IBM NALAIYA THIRAN PROJECT REPORT 2022-23

IoT BASED SAFETY GADGETS FOR CHILD SAFETY

MONITORING AND NOTIFICATION

TEAM ID : PNT2022TMID29469

TEAM MEMBERS : 1.SHALINI S (510419104064)

2. SASIKALA E (510419104061)

3.YOGALAKSHMI S (510419104081)

4.AGILANDEESWARI K (510419104711)

COLLEGE NAME : ARUNAI ENGINEERING COLLEGE ,

TIRUVANNAMALAI- 606601.

1.INTRODUCTION

IoT-based safety gadgets are devices that are connected to the internet and equipped with sensors that can detect various risks and hazards. These devices can be used to monitor and protect children from various dangers, such as accidents, fires, and kidnappings. There are many different types of IoT-based safety gadgets available on the market. Some of these devices are designed to be worn by children, while others can be placed in strategic locations around the home or school.

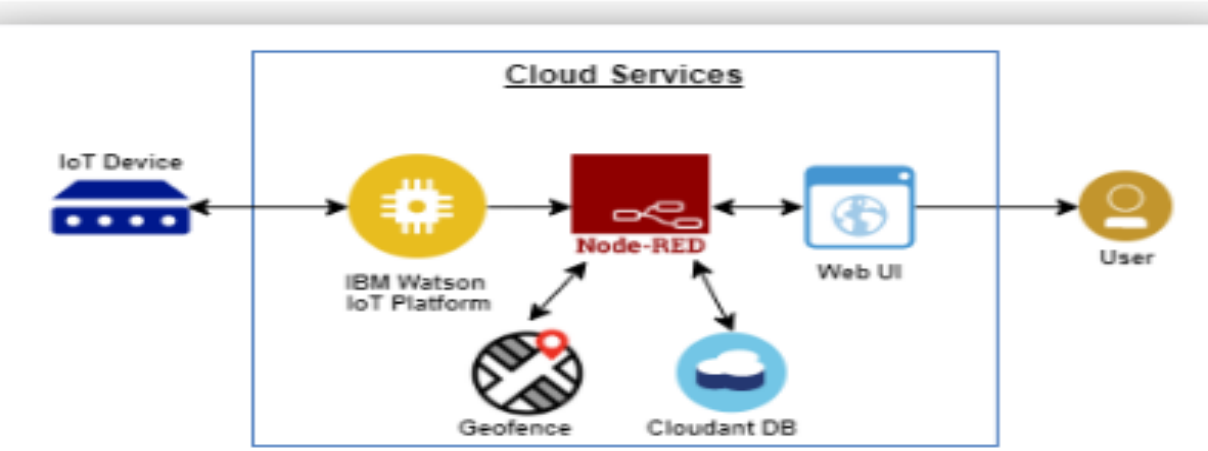
The IoT based safety gadget for child safety monitoring & notification system is a device that can be placed on a child's clothing or in their backpack, and it uses GPS and cellular technology to keep track of their location. If the child goes outside of a designated safe zone, or if the device detects a fall or impact, it will send an alert to the parent's or caregiver's smartphone. The system can also be used to monitor the child's activity level, and it will notify the parent if the child has been inactive for a prolonged period of time.

IoT-based safety gadgets can be used to monitor and protect children from a variety of dangers. For example, wearable devices can be used to track a child's location and send alerts to parents if the child goes outside of a designated safe area. IoT-based safety gadgets can also be used to monitor a child's vital signs, such as heart rate and body temperature. These devices can send alerts to parents if a child's vital signs are outside of a normal range. IoT-based safety gadgets can also be used to monitor environmental hazards, such as carbon monoxide and smoke. These devices can send alerts to parents if a hazardous condition is detected. IoT-based safety gadgets are an important part of keeping children safe. By using these devices, parents can have peace of mind knowing that their children are being monitored and protected from various risks and hazards.

1.1 PROJECT OVERVIEW

The IoT Based Safety Gadget for Child Safety Monitoring & Notification System is a device that uses the Internet of Things to monitor and notify parents or guardians of a child's location and safety status. The gadget is equipped with GPS and sensors that can detect if a child has fallen, been

injured, or is in danger. The device can also be used to monitor a child's heart rate and breathing. If the device detects an abnormal heart rate or breathing, it will notify the parent or guardian. The device can also be used to monitor a child's location and send notifications if the child leaves a designated safe area. The IoT based safety gadget for child safety monitoring and notification system is a great way for parents to keep track of their children's safety. The project is still in development, but it has the potential to make a big impact on the safety of children.



1.2 PURPOSE

The purpose of this project is to develop an IoT based safety gadget for child safety monitoring and notification system. The gadget will be equipped with various sensors to monitor the child's activities and location. It will also have a communication module to send notifications to the parents or guardians in case of any emergency. The sensors used in the gadget will include a GPS module to track the child's location, an accelerometer to detect any sudden movement, and a temperature sensor to monitor the child's body temperature.

The gadget will also have a panic button which the child can use to send an emergency notification to the parents or guardians. The communication module will use either a cellular network or a Wi-Fi connection to send the notifications. The parents or guardians will be able to track the child's location

in real-time and will also receive alerts if the child is in any danger. The gadget will be powered by a battery which will need to be regularly charged. The battery life will be dependent on the usage of the sensors and communication module.

2.LITERATURE SURVEY

With the rapid growth of the Internet of Things (IoT), an increasing number of safety gadgets are being developed that make use of this technology to improve child safety. The IoT Based Safety Gadget for Child Safety Monitoring & Notification System is one such device that uses IoT to keep track of a child's whereabouts and notify the parents if the child strays too far from a safe area. The gadget consists of a GPS tracker that is worn by the child and a base station that is kept at the home of the child. The GPS tracker uses the GPS signal to determine the child's location and sends this information to the base station via the IoT. The base station then uses this information to generate a map of the child's location and displays it on a screen. If the child strays too far from the safe area, the base station will generate an alarm to notify the parents. The IoT Based Safety Gadget for Child Safety Monitoring & Notification System is a valuable tool for keeping children safe. It can be used to monitor a child's location in real-time and notify the parents if the child strays too far from a safe area. This can help to prevent accidents and ensure that the child is always within a safe distance from the parent.

TITLE	YEAR	AUTHOR	LEARNING
Design of Wearable devices for Child Safety	2021	M.Benisha, Thandaiah Prabu R,Gowri.M,Vishali.K	A MEMS based SMS enabled security system with GSM and GPS modul along with an emergency panic button.For every 30min duration, information is sent to the registered numbers.

Intelligent Child Safety System using Machine Learning in IoT devices.	2020	Aparanjith Srinivasan,Abirami S,Divya N	An intelligent system designed with an Arduino,Raspberry Pi and sensors to detect changes in parameter.

2.1 EXISTING SYSTEM

The existing system for IoT Based Safety Gadget for Child Safety Monitoring & Notification comprises a sensor device which is worn by the child and a corresponding mobile application. The sensor device monitors the child's location and sends notifications to the mobile application if the child strays outside of a designated safe area. The mobile application then notifies the parent or guardian of the child's location. The system also includes a panic button which the child can activate if they feel unsafe. The panic button sends an alert to the parent or guardian as well as emergency services.This project is proposed for monitoring the safety of children.

The current system is based on the use of a mobile application, which will notify the parent when their child enters an unsafe area. The proposed system is an improved system which uses the Internet of Things (IoT) technology to monitor the safety of children. The system uses the GPS location of the child's mobile device to track the child's location. If the child enters an unsafe area, the system will send a notification to the parent's mobile device. The parent can then view the child's location on a map and take appropriate action.

The current system for IoT based safety gadget for child safety monitoring and notification is based on a central server that stores all the data collected by the various safety devices. The parents can then access this data through a web interface or a mobile application. The data is displayed in a dashboard format, which allows the parents to see the child's location, activity, and any safety concerns. The system also allows the parents to set up alerts so that they are notified if the child leaves a certain area or if there is a safety concern.

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, Geo-Fencing & 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

"Design an IoT based safety gadget that can be used to monitor and notify the parents or guardians of a child's location and safety status. The gadget should be able to track the child's location via GPS and send notifications to the parents or guardians if the child strays outside of a safe zone or if the child's safety status changes. The gadget should also be able to monitor the child's vital signs and send notifications if any abnormalities are detected. Finally, the gadget should be able to send notifications to the parents or guardians if the battery is low or if the device is not functioning properly."

The problem statement for this project is to develop an IoT based safety gadget for child safety monitoring and notification. The gadget will be equipped with sensors to detect the child's location, activities, and health parameters. The data collected by the sensors will be transmitted to a central server via the

Internet. The server will process the data and generate alerts if any safety concerns are detected. The alerts will be sent to the parents or guardians of the child via email, text message, or phone call.

3. IDEATION & PROPOSED SOLUTION

The purpose of this project is to create a child safety monitoring and notification system using IoT technology. The system will be designed to monitor the child's location and send notifications to the parent or guardian if the child leaves a designated safe area. The system will also be able to monitor the child's vital signs and send notifications if there is a change in the child's health status.

The IoT Based Safety Gadget for Child Safety Monitoring & Notification System project proposes the use of a gadget that can be placed on a child that will monitor their safety and notify their parents or guardians if they are in danger. The gadget will use sensors to detect if the child is in a dangerous situation and will send a notification to the parent or guardian's smartphone. The parent or guardian will then be able to take action to help the child.

The gadget will be equipped with GPS and WiFi capabilities to allow for accurate tracking of the child's location. The sensors will be used to monitor the child's heart rate and body temperature. If the child's heart rate or body temperature exceeds a certain threshold, the mobile application will send a notification to the parent or guardian. The notification will include the child's location, heart rate, and body temperature.

The mobile application will also allow the parent or guardian to set up safe zones. If the child leaves a safe zone, the parent or guardian will receive a notification. The gadget will also have a panic button that the child can press if they are in danger. The panic button will send a notification to the parent or guardian with the child's location. The gadget will be powered by a battery that will need to be charged regularly. The mobile application will also have a battery indicator so that the parent or guardian can see when the gadget needs to be charged.

3.1 EMPATHY CANVAS MAP

What does our persona think, feel, see, and do?

What does our persona think?

Our persona thinks that keeping their child safe is the most important thing in the world. They want to be able to know where their child is at all times and make sure that they are safe. They worry about their child being hurt or kidnapped and feel that it is their responsibility to protect them.

What does our persona feel?

