IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING AND NOTIFICATION

A PROJECT REPORT

Submitted by

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SALEM COLLEGE OF ENGINEERIMG AND TECHNOLOGY

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 basedgadgets 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.

Fig 1.1 Child Safety using geo fence

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.

Theremaining chapters of the project are organized as follows, Chapter2 discusses the literature survey gone through for the project, Chapter 3 briefs about the ideation & proposed solution, Chapter 4 explains the requirement analysis, Chapter 5explains about the project design,Chapter 6 depicts the project planning and scheduling of this project, Chapter 7 and 8 shows the coding and outcome of the project, Chapter 9 shows the advantages and disadvantages of the project, Chapter 10 concludes the project continued with the future scope explained in Chapter 11.

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] SMART IOT DEVICEFOR CHILD SAFETYAND TRACKING :

Authors: M Nandini Priyanka, S Muranga, K. N. H. Srinivas, T. D. S. Sarveswararao, E. Kusuma Kumari.**Published in**: 2019 IEEE.

The system is developed using Link-It ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM&digital camera modules.The novelty of the work is that the system automatically alerts the parent/caretaker by sending SMS, when immediate attention is required for the child during emergency.

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

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

[2] CHILD SAFETY WEARABLE DEVICE :

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

The purpose of this device is to help the parents to locate their children with ease. At the moment there are many wearable In the market which helps to track the daily activity of children and also helps to find the child using WI-Fi and Bluetooth services present on the device.

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

Demerits: As, this device's battery gives short life-time. High power efficient model willhave to be used which can be capable of giving the battery life fora longer time.

[3] CHILD SAFETY&TRACKING MANAGEMENT SYSTEM BY USING **:**

GPS.Authors:Aditi Gupta, VibhorHarit.**Published in**:2016 IEEE.

This paper proposed a model for child safety through smart phones that provides the

option to track the location of their childrenas well as in case of

emergencychildren isable to send a quickmessage and its current locationvia

Short Messageservices.

Merits: The advantages of smart phoneswhich offers rich features like

Google-maps,GPS, SMS etc.

Demerits: This systemis unable to sense human behavior of child.

[4] CHILDREN LOCATIONMONITORING ON GOOGLEMAPS USING GPSAND GSM :

Authors: Dheeraj Sunehera, Pottabhatini Laxmi Priya.**Published in**:2016 IEEE.

This paper provides an Android based solution for the parents to track their children in real time. Different devicesare connected with a single device through channels of internet.The concerned device is connected to server via internet. The device can be used by parents to track their children in real time or for women safety. The proposed solution takes the location services provided by GSM module. It allows the parents to get their child's current-location via SMS.

Merits: A child tracking systemusing android terminaland hoc networks.

Demerits: This devicecannot be used in ruralareas.

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.

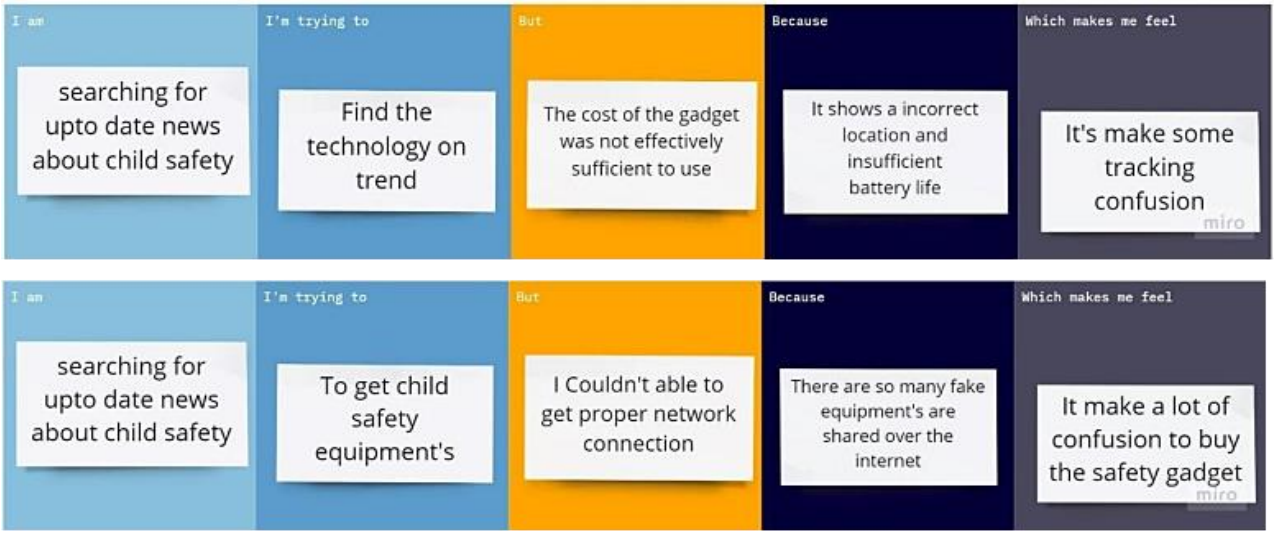


Fig 2.1 Problem Statement Definition

Problem Statement (PS)	**I am (Customer)**	**I'm trying to**	**But**	**Because**	**Which makesmefeel**
PS-1	Searching for up to daynews aboutchild safety	Find thetechnology on trend	The cost of the gadget was noteffective ly Sufficient to use	It shows a incorrect location and insufficient battery life	It's make some tracking confusi on
PS-2	Searching for up to daynews aboutchild safety	To get the child safety Equipment's	I couldn't able toget proper networkconnection	There are so many fake equipment's areshared over the internet	It's make a lot of confusionto buy theSafety gadget

Table 2.1 Problem Statement Definition

CHAPTER 3

IDEATION & PROPOSEDSOLUTION :

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.

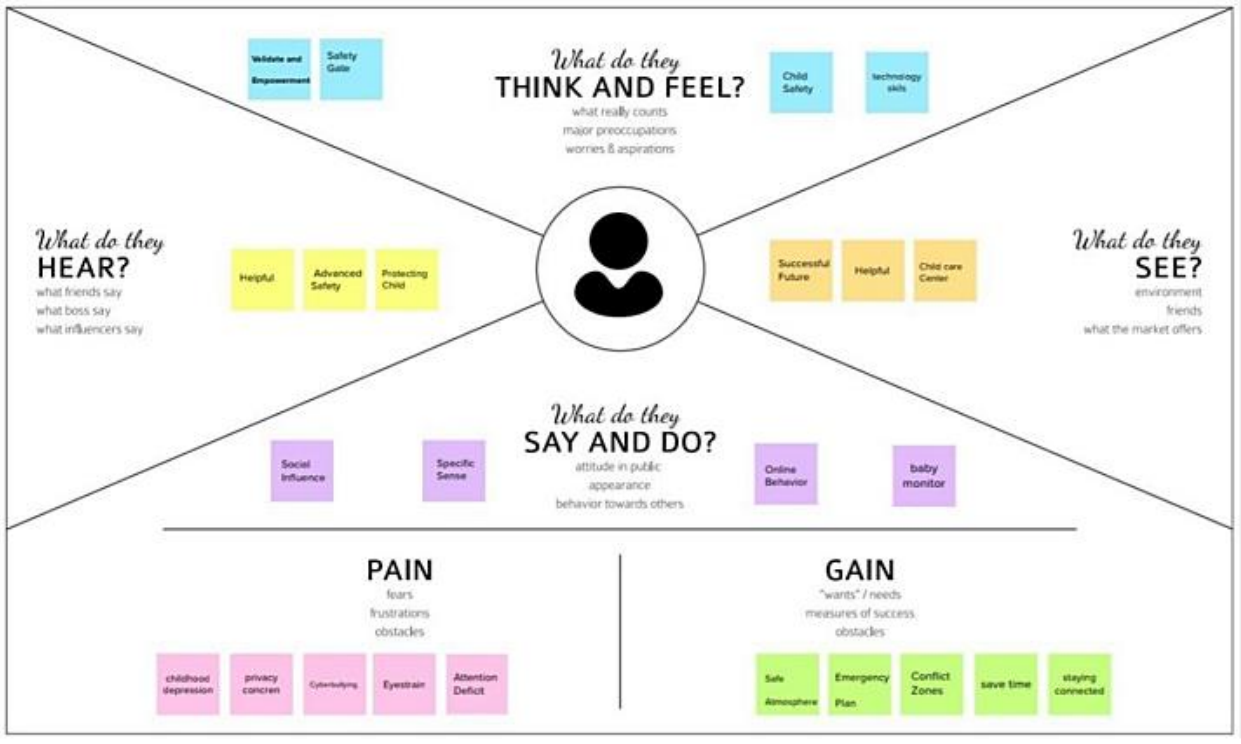


Fig 3.1 EmpathyMap Canvas

IDEATION & BRAINSTORMING :

Brainstorming provides a free and open environment that encourages everyonewithin a team to participate in the creativethinking 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.

