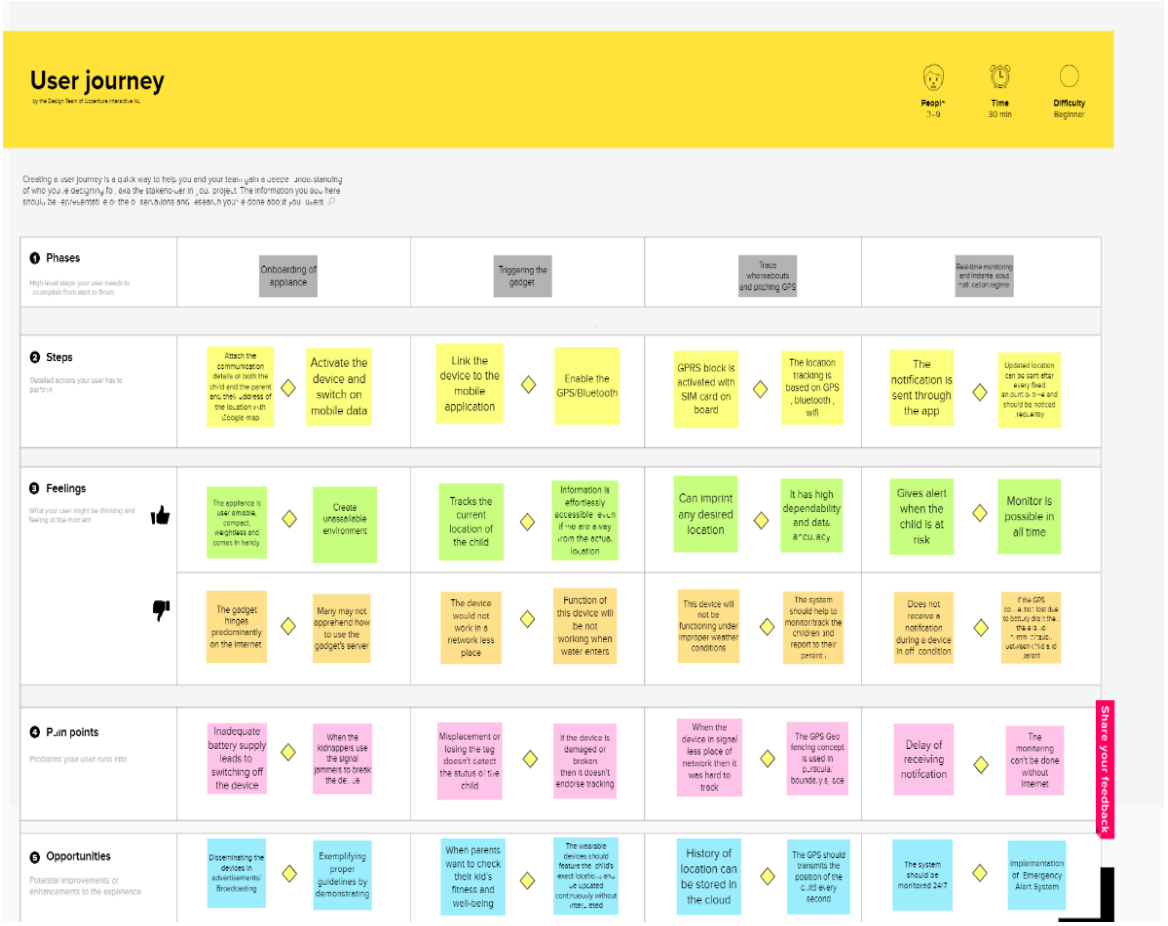
S.No	Components	Description	Technology
1.	User Interface	Users had to register and outlook the other device's location e.g.Web UI, Mobile App, etc.	HTML, CSS, JavaScript / Angular Js / React Js, etc.
2.	Application Logic-1	Registration of child's and parent's device in each other device.	Python
3.	Application Logic-2	The child's GPS should be in ON condition, Parent's device should always be correlated to Child's appliance.	IBM Watson STT service IBM Watson Assistant
4.	Application Logic-3	The information is to be collected and dispatched to the authenticator via GSM equipping the GPS coordinates to efficiently locate access and monitor the child.	IBM Watson Assistant IBM Watson STT Service
5.	Database	Data Type can be any configuration such as arbitrary binary data, or text. Location history is stored in the cloud and the values include distance, latitude, and longitude. A user-defined blob of data transmitter from Cloud IoT Core to a device etc.	MySQL, NoSQL, etc. SQLite, InFluxDB
6.	Cloud Database	Users install tracking software on a cloud infrastructure to perpetrate the database.	IBM DB2, IBM Cloudant, etc
7.	File Storage	Files will be labelled with what they encompass and how long they should be kept.	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	The purpose of the external API employed in the device is to exploit the internet for communicating and executing allotted operations efficiently.	IBM Weather API, Aadhar API, etc.
9.	External API-2	External API laboured in the device to unveil the data that permits those gadgets to disseminate data to your device/mobile, functioning as a data interface.	Aadhar API, City Geo-Location Lookup API, etc.
10.	Machine Learning Model	IoT and machine learning deliver insights otherwise hidden in data for prompt, automated retorts and enhanced governing.	Object Recognition Model, Danger Prediction Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server chassis: Wearable high-tech mechanism. Cloud Server Configuration: a tremendous network that reinforces IoT devices and applications.	Local, Cloud Foundry, Kubernetes, Underlying Infrastructure, etc.

