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1.INTRODUCTION

1.1 PROJECT OVERVIEW

Internet of Things (IoT) plays a major role in every day to day life. IoT devices are smart devices, which are able to take decisions by sensing the environment around the device

The internet of things (IoT) refers to the set of devices and system that stay interconnected with real-world sensors and to the internet.

During years and years Child safety is under threat and it is very important to provide a technology-based solution which will help them under panic situations and monitor them using a smart gadget.

The proposed system is equipped with GSM and GPS modules for sending and receiving call and SMS between safety gadget and parental phone, the proposed system also consists of Wi-Fi module used to implement IoT and send all the monitoring parameters to the cloud for android app monitoring on parental phone.

Android application can be used to track the current location of safety gadget using its location coordinates on parental phone android app and also via SMS request from parent phone to safety gadget.

Panic alert system is used during panic situations and automatic SMS alert and phone call is triggered from safety gadget to the parental phone seeking for help and also monitored for plug and unplug from hand, as soon the gadget is unplugged from hand a SMS is triggered to parental phone and the alert parameter is also updated to the cloud.

Heart-beats, temperature is monitored and the values are updated to cloud continuously for parent app monitoring. Boundary monitoring system is implemented on safety gadget with the help of BEACON technology, as soon as the safety gadget moves far away from the binding gadget an alert is provided to parent on binding gadget.

The system is used to monitor the health parameters and also used for location tracking during necessary situations in safety concern.

1.2 PURPOSE

This device is programmed by continuously monitor the child parameter and take action when any dangerous situation presents in the place.

It does by detecting the change in the monitored signals, following which appropriate action is taken by mean of sending notification and alert to parents or their guardian

Enable tracking of the child’s location and capturing of data remotely such as temperature, pulse, respiratory rate, quality of sleep and many more.

To show the child's actual data with reference values. Enable sending of notification if the child is out of location or when the device realizes abnormal conditions/situations.

When the child is in a panic situation the alarm will automatically gives the beacon sound. Then it sends automatic message to their parents or their guardians mobile phone that the child is in a critical situation.

Develop a prototype of IoT wearable smart band connected to parents’ mobile apps so that they can monitor the actual condition of children at anytime and anyplace.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

The global position system based child care system using RSSI Technique . This paper proposed the GPS technology helps to determine the exact position of the child. A data from received signal strength indicator (RSSI)is extracted out from the Bluetooth connection Using which the distance between parent and child is found. An alert is triggered when the distance between the parent and child is far apart for a certain range. The Remote Video Monitoring System Based on Embedded Linux and GPRS.

This video monitoring system based on embedded Linux and GPRS (General Packet Radio Service) network. The main function realized by python programming to achieve real-time camera data acquisition, image compression and network transmission through GPRS module. Monitoring centre receives image data and displays after connects with the terminal. It is easier to be use in window systems.

Image data can be transmitted to the monitoring centre in 3-6 seconds after JPEG compression. The Children Safety and School Bus Tracking Solution School bus monitoring is an effective major to restrict the mishaps. This paper proposes an embedded system which focuses on children safety, tracking of school bus and exact we also provide with the help of longitude and altitude positioning of GPS and sending information through SMS. Each student possesses an RFID tag on his own smartcard which is useful for identifying the student. Two IR sensors are used to check whether a student is arriving or leaving bus. Hence, we have proposed “LPC 2148” based embedded system which provides a complete solution to children safety and school bus tracking. IoT based School Bus Tracking System .

This project recommends an android based solution which assists parents to track their children location in real time. To track the location Active RFID module is used and to identify the identity of the child a biometric

identification is used which is in built in the system. Whenever a child boards a bus, the biometric identification is done in the bus, and the system will identify the child and update log on a server will send notification to the parents which consist of current location and time. Parents can see the location of bus, they will be notified when the children is getting into a bus or getting down from a bus. Smart IOT Device for Child Safety and Tracking.

Where the system is developed using Link It ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & amp; 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.

2.2 REFERENCES

1. TOPIC:

IoT-based Child Security Monitoring System. AUTHOR: Lai Yi Heng1,Intan Farahana Binti Kamsin. DESCRIPTION: Nowadays, crime rate associated with children keeps increasing due to which draws peoples' attention regarding child safety. This research is conducted to propose a child security smart band utilizing IoT technology. Online questionnaire and semi-structured interview are methodologies used to collect data. The online questionnaire gains feedbacks by sending questions electronically, where answers need to be submitted online. In the semi structured interview, researcher meets and asks respondents some predetermined questions while other being asked are not planned in advanced. Through information obtained, a smart band have been proposed to monitor the safety of children. By this, parents know what is happening remotely and can take actions if something goes wrong. The future improvements of this device will be adding functions and software to make it works like a phone such as messaging, gallery, Google, YouTube, meanwhile, adding more child security features so that child safety is guaranteed.

2. TOPIC:

Child Safety Monitoring System Based on IoT AUTHOR: N. Senthamilarasi, N.Divya Bharathi, D.Ezhilarasi, R.B.Sangavi DESCRIPTION: The overall percentage of child abusements filed nowadays in the world is about 80%, out of which 74% are girl children and the rest are boys. For every 40 seconds, a child goes missing in this world. Children are the backbone of one's nation, if the future of children was affected, it would impact the entire growth of that nation. Due to the abusements, the emotional and mental stability of the children gets affected which in turn ruins their career and future. These innocent children are not responsible for what happens to them.

So, parents are responsible for taking care of their own children. But, due to economic condition and aims to focus on their child's future and career, parents are forced to crave for money. Hence, it becomes difficult to cling on to their children all the time. In our system, we provide an environment where this problem can be resolved in an efficient manner. It makes parents to easily monitor their children in real time just like staying beside them as well as focusing on their own career without any manual intervention.

3.TOPIC:

Child Monitoring and Safety System Using Wsn and Iot Technology AUTHOR: P.Poonkuzhlai,R.Aarthi ,Yaazhini.V.M ,Yuvashri.S ,Vidhyalakshmi.G DESCRIPTION: This paper presents the design and implementation of a portable IOT-based safety and health monitoring system for children through a sensor embedded health monitoring device for safety and emergency services. It is known that the technological advancements are increasing at a faster pace. But the utilization of technologies in various sectors is very low. We know that people of different age group faces different difficulties.

But the security for children's is very low. There is lot of cases registered regarding child safety. Nowadays, the schools and the parents are very much worried about their school children's for school transport and other places. So, the safety and monitoring the school children is very much difficult. In this project we are introducing the IOT based embedded system is used in this project. So we propose a system to continuously monitor the parameters of the child and also their location for safety purpose. The system provides smart child tracking and monitoring system.

4. TOPIC:

IoT Based Smart Gadget for Child Safety and Tracking. AUTHOR: N. Manjunatha, H. M. Jayashree, N. Komal, K. Nayana. DESCRIPTION: This paper is mainly streamed towards child safety solution 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.

5.TOPIC:

Survey on Child Safety Wearable Device Using IoT Sensors and Cloud Computing. AUTHOR: Prakriti Agarwal, R Ramya, Rachana Ravikumar, Sabarish G, Sreenivasa Setty. DESCRIPTION: Child safety is a major concern in any society due to the vulnerability of a child and consequently, higher rates of crimes against children. With this issue on our hands, a smart wearable Internet of Things sensor network for monitoring the environment of a child can be developed to help parents ensure the safety of their children. It must also necessarily include a mechanism for tracking the child. An advantage of this wearable device is that, according to its design, it can be accessed from any

mobile device and does not mandate a lot of technical knowledge from the user to operate.

