THANTHAI PERIYAR GOVERNMENT INSTITUTE OF TECHNOLOGY,VELLORE.

IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING &NOTIFICATION

DOMAIN: INTERNET OF THINGS

TEAM MEMBERS:

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1.INTRODUCTION

1.1 OVERVIEW

This paper presents the design and implementation of a portable IOT-based safety and health monitoring system for children through a sensor embedded health monitoring device for safety and emergency services. It is known that the technological advancements are increasing at a faster pace. But the utilization of technologies in various sectors is very low. We know that people of different age group face different difficulties. But the security for children's is very low. There is lot of cases registered regarding child safety.

1.2 PURPOSE

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

2 LITERATURE SURVEY

PAPER 1: Smart Waste Management System Using LoRa and TensorFlow Deep Learning Model

Publication year: August 12, 2020

Author name: TEOH JI SHENG 1 , MOHAMMAD SHAHIDUL ISLAM 1 , (Graduate Student Member, IEEE), NORBAHIAH MISRAN 1 , (Senior Member, IEEE), MOHD HAFIZ BAHARUDDIN 1 , (Member, IEEE), HASLINA ARSHAD 2 , MD. RASHEDUL ISLAM 1 , MUHAMMAD E. H. CHOWDHURY 3 , (Member, IEEE), HATEM RMILI 4 , (Senior Member, IEEE), AND MOHAMMAD TARIQUL ISLAM 1 , (Senior Member, IEEE).

Summary: Traditional waste management system operates based on daily and allow for better waste management. The aim of this research is to develop a smart waste management system using LoRa communication protocol and TensorFlow based deep learning model. LoRa sends the sensor data and TensorFlow performs real time object detection and classification. The bin consists of several compartments to segregate the waste including metal, plastic,

paper, and general waste compartment which are controlled by the servo motors. Object detection and waste classification is done in TensorFlow framework with pre-trained object detection model. This object detection model is trained with images of waste to generate a frozen inference graph used for object detection which is done through a camera connected to the Raspberry Pi 3 Model B+ as the main processing unit. Ultrasonic sensor is embedded into each waste compartment to monitor the filling level of the waste. GPS module is integrated to monitor the location and real time of the bin. LoRa communication protocol is used to transmit data about the location, real time and filling level of the bin. RFID module is embedded for the purpose of waste management personnel identification.

Methodology used: This work was supported in part by the Ministry of Malaysia under Grant LRGS MRUN/F2/01/2019/1/2, and in part by the Deanship of Scientific Research (DSR), King Abdul-Aziz University, Jeddah, Saudi Arabia, under Grant RG-39-135-40.

Conclusion: This article presented a smart waste management system by implementing sensors to monitor the status of the bin, LoRa communication protocol for low power and long-range data transmission, and TensorFlow Based object detection to perform waste identification and classification. The pre-trained object detection model, SSDMobilnetV2 is able to perform well in Raspberry Pi 3 Model B+ due to its lightweight nature. The model was able to detect and classify waste according to classes such as metal, plastic, and paper. However, the accuracy of the model can be improved by increasing the number of training data—in this case, the number of waste images—and by increasing the training time. The segregation of waste is interfaced and coordinated well between the object detection performed by Raspberry Pi and the servo motor controlling the lid of the individual waste compartment. An RFID module controls the locking mechanism of the bin. Ultrasonic sensors monitor the filling level, while the GPS module monitors the location and real-time of the bin. LoRa operating at a frequency band of 915MHz transmits data regarding the status of the bin regarding filling level, location, and real-time from the bin to the LoRa gateway. The data received at the gateway is decoded by a terminal program, RealTerm. This automated segregation and monitoring system implementation in the bin aims to reduce the operating cost and improve the waste management system. At the same time, we are eager to develop the city into asmart city. In the future, the waste detection model is to be improved by increasing the number of waste images in the dataset to increase the flexibility of the system in identifying waste. Moreover, an automated routing system can be developed to identify and pinpoint the shortest path to the bin for the purpose of maintenance. With this in

mind, the existing waste management system can be improved and bring society towards a greener and healthier life.

PAPER 2: Smart City Platform Environment for Waste Management Publication year: 05 | May 2019

Author name: G. Paulin Nancy1, R. Resmi2 Journal name: International Research Journal of Engineering and Technology (IRJET)

Summary: Coimbatore city is one of the smart cities. There are many projects going on for the development of Coimbatore as a smart city. Waste management has become a challenge before society as it is being continuously neglected in the field of environment which is getting harmful for the health of living organism's as well as the environment. Effective waste management strategies are required that involves a synchronized system of controlling the production and disposal of wastes. Most of the waste management techniques like landfills, incineration, sanitary landfills provide a variety of environmental benefits but have negative impacts too like emission of large amount of green house gas. This paper reveals the risk and issues occurred during all stages of waste management and find the smart solution for those major issues thereby developing the platform of smart city for waste management.

Methodology used: Identifying the key risk factors of waste management process by reviewing the literature and through the additions that could be made by the participants i.e. workers .Questions are prepared based on the identified risk factors such as storage system, lack of proper segregation, area coverage, capacity issue, climatic change, etc. Major factors and issues are identified with the help of questionnaire survey. Providing practical suggestions and recommendations pointing toward upgrading waste management process and improve the performance of workers thereby create platform of smart city.

Conclusion: From the survey report, several risk factors such as storage system, lack of proper segregation, area coverage, capacity issue, climatic change were identified. Based on these risk factors, smart solutions recommended were automated sorting system, automated solid waste management, smart planning by using web camera & load sensor, Smart garbage.

PAPER 3: IoT-based smart waste level monitoring system for smart cities

Publication year: January 2021

Author name: A.A.I. Shah1 , S.S.M. Fauzi2 , R.A.J.M. Gining3 , T.R.Razak4 , M.N.F.Jamaluddin5 , R. Maskat6 Journel name: Indonesian Journal of Electrical Engineering and Computer Science

Summary: Smart cities are covering the population that are seeking the best lifestyle and fulfilling their needs. Through smart cities, necessary modern facilities using ICT emerging technologies such as the internet of things (IoT) had been installed to ensure the sustainability of the city. In the perspective of waste management, several different IoT-based solutions also had been proposed as an

alternative to monitor and to ensure the health of communities. This paper reviews existing IoT-based solutions in smart cites' waste level management system to bring together the state-of-the-art. We performed reviews on 16 research articles from the past 5 years in the literature to provide a comprehensive review of different works on IoT-based solutions related to the smart waste level monitoring system, possible solutions and technologies used. The results obtained shows that existing solutions were similar in the platform used to integrate with the IoT technologies but had some differences in term of the used of sensors and communication technologies. The study also shows that many of the prior studies used Arduino Uno. Results from this study will assist the researcher, focusing on expanding further the used of different technologies or improved the existing system

Methdology used: This study employs a necessary systematic mapping study (SMS) steps [35]. An SMS is intended to encompass an exhaustive search. It aims to provide a thorough and repeatable analysis of all relevant literature. The five main steps in the method are: definition of research questions, searching for relevant papers, screening papers, keywording of abstracts, and data extraction and mapping

Conclusion: This study contributes to research on smart waste level monitoring system by synthesising the literature on the current state-of-the-art. This study is crucial as it provides a clear overview of the state-ofthe-art of the development and implementation of the smart waste level monitoring system. An in-depth review suggests that the existing solutions were similar in the platform used to integrate with the IoT technologies but have some differences in term of the used of sensors and communication technologies. The study also shows that many of the prior studies used Arduino Uno. In future research, we intend to identify the requirement of the proposed

2.1 EXISTING PROBLEM

This system requires network connectivity, satellite communication, and high-speed data connection when we use web camera and GPS to lively monitor. **It is difficult to monitor when there occurs any hindrance to satellite communication or any network issue**.

