IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING AND NOTIFICATION

A PROJECT REPORT

Submitted by

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in partial fulfilment of IBM-

NALAIYATHIRAN project

BACHELOR OF ENGINEERING

IN

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VELAMMAL COLLEGE OF ENGINEERING AND TECHNOLOGY

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ABSTRACT

This paper is mainly streamed towards child safety solutions by developing 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 connect switch and alarm the parent as soon as it is unplugged.

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CHAPTER 1

INTRODUCTION :

The introduction about the child safety monitoring and notifying using IoT based gadgets are briefly discussed in this chapter.

PROJECT OVERVIEW :

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

PURPOSE :

a. As we all know, kids are the heartbeat of every parent,and when it comes to a child with special needs, parents have to be extra careful. They have to take extra care of their child.

b. Child tracker help the parents in continuously monitoring the child's location. They can simply leave their children in school or parks and create a geo-fence around The location.

c. By continuously checking the child's location notification will be generated if the child cross the geo fence. Notification will be sent according to the child's location to their parents or caretakers. The entire location data will be stored in the database.

d. child can also initiate emergency notification to the parents in case of unsafe situation.

1. Enable tracking of the child's location and capturing of data remotely such as where the child located distance etc.

2. To show the child's actual data with reference values.

3. Enable sending of notification if the child is out of location or when the device realizes abnormal condition or situation.

4. Develop a prototype of IOT wearable smart band connected to parent's Mobile apps so, that they can monitor the actual condition of children at anytime and any place.

CHAPTER 2

LITERATURE SURVEY:

The introduction about the literature survey gone through for the project are briefly discussed in the chapter.

EXISTING PROBLEM :

As we all know, kids are the heartbeat of every parent,and when it comes to a child with special needs, parents have to be extra careful. They have to take extra care of their child. 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 geo-fence around the location. By continuously checking the child's location notifications will be generated if the child crosses the geo-fence. Notifications will be sent according to the child's location to their parents or caretakers. The entire location data will be stored in the database. Child can also initiate emergency notification to the parents in-case of unsafe situation.

This research demonstrates Smart IoT device for child safety and tracking, to help the parents to locate and monitor their children.If any abnormal readings are detected by the sensor,then an SMS and phone call is triggered to the parents mobile. Also,updated to the parental app through the cloud. The system is equipped with GSM and GPS modules for sending and receiving call, SMS between safety gadget and parental phone.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. 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 BLE listener gadget an alert is provided to itself.

REFERENCSES :

[1] Child Gaurd : A child safety monitoring system

Authors: Zhigang Gao, Ke Yan, Huijuan Lu, Yanjun Luo, Yunfeng Xie.

[2] Child safety wearable device :

Authors: Akash Moodbidri, Hamid Shahnasser **Published in**:2017 IEEE.

[3] Smart child safety wearable device **:**

Authors:Bannuru Ranjeeth,B.Srinivasa reddy,Y.manoj kumar reddy, S.Suchithra , B.Pavithra.

[4] Multi-sensor wearable for child safety**:**

Authors:Ushashi, Chowdhury pranjal, Chowdary Sourav, Paul anweshwa sen.

[5] Intelligent child safety system using machine learning in Iot devices:

Authors: Aparajith, Srinivasan, S.Abirami, N.Divya, R.Akshya.

PROBLEM STATEMENT DEFINITION :

There are multiplenews-sharing apps used by a single user and are often spammedwith notifications.There is also a lot of fake news which gets shared. A news-sharing app wants to help users find relevantand important news easily every day and also understand explicitly that the news is not fake but from proper sources. While Opening app for reading a news, I'm literally getting too much of advertisements in-between the content because of these ads I was unable to read the content properly and it makes me feel irritated,App wants to help users find relevant and important news easily every day and also understand explicitly without the ads.

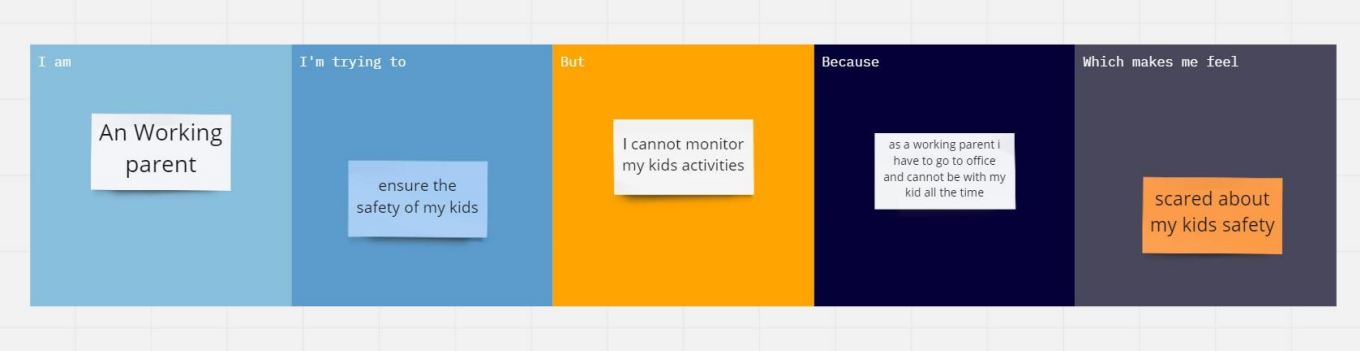


Fig 2.1 Problem Statement Definition

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	working parent	ensure the safety of my 3yr old kid	i cannot monitor my kids activities	i have to go to office	scared about my kids safety
PS-2	parent of a girl child	protect my girl child from dangers	i cannot accompany her all the time	i have to take care of the households	panic stricken

Table 2.1 Problem Statement Definition

CHAPTER 3

IDEATION & PROPOSED SOLUTION :

EMPATHY MAP :

An empathy map is a simple, easy to digtal visual that captures knowledge about user's behaviors and attitudes. it is a usefull tool hep tems better understand their users.

Creating an effective solution requires understanding the true problem and the person who is experiencing it. the exercise of creating the map help participants consider things from the user's sperspective along with his or her goals and challenge.

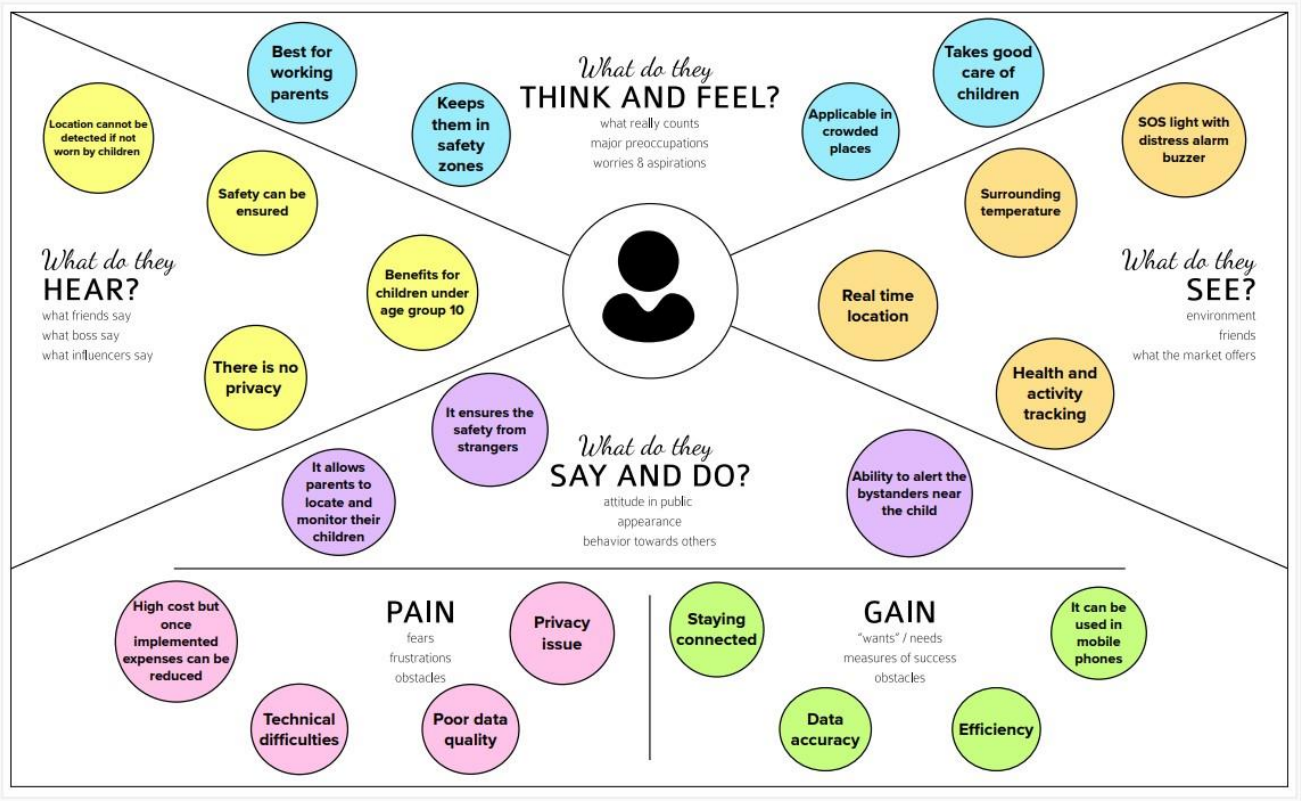


Fig 3.1 EmpathyMap Canvas

IDEATION & BRAINSTORMING :