The purpose of this device is to facilitate the guardian or parents in locating their child with ease and ensuring its well-being. The basic mechanism of this system involves monitoring the environment through sensor nodes, acquiring real-time data and transmitting this data to a cloud server.

The data can be accessed by users through a web-based interface present on this cloud server. The wearable also functions to send alerts to the user through a mobile application in case an emergency condition is detected by it.

The design of this model involves developing a medium for communication between the parent/guardian and the child's wearable device. The child's location is tracked using GSM mobile communication to specify the location of the child in real time.

We have surveyed relevant papers and have discussed about the different methodologies that have been used to achieve similar but different results. We later also compare these papers using their advantages and disadvantages and we try to bring out the uses from their results.

2.2 REFERENCE

Kok Sun Wong, Wei Lun Ng, Jin Hui Chong, Chee Kyun Ng, AduwatiSali, Nor KamariahNoordin proposed the global position system (GPS) based child care system using RSSI Technique.

V. Lavanya, C. Meenambigai, M. Suriyaa, S. Kavya, “Child Safety Wearable Device”.

Jay Limbachiya, ApurvHarkhani, Nehil Jain, Suraj Gupta proposed IoT based School Bus Tracking System.

Jatti, Anand & Kannan, Madhvi& M Alisha, R & Vijayalakshmi, P & Sinha, Shrestha.2016. Design and development of an IOT based wearable device for the safety and security of women and girl .

Li Bing and Sun JianPing proposed Remote Video Monitoring System Based on Embedded Linux and GPRS.

Mayur Bhor, Nikhil Kadam, Dinesh Shinde, Pranoti Mane proposed Children Safety and School Bus Tracking Solution.

Anwaar Al-Lawati, Shaikha Al-Jahdhami, Asma Al- Belushi, Dalal Al-Adawi, Medhat Awadalla and Dawood Al-Abri proposed the RFID-based System for School Children Transportation Safety Enhancement.

Akash Moodbidri, Hamid Shahnasser, “Child safety wearable device,”in IEEE Xplore, June 2017.

Child safety wearable device Gopinadh Jonnadula1, Bhanu Prasad Davu, Hari Kishore Kandula, Vinod Donepudi, sivaiahEtukuri Student of ECE, VVIT, Guntur, Andhra Pradesh, India. International Journal for Research in Applied Science & Engineering Technolgy (IJRASET). Volume 6 Issue II, February2018. Jay Limbachiya, Apurv Harkhani, Nehil Jain, Suraj Gupta proposed IoT based School Bus Tracking System.

Shahid Bangali,S.K.Shah, “review: Real Time School Bus Security System with Biometrics, GPS and GPRS using ARM Controller” International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE)Volume 4, Issue 4,PP 730732,April 2015.

Asia Pacific University of Technology and Innovation, Technology Park, Bukit Jalil, Kuala Lumpur, Malaysia *Corresponding author. Email: TP050974@mail.apu.edu.my ABSTRACT

Sadhana B Assistant professor , Department of Information Science and Engineering CEC Bantwal. Navya A, Nidhishree, Vidhyashree, Vishwa Students Department of Information Science and Engineering CEC

2.3 PROBLEM STATEMENT

- The child could not produce the exact alert command during a panic condition
- The command produced may not match with the previously stored command
- This project requires manual intervention.

Some previous studies have been included for designing the IoT-based child security smart band.

- It assists parents to monitor their children remotely.
- In case situations happen, notifications will be send to parent so that action can be taken.

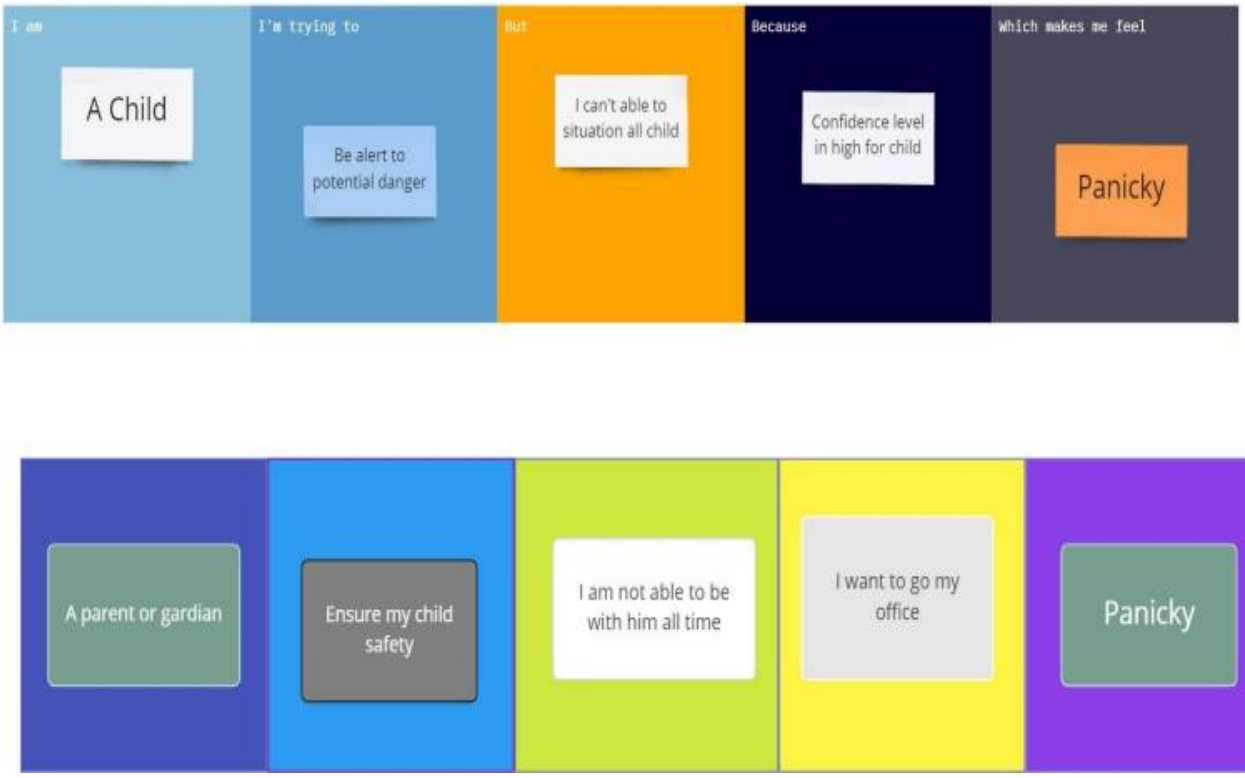


Fig:2.3 Problem Statement

It is used for the child safety. This sends message to the parents and their Guardian.

