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NAALAIYA THIRAN – IBM PROJECT

IOT BASED GADGET FOR CHILD SAFETYMONITORING AND NOTIFICATION

Presented by,

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TITLE

1.INTRODUCTION

1.1 PROJECT OVERVIEW

The main concept is to create a app that used to check the location of thechild as safety system. This concept focus on finding the child and continuously update the current location to the parent or caretaker.

The IBM cloud, Node-red and IBM Watson are used to createthe web-application which is to be used in IoT child safety monitoring gadget.

1.2 PURPOSE

Parents can simply leave their children in park, school orsomewhere else, child tracker application helps the parent to continuously monitor the child's location.

Notifications will be sent to the caretaker's mobile, accordingto the particular geofence aound the child.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

1. If the child may in the area where there is no network or moveaway from the network coverage area, there is a difficulties to identifyand track the location of the child.

2. The wearable device may be removed by someone who try tokidnap the child.

3. If it was removed or missed by the child, the identification and tracking are worthless then we proposed the method of sense the bodytemperature of child to identify whether it is with the child or not.

2.2 REFERENCE

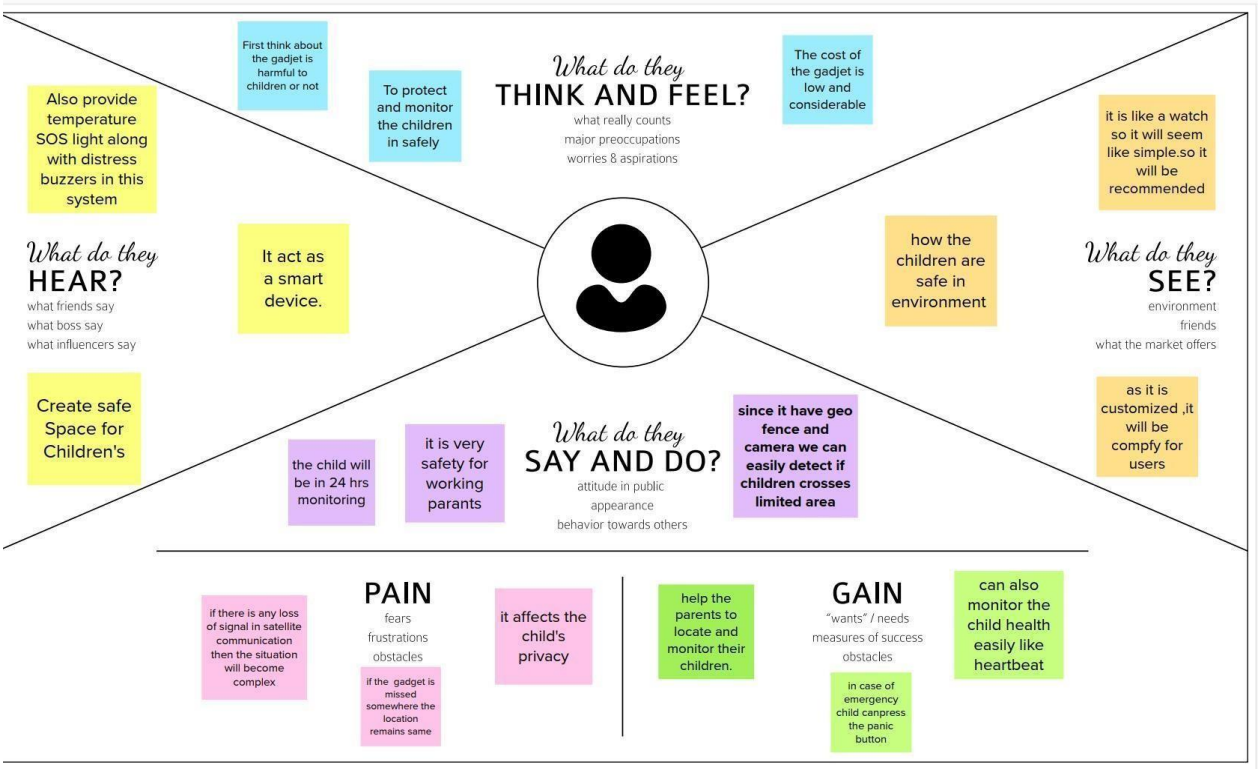
S.No	Title	Reference
01	Safety of a child in large public	https://ieeexplore.ieee.org/abstract/document/9031524
02	Intelligent child safety systemusing Machine Learning in IoT devices	https://ieeexplore.ieee.org/document/9277136
03	Smart wearable devices for littlechildren	https://ieeexplore.ieee.org/document/7899531

