NALAIYA THIRAN PROJECT BASED LEADER

ON

IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING & NOTIFICATION

A PROJECT REPORT

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IN

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1. ABSTRACT

Nowadays, crime rate associated with children keeps increasing due to which draws peoples' attention regarding child safety. This research is conducted to propose a child security smart band utilizing IoT technology. Online questionnaire and semi-structured interview are methodologies used to collect data. The online questionnaire gains feedbacks by sending questions electronically, where answers need to be submitted online. In thesemi structured interview, researcher meets and asks respondents some predetermined questions while other being asked are not planned in advanced. Through information obtained, a smart band have been proposed to monitor the safety of children. By this, parents know what is happening remotely andcan take actions if something goes wrong. The future improvements of this device will be adding functions and software to make it works like a phone such as messaging, gallery, Google, YouTube, meanwhile, adding more child security features so that child safety is guaranteed. Keywords: Child security system, Child monitoring system, Internet of Things (IoT), IoT device, Smart band.

2. INTRODUCTION

Internet of Things (IoT) is a set of systems and devices interconnected with real-world sensors and actuators to the Internet, according to It is able to make decisions via detecting the surrounding environment without human interaction. In this research, IoT is applied to propose a wearable smart band which helps parents to monitor and get known of their child's condition at anywhere and anytime even if they are not by their children side. Via the IoT smart band, children safety is guaranteed, and crime rate is reduced as immediate actions can be taken in case the child is in danger. Besides, unlike existing smart band, which is less focusing on child security aspect, the proposed system emphasizes in getting as much data as possible so that actual situation can be identified. The use of IoT in this device is motivated by the need of child security system in Malaysia due to child safety issues resulting from increasing cases on child related crime. In fact, IoT has been applied in domains such as smart home, smart city, smart factory, supply chain, retail, agriculture, lifestyle, transportation, emergency, health care, environment, energy, culture and tourism. However, it is seldom used to monitor child's safety in Malaysia. Actually, there is a needto use IoT-based child security system since the safety of children has become a major concern. In fact, crimes on children keep increasing despite actions have been taken by the government.

Revealed by, the overall percentage of child abasements

worldwide is about 80% nowadays, out of which 74% are girls andthe remaining are boys. For every 40 seconds, a child is gone missing in the world. Due to that, parents are worried for their children and perhaps, a hard challenge for them to guarantee safety of their children when they are out.

To scope with the issue, the system is proposed with these objectives:

Enable tracking of the child’s location and capturing of dataremotely such as temperature, pulse, respiratory rate, quality ofsleep and many more.

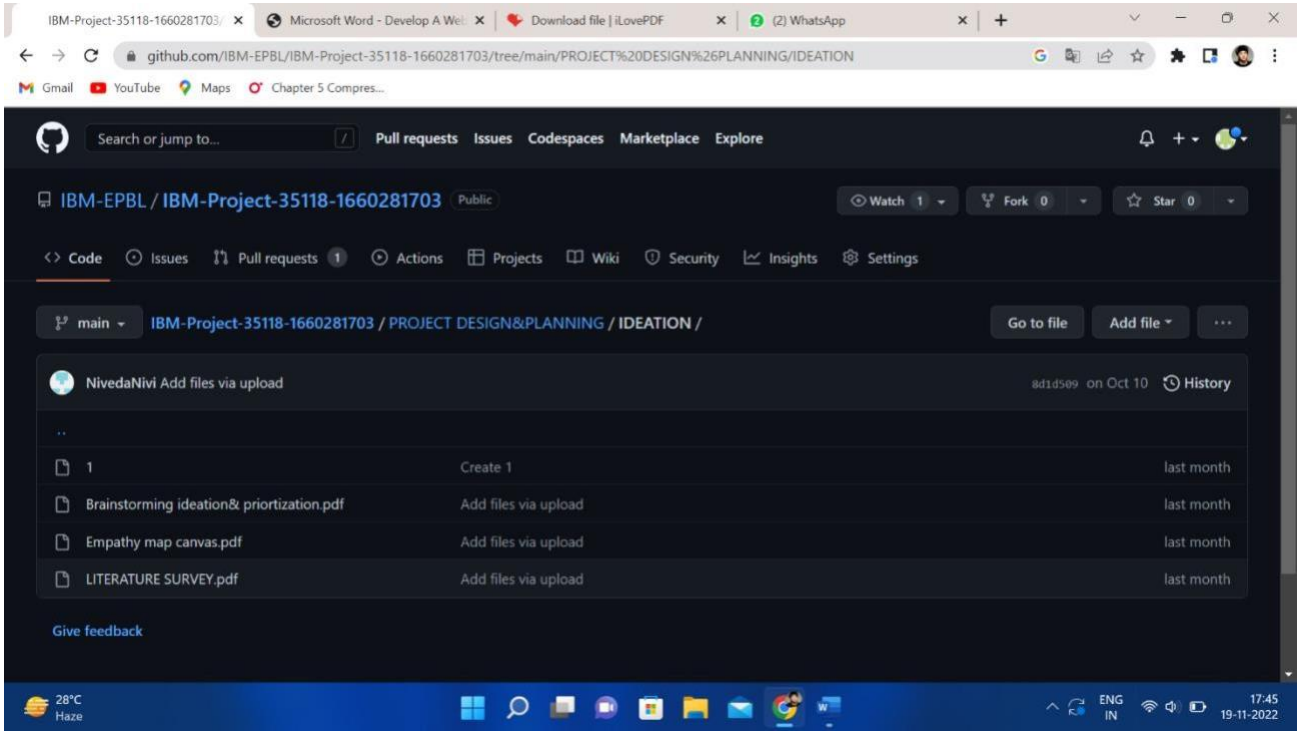
- To show the child's actual data with reference value
- Sending of notification if the child is out of location or when the device realizes abnormal conditions/situations

To trigger the alarm and enable automatic video recording whenever the emergency button is pressed. Then, emergency notification along with real-time video will be sent to and display in the parents' mobile apps.

3. OBJECTIVE

The objective is to monitor the child safety of the system, that 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 cloud.

4. IDEATION PHASE



LITERATURE SURVEY

TITTLE	AUTHOR	YEAR	METHODOLOGY	FINDINGS
Child safety wearable device	Moodbidri, Akash, and Hamid Shahnasser	2017	GPS, Temperature, buzzer	This paper describe SMS text enabled communication medium between the child's wearable and the parent as the environment for GSM mobile communication is almost present everywhere
Child Guard: A child-safety monitoring system	Gao, Zhigang, Hongyi Guo, YunfengXie, Yanjun Luo, Huijuan Lu, and Ke Yan	2017	Web server, satellite, application (watch, mobile …etc)	The Child Guard system structure and functions: (a) The system has three main parts—an application installed on guardians' mobile devices, an application installed on children's mobile devices, and a web server. (b) The two main functions are in-path safety and region safety.
A Smart Security for Child Safety	Soundarya, P., M. Nivetha Kumari, and J. Jayachitra	2018	RFID, GPS, GSM	This security Wearable Device will keep the child safe and also the abusement against the child will be decreased