3.IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

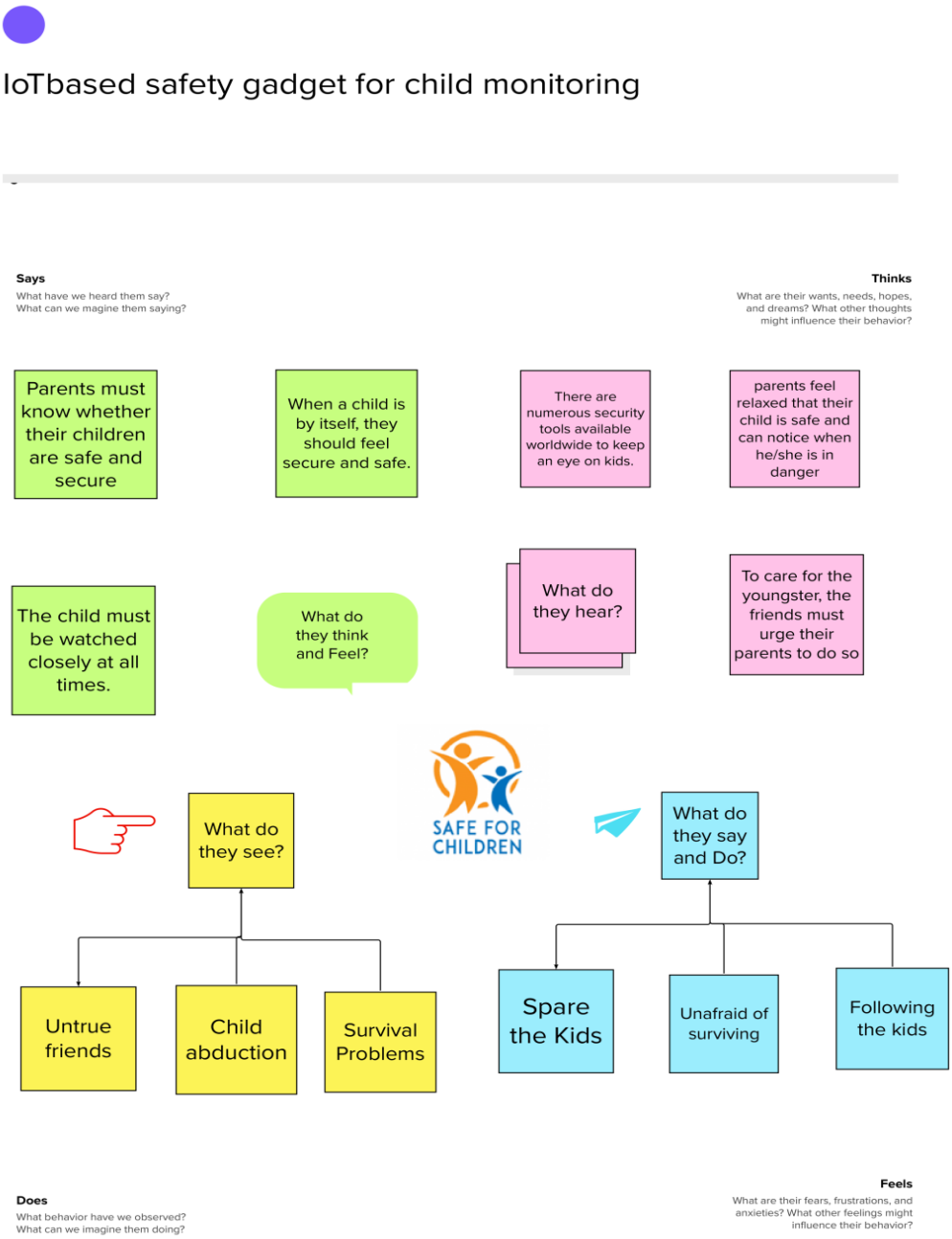


Fig:3.1.Empathy Map Canvas

3.2 IDEATION AND BRAINSTROMING

3.2.1 IDEATION PHASE

IDEA 1:

The device has IoT monitoring and a GSM module that allows the child to be monitored at all times. It also has numerous sensors that are connected to a CPU and are used to detect exact signals such as heart rate, temperature, and other dangers and alert the parents. In the event of a power outage, the wearable serves as a backup. On the device, there is an additional panic button. The purpose of this button is to notify parents and the police of a child's current location whenever they are in a perilous scenario. A GPS module is utilised to access their present location, and a GSM module assists in transmitting the information via SMS to designated contacts. In this approach, the device tries to provide child safety while remaining unobtrusive.

IDEA 2:

Our proposed system is based on the Internet of Things-based Smart Child Safety Wearable Device System designed as an efficient and low-cost IoTbased system for monitoring infants in real-time. This system plays a key role in providing better care for the lost children until they reconvene with the parents. In this present era, most of the wearable devices today are designed based on the location , activity , temperature, pressure, etc of the child and inform the parents via GPS. Therefore it is intended to use voice call as the way of communication between the parent mobile and child’s wearable device. The system operates on the microcontroller board and the functions of sending and receiving notifications , calls, voice messages via GPS.

IDEA 3:

A portable device which will have a pressure switch. As soon as an assailant is about to attack the person or when the person senses any insecurity from a stranger, he/she can then put pressure on the device by squeezing or compressing it. Instantly the pressure sensor senses this pressure and a conventional SMS, with the victim's location will be sent to their parents/guardian cell phone numbers stored in the device while purchasing it, followed by a call. If the call is unanswered for a prolonged time, a call will be redirected to the police and the same message will be sent. Additionally, if the person crosses some area which is usually not accessed by the person then a message with the real-time location is sent to the parent/guardian's phone via conventional SMS.

BENEFITS OF PROPOSED SOLUTIONS:

- Easy Availability and Affordability
- Tracking of missing kids can be made easily
- High Data accuracy
- Guarantees peace of mind for parents
- High reliability , efficiency
- Short response time and high accuracy.

DEMERITS OF PROPOSED SOLUTIONS:

Gadgets release a form of radiation referred to as Electro Magnetic Frequency (EMF), which has been cited as a form of carcinogen–a substance capable of causing cancer in living tissue.

High Cost but once it is implemented the expenses can be reduced

3.2.2 BRAINSTROMING

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Define your problem statement? What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm. PROBLEM IoT-Based Safety Gadget for Child Safety Monitoring and Notifcation[IoT-Based Child safety monitoring system helps the parents in monitoring critical situation]