2.3 PROBLEM STATEMENT DEFINITION

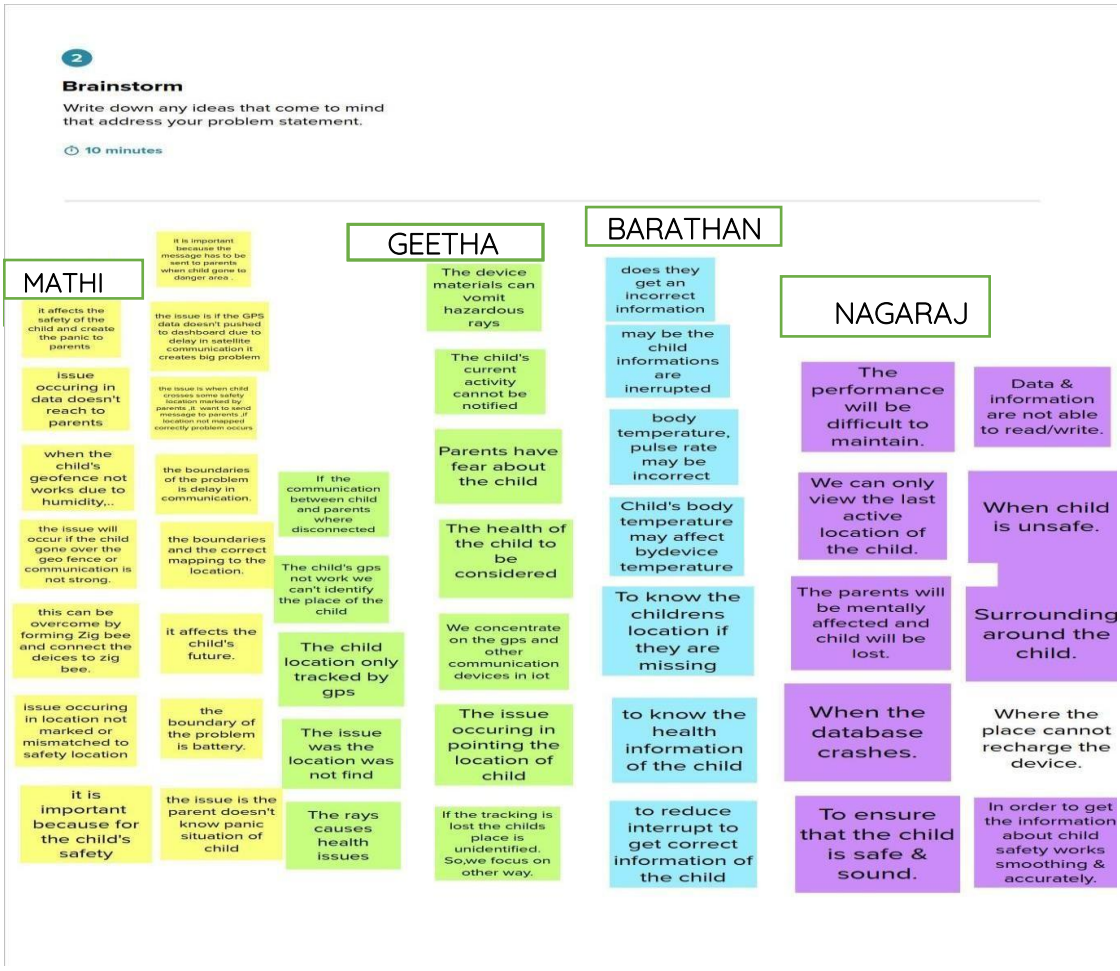
I am	Product developer	to make a device
I'm trying to	made a device	for child safety
But	will not receiving the propersignal	signal clashes
Because	out of coverage and sometechnical issue	internet issue and serverdown
Which makes me feel	Anxiety	we can't face the problemdirectly