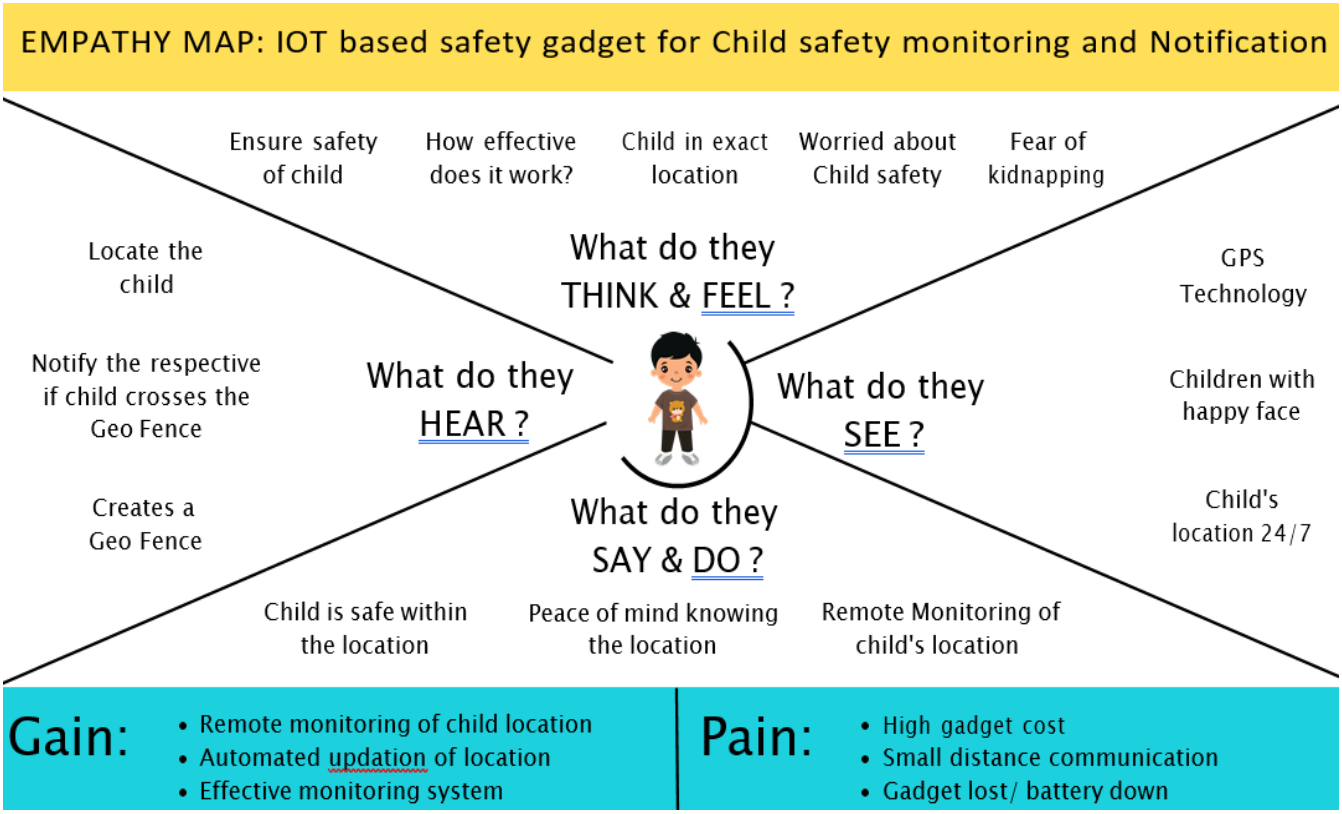
Our persona feels anxious and worried when they are not with their child or do not know where they are. They feel relief and happiness when they are able to see their child and know that they are safe. They feel guilty and responsible if something were to happen to their child.

What does our persona see?

Our persona sees their child as the most important thing in their life. They see the world as a dangerous place and want to do everything they can to protect their child. They see other parents as either being too lenient or too overprotective.

What does our persona do?

Our persona is constantly thinking about their child and their safety. They are always looking for ways to improve their child's safety and make sure that they are always aware of their surroundings. They will go to great lengths to make sure their child is never in danger.



3.2 IDEATION AND BRAINSTROMING

IDEATION

The basic idea for this project is to develop an IoT based gadget that can be used for child safety monitoring and notification purposes. The gadget will be equipped with various sensors and communication modules that will allow it to communicate with the parent's smartphone or other such devices. The gadget will be able to track the child's location, monitor their activities and also send out notifications in case of any emergencies. The various sensors that can be used in this project include GPS, accelerometer, temperature sensor, etc. The accelerometer can be used to detect if the child has fallen or is in any danger. The temperature sensor can be used to detect if the child is in a hot or cold environment. The GPS sensor can be used to track the child's location. The communication module can be used to send out notifications to the parent's smartphone or other such devices. This project can be further developed by adding more features to the gadget such as heart rate monitor, blood pressure

monitor, etc. This will help in further monitoring the child's health and safety.

IDEA 1

- Our proposed system is based on the Internet of Things-based Smart Child Safety Wearable Device System designed as an efficient and low-cost IoT based system for monitoring infants in real-time.

- This system plays a key role in providing better care for the lost children untilthey 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 parentsvia GPS.

- Therefore it is intended to use voice call as the way of communication betweenthe 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 2

- ➤ Our project 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 checkingthe child's locationnotifications will be generated if the child crosses the geofence. Notifications will be sent according to the child's location to their parentsor caretakers. The entire locationdata will be stored in the database.

- ➤ Here we can also notify the child's location to the near by police station by attaching the emergency number of the corresponding police station to the gadget. So that the police can take action immediately.

IDEA 3

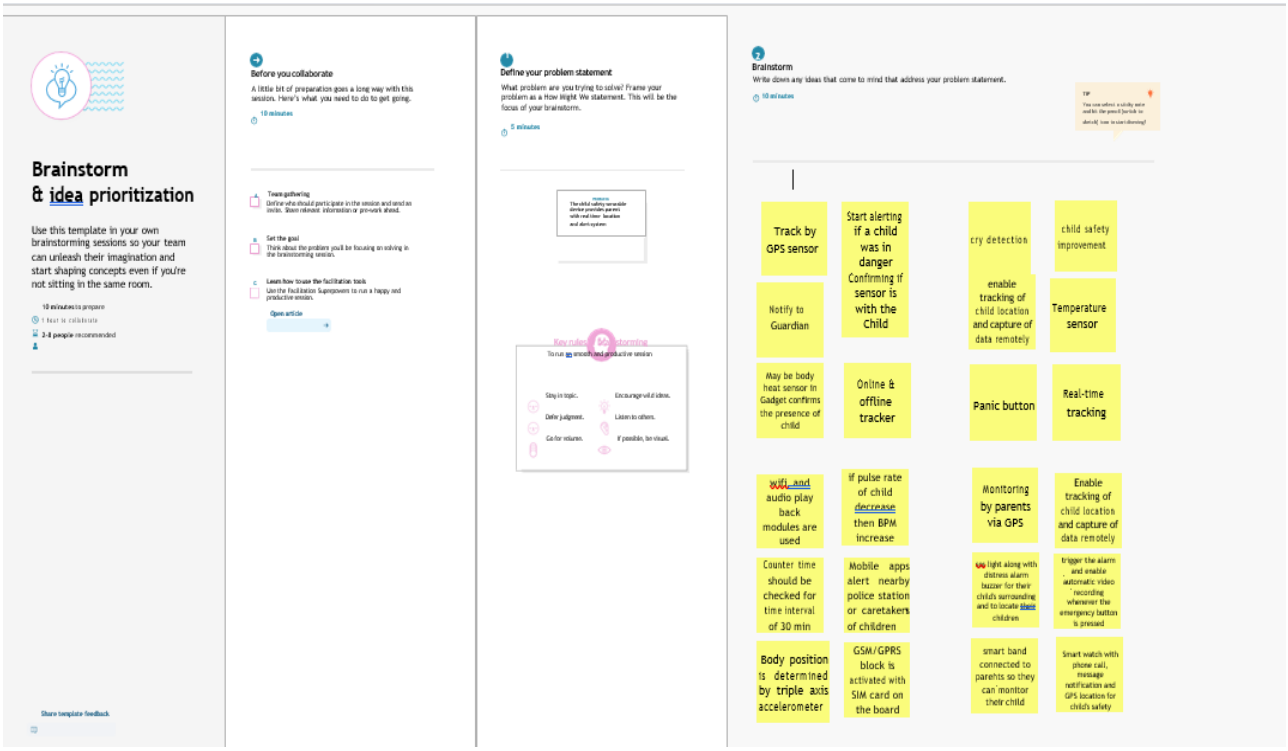
- ☆ Our project focuses on monitoring children by wearable sensors attached either to the kid or to their belongings. Vibration sensor and

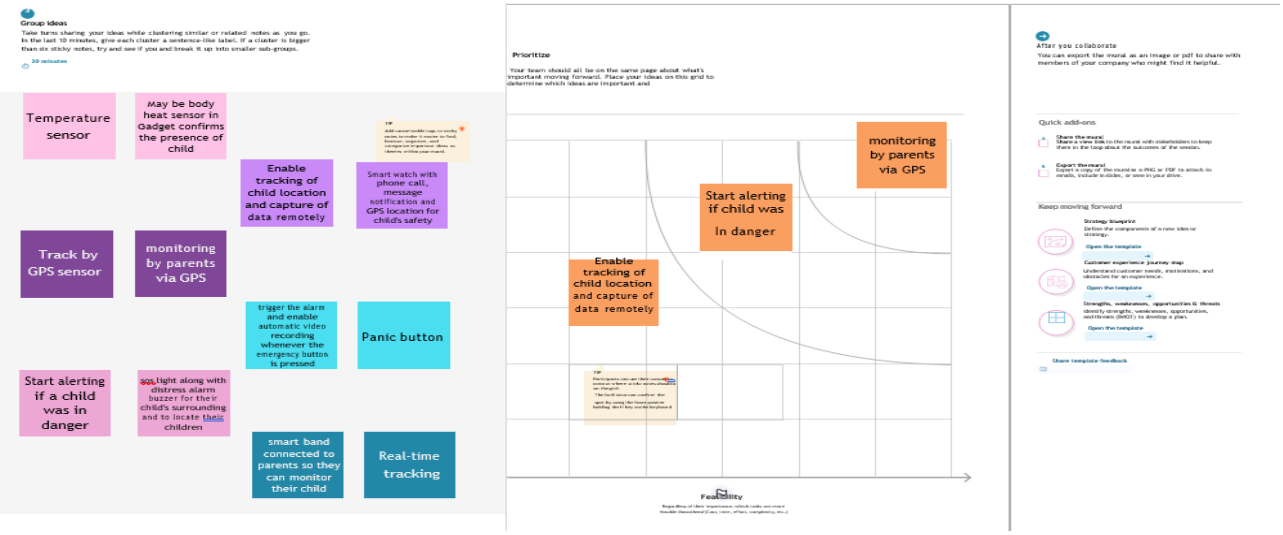
heartbeat sensor are used in addition to GPS (to track their location24/7).

BRAINSTROMING

The aim of the project is to design and develop a low-cost IoT-based safety gadget for child safety monitoring and notification. The main objective of the project is to design a device which can monitor the child's location and send notifications to the parents in case the child goes out of the safe zone. The device should be able to track the child's location using GPS and send real-time notifications to the parents through a mobile application.

The parents should be able to view the child's location on the map and set up a safe zone for the child. If the child goes out of the safe zone, the parents should be notified immediately.

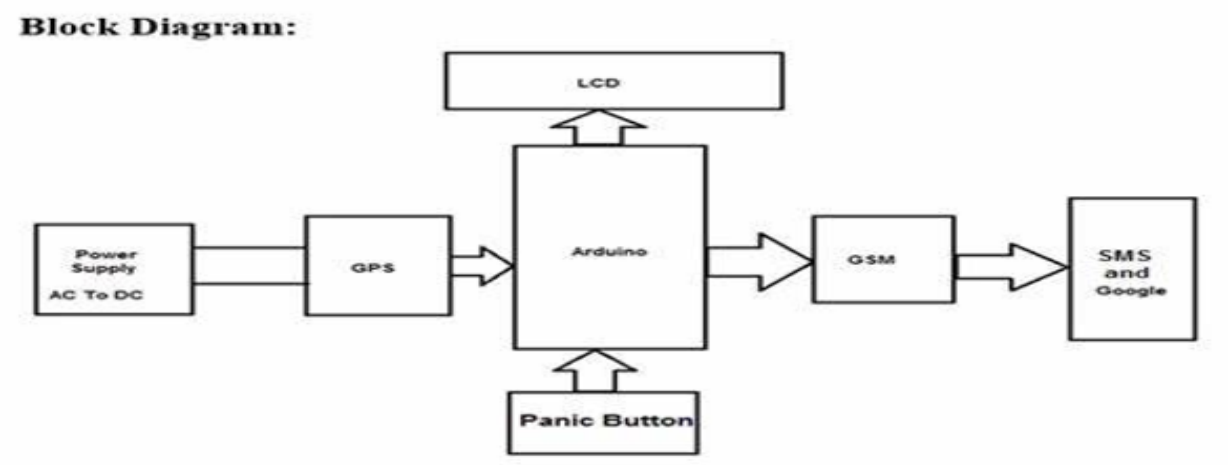




3.3 PROPOSED SOLUTION

The device will use GPS to track the child's location and will send a notification to the parents' smartphones if the child goes outside of the designated area. The parents will be able to set up the device so that they are notified if the child goes to school, leaves the house, or goes to a friend's house. The Gadget will be connected to the internet and will send real-time data to a central server. The server will process the data and will send notifications to the parents or guardians if any hazard is detected. The device will use GPS to track the child's location and will send notifications to the parent's or guardian's smartphone if the child goes outside of a designated safe area. The parent or guardian will be able to set up a safe area using a map interface on their smartphone.