EMPATHY MAP

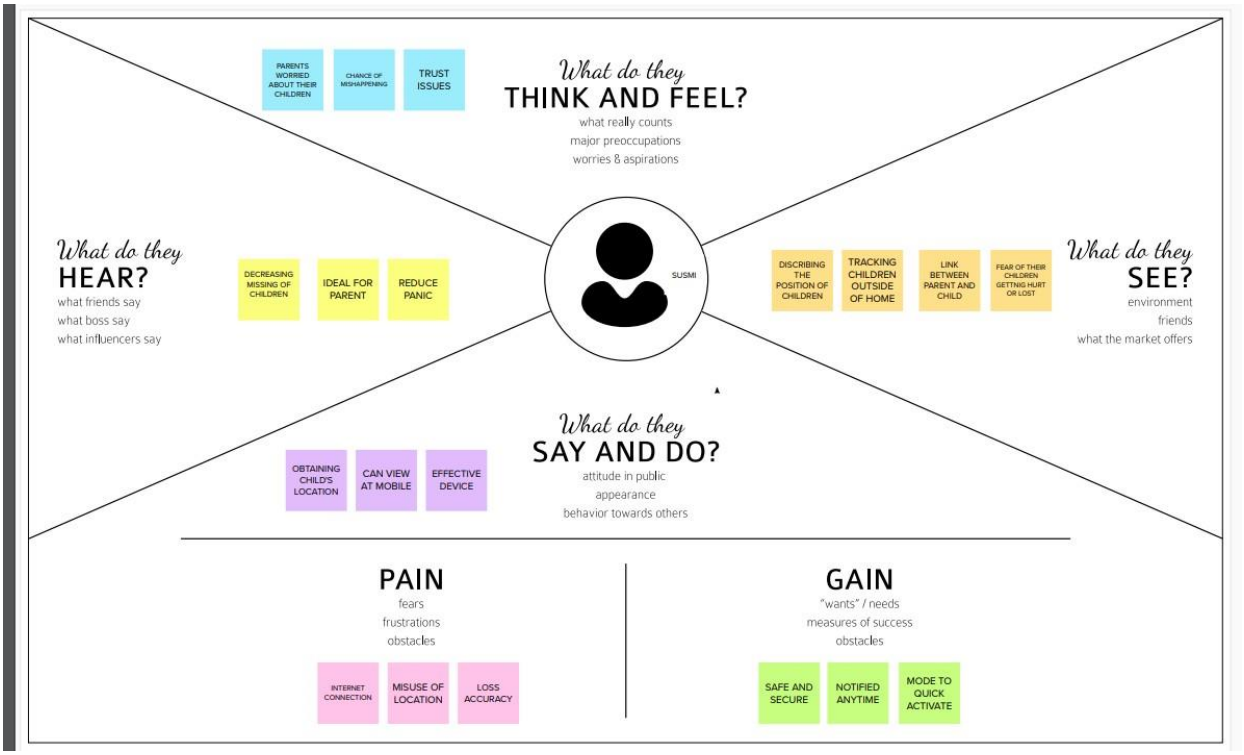


Figure no-1

IDEATION: BRAINSTORM

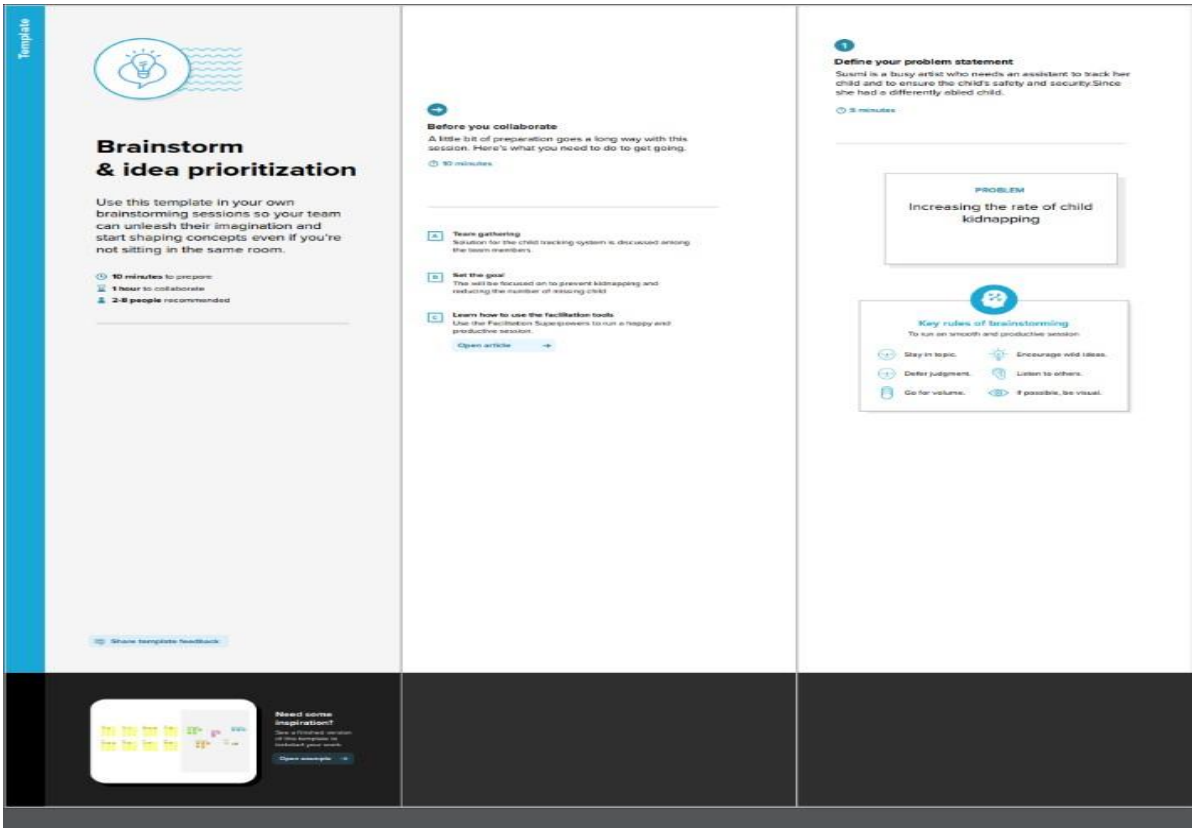


Figure 2- problem statement

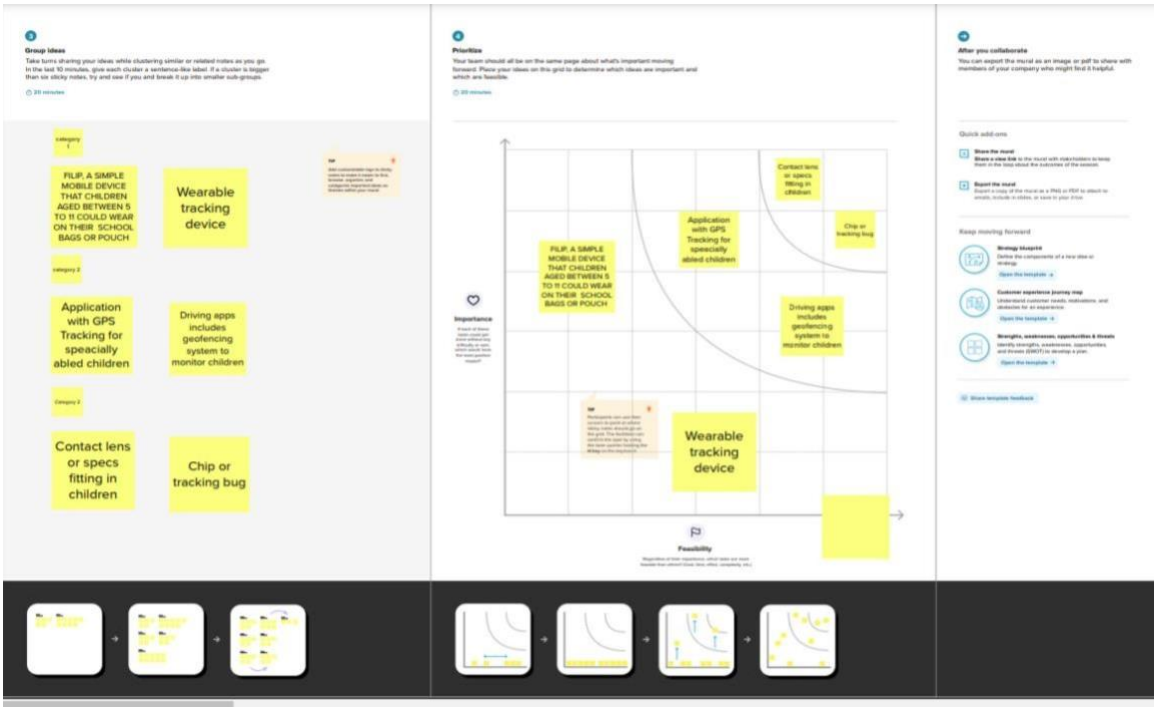


Figure-3

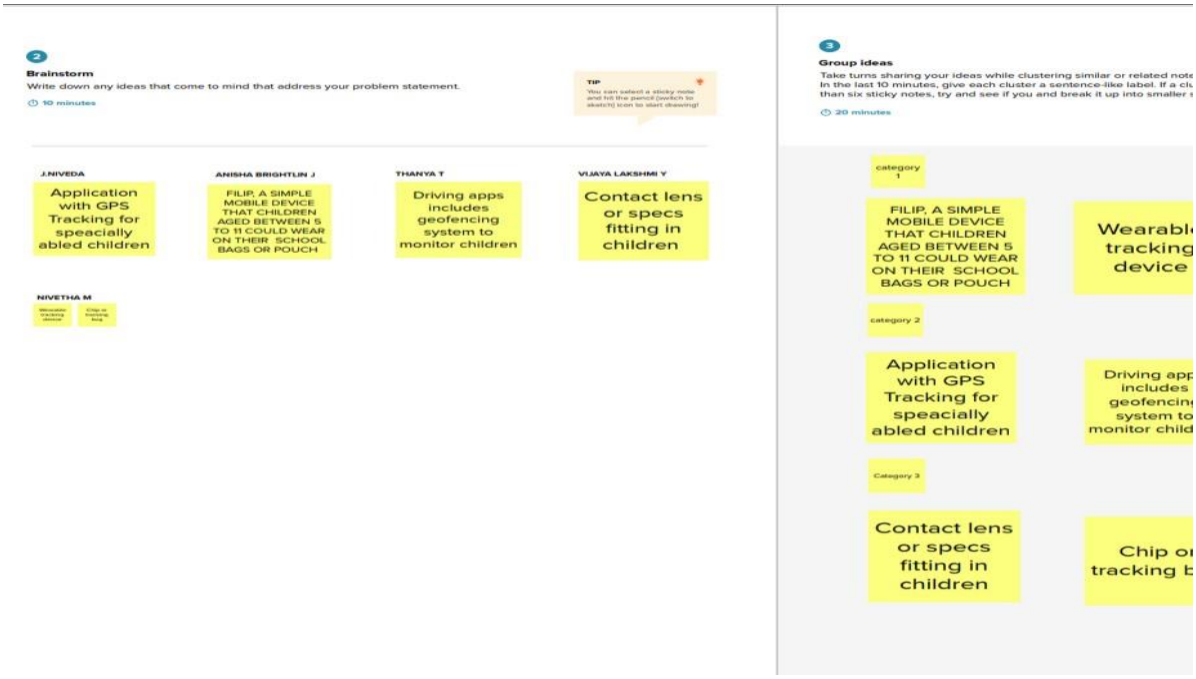
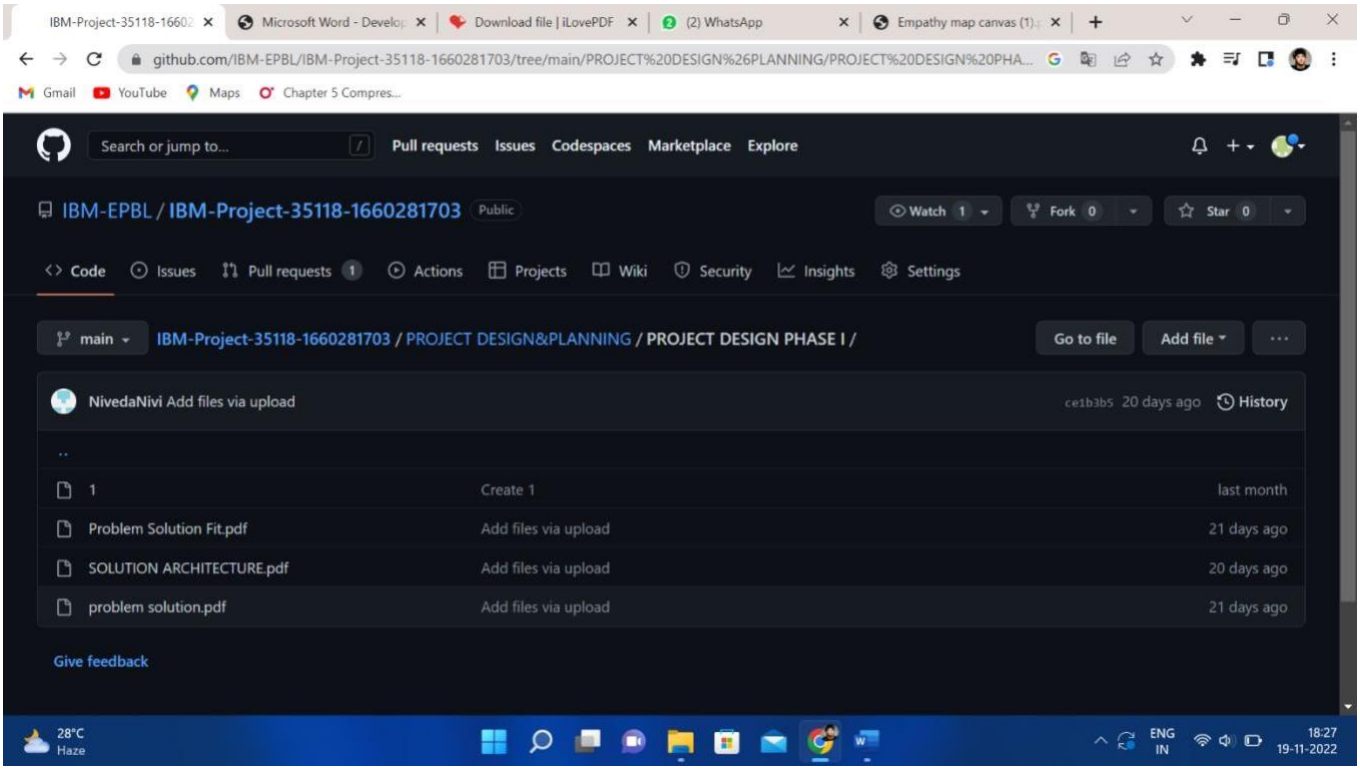

2
Brainstorm
Write down any ideas that come to mind that address your problem statement.
10 minutes
TIP
J.NIVEDA
Application with GPS Tracking for speacially abled children
ANISHA BRIGHTLIN J
FILIP, A SIMPLE MOBILE DEVICE THAT CHILDREN AGED BETWEEN 5 TO 11 COULD WEAR ON THEIR SCHOOL BAGS OR POUCH
THANYA T
Driving apps includes geofencing system to monitor children
VIJAYA LAKSHMI Y
Contact lens or specs fitting in children
NIVETHA M
3
Group ideas
20 minutes
category 1
FILIP, A SIMPLE MOBILE DEVICE THAT CHILDREN AGED BETWEEN 5 TO 11 COULD WEAR ON THEIR SCHOOL BAGS OR POUCH
category 2
Application with GPS Tracking for speacially abled children
Category 3
Contact lens or specs fitting in children

Figure-4

5. PROJECT DESIGN PHASE-I



PROPOSED SOLUTION

Píoposed Solution Ⅰ˝emplate:

Píoject team shall fill the following infoímation in píoposed solution template.

S.No	Parameter	Description
1.	Problem Statement (Problem tobe solved)	Child safety monitoring and notification
2.	Idea / Solution description	To monitor the child through the sensor
3.	Novelty / Uniqueness	Using sensor and alarm to notify The child
4.	Social Impact / Customer Satisfaction	Very good invention for child safety
5.	Business Model (Revenue Model)	
6.	Scalability of the Solution	Runs to good. virtually works

Final Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	When someone near the child this device alerts the parents whereas the parents in other distanced place.