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.2 IDEATION & BRAINSTORMING



3.3 PROPOSED SOLUTION

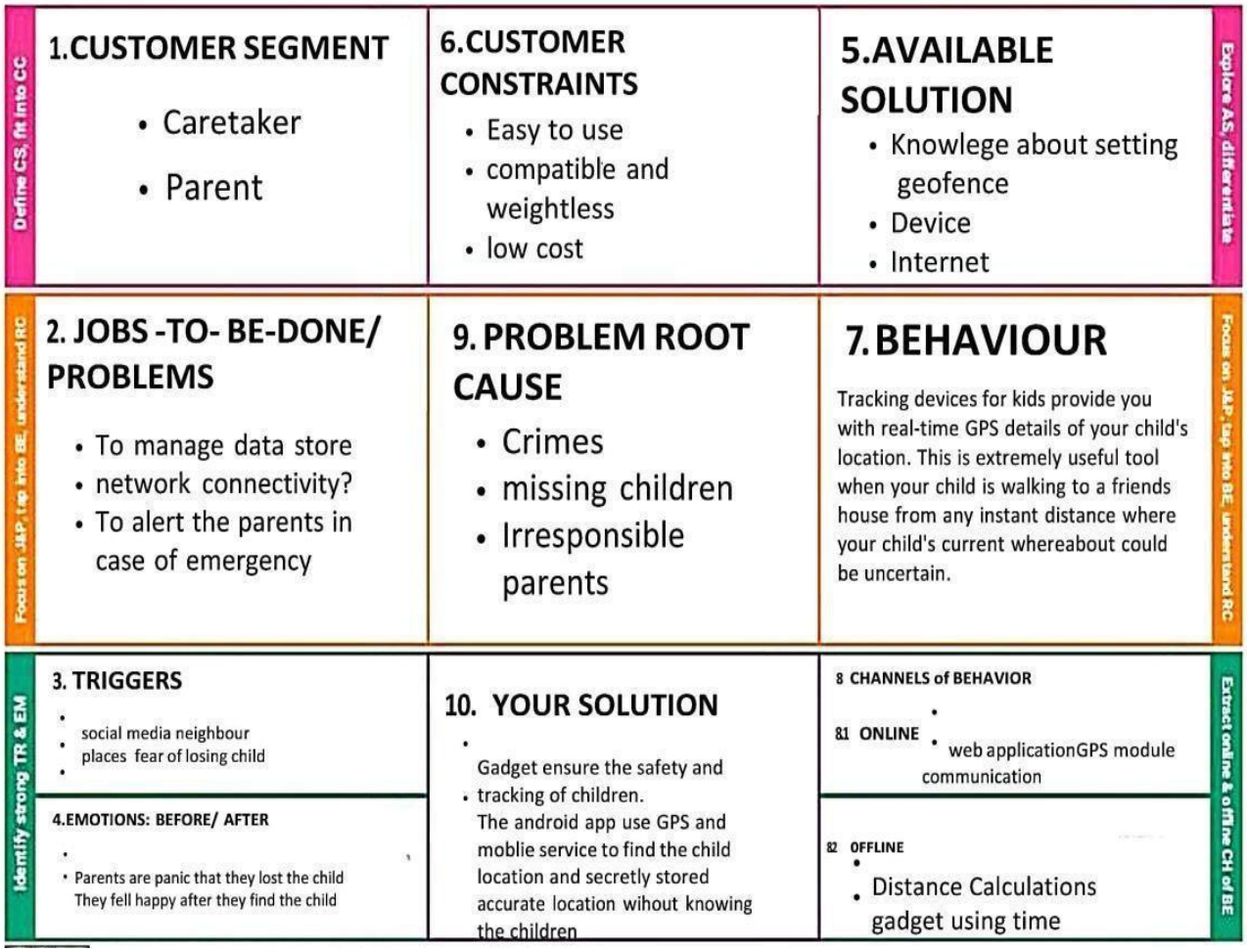
Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Basically, children cannot complain about abusement which they face in their daily life to their parents. They can't even realize what actually happens to them at their age. It is also difficult for parents to identify their children are being abused. Since to prevent children before being attacked. Child goes missing in this world. To protect them in school , outside the house, when crossing road and respective environment .
2.	Idea / Solution description	In this system, the collected values from every sensor like temperature sensor, pulse rate detection sensor, metal detection sensor, and the location value from GPS are used to detect the status of the child and alerts the respective guardians using GSM accordingly. This paper presents a system to monitor pick-up/drop-off of school children to enhance the safety of children during daily transportation from and to school. The system consists of two main units, a bus unit, and a school unit. The bus unit the system is used to detect when a child boards or leaves the bus. This information is communicated to the school unit that identifies which of the children did not board or leave the bus and issues an alert message accordingly the aim of this work is to develop a wearable device for the safety and protection of women and girls. This objective is achieved by the analysis of physiological signals in conjunction with body position. The physiological signals that are analyzed are galvanic skin resistance and body temperature. Body position is determined by acquiring raw accelerometer data from a triple axis accelerometer. A portable device which will have a pressure switch. As soon as an assailant is about to