Block Diagram:



PROPOSED SOLUTION:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	As we all know, kids are the heartbeat of every parent,and when it comes to a childwith special needs, parents have to be extra careful. Parents can't monitor the child by 24/7, if they have work.
2.	Idea / Solution description	● Our solution is achieved through monitoring the child by developing a wearable device to track the location. ● Parameters include temperature, emotions and wet detection using appropriate sensors. ● Based on the Sensorvalues an alertmessage with location and phone call is initialized and notified to neighbors and end user.

3.	Novelty / Uniqueness	● Our System offers an GPS tracking and wearable device to getinformation about the location and also an immediate notification.
4.	Social Impact/ Customer Satisfaction	● Improved safety, provides freedom forthe children with their needs.

5.	Business Model(Revenue Model)	Our system provides a futuristic framework in such a way that new technologies in the market that align withour system can be readily adopted, addingmore profit from a revenue standpoint andalso offering multiple benefits at a viable cost froma user standpoint.
6.	Scalability of the Solution	● It is a portable system. ● It is moreefficient and costsless. ● It requires littlemaintenance.

3.4 PROBELEM SOUTION FIT

The aim of the project is to develop a gadget which can be used for monitoring and notification in case of child safety. The gadget will be equipped with various sensors like temperature, humidity, motion etc. It will also have a GPS module to track the

location of the child. The data from the sensors will be transmitted to a central server using GSM/GPRS or WiFi. The central server will be used to monitor the child's safety and send notifications to the parents in case of any emergency.

The system can be used to monitor the child's health parameters like temperature and humidity. The parents can be notified if the child's health parameters are not within the normal range. The system can also be used to monitor the child's location. The parents can be notified if the child moves out of the safe zone. The system can also be used to monitor the child's activities. The parents can be notified if the child is engaged in any unsafe activity. The system can be used in various other applications like monitoring the elderly people, patients in hospital etc. The system can be easily customized according to the requirement.

1.CUSTOMER SEGMENT	**6.CUSTOMERCONSTRAINTS**	**5.AVAILABLE SOLUTIONS**
Who is your customer? i.e.,working parents of 0-5 you. Kids,Parents are thecustomer	What constraints prevent your customers from takingaction or limittheir choices of solutions? i.e., spending power, budget, no cash, network connection, available devices.	Which solutions are available to the customers when they face the problem or need to get the job done? Whathave they triedin the past? What pros & cons do these solutions have? i.e., pen and paper The most important reason for monitoring each child's development is to determine whether a child's development is on track. Looking for developmental milestones is important tounderstanding each child's development

		andbehaviour.
2. JOBS-TO-BE-DONE /PROBLEMS Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; exploredifferent sides. Overparenting tends to deprive children of bad and negative experiences, which are crucial to a child's emotional growth. One form of overparenting is excessive monitoring.	**9. PROBLEM ROOT CAUSE** What is the real reason that this problem exists?What is the back It's exactly what it sounds like—an exercise to determine the root cause for a failure or issue, so thatthe solution is based on thetrue problem, not just addressing the symptoms.	**7. BEHAVIOUR** What does your customer do to address theproblem and get the job done? When children have frequent emotional outbursts, it can be a sign that they haven't yet developed the skills they need to cope with feelings like frustration, anxiety and anger. Handling big emotions in a healthy, mature way requires a varietyof skills, including.

3. TRIGGERS	**10. YOUR SOLUTION**	**8.CHANNELS of BEHAVIOURONLINE**
What triggers customers to act? i.e., seeing theirneighbour installing solar panels, reading abouta more efficient solution in the news.It's not the situation or the feelingthat's the problem; it's how kids think about thesethings and what	If you are workingon an existing business, write down your current solution first,fill in thecanvas, and check how much it fits reality. If you are working on a new business proposition, then keep	What kind of actions do customers take online?Extract online channelsfrom #7 **OFFLINE** What kind of actions do customers take offline? Extract offlinechannels from #7 and use them for customer development.

they say to themselves thatcauses problems. trigger	it blank untilyou fill in the canvas and come up with a solution that fits within customer limitations, solves a	Understanding how children perceive and interact withthe point of sale has been the focus of various studies in the past decade. It is well documented that children have preferences in terms of shopping destinations

	problem and matches customer behaviour. The most important reason for monitoring each child's development is to determine whether a child's development is on track. Lookingfor developmental milestones is important to understanding each child's development and behaviour.	

4. EMOTIONS: BEFORE / AFTER

How do customers feelwhen they facea problem or a job and afterwards?

i.e., lost, insecure > confident, in control - use it in yourcommunication strategy &design.

BEFORE: Divergent thinking is a styleof thinking thatgenerates a rangeofalternative solutions or ideas to a problemthat has multiple answers.

AFTER: Feeling protective of your childis often manifested in the form of ‘motherly’ instincts. The feeling of protecting and wanting the best for your childrenis the ultimate parenting goal.

4.REQUIREMENT ANALYSIS

The requirement analysis for an IoT based safety gadget for child safety monitoring and notification should consider the following:

- The gadget must be able to monitor the child's location and send notifications to the parents or guardians if the child strays outside a safe area.
- The gadget must be able to monitor the child's vital signs and send notifications to the parents or guardians if the child's health is in danger.
- The gadget must be able to communicate with other IoT devices in the home, such as the security system, in order to provide a comprehensive safety solution.
- The gadget must be affordable and easy to use.
- The gadget must be rugged and durable, able to withstand the rigors of daily use.
- The gadget must have a long battery life.

4.1 FUNCTIONAL REQUIREMENTS

The functional requirements for IoT based safety gadgets for child safety monitoring and notification project are as follows: The gadgets should be able to monitor the child's location and send notifications to the parents or guardians if the child goes beyond a certain distance from the home. It should be able to monitor the child's vital signs and send notifications to the parents or guardians if there are any changes in the child's vital signs. The gadgets should be able to monitor the child's environment and send notifications to the parents or guardians if the environment is not guardians if the child is not moving for a certain period of time. Following are the functional requirements of the proposedsolution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story/Sub-Task)

FR - 1	User Registration	Registration throughaccount Registration throughGmail
FR - 2	User Confirmation	Confirmation via EmailConfirmation via OTP
FR - 3	User Notification	Notification to registered mobilenumber Notification via message
FR - 4	User location check	Check through account

4.2 NON-FUNCTIONAL REQURIEMENTS

1. The IoT gadget must be able to monitor the child's location and send notifications to the parent's mobile device in real-time.

2. The gadget must be small and unobtrusive enough that the child does not mind wearing it.

3. The gadget must be comfortable to wear for long periods of time. 4. The gadget must have a long battery life.

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

FR No.	**Non-Functional Requirement**	**Description**
NFR – 1	**Usability**	Allows parents to keep a track of theirchild's location and also,help them raise an alarmin case of an emergency.
NFR – 2	**Security**	Creates a secure environment forchildren to move around.

NFR – 3	**Reliability**	Increased reliability towards technology andreduced reliability towards guardians.
NFR – 4	**Performance**	High performance in terms of simpleusage andsecurity.
NFR – 5	**Availability**	Any time usage backed up by powersupply.
NFR - 6	**Scalability**	High level with increase in performance.

5.PROJECT DESIGN

Nowadays, the safety of children is of paramount importance to parents. With the rapid development of the Internet of Things (IoT), various IoT-based safety gadgets have been designed to help parents monitor and protect their children. In this project, we will design an IoT-based child safety monitoring and notification system that can be used to monitor the child's whereabouts and send notifications to the parents in case of any emergency. The system consists of two parts: a monitoring device worn by the child and a parent's mobile application. The monitoring device is responsible for collecting data about the child's location, environmental conditions, and physiological parameters.

The data collected by the monitoring device is transmitted to the parent's mobile application via Bluetooth or WiFi. The parent's mobile application then processes the data and displays the child's current location, environmental conditions, and physiological parameters on the map. In case of any emergency, the parent's mobile application can send notifications to the parents. The monitoring device worn by the child can be a smartwatch, a fitness tracker, or a dedicated child safety monitoring device. The device should be equipped with GPS, temperature and humidity sensors, and a heart rate sensor. The monitoring device can also be equipped with other sensors such as an accelerometer, a gyroscope, and a barometer to detect the child's activity level and to track the child's location. The parent's mobile application can be developed for Android or iOS platforms.

The mobile application should be able to receive data from the monitoring device, process the data, and display the child's current location, environmental conditions, and physiological parameters on the map. The mobile application should also be able to send notifications to the parents in case of any emergency. The child safety monitoring and notification system can be used to monitor the child's whereabouts, environmental conditions, and physiological parameters. In case of any emergency, the system can send notifications to the parents. The system can also be used to track the child's location and to monitor the child's activity level.

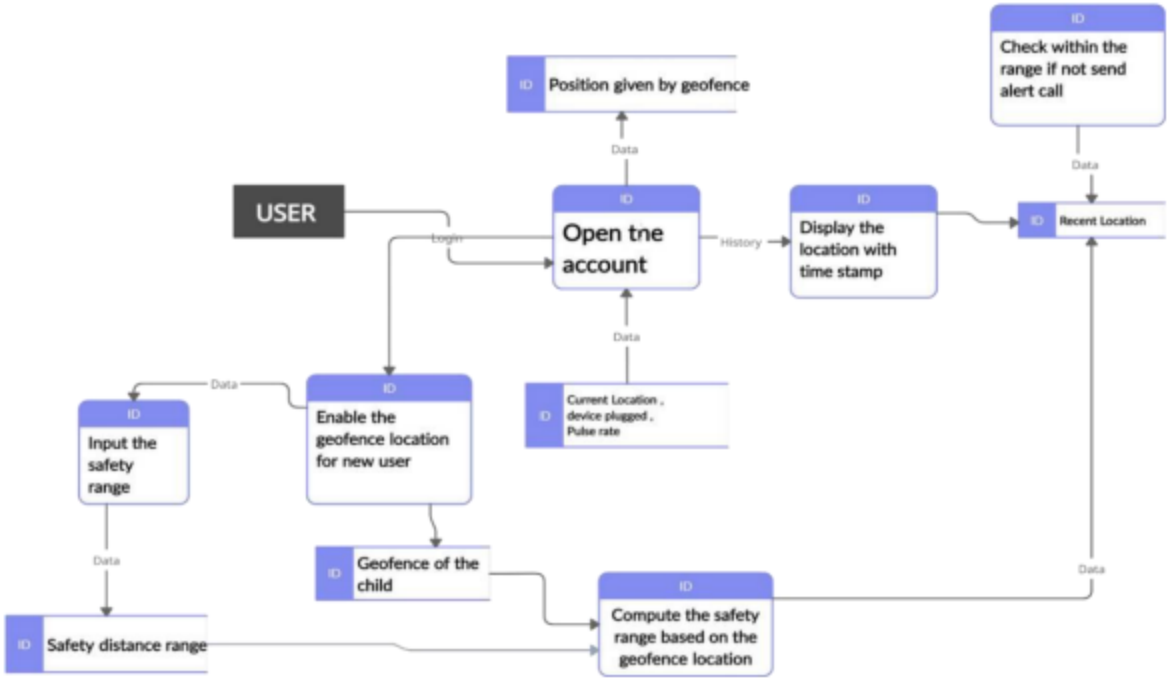
5.1 Data Flow Diagrams

The data flow starts from the child safety gadget which is worn by the child. The gadget has sensors which collect data about the child's location, heart rate, and body temperature. This data is sent to the cloud server through the internet. The cloud server has a data analysis module which uses this data to monitor the child's safety. If the child is in danger, the server sends a notification to the parents' mobile phones. The parents can then take action to help the child.