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

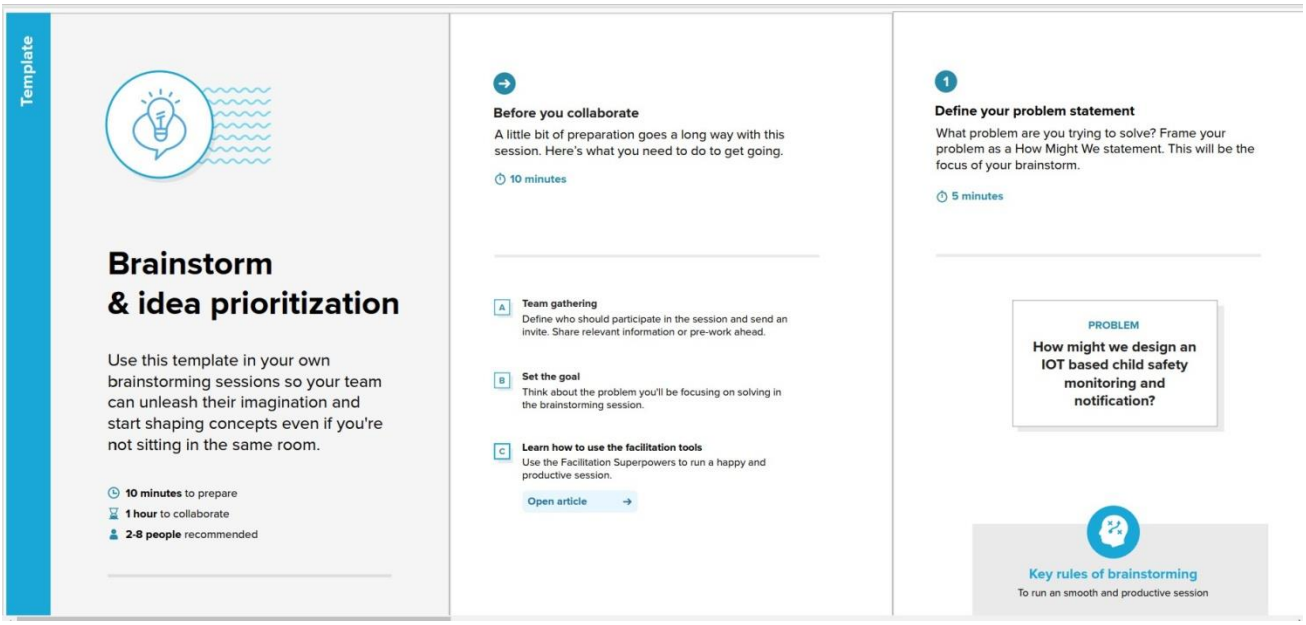


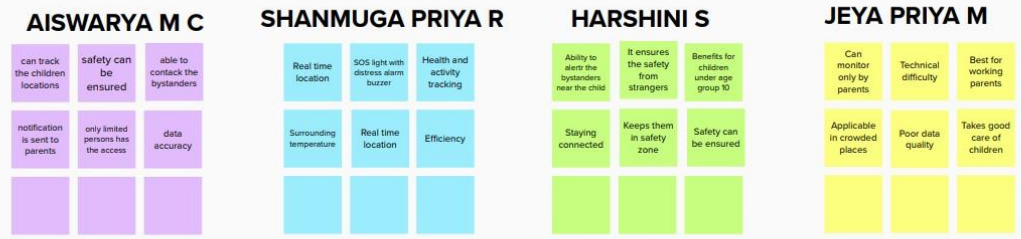
Fig 3.2 Brainstorming 1

2

Brainstorm

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

10 minutes



3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

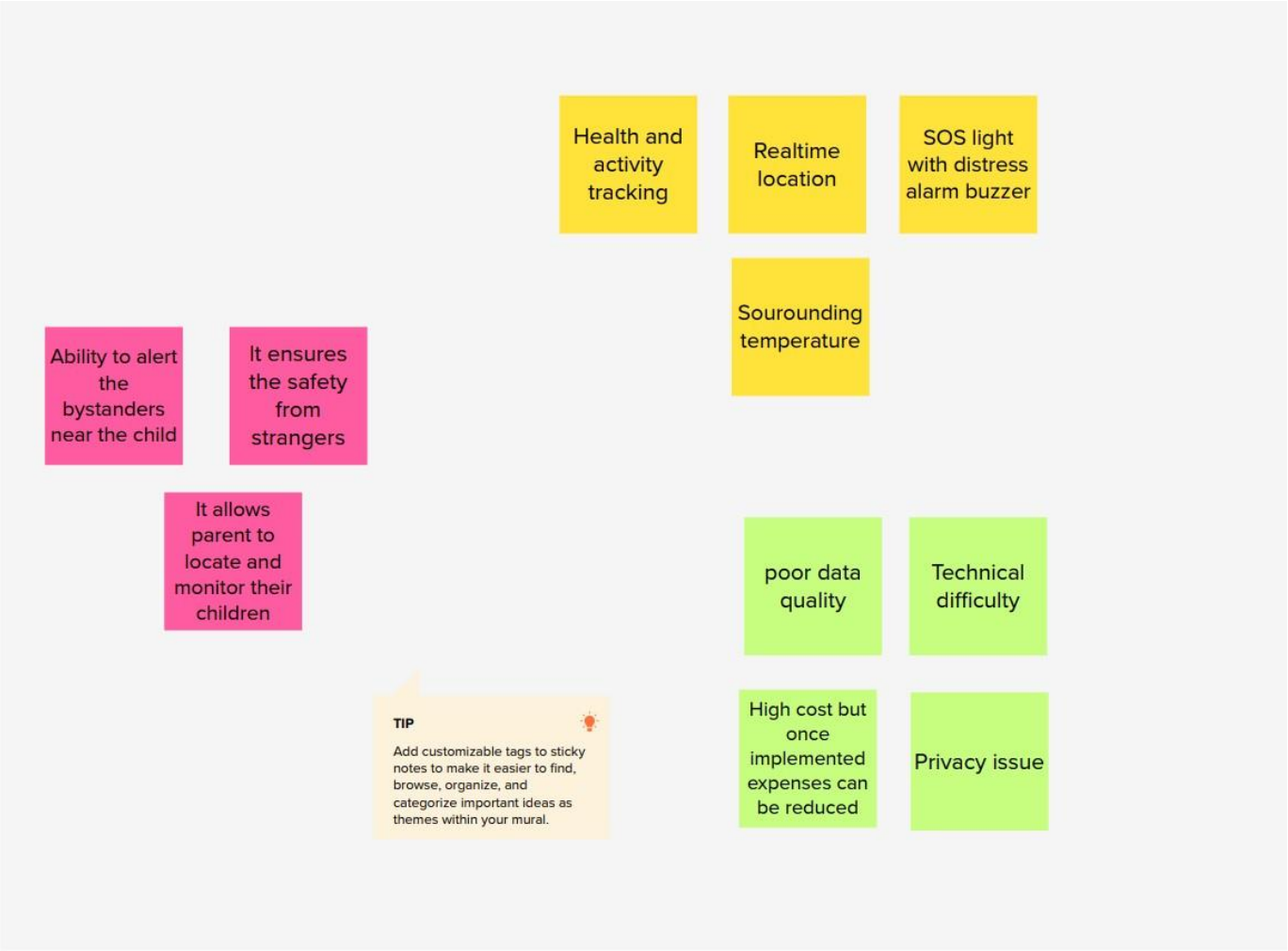


Fig 3.3 Brainstormin

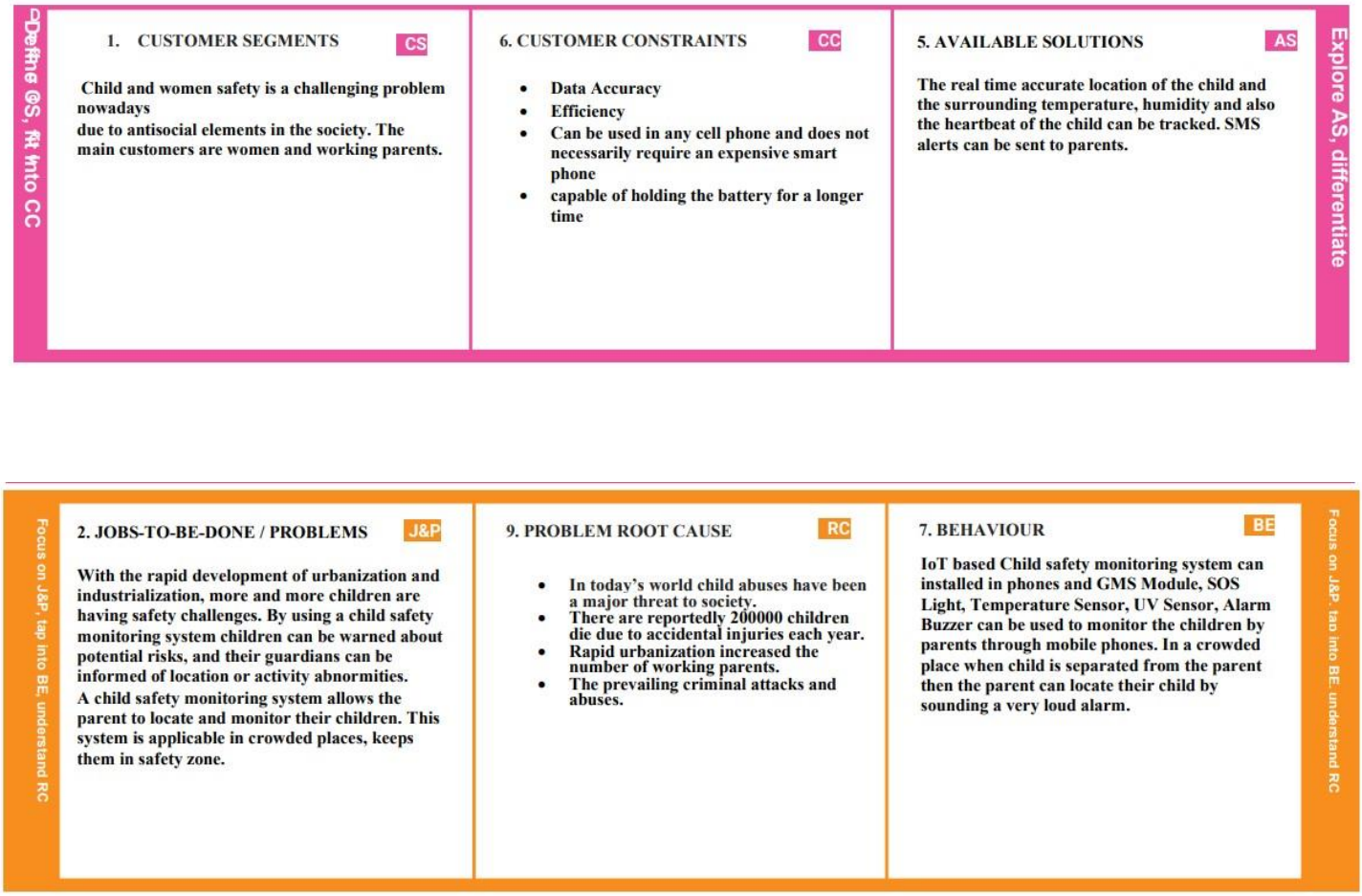
PROPOSED SOLUTION :

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	With the rapid development of urbanization and industrialization, more and more children are having safety challenges. In order to overcome the challenges, we design a child safety monitoring system where children can be warned about potential risks, and their guardians can be informed of location or activity abnormities. A child safety monitoring system allows the parent to locate and monitor their children. This system is applicable in crowded places, keeps them in safety zone.
2.	Idea / Solution description	The proposed solution is a IOT wearable device for children based on Arduino UNO and ATmega328P microcontroller that contains the real time accurate location of the child by GPS module and will also provide the surrounding temperature, humidity and also the heartbeat of a child by sensors. The secondary measure implemented was using a bright SOS Light and distress alarm buzzer present on the wearable device which when activated by the parents via SMS text should display the SOS signal brightly and sound an alarm which a bystander can easily spot as a sign of distress. The sensors are activated automatically when they are subjective to the miscellaneous activities. If any problem occurs it would alert parents through the cell phone so that they can take immediate action. The parent can get to the kid data intermittently by interfacing through this gadget. The data is stored into a cloud permanently to keep the track record of old data of the children for further reference. This device focus on the SMS text enabled communication.

3.	Novelty / Uniqueness	• 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. • To get geo coordinates of child using GPS module • To get temperature, humidity details of area of child • It displays the SOS signal brightly and sound an alarm which a bystander can easily spot as a sign of distress and reach out the child.
4.	Social Impact / Customer Satisfaction	• Improved safety index of children. • Freedom for children with special needs. • Parents feel that this device can lead to a safer community. • Easy availability and affordability. • Tracking made easier. • Guarantee peace of mind to parents.
5.	Business Model (Revenue Model)	• Selling the product directly to parents along with monthly subscriptions for tracking and notification services. • Selling the product to child care centers. • This product will be useful for working parent's community by increasing safety of their child as well as their career. • The product can be a wearable watches or bands with attractive colours so that young group can wear it as a style statement.

6.	Scalability of the Solution	• The security and safety of the child is increased than earlier. • The privacy of end user is protected as it can support only mutual authentication. • Location determination protocol can support better scalability. • The communication and computational cost are low

PROBLEM SOLUTION FIT :



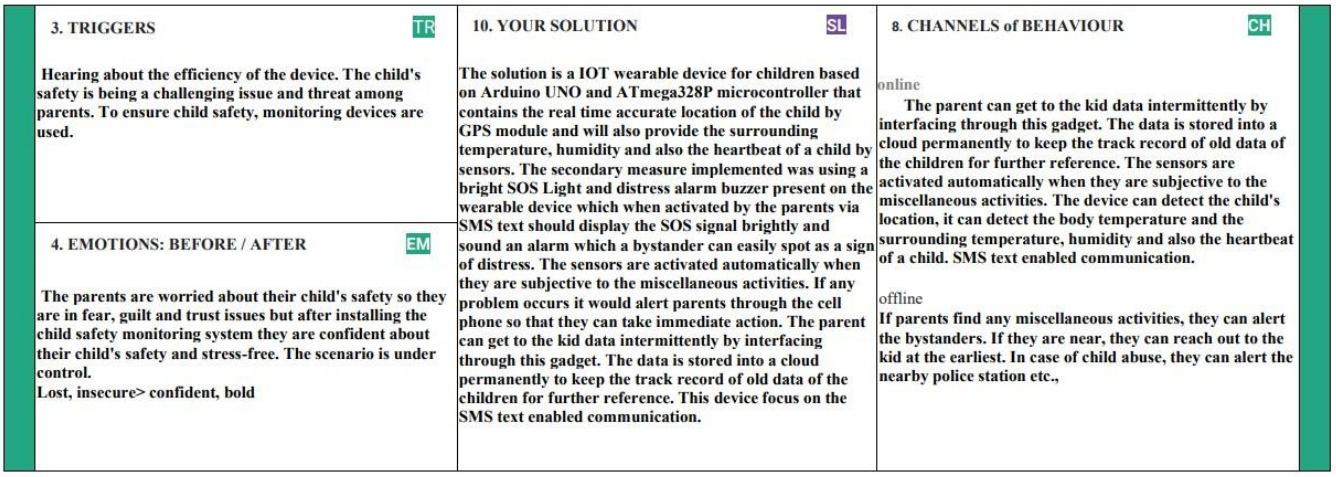


Fig 3.5 Problem SolutionFit

CHAPTER 4

REQUIREMENT ANALYSIS :

In this chapter,the requirement analysisof the proposed system has beendiscussed along with the brief explanation about its advantages.

4.4 FUNTIONAL REQUIREMENT :

Following are the functional requirements of the proposed solution.

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Interfacing with hardware	Interface the sensors with the software application so as to alert the users in case of any change in the child safety measures.
FR-4	Database Connection	Database are retrieved from IBM cloudant
FR-5	Mobile Application	Alarm and buzzer can be accessed from the mobile app

4.2 NON-FUNCTIONAL REQUIREMENT *:*

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

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	• With the rapid development of urbanization and industrialization, more and more children are having safety children.In order to overcome the challenges,we design a child safety monitoring system where children can be warned about potential risks,and their guardians can be informed of location or activity abnormalities.A child safety monitoring system allows the parent to locate and monitor their children.This system is applicable in crowded places,keeps them in safety zone.
NFR-2	**Security**	• The parents feels that this device can lead to a safer community.

		• It ensure safety from stangers and other hazardous activity. • Working parents can monitor their childs health,location. • It will be useful for working parent's community by increasing safety of their child as well as their carrier.
NFR-3	**Reliability**	• This system provides communication between parent and child. • It provides parents with the real time location,heart beat along with distress alarm buzzer for their child's surroundings and the ability to locate their child or alert bystanders in acting to rescue or comfort the child. • The application keeps track of the child periodically and updates the status of child to the user. • Thus the parents are always kept aware of their child constantly.
NFR-4	**Performance**	• Improved safety index of children • Easy availability and affordability • Tracking made easier • Freedom for children with special needs • Guarantee peace of mind to parents.

		• Guarantee peace of mind to parents.
NFR-5	**Availability**	• ATmega328p microcontroller that contains the real time accurate location of the child by GPS module and will also provide the surrounding temperature, humidity and also the heartbeat of a child by sensors. • The secondary measure implemented was using a bright SOS light and distress alarm buzzer present on the wearable device which when activated by the parents via SMS text should display the SOS signal brightly and sound an alarm which a bystander can easily spot as a sign of distress. • The sensors are activated automatically when they are subjective to the miscellaneous activities . • If any problem occurs it would alert parents through the cell phone so that they can take immediate action. • The parent can get to the kid data intermittently by interfacing through this gadget. • The data is stored into a cloud permanently to keep the track record of old data of the children for further reference. • This device focus on the SMS text enabled communication.

NFR-6	**Scalability**	• The security and safety of the child is increased than earlier. • The privacy of end user is protected as it can support only mutual authentication. • Location determination protocol can support better scalability. • The communication and computational cost are low.

This chapter dealt with the funtional and non-functional requirement analysis of proposed system.