TABLE-2: APPLICATION CHARACTERISTICS:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	The framework is exemplified for child safety utilizing a Sensor network and IoT. The Key attribute of the system is the deployment of a smart detector for the collection of Data, cloud-based analysis, and decision-based on Monitoring for children's Safety. The framed solution is in the form of an android application furnishing the end user leisure surveillance of their children.	Maintlux, Thinger.io, and Zetta for non-stop streaming of child condition Open remote
2	Security Implementations	To activate the alarm and facilitate video recording whenever the emergency button is pressed. 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.	e.g. SHA-256, Encryption of data regarding child condition, Firewalls, Antivirus, and Data Loss Prevention
3.	Scalable Architecture	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.	Multiple Data Storage Technologies, Reliable Microservices, Automated Bootstrapping
4.	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.	Temperature, Pulse sensor, GPS, GSM, Web camera, Raspberry pi microprocessor
5.	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.	GSM tracker, High Durable Device Battery

5.3 USER STORIES





CHAPTER 6

6.1 PROJECT PLANNING & SCHEDULING

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	User Registration	USN-1	Registration through website Registration through app	2	High	Mohamed Asif M Safeeq R Faris Muhammed P Al Fayadh TB
Sprint-1	User Confirmation	USN-2	Confirmation via Email Confirmation via OTP	1	High	Mohamed Asif M Safeeq R Faris Muhammed P Al Fayadh TB
Sprint-2	User login	USN-3	Setting up User Id and password	2	Low	Mohamed Asif M Safeeq R Faris Muhammed P Al Fayadh TB
Sprint-1	App permission	USN-4	Grant the permission for the app to access location, contact etc..	2	Medium	Mohamed Asif M Safeeq R Faris Muhammed P Al Fayadh TB

6.2 SPRINT DELIVERY SCHEDULE

Sprint-1	Interface with the Device	USN-5	Connecting the device with the registered app with the device ID.	1	High	Mohamed Asif M Safeeq R Faris Muhammed P Al Fayadh TB
Sprint	**Functional Requirement (Epic)**	**User Story Number**	**User Story / Task**	**Story Points**	**Priority**	**Team Members**
Sprint-2	Setting Geo-location	USN-6	Creating the Geo-location area in the map	2	Low	Mohamed Asif M Safeeq R Faris Muhammed P Al Fayadh TB
Sprint-3	Database	USN-7	Location history is stored in the cloud. Can be accessed from the dashboard.	2	High	Mohamed Asif M Safeeq R Faris Muhammed P Al Fayadh TB
Sprint-4	Tracking location	USN-8	Tracking the location through app. Tracking the location through website.	2	High	Mohamed Asif M Safeeq R Faris Muhammed P Al Fayadh TB