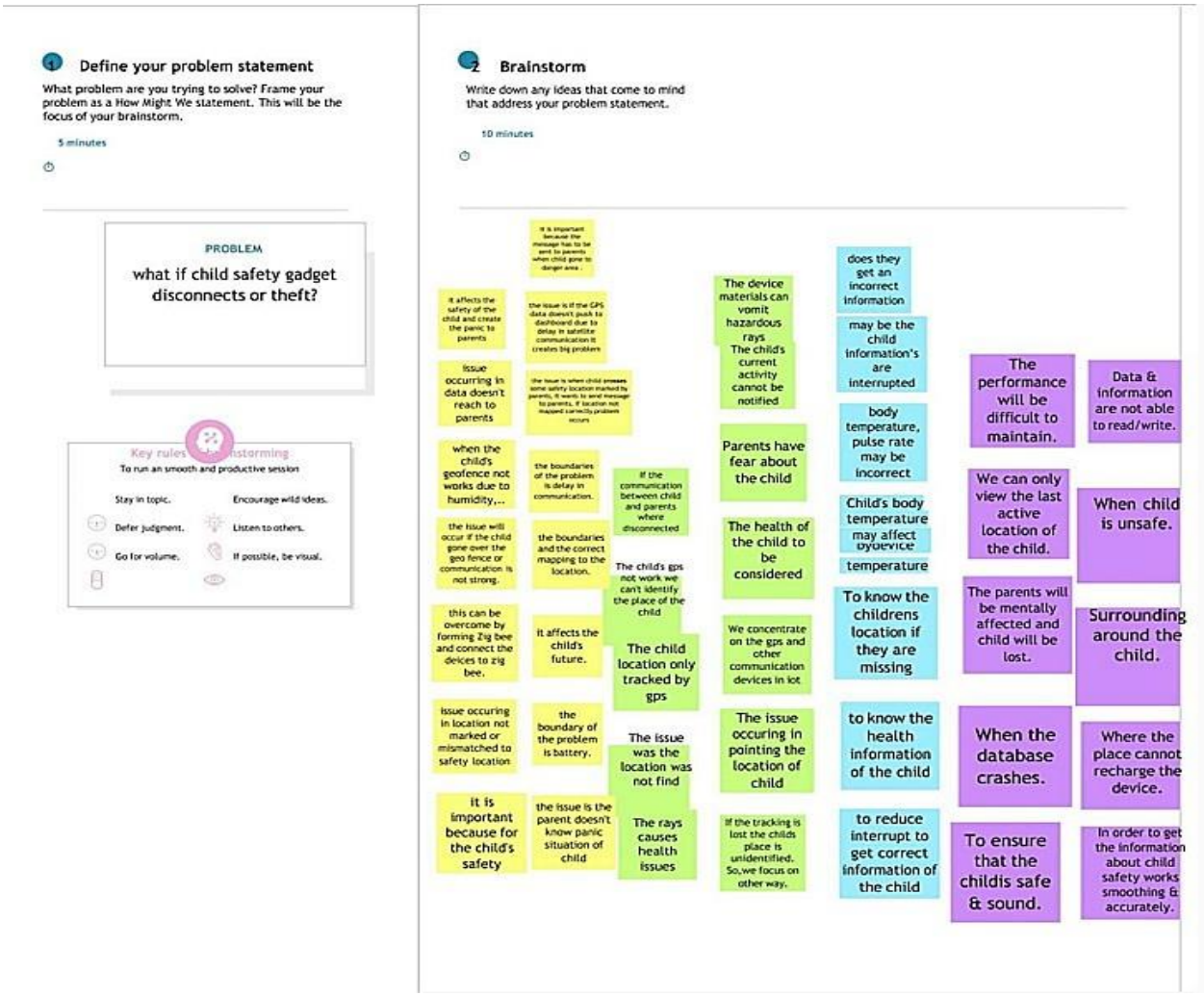


Fig 3.2 Brainstorming 1

Fig 3.3 Brainstorming 2

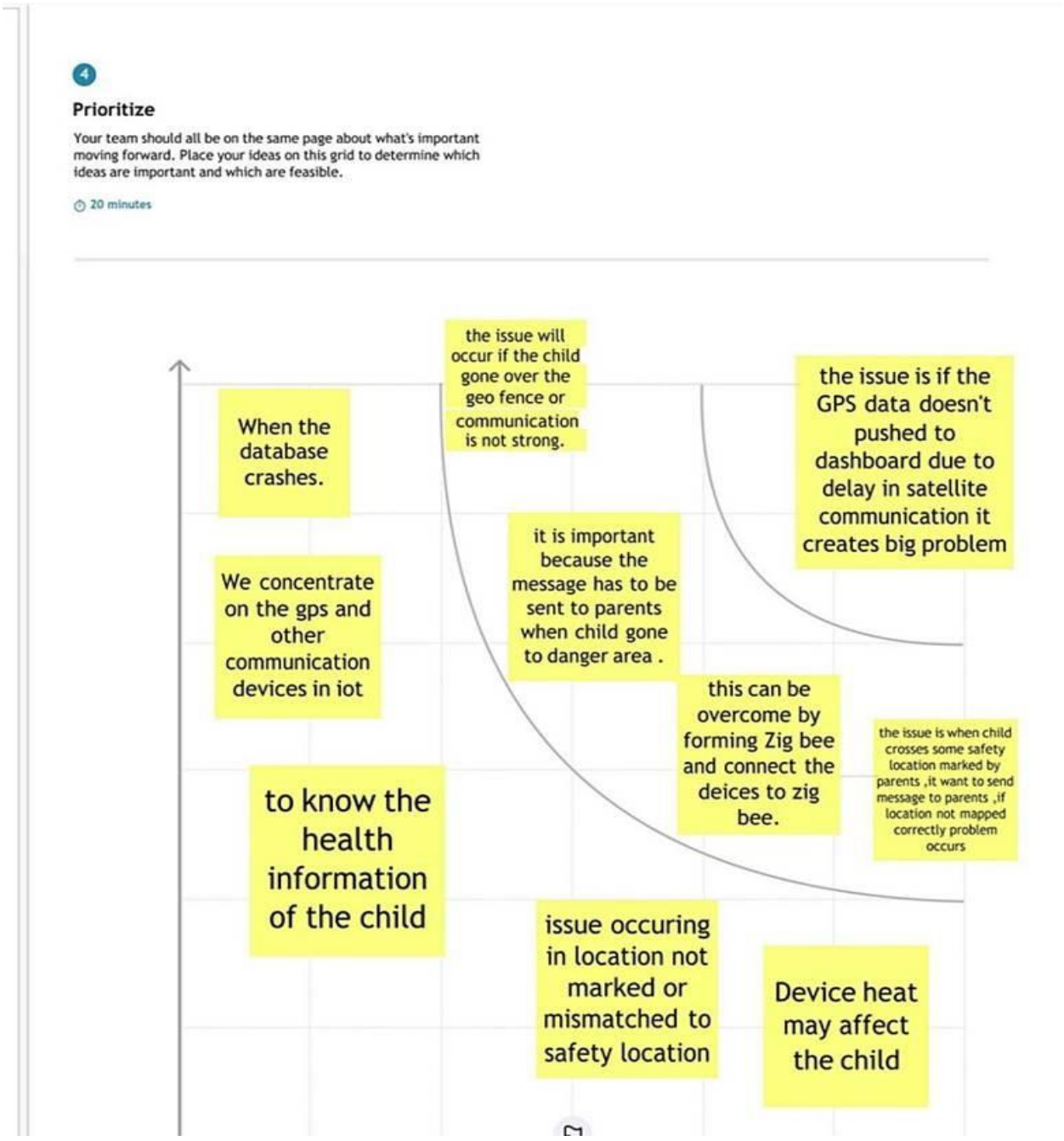


Fig 3.4 Brainstorming 3

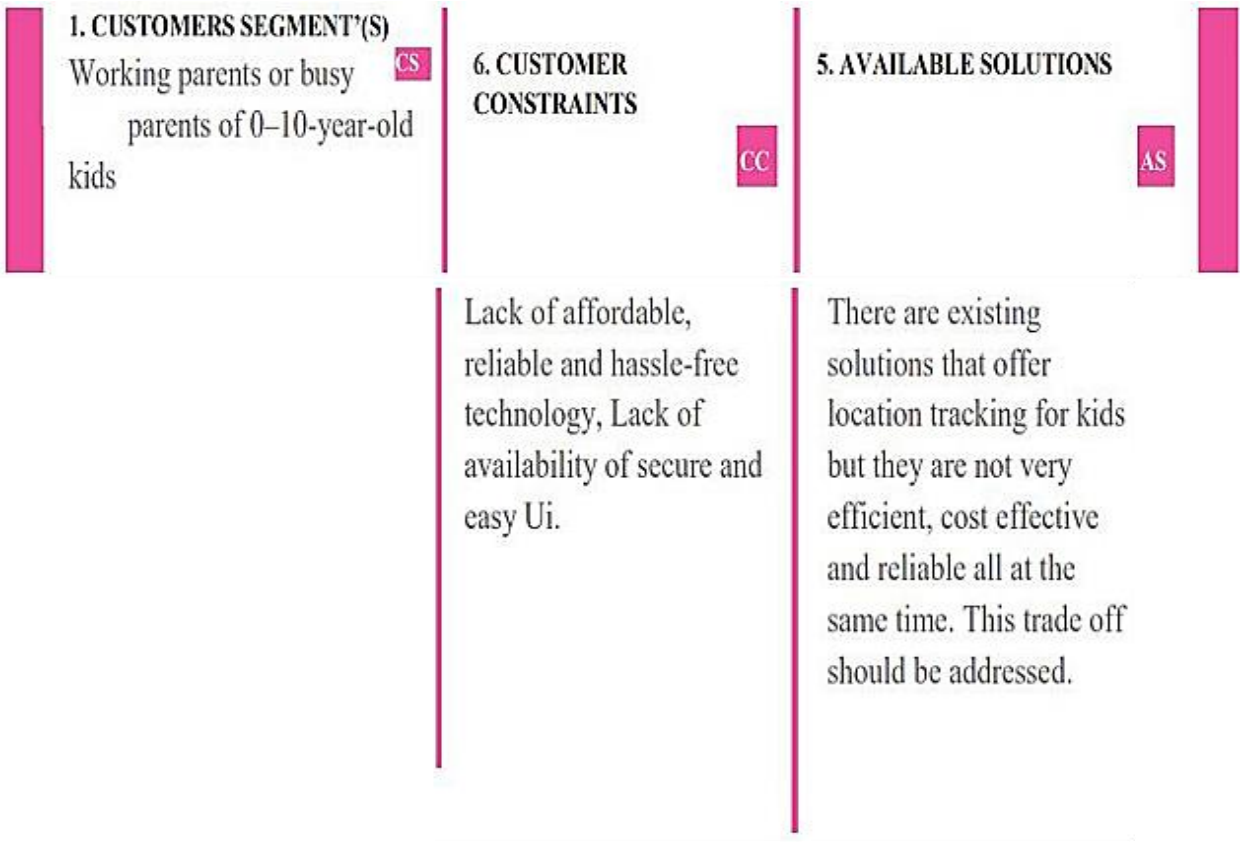
PROPOSED SOLUTION :

SI.NO.	PARAMETER	DESCRIPTION
1.	Problem Statement (Problemto be solved)	With the increasing rate of child kidnapping and trafficking and lack of tracking technology for child, thereis limited application for child monitoring. Hence an IoT based safety gadget fo child safetyis probably the need of the hourtoday
2.	Idea / Solution description	A good solution to this issue would be to design a smartwearable Internet of Things sensor based device for monitoring the environment of a child along witha mechanism for tracking the child. Thegadget will makeuse of GPSand a python script to publish the location details to the IBM IoT platform. The wearable also functions to send immediate alerts to the user through in case ifthe child crosses the geofence.

3.	Novelty / Uniqueness	All the existing systems make use of GPS and a mobileapp to trackand receive alerts regarding the child's location, while this system make use ofthe IBM Watson IOT Platform and IBM Cloud Services which is reliable and efficient to maintainthe database of the child's location. The parent canset geofence and receive alerts through the webapplication which is user friendly and secure Createdusing the NodeRed Service. .
4.	Social Impact /CustomerSatisfaction	The main concernof any parentwould be the safety and security of their kids. The design of thismodel does not mandate a lot of technical knowledge from the user to operateand it is simple.The purpose of this deviceis to facilitate the guardian or parents in locating their childwith ease andensuring its well-being.
5.	Business Model(RevenueModel)	The target audience of this device is majorly the parents. Considering the Tracking ability of the device,Hardware quality, used technology and sensors, the starting range of price would go from Rs. 6000 and above. This type of wearable safety system is of utmost importance today and would be a must buy gadget in the market today.

6.	Scalability of the Solution	With the presentneeds for monitoring the child the systemis designed. It has a location database to maintain the entire location history of the child and the parent can set the geofence to determine the safer boundary of the child. . If there is a need for integrating additional sensors to improve accuracy, it can be done to make the system efficient in the long run.

PROBLEM SOLUTION FIT :



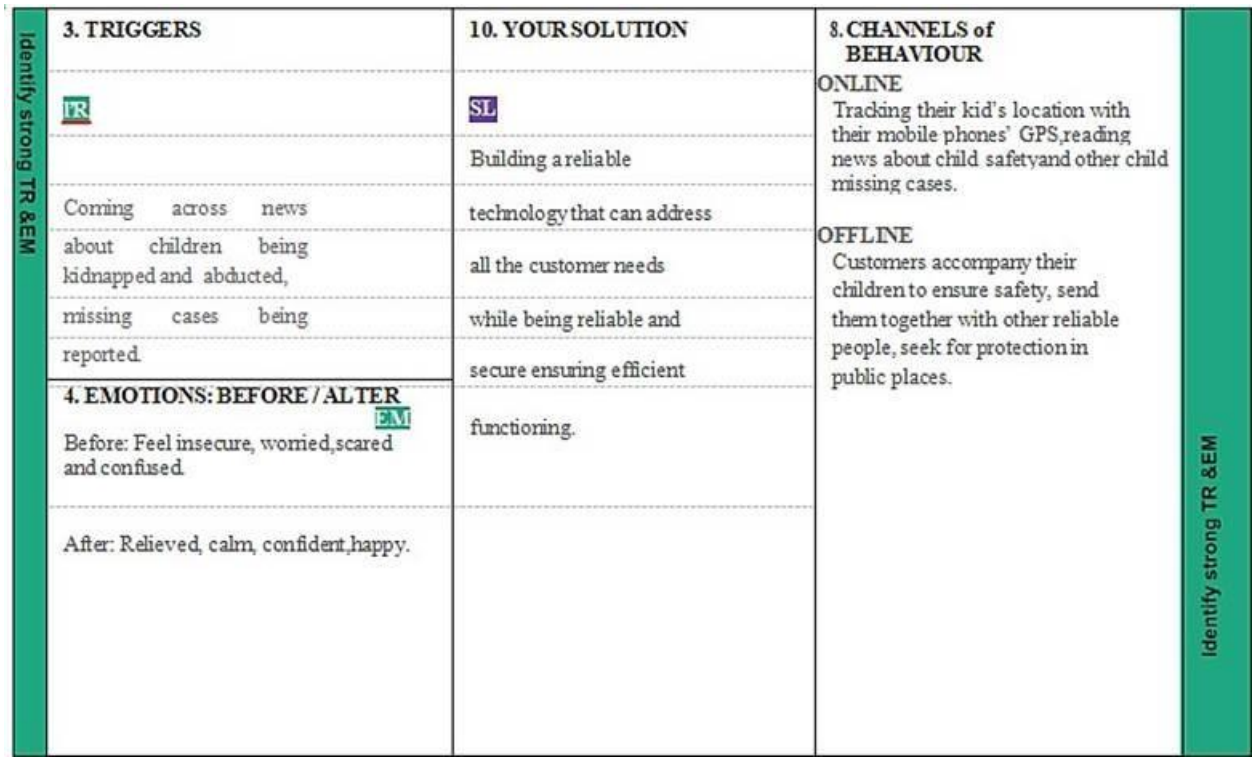


Fig 3.5 Problem SolutionFit

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.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Gmail Registration throughphone number
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	App installation	Installation through link Installation throughplay store
FR-4	Settings geofence	Setting by user to find childlocation
FR-5	Detecting child location	Detecting location via app Detecting location via SMS
FR-6	User Interface	User Login Form. Admin LoginForm.

FR-7	Database	Stored in cloud for seamless connectivity. Parents and kids link with the distance and the location values obtained from the mobile devices are stored here. The values include parentid, kid id, distance, longitude, latitude etc.
FR-8	Server	It connects the database and the front endapplication. The back-end server has been implemented to run as a serviceand is deployed in an IBM cloud instance. The backend server has been implemented to run as a serviceand is deployed in an IBM cloud instance.
FR-9	GPS tracking	The system is implemented with a GPS module, which acquires the location information of the user and stores it to the database.
FR-10	API	The value collected is sent to the database usingan API.
FR-11	React JS	We are usingreact is as front end for us project. Node JS for the back end we are usingnode is.

FR-12	GPS modules	It receives data directly from satellites.

FR-13	Battery Life	If the child or parent forgets to charge the device for a whole day then also the device will work. That's why we aim to make this device last the wholeday with onecharge. It shouldbe long-lasting.
FR-14	Location History	The location history willhelp to trackthe child's activity so that the aren't will beupdated. Location history will be there for 30 days. For example if the child gets missing with the help of location history the aren't can trackdown their child's activity and alsocan find their child.