Step-2: Brainstorm, Idea Listing and Grouping

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

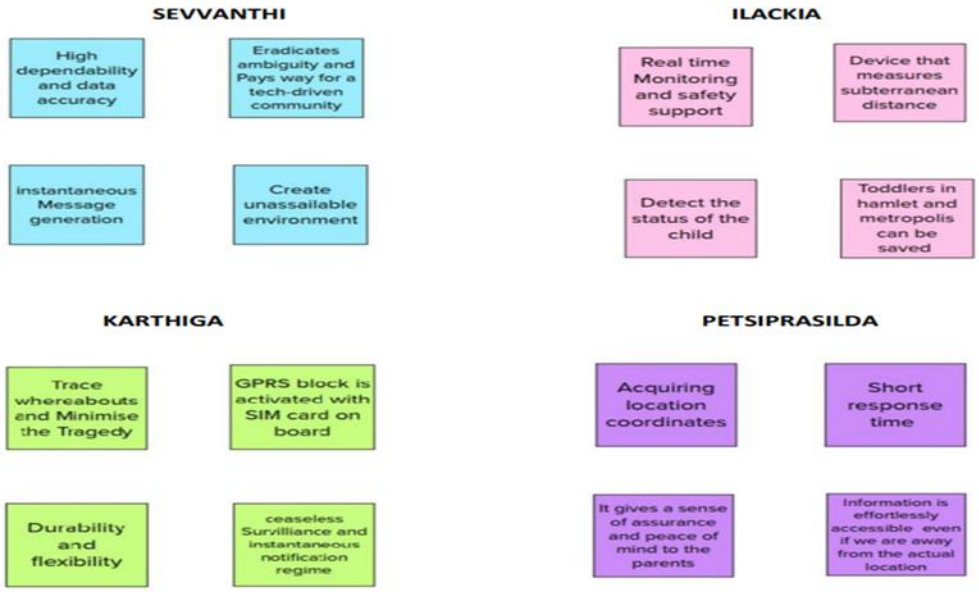


Fig:3.2.2 Brainstroming

3.3 PROPOSED SOLUTION

Table : 3.3 Proposed Solution

S.No	.No S	Description
1.	Problem Statement (Problem to be solved)	Child abductors are continually abducting the children from parents/legally appointed guardians to get the ransom/money for their benefit. Where the Parents have no supplementary option but to view the exact scenario of children's intuitions. The crisis outturn of kidnapping can be highly cynical and perpetual, more measures must be taken to protect children against abduction and its impacts.
2.	Novelty / Uniqueness	The system software involuntarily alerts the parent/guardian by redirecting a text Message.

		Contrary to other devices, it has plenty of characteristics like the development of sensors technology, availability of internet-connected devices and the data analysis algorithms making IOT devices act smart in emergencies without human intervention
3.	Scalability of the Solution	This solution could 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
4.	Business Model (Revenue Model)	In this contemporary market,this would be desired as kids need more protection in the current times. The gadget can be acquired at an affordable rate. Where Our gadget possesses a lot of ingenious attributes and it would 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
5.	Idea / Solution description	Our Smart IOT device for tracking the children is developed to aid parents for detection. In

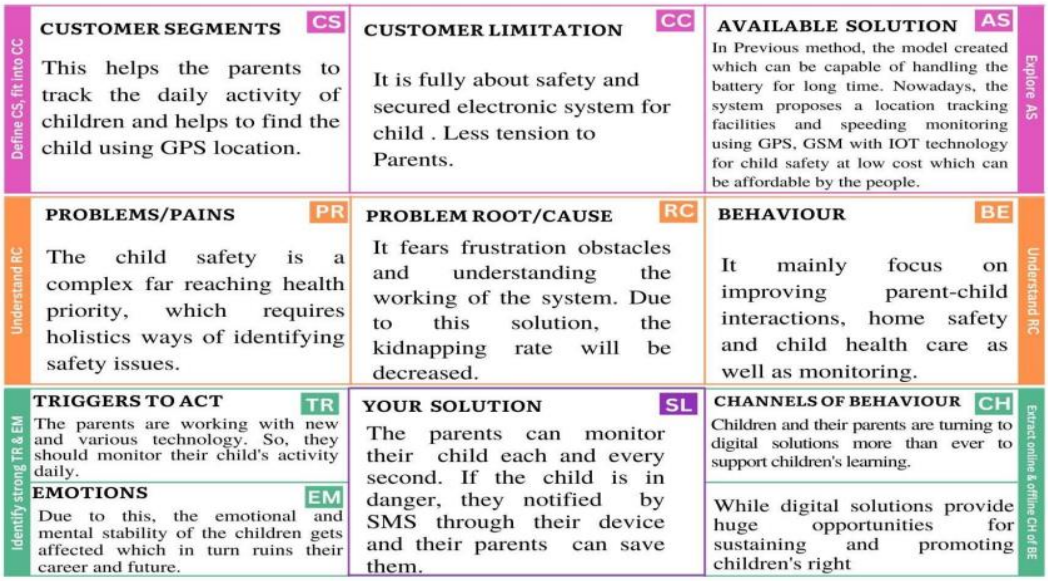
		this project, we are going to develop a wearable safety gadget to display the live location of a children at any time on the parent's mobile to set the seal on their safety. The application is to track down the children when they’re within Bluetooth range, also functions when the kids go farther afield. Its competence as a tracker is outstanding if you live in densely populated areas like cities or big towns. This means that will able to see the identity of the participating devices and also It helps to diminish their vulnerability in harmful situations and also protects the children in an emergency situations.

6.	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 it.

3.4 PROBLEM SOLUTION FIT

Table :3.4.1 Problem Solution Fit



4.REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Table:4.1.1 Functional Requirement

FR No.	**Functional Requirement (Epic)**	**Sub Requirement (Story / Sub-Task**
FR-1	User Registration	Registration through website Registration through app
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User login	Setting up User Id and password
FR-4	App permission	Grant the permission for the app to access location, contact etc..
FR-5	Interface with the Device	Connecting the device with the registered app with the device ID.
FR-6	Setting Geo-location	Creating the Geo-location area in the map
FR-7	Database	Location history is stored in the cloud. Can be accessed from the dashboard.
FR-8	Tracking location	Tracking the location through app. Tracking the location through website.

4.2 NON FUNCINAL REQUIREMENT

Table:Non-Funcinal Requirement

FR No.	**Non-Functional Requirement**	**Description**
NFR-1	Usability	The device and its applications are user-friendly. The device is portable and easy to use.
NFR-2	Security	Providing permission for some information can only be decided by the user. Location data can only be viewed by the user.
NFR-3	Reliability	An update will be provided if any errors are found in the device.
NFR-4	Performance	The performance of the device decrease in a network less area. No interference between users. Location tracking will be accurate.
NFR-5	Availability	If there is any update then the device wont be able to operate for a amount of time.

5.PROJECT DESIGN

5.1.Data Flow Diagrams

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically.