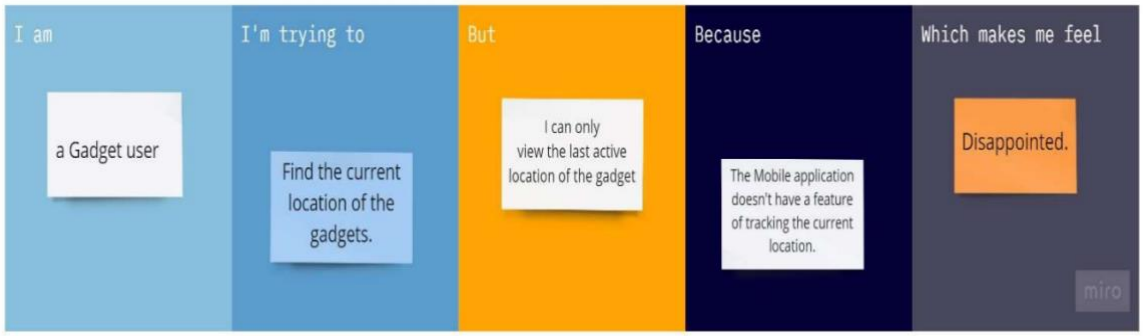
2.2 REFERENCES

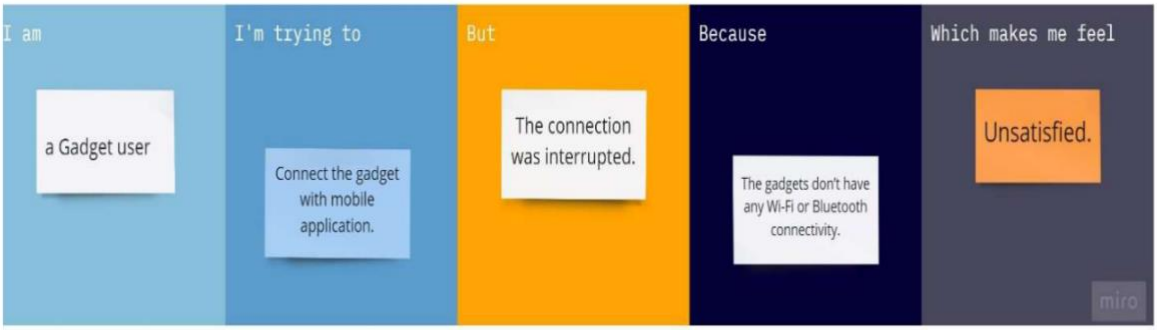
Child safety wearable device | IEEE Conference Publication | IEEE Xplore

RFID-based system for school children transportation safety enhancement | IEEE Conference Publication | IEEE Xplore

Design and development of an IOT based wearable device for the safety and security of women and girl children | IEEE Conference Publication | IEEE Xplore

2.3 PROBLEM STATEMENT DEFINITION



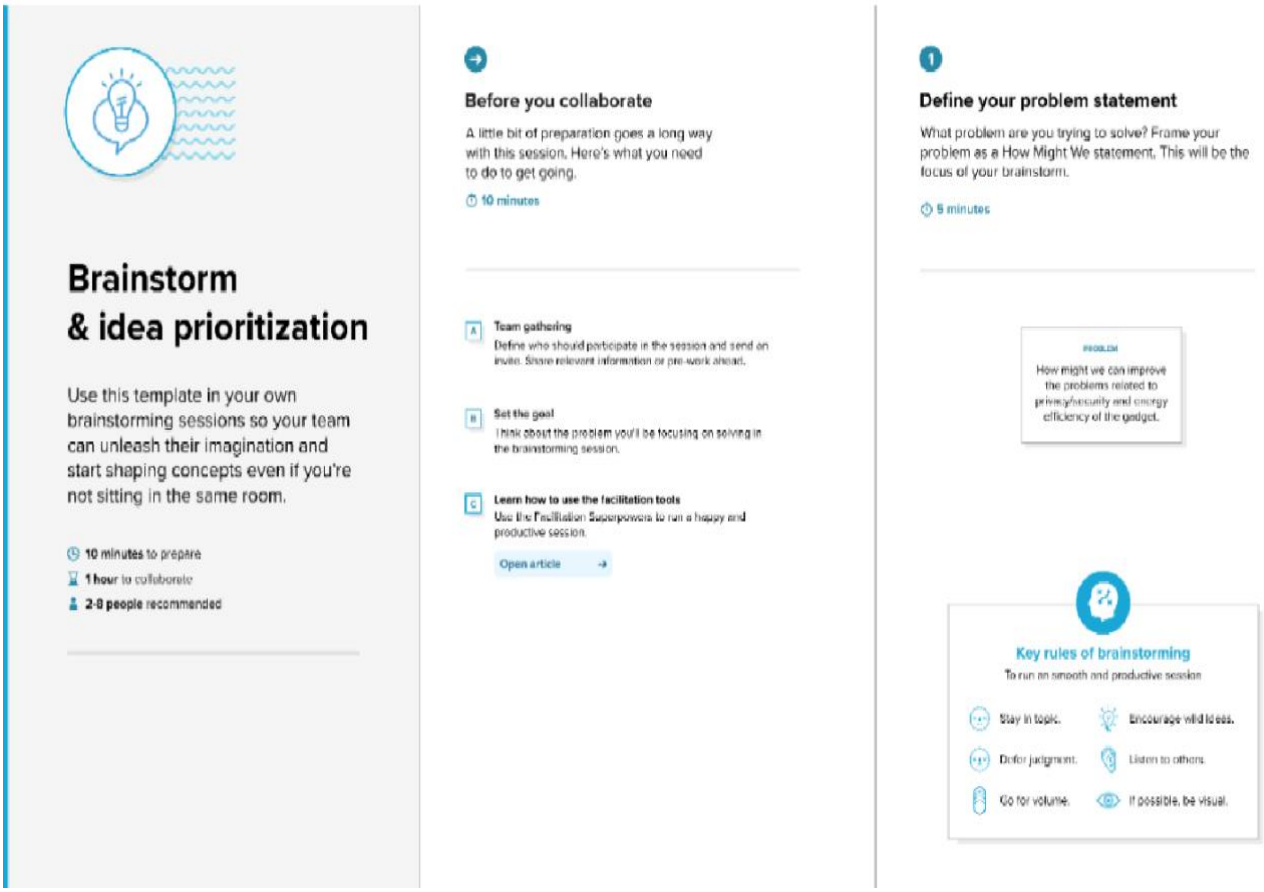


3.IDEATION &PROPOSED SOLUTION

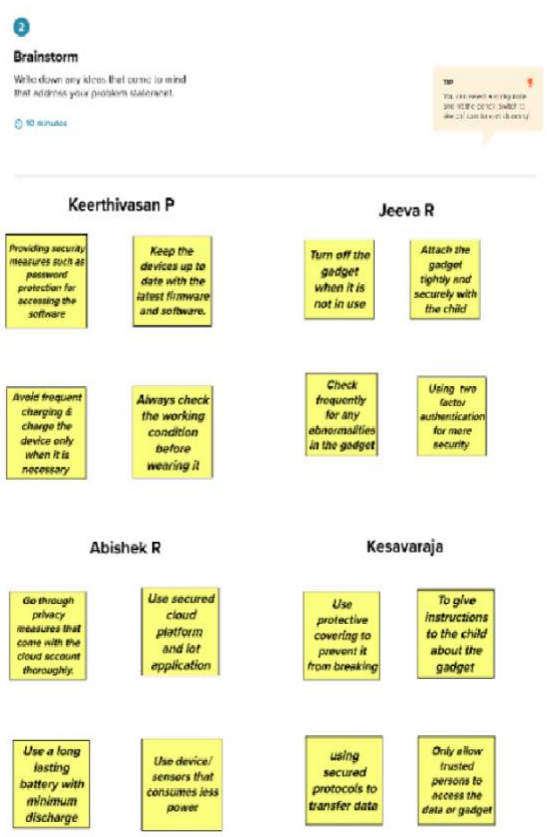
3.1 Empathy map Canvas

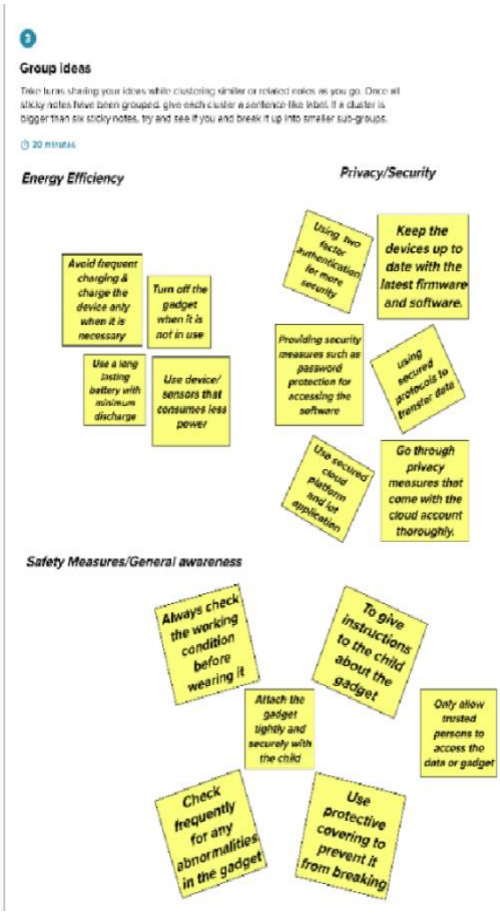
3.2 Ideation & Brainstorming:

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

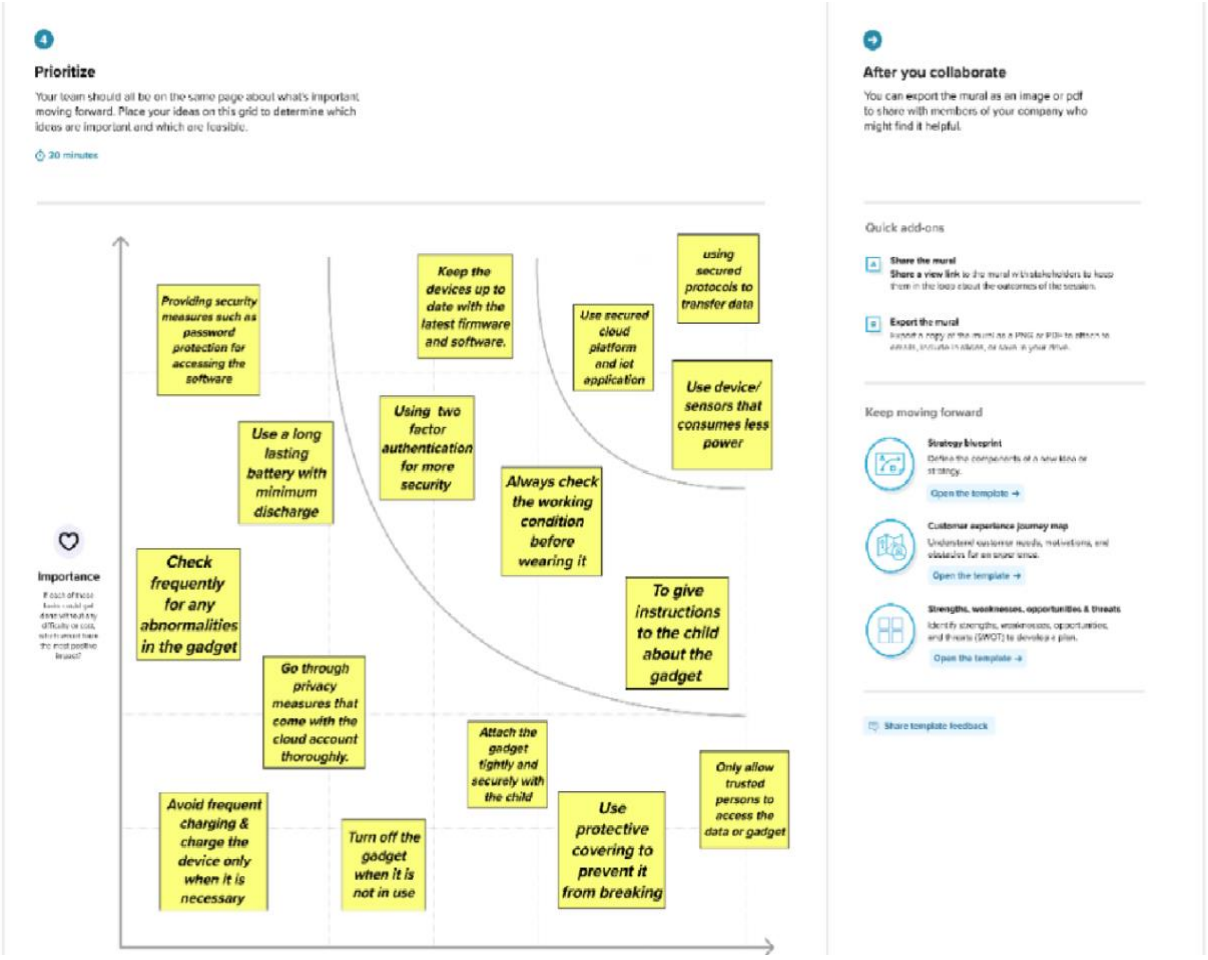


Step 2: Brainstorm, Idea listing and Grouping





Step 3:Idea Prioritization:



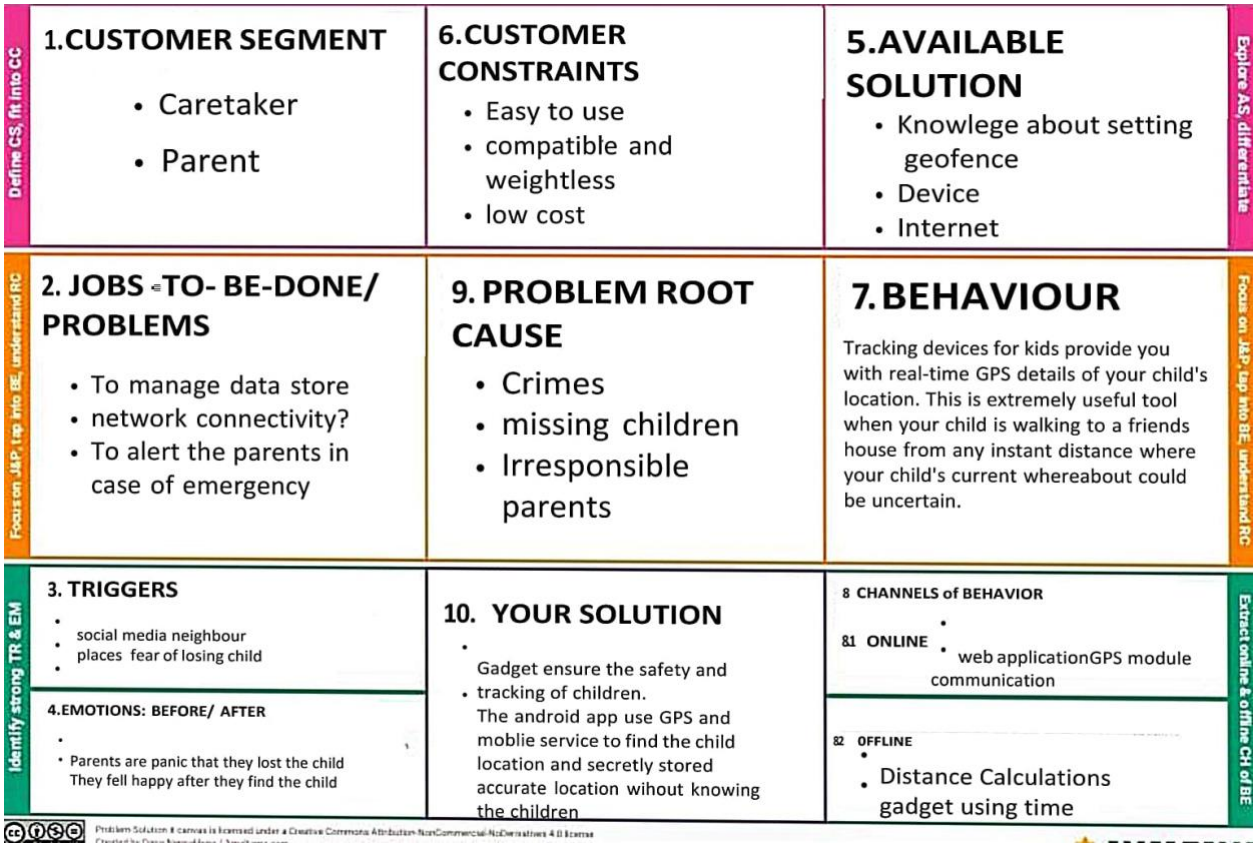
3.3 Proposed Solution

S.NO	PARAMETER	DESCRIPTION
1`	Problem Statement (Problem Solved)	Safety of children is very critical since

		children cannot protect themselves. A momentary lack in parental supervision should be combated with an appropriate IT solution in context
2	Idea/Solution description	In our system, we automatically monitor the child in real time using Internet of Things, with the help of GPS, GSM. This system requires network connectivity, satellite communication, and high-speed data connection when we use web camera and GPS to lively monito
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. The parameters such as touch, temperature &heartbeat of the child are used for parametric analysis and results are plotted for the same
4	Social Impact/Customer Satisfaction	Safer society for the children. Receive immediate information about child and feel secure.