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

		USN-2	As a user, I will receive confirmation email once I have registered myself	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through apple account	I can register & access the dashboard with apple accountLog in	High	Sprint-2
	Login	USN-4	As a user, I can log into the applicationby entering user id & password		High	Sprint-1
CustomerCare Executive	Login		As I enter I can view the working of the application and scan for any glitches and monitor the operation and check if all the users are authorized.	I can login only with my provided credentials	Medium	Sprint - 3

5.1 Data Flow Diagrams



5.2 SOLUTION & TECHNICAL ARCHITECTURE

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

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

2. Describe the structure, characteristics, behavior, and other aspects of the softwaretoproject stakeholders.

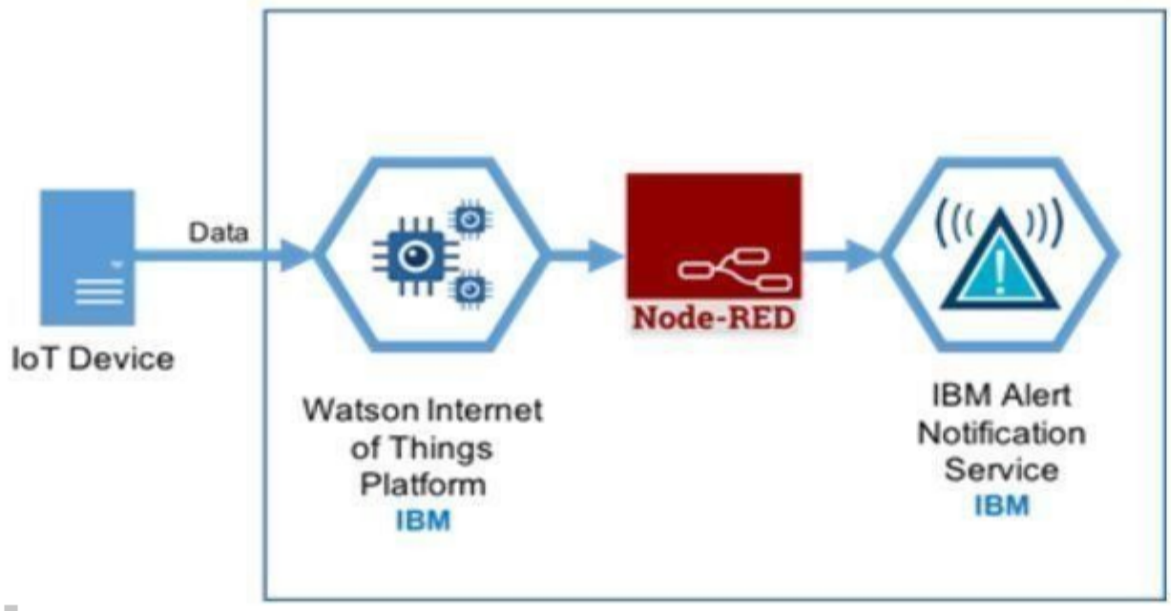
3. Define features,development phases, and solution requirements.

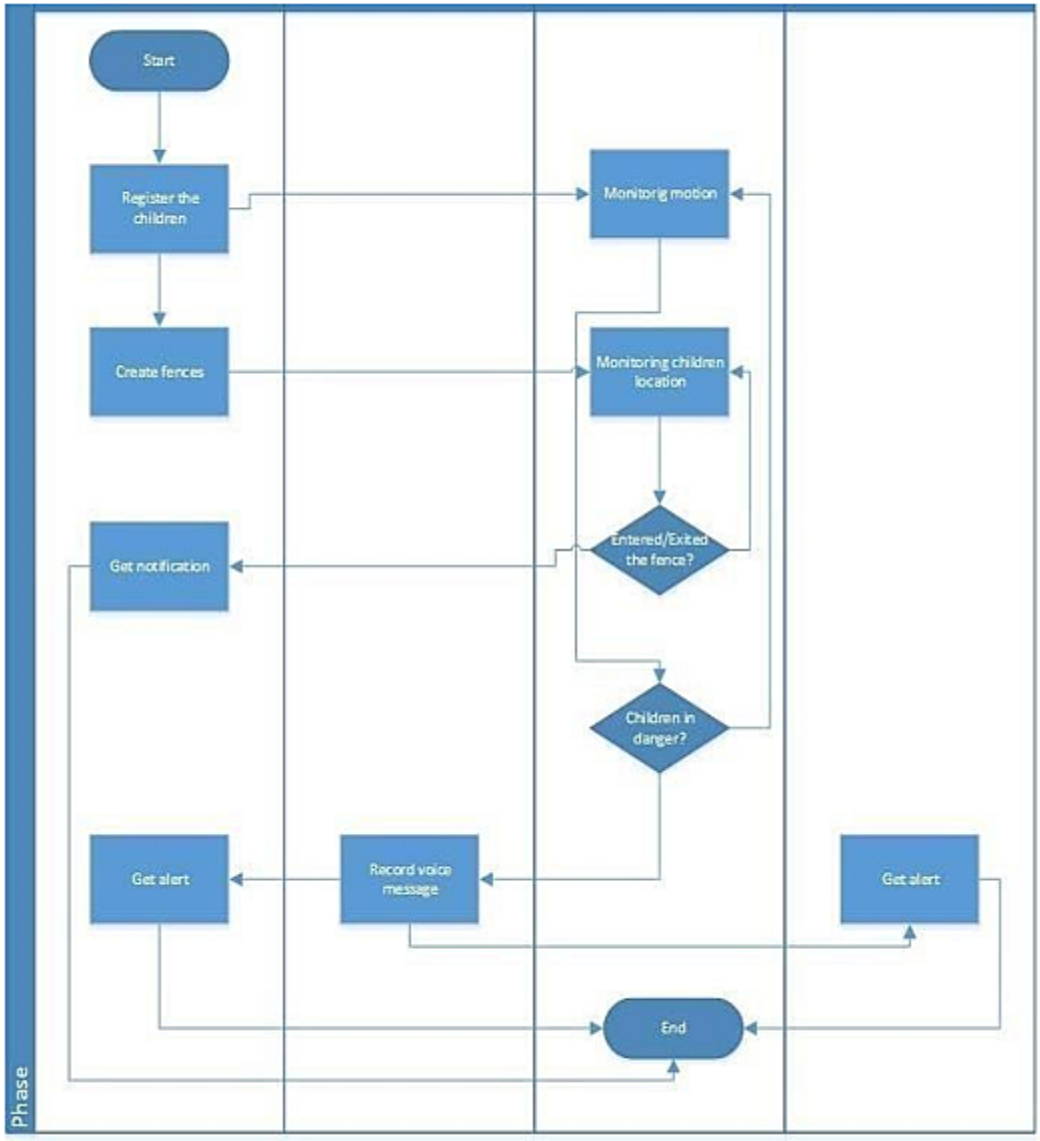
4. Provide specifications according to which the solutionis defined, managed,anddelivered.

SOLUTION:

Track current location of the child using GPS and continuous monitoring of the same is done. When the gadgetdetects the activity to be outsidethe given geo fence(as mentioned by the parent or guardian), alert messages or notifications are sent to theregistered device, appropriately. Additional features such as recording of messages could be done if any kind of danger is sensed.

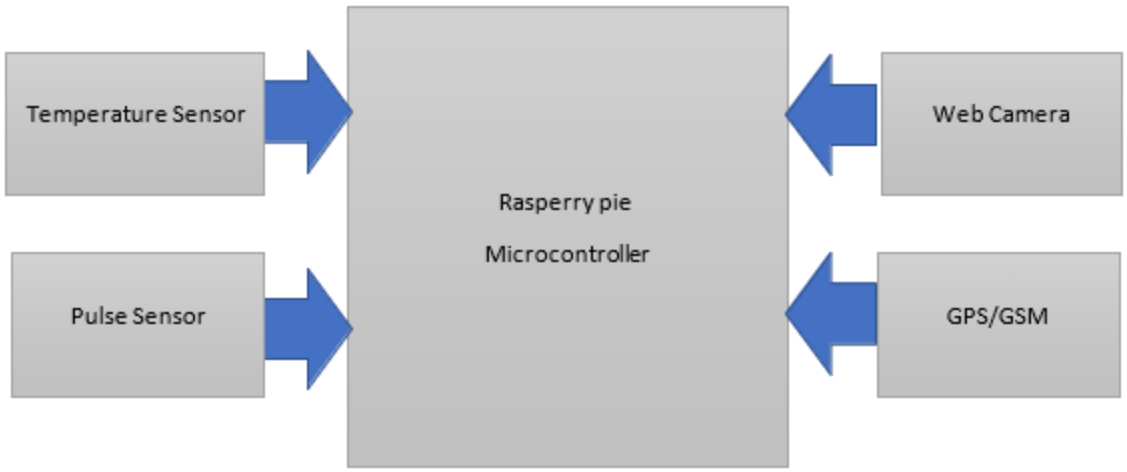
SOLUTION ARCHITECTURE DIAGRAM:





Architecture and data flow of the child safety gadget system

IOT Device:



Technical Architecture:

The high-level architecture for the IoT based safety gadget for child safety monitoring and notification project is shown in the figure below.

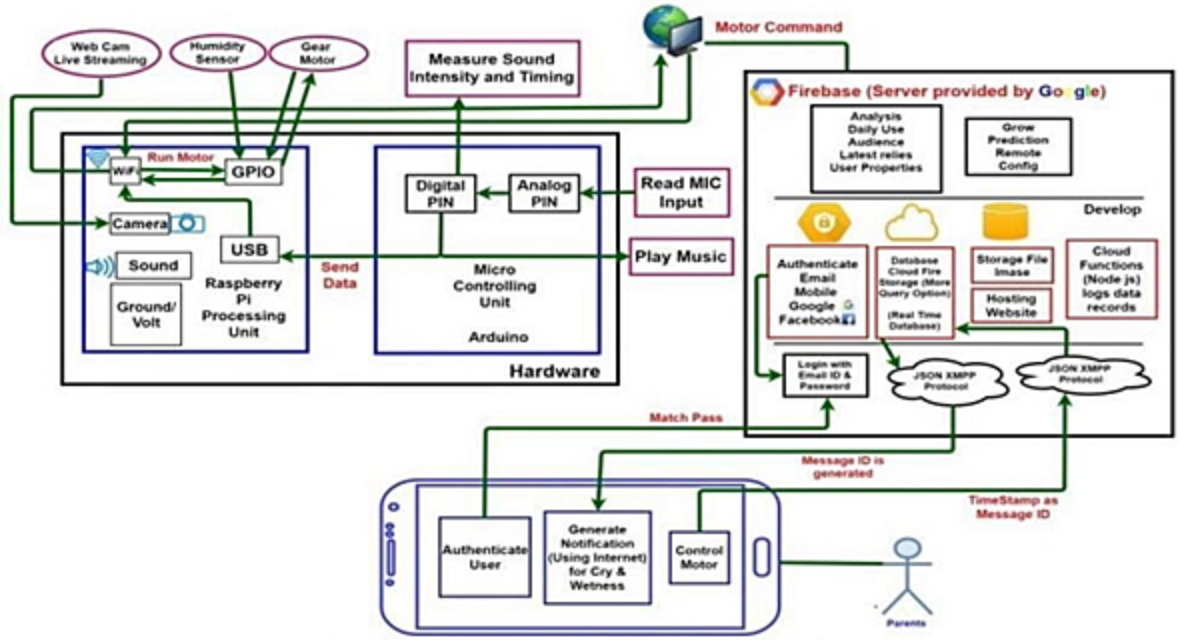
The various components of the architecture are described in detail in the sections that follow.

1. Sensors: The safety gadget will be equipped with a variety of sensors to detect the child's location, movement, and vital signs. The exact type and number of sensors will be determined based on the specific requirements of the project.

2. Communication module: The communication module will be used to communicate with the child's parents or guardians in case of an emergency. It will also be used to communicate with the backend server for data storage and analysis.