Project Tracker, Velocity & Burndown Chart: (4 Marks)

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	31 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	07 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	14 Nov 2022

CHAPTER 7

7 CODING & SOLUTIONING (Explain the features added in the project along with code)

7.1 FEATURE 1 (ADDING GEOFENCE)

- Geofence is like a round wall covering the given location. So parents can use them to mark the locationwhere their children are going.

PYTHON CODE:

```
import json
import wiotp.sdk.device
import time
import
random
myConfi
g = {
"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= 78.5458842

latitude= 17.4225176
longitude= 78.5458842

#out area location

#latitude= 17.4219272
#longitude= 78.5488783

7.1 FEATURE 2 (ALERT NOTIFICATION)

Once geofence is added, when the child enters the geofence a notification will be sent
When the child leaves the geofence a notification will be sent.

CODE:

```
<!DOCTYPE html>
<html> <head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<title> Login Page </title>
<style>
Body {
  font-family: Calibri, Helvetica, sans-serif;
  background-color: #9FE2BF;
}
button {
      background-color: #9FE2BF;
```

```
      width: 100%;
       color: black;
       padding: 15px;
       margin: 10px 0px;
       border: none;
       cursor: pointer;
        }
form {
       border: 3px solid #f1f1f1;
  }
input[type=text], input[type=password] {
       width: 100%;
       margin: 8px 0;
       padding: 12px 20px;
       display: inline-block;
       border: 2px white;
       box-sizing: border-box;
  }
button:hover {
       opacity: 0.7;
  }
 .cancelbtn {
       width: auto;
       padding: 10px 18px;
       margin: 10px 5px;
  }
.container {
       padding: 25px;
       background-color: #CCCCFF;
  }
</style> </head>
<body>
   <center> <h1> Login Form </h1> </center>
   <form>
       <div class="container">
```