CHAPTER 5

PROJECT DESIGN :

It is design of the project

DATA FLOW DIAGRAMS :

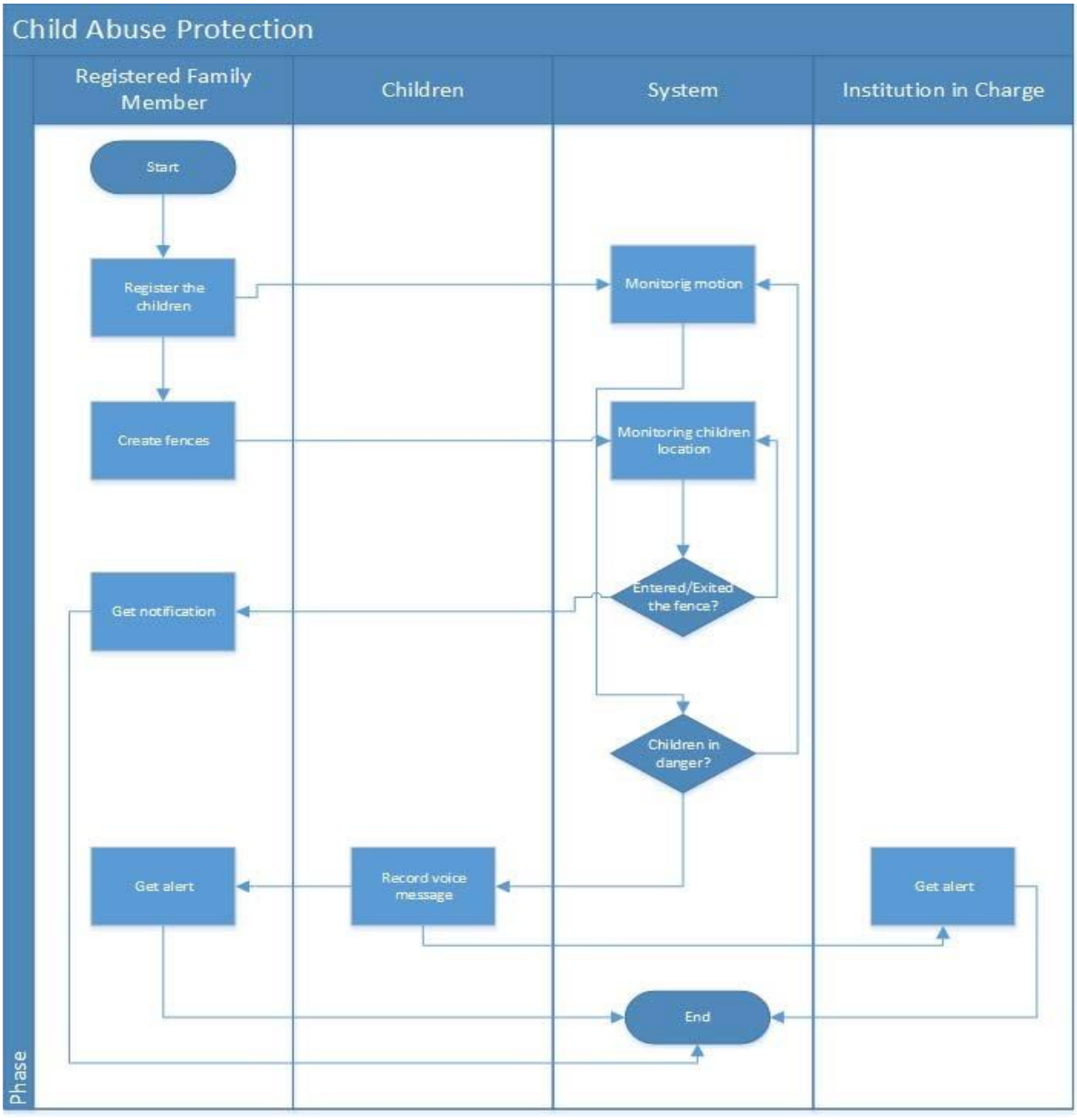


Fig 5.1 DataflowDiagram

SOLUTION & TECHNICAL ARCHITECTURE :

SOLUTION ARCHITECTURE :

Track current location of the child using GPS and continuous monitoring of the same is done. When the gadget detects the activity to be outside the given geofence(as mentionedby the parent or guardian), alert messagesor notifications are sent to the registered device, appropriately. Additional features such as recording of messages could be doneif any kind of danger is sensed.

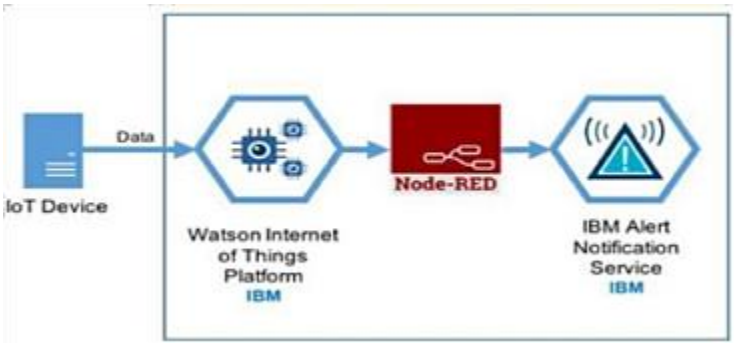


Fig 5.2 Solution Architecture Diagram

TECHNICAL ARCHITECTURE :

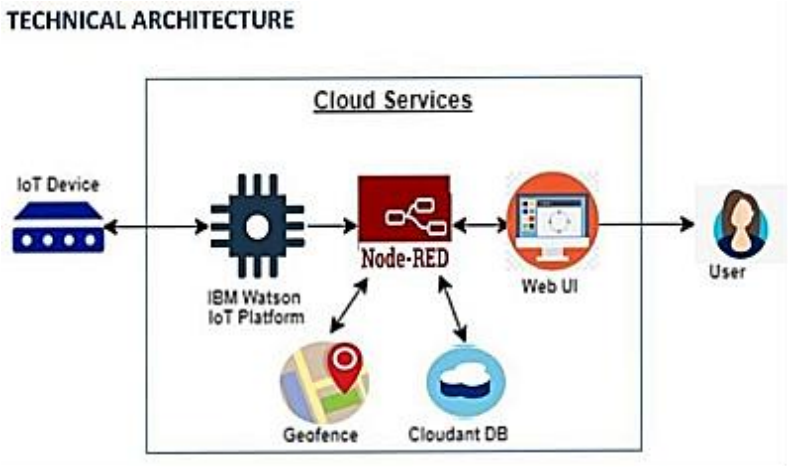


Fig 5.3 Technical Architecture Diagram

USER STORIES :

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (people)	Monitor the child safety	USN-1	As a user, I can monitor the child safety	I can maintain the security for working parents	High	Sprint-1
	Analysing Problems	USN-2	As a user, I collect the required information about the problems on child safety	I can ask the government directly.	Low	Sprint-2
		USN-3	As a user, I can monitor the temperature, location and solve the problems by using Smart IOT System	I can take remedial action immediately	High	Sprint-1
Project Designers	Identifying the problem and provide solutions	USN-4	As a user, I can sense the child safety device using sensor and monitor using IOT	I can perform these actions via IoT.	Medium	Sprint-1
		USN-5	As a user, I can test the buzzer or alarm	I can solve this problem using IOT	High	Sprint-1
			As a user, I can monitor the data is stored or not	I can monitor the child's action continuously.	Medium	Sprint-2
Customer (people)	Problem solutions	USN-6	As a user, areas can be monitored from a remote place	Checking Process	Medium	Sprint-3
	Application	USN-7	As a user, I can respond to the problems immediately	Continuous monitoring and remedial actions.	Medium	Sprint-3
	Final Process	USN-8	This IOT based safety gadget for child safety monitoring and notification is found to be cost-effective and efficient	I can take necessary action if required.	Medium	Sprint-4

CHAPTER 6

PROJECT PLANNING & SCHEDULING

SPRINT PLANNING& ESTIMATION :

MILESTONE NAME	ACTIVITIES	MILESTONE NUMBER	DESCRIPTION	COMPLETION DATE
PREREQUISITES			Create the IBM account and download the necessary softwarefor your chosen category of the project	27/08/2022
IDEATION PHASE	Literature Survey	1	Literature survey on the selected project by gatheringand referring research paper and publications	02/09/2022
	Empathy Map	1	Create an empathy map that list theuser's painsandgains	08/09/2022

	Brainstormi ng	1	Gather many different ideas fromthe team mates and prioritize the idea based on feasibilityand innovative	16/9/2022
PROJECT DESIGNPHASE -1	Propos ed Solution	2	Prepare the proposed solutiondocument that youproposed to solve the problem statement which should include feasibility ,business model …etc.	24/9/2022
	Solution Architecture	2	Prepare Solution architecture diagram for the proposed solution	01/10/2022
	Problem Solution Fit	2	Prepare Solution Fit Document forthe proposed solution	01/10/2022

PROJECT DESIGN PHASE -2	Customer Journey Map	3	Prepare a customer journey map to understand how theuser interact and experience your product	08/10/2022
	Data Flow Diagram	3	Draw the dataflow diagram for you proposed solution	12/10/2022

	Brainstorming	1	Gather many different ideas fromthe team mates and prioritize the idea based on feasibilityand innovative	16/9/2022
PROJECT DESIGNPHASE -1	Proposed Solution	2	Prepare the proposed solutiondocument that youproposed to solve the problem statement which should include feasibility ,business model …etc.	24/9/2022

	Solution Architecture	2	Prepare Solution architecture diagram for the proposed solution	01/10/2022
	Problem Solution Fit	2	Prepare Solution Fit Document forthe proposed solution	01/10/2022
PROJECT DESIGN PHASE -2	Customer Journey Map	3	Prepare a customer journey map to understand how theuser interact and experience your product	08/10/2022
	Data Flow Diagram	3	Draw the dataflow diagram for you proposed solution	12/10/2022

Table 6.1 Sprint Planningand Estimation

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 user, I can register for the application by entering my email, password, and confirming my password.	5	High	Aiswarya
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	5	High	Shanmugapriya
Sprint-2		USN-3	As a user, I can register for the application through Facebook	10	Low	Jeyapriya
Sprint-1		USN-4	As a user, I can register for the application through Gmail	5	Medium	Harshini
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	5	High	Aiswarya
Sprint-2	Dashboard	USN-6	As a user, I can see the temperature, GPS tracker, alarm in case of Emergency and notification options.	10	High	Harshini, Jeyapriya
Sprint-3	Interfacing with mobile application	USN-7	As a user, I can send alarm sound to alert the bystanders	10	Low	Shanmugapriya, Jeyapriya
Sprint-3		USN-8	As a user, I can see the temperature, location of my child	10	High	Aiswarya, Shanmugapriya
Sprint-4	Data base collection	USN-9	As a user, I want the data to be stored	5	Medium	Aiswarya, Harshini, shanmugapriya

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint 4	Mobile application	USN-10	As a user, I can sense the child safety device using sensor and monitor using mobile app	15	Medium	Aiswarya, Jeyapriya

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

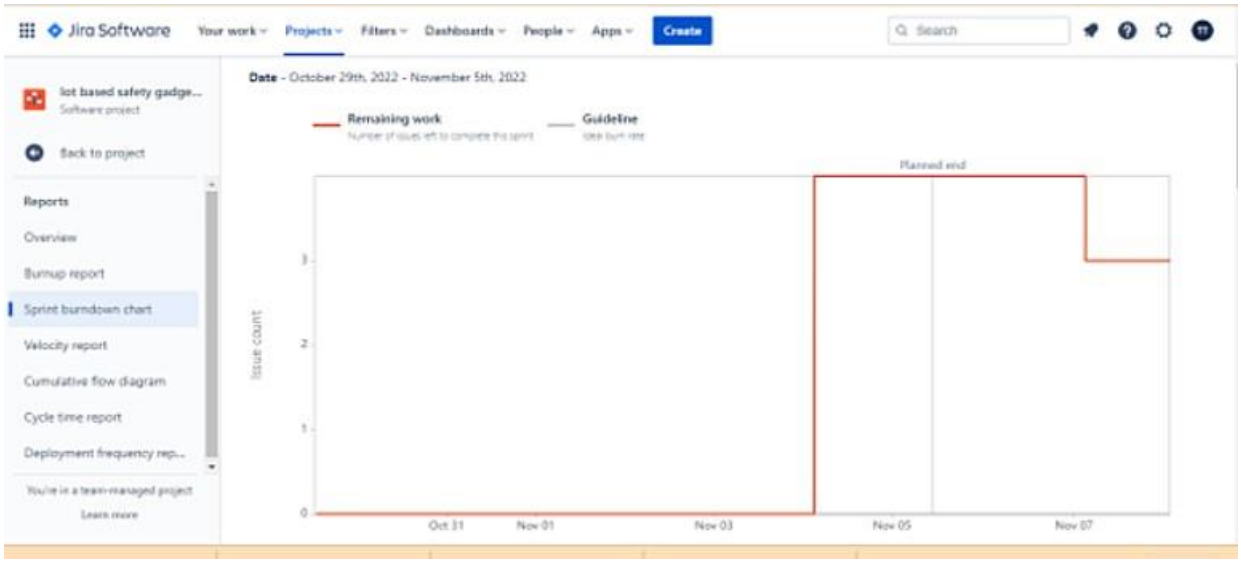
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022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

Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

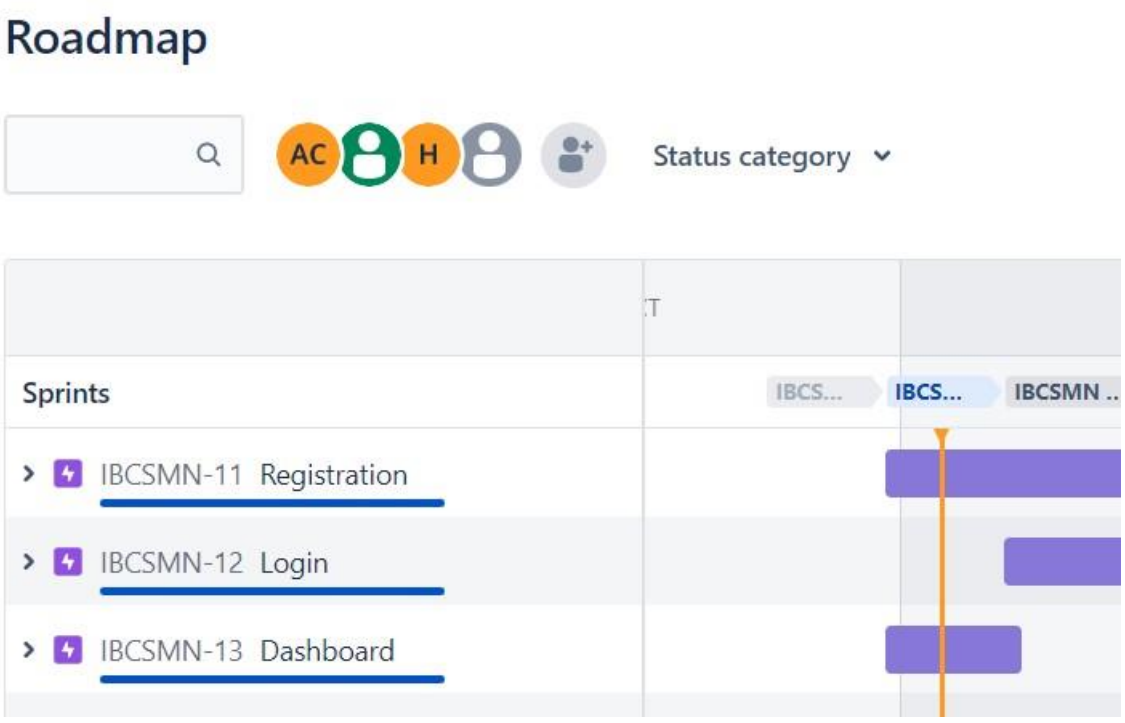
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