4.2 NON-FUNCTIONAL REQUIREMENT :

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

FR. No.	Non-functional Requirements	Description
NFR-1	Usability	Device have GSM can help to inform the parents or relatives aboutthe current situations of the childby deliver the message immediately to

		save thechild.
NFR-2	Security	Make children parents more assure about their kid'ssecurity, we have a feature in our devicecalled Geo-Fence. Whenever your child crosses that specific area,you will get an instant notification on your phone.
NFR-3	Reliability	Portable Easy to use Flexibility
NFR-4	Performance	Create a Child tracker which helps the parents with continuously monitoring the child's location. The notification will be sent according to the child'slocation to theirparents or caretakers. The entire location data will be stored in the database.

NFR-5	Availability	Track your child even in a crowd Get travel detailsof kids at any time Know the current location
NFR-6	Scalability	Gadget ensures the safety and tracking of the children. Parents need not worry abouttheirchildren.
NFR-7	Evaluability	The system shouldbe able to deliver promptly to the financing authority. In the case of non-profit organizations, the solution should be 'advancing the mission'.
NFR-8	Dynamicity	IoT devices may have thecapability to adapt dynamically and change basedon their conditions.
NFR-9	Desirability	Navigation should be made easy. The user should be able to search and find the information he needs withoutmuch hassle.

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 :

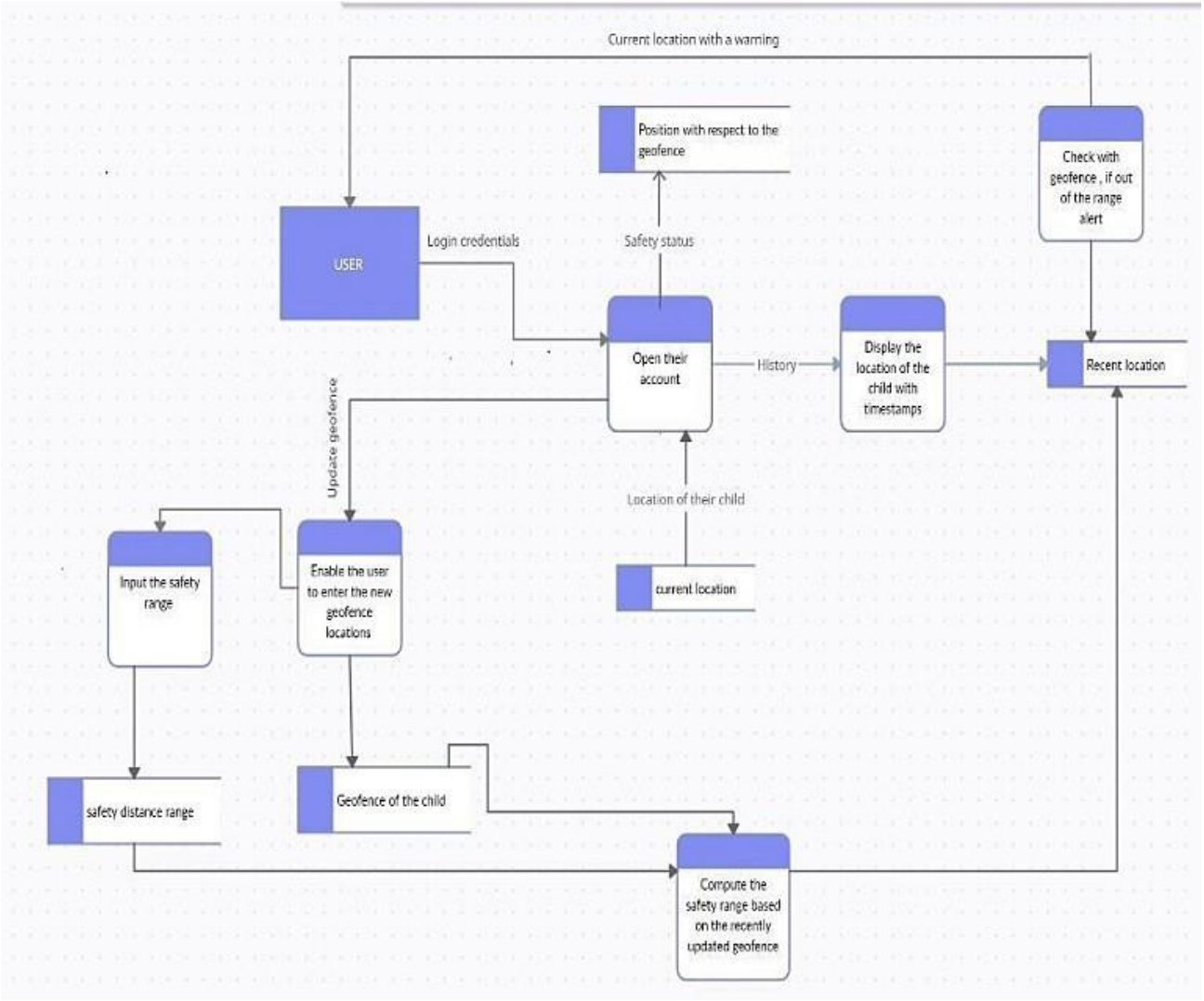


Fig 5.1 DataflowDiagram

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.

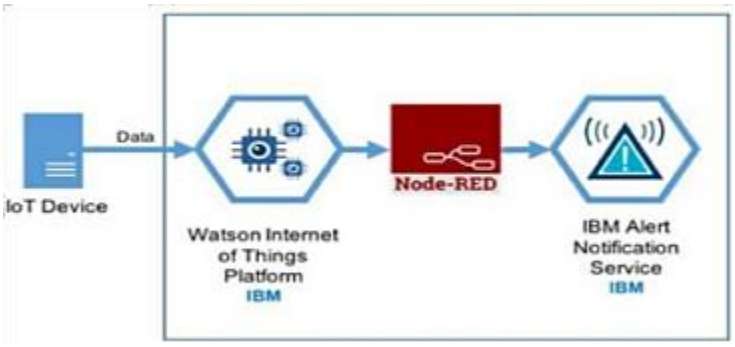


Fig 5.2 Solution Architecture Diagram

TECHNICAL ARCHITECTURE :

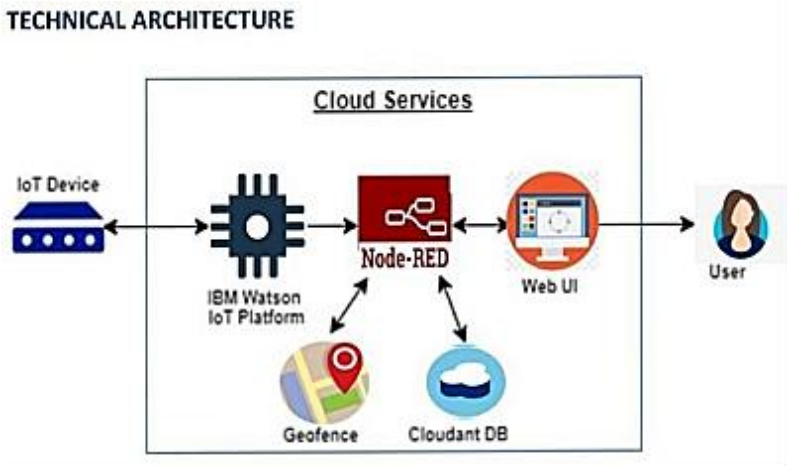


Fig 5.3 Technical Architecture Diagram

USER STORIES :

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptancecriteria	Priority	Release
Customer (Mobile user)and (Web user)	Registration	USN-1	As a user,I can registermy accountby enteringmy email,password, and confirming my password.	I can accessmy account / dashboard	High	Sprint-1
		USN-2	As a user,I will receive confirmation emailonce I haveregistered myself	I can receive confirmationemail &click confirm	High	Sprint-1
		USN-3	As a user,I can registerfor the application through apple account	I can register & access the dashboard with apple accountLogin	High	Sprint-2

	Login	USN-4	As a user,I can log intothe application by enteringuser id & password		High	Sprint-1
Customer Care Executive	Login		As I enter I can viewthe working of the application and scan forany glitches andmonitorthe operation and check ifall the users areauthorized.	I can loginonly with my provided credentials	Medium	Sprint-3

Table 5.1 User Stories

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

	Problem Statement	1	Summarize the problem that customer needsto be solved	09/09/2022

	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

	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	Login	USN-1	As a customer, I might ensure logincredential through gmail ease manner forthe purposeof sending alertmessage tothe parents or guardians (or) informing throughnormal message.	2	High	Kanimozhi Preethika S Harini N

			As a user,			
Sprint-1	Registration	USN-2	I have to registered my details and tools details in a simple and easy manner by consideringthe safety of child, this registered system sends notificationto the parents.	2	High	N.Harini S.Preethika
			As a user,			
Sprint-2	Dashboard	USN-3	In case of any emergency situation parents(I) must get thealert notification and location of the child.	3	Medium	M.Kanimozhi S.Preethika
			As a user,			

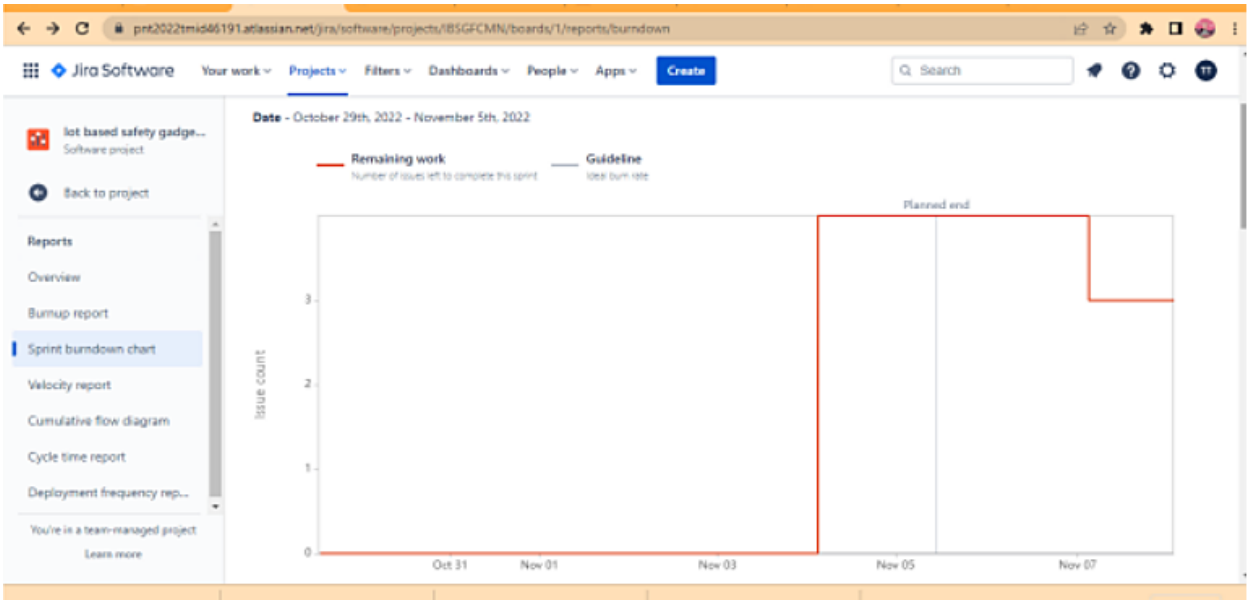
			I(parent) need to safeguard child and			
Sprint-3	Dashboard	USN-4	tracking the child's location and it is	2	High	Kanimozhi.M Harini.N
			important to notify near police stationinca se of more emergency .			
			As a user,			
Sprint-3	Dashboard	USN-5	Its good to have a IOT based systemto safeguard monitoring without presence of parent.	2	High	Preethika.S Kanimozhi.M

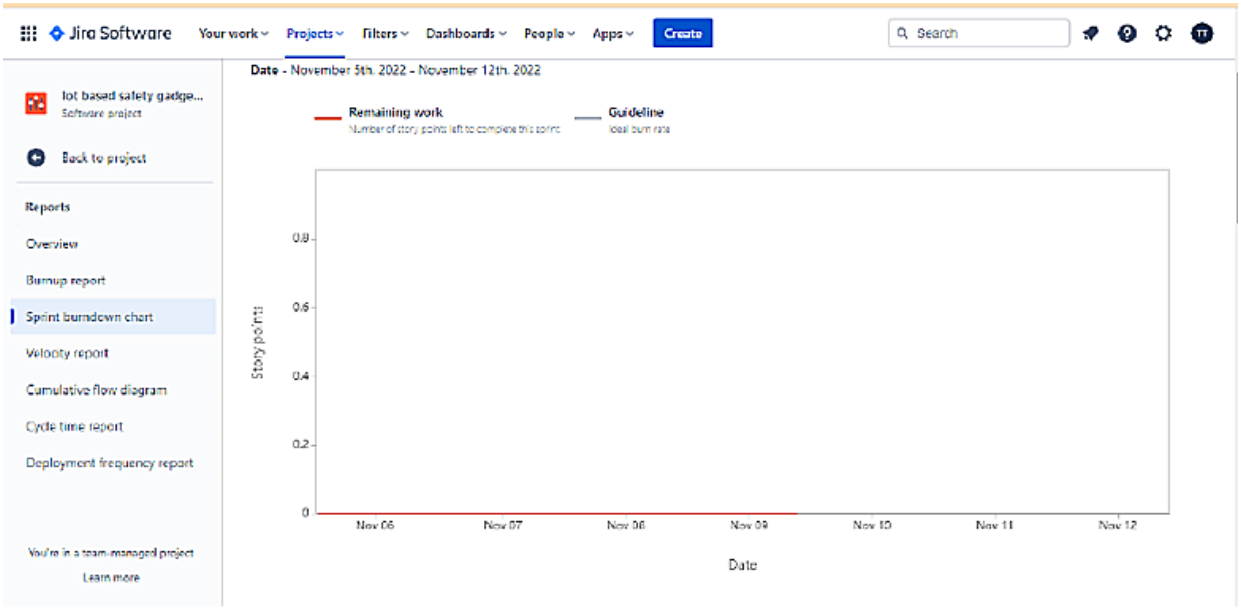
Sprint -4	Monitoring the environment	USN 1	User can monitor the situation ofthe environment from a dashboard that displays	2	High	S.Preethika N.Harini
			sensor informati onabout the environment and child health.			
Sprint-4	Event Notification	USN 6	Sending an alert SMS to the parents and guardians in case of panic situation.	2	High	Preethika.S Harini.N