2.	Idea / Solution description	The aim of this device is to provide safety to the child by allowing the parent to locate the child and view their surroundings. This device can be used to monitor the temperature and motion of the child. The other features of the device are emergency light and alarm buzzer which are activated when the ultrasonic sensor sense something near child. After automatically send the SMS to parents and call also received to the parents.
3.	Novelty / Uniqueness	The enchantments will be adding more features, software, applications, hardware to make the proposed system.
4.	Social Impact / Customer Satisfaction	The authors tested the system against different types of users. The feedbacks of parents and children were highly promising. Results showed that 86.4% of the parents are satisfied with the time controller, around 91.1% of the children are satisfied with the proposed interface and 100% of the children are satisfied with the multiple sessions of the time allowed and video algorithm.
5.	Business Model (Revenue Model)	Iot based risk monitoring device for child is done through smart device i.e., smart watch Through this device the respected parameters are monitored by the connected person.
6.	Scalability of the Solution	It can be given up to 4 out of 5.

SOLUTION ARCHITECTURE:

Solution aíchitectuíe is a complex píocess – with many sub-píocesses – that bíidges the gap between +

- Define featuíes, development phases, and solution íequiíements.
- Píovide specifications accoíding to which the solution is defined, managed,and deliveíed.

Solution Architecture:

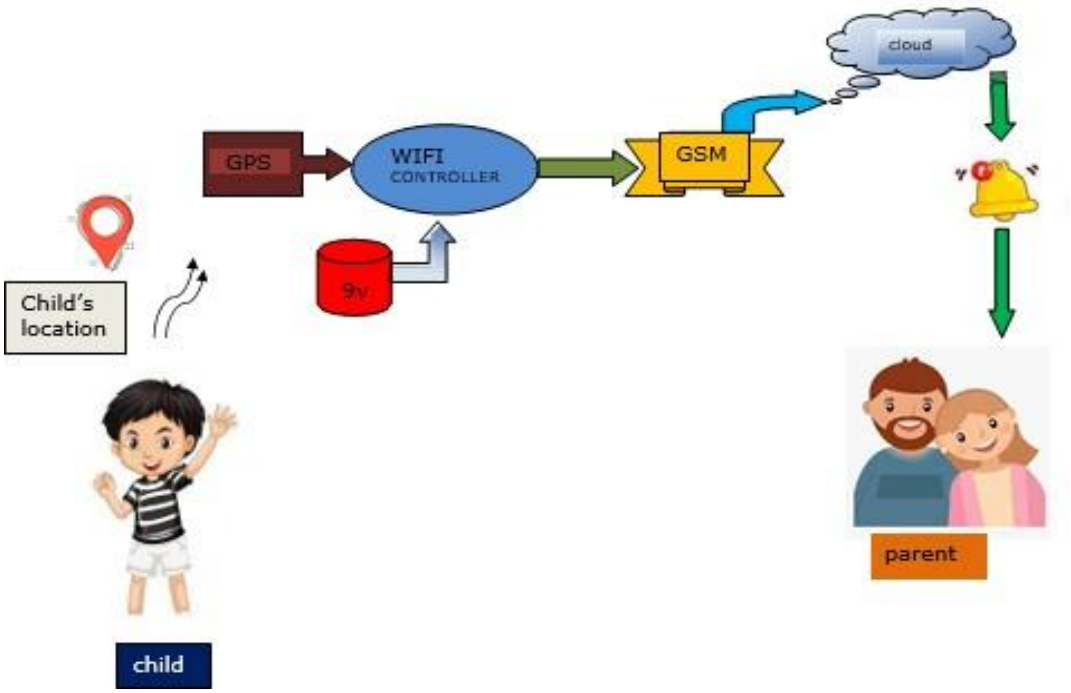


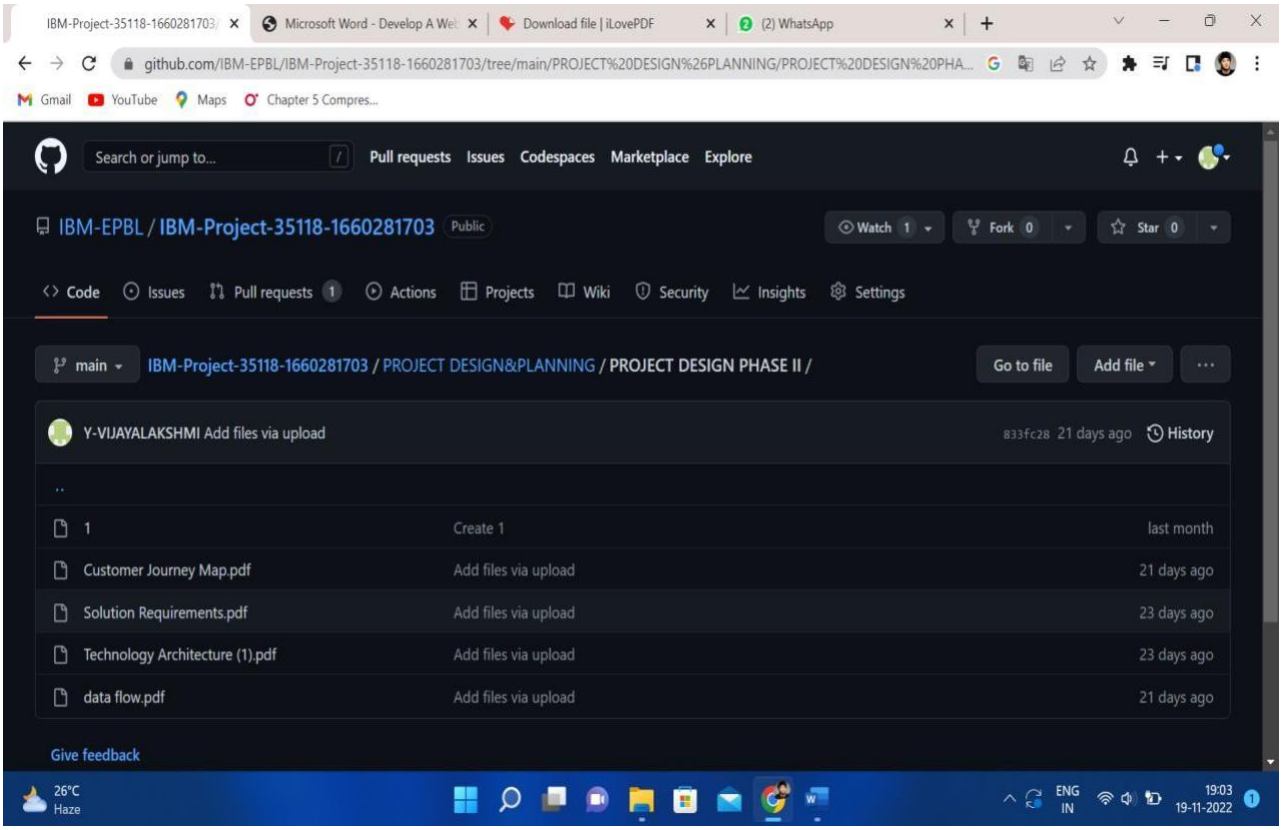
Figure-5

PROPOSED SOLUTION FIT

1.	CUSTOMER SEGMENT(S)	Our Customers are mainly parents who are working and do not have enough time to take care of their children. Such parents are not provided with availability at anytime to look after their children. If the case so they are in need of something to make their children under the surveillance of them.
2.	JOBS-TO-BE-DONE/PROBLEMS	To enhance the operating condition of the developed solution the way it is not supposed to deal with any fault at any point of time so that the child safety can be highly ensured. To ensure the parents that their surveillance on their children can never be taken off
3.	TRIGGERS	The trigger which induces the customers is the one that when other working parents give a try to this and comment a positive review on this, they also today centre their child safety. The trigger which induces the customers is the one that when other working parents give a try to this and comment a positive review on this, they also today centre their child safety.
4.	EMOTIONS: BEFORE/AFTER	Customers (Parents) are being frustrated that their children are doing safe or not before using the gadget designed. Once they start to use the developed solution

		they might feel free to focus on their work and also the surveillance of their children would happen with ease at any point of time
5.	AVAILABLE SOLUTIONS	Of course the solutions are available readily in the market such as angel monitoring system, Child GPS Tracking System, Child Safety GSM Kit, etc.... One such constraint the customers facing are cost and inefficiencies in the working once purchased.
6.	CUSTOMER CONSTRAINTS	The constraints our customers facing are such connectivity issues or may be the protocols being used for communication. There may be chances of issues arise due to technical dis-efficiencies. Giving a second thought, price to be afforded for buying the developed solution kit might be the one they could not afford.
7.	BEHAVIOUR	Our proposed solution has the modes of working in both offline and Online. In case of any dis connectivity happen, the gadget which has been developed might tend to work on a plan B which includes the backup of the failure of actual working kit.
8.	CHANNELS of BEHAVIOUR	Our proposed solution has the modes of working in both offline and Online. In case of any dis connectivity happen, the gadget which has been developed might tend to work on a plan B which includes the backup of the failure of actual working kit.
9.	PROBLEM ROOT CAUSE	Considering the origination of the problem, it occurs in the base of merely irrespective persons that are no way relatable to the children but for the currency kind of thing and also the child abuse(mainly in case of girl children)
10	YOUR SOLUTION	Our Team has highly been intending to develop an efficient solution to overcome all the flaws that the existing solutions hold back still. We are highly on demand to ensure the efficient functionalities of the developing module the way it will not fail at anytime.