REPORTS FROM JIRA :

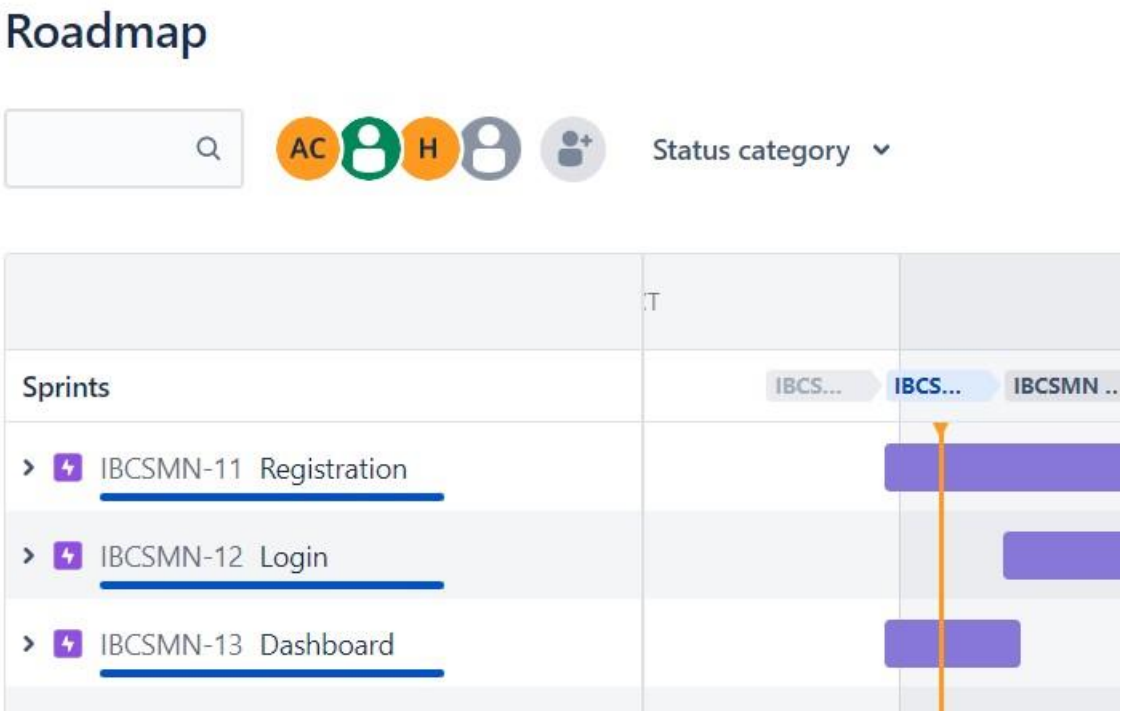
BURNDOWN CHART :



ROADMAP :



ROADMAP :


Roadmap
AC
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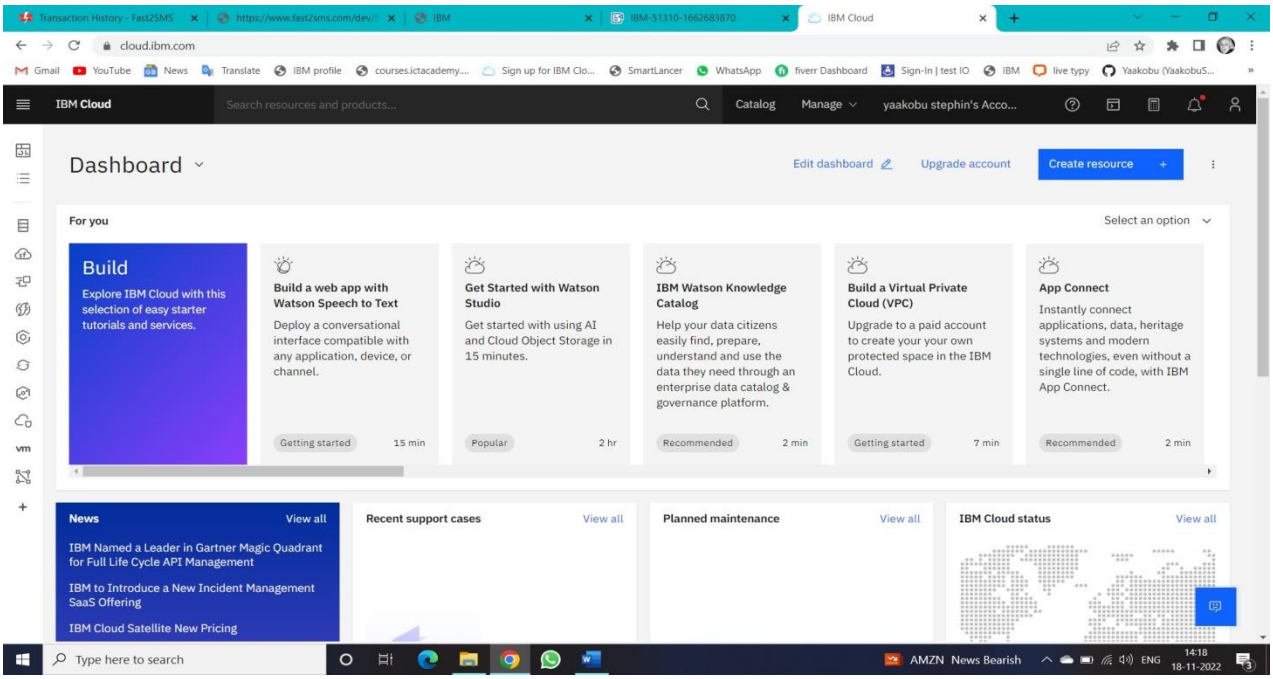
Status category
Sprints
IBCS...
IBCS...
IBCSMN ..
IBCSMN-11 Registration
IBCSMN-12 Login
IBCSMN-13 Dashboard

CHAPTER 7

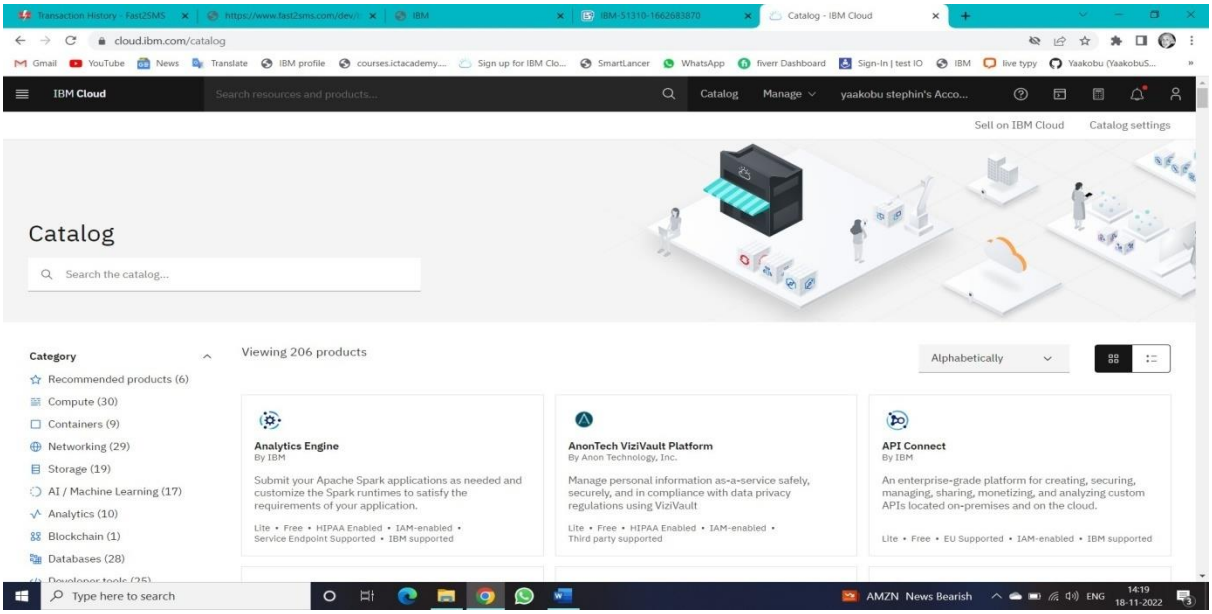
CODING AND SOLUTIONING

CREATE AND CONFIGURE IBM CLOUD SERVICES :

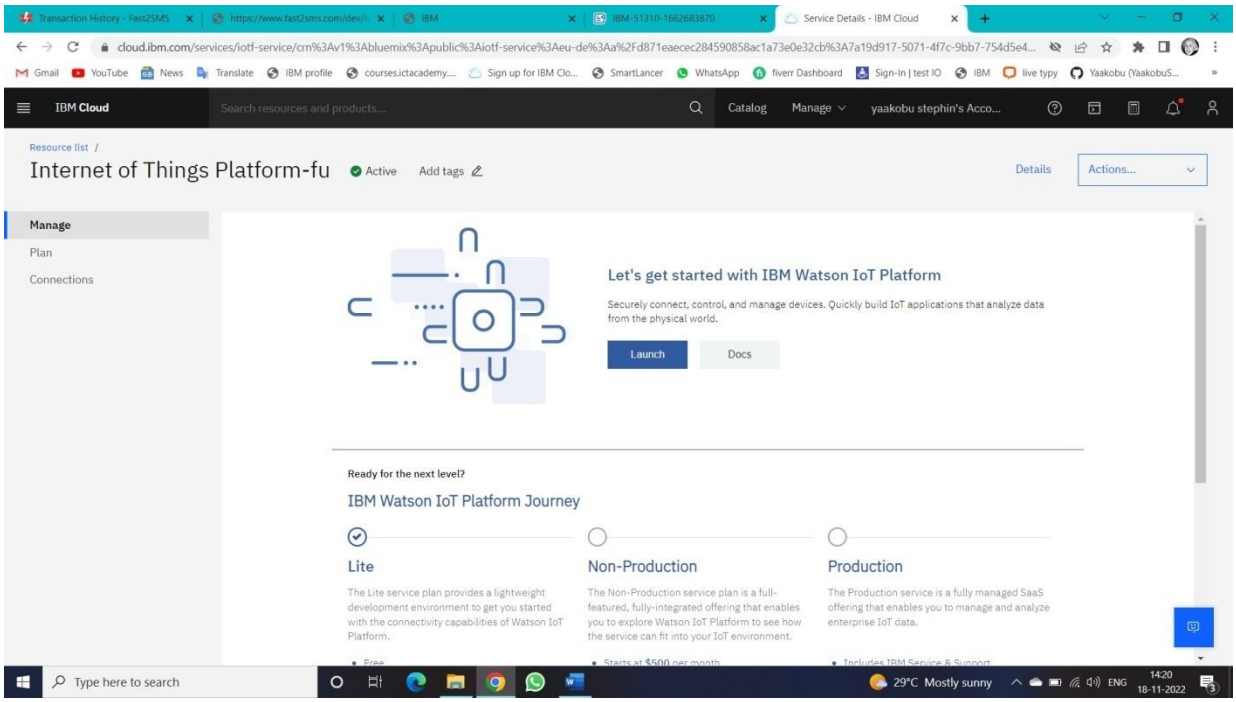
USN 1: As a user I need to enroll the cloud registration :



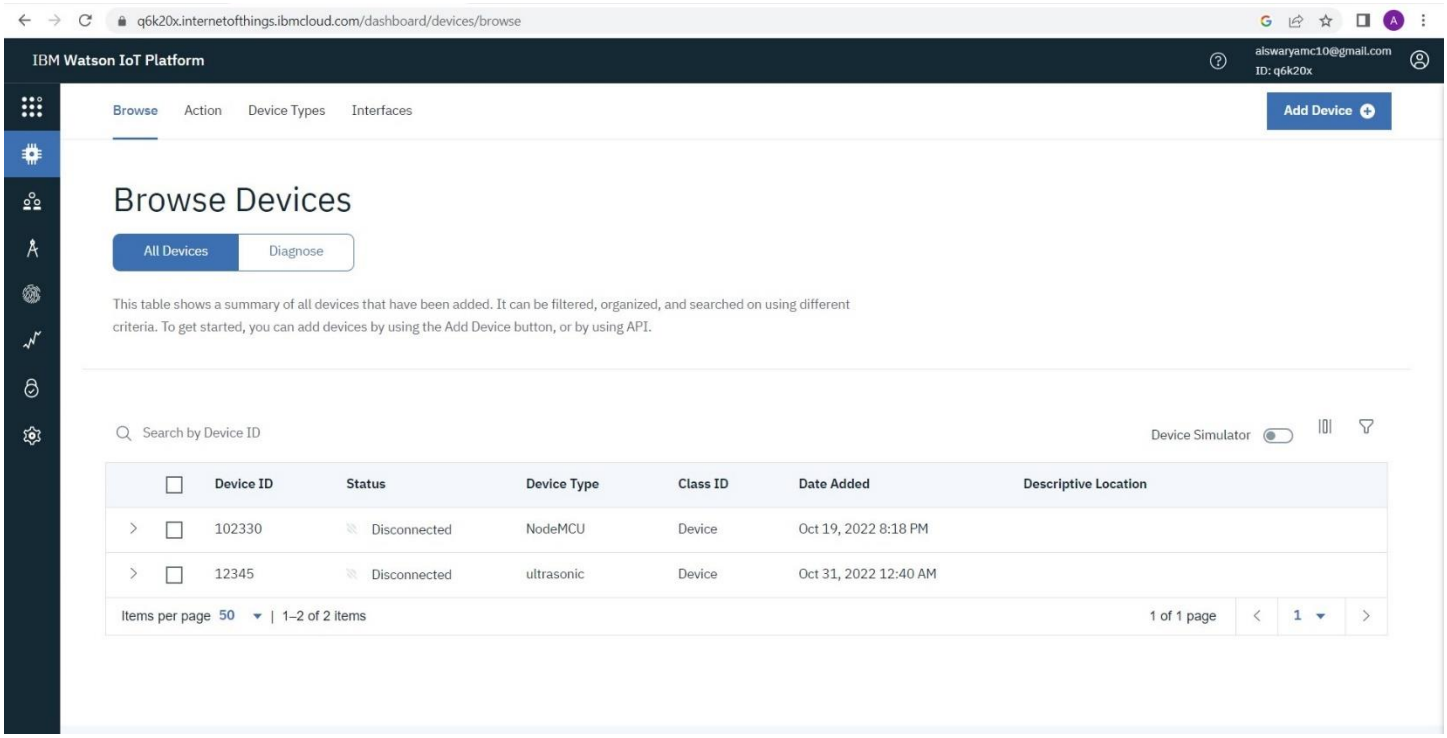
USN 2: As a user, I will create IBM cloud account :