Table 6.2 Sprint DeliverySchedule

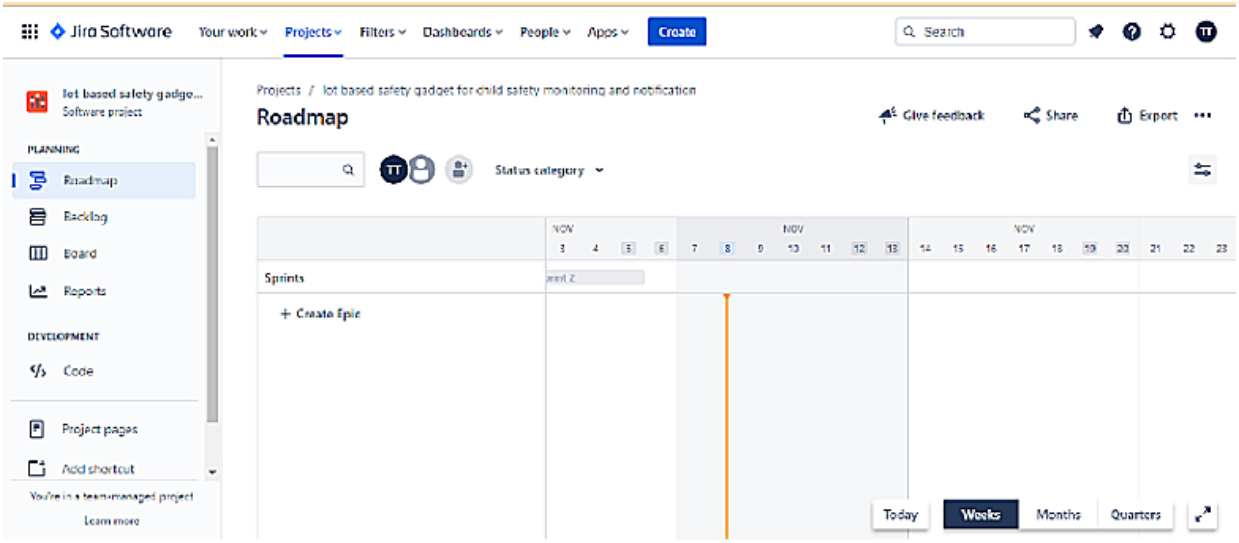
REPORTS FROM JIRA :

BURNDOWN CHART :





ROADMAP :

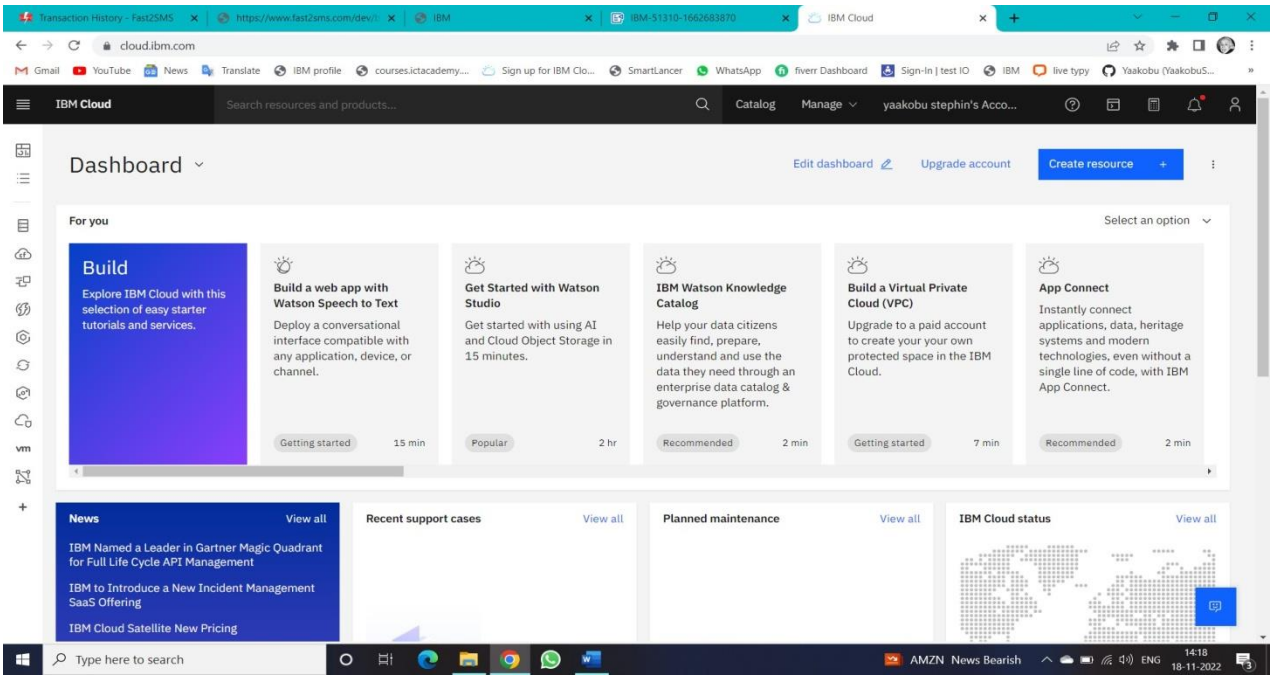

Jira Software
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
Projects / Iot based safety gadget for child safety monitoring and notification
Roadmap
Give feedback
Share
Export
Status category
PLANNING
Roadmap
Backlog
Board
Reports
DEVELOPMENT
Code
Project pages
Add shortcut
Sprints
+ Create Epic
NOV
Today
Weeks
Months
Quarters

CHAPTER 7

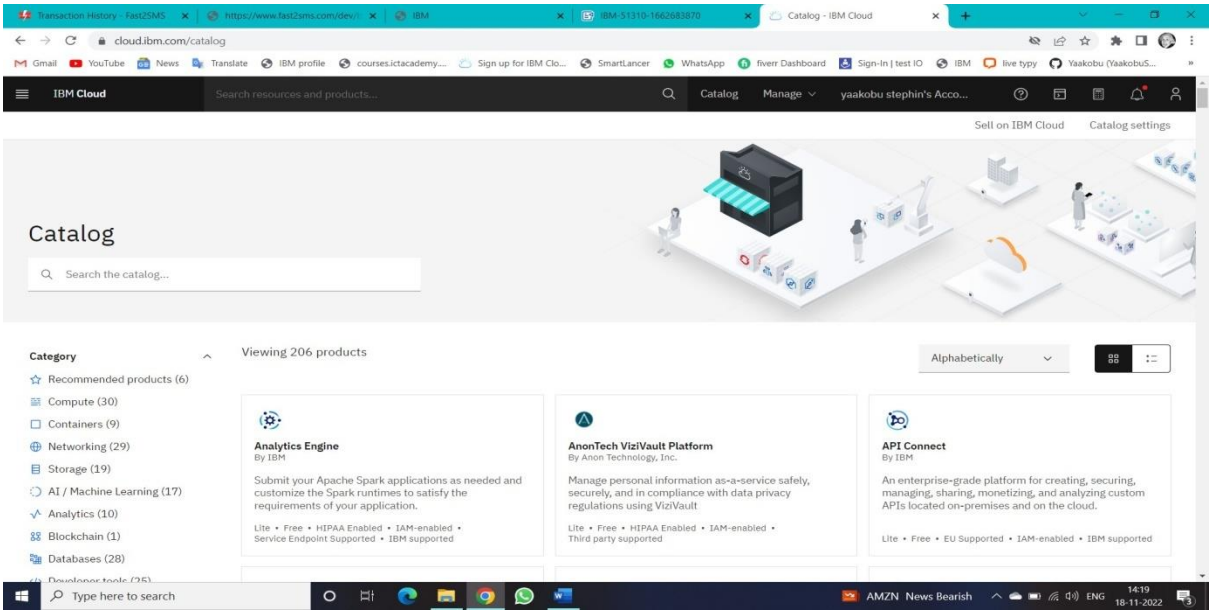
CODING AND SOLUTIONING

CREATE AND CONFIGURE IBM CLOUD SERVICES :

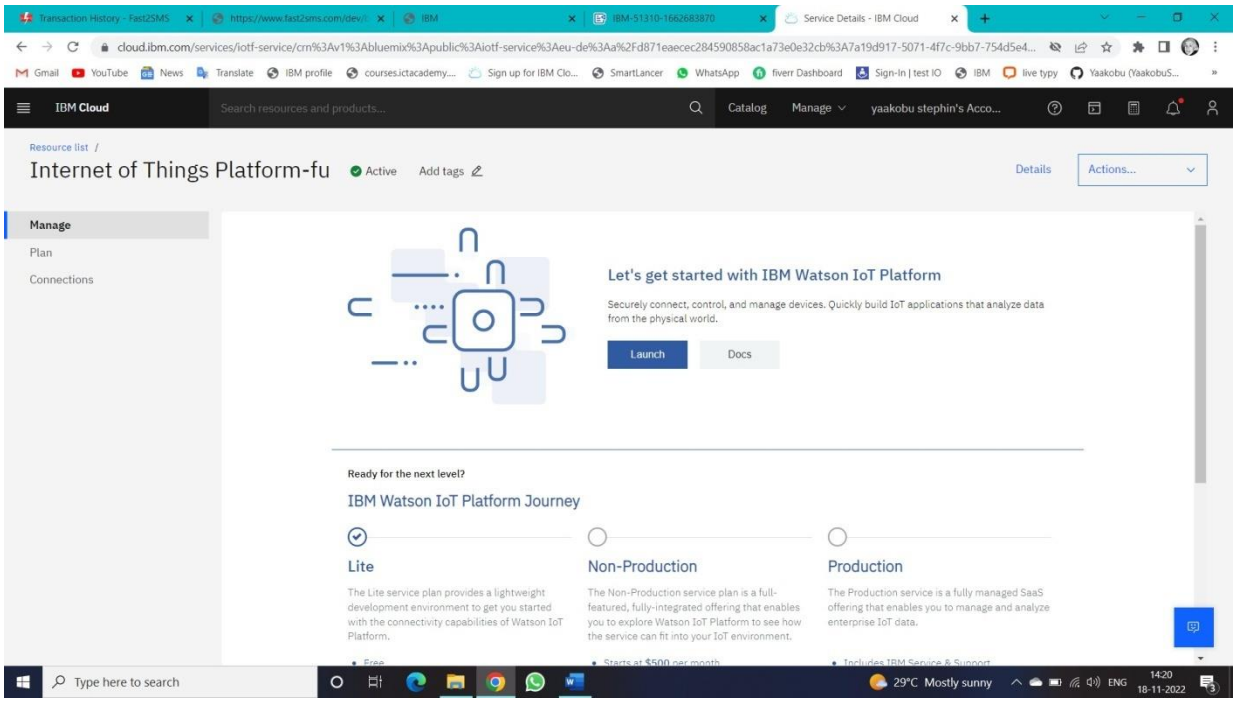
USN 1: As a user I need to enroll the cloud registration :



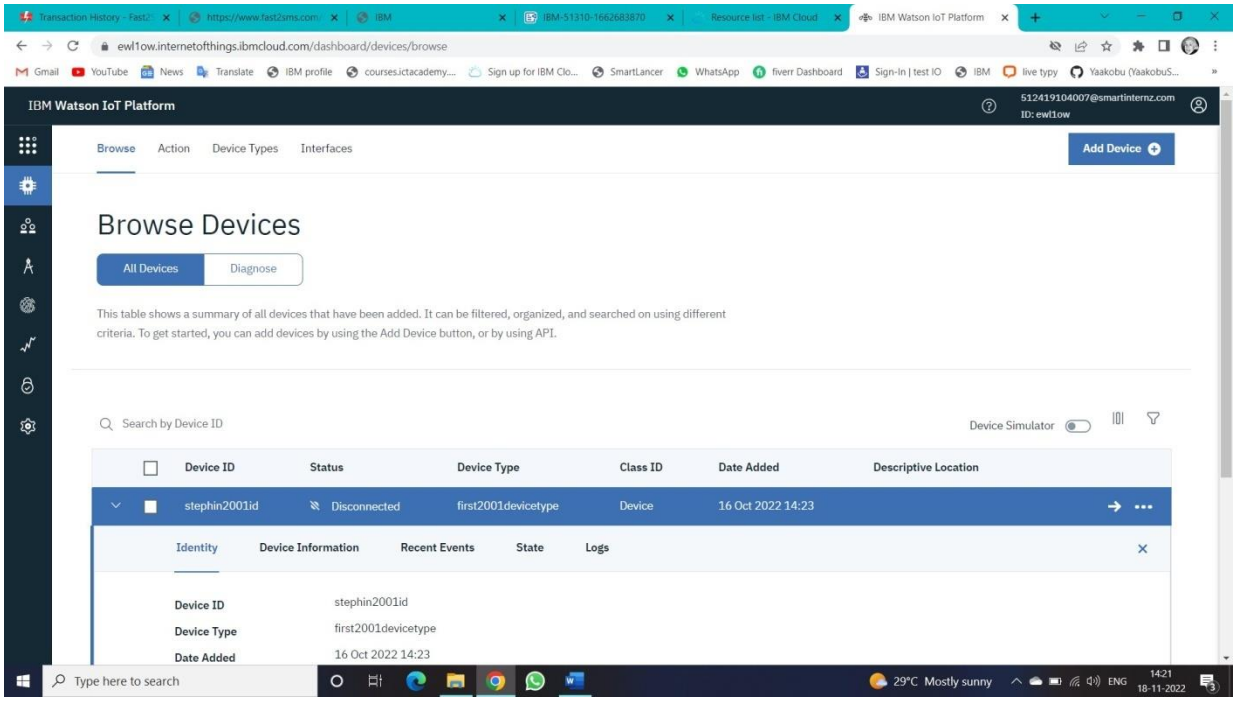
USN 2: As a user, I will create IBM cloud account :