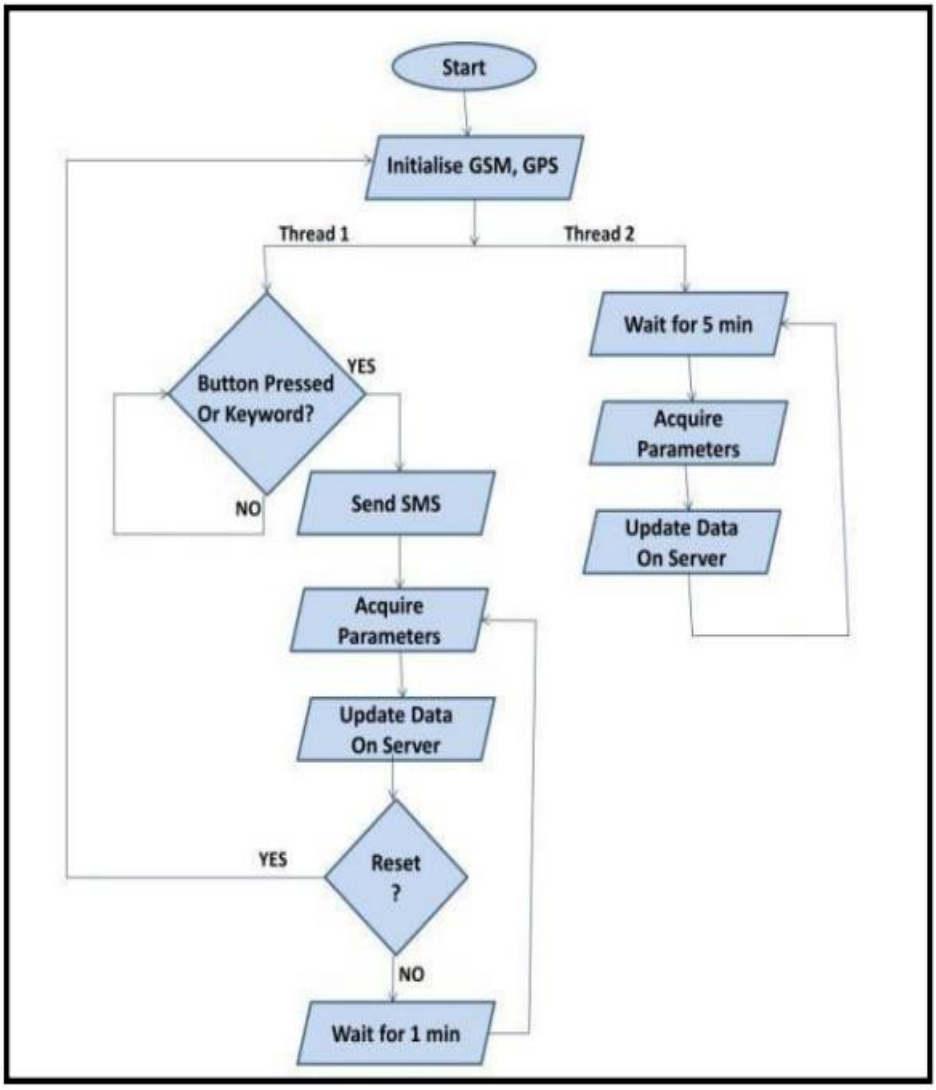


Fig:5.1 Flow Diagram

5.2 SOLUTION AND TECHNICAL ARCHITECTURE

REQUIREMENTS:

The requirements of this project are

➢ Embedded C

➢ Python framework For AVR,ARM and in addition for Wiring as Device Boot Loader.

➢ IBM Cloud workspace for depository and APIs.

➢ The front end by 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 is done and executed by progressing the logic and coding. Where 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 understated examination of their parents. The various aspects involve:

➢ GPS

➢ Signal by Notification

INDIVIDUAL TESTING:

➢ Every portion of the software is to be designed by discreet team members.

➢ Also tested individually by the python unit testing IOT.

INTEGRATION AND TESTING:

After individual testing, all the software sections were integrated and tried out ultimately, so the flask program could 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.

MAINTENANCE:

After deployment, if there is any conglomeration refurbish, it is accomplished in the software.

SOME CATASTROPHIC FEATURES IN THE DEVICE:

1. **ALARM RING:**

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

2. **EMERGENCY NOTIFICATION:**

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

3. **GPS:**

   The GPS helps to escalate the protection and fitness characteristics on the device. Depending on 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 about their child's location in case of any crisis and helps to trace their route duration and distance

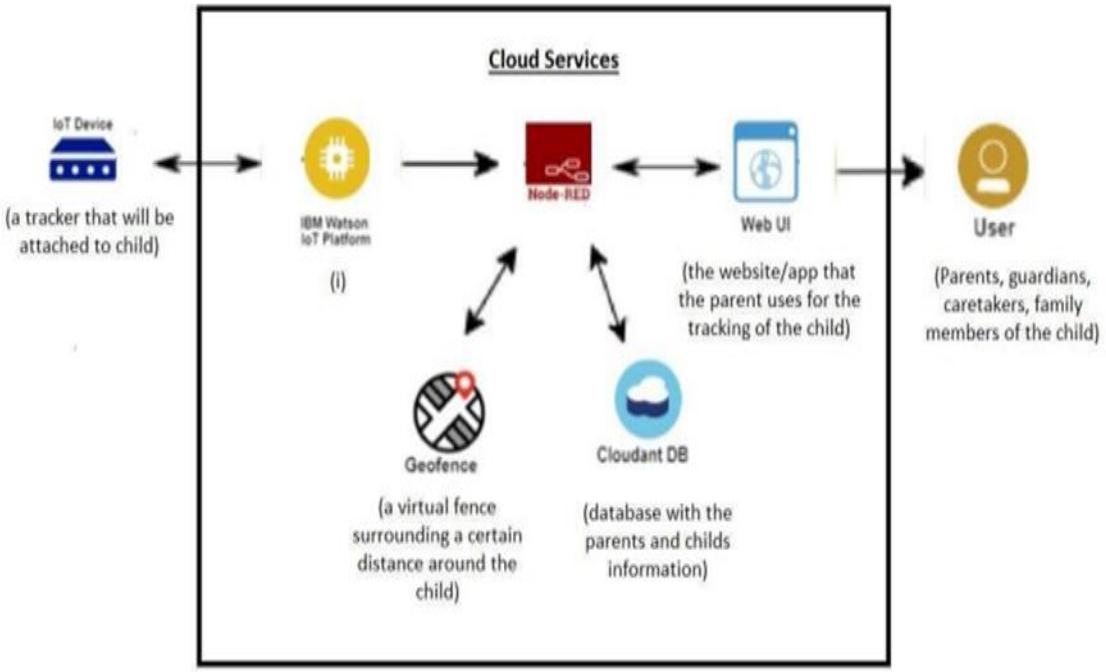


Fig:5.2 Solution Architecture Diagram

5.3 USER STORIES

Table:5.3 User Stories

User Type	**Functional Requirement (Epic)**	**User Story Number**	**User Story / Task**	**Acceptance criteria**	**Priority**	**Release**
Customer (Mobile user)	Registration	USN-1 (FATHER	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1

			using the credentials provided as a Father.			
		USN-2 (MOTHER)	As a user, I can register by entering my email, password, and confirming my password. 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/ CARETAKER)	As a user, I can also monitor the children's activities using a safety gadget monitoring system.	I can access my account / dashboard and receive confirmation email & click confirm	Medium	Sprint-1
	Login	USN-4	As a user, I can log into the application by entering email & password.	I can access my account / dashboard.	Medium	Sprint-2
	Dashboard	USN-5	As a user, I can fix the geofence for my child's location so that I	I can monitor the current location of my child.	High	Sprint-2

			will receive alerts if my child crosses the geofence			
Customer (Web user)	Registration	USN-1 (FATHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1

			as a Father.			
		USN-2 (MOTHER)	As a user, I can register by entering my email, password, and confirming my password. 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/	As a user, I can also monitor the	I can access my account /	Medium	Sprint-1

		CARETAKER)	children's activities using a safety gadget monitoring system.	dashboard and receive confirmation email & click confirm		
	Login	USN-4	As a user, I can log into the application by entering email & password.	I can access my account / dashboard.	Medium	Sprint-2
	Dashboard	USN-5	As a user, I can fix the geofence for my child's location so that I will receive alerts if my child	I can monitor the current location of my child.	High	Sprint-2

			crosses the geofence.			
Customer Care	Dashboard	USN-6	As a customer care service person, whenever I receive a complaint, I forward the complaint and ensure that the complaint is resolved.	I can keep track of all the complaints and the status of the complaints received.	High	Sprint-3
Administrator	Admin Dashboard	USN-7	As an administrator, I will take care of all the payment .	I can access all the customer details, payment details	High	Sprint-4

6.PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Sprint planning is an essential process that an organization needs to adapt to be successful. It indicates the roadmap for the next two to four weeks when stakeholders and team members decide as a group what they need to complete and deliver before the next sprint review meeting.