5	Business Model(Revenue Model)	Prevention against immediately and safely if in dang
6	Scalability of the Solution	To monitor health conditions of a child (heart rate, body temperature, body posture).

3.4 PROBLEM SOLUTION FIT



4.REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

FR.NO	Functional Requirement	Sub Requirement (Story/Sub-Task)
FR-1	User Registration	Registration through Gmail

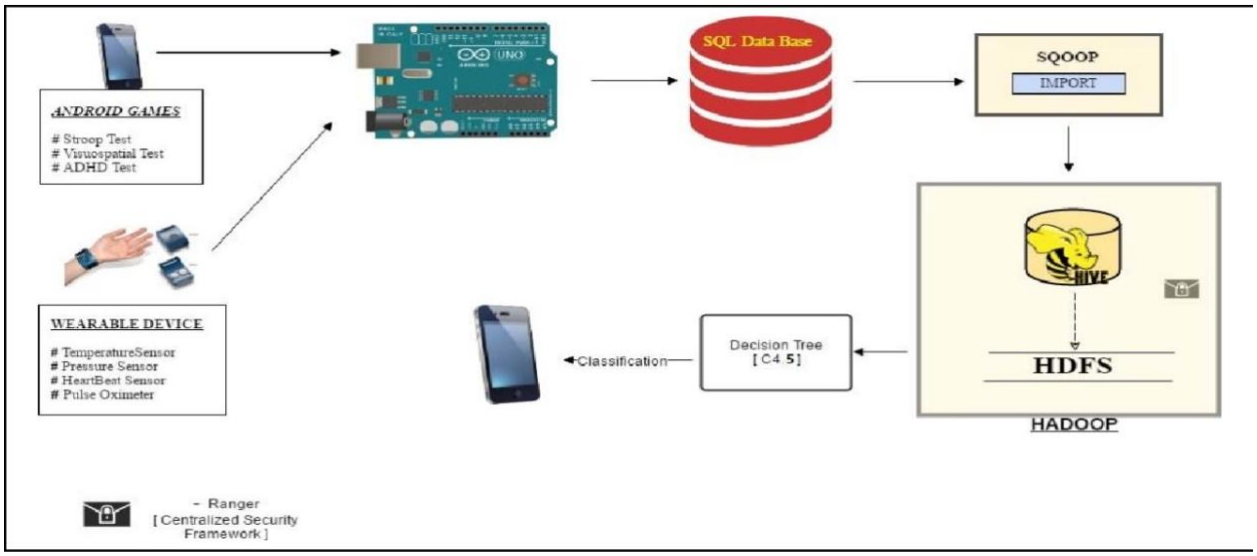
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	login	Check credentials
FR-4	Checks the location	Through GPS
FR-5	Monitors the location and video capture	Capture the video and location through the gadget which the child wears
FR-6	logout	Exit

4.2 NON-FUNCTIONAL REQUIREMENT

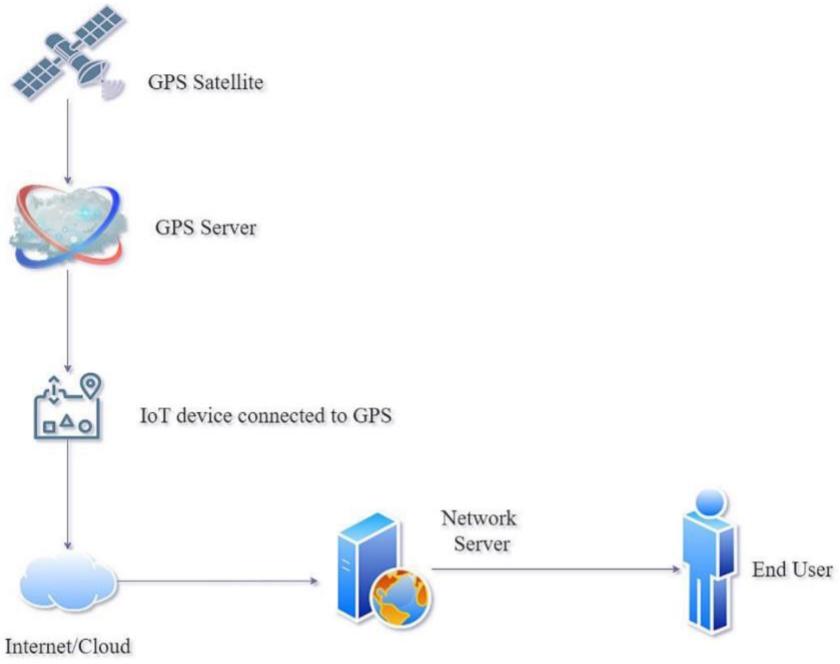
NFR.NO	Non-Functional Requirement	Description
NFR-1	**Usability**	Easy to use the gadget.
NFR-2	**Security**	Make sure your child understands that they should always tell you if a stranger approaches, and never to keep this secret
NFR-3	**Reliability**	Child's surroundings can be located with the help of accurate and precise real-time location
NFR-4	**Performance**	It easy to track the smart gadget
NFR-5	**Availability**	Audio, video, GPS and sensor
NFR-6	**Scalability**	Young children may refuse to cooperate unless allowed to play with their gadgets