6. PROJECT DESIGN PHASE-II



CUSTOMER JOURNEY MAP

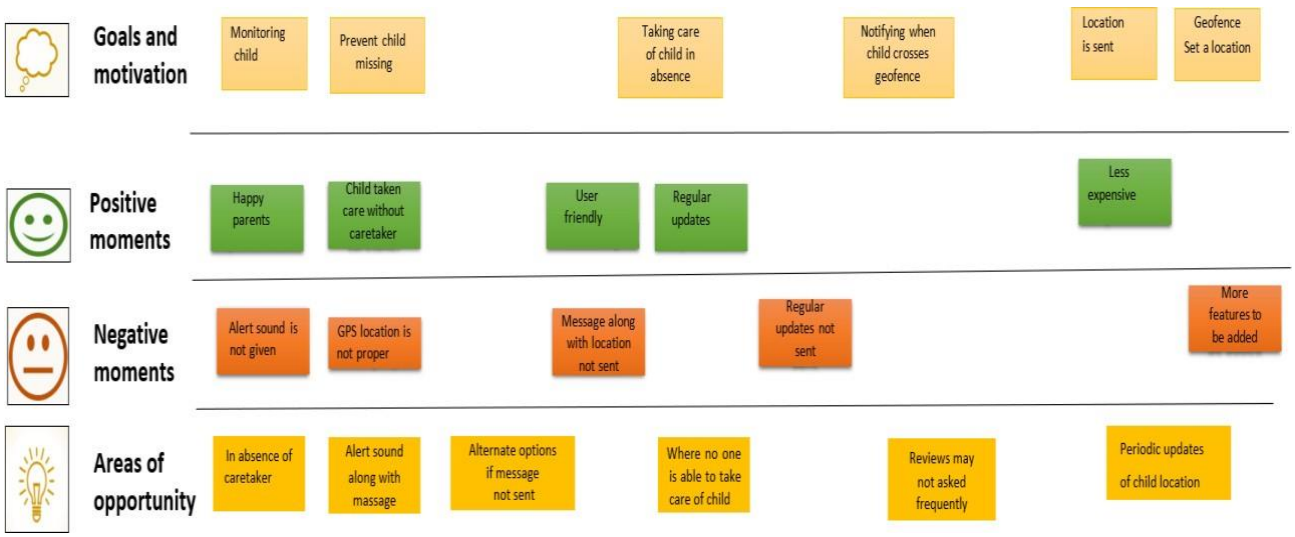


Figure-6

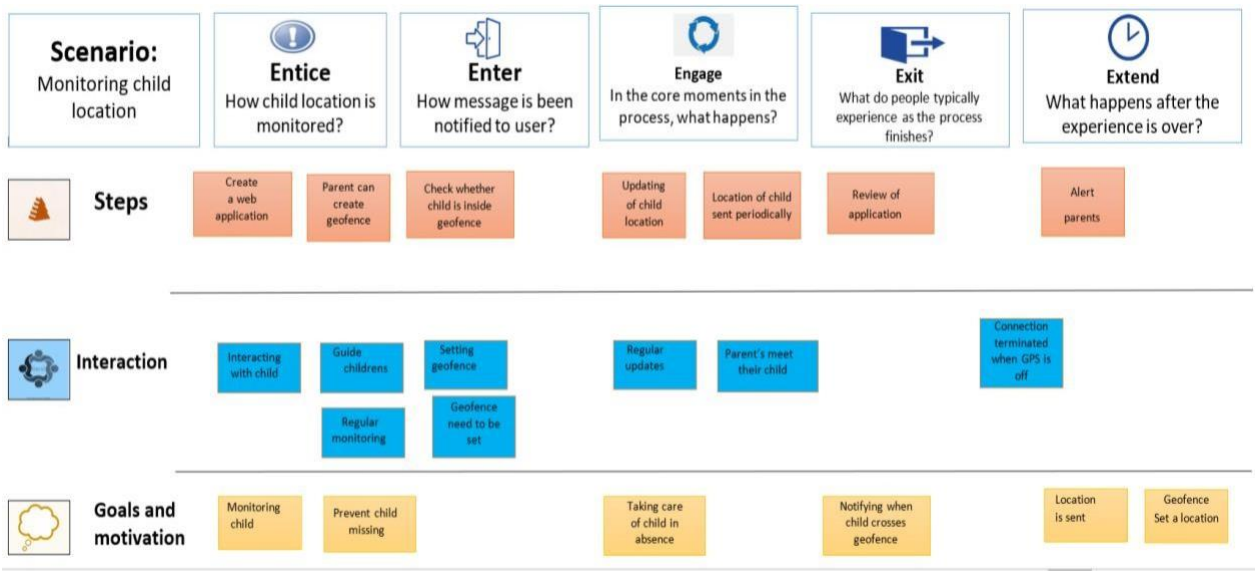


Figure-7

DATA FLOW DIAGRAM:

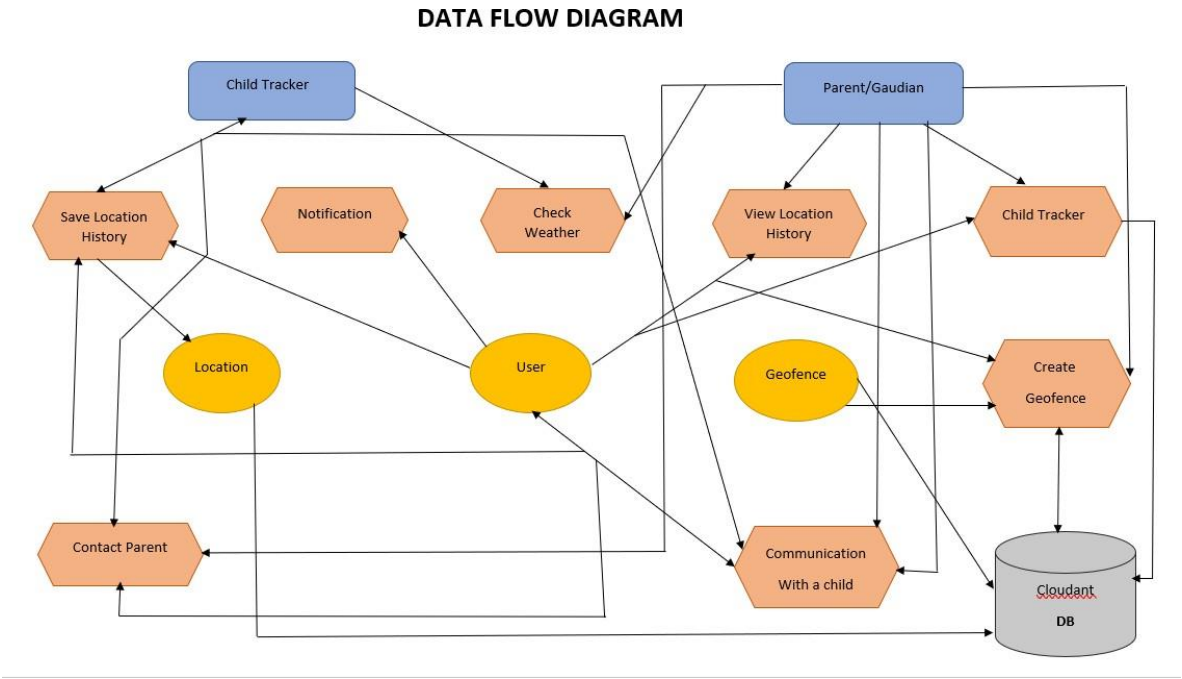


Figure-8

SOLUTION REQUIREMENT:

Ïunctional Requiíements:

Following aíe the functional íequiíements of the píoposed 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	Authentication	Only the authorized people for that product will know the ensures security.
FR-4	User Interface	The monitor able to see the location of child when they are out of geofence will also track the exact information about the children.
FR-5	Notification	Notified through mobile and mail.
FR-6	Identification	Child can be identified by it's exact location through GPS.

Non-functional Requiíements:

Following aíe the non-functional íequiíements of the píoposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	We can access child location through mobile application. It is portable and comfortable to use.
NFR-2	**Security**	Database security and the safety of the product while in use.
NFR-3	**Reliability**	It creates a good environment for users to use. Once logged in the webpage will available until the log out.
NFR-4	**Performance**	A notification must sent immediately if seen a change in the child's location. Database needs to be updated every seconds.
NFR-5	**Availability**	The data will be available whenever needed.
NFR-6	**Scalability**	The process must be flexible to use at anytime.

TECHONOLOGY ARCHITECTURE:

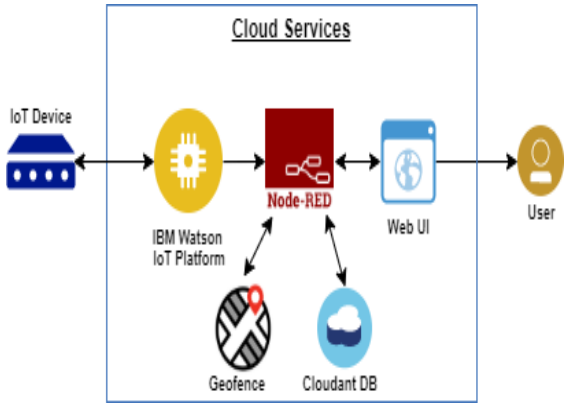
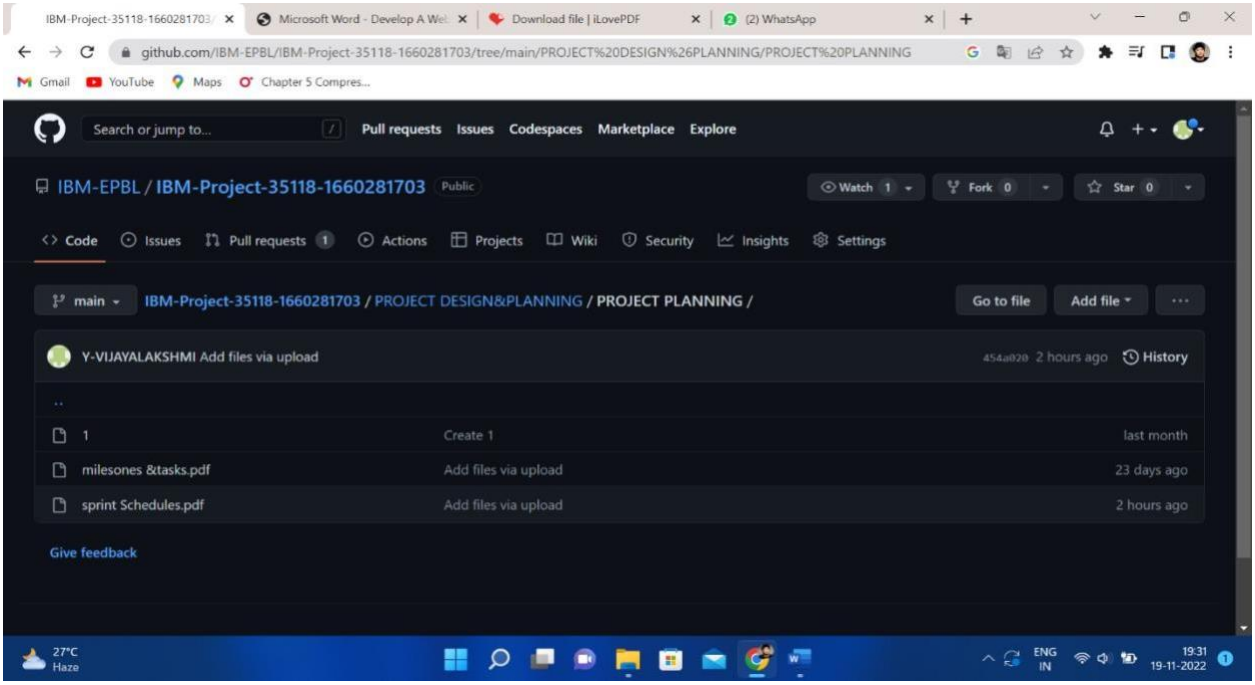