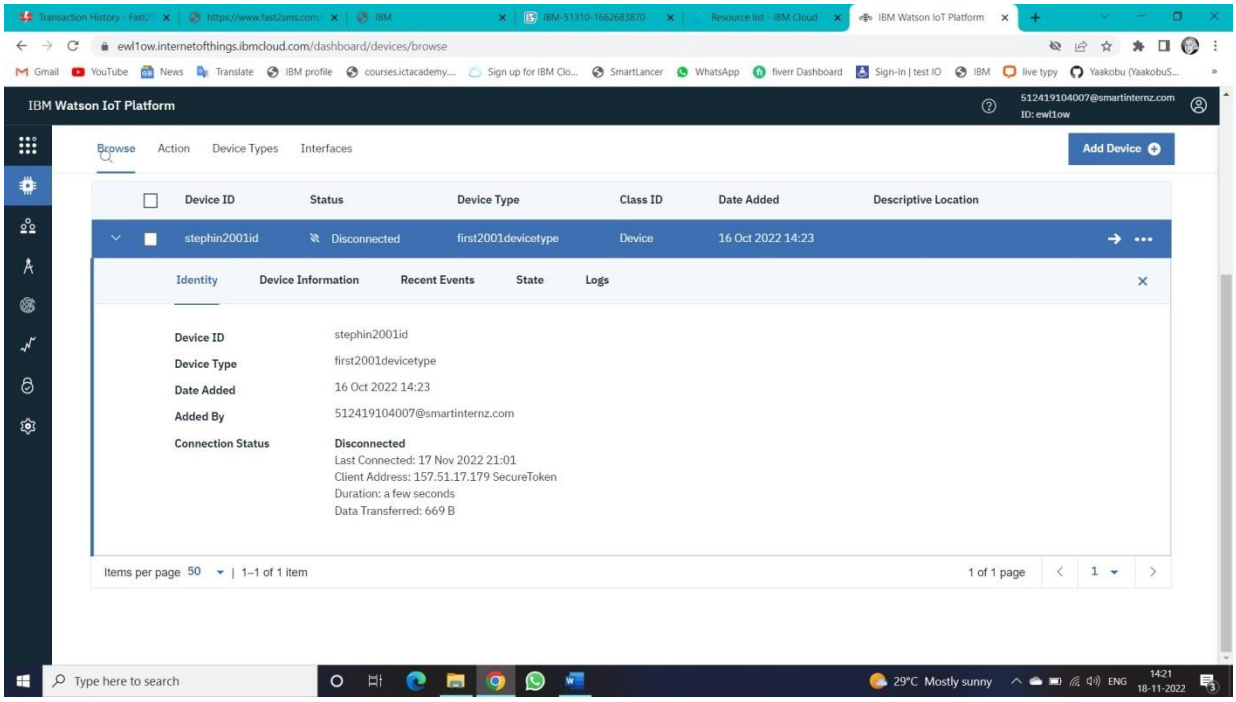
USN 3: After creating cloud account launchIBM Watson IOT platform by accessingcloud account :



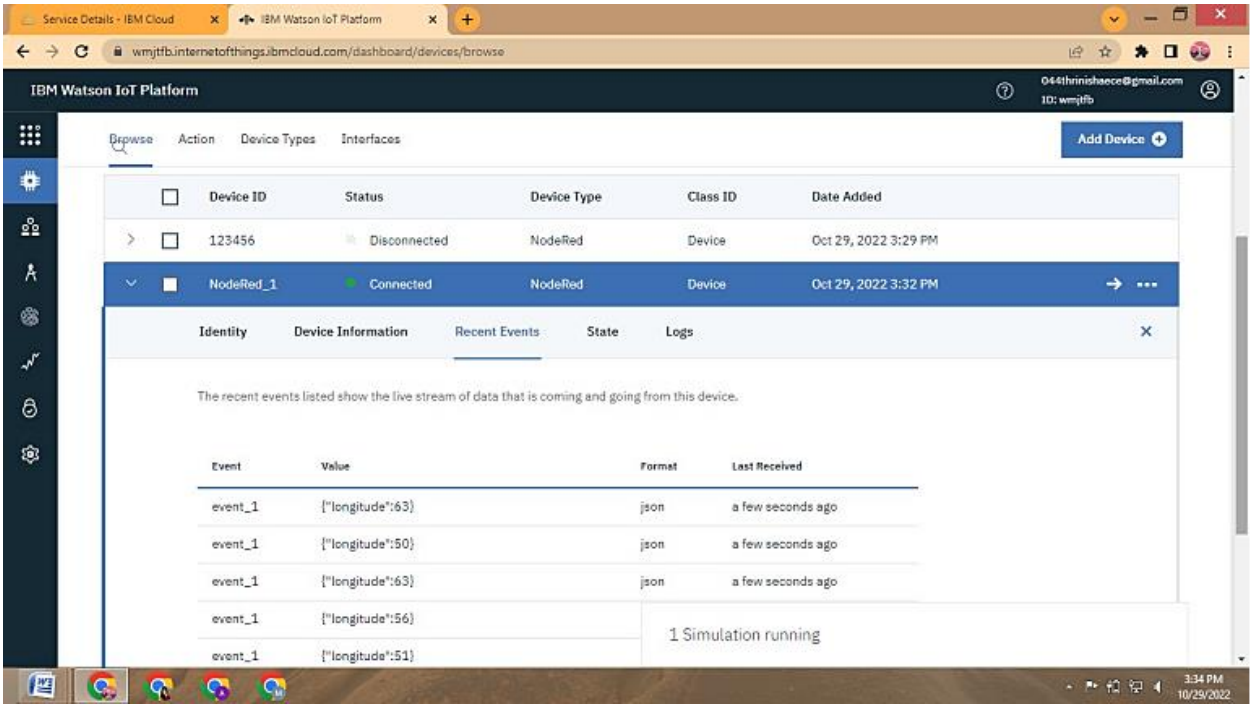
USN 4: Create the node in IBM Watsonplatform :



USN 5: After Creatingnode get deviceType and ID :

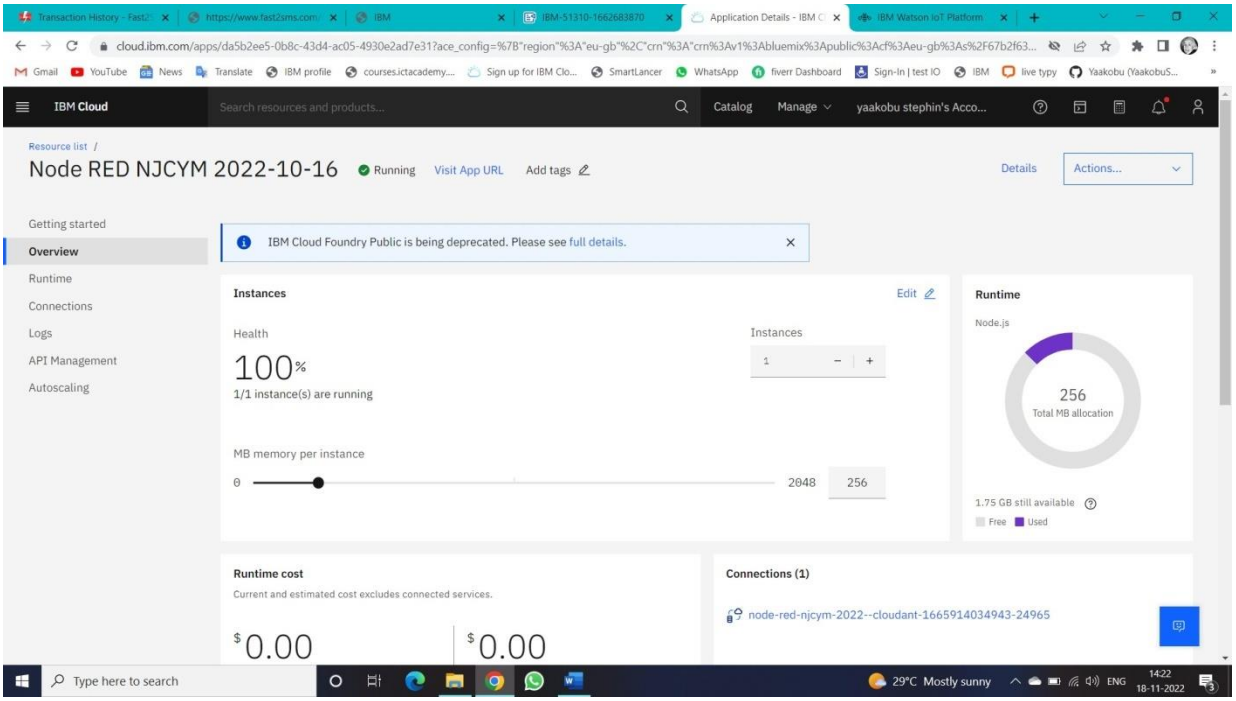


USN 6: Simulate the node created :

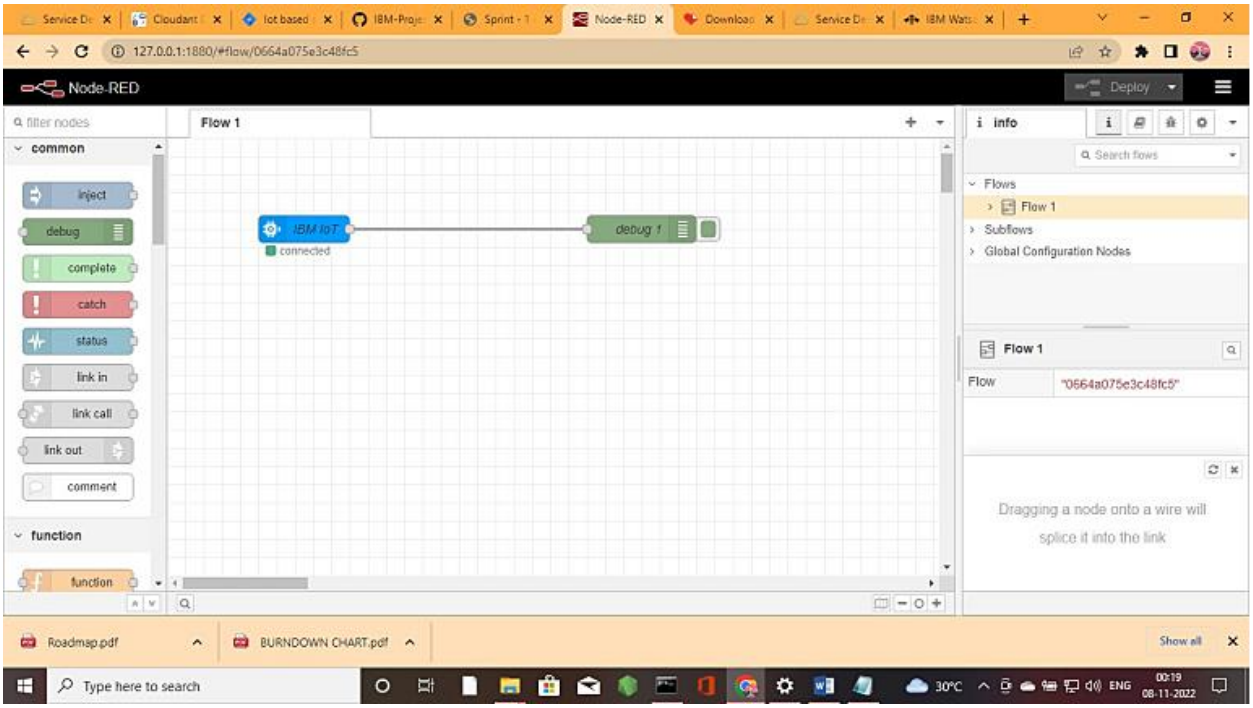


CREATE AND ACCESSNODE-RED :