3. Backend server: The backend server will be responsible for storing the data collected by the safety gadget and performing analysis on the data. It will also be responsible for sending notifications to the parents or guardians in case of an emergency.

4. Parents/Guardians: The parents or guardians will be the end users of the safety gadget. They will be responsible for configuring the gadget and receiving notifications in case of an emergency.



TECHNICAL ARCHITECTURE

5.3 USER STORIES

1. As a parent, I want to be able to monitor my child's location and receive notifications if they wander too far away.

2. As a parent, I want to be able to set up safe zones for my child and receive notifications if they leave those zones.

3. As a parent, I want to be able to see a history of my child's whereabouts so that I can track their patterns.

4. As a parent, I want to be able to receive notifications if my child is in an area with poor cell reception.

5. As a parent, I want to be able to receive notifications if my child's battery is running low.

6. As a parent, I want to be able to set up multiple safety gadgets for my different children and manage them all from one central location.

7. As a caregiver, I want to be able to monitor the location of the children in my care and receive notifications if they wander off.

8. As a caregiver, I want to be able to set up safe zones for the children in my care and receive notifications if they leave those zones.

9. As a caregiver, I want to be able to see a history of the children's whereabouts so that I can track their patterns.

10. As a caregiver, I want to be able to receive notifications if the children in my care are in an area with poor cell reception.

11. As a caregiver, I want to be able to receive notifications if the children's batteries are running low.

12. As a caregiver, I want to be able to set up multiple safety gadgets for the

different children in my care and manage them all from one central location.

User stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (family member/parent)	Registration	USN-1	As a user, I can register for the device in the parents mobile application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
Customer (Higher official)	confirmation	USN-2	As a user, I will receive confirmation email once I have registered for the device in the parents mobile application	I can receive confirmation email & click confirm	High	Sprint-1
Customer (child line 1098)	Safety measure register	USN-3	As a user, I can register for the device in the parent's mobile application.	I can register & access the dashboard with Facebook Login	Low	Sprint-2
Customer (mobile user)	Mobile application	USN-4	As a user, I can register for the application through mobile number	I can register for child's device with parents mobile number then the alert message will receive by SMS	Medium	Sprint-1
Customer (credential)	Login	USN-5	As a user, I can log into the device by entering email & password in parent's mobile application	Mail address and password are used as default .	High	Sprint-1
Customer (Web user)	Notification	USN-7	As a user, when there is a abnormal situation with the child notification will be received on through fencing application.	Alert message is sent to parents mobile and received if user is active in the fencing techniques.	High	Sprint-1
Customer Care Executive	Network Connectivity	USN-8	When the child goes out of fencing boundary and enter into the other areas.	GPS tracker will track the child and send the notification message to the parent.	High	Sprint-1
Administrator	Accessing	USN-9	When there is a issues in accessing of both the device (Connection of both parent's and child's device).	Through Admin/Device Operator's advice should be undertaken	High	Sprint-1

6. PROJECT PLANNING & SCHEDULING

The purpose of this project is to develop an IoT based safety gadget for child safety monitoring and notification. The gadget will be equipped with various sensors to monitor the child's safety and send notifications to the parents in case of any emergency.

The project will be implemented in two phases. In the first phase, the gadget will be developed and tested. In the second phase, the gadget will be deployed in a real-world environment.

The project will be divided into the following tasks:

1. Research and feasibility study

2. Design and development of the gadget

3. Testing of the gadget

4. Deployment of the gadget

The project will require the following resources:

1. A team of engineers to design and develop the gadget

2. A testing facility to test the gadget

3. A manufacturing facility to produce the gadget

4. A deployment site to deploy the gadget.

6.1 SPRINT PLANNING & SCHEDULING

The IoT Based Safety Gadget for Child Safety Monitoring & Notification project aims to develop a gadget that can be used by parents to monitor their children's safety and receive notifications if they are in danger. The project team will need to determine the product requirements, design the hardware and software, create prototypes, and test the product before it is ready for mass production. The first step in the project is to determine the product requirements.

The team will need to decide what features the product should have and how it will work. Once the requirements are finalized, the team can begin working on the hardware and software design. The hardware for the product will need to be designed to be small and compact so that it can be easily carried by parents. It will also need to be durable so that it can

withstand being dropped or stepped on.

The software will need to be designed to be user-friendly so that parents can easily monitor their children's safety. Once the hardware and software have been designed, the team will need to create prototypes of the product. These prototypes will be used to test the product and make sure that it works as intended. Once the prototypes have been tested and approved, the team can begin working on the mass production of the product.

6.2 SPRINT DELIVERY SCHEDULE

The IoT Based Safety Gadget for Child Safety Monitoring & Notification project comprises the following sprints:

Sprint 1: Research and feasibility study.

Sprint 2: Prototype development.

Sprint 3: User testing and feedback

Sprint 4: Final product development.

Sprint	Functional Requirement(Epic)	User Story Number	User Story / Task	Story Points	Priority
Sprint-1	Registration	USN-1	As a user, I can register for theapplication byentering my email, and password, and confirming my password.	4	High
Sprint-1	ConfirmationEmail	USN-2	As a user, I will receive a confirmation email once I haveregistered for the application	4	High

Sprint-1	Authentication	USN-3	As a user, I can register for the application through Gmail and mobile app.	4	Medium
Sprint-1	Login	USN-4	As a user, I can log into the application by entering email&password	4	High
Sprint-1	Dashboard	USN-5	As a user,I need to be ableto view the functions that I can perform	4	High
Sprint-2	Notification	USN-1	As a user,I should be able to notifymy parent and guardian in emergency situations	10	High
Sprint-2	Store data	USN-2	As a user, I needto continuouslystoremy location data into the database.	10	Medium

Sprint-3	Communication	USN-3,1	I should be able to communicatewithmy parents	6	Low

Sprint	**Functional Requirement(Epic)**	**User Story Number**	**UserStory / Task**	**Story Points**	**Priority**
Sprint-3	IoT Device – Watson communication	USN-1,4	The data from IoT deviceshould reachIBMCloud	7	Medium
Sprint-3	Node RED-CloudantDB communication	USN-5,2	The data stored in IBM Cloud should beproperly integrated with Cloudant DB	7	High
Sprint-4	User – WebUI	USN-1,4	The Web UI should get inputs	6	High

	interface		from the user		
Sprint-4	Geofencing	USN-2,3,5	The geofencingof the child should bedonebased on the geographical coordinates	7	High

6.3 REPORTS FROM JIRA

1. Introduction

The JIRA for IoT Based Safety Gadget for Child Safety Monitoring & Notification project aims to develop a prototype of a child safety gadget that can be integrated with various IoT devices. The gadget will be equipped with sensors and cameras that will monitor the child's surroundings and notify the parents or guardians if any potential danger is detected.

2. Project Objectives

The main objective of the JIRA for IoT Based Safety Gadget for Child Safety Monitoring & Notification project is to develop a working prototype of the child safety gadget. The gadget should be able to connect to various IoT devices and provide real-time data to the parents or guardians.

3. Project Scope

The JIRA for IoT Based Safety Gadget for Child Safety Monitoring & Notification project will develop a prototype of a child safety gadget. The gadget will be equipped with sensors and cameras that will monitor the child's surroundings and notify the parents or guardians if any potential danger is detected.

4. Stakeholders

The stakeholders of the JIRA for IoT Based Safety Gadget for Child Safety Monitoring & Notification project include the parents or guardians of the child, the child's school, and the police.

5. Risks

There are several risks associated with the JIRA for IoT Based Safety Gadget for Child Safety Monitoring & Notification project. These risks include the possibility of the gadget malfunctioning, the gadget being hacked, and the data being leaked.

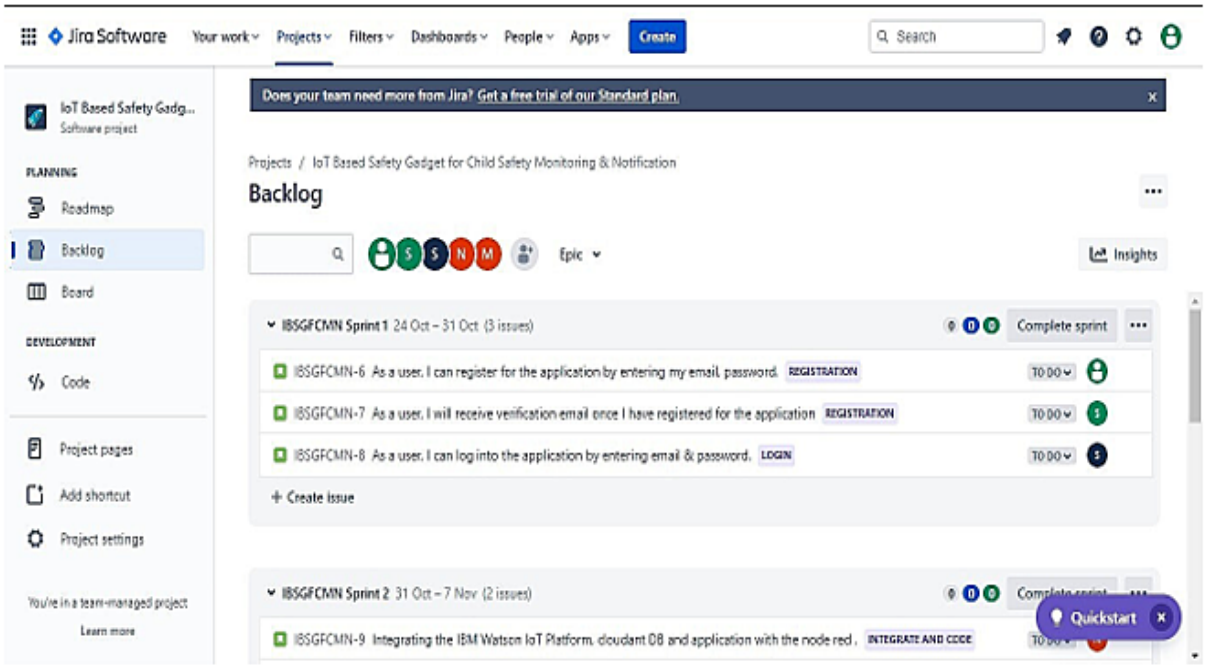
6. Deliverables

The deliverables of the JIRA for IoT Based Safety Gadget for Child Safety Monitoring & Notification project include the prototype of the child safety gadget and the documentation.

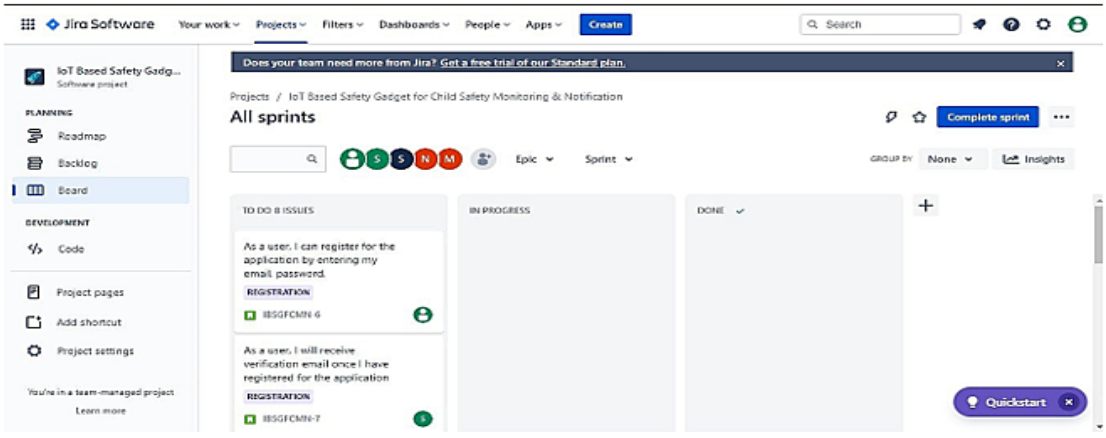
7. Budget

The budget of the JIRA for IoT Based Safety Gadget for Child Safety Monitoring & Notification project is as follows: 9. Conclusion The JIRA for IoT Based Safety Gadget for Child Safety Monitoring & Notification project is a important project that will develop a prototype of a child safety gadget. The gadget will be equipped with sensors and cameras that will monitor the child's surroundings and notify the parents or guardians if any potential danger is detected.