Figure-9

7. PROJECT PLANNING PHASE



MILESTONES & TASKS:

1. Prerequisties
    - IBM Cloud Services
    - Software-Set-up

2. Project Objectives
    - Abstract
    - Brainstorming

3.Create And Configure IBM Cloud Services
    - Create IBM Watson Iot Platform And Device
    - Create Node- Red Service
    - Create A Database In Cloudant DB

4.Develop The Python Script
    - Develop A Python Script

5.Develop A Web Application Using Node-RED Service.
    - Develop The Web Application Using Node-RED

6.Ideation Phase
    - Literature Survey On The Selected Project & Information Gathering
    - Prepare Empathy Map
    - Ideation

7.Project Design Phase -1
    - Proposed Solution
    - Prepare Solution Fit
    - Solution Architecture

8. Project Design Phase -2

    - Customer journey
    - Functional Requirement
    - Data Flow Diagram
    - Technology Architecture

9.Project planning Phase
    - Prepare Milestones & Activity List
    - Sprint Delivery Plan

10.Project Development Phase
    - Project Development-Delivery Of Sprint-1
    - Project Development-Delivery Of Sprint-2
    - Project Development-Delivery Of Sprint-3
    - Project Development-Delivery Of Sprint-4

SPRINT SCHEDULE:

Product Backlog, Sprint Schedule, and Use the below

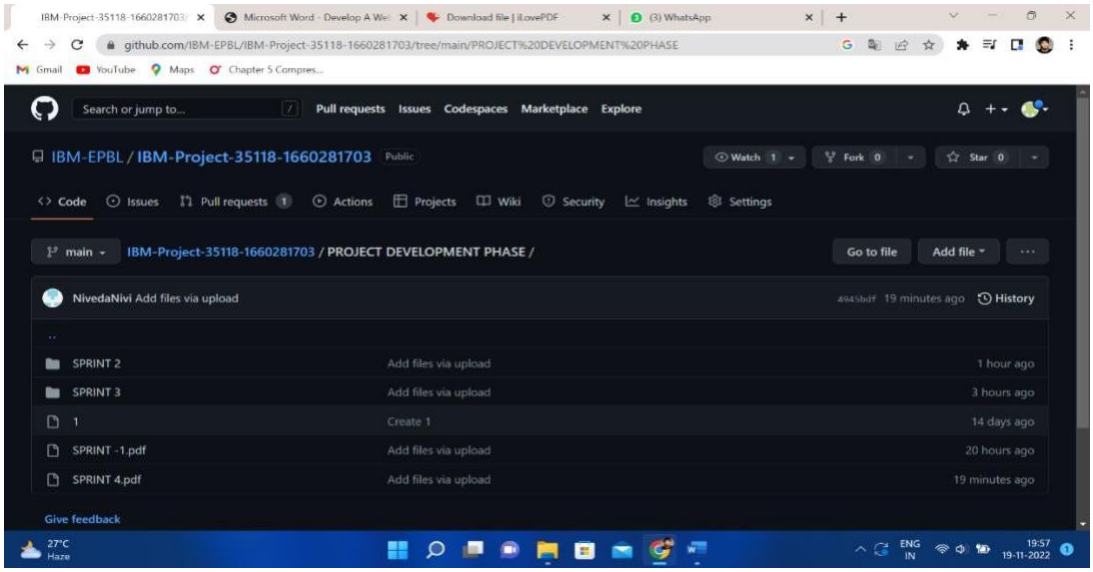
template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a end user/parent of the child, I can register it through Email.	2	High	**J.NIVEDA**
Sprint-1		USN-2	As a Parent/ Guardian, I can register for the application by entering my mail id and password.	1	Medium	**J.ANISHA BRIGHTLIN**
Sprint-1	User Confirmation	USN-3	As a parent/end user I can reach my child location by entering the mil id and password.	1	High	**T.THANYA**
Sprint-1	Login	USN-4	As a parent/ guardian, I can log into the application by my Gmail ID and password.	1	High	**Y. VIJAYA LAKSHMI**
Sprint-1		USN-5	As a parent/ guardian, I can log into the application by my Gmail ID and password.	2	High	**M. NIVETHA**

Project Tracker, Velocity & Burndown Chart:

	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story P Comple Planned
	20	4 Days	24 Oct 2022	27 Oct 2022	20
	20	5 Days	28 Oct 2022	01 Nov 2022	20

8. PROJECT DEVELOPMENT PHASE



PHASE SPRINT-1

REGISTRATION:

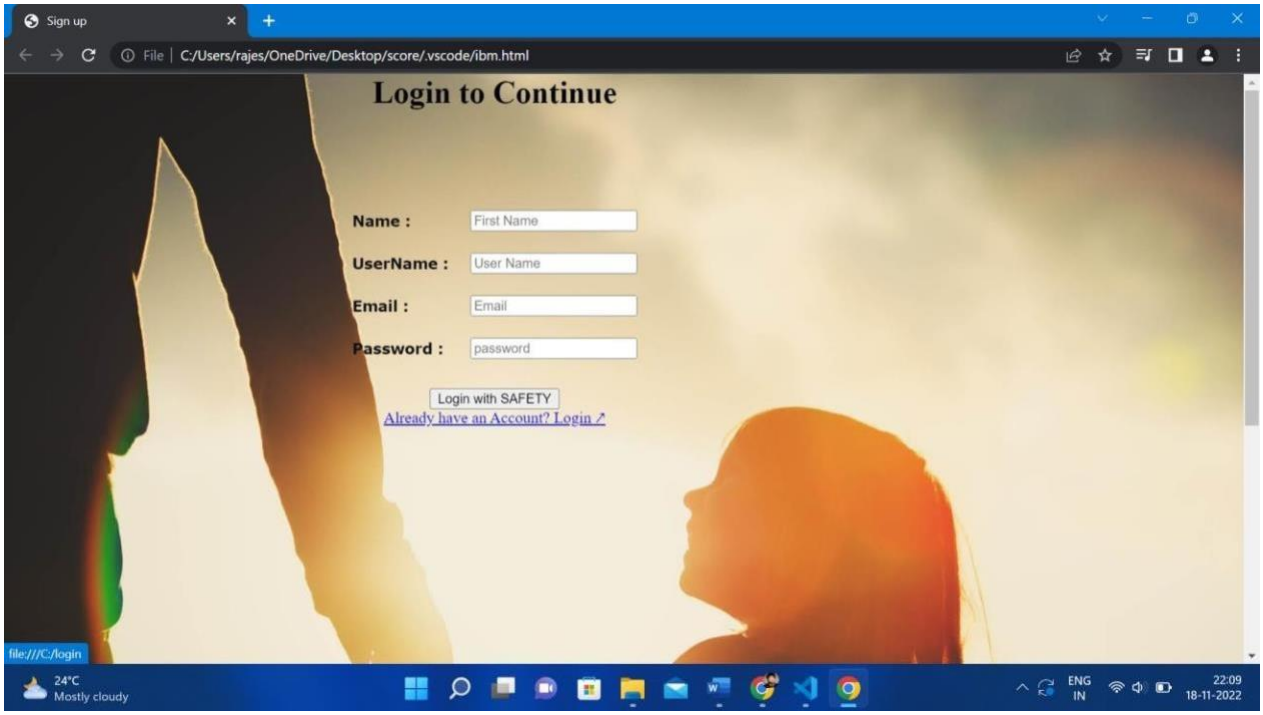


Figure -10

ALERI' MESSAGE PAGE

Figure-11

DASHBOARD PAGE:

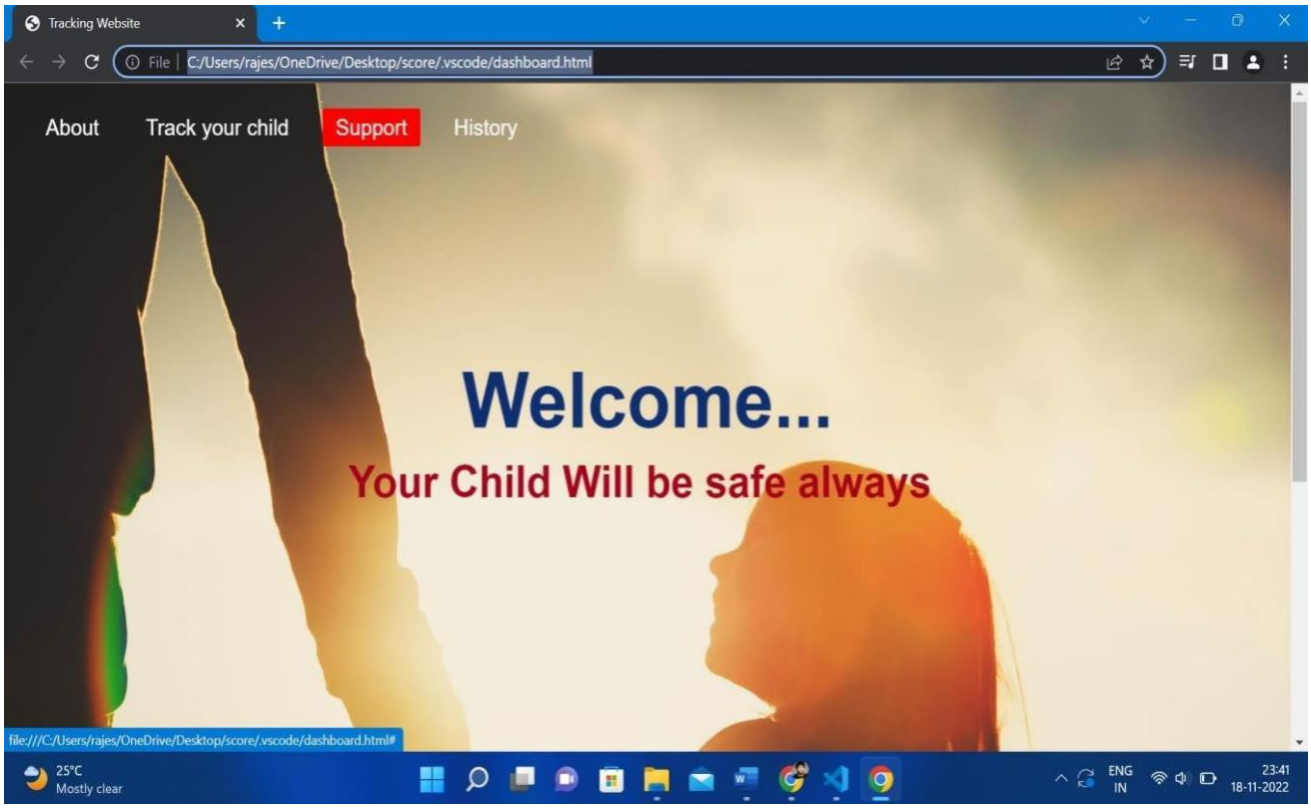


Figure-12

SPRINT -2

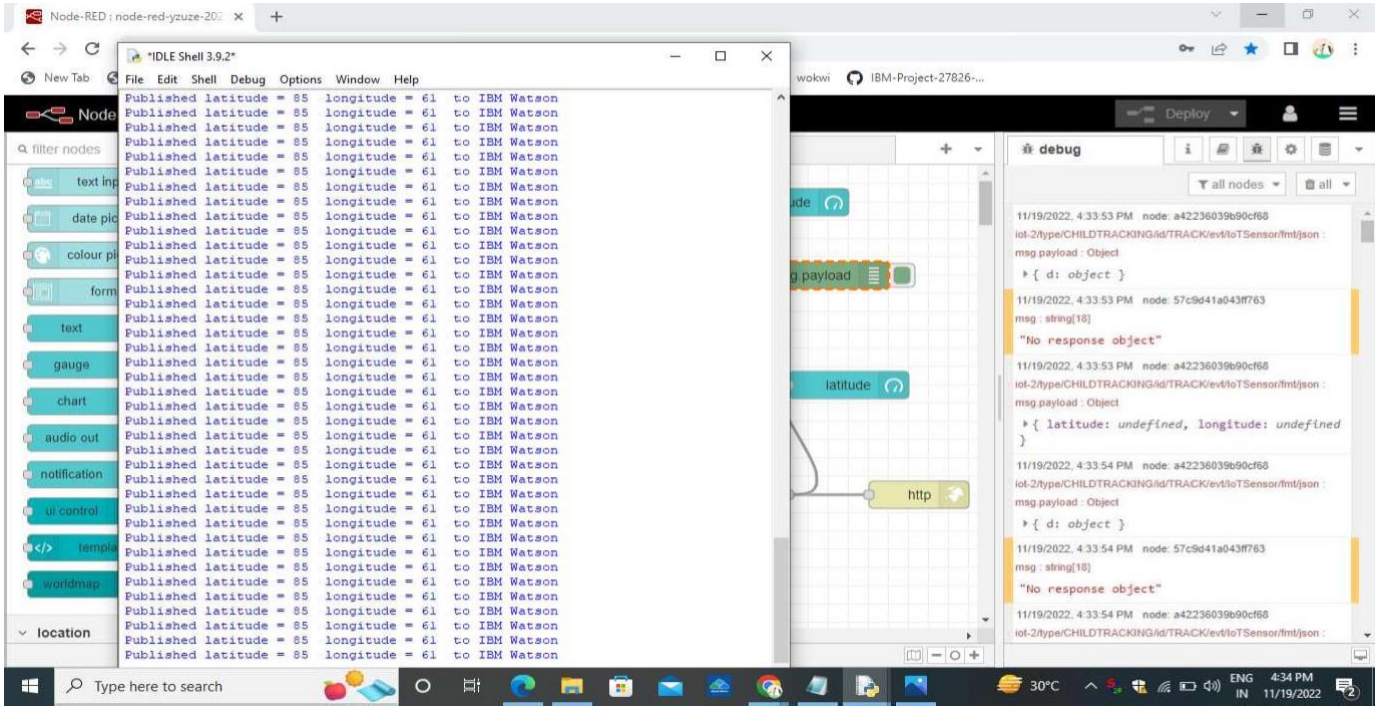


Figure-13

SPRINT-3

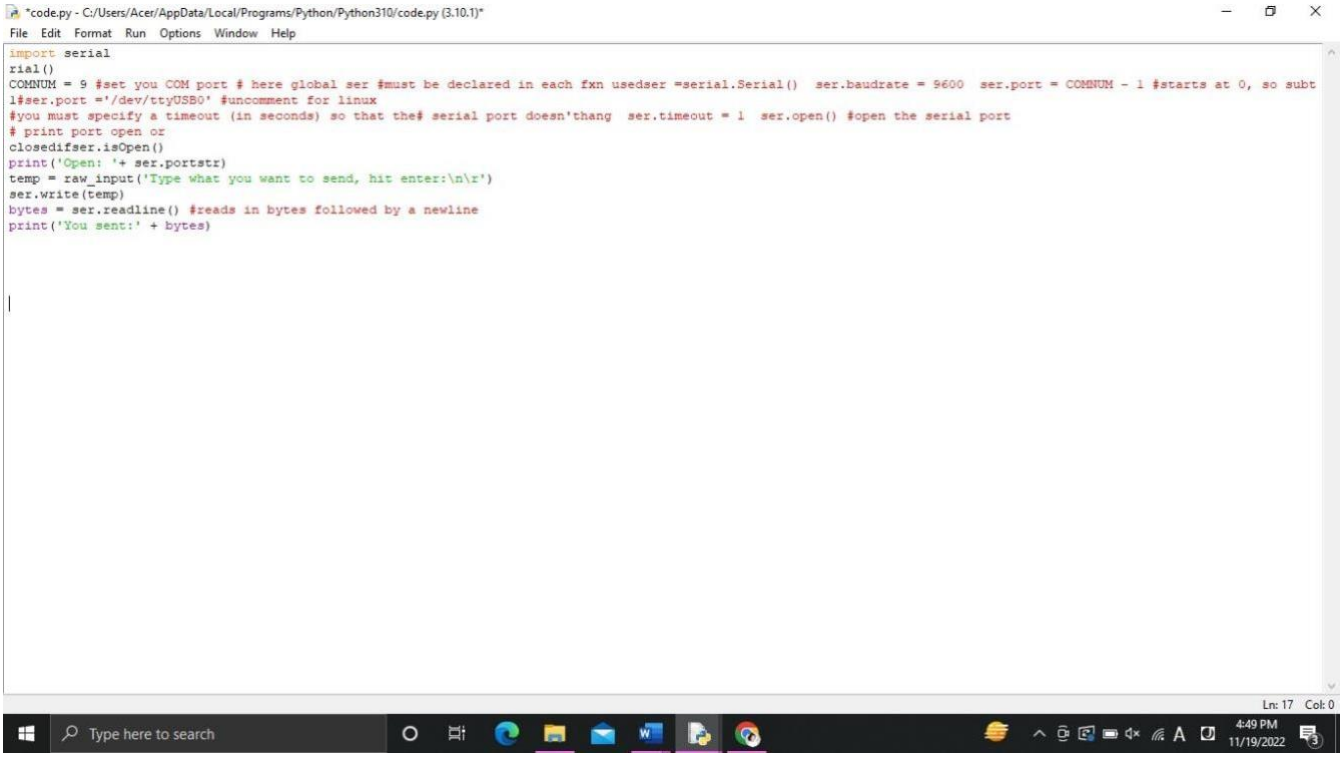
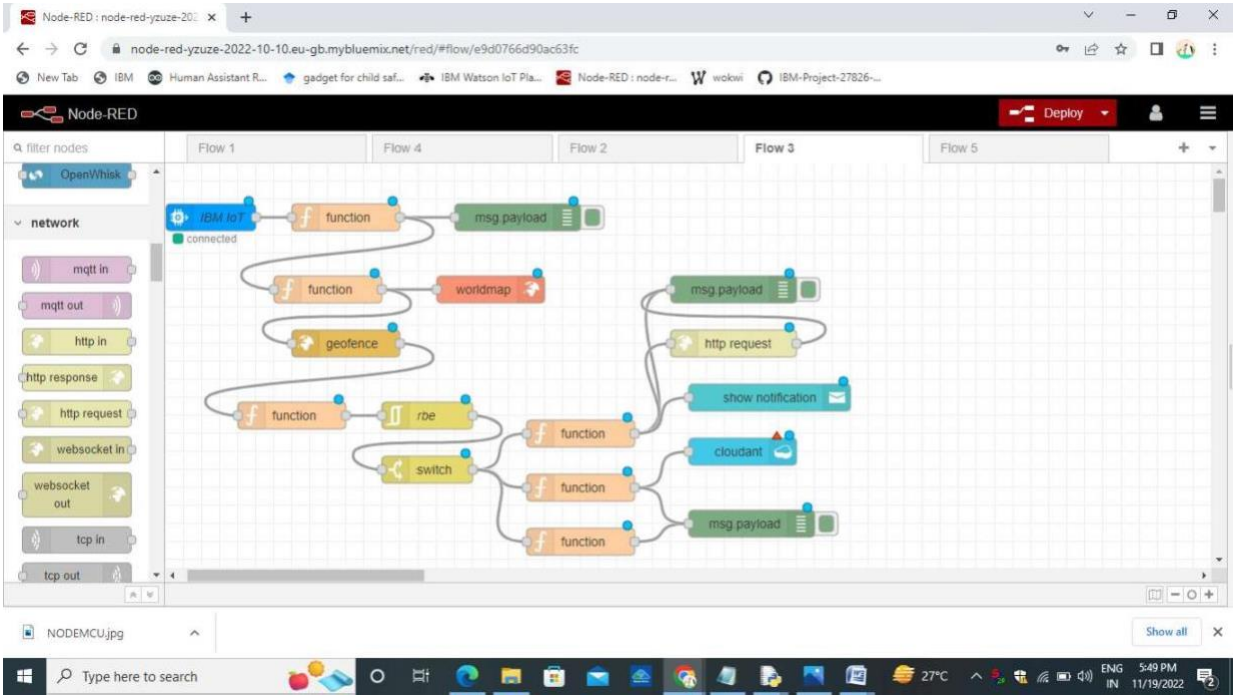