5.PROJECT DESIGN

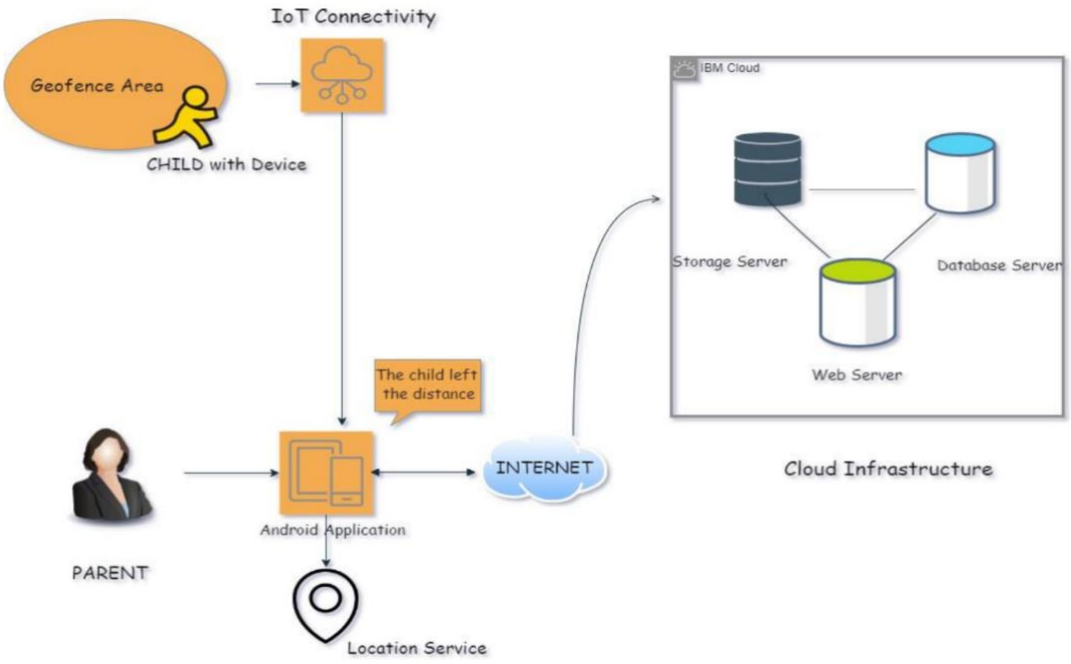
5.1. Data Flow Diagram



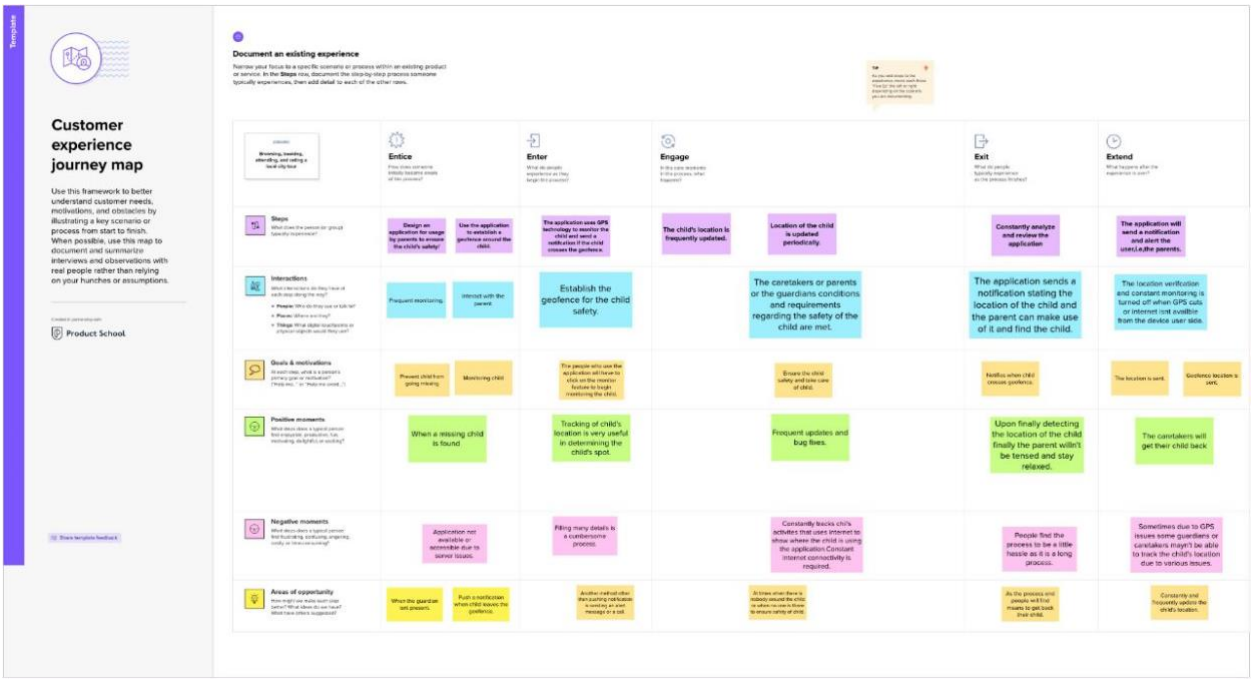
5.2 Solution & Technical Architecture



5.3 Outline Architecture


IoT Connectivity
Geofence Area
CHILD with Device
IBM Cloud
Storage Server
Database Server
Web Server
Cloud Infrastructure
The child left the distance
INTERNET
Android Application
PARENT
Location Service

5.3 User Stories



6.PROJECT PLANNING & SCHEDULING

6.1.SPRINT PLANNING & ESTIMATION

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 login credential through Gmail ease manner for the purpose of sending alert message to the parents or guardians (or) informing through normal message.	2	High	Subalakshmi, Ranjithkumar,Tamizh, Velmurugan

Sprint-1	Registration	USN-2	As a user, I have to registered my details and tools details in a simple and easy manner by considering the safety of child, this registered system sends notification to.	2	High	Subalakshmi, Tamizh, Ranjithkumar, Velmurugan

Sprint-2	Dashboard	USN-3	As a user, In case of any emergency situation parents(I) must get the alert notification and location of the child.	3	Medium	Subalakshmi, Velmurugan
Sprint-3	Dashboard	USN-4	As a user, I(parent) need to safeguard child and tracking the child's location and it is important to notify near police station	2	High	Subalakshmi, Ranjithkumar
Sprint-3	Dashboard	USN-5	As a user, Its good to have a IOT based system to safeguard monitoring without presence of parent.	2	High	Subalakshmi, Tamizh
Sprint -4	Monitoring the environment	USN 1	User can monitor the situation of the environment from a dashboard that displays sensor information about the environment and child health.	2	High	Subalakshmi, Velmurugan
Sprint- 4	Event Notification	USN 6	Sending an alert SMS to the parents and guardians in case of panic situation.	2	High	Subalakshmi

6.2 SPRINT DELIVERY AND SCHEDULE

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

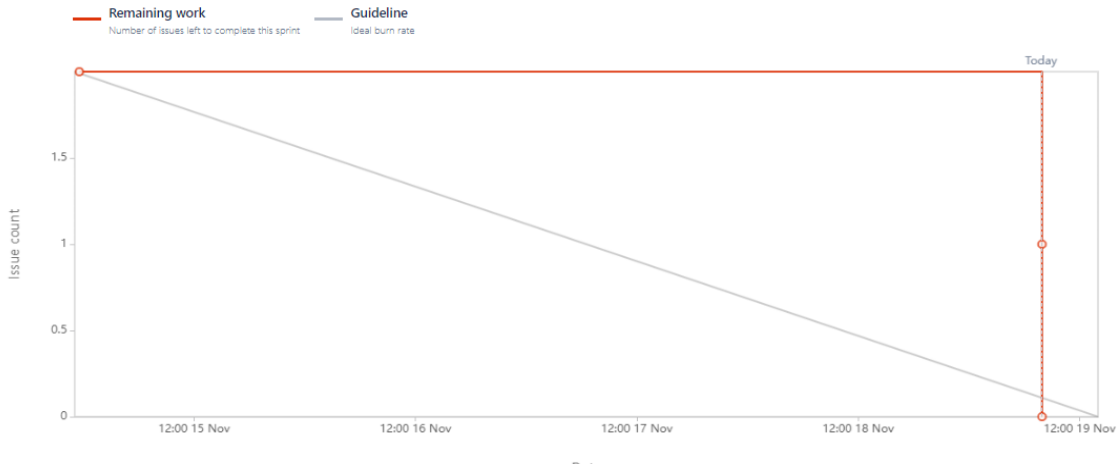
Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

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

6.3 REPORTS FROM JIRA

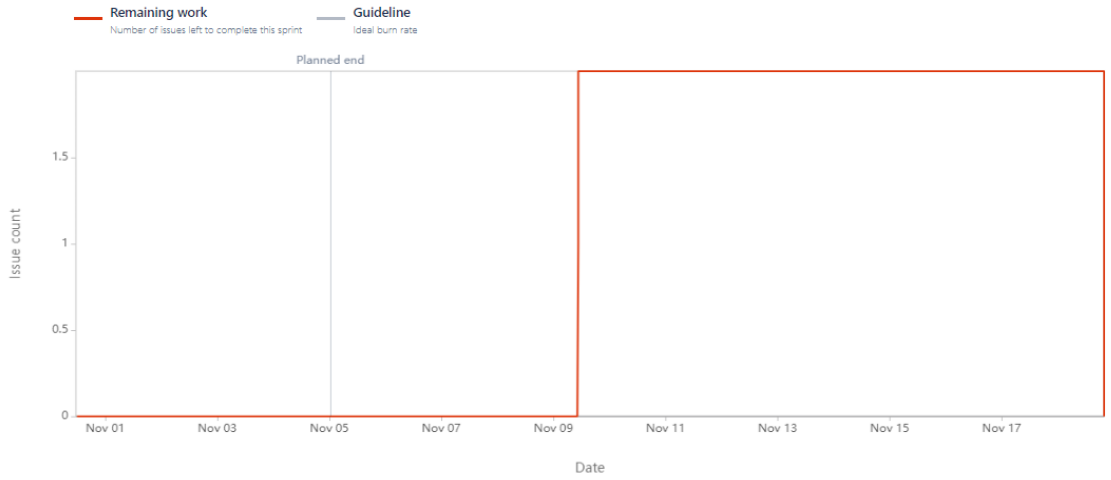
WPD Sprint 4 | Issue count

Date - November 14th, 2022 - November 19th, 2022



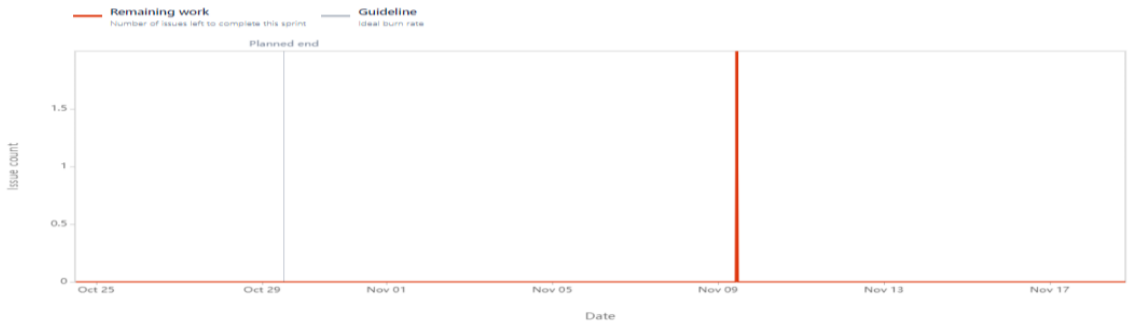
Sprint: WPD Sprint 2 | Estimation field: Issue count