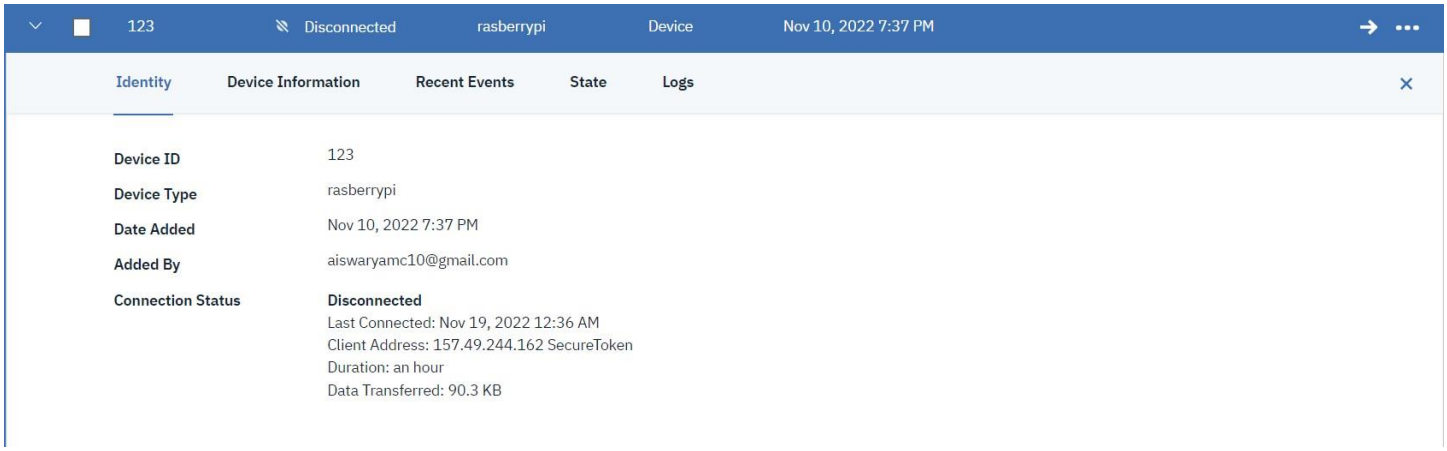
USN 3: After creating cloud account launchIBM Watson IOT platform by accessingcloud account :



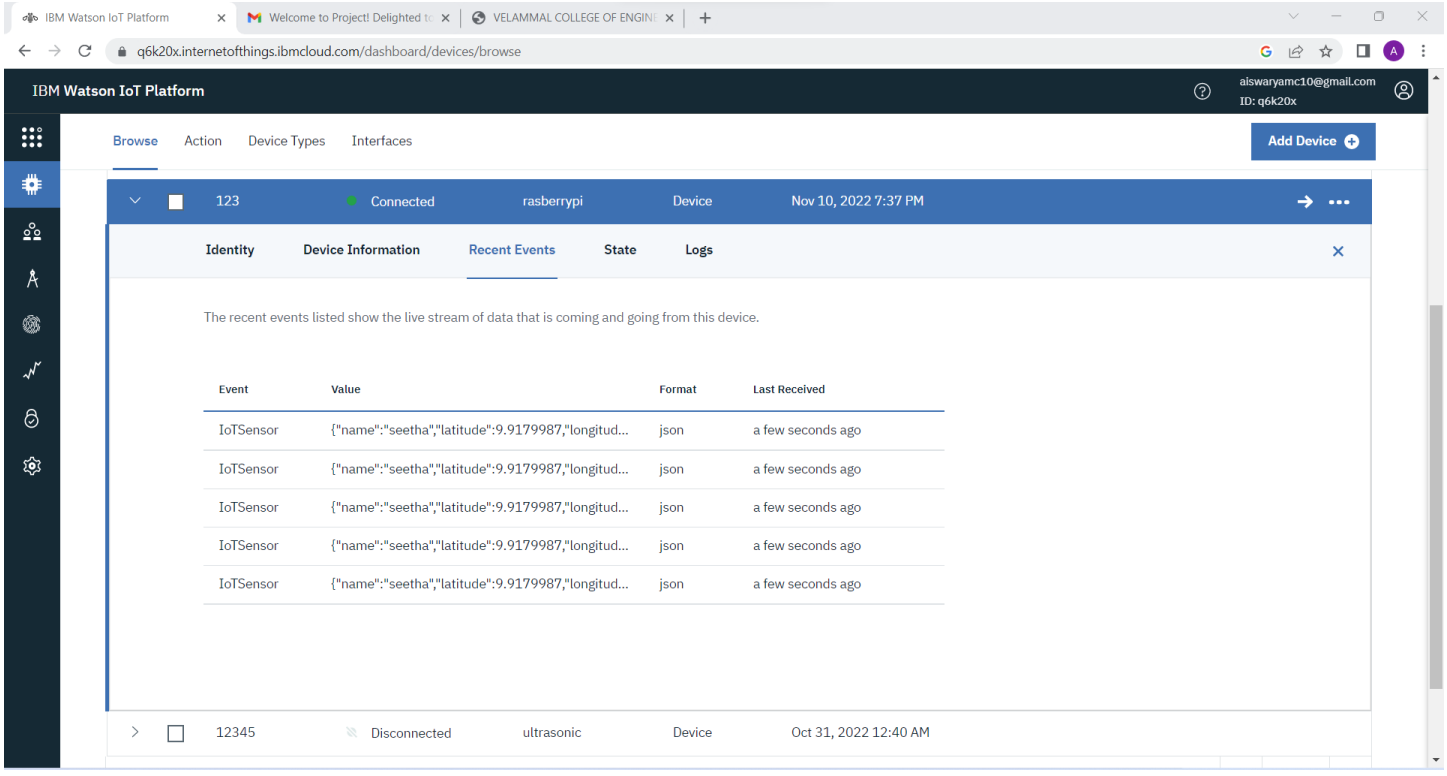
USN 4: Create the node in IBM Watsonplatform :



USN 5: After Creatingnode get deviceType and ID :

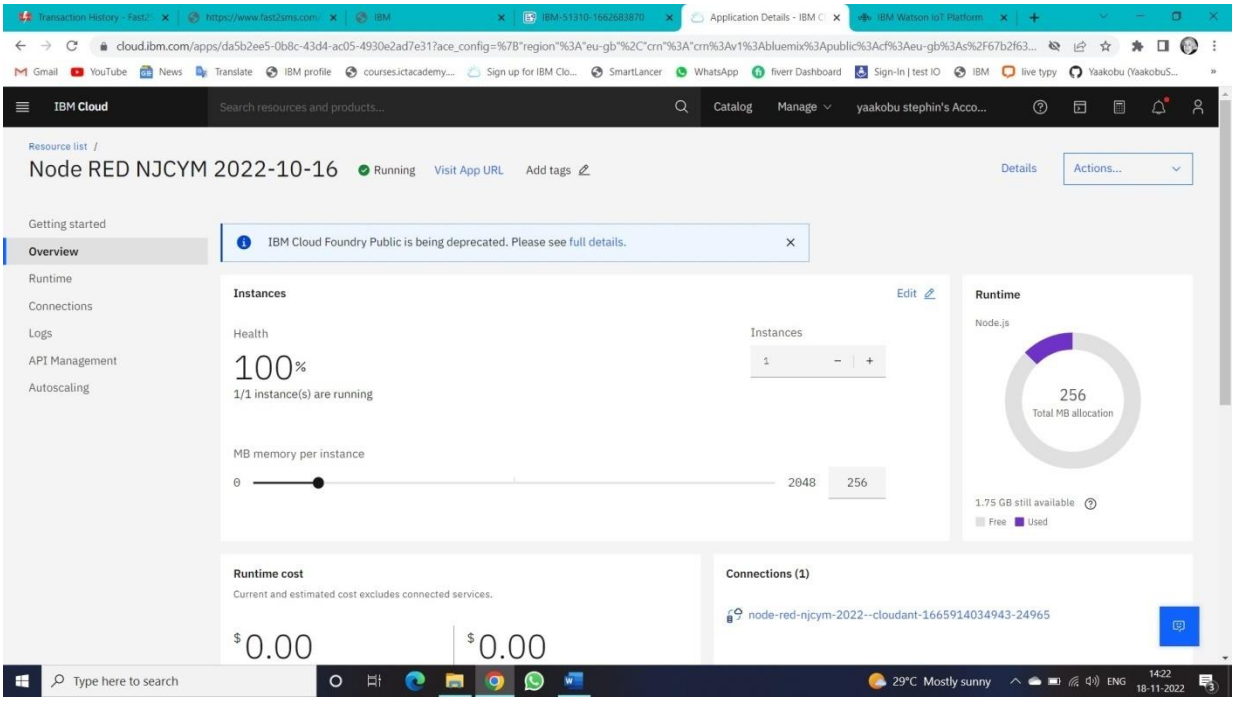


USN 6: Simulate the node created :

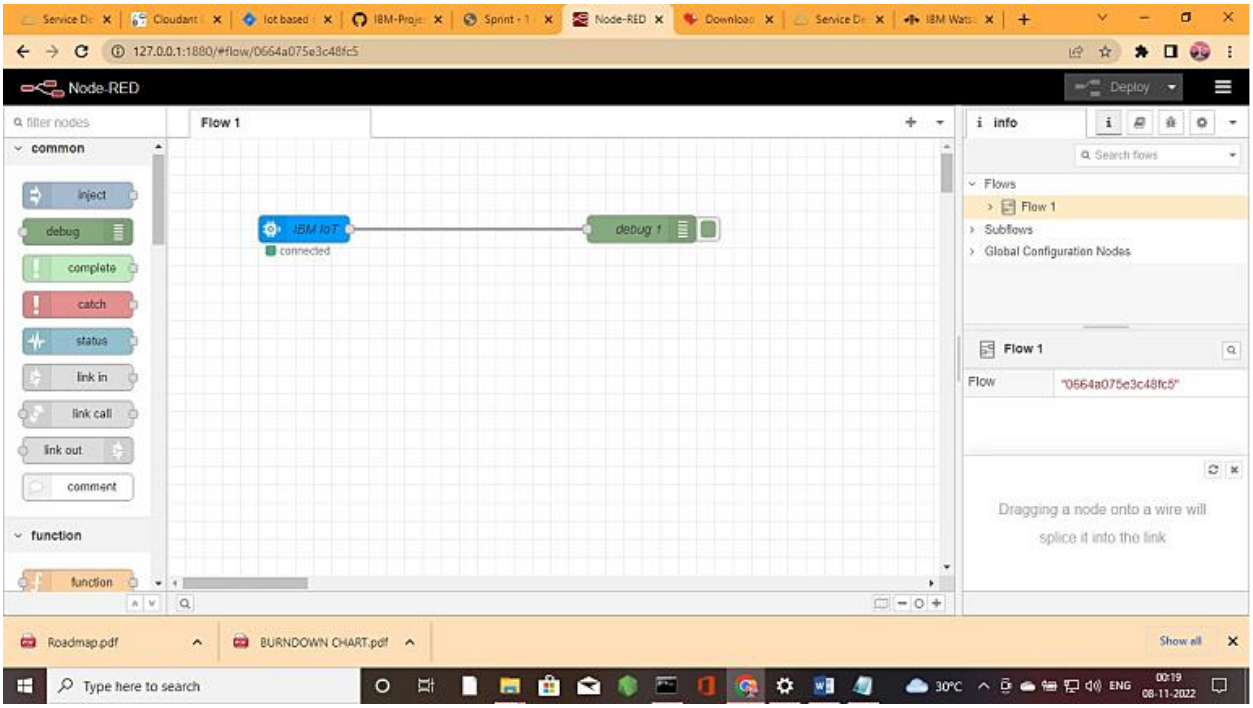


CREATE AND ACCESSNODE-RED :

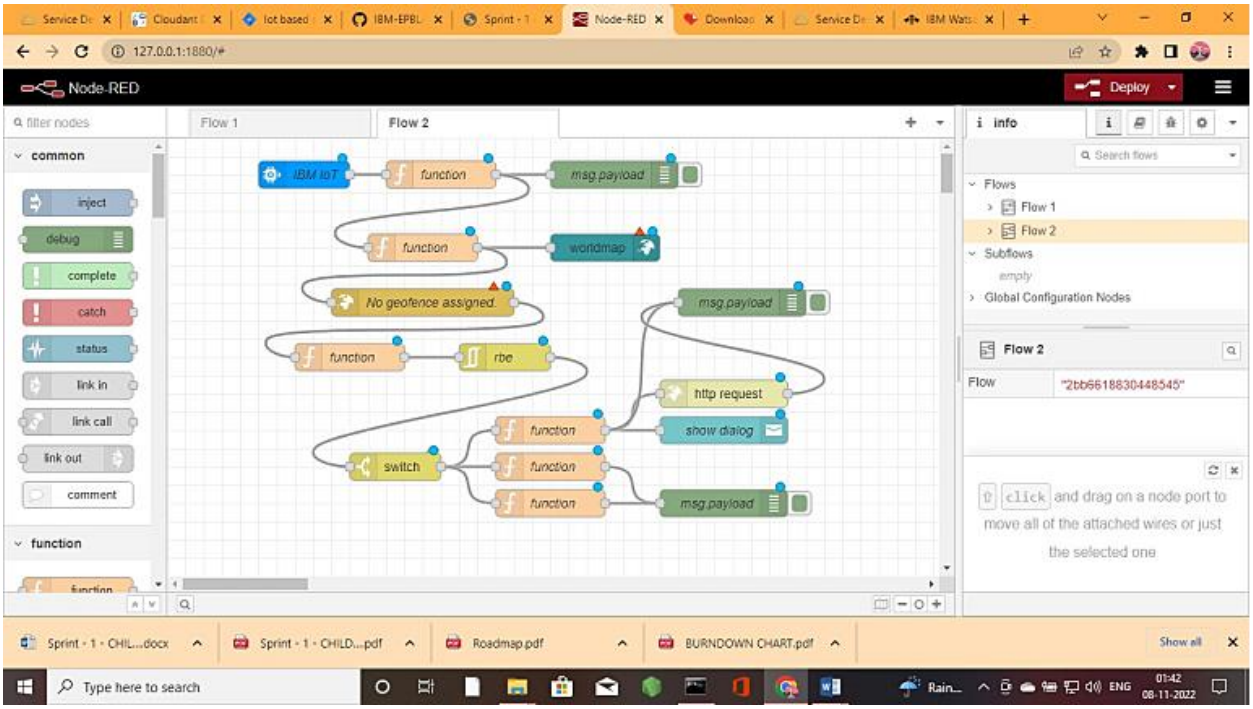
USN 7: As a user, I can createNode-red by app deployment :