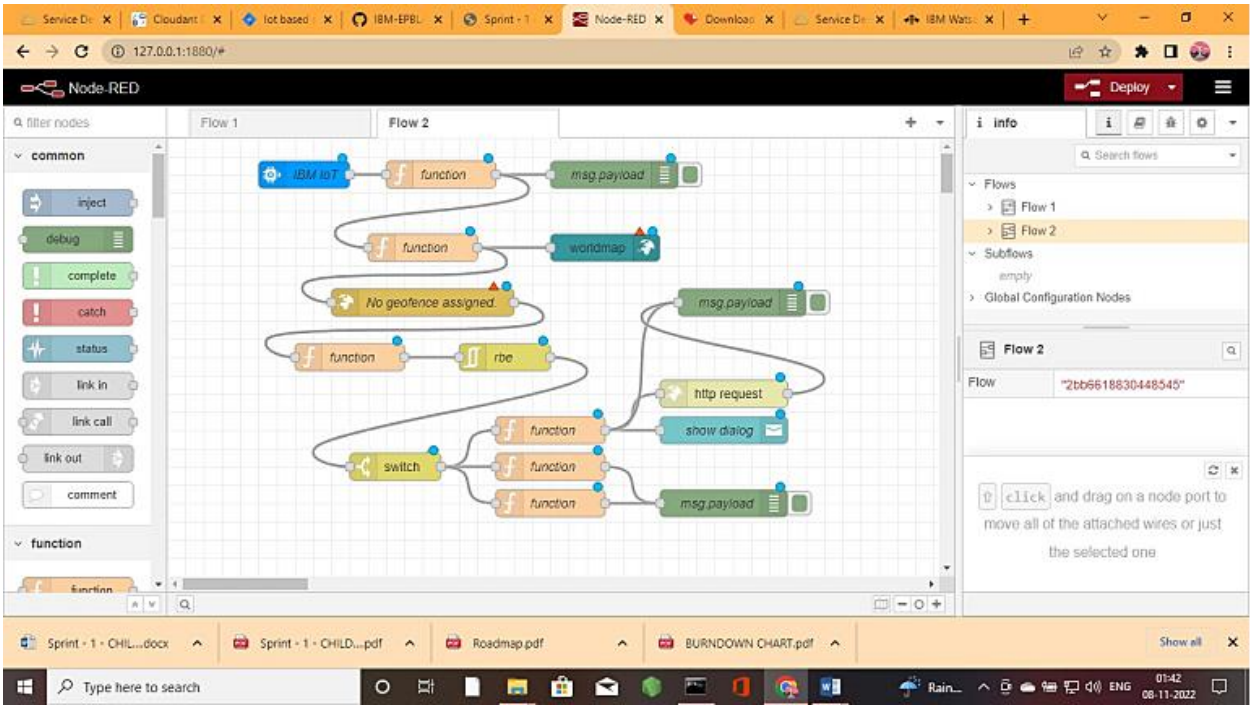
USN 7: As a user, I can createNode-red by app deployment :



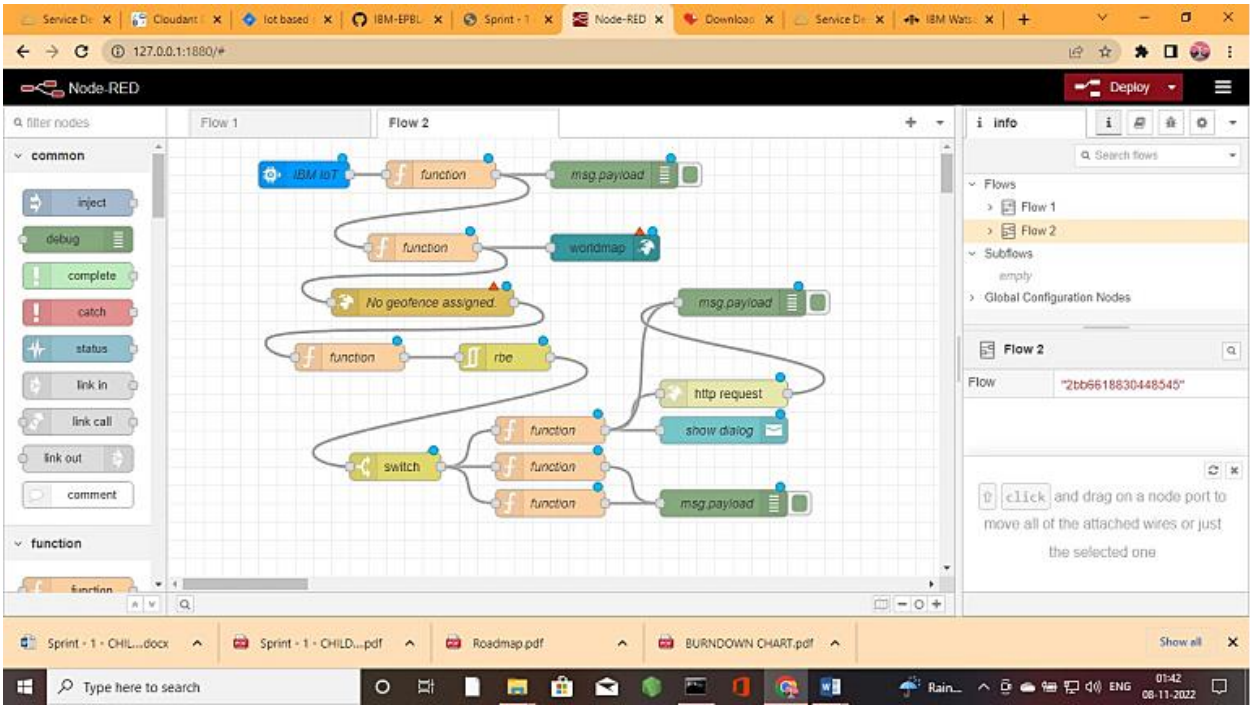
USN 8: Connect IBM Watson with node red through API key :



USN 9 : Designthe project flow using Node-Red :

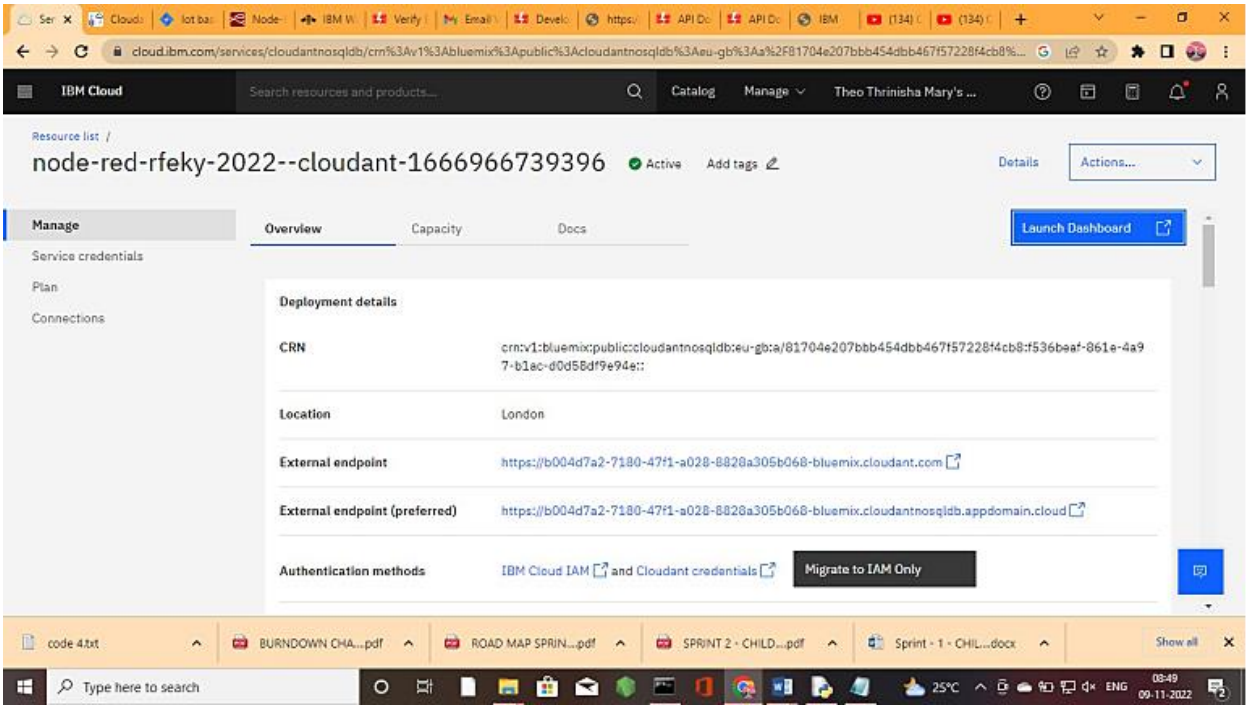


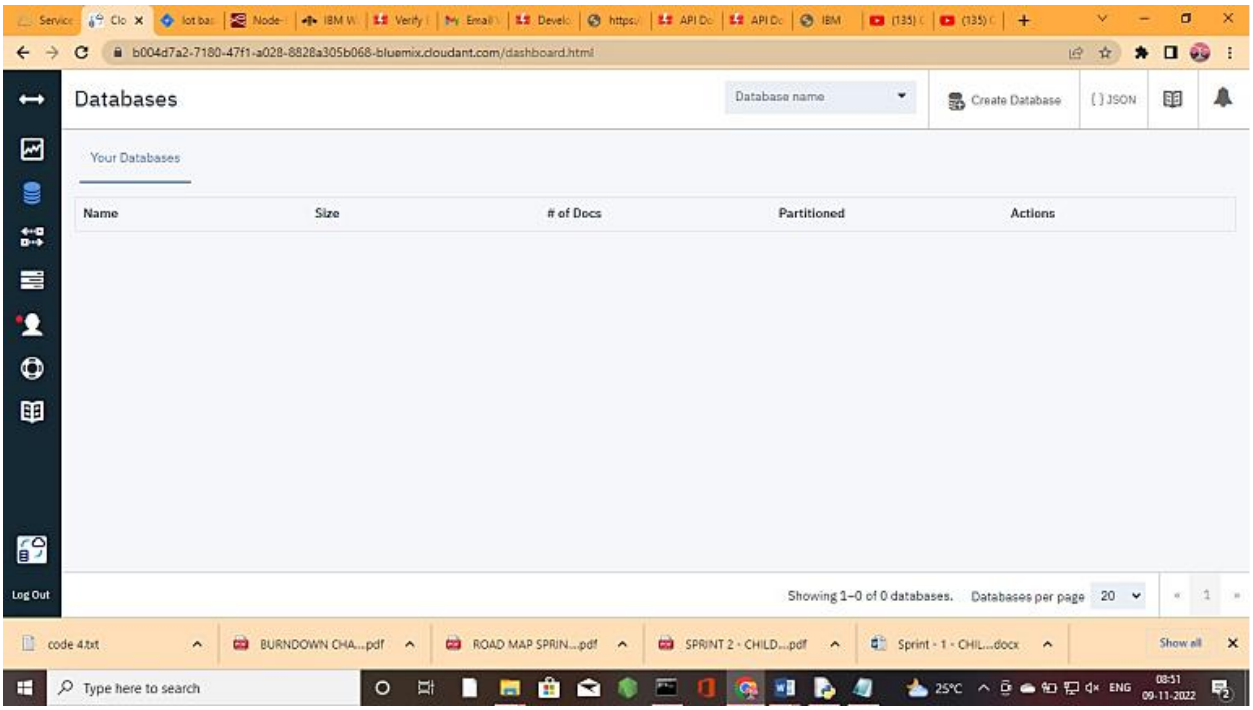
USN 10: Check for the properconnections and the output in the node red application :



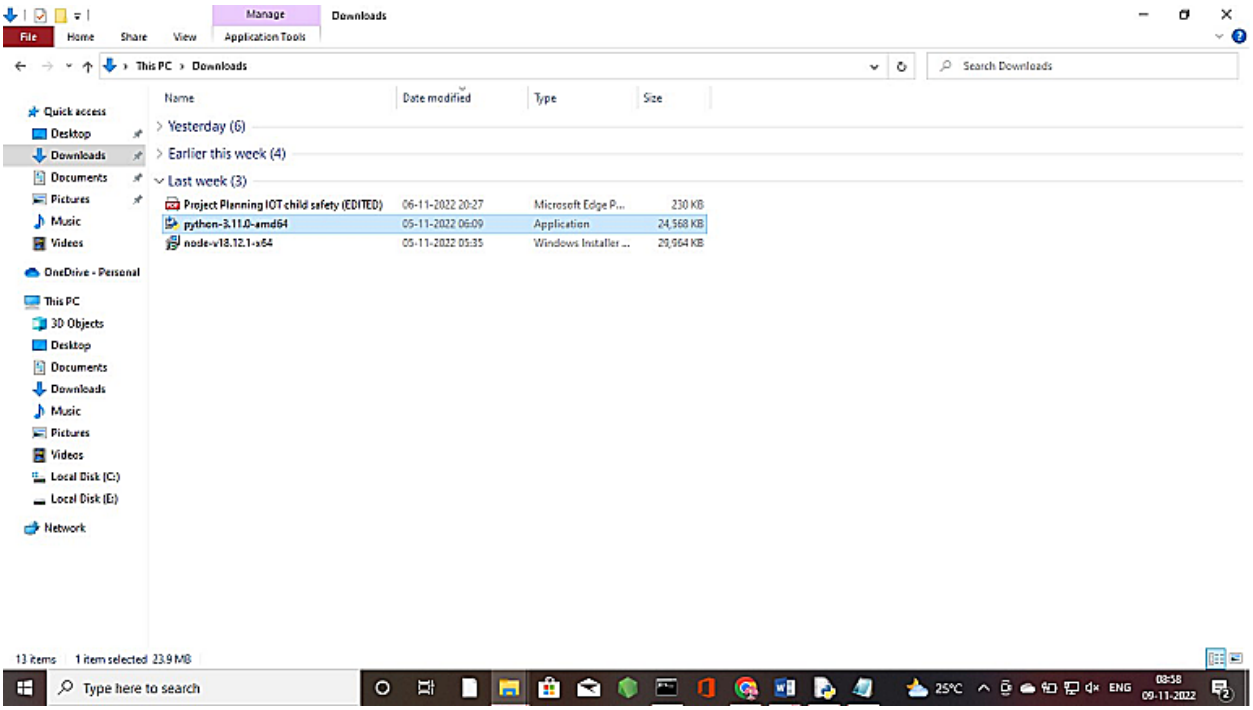
CREATE A DATABASE IN CLOUDANT DB AND DEVELOPTHE PYTHONSCRIPT :