Date - October 31st, 2022 - November 5th, 2022



Sprint: WPD Sprint 1 | Estimation field: Issue count

Date - October 24th, 2022 - October 29th, 2022

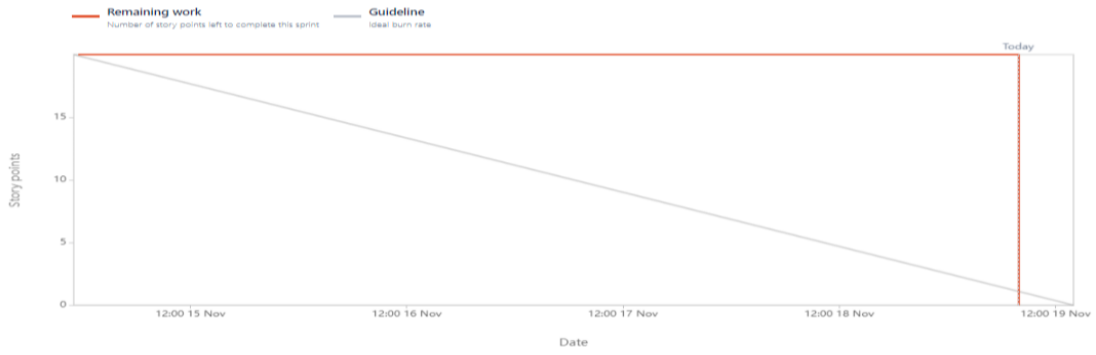


Sprint: WPD Sprint 3 | Estimation field: Story points

Date - November 7th, 2022 - November 12th, 2022

Sprint: WPD Sprint 4 | Estimation field: Story points

Date - November 14th, 2022 - November 19th, 2022

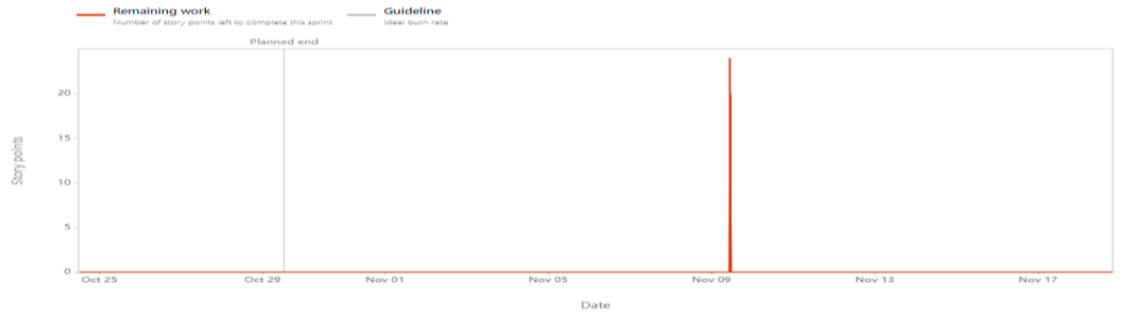


Sprint: WPD Sprint 2 | Estimation field: Story points

Date - October 31st, 2022 - November 5th, 2022

Sprint: WPD Sprint 1 | Estimation field: Story points

Date - October 24th, 2022 - October 29th, 2022



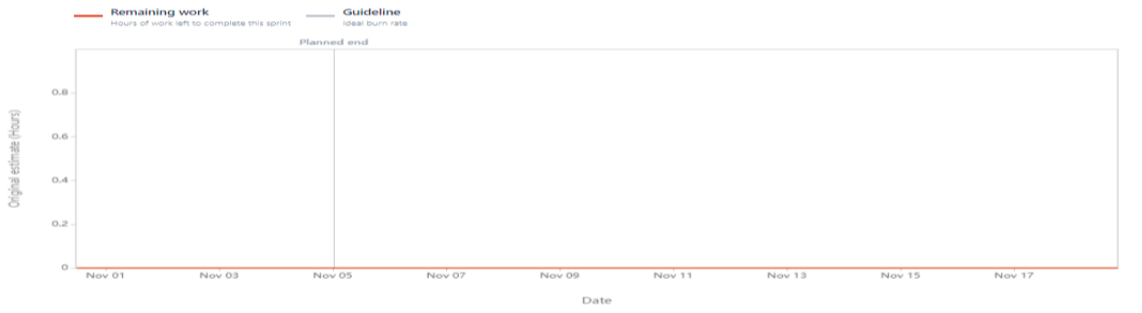
Sprint: WPD Sprint 1 | Estimation field: Time