```
        <label>Device ID/Number: </label>
            <input type="password"
            placeholder="Enter Password"
            name="password" required> <label>E-
            Mail : </label>
            <input type="text"
            placeholder="Enter Username"
            name="username" required>
            <label>Password : </label>
            <input type="password"
            placeholder="Enter Password"
            name="password" required> <button
            type="submit">Login</button>
            <button class="loginBtn loginBtn--
            facebook">Login with
            Facebook.</button> <button
            class="loginBtn loginBtn--
            google">Login with
            Google.</button>
            <input type="checkbox" checked="checked"> Remember me
            <button type="button" class="cancelbtn"> Cancel</button>
            Forgot <a href="#"> password? </a>
        </div>
    </form>
</body>
</html>
```

CHAPTER 8

8.TESTING

8.1 TEST CASES

Z

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
IBM CLOUD _TC_001	Functional	IBM ?loud Service	Verify the login cloud services	?oftware	?. Login in using cloud.ibm.com 2. O:tain promocode in ICT 3. TLen apply code the and Lo~in -. The page will be directed to the IBM cloud account	email: julianthomaspaul16@gmail.com Password: *Mdse _v.0200i	Successfull_ created the IBM account	Working as e pected	Pass	' ES	NIL
IBM Watson IoT Platform_TC_002	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 de ice type and ID 5.Generate the API Key	Create a device & integrate with code	{'name': 'Smart ridge', 'lat': 17. .219272, 'lon': 78.54(a783}	Working as expected	Pass	YES	NIL

PythonCode_TC_003	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": "jgryfx ",
							022-11-18 12:25:57.235 wiotp.sdk.device.client. DeviceClient INFO Connected successfully: id: jgryfx TestDeviceType:12345	Working as expected	Pass	YES	NIL

Node_Red_TC_004	Non-Functional	IBM Cloud Service	Verify to create a node-red services	IBM cloud services	1. In IBM cloud go to catalog 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 IBM watson	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
CloundantDB_TC_005	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
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 deploy it. 3. Copy the URL and paste it in the new tab with "/ui" extention. 4. Display the child and geofence location.	Shows the location of parent and child	And as expected it displays the Position of the child and parent	Working as expected	Pass	NO	NIL
FastSMS Service_TC_007	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

8.2 USER ACCEPTANCE TESTING

1. 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