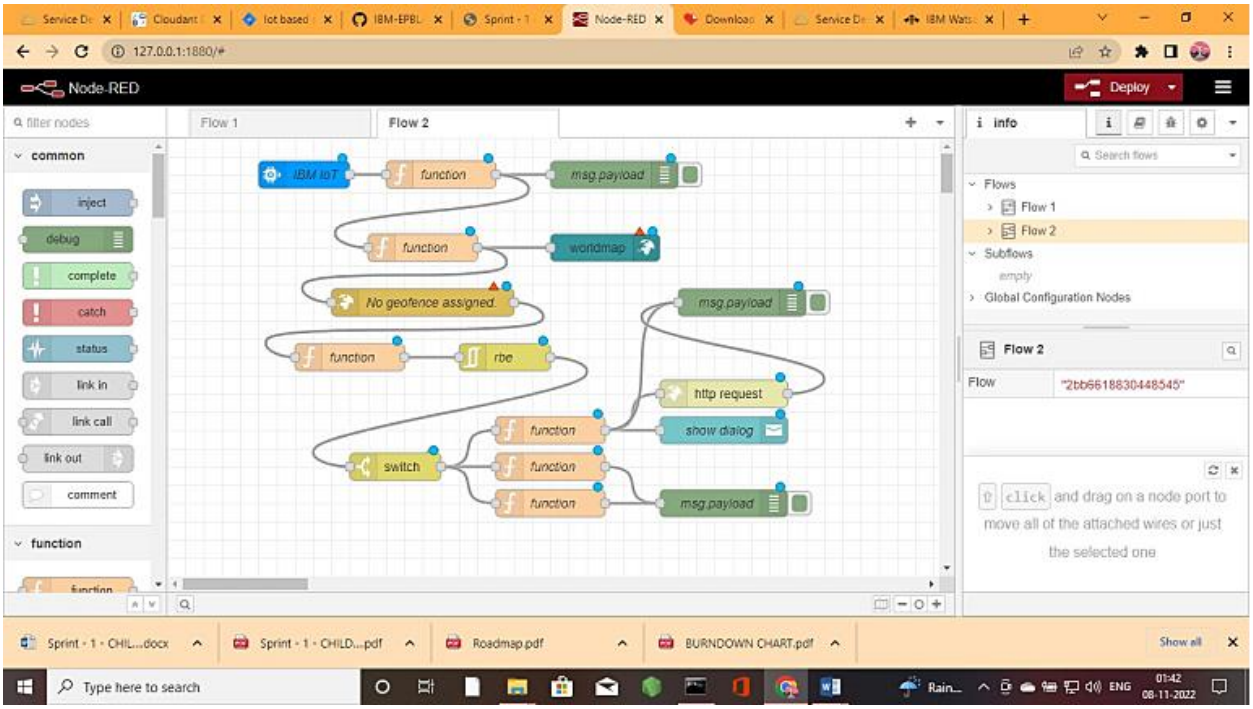
USN 8: Connect IBM Watson with node red through API key :



USN 9 : Designthe project flow using Node-Red :

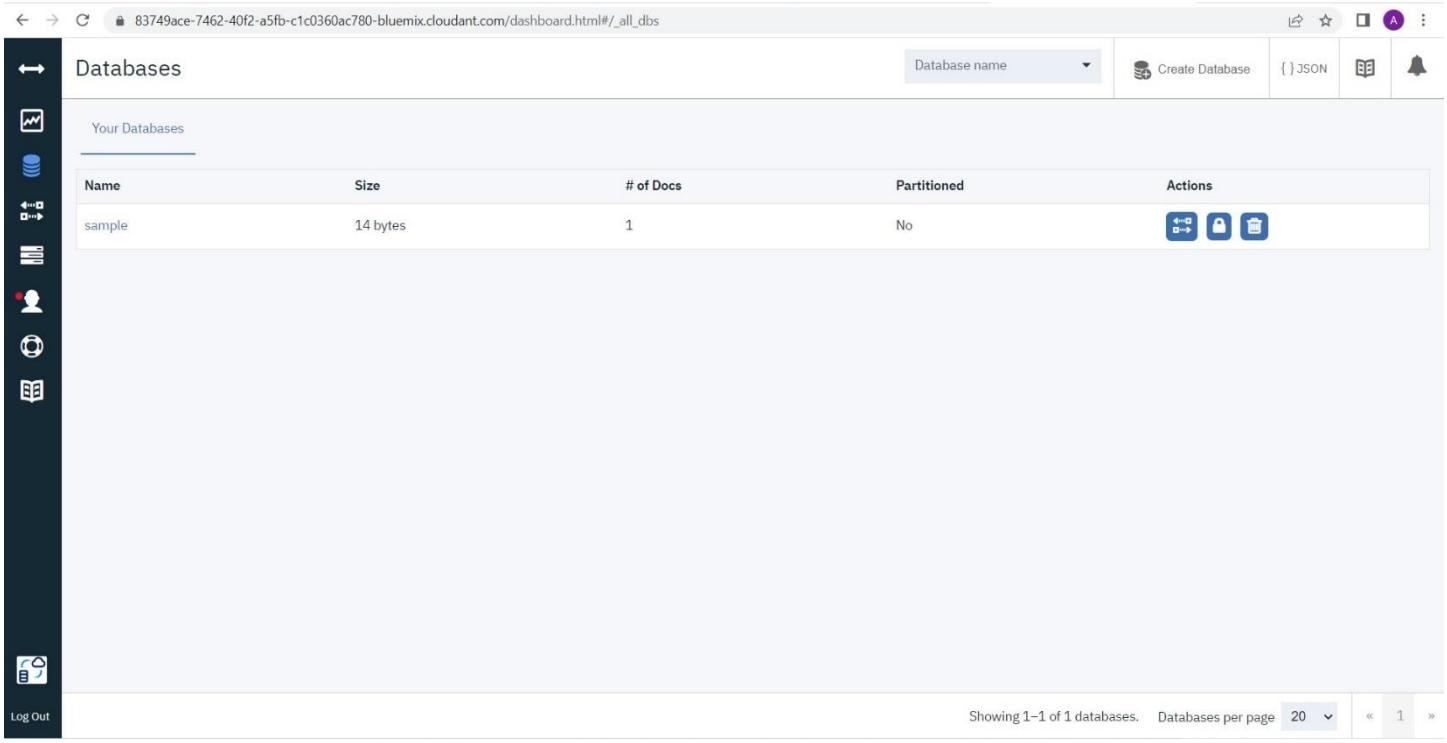


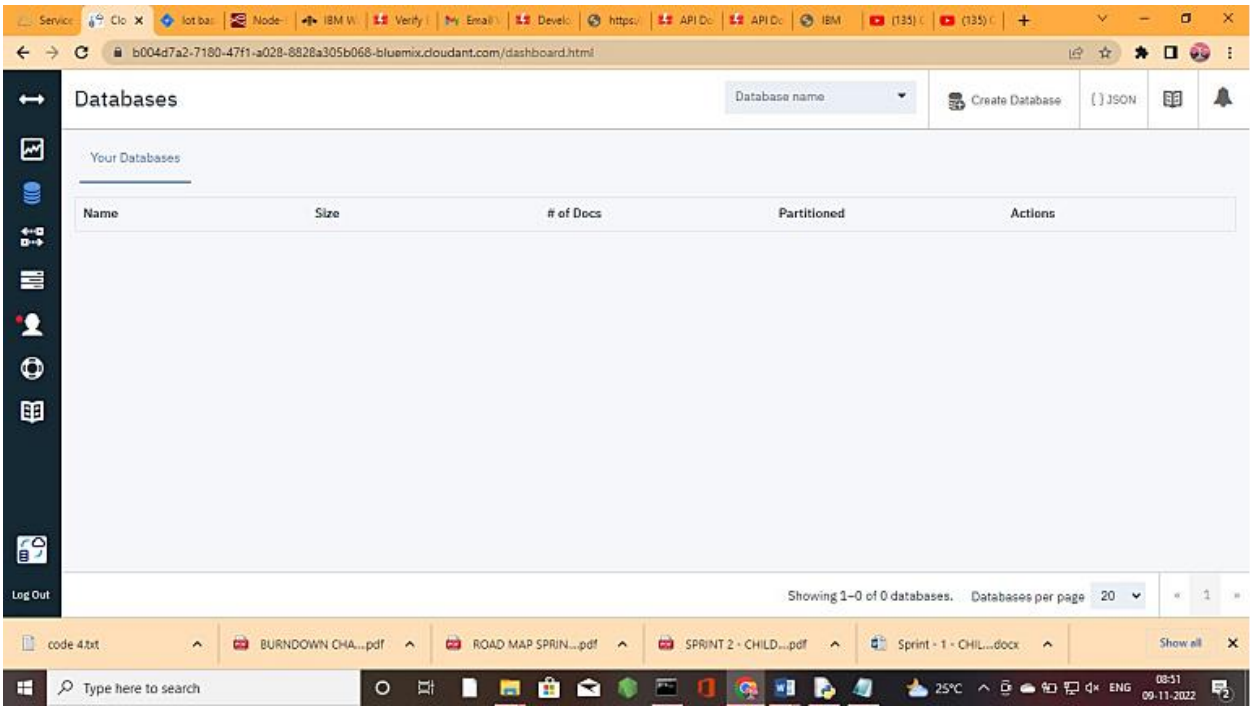
USN 10: Check for the properconnections and the output in the node red application :



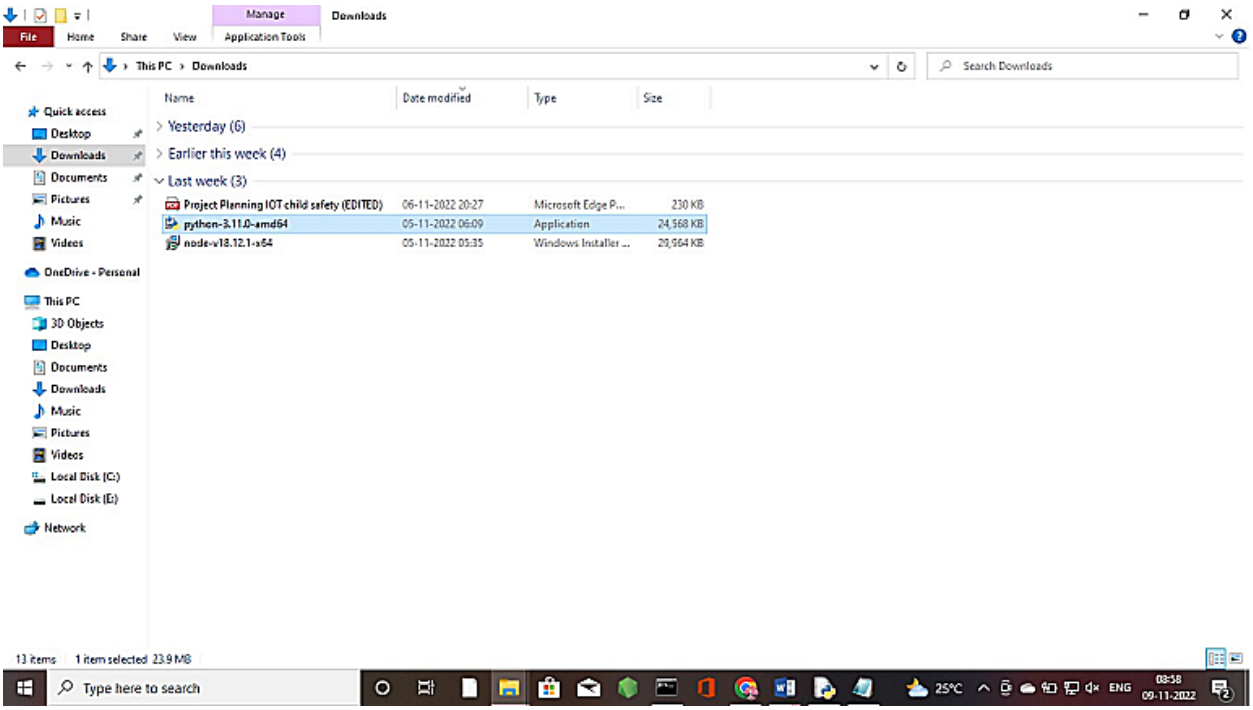
CREATE A DATABASE IN CLOUDANT DB AND DEVELOPTHE PYTHONSCRIPT :

USN 11: Launch the Cloudant DB and Create database to store the location data :