Date - October 24th, 2022 - October 29th, 2022

Sprint: WPD Sprint 4 | Estimation field: Time

Date - November 14th, 2022 - November 19th, 2022

Date - October 31st, 2022 - November 5th, 2022

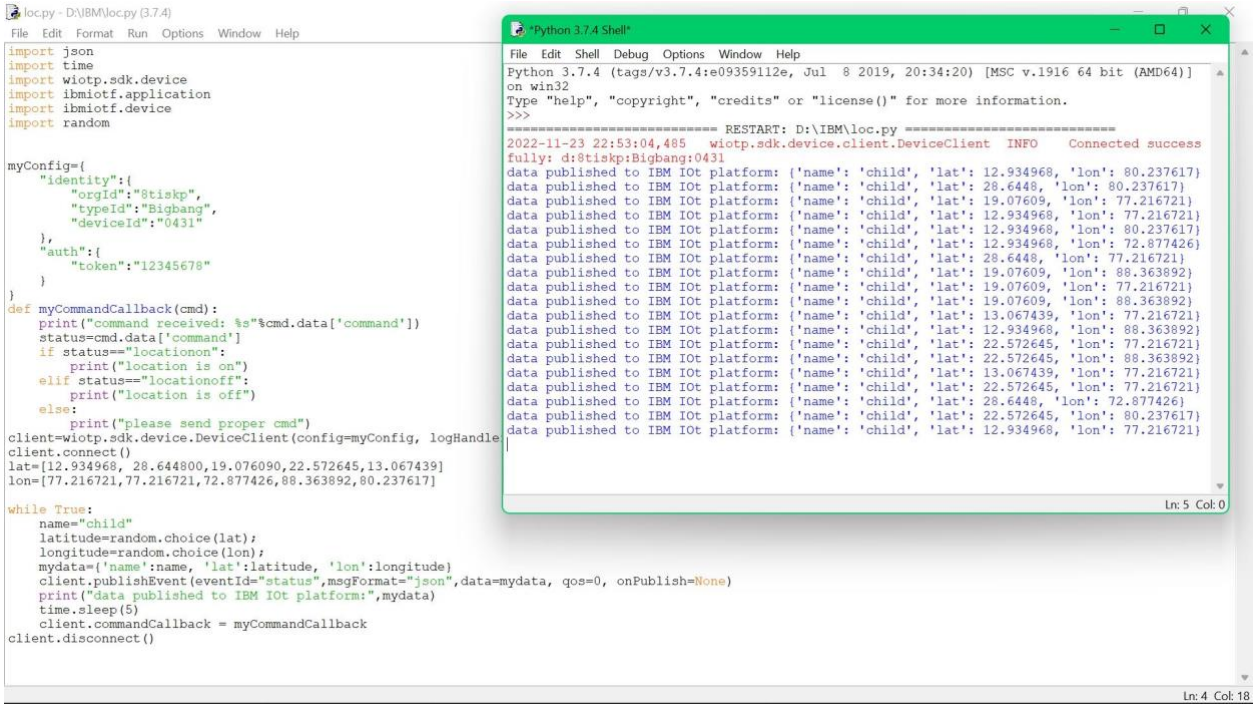


Report: WPD Sprint 2

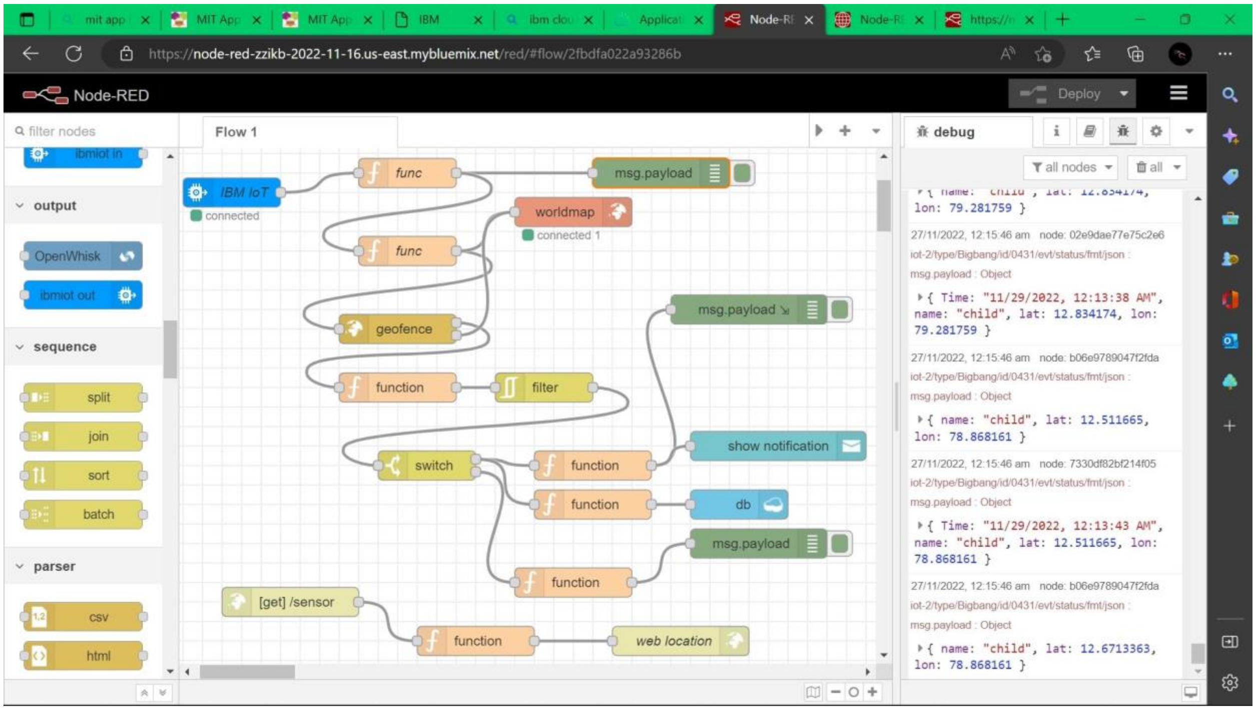
*Issue added after sprint st

7. CODING AND SOLUTIONING

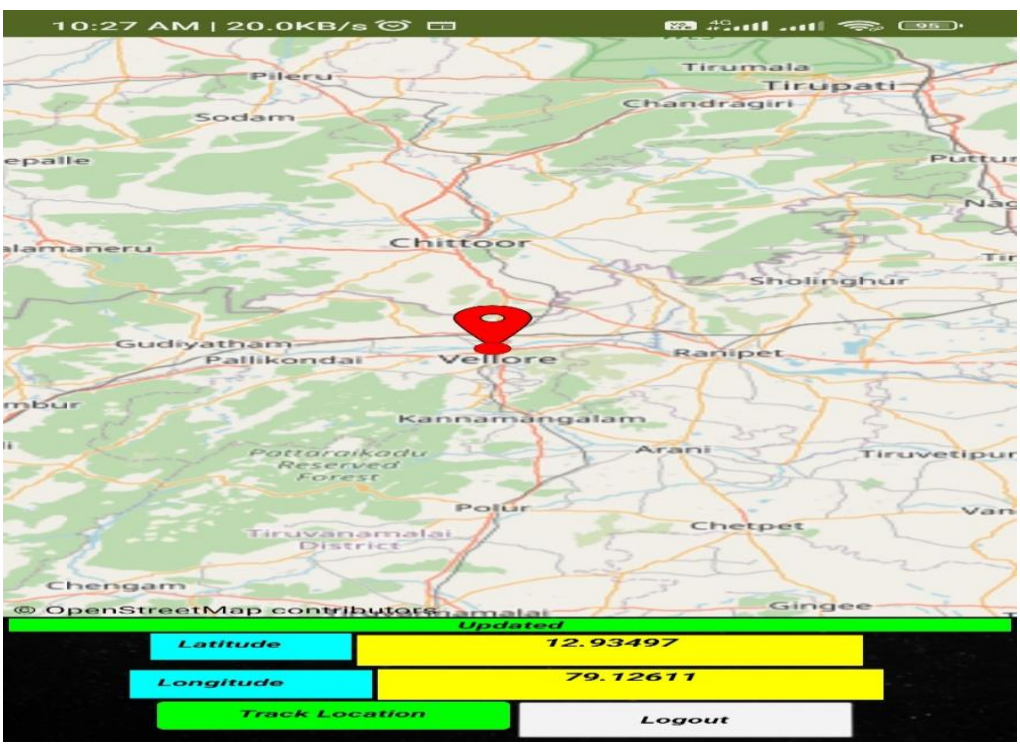
7.1 FEATURE 1



7.2 FEATURE 2


Node-RED
Deploy
Flow 1
debug
IBM IoT
connected
func
func
geofence
function
filter
switch
function
function
function
msg.payload
worldmap
connected 1
msg.payload
show notification
db
msg.payload
[get] /sensor
function
web location
output
OpenWhisk
ibmiot out
sequence
split
join
sort
batch
parser
csv
html

7.3 FEATURE 3


10:27 AM | 20.0KB/s
Tirumala
Tirupati
Chandragiri
Pileru
Sodam
Chittoor
Sholinghur
Gudiyatham
Pallikondai
Vellore
Ranipet
Kannamangalam
Arani
Polur
Chetpet
Chengam
Gingee
© OpenStreetMap contributors
Updated
Latitude
12.93497
Longitude
79.12611
Track Location
Logout