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



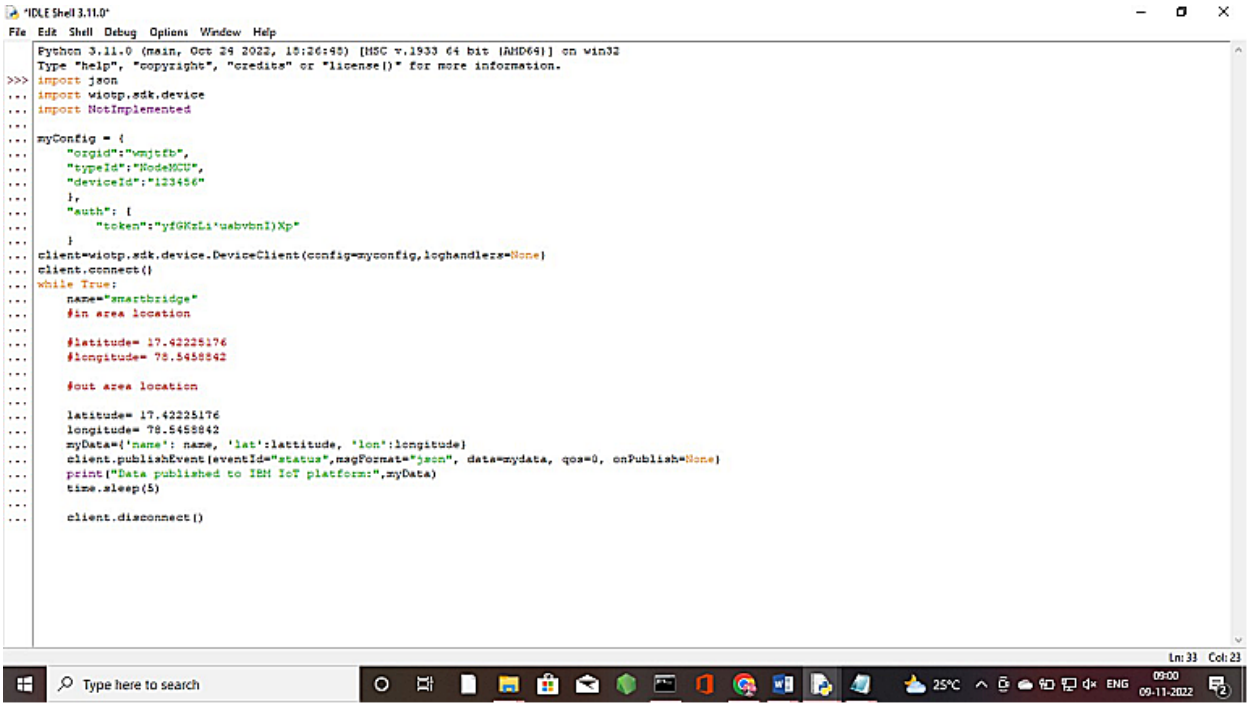


USN 12: Install the python software :

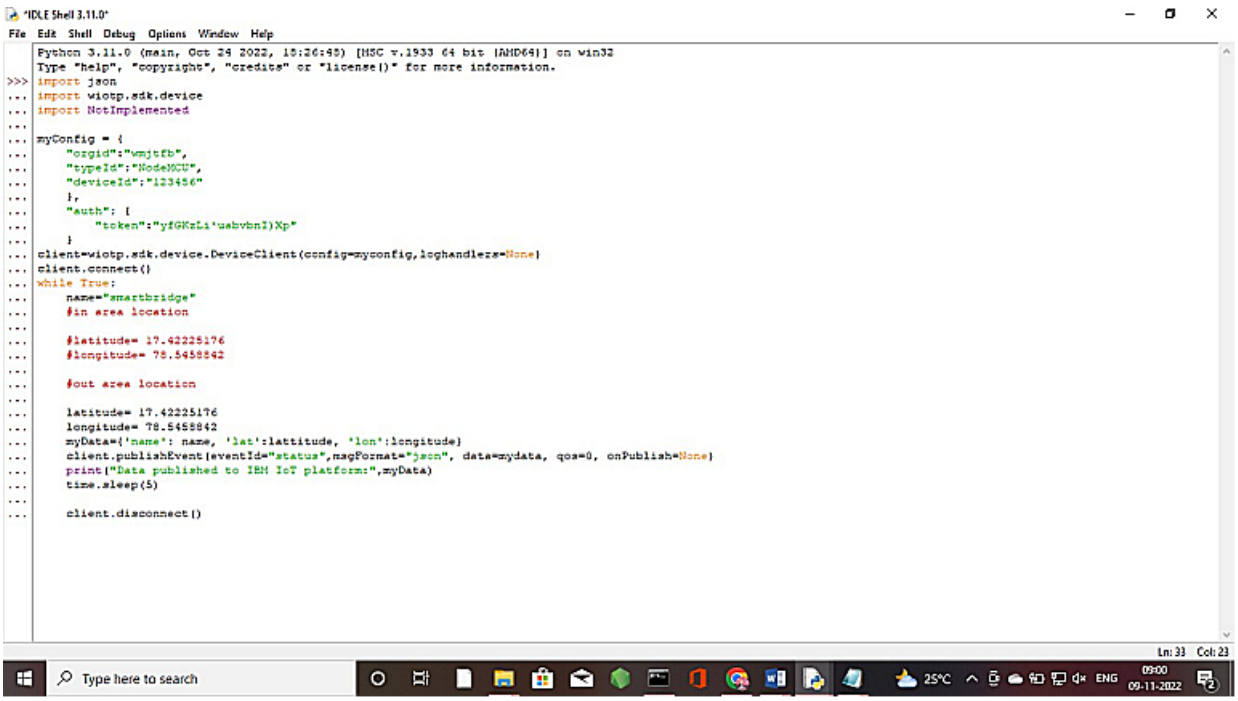


USN 13: Develop the python scriptsto publish detailsto IBM IoT Platform :

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

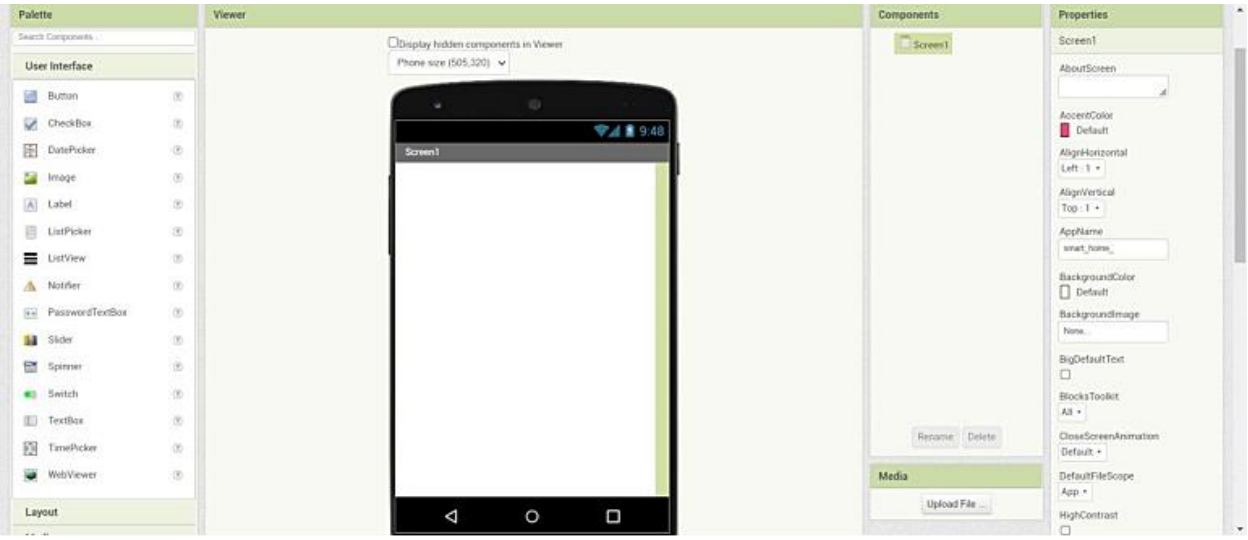


USN 15: Develop the python code for publishing the location (latitude& longitude) toIBM IoT Platform :

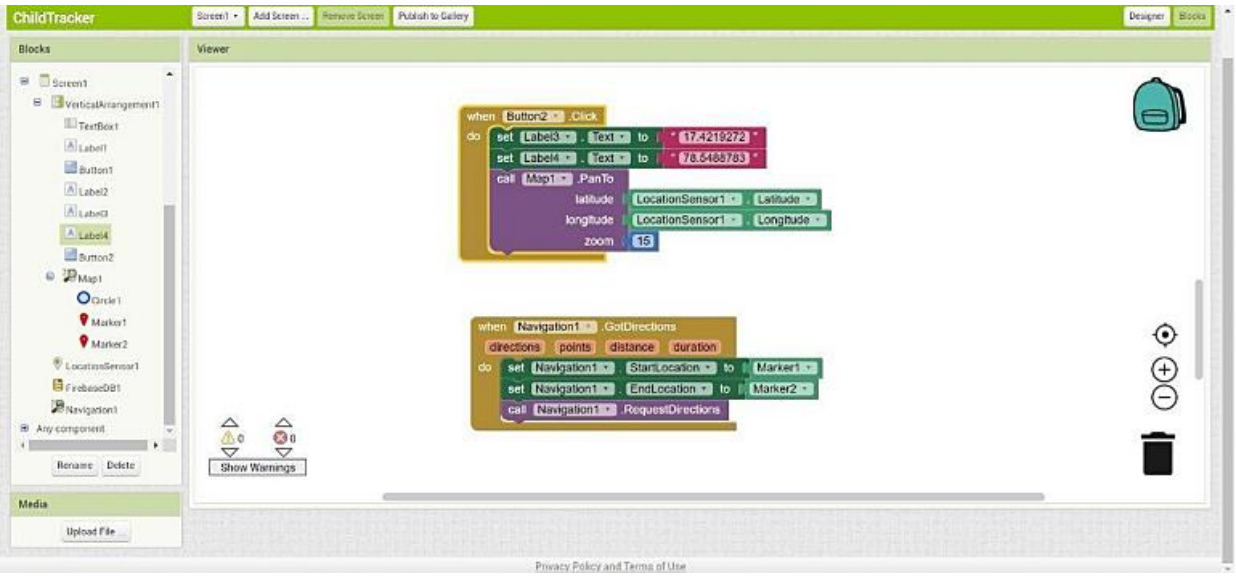


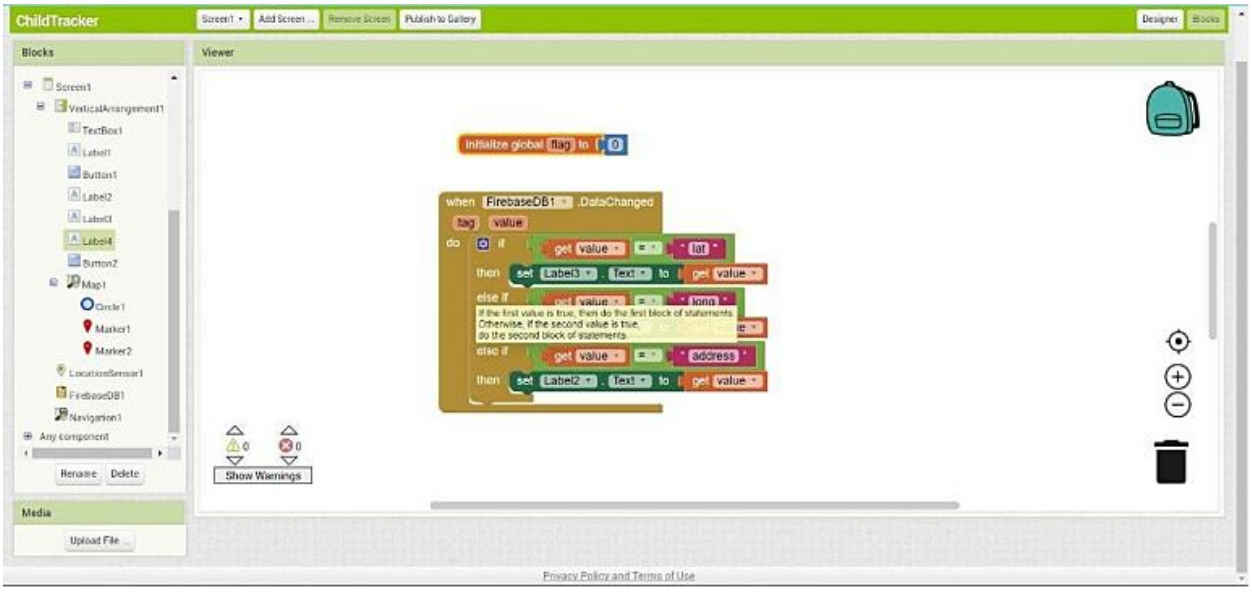
CREATE THE MOBILE APPLICATION USING MIT APP INVENTOR :