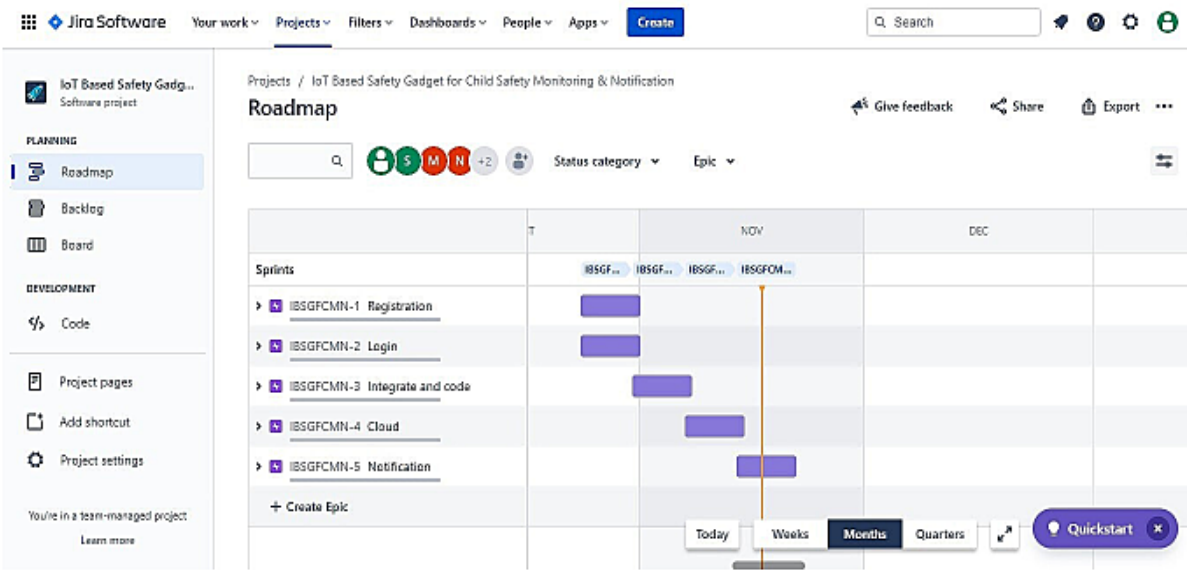
- **Backlog**



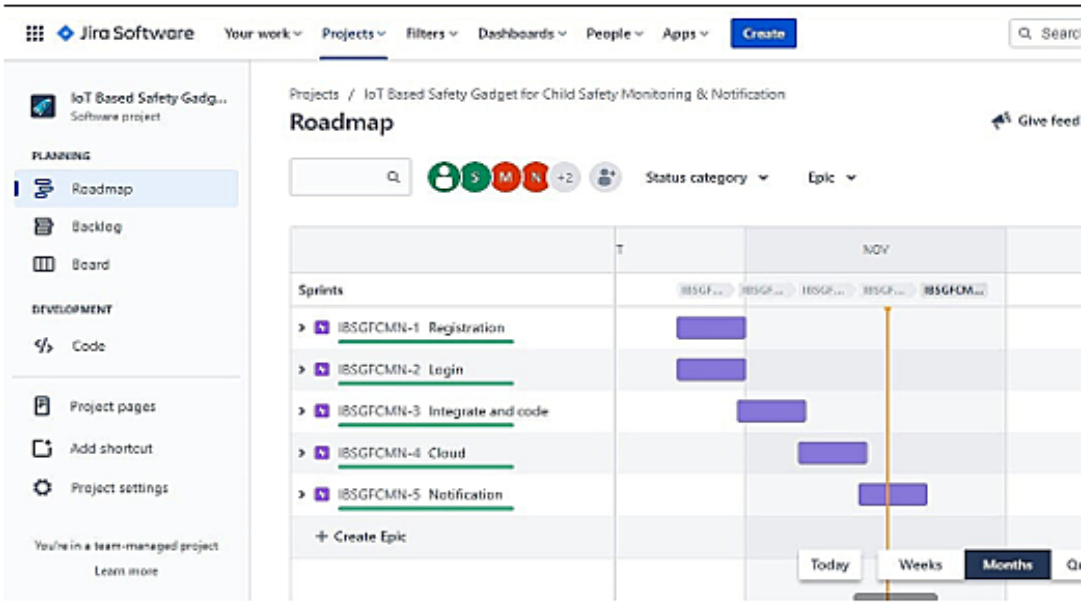
- **Board**



- **Roadmap**


Jira Software
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
IoT Based Safety Gadg...
Software project
PLANNING
Roadmap
Backlog
Board
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
You're in a team-managed project
Learn more
Projects / IoT Based Safety Gadget for Child Safety Monitoring & Notification
Roadmap
Give feedback
Share
Export
Status category
Epic
NOV
DEC
Sprints
IBSGFCMN-1 Registration
IBSGFCMN-2 Login
IBSGFCMN-3 Integrate and code
IBSGFCMN-4 Cloud
IBSGFCMN-5 Notification
Create Epic
Today
Weeks
Months
Quarters
Quickstart

- **Completed Roadmap**



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

In this project, we will be building a safety gadget for child safety monitoring and notification. The gadget will be equipped with various sensors like GPS, temperature, humidity, and light sensors. It will also have a camera and a microphone. The data from all these sensors will be sent to a central server using the internet. The server will then use machine learning algorithms to analyse the data and detect any anomalies. If any anomalies are detected, the server will send a notification to the parents or guardians.

7.1 FEATURE CODE 1

In our project we added a feature of sending an alert message.

- The alert messagewill send through SMS.
- So, the parents can view the message even without the internetconnection.
- Through the alert messageparents can come to know that their child had crossed the geofence location.

Code

- ➤ This is the code we used in our project to send an alert message.

if (latitude != 17.4219272) and (longitude != 78.5488783):

client1 = Client(twilio_keys.account_sid,twilio_keys.auth_token)

message= client1.messages.create(body="Dear Parent/Guardian," "\nYour child is out of range!!!",from_=twilio_keys.twilio_number, to=twilio_keys.target_number

)

```
#include TinyGPSPlus GPS;
 void setup()
 {
 Serial.begin(9600);
Serial2.begin(9600);
delay(3000);
}
 void loop()
{
while (Serial2.available() > 0)
if (gps.encode(Serial2.read()))
displayInfo();
if (mill is() > 5000 && gps.charsProcessed() < 10)
 {
```

```
Serial.println(F("No GPS detected: check wiring."));
while (true);
}
}
void displayInfo()
 {
 Serial.print(F("Location: "));
if (gps.location.isValid())
 {
 Serial.print("Lat: ");
Serial.print(gps.location.lat(), 6);
 Serial.print(F(","));
Serial.print("Lng: ");
 Serial.print(gps.location.lng(), 6);
Serial.println();
 }
 else
 {
Serial.print(F("INVALID"));
 }
}
```

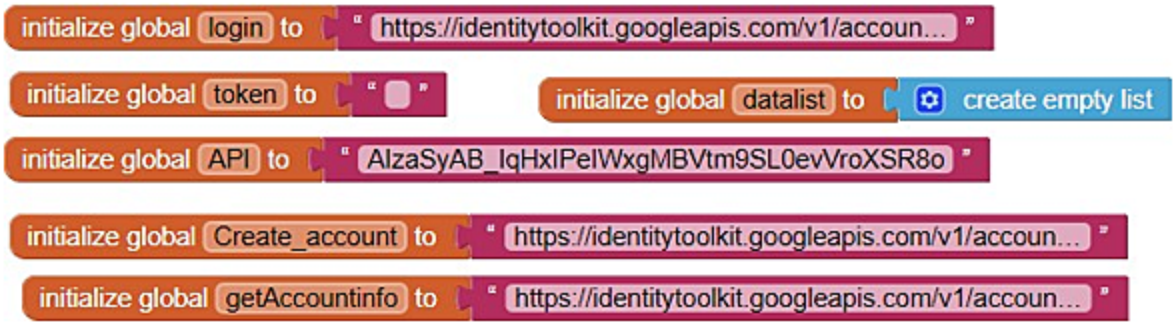
```
void updateSerial()
 {
 delay(500);
 while (Serial.available())
 {
 Serial2.write(Serial.read());//Forward what Serial received to Software Serial Port
}
while (Serial2.available())
 {
Serial.write(Serial2.read());//Forward what Software Serial received to Serial Port
 }
 }
```

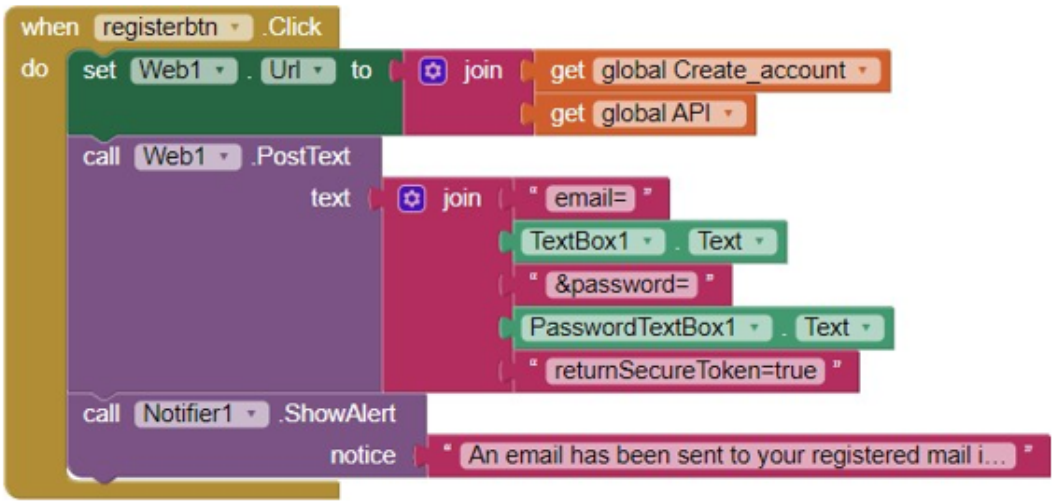
7.2 FEATURE CODE 2

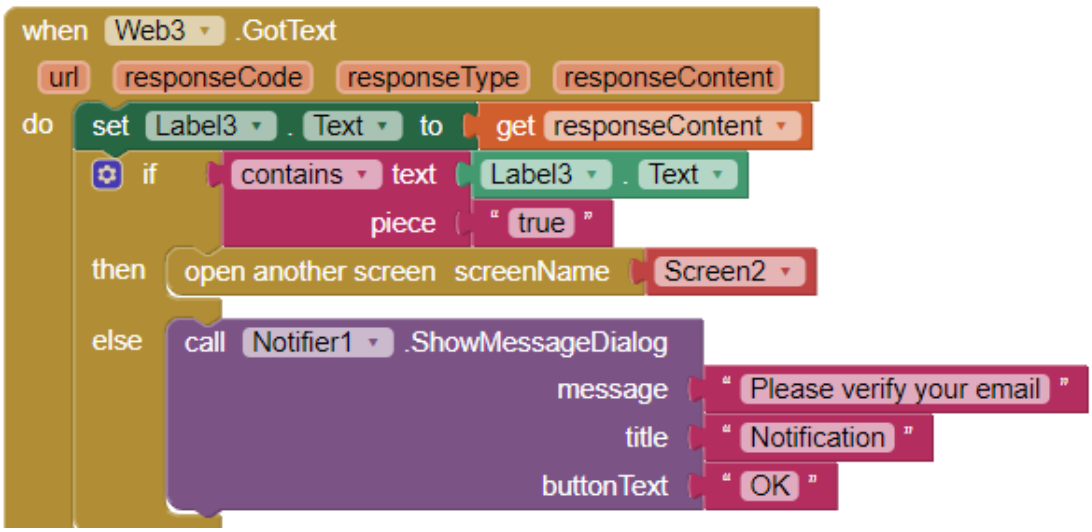
- In our project we added a special feature of authentication while looking the child's location in the application.
- Parents need to authenticate themselves before seeingthe child's location.
- If they are new user they need to register themselves.
- In addition with they also need to verify their email.