Sprint planning is the first step in an agile project and is crucial to project success. A high level view of the sprint backlog is created where the scrum team discusses, creates a plan for completing their work, establishes dependencies, and identifies risks that need to be addressed.

Sprint planning is an open forum where everyone comes together, appreciates each other's work, and gets more clarity about the sprint goals and objectives. That makes every member of the team accountable and re-enforces healthy communication This article will explain and help you understand the concepts and provide tips for successful sprint planning meetings.

Additionally, we'll show you how it's not just about the tasks themselves. It's also about helping your team to reach their full potential. The members who take part in the sprint planning meeting include.

- **Product Owner**

The product owners ensure all the items in the product backlog are set before they start the meeting. Therefore, they have to prepare adequately and know the objective of each item. Moreover, the members ask them questions concerning the case and acceptance criteria, and they have to clarify to them .

• **The Scrum Master**

The scrum master is in charge of facilitating the sprint planning meeting and ensures that the rooms are set, people are prepared, supplies are available, and the video conferencing and other connectivity are set accordingly. He/she time boxes the meeting according to the length of the sprint. For example, the duration of a two weeks' sprint should be 2-4 hours. He keeps time and ensures they attain their goal at the end of the sprint planning meeting

6.2 SPRINT DELIVERY SCHEDULE

Product Backlog, Sprint Schedule, and Estimation:

Use the below template to create product backlog and sprint schedule.

Table:6.2.1 Sprint Delivery Schedule

Sprint	**Functional Requirement (Epic)**	**User Story Number**	**User Story / Task**	**Story Points**	**Priority**	**Team Members**
Sprint-1	Registration	USN-1	As a end user/parent of the child .I can register it through Email..	2	High	T.SEVVANTHI
Sprint-1		USN-2	As a Parent/ Guardian,	1	Medium	J.ILACKIA

			I can register for the application By entering my mail id and password.			
Sprint -1	User Confirmation	USN-3	As a parent/end user I can reach my child location by entering the mil id and password.	1	High	M.PETSI PRASILDA
Sprint -1	Login	USN-4	As a parent/ guardian , I can log into the application by my Gmail ID	2	High	G.KARTHIGA

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a end user/parent of the child .I can register it through Email..	2	High	T.SEVVANTHI
Sprint-1		USN-2	As a Parent/ Guardian, I can register for the application By entering my mail id and password.	**1**	Medium	J.ILACKIA
Sprint-1	User Confirmation	USN-3	As a parent/end user I can reach my child location by	**1**	High	M.PETSI PRASILDA

			entering the mil id and password.			
Sprint-1	Login	USN-4	As a parent/ guardian , I can log into the application by my Gmail ID and password.	**2**	High	G.KARTHIGA

SPRINT DURATION

Table : 6.2 Sprint Duration

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	4 Days	24 Oct 2022	27 Oct 2022	20	29 Oct 2022
Sprint-2	20	5 Days	28 Oct 2022	01 Nov 2022	20	04 Nov 2022
Sprint-3	20	8 Days	02 Nov 2022	10 Nov 2022	20	12 Nov 2022
Sprint-4	20	9 Days	10 Nov 2022	18 Nov 2022	20	19 Nov 2022

7.CODING & SOLUTIONING

7.1 FEATURES

Feature 1 :

Log into the website by using email and password.

Feature 2 :

Used to find out the location of the child.

Feature 3 :

Monitor the child’s pressure and temperature.

Feature 4 :

Sends the message to the parents or their guardian.

Other Features:

The system also consists of wi-fi module used to implement IoT and send all the monitored parameters to the cloud for android app monitoring on parental phone. Panic alert system is used during panic situations alerts are sent to the parental phone, seeking for help also the alert parameters are updated to the cloud.

Coding:

```
package com.example.geofence;

import
android.content.BroadcastReceiver; import
android.content.Context; import
android.content.Intent; import
android.location.Location; import
android.os.CountDownTimer; import
android.util.Log; import android.widget.Toast;

import com.google.android.gms.location.Geofence
; import com.google.android.gms.location.GeofencingEvent; import
java.util.List
; import android.os.Handler;

public class GeofenceBroadcastReceiver extends BroadcastReceiver {

  private static final String TAG = "GeofenceBroadcastReceiv";
  @Override     public void onReceive(Context context, Intent
intent) {
    // TODO: This method is called when the BroadcastReceiver is receiving       // an
Intent broadcast
    //.
  /*Toast.makeText(context, "GEOFENCE_ENTERED",
Toast.LENGTH_SHORT).show();

    final Toast mToastToShow;
```

Fig:7.1.1 Coding

```
    int toastDurationInMilliSeconds = 1200000;         mToastToShow = Toast.makeText(context,
"GEOFENCE_EXITED", Toast.LENGTH_LONG);



    // Set the countdown to display the toast       CountDownTimer toastCountDown;         toastCountDown = new
CountDownTimer(toastDurationInMilliSeconds,
100000) {            public void onTick(long millisUntilFinished) {
mToastToShow.show();
        }

        public void onFinish() {              mToastToShow.cancel();
}
    };

    // Show the toast and starts the countdown        mToastToShow.show();
toastCountDown.start();*/



  NotificationHelper notificationHelper = new
NotificationHelper(context);

notificationHelper.sendHighPriorityNotification("GEOFENCE_TRANSITION_ENTER" , "", MapsActivity.class);

   GeofencingEvent geofencingEvent = GeofencingEvent.fromIntent(intent);

    if (geofencingEvent.hasError()) {
        Log.d(TAG, "onReceive: Error receiving geofence event...");          return;
    }

    List<Geofence> geofenceList =
geofencingEvent.getTriggeringGeofences();       for (Geofence geofence:
geofenceList) {
        Log.d(TAG, "onReceive: " + geofence.getRequestId());       }
//      Location location = geofencingEvent.getTriggeringLocation();       int transitionType =
geofencingEvent.getGeofenceTransition();
     switch (transitionType) {          case
Geofence.GEOFENCE_TRANSITION_ENTER:
```

Fig:7.1.2 coding

```
            notificationHelper.sendHighPriorityNotification("Entered the Location", "", MapsActivity.class);    break;
case Geofence.GEOFENCE_TRANSITION_EXIT:


            notificationHelper.sendHighPriorityNotification("Exited                the              Location          ",       "",
MapsActivity.class);              break;
    }


  }
 }
```

Fig:7.1.3 Coding

```
package com.example.geofence;

import android.app.Notification; import
android.app.NotificationChannel; import
android.app.NotificationManager; import
android.app.PendingIntent; import android.content.Context;
import android.content.ContextWrapper; import
android.content.Intent; import android.graphics.Color; import
android.os.Build;

import androidx.annotation.RequiresApi; import
androidx.core.app.NotificationCompat;   import
androidx.core.app.NotificationManagerCompat;

import java.util.Random;

public class NotificationHelper extends ContextWrapper {

  private static final String TAG = "NotificationHelper";

  public NotificationHelper(Context base) {       super(base);
    if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {          createChannels();
    }
  }
  private String CHANNEL_NAME = "High priority channel";
  private String CHANNEL_ID = "com.example.geofence" + CHANNEL_NAME;




  @RequiresApi(api = Build.VERSION_CODES.O)    private void createChannels()
```