2.TEST CASE ANALYSIS

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

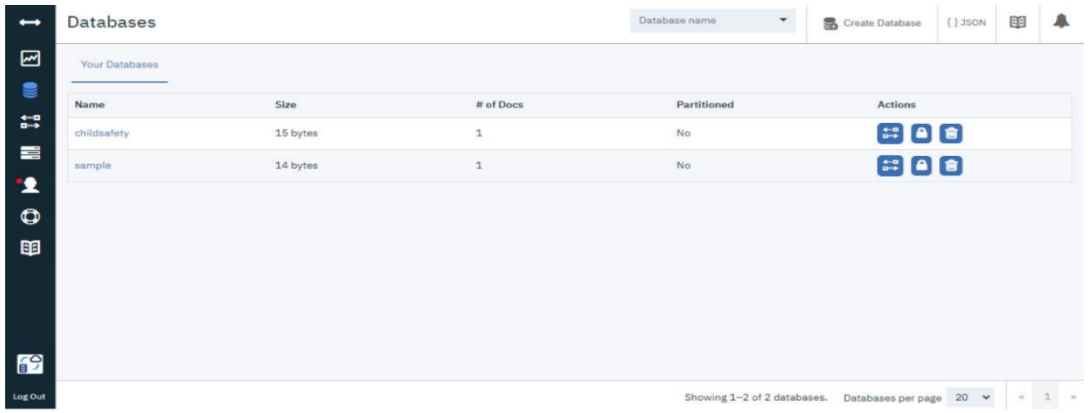
Section	Total Cases	Not Tested	Fail	Pass
Print Engine	1	0	0	1
Client Application	1	0	0	1
Security	1	0	0	1
Outsource Shipping	1	0	0	1
Exception Reporting	1	0	0	1
Final Report Output	1	0	0	1
Version Control	1	0	0	1

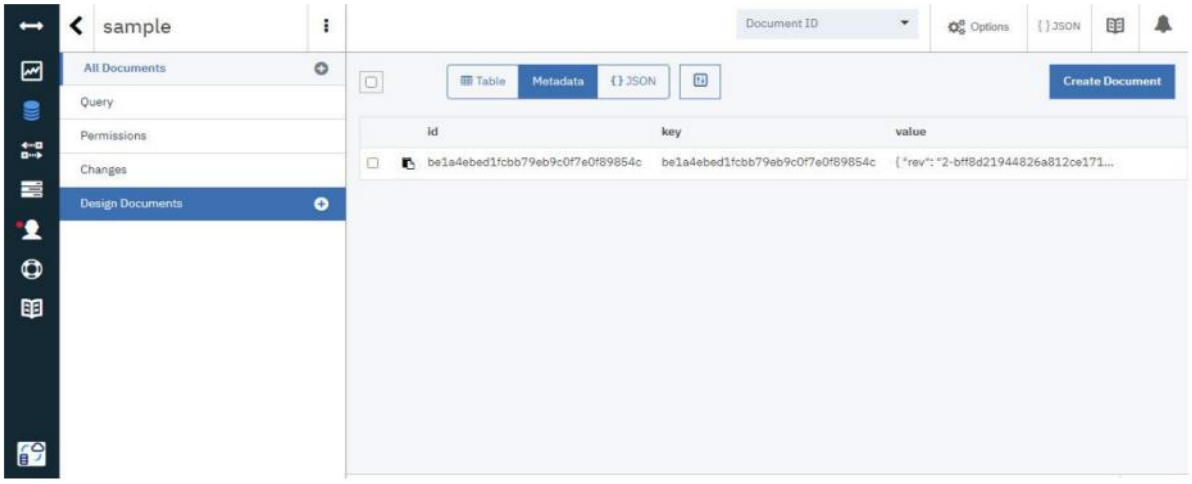
CHAPTER 9

9 RESULTS

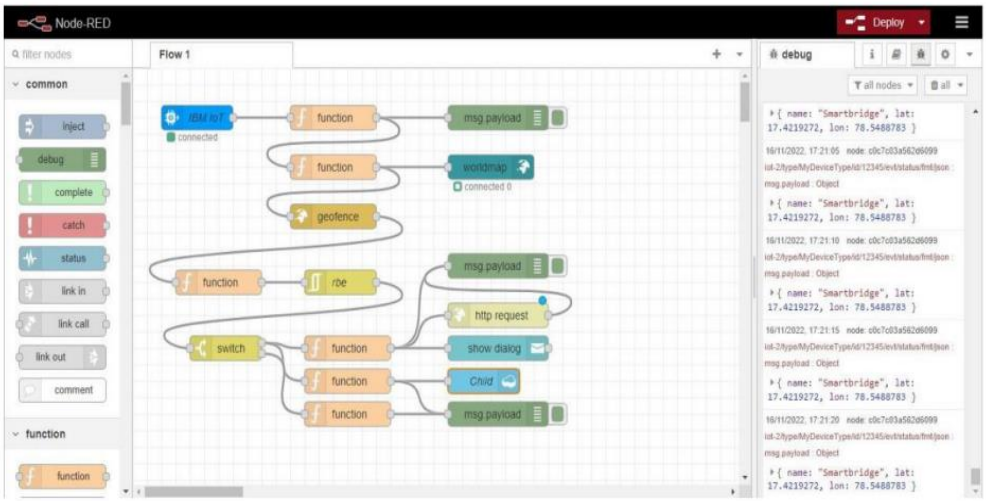
USING NODE RED:

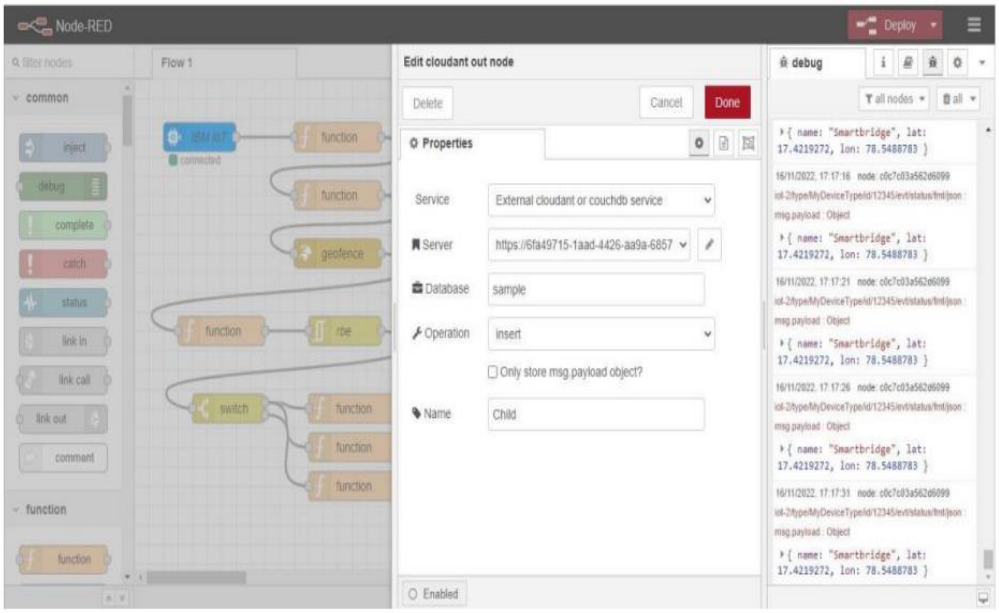
Create Cloudant DB:





Node-Red Service with Cloudant Database:



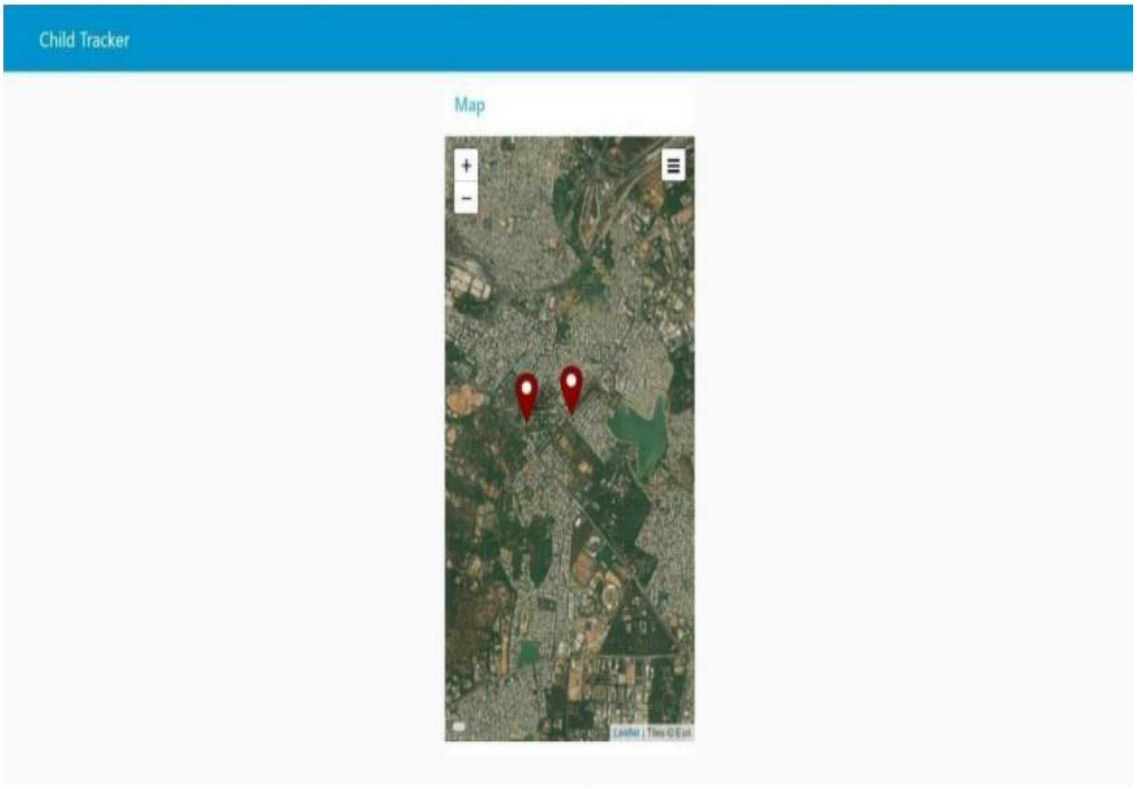


ADDING GEOFENCE AND ALERT NOTIFICATION

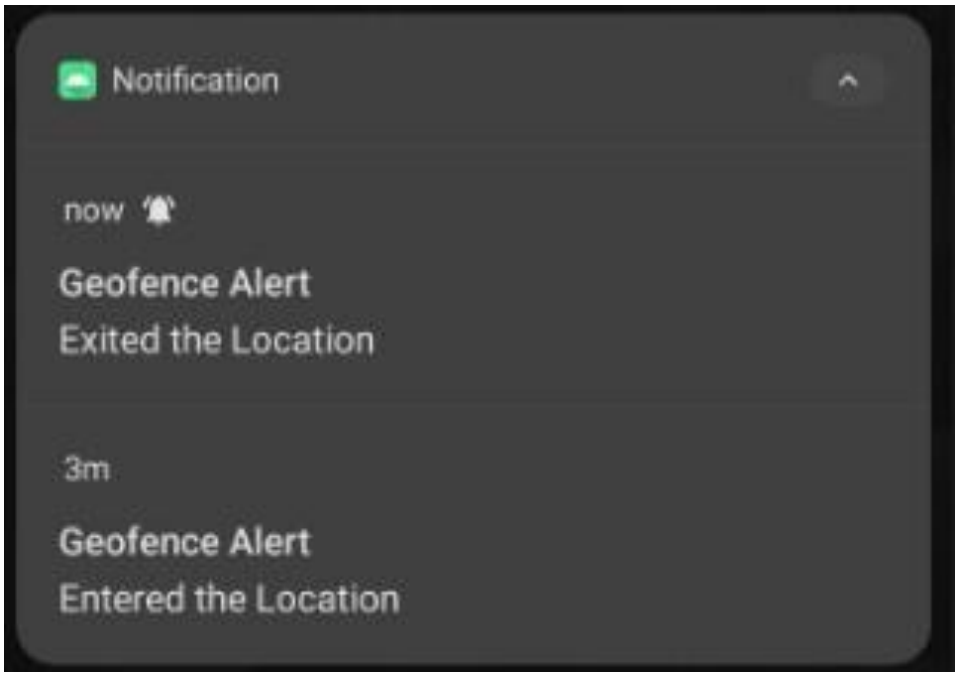
User can add geofence in the location where they want to add or where their child is going play so they can monitor the child location. Once the child enters the geofence alert notification says entered the location will be displayed. When the child leaves the geofence alert notification says exited the location will have displayed.

GEOFENCE:

Node-Red Dashboard(Web ui):



NOTIFICATION



CHAPTER 10

ADVANTAGES & DISADVANTAGES

ADVANTAGES:

- ✓ Simple and easy to use
- ✓ Parents can feel secure because if the child leave the desired location and immediately anotification will be sent.
- ✓ Geofence can be added easily.
- ✓ Accurate real-time data.
- ✓ Efficient use of resources.
- ✓ Accountability and Safety.
- ✓ Process automation

DISADVANTAGES:

- ✓ Multiple geofence can be a problem.
- ✓ Maintenance can be time-consuming.
- ✓ Pushback due to privacy concerns.
- ✓ Battery and data draining.
- ✓ Lack of formal policies

CHAPTER 11

10 CONCLUSION

This research demonstrates Smart IoT device for child safety and tracking, to help the parents to locate and monitor their children. Through this device, the parent can track and monitor their child with just a simple app. It is not possible to always stay beside children as most of the parents need to go for work. With this project, parents can track the location of their children and get alerts whenever the child out of the geofence. It becomes easy for parents to look after their child while working. This device is efficient to use. Thus, by keeping in mind the advantages and applications we are developing a child monitoring device. In order to avoid kidnapping cases, the child monitoring system is needed.

CHAPTER 12

11 FUTURE SCOPE

The future work would be to further develop and implement the safety wearable device so that it could be watch or sown into a fabric that could be worn, using synthetic fibers.

CHAPTER 13

12 APPENDIX

Source Code
https://github.com/IBM-EPBL/IBM-Project-40345-1660628501
GitHub
https://github.com/IBM-EPBL/IBM-Project-40345-1660628501