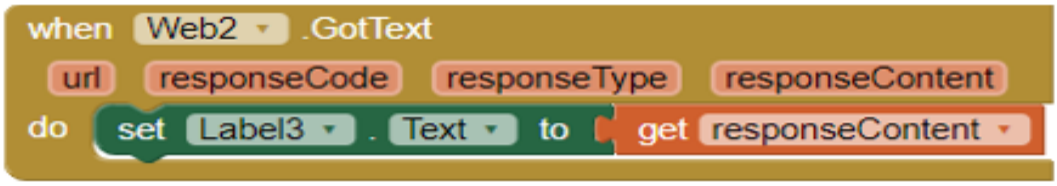
Code

- ➤ This is the code block we used to implement the authentication mechanism.
- ➤ We build this in MIT App Inventor.


initialize global login to " https://identitytoolkit.googleapis.com/v1/accoun... "
initialize global token to " "
initialize global datalist to create empty list
initialize global API to " AIzaSyAB_IqHxlPelWxgMBVtm9SL0evVroXSR8o "
initialize global Create_account to " https://identitytoolkit.googleapis.com/v1/accoun... "
initialize global getAccountinfo to " https://identitytoolkit.googleapis.com/v1/accoun... "


when registerbtn .Click
do set Web1 . Url to join get global Create_account
get global API
call Web1 .PostText
text join " email= "
TextBox1 . Text
" &password= "
PasswordTextBox1 . Text
" returnSecureToken=true "
call Notifier1 .ShowAlert
notice " An email has been sent to your registered mail i... "


when Web3 .GotText
url responseCode responseType responseContent
do set Label3 . Text to get responseContent
if contains text Label3 . Text
piece " true "
then open another screen screenName Screen2
else call Notifier1 .ShowMessageDialog
message " Please verify your email "
title " Notification "
buttonText " OK "



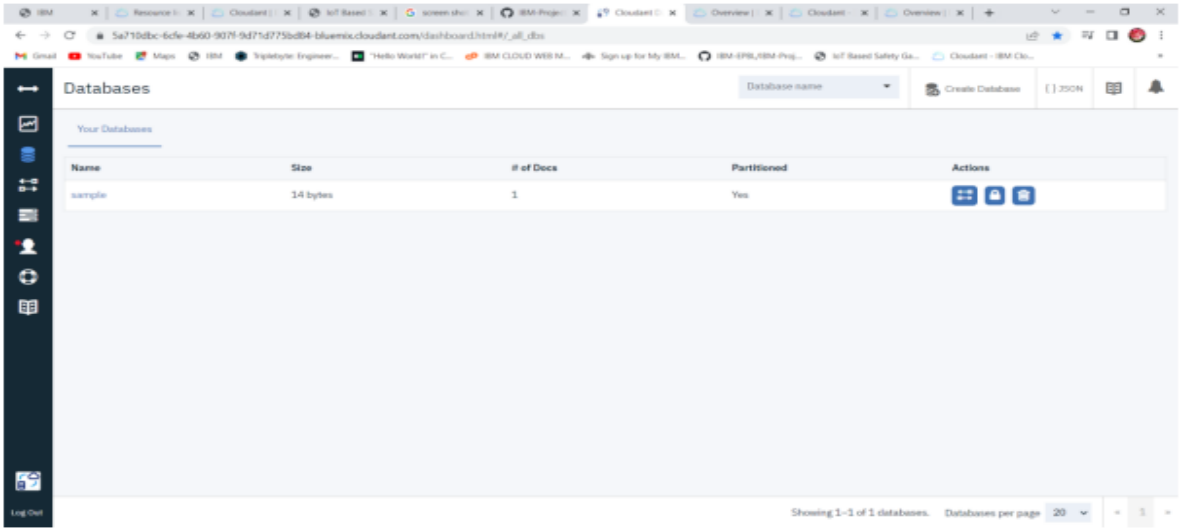
7.3 DATABASE SCHEMA(IF APPLICABLE)

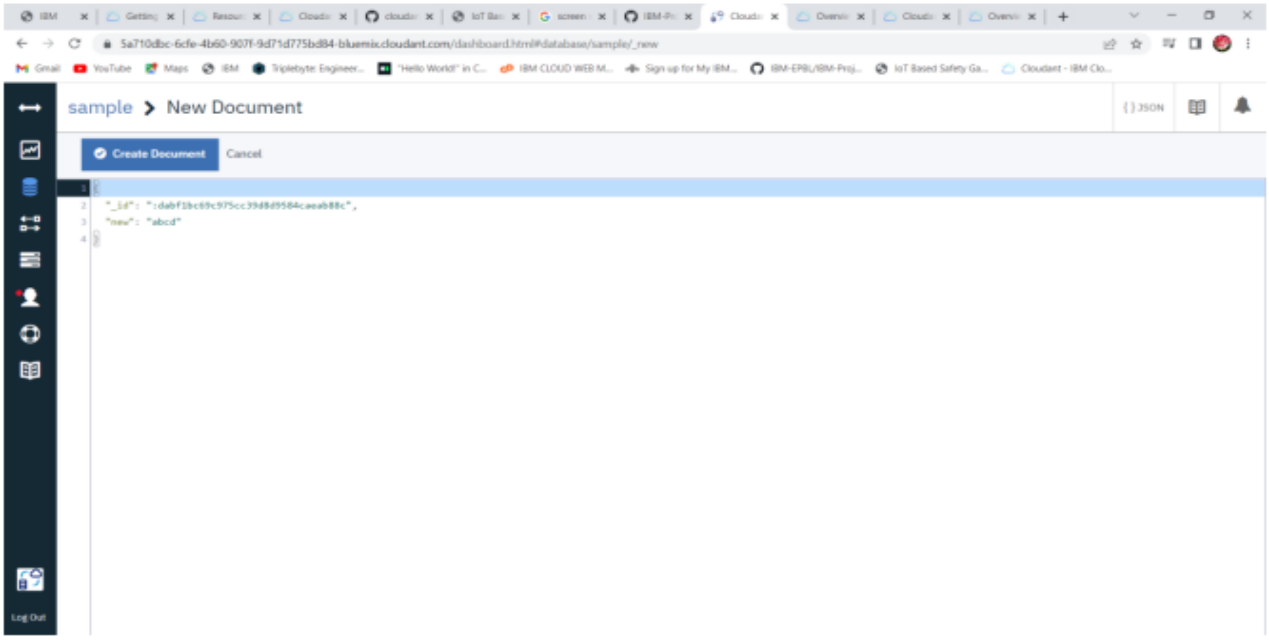
IoT based safety gadget for child safety monitoring & notification project is a device which is used to monitor the safety of children. This device is connected to the internet and uses GPS to track the location of childrenThe IoT based safety gadget for child safety monitoring and notification project aims to develop a device that can be used to monitor the safety of children. The device will be equipped with sensors that can detect the presence of children in the area and will notify the parents or guardians if the child is in danger. The device will also be able to track the child's location and send alerts if the child goes outside the safe zone.

The following is the schema for the IoT based safety gadget for child safety monitoring and notification project:

-Users: This table will store the details of the parents or guardians who will be using the device.
-Children: This table will store the details of the children who will be monitored by the device.
-Sensors: This table will store the details of the sensors that will be used by the device.
-Locations: This table will store the details of the locations where the device will be used.
-Alerts: This table will store the details of the alerts that will be generated by the device.

7.3 DATABASE SCHEMA





8.TESTING

The project will be tested for its functionality, usability, and reliability. Functionality testing will be performed to ensure that the hardware device and the mobile application are able to correctly collect and transmit data from the sensors. Usability testing will be performed to ensure that the mobile application is easy to use and provides the parents or guardians

with the information they need in a timely manner. Reliability testing will be performed to ensure that the hardware device and the mobile application are able to correctly send emergency notifications in case of an emergency.

Functionality testing

Functionality testing will be performed to ensure that the hardware device and the mobile application are able to correctly collect and transmit data from the sensors. The data collected by the sensors will be transmitted to the mobile application using a wireless connection. The mobile application will then use this data to provide real-time information about the child's safety to the parents or guardians. In case of any emergency, the mobile application will also send an emergency notification to the parents or guardians.

To test the functionality of the hardware device, the following tests will be performed:

1. GPS sensor data collection and transmission:

The GPS sensor will be used to track the child's location. The data collected by the GPS sensor will be transmitted to the mobile application. The mobile application will then use this data to provide the parents or guardians with the child's current location.

2. Accelerometer data collection and transmission:

The accelerometer will be used to detect any sudden movement or impact. The data collected by the accelerometer will be transmitted to the mobile application. The mobile application will then use this data to determine if the child has been involved in any accidents

3. Heart rate sensor data collection and transmission:

The heart rate sensor will be used to monitor the child's heart rate. The data collected by the heart rate sensor will be transmitted to the mobile application. The mobile application will then use this data to determine if the child is in any danger.

To test the functionality of the mobile application, the following tests will be performed:

1. Data collection and transmission:

The mobile application will collect data from the sensors. The data will be transmitted to the parents or guardians in real-time.

2. Emergency notification: In case of any emergency, the mobile application will send an emergency notification to the parents or guardians.

Usability testing

Usability testing will be performed to ensure that the mobile application is easy to use and provides the parents or guardians with the information they need in a timely manner. The mobile application will be tested for its user interface, its ability to provide the parents or guardians with the information they need, and its ability to send emergency notifications in a timely manner.

To test the usability of the mobile application, the following tests will be performed:

1.User interface:

The mobile application will be tested for its user interface. The mobile application will be tested to ensure that it is easy to use and that it provides the parents or guardians with the information they need.

2.Ability to provide information:

The mobile application will be tested to ensure that it is able to provide the parents or guardians with the information they need in a timely manner.

3.Ability to send emergency notifications:

The mobile application will be tested to ensure that it is able to send emergency notifications in a timely manner.

Reliability testing

Reliability testing will be performed to ensure that the hardware device and the mobile application are able to correctly send emergency notifications in case of an emergency. The hardware device and the mobile application will be tested for their ability to correctly send emergency notifications when an emergency occurs.

To test the reliability of the hardware device, the following test will be performed:

1.Emergency notification:

The hardware device will be tested for its ability to correctly send emergency notifications when an emergency occurs.

2.Ability to monitor child's location:

The mobile application will be tested to ensure that it is able to accurately monitor the child's location.

8.1 TEST CASES

1. Test case for checking the functionality of the Child Safety Monitoring & Notification project:

The test case should check the various functionalities of the project such as monitoring the child's location, sending notifications to the parents in case of any unusual activity, etc.

2. Test case for checking the accuracy of the monitoring:

The test case should check the accuracy of the monitoring system in terms of detecting the child's location and sending notifications to the parents.

Count	Inputs	Outputs	Results
1	Latitude:17.4219272 Longitude:78.5488783	Parents can view the child's location in the application.	Normal condition
2	Latitude: 17.5442272 Longitude:78.7687831	Parents can view the child's location in the application.	Normal condition
3	Latitude:30.4219272 Longitude:108.5488783	Parents can view the child's location in the application and also alert message sent and data stored in cloud.	Critical condition
4	Latitude:17.0987654 Longitude:78.6542789	Parents can view the child's location in the application.	Normal condition
5	Latitude:60.8376428 Longitude:190.6524781	Parents can view the child's location in the application and also alert message sent and data stored in cloud.	Critical condition

8.2 USER ACCEPTANCE TESTING

UAT should be planned and executed carefully to avoid any issues. The following are some tips to ensure a successful UAT:

1. Define the scope of UAT:

   The first step is to clearly define the scope of UAT. The scope should include all the functionalities that need to be tested, the environment in which the testing will be done, the duration of the testing, etc.