		attack the person or when the person senses any insecurity from a stranger, he/she can then put pressure on the device by squeezing or compressing it. Instantly the pressure sensor senses this pressure and a conventional SMS, with the victim's location will be sent to their parents/guardian cell phone numbers stored in the device while purchasing it, followed by a call. If the call is unanswered for a prolonged time, a call will be redirected to the police and the same message will be sent. Additionally, if the person crosses some area which is usually not accessed by the person then a message with the real-time location is sent to the parent/guardian's phone via conventional SMS.
3.	Novelty / Uniqueness	RFID-based System for School Children Transportation Safety Enhancement. Design and Development of an IOT based wearable device for the Safety and Security of women and girl children. Smart Intelligent System for Women and Child Security
4.	Social Impact / Customer Satisfaction	increased fear, guilt and self-blame. distrust of adults or difficulty forming relationships with others. disrupted attachments with those who are meant to keep them safe. mental health disorders such as anxiety, attachment, post-traumatic stress and depression disorders.
5.	Business Model (Revenue Model)	The model of the gadget is wearable device. Like watch , pendent and other models. That consist the GPS to track the location of the person . If it is business model we first consider about cost and the gadget is not harmful to health. Because the device was used by the person in 24 hours.
6.	Scalability of the Solution	The scalability we can use the gadget in 24 hours. That sense and sends the information to the parents and guardians to the right ways. To ensure that it works in the day full. This is the scalability of the gadget

3.4 PROBLEM SOLUTION FIT



4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Notification	Notified via Mobile App
FR-4	User Interface	Mobile App- MIT App Inventor Able to see location of children when they are out of geofence

4.2 NON-FUNCTIONAL REQUIREMENTS

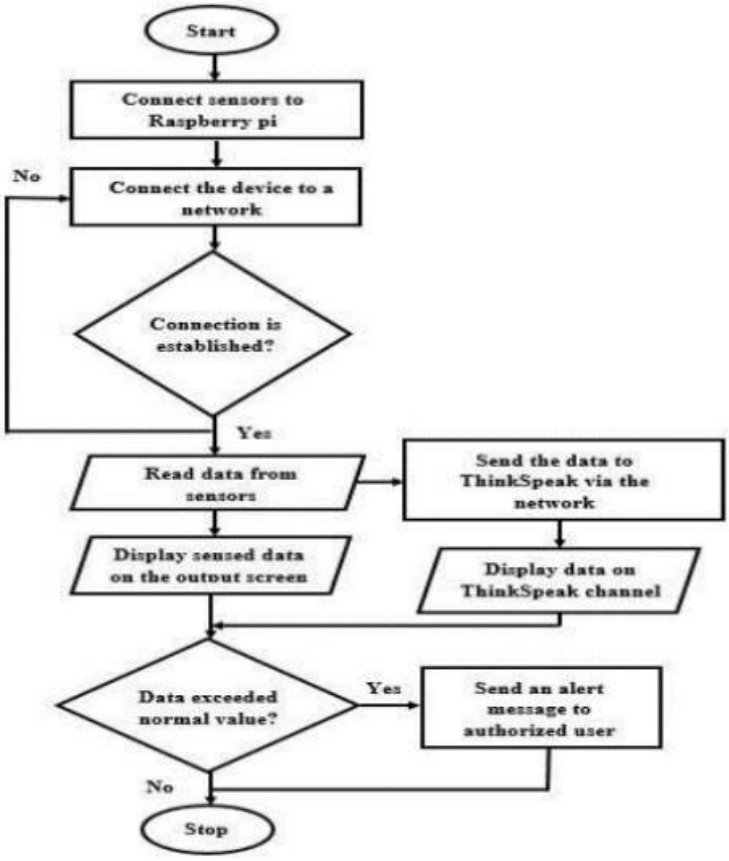
Non-functional Requirements:

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

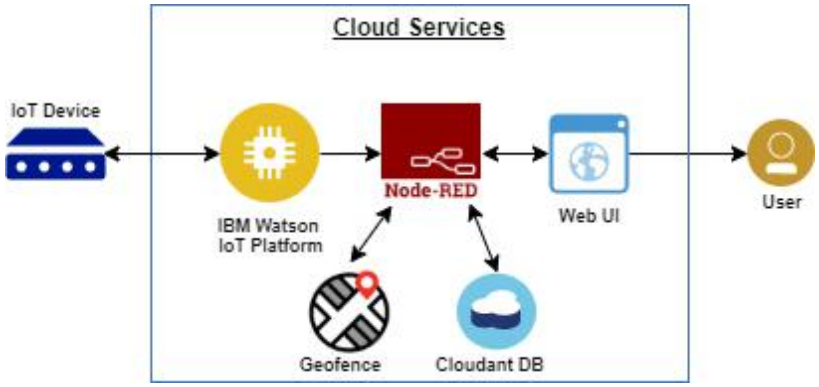
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Accessed through Mobile App Showing location (latitude and longitude) of child
NFR-2	**Security**	Database security must meet HIPAA requirements
NFR-3	**Reliability and Availability**	Once logged in ,webpage is available until logging out of the app
NFR-4	**Performance**	Each page must load within 2 seconds
NFR-6	**Scalability**	The process must finish within 3 hours so data is available by 8 a.m. local time after an overnight update

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS



5.2 SOLUTION & TECHNICAL ARCHITECTURE



5.3 USER STORIES

List all the user stories for the product.

USER STORY NUMBER	USER STORY/ TASK	ACCEPTANCE CRITERIA	PRIORITY
USN-1	To use the product when the child needs safety	Parents can access the device with lock	HIGH
USN-2	Notification will be provided when child is in trouble.	Child cannot access the device as there is a lock	HIGH
USN-3	To safeguard the child when in danger using GPS they can track their location.	Lock Access Only by parents.	LOW
USN-4	During Emergency there will be alarm	Lock Access Only by concerned persons.	MEDIUM
USN-5	When child is missing parents will be notified	Lock Access Only by Users.	HIGH