8. TESTING

8.1 TEST CASE

				Date	16 November 2022	Team ID: PNT2022TMID36015						
				Team ID	PNT2022TMID36015							
				Project Name	Project - IoT Based Safety Gadget for Child Safety Monitoring & Notification							
				Maximum Marks	4 marks							
Test case ID	**Feature Type**	**Component**	**Test Scenario**	**Pre-Requisite**	**Steps To Execute**	**Test Data**	**Expected Result**	**Actual Result**	**Status**	**TC for Automation(Y/N)**	**BUG ID**	**Executed By**
IBM CLOUD _TC_001	Functional	IBM Cloud Service	Verify the login cloud services	Software	1. Login in using cloud.ibm.com 2. Obtain promocode in ICT 3. Then apply code the and Login 4. The page will be directed to the IBM cloud account	email: 310819106301@smartintern.com Password : PNTIBMBb22	Successfully created the IBM account	Working as expected	Pass	YES	NIL	1.ROZEN BERG 2.THARUN RAJ 3.BHAGYA NARAYANAN 4.MATHUBAALA 5.JANANIPRIYA
IBM Watson IoT Platform_TC_002	Functional	IBM Cloud Service	Verify create a device in the IBM Watson IoT platform and get the device credentials.	IBM Cloud Service	1. In IBM Cloud Service go to catalog 2. Create and launch the IBM Watson IoT Platform 3.Login to the Platform by clicking organization ID 4.Create a device & configure the device type and ID 5.Generate the API Key	Create a device & integrate with code	{'name': 'Smartbridge', 'lat': 17.42f9272, 'lon': 78.5488783}	Working as expected	Pass	YES	NIL	1.ROZEN BERG 2.THARUN RAJ 3.BHAGYA NARAYANAN 4.MATHUBAALA 5.JANANIPRIYA
PythonCode_TC_003	Code	Python 3.9	Verify wheather the python code is without error by running it	Software	1. Download the python version3.9 2. Type the program and save it with the extention .py 3.Verify it by compiling the code	import json import wiotp.sdk.device import time import random myConfig = { "identity":{ "orgId":"4o1qxb"	022-11-18 12:25:57,235 wiotp.sdk.device.client. DeviceClient INFO Connected successfully: d:4o1qxb: TestDeviceType: 12345	Working as expected	Pass	YES	NIL	1.ROZEN BERG 2.THARUN RAJ 3.BHAGYA NARAYANAN 4.MATHUBAALA 5.JANANIPRIYA
Node_Red_TC_004	Non-Functional	IBM Cloud Service	Verify to create a node-red services	IBM cloud services	1. In IBM cloud go to catalog 2. To create a Node-Red app 3. Click onto Deploy App 4. Visit the app URL 5. We need to connect the Node-Red with the IBM watson	We use a geofence node to form a cirlce shaped range whether the child is present in the circle or not.	Successfully created the node-red	Working as expected	Pass	NO	NIL	1.ROZEN BERG 2.THARUN RAJ 3.BHAGYA NARAYANAN 4.MATHUBAALA 5.JANANIPRIYA
CloundantDB_TC_005	Dataset	IBM Cloud Service	Verify the events is stored in the database	IBM Cloud Service	1. Go to IBM Cloud Services 2. In resources list, click onto cloudant 3. Click onto the launch dashbord to redirect to the cloud DB 4.Click onto create DB.	Document: tracker	Successfully created the Database	Working as expected	Pass	NO	NIL	1.ROZEN BERG 2.THARUN RAJ 3.BHAGYA NARAYANAN 4.MATHUBAALA 5.JANANIPRIYA
Web UI_TC_006	Functional	Node-Red Service	To create a web UI to interact with user	Node-Red Service	1. Go to Node-Red Dashboard 2. Make the necessary connection and deploy it. 3. Copy the URL and paste it in the new tab with "/ui" extention 4. Display the child and geofence location.	Shows the locaion of parent and child	And as expected it displays the Position of the child and parent	Working as expected	Pass	NO	NIL	1.ROZEN BERG 2.THARUN RAJ 3.BHAGYA NARAYANAN 4.MATHUBAALA 5.JANANIPRIYA
FastSMS Service_TC_007	Functional	Fast2SMS Service	To send SMS to the particular child's guardian	Software	1. Login to Fast2SMS Service 2. GO to Dev API and select quick API 3. SMS will be sent using Flash SMS option to the registered number	Show the pop up SMS	Alert: The person is not in the particular geofence area	Working as expected	Pass	NO	NIL	1.ROZEN BERG 2.THARUN RAJ 3.BHAGYA NARAYANAN 4.MATHUBAALA 5.JANANIPRIYA

Test Scenarios

1.) Verify the login cloud services

2.)Verify create a device in the IBM Watson IoT platform and get the device credentials.

3.) Verify wheather the python code is without error by running it

4.) Verify to create a node-red services

5.) Verify the events is stored in the database

6.) To create a web UI to interact with user

7.) To send SMS to the particular child's guardian

8.2 USER ACCEPTANCE TESTING

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

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2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	4	4	2	0	10
Duplicate	0	0	0	1	1
External	2	0	0	1	3
Fixed	7	2	0	0	9
Not Reproduced	0	1	1	0	2
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	13	7	3	2	25

3. Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	1	0	0	1
Client Application	1	0	0	1
Security	1	0	0	1
Outsource Shipping	1	0	0	1
Exception Reporting	1	0	0	1
Final Report Output	1	0	0	1
Version Control	1	0	0	1

9. RESULTS

9.1 PERFORMANCE METRICS

			Team ID	PNT2022TMID36015		
			Project Name	Project - IoT Based Safety Gadget for Child Safety Monitoring & Notification		
			NFT - Risk Assessment			
S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Risk Score	Justification
1	IoT Based Safety Gadget for Child Safety Monitoring & Notification	New	No Changes	No Changes	GREEN	As we have completed the project successfully
			NFT - Detailed Test Plan			
			S.No	Project Overview	NFT Test Approach	
			1	This project proposes a model for child safety through smartphones that can track their children's location and give the precise coordinates of the child's location in real-time anywhere.	Load Test	
			End Of Test Report			
S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	Approvals / SignOff	
1	The application aside from conceding you to track down your children when they're within Geofence range, also functions when your kids go farther afield. Its competence as a tracker is outstanding if you live in densely populated areas like cities or big towns.	Load Test	Nil	Respone time meet the actual Result	Approved	

NFT Test approach	
Load Test	
Scenario Name	Load Test - Location Tracker SAMPLE PROJECT
Scenario Type	Load Test - Duration 15 minutes
Scenario Objectives	To Stimulate Python Code(Location Details) and to monitor the performance of Location Tracker SAMPLE PROJECT
Steps	1. We have integrate IBM Watson IoT Platform in order to get this Location details from python program. 2. We also integrate fast SMS service in order to send an alert to guardian or parent
Entry Criteria	Test data is set-up. All the Components(software & hardware) is set-up. It is completed successfully.
Exit Criteria	Response time meets the actual Result. Test completion report is agreed upon by mentors

10. ADVANTAGES

1.) Trace whereabouts and Minimise the Tragedy

2.) Create unassailable environment

3.) Toddlers in hamlet and metropolis can be saved

4.) ceaseless Surveillance and instantaneous notification regime

5.) High dependability and data accuracy

6.) Eradicates ambiguity and Pays way for a tech-driven community

DISADVANTAGES

1.) Inadequate battery supply leads to switching off the device

2.) Impractical to use the device forever

3.) Improper weather condition

4.) Improper connectivity

5.) Misplacement or losing the tag

6.) Over usage of data

11. CONCLUSION

The System put forward this paper to ensure the safety of children and increase their confidence. Many experimenters are operating in this area and have formulated different technologies to aid children. The key represented in this paper takes the advantage of smartphones which proposes affluent elements like Google maps, SMS, etc. The child safety and protection device is proficient in acting as a smart IoT device. It equips parents with real-time location, the surrounding temperature, and along with an alarm buzzer for their child's circumstances and the capability to locate their child. This paper depicts the fundamental design concept and functionality along with the anticipated consequensce.

The application aside from conceding you to track down your children when they're within Bluetooth range, it also functions when your kids go farther afield. Its competence as a tracker is outstanding and if you live in densely populated areas like cities or big towns. This means you will be able to see the identity of the participating devices and It helps to diminish their vulnerability in harmful situations and also protects the children in emergency situations.

Parents take measures both at home and outdoors to safeguard their kids from hurting themselves. But sometimes, it's impossible to pre-empt what can cause a treacherous encounter. However, it's possible to prevent such hazards with some forethought and simple measures using these safety gadgets.

12. FUTURE SCOPE

Ceaseless Surveillance :

If any deviant readings are disclosed by the sensor, then an SMS and phone calls are set off to the parent's mobile.

Create unassailable environment :

Precisely predicting the circumstances of the children and swiftly sensing the problems around children will make parents at ease.It helps to diminish their vulnerability in harmful situations and also protects the children in emergency situations.

Pays way for a tech-driven community :

Children and their parents are veering around to digital solutions more than ever to support children's cognition and it notifies the information about the child in a web application.

13. APPENDIX

GITHUB LINK

https://github.com/IBM-EPBL/IBM-Project-5458-1658765864

SOURCE CODE

```
import json
import time
import wiotp.sdk.device
import ibmiotf.application
import ibmiotf.device
import random


myConfig={
    "identity":{
        "orgId":"8tiskp",
        "typeId":"Bigbang",
        "deviceId":"0431"
    },
    "auth":{
        "token":"12345678"
    }
}
def myCommandCallback(cmd):
    print("command received: %s"%cmd.data['command'])
    status=cmd.data['command']
    if status=="locationon":
        print("location is on")
    elif status=="locationoff":
        print("location is off")
    else:
        print("please send proper cmd")
client=wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()
lat=[12.934968, 28.644800,19.076090,22.572645,13.067439]
lon=[77.216721,77.216721,72.877426,88.363892,80.237617]

while True:
    name="child"
    latitude=random.choice(lat);
    longitude=random.choice(lon);
    mydata={'name':name, 'lat':latitude, 'lon':longitude}
    client.publishEvent(eventId="status",msgFormat="json",data=mydata, qos=0, onPublish=None)
    print("data published to IBM IOt platform:",mydata)
    time.sleep(5)
    client.commandCallback = myCommandCallback
client.disconnect()
```