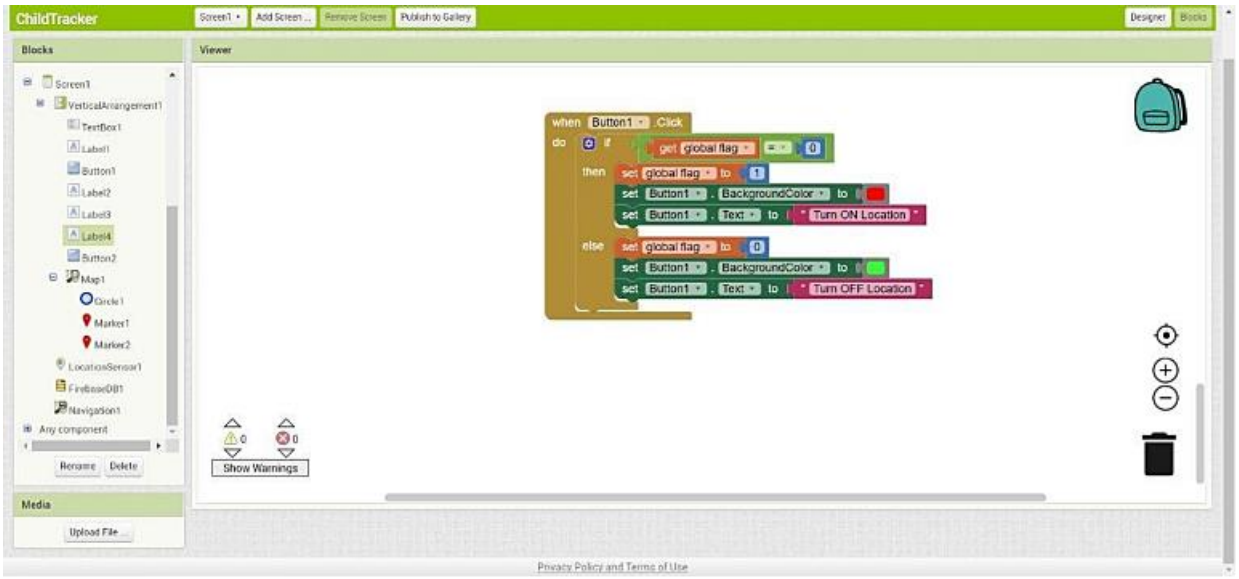
CREATE APP IN MIT APP INVENTOR :

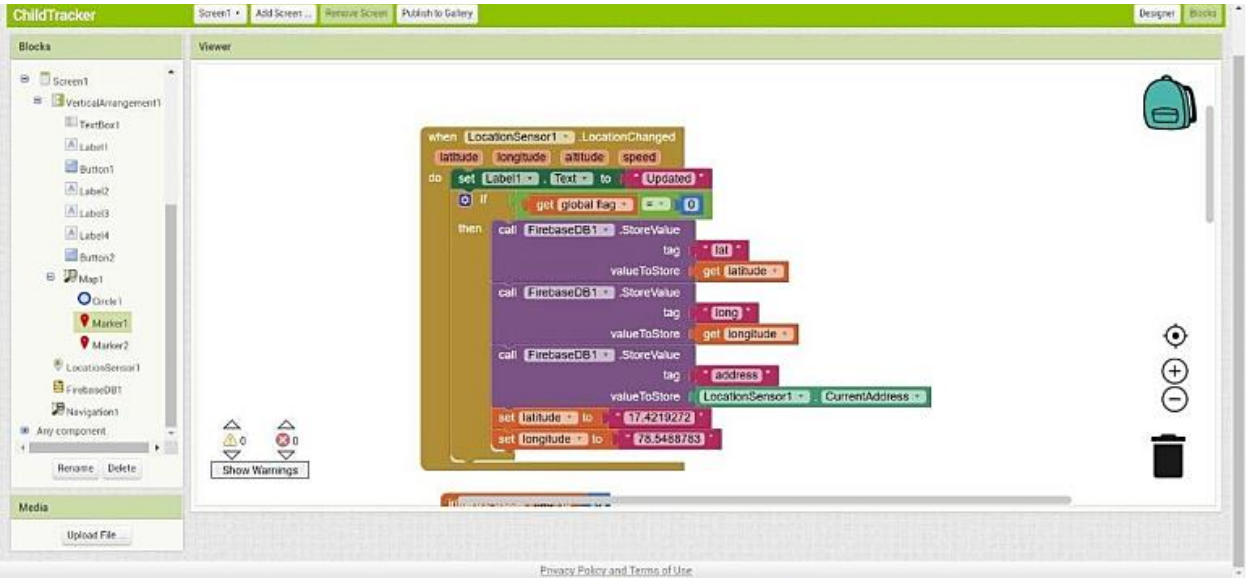


BLOCK CONFIGURATION :




ChildTracker
Blocks
Viewer
Initialize global flag to 0
when FirebaseDB1 .DataChanged
tag value
do if get value = "lat"
then set Label3 . Text to get value
else if get value = "long"
else if get value = "address"
then set Label2 . Text to get value
Show Warnings
Media
Upload File ...
Privacy Policy and Terms of Use

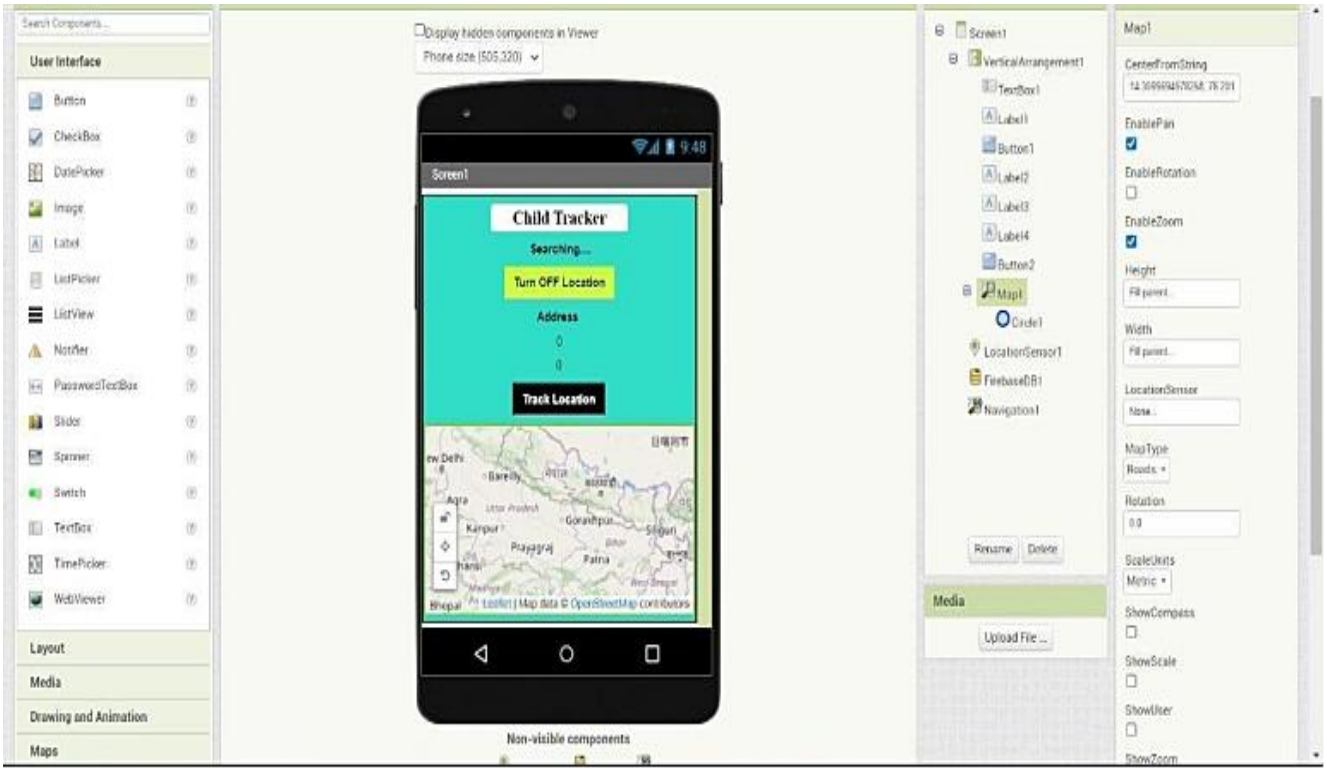

ChildTracker
Blocks
Viewer
when Button1 .Click
do if get global flag = 0
then set global flag to 1
set Button1 . BackgroundColor to
set Button1 . Text to "Turn ON Location"
else set global flag to 0
set Button1 . BackgroundColor to
set Button1 . Text to "Turn OFF Location"
Show Warnings
Media
Upload File ...
Privacy Policy and Terms of Use



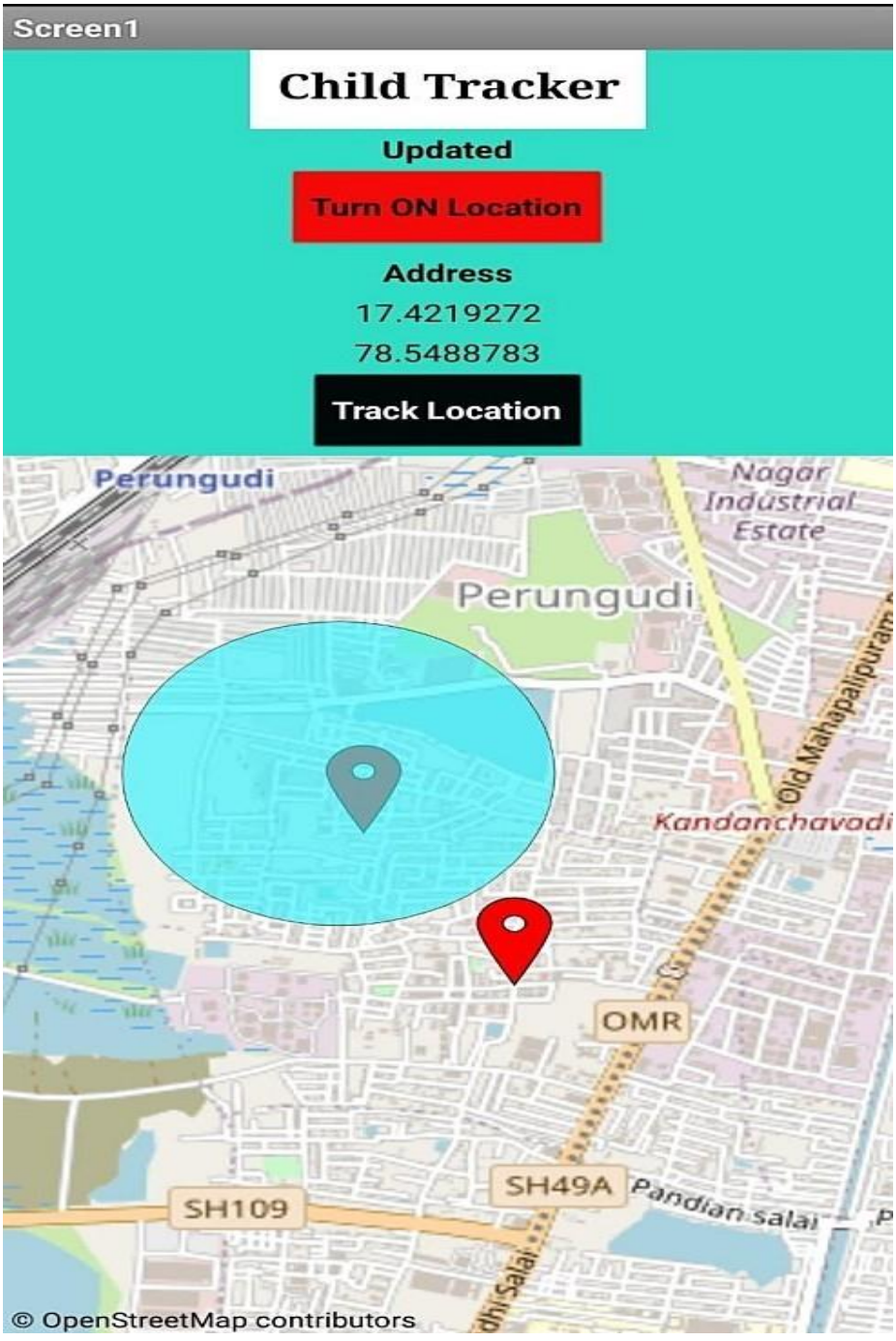
Thus, this chapter dealt with the coding and development process of proposed system.

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.