6. CODING & SOLUTIONING

6.1 FEATURE 1

1. HTML
2. JAVA SCRIPT
3. CSS
4. PYTHON

6.2 FEATURE 2

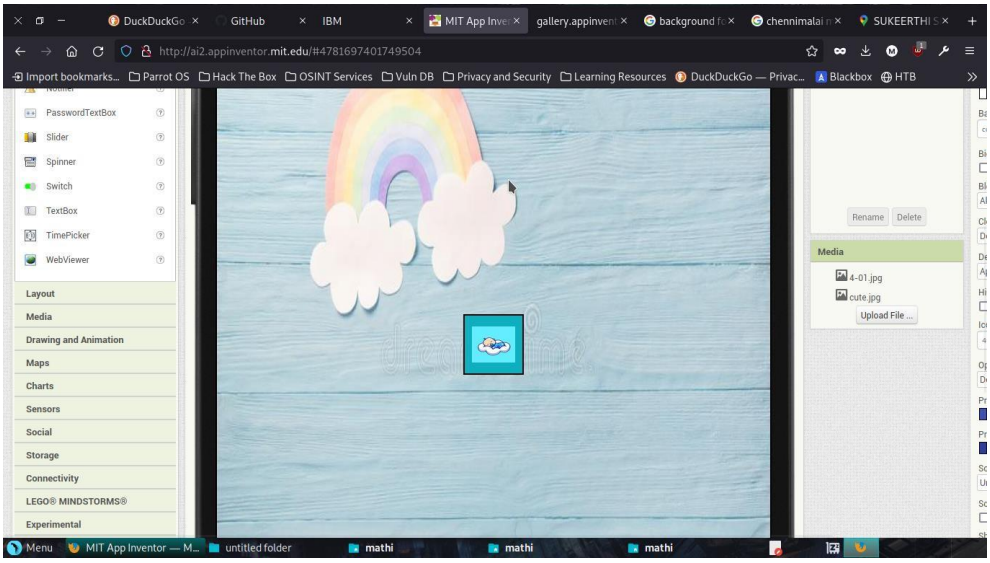
S.NO	COMPONENT	DESCRIPTION	TECHNOLOGY
01	User Interface	The communication protocol being used in theproposed solution might act as an interface the way like wifi, bluetooth	MIT APP
02	Application logic	The data to be collected and send to the authenti-cator via GSM providing the GPS coordinates to easily located access and monitor the child	IBM Watson STT service,python etc
03	Database	Date to be segregated andsecured in the form of re-	MySQL

		lation DBMS	
04	Cloud Database	IBM	IBM Cloudant
05	File storage	File storage requirements	IBM block storage or other storage service or local filesystem
06	External API-1	To access the children location	GPS location monitoring etc
07	Infrastructure	Application deployment on local system/ cloud local server configuration	Cloud foundry