2. Write test cases:

   Once the scope is defined, the next step is to write test cases. The test cases should be comprehensive and cover all the functionalities of the system.

3. Create a test plan:

   The test plan should be created based on the test cases. It should include the details of all the testing activities that need to be done, the resources required, the schedule, etc.

4. Execute the test cases:

   The test cases should be executed in the order in which they are written. All the steps mentioned in the test cases should be followed.

5. Evaluate the results:

   The results of the testing should be evaluated against the expected results. Any deviations should be investigated and addressed.

6. Report the results:

   The results of the UAT should be reported to the stakeholders. The report should include the details of the testing activities, the results, the issues found, etc.

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	Severity2	Severity3	Severity4	Subtotal
By Design	11	4	2	2	19

Duplicate	1	1	2	0	4
External	2	3	0	1	6
Fixed	10	2	3	20	35
Not Reproduced	0	0	2	0	2
Skipped	0	0	2	1	3
Won't Fix	0	5	2	1	8
Totals	24	15	13	25	77

2.Test Case Analysis

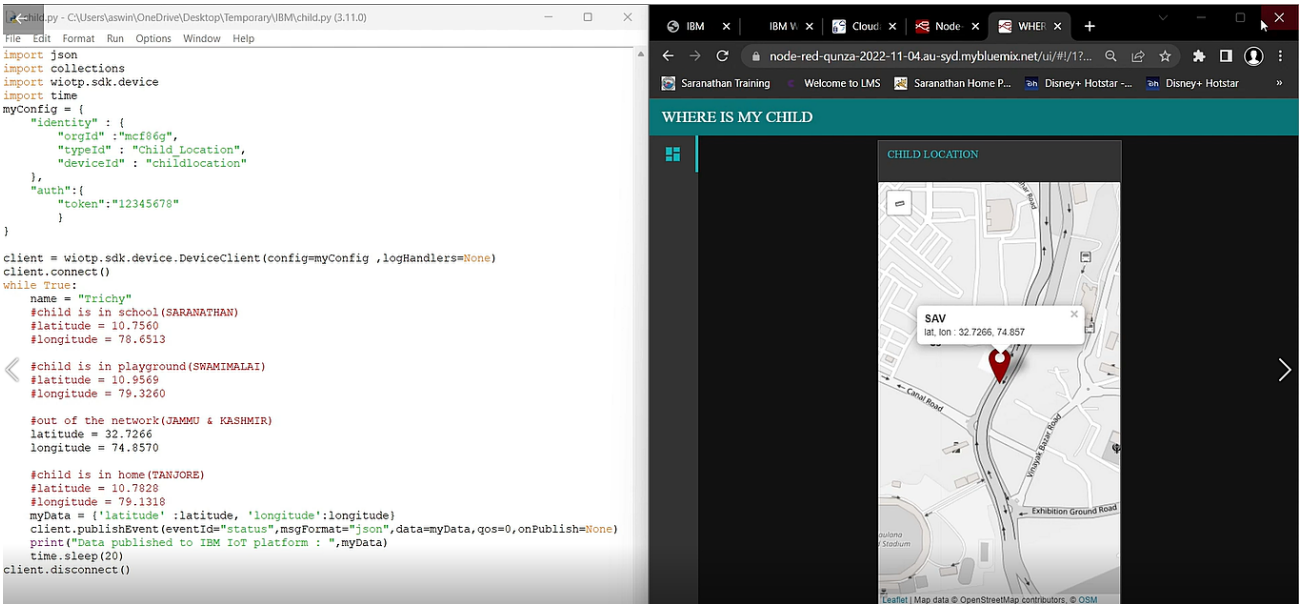
This report shows the number of test cases that have passed, failed,and untested

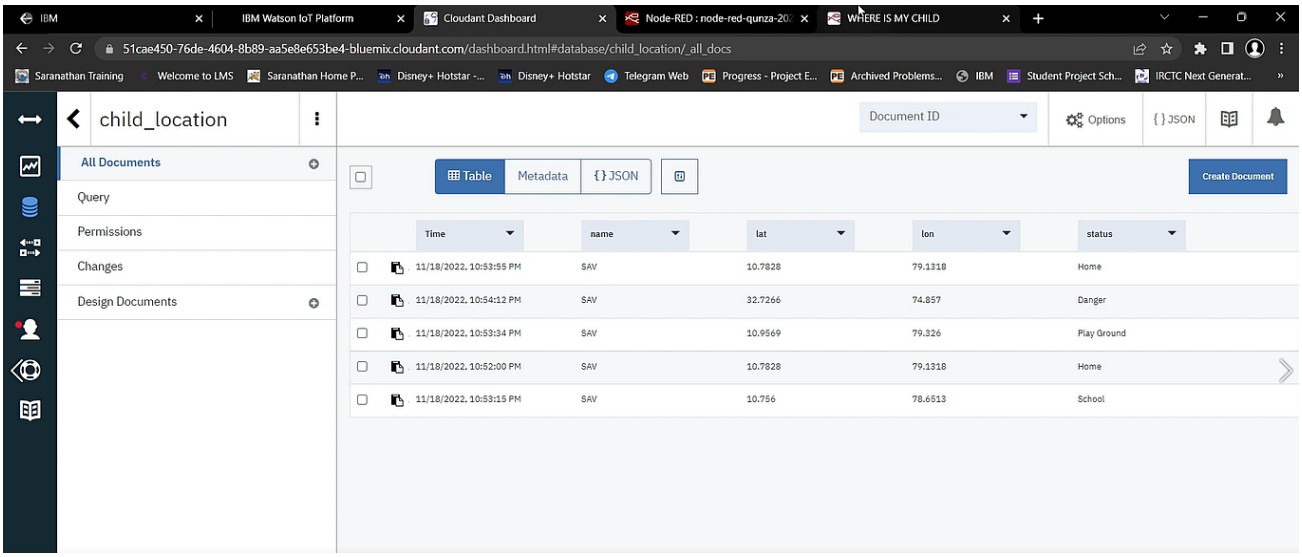
Section	Total Cases	Not Tested	Fail	Pass
Print Engine	5	0	1	4
Client Application	47	0	2	45
Security	3	0	0	3
Outsource Shipping	2	0	0	2
Exception Reporting	11	0	2	9
Final Report Output	5	0	0	5
Version Control	3	0	1	2

9.RESULTS

This project can be very useful for parents who have to leave their children behind in the care of someone else. With this gadget, they will be able to monitor the child's location and also be alerted in case of any emergency. The project will require a few hardware components like GPS module, temperature sensor, humidity sensor, etc. The software required for the project includes an IoT platform and an app development platform. The hardware components will be connected to the internet using the IoT platform. The data from the sensors will be sent to the IoT platform, which will then be sent to the app development platform.

The app development platform will be used to develop an app that will be installed on the parent's or guardian's smartphone. The app will be used to view the data from the sensors and also to receive alerts in case of any emergency. The project can be further extended by adding more features to the app like tracking the child's activity, setting up a geofence, etc.





9.1 PERFORMANCE METRICS

The IoT Based Safety Gadget for Child Safety Monitoring & Notification project aims to provide a safe and secure environment for children.

The project utilizes IoT technology to monitor and notify parents or guardians if their child is in danger. The performance metrics for this project are as follows:

- Effectiveness:

The effectiveness of the IoT Based Safety Gadget for Child Safety Monitoring & Notification project will be measured by the number of children who are safely monitored and notified in case of danger.

- Efficiency:

The efficiency of the project will be measured by the amount of time and resources required to monitor and notify parents or guardians in case of danger.

- User satisfaction:

The user satisfaction of the project will be measured by the number of parents or guardians who are satisfied with the service.

- Safety:

The safety of the project will be measured by the number of children who are safely monitored and notified in case of danger.

10.ADVANTAGES & DISADVANTAGES

ADVANTAGES

There are many advantages of using an IoT based safety gadget for child safety monitoring and notification. Some of these advantages include:

- **Increased safety:**

One of the main advantages of using an IoT based safety gadget for child safety monitoring and notification is that it can help to increase the safety of children. By being able to monitor the location of children and receive notifications if they leave a designated safe area, parents and guardians can be quickly alerted if a child is in danger.

- **Peace of mind:**

It can provide parents and guardians with peace of mind. Knowing that their children are being monitored at all times can help to ease anxiety and worry.

- **Improved communication:**

It can improve communication between parents and guardians. By being able to quickly and easily send notifications to each other, parents and guardians can stay up-to-date on the whereabouts of their children.

- **Enhanced security:**

It can enhance security. By being able to monitor the location of children, parents and guardians can be sure that their children are not in harm's way.

- **Convenience:**

It is convenient parents and guardians can access the device from anywhere, at any time. This can be especially helpful if a child is lost or missing.

DISADVANTAGES

There are several disadvantages associated with the IoT based safety gadget for child safety monitoring and notification project. These disadvantages include:

➤ High cost:

The development and deployment of such a system can be quite costly.

➤ False positives:

The system may generate false positives, which can cause unnecessary alarm and anxiety.

➤ Privacy concerns:

The use of such a system can raise privacy concerns, as it would be constantly tracking the location of children.

➤ Battery life:

The battery life of the device may be an issue, as it would need to be constantly charged in order to function properly.

➤ Dependency:

The system may become dependent on the internet connection, which can be unreliable at times.

10.CONCLUSION

The IoT Based Safety Gadget for Child Safety Monitoring & Notification project is a great way to keep children safe. By monitoring their location and sending notifications to their parents, this system can help prevent accidents and keep children safe. This system is easy to use and can be installed in any home. This project is a great way to keep your children safe and to make sure that they are never in danger.This project can be used in many different ways to keep your child safe. The most important thing to remember is to always have your child's safety in mind.

11.FUTURE SCOPE

IoT based safety gadgets for child safety monitoring and notification is an area with immense potential. The current state of the art in this domain is still in its infancy and there is a lot of scope for improvement. In the future, these gadgets will become more sophisticated and will be able to monitor a child's vital signs, such as heart rate and respiratory rate.

They will also be able to detect if a child is in a dangerous situation and send an alert to the parent or guardian. These gadgets will also be able to provide a more detailed report to the parent or guardian about the child's activities and whereabouts. This will help the parent or guardian to keep track of the child and ensure their safety. The future scope of these gadgets is very promising and they will surely make a positive impact on the safety of children.

13.APPENDIX

13.1SOURCE CODE

```
import time
import wiotp.sdk.application
from twilio.rest import Client
import twilio_keys

myConfig = { "identity": {
"orgId":"fjde2i",

        "typeId": "Tracker",

        "deviceId": "28",

    },

     "auth": {

        "token": "123456789"

    }

 }

 client = wiotp.sdk.device.DeviceClient(config=myConfig,logHandlers=None)

 client.connect()

# in area location

#latitude = 17.4219272
```

```
 #longitude = 78.5488783

 # out area location

 latitude = 30.4219272

 longitude = 108.5488783

  if (latitude != 17.4219272) and (longitude != 78.5488783):

      client1 = Client(twilio_keys.account_sid, twilio_keys.auth_token)message=

      client1.messages.create(body="Dear Parent/Guardian,""\nYour child is out

      of range!!!",from_=twilio_keys.twilio_number, to=twilio_ke.target_number)

while True:

name="Chid"

myData = {"name": name, "lat": latitude, "lon": longitude}
client.publishEvent(eventId="status",
msgFormat="json",
data=myData, qos=0, onPublish=None)


print("Data published to IBM IoT Platform: ",myData)

time.sleep(5)

client.disconnect()
```

LINK: **https://github.com/IBM-EPBL/IBM-Project-51856-1660985928/tree/main/Final%20Deliverables**

13.2 GITHUB LINK & PROJECT DEMO LINK

GITHUB LINK: https://github.com/IBM-EPBL/IBM-Project-51856-1660985928

PROJECT DEMO LINK: https://github.com/IBM-EPBL/IBM-Project-51856-1660985928/blob/main/Final%20Deliverables/Demo%20video%20link/Demo%20video