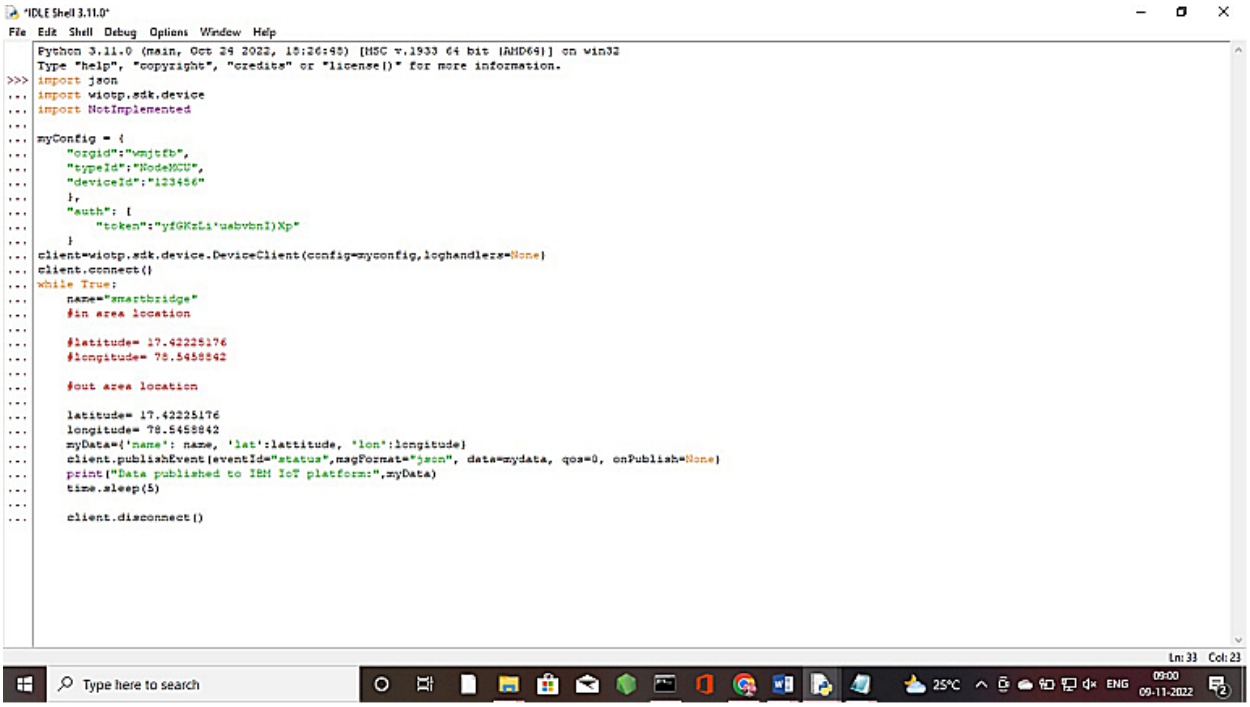


USN 12: Install the python software :

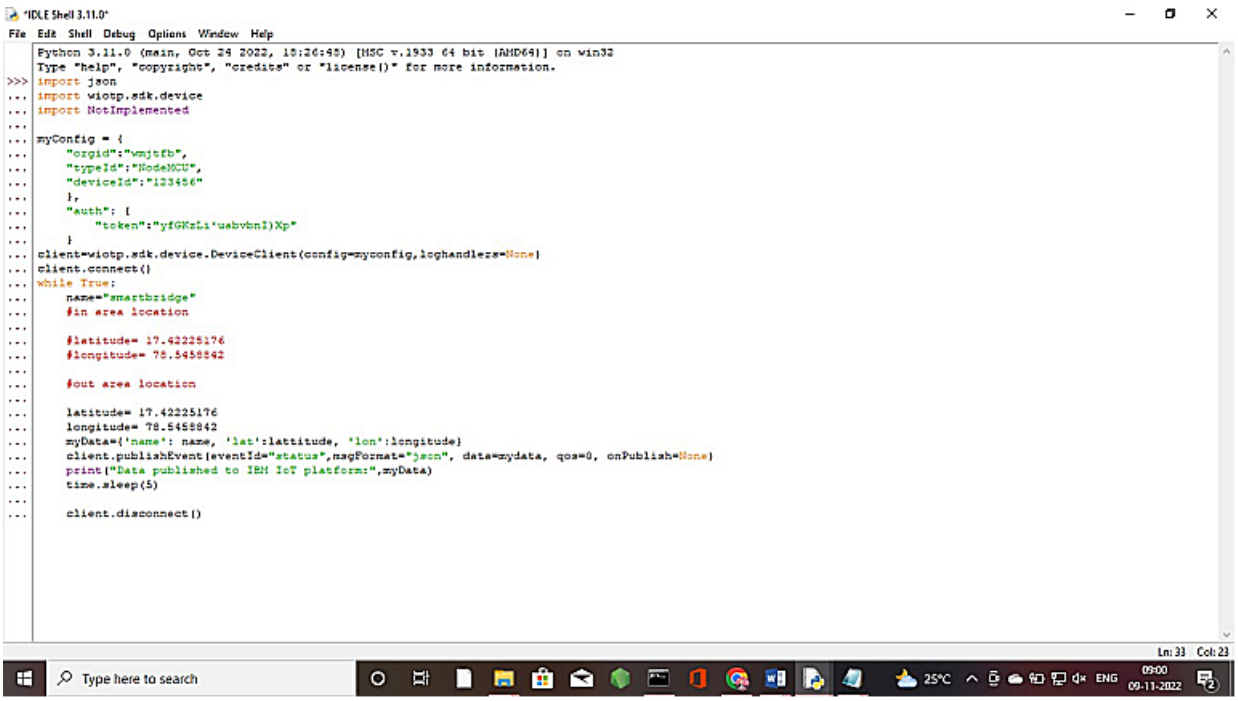


USN 13: Develop the python scriptsto publish detailsto IBM IoT Platform :

USN 14: Integrate the device id, authentication token in python script :

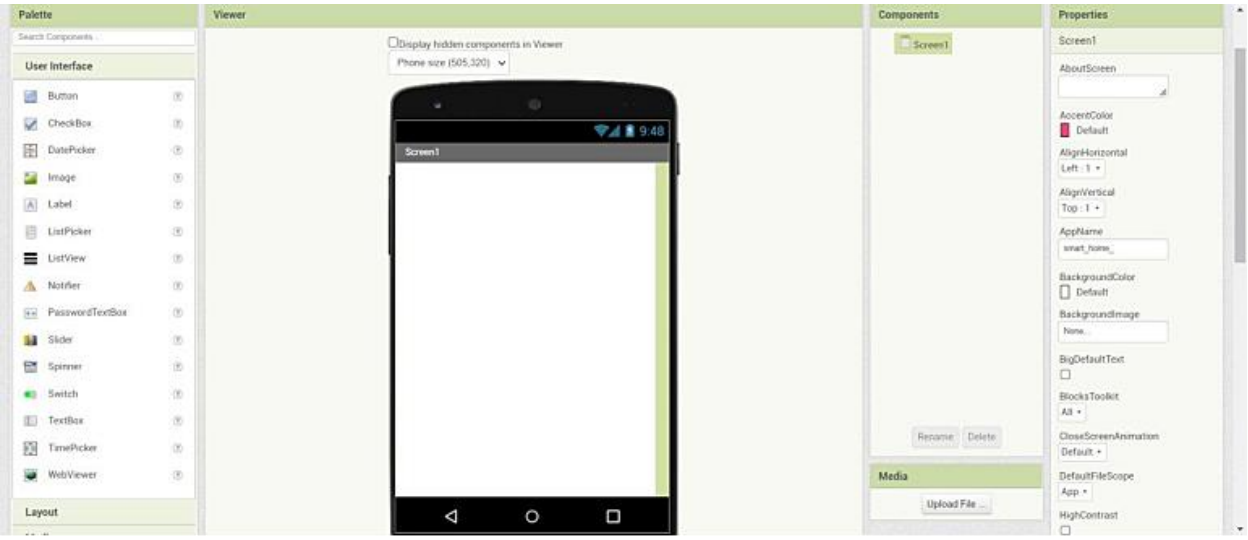


USN 15: Develop the python code for publishing the location (latitude& longitude) toIBM IoT Platform :

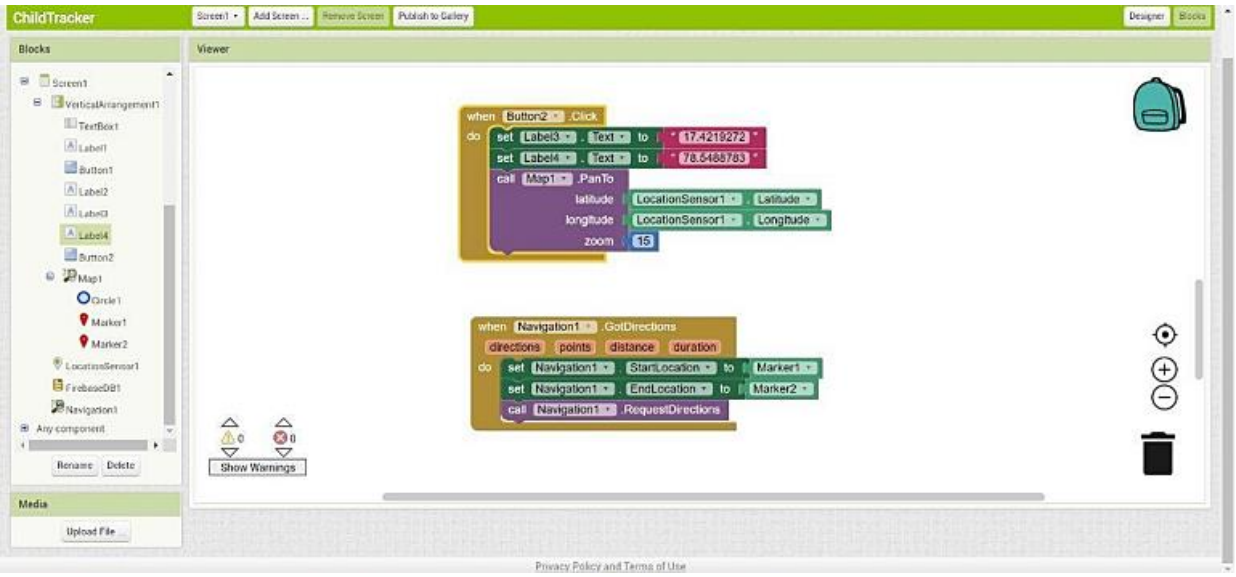


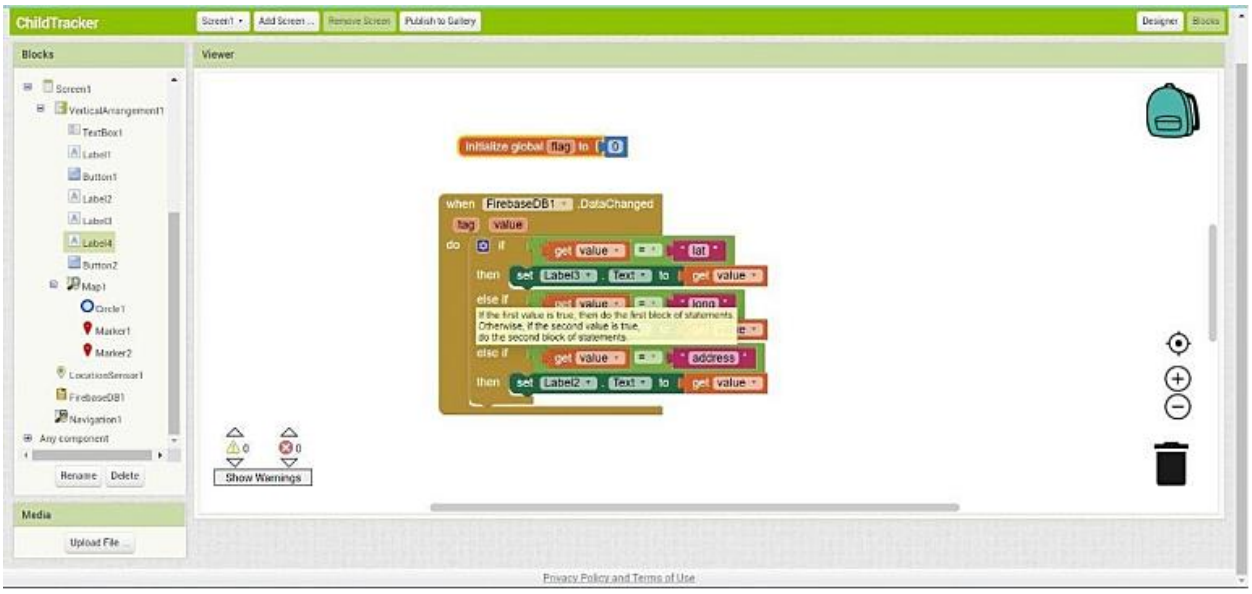
CREATE THE MOBILE APPLICATION USING MIT APP INVENTOR :

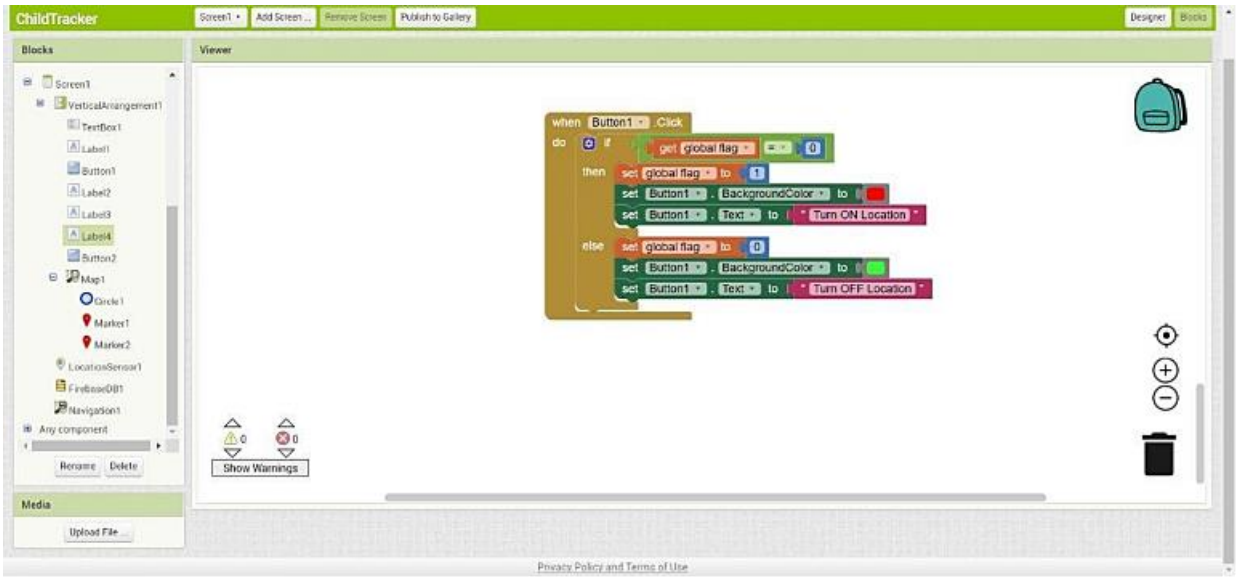
CREATE APP IN MIT APP INVENTOR :