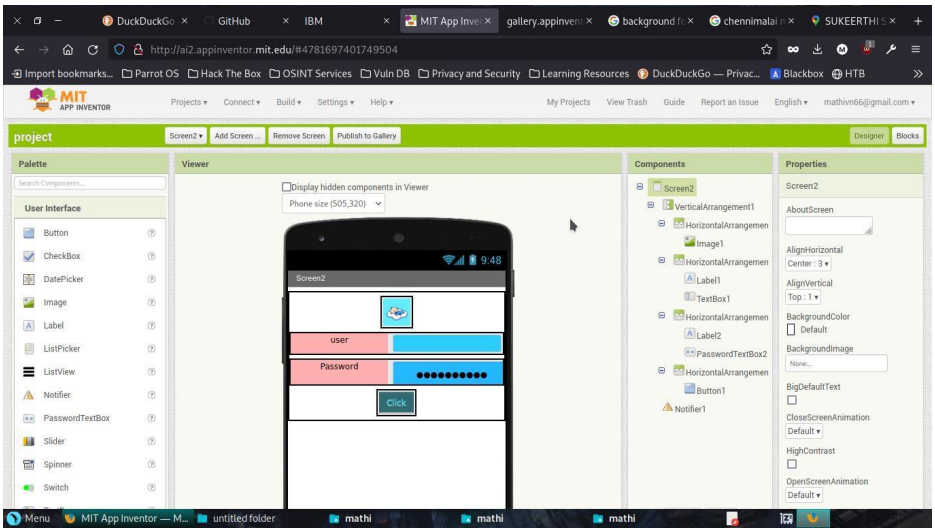
7. TESTING

7.1 USER ACCEPTANCE TESTING

MIT APPLICATION INTERFACE

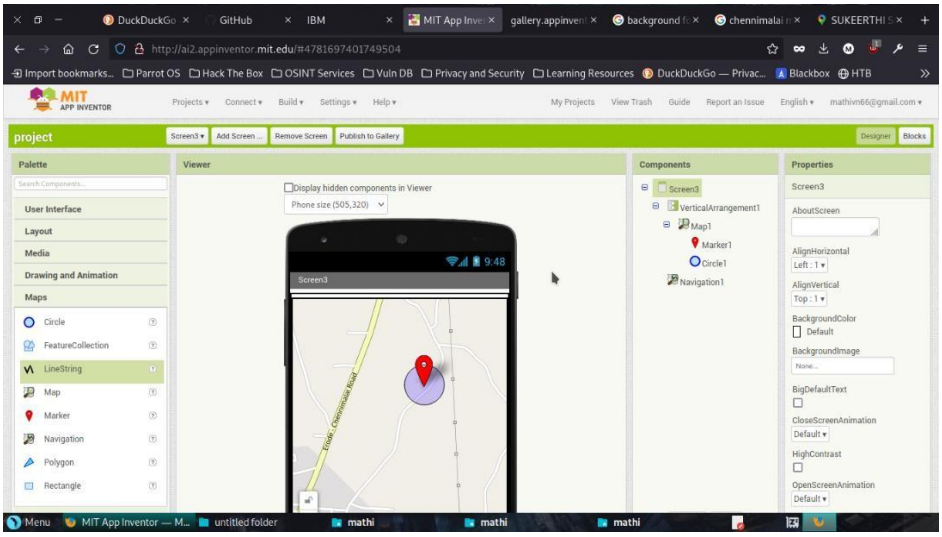


PARENTAL CONTROL INTERFACE

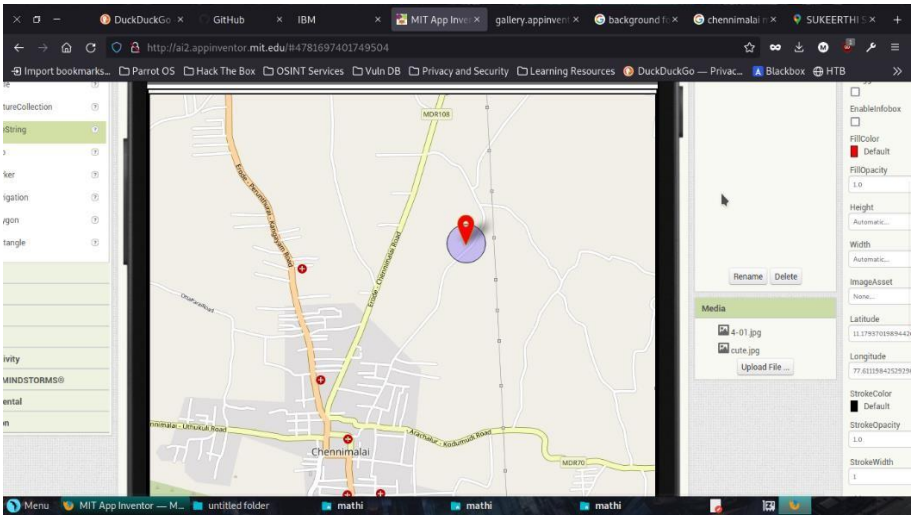


OUTPUT

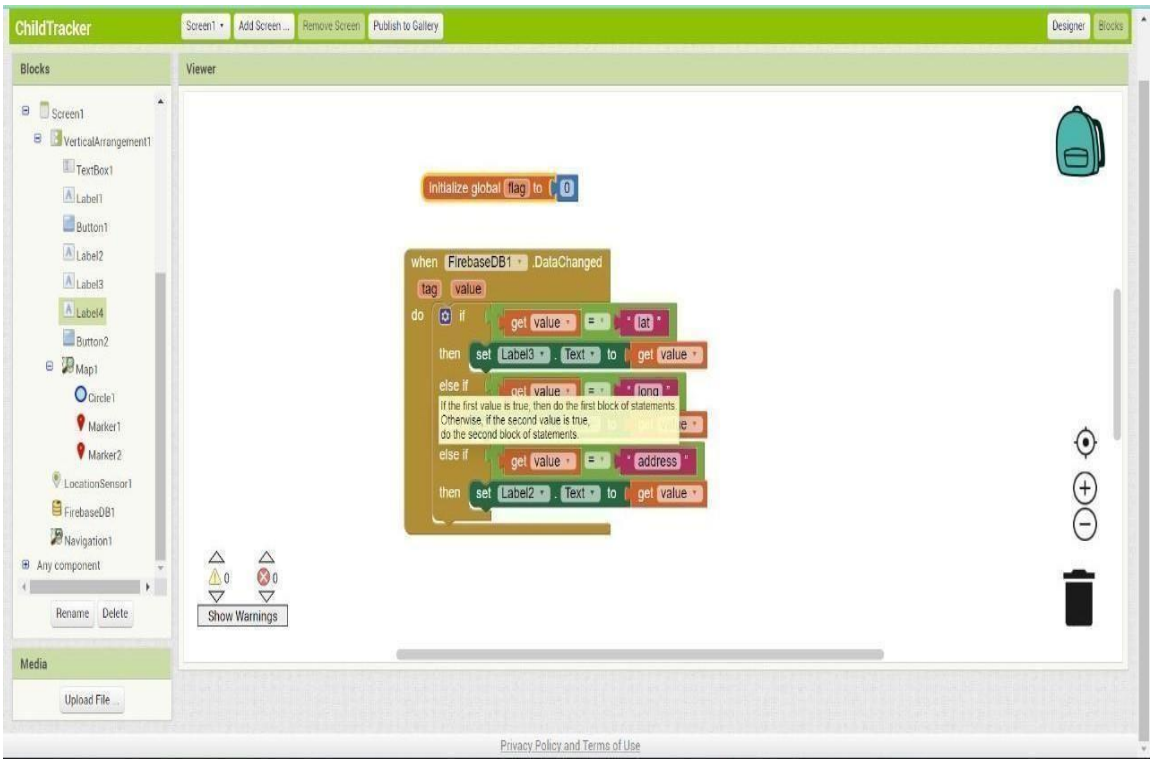
LOCATION STATUS OF CHILD (EMULATOR)