Fig:7.1.4 Coding

```
{
    NotificationChannel notificationChannel = new
NotificationChannel(CHANNEL_ID, CHANNEL_NAME, NotificationManager.IMPORTANCE_HIGH);
notificationChannel.enableLights(true);       notificationChannel.enableVibration(true);
notificationChannel.setDescription("this is the description of the channel.");
notificationChannel.setLightColor(Color.RED);

notificationChannel.setLockscreenVisibility(Notification.VISIBILITY_PUBLIC) ;       NotificationManager manager =
(NotificationManager) getSystemService(Context.NOTIFICATION_SERVICE);
manager.createNotificationChannel(notificationChannel);    }
  public void sendHighPriorityNotification(String title, String body, Class activityName) {

    Intent intent = new Intent(this, activityName);
    PendingIntent pendingIntent = PendingIntent.getActivity(this, 267, intent,
PendingIntent.FLAG_UPDATE_CURRENT);
    Notification notification = new NotificationCompat.Builder(this, CHANNEL_ID)
//            .setContentTitle(title)
//            .setContentText(body)
          .setSmallIcon(R.drawable.ic_launcher_background)
          .setPriority(NotificationCompat.PRIORITY_HIGH)            .setStyle(new
NotificationCompat.BigTextStyle().setSummaryText("summary").setBigContentTi tle(title).bigText(body))
          .setContentIntent(pendingIntent)
          .setAutoCancel(true)
          .build();

    NotificationManagerCompat.from(this).notify(new Random().nextInt(), notification);
}
}
```

Fig:7.1.5 Coding

8.TESTING

8.1 TEST CASES

- ✓ Login website with email
- ✓ GPS Tracking
- ✓ Send Message to Parents or Guardian
- ✓ Monitoring the location of the child

8.2 USER ACCEPTANCE TESTING

User Acceptance Testing (UAT) checks whether a product is the right one for the end users. It has other names, e.g., end-user testing, operational, application, beta testing, or validation but they describe the same thing. In quality assurance, it's important to distinguish between validation and verification.

Verification refers to general QA processes aimed at testing the technical aspects of a product to ensure it actually works. Validation (or user acceptance testing) is conducted to make sure that the product corresponds with business requirements and can be used by the end user.

Alpha testing is the initial stage of acceptance testing, typically performed by internal testers, to ensure that the product functions correctly and meets business requirements. Beta testing, the second type of acceptance testing, aims at meeting user acceptance criteria.

If the child is missed in the not available internet connection then it is very difficult to find the child.

9.RESULTS

1.User Registration :

Users get registered to the app using their mail and create their password. On the user is registered a verification mail will be sent to the user mail id. The user needs to verify the account. All user details are stored in the firebase and verification mail is sent by firebase authentication .

2. User Login:

Users with their registered mail and password will login to the account . As the details are stored in firebase, when invalid email or password is entered a message say invalid email or password occur .

3.Adding Geofence and Alert Notification :

Users can add geofence in the location where they want to add or where their child is going to 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 be displayed.

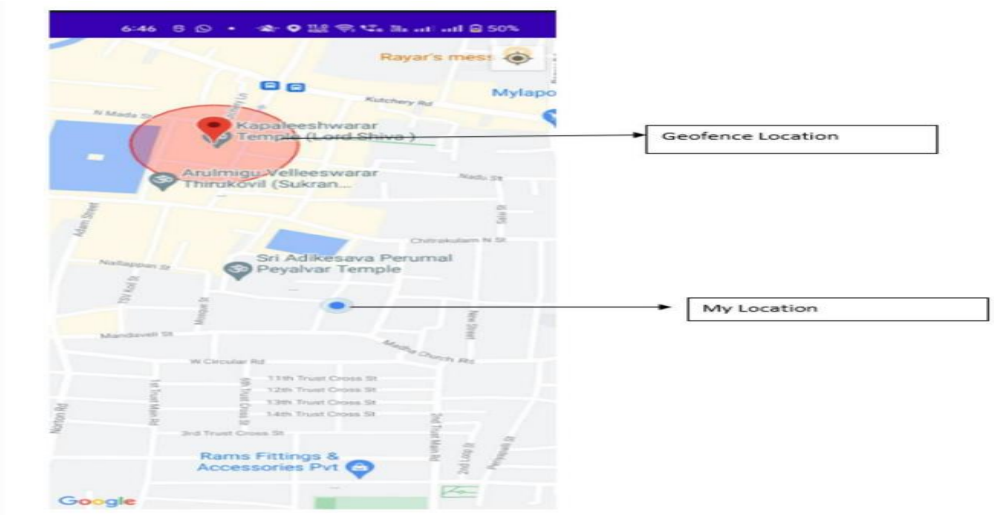


Fig:9.1 Results

NOTIFICATION

Fig:9.2 Notification

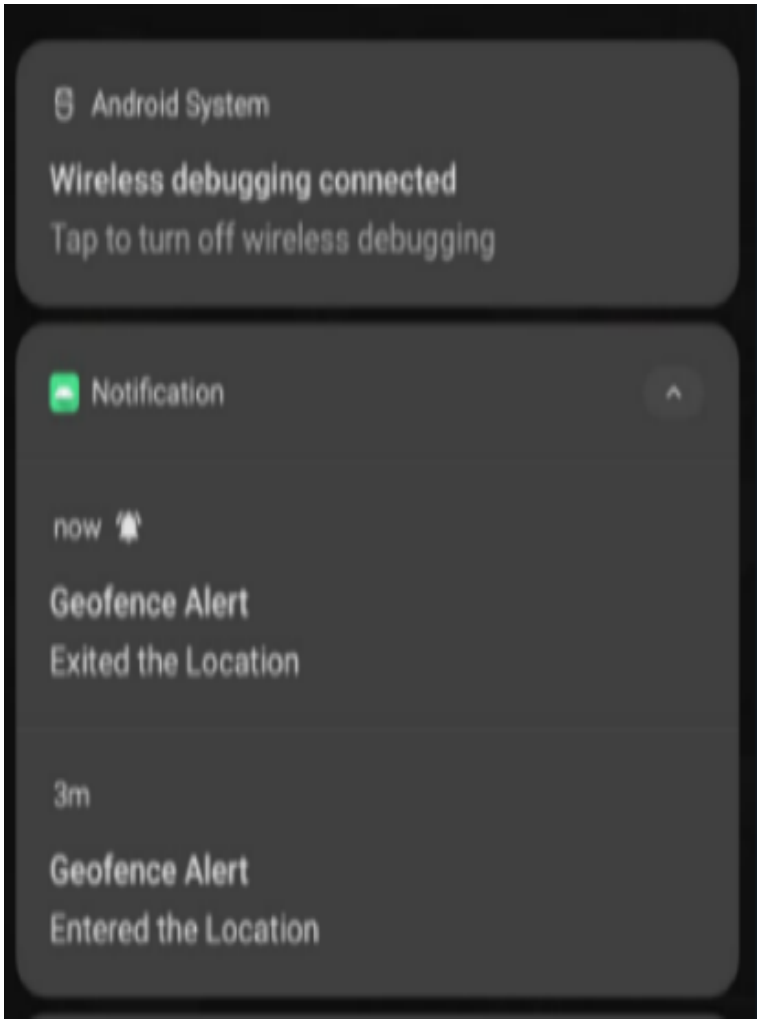


Fig:9.2 Notification

10.ADVANTAGES & DISADVANTAGES

ADVANTAGES

The parent can monitor their child from anywhere at any time, and also get a notification when the child goes away from the permitted radius.