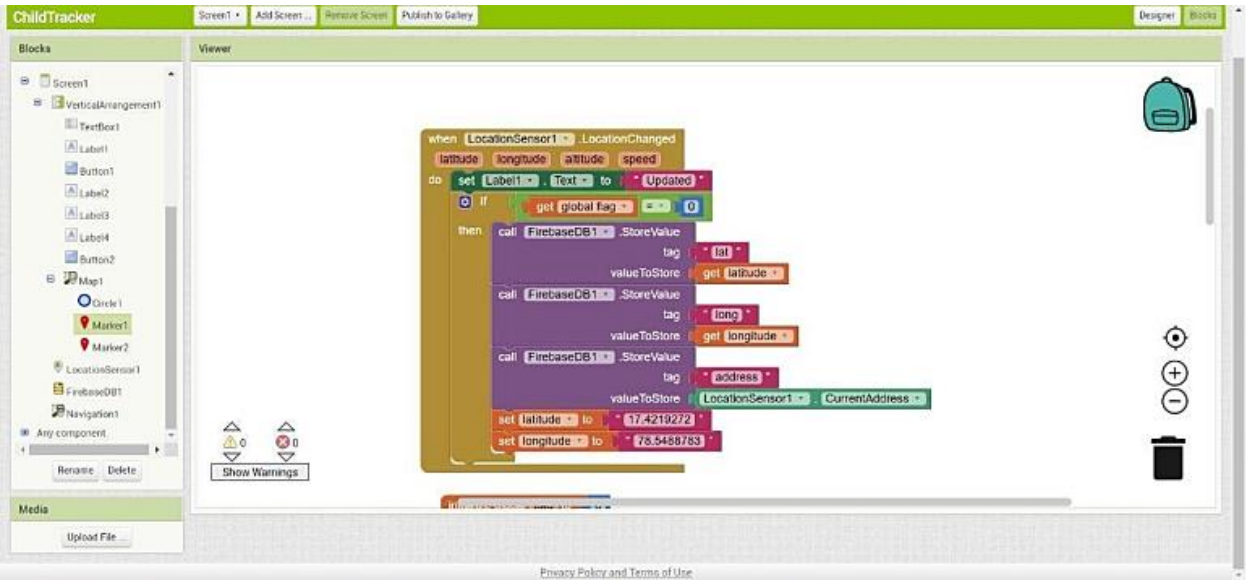


BLOCK CONFIGURATION :




ChildTracker
Blocks
Viewer
Media
Upload File ...
Show Warnings
Privacy Policy and Terms of Use

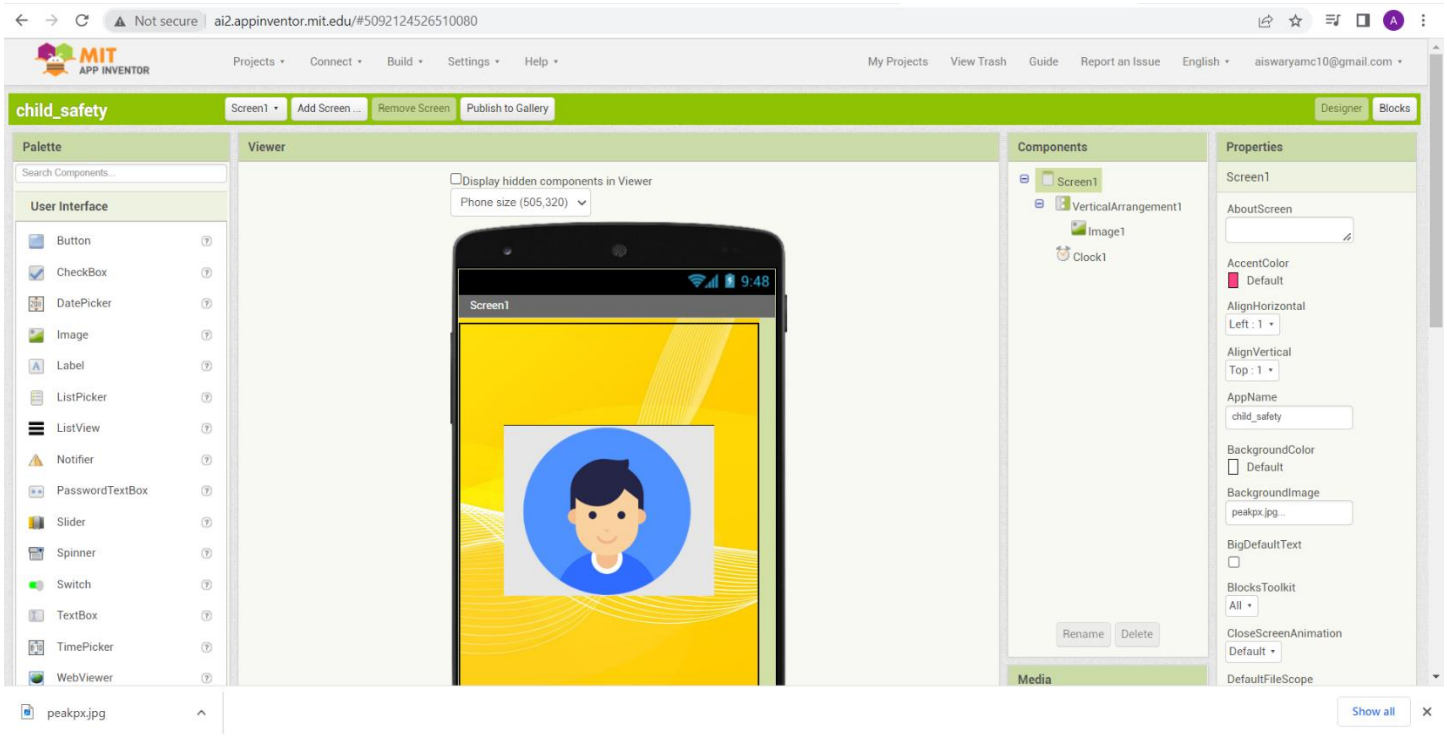

ChildTracker
Blocks
Viewer
Media
Upload File ...
Show Warnings
Privacy Policy and Terms of Use



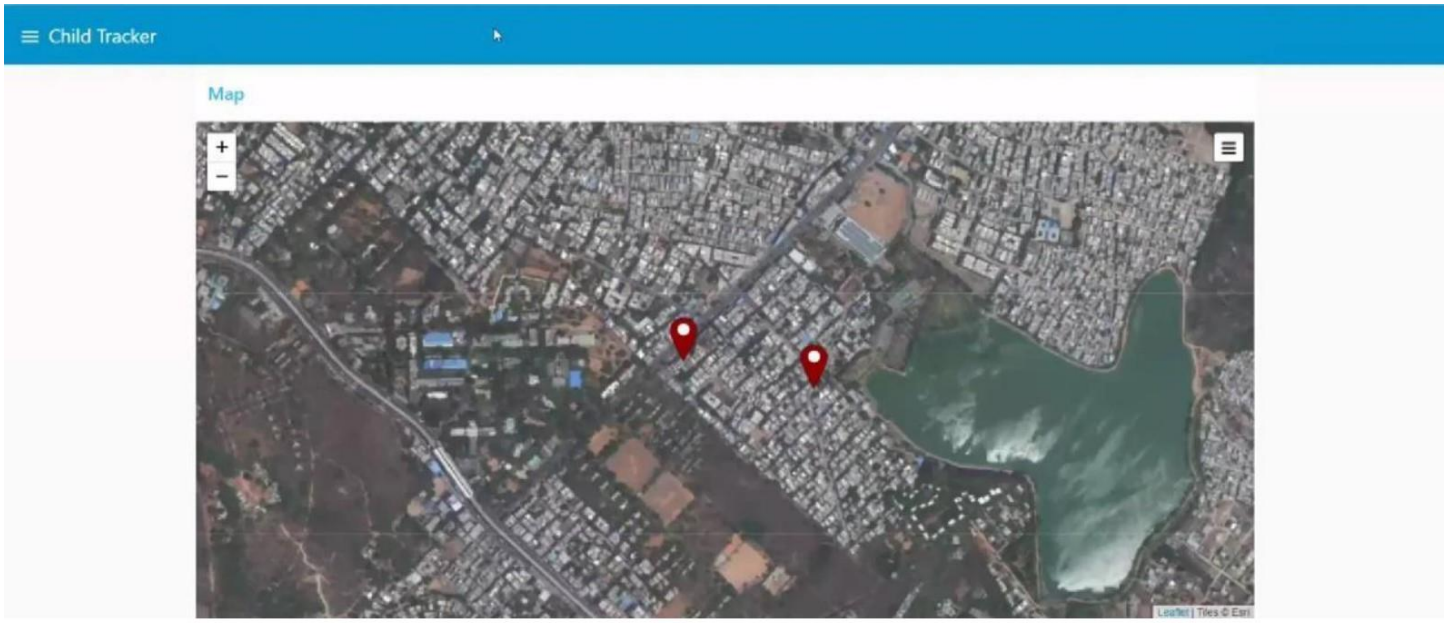
Thus, this chapter dealt with the coding and development process of proposed system.

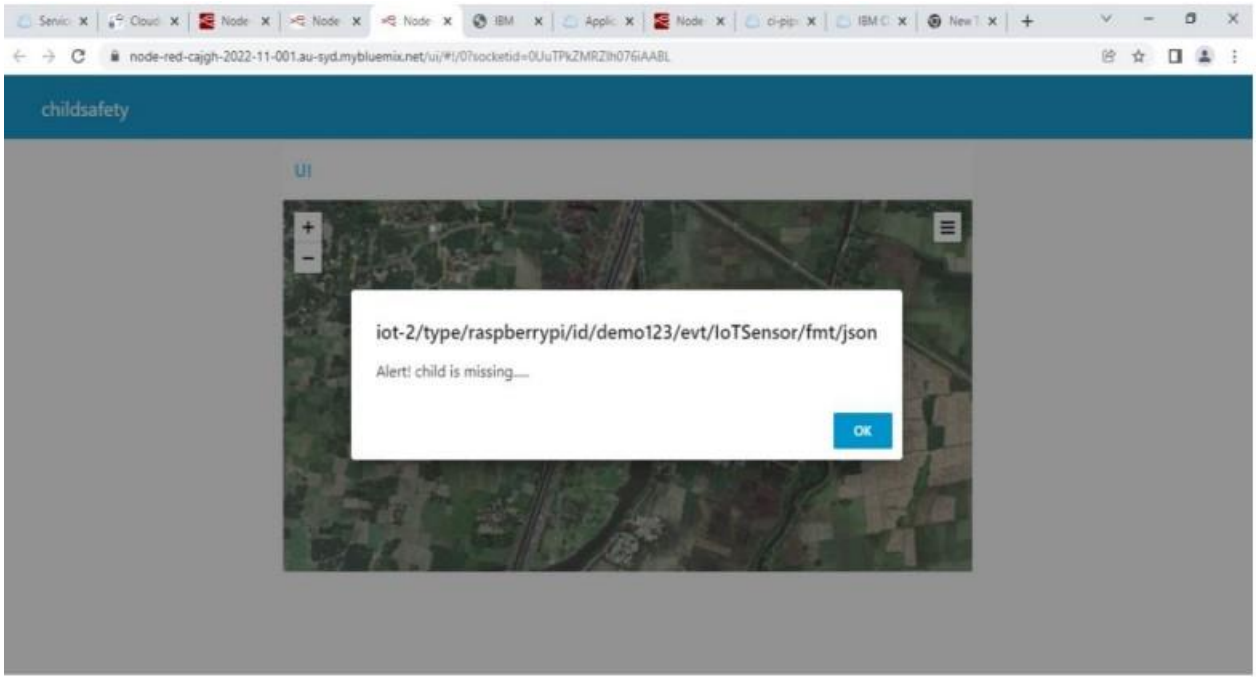
CHAPTER 8

RESULT OF APK :



OUTPUT IN MOBLIE SCREEN :





CHAPTER 9

ADVANTAGES AND DISADVANTAGES

ADVANTAGES :

1. A Child'sGPS Tracker reportsany potential dangersand protects them in the process.

2. It acts as a communication tool for parentsand can be helpful even when traveling.

3. Usually, childrentend to wander a lot. With the help of GPS Trackingdevices, youcan easily and quickly know where your children are.

4. Parents will get all the details like their kid boarding/de-boarding schoolbus. Also, they can get emergency alerts when the child fails to board or de-board at the otherstop.

5. Prevent abduction and let your children play and walk around safely.Our Personal GPS trackers for kids are great optionsfor parents for monitoring their children24/7.

DISADVANTAGES :

1. Young childrenmay refuse to cooperate unless allowed to play with their gadgets.

2. Excess use of electronic gadgets can lead to childrenspending less time outdoorsand limiting theirsocial interaction.

3. Itmay lead to poor concentration in studies and lack of interest in day-to-dayactivities.

4. Excessive gadgets use can lead to poor health, a sedentary lifestyle, and bad eating habits.

CHAPTER 10

CONCLUSION :

This research demonstrates Smart IoT device for child safety and tracking, to help the parents to locate and monitor their children.If any abnormal readings are detected by the sensor, then an SMS and phone call is triggered to the parents mobile. Also, updated to the parentalapp through the cloud. The system is equipped with GSM and GPS modules for sending and receiving call, SMS betweensafety gadget and parental phone.The system also consists of Wi-Fi module used to implement IoT and send all themonitored 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 alertparameters are updatedto the cloud. Boundary monitoringsystem is implemented on safety gadget with the help of BEACON technology, as soon as the safety gadget moves far away from the BLE listenergadget an alertis provided to itself.

This wearable device has a superior mode for viewing and locating the children\'swhereabouts with correct latitude and longitude, which is especially useful when using Google maps. This could assist to reduce the number of attacks on children while also making them feel protected and secure. The major goal of this project is to create a device that protects youngsters from risky circumstances while also assisting them in combating them.

CHAPTER 11

FUTURE SCOPE

A camera module for surveillance of the child'ssurrounds can be added to improve the system's performance. It's also possible to do it with a Raspberry Pi and Lily pad. It is possible to develop a more energy-efficient type that can keep the battery for a longerperiod of time.

This system can be further enhanced by installation of mini camera inside smart gadget for better security so that live footage can be seen on parental phone during panic situations. The system can be modified by installation of small solar panels for charging the battery of smart gadget togain maximum battery backup.

For surveillance of the child's surroundings, to get a clearer picture of the location, this wearable can also contain a camera module incorporated in it. The camera will be collecting information in the same manner as the GPS module. It will be on stand by conserving power waiting for the particular keyword "SNAPSHOT" to be sent from the user's smart phone to the GSM shield will activate the camera to start clicking a snapshot of the surrounding and save the file temporarily on the external micro SD card. After which Arduino UNO will access the saved image from the micro SD storage and transfer it to the GSM modulewhich send it to the user via SMS/MMS text.