LOCATION STATUS OF CHILD (MONITOR)



BLOCK DIAGRAM



8. ADVANTAGES & DISADVANTAGES

ADVANTAGES:

- √ Provide safety to the child by allowing their parent to locate.
- √ This application can be used to monitor the temperature andmotion of the child.
- √ Child safety can be ensured and crime rate against the child can bereduced.
- √ It can be used to analyze the dynamic environment of the child andalerting system.

DISADVANTAGES:

Technical difficulties.

High cost and difficult to implement.

Poor data quality.

Design quality.

9. CONCLUSION

This concept demonstrates IoT based gadget for child safety monitoring and notifications is helping the parent to locate and monitor their children. If any abnormal values are read by the sensor then an SMSis sent to the parents mobile. It assists parents to monitor their children remotely. The project aims to create a system that allows the parents to keep track their children when they are out of their sight. This is done byusing the IBM cloud, Node-red and IBM Watson which is used to create and store the informations of the project. The child will wear GPS enabled device which is connected to the parent's smart phone where the child safety web-application is installed.

10. FUTURE SCOPE

In this web-application if any abnormalities are read by thesensor an MMS indicating an image or video captured by the serial camera which is to be included with emergency and safety system for accurate surveillance of the child's surroundings. The future scope of the work is to implement the IoT device which ensures the complete solution for child safety problems.

For this project using the GSM technologies is beneficial as the cellular range is vast and since all the communication between wearable device and the parent is taking place via SMS, therefore no internet connectivity is required. But, still the GSM module possess the added advantage of using GPRS which enables the board to use the internet if required. Whereas for camera module which supports videostreaming but due to the constraint of trying to use only SMS, thereforemore number of connections will be taking place.

11. APPENDIX

SOURCE CODE

```
import json

import wiotp.sdk.device
```

```
import time



myconfig = {

"identify": {

"orgId": "948e13",

"typeId": "childSafety",

"devicId": "731736810"



},

"auth": {

"token": "SwoZoaA@ikppxUR9sG"

}

}

clientwiotp.sdk.device.DeviceClient(config=myConfig, longHandlers=None)

client.connect()
```

```
while True:

name="Smartbridge"

#in area location



#latitude=11.165198

#longitude=77.6037642



#out are location



latitude=11.165198

longitude=77.6037642

myData={'name':name,'lat':latitude,'lon':longitude}

client.publishEvent(eventId="status",msgFormat="json",data=myData,qos=0,
onPublish=None0)

print("Data published to IoT platfrom:",myData)

time.sleep(5)

client.disconnect()
```

Demo Link

https://drive.google.com/file/d/1RsReP2SbkIXPo4gfMjiAsNtskzQTanjr/view?usp=share_link