It also allows the parent to know if their child is in any dangerous situation.

DISADVANTAGES

This system are that the child could not produce the exact alert command during a panic condition.

The command produced may not match the previously stored command.

This project requires manual intervention.

11.CONCLUSION

- Throughout the research , it is clearly explained the IoT concept, child safety issues and the need of using child security system
- It assists parents to monitor their children remotely .
- In case situation happens , notifications will be send to the parents so the action can be taken.
- Though this child safety can be ensured and crime rate will be reduced .
- However, the proposed method is not robust enough and does not contain sufficient functions to operate like a mobile phone.
- Hence the future enhancement will be adding some more futures , software application, and hardware to make the proposed system cable of working more intelligently, and guarantee the safety of the children.

12.FUTURE SCOPE

In future, the currently proposed system can be improvised by adding other parameters that is required for children .The system can be developed further by implementing additional health monitoring sensors like, blood pressure, respiration rate, sleep cycles of REM&NREM and EEG analysis

The system accuracy can also be improved by increasing the trustworthiness of the device to avoid any discrepancies, as in medical and healthcare, a minute error may cost a life. In addition we can also add different zones such as bus section, along with wireless camera which ensures the safety .In bus section we also can implement the fire detecting concept.

In our system, we use the Internet of Things, GPS, GSM, and Raspberry Pi to automatically monitor the youngster in real time. When we utilize a web camera and GPS to actively monitor, this system needs network connections, satellite communication, and a high-speed data connection.

It is challenging to keep an eye out for any network problems or satellite connection problems. Additionally, there is a lag when streaming videos through the server. The Zigbee concept or accessing the system without the internet and employing high-speed server transmission can therefore be used in the future to solve these problem.

13.APPENDIX

13.1 SOURCE CODE

Alert Notification Code

```
package com.example.geofence;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.location.Location;
import android.os.CountDownTimer;
import android.util.Log;
import android.widget.Toast;
import com.google.android.gms.location.Geofence;
import com.google.android.gms.location.GeofencingEvent;
import java.util.List;
import android.os.Handler;
public class GeofenceBroadcastReceiver extends BroadcastReceiver {
private static final String TAG = "GeofenceBroadcastReceiv";
@Override
public void onReceive(Context context, Intent intent) {
// TODO: This method is called when the BroadcastReceiver is receiving
// an Intent broadcast
//.
/*Toast.makeText(context, "GEOFENCE_ENTERED",
Toast.LENGTH_SHORT).show();
final Toast mToastToShow;
int toastDurationInMilliSeconds = 1200000;
mToastToShow = Toast.makeText(context, "GEOFENCE_EXITED",
Toast.LENGTH_LONG);
```

```
// Set the countdown to display the toast
CountDownTimer toastCountDown;
toastCountDown = new CountDownTimer(toastDurationInMilliSeconds,
100000) {
public void onTick(long millisUntilFinished) {
mToastToShow.show();
}
public void onFinish() {
mToastToShow.cancel();
}
};
// Show the toast and starts the countdown
mToastToShow.show();
toastCountDown.start();*/
NotificationHelper notificationHelper = new NotificationHelper(context);
notificationHelper.sendHighPriorityNotification("GEOFENCE_TRANSITION
_ENTER", "",
MapsActivity.class);
GeofencingEvent geofencingEvent = GeofencingEvent.fromIntent(intent);
if (geofencingEvent.hasError()) {
Log.d(TAG, "onReceive: Error receiving geofence event...");
return;
}
List<Geofence> geofenceList = geofencingEvent.getTriggeringGeofences();
for (Geofence geofence: geofenceList) {
Log.d(TAG, "onReceive: " + geofence.getRequestId());
}
// Location location = geofencingEvent.getTriggeringLocation();
int transitionType = geofencingEvent.getGeofenceTransition();
```

```
switch (transitionType) {
case Geofence.GEOFENCE_TRANSITION_ENTER:
notificationHelper.sendHighPriorityNotification("Entered the Location", "",
MapsActivity.class);
break;
case Geofence.GEOFENCE_TRANSITION_EXIT:
notificationHelper.sendHighPriorityNotification("Exited the Location ", "",
MapsActivity.class);
break;
}
}
```

13.2. Geofence:

```
Package com.example.geofence;
import android.app.PendingIntent;
import android.content.Context;
import android.content.ContextWrapper;
import android.content.Intent;
import android.widget.Toast;
import com.google.android.gms.common.api.ApiException;
import com.google.android.gms.location.Geofence;
import com.google.android.gms.location.GeofenceStatusCodes;
import com.google.android.gms.location.GeofencingRequest;
import com.google.android.gms.maps.model.LatLng;
public class GeofenceHelper extends ContextWrapper {
private static final String TAG = "GeofenceHelper";
PendingIntent pendingIntent;
public GeofenceHelper(Context base) {
```

```
super(base);
}
public GeofencingRequest getGeofencingRequest(Geofence
geofence) {
return new GeofencingRequest.Builder()
.addGeofence(geofence)

.setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER)
.build();
}
public Geofence getGeofence(String ID, LatLng latLng, float
radius, int transitionTypes) {
return new Geofence.Builder()
.setCircularRegion(latLng.latitude,
latLng.longitude, radius)
.setRequestId(ID)
.setTransitionTypes(transitionTypes)
.setLoiteringDelay(5000)
.setExpirationDuration(Geofence.NEVER_EXPIRE)
.build();
}
public PendingIntent getPendingIntent() {
if (pendingIntent != null) {
return pendingIntent;
}
Intent intent = new Intent(this,
GeofenceBroadcastReceiver.class);
pendingIntent = PendingIntent.getBroadcast(this, 2607,
intent, PendingIntent.FLAG_IMMUTABLE);
```

```
return pendingIntent;
}
public String getErrorString(Exception e) {
if (e instanceof ApiException) {
ApiException apiException = (ApiException) e;
switch (apiException.getStatusCode()) {
case GeofenceStatusCodes
.GEOFENCE_NOT_AVAILABLE:

return "GEOFENCE_NOT_AVAILABLE";
case GeofenceStatusCodes
.GEOFENCE_TOO_MANY_GEOFENCES:
return "GEOFENCE_TOO_MANY_GEOFENCES";
case GeofenceStatusCodes
.GEOFENCE_TOO_MANY_PENDING_INTENTS:
return "GEOFENCE_TOO_MANY_PENDING_INTENTS";
}
}
return e.getLocalizedMessage();
}
}
```

13.2. Github link:

https://github.com/IBM-EPBL/IBM-Project-30556-1660148833

Project Demo Link:

https://drive.google.com/file/d/1KwUMtFWGSYeOfKX07D6EXx_8DpWu5dh/view?usp=share_link

13.2 GitHub Link

https://github.com/IBM-EPBL/IBM-Project-53802-1661497568/tree/main#ibm-project-53802-1661497568

Project Demo Link

https://drive.google.com/file/d/16ZkG9wibfHhqYJf3Ob9cIyDJ-tGTsHhw/view?usp=drivesdk