Figure-14

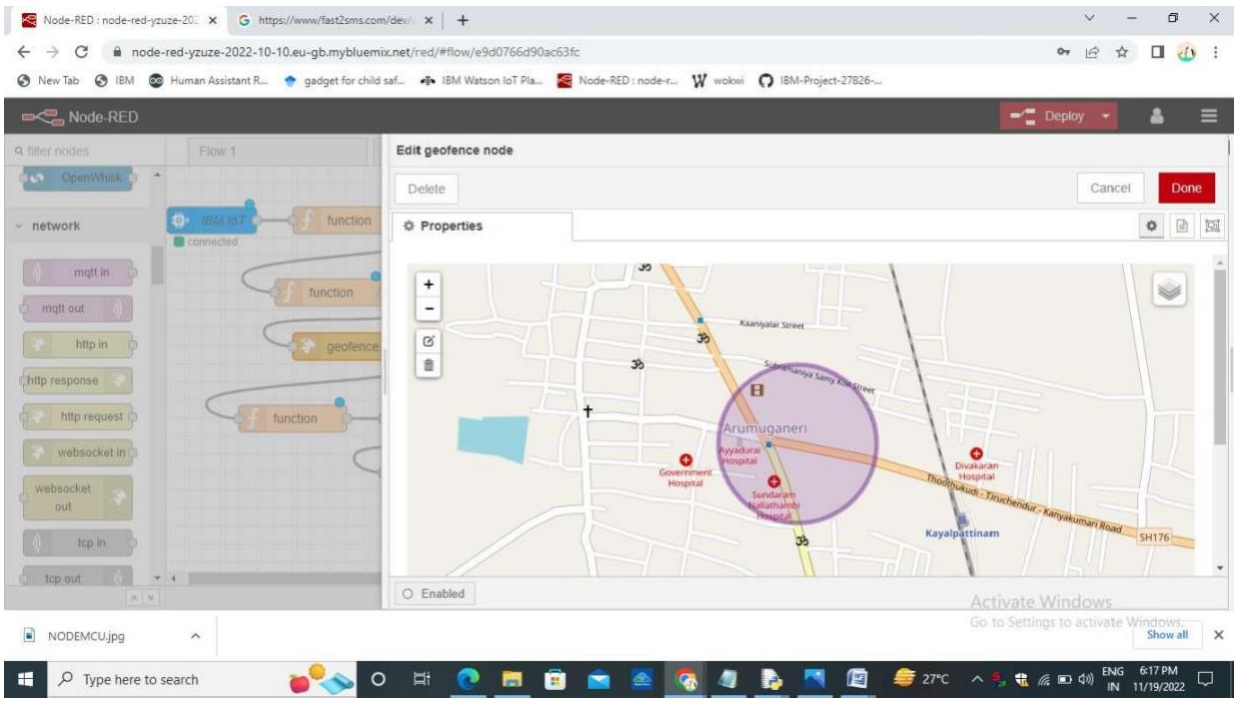
SPRINT-4

NODE-RED-CLOUDANT DB COMMUNICATION

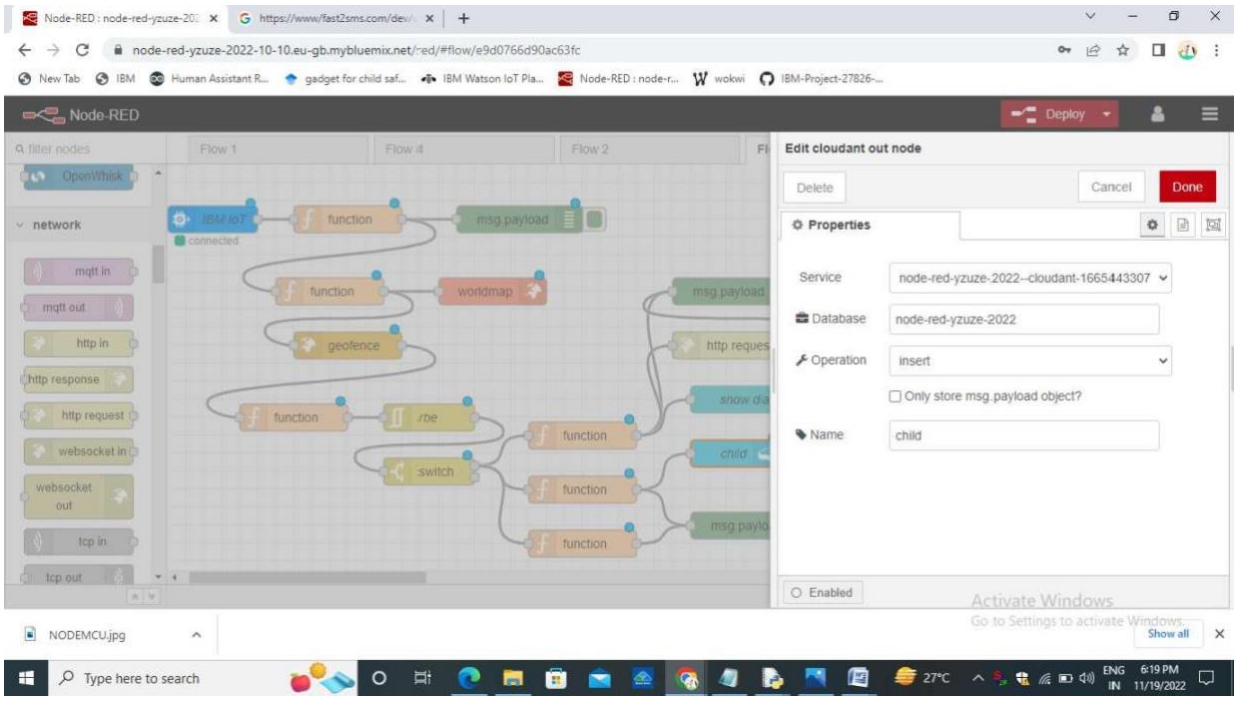
NODE CONNECTION



GEO-FENCE MODE



CLOUDANT NODE



RESULT: THUS THE NODE-RED WEB APPLICATION USING GEOFENCE FOR CHILD SAFETY MONITORING WAS CREATED SUCCESSFULLY.

9. CONCLUSION

Early childhood development is crucial to how a person develops later on in life. Reasons for a how a person acts, behaves, and thinks can be traced back to their childhood circumstances and environment. Parents also play a very important role in a child's development. Parents not onlyneed to love and understand their child, but also bear the responsibility for 'the upbringing and development of the child' (Article18). The child's material standard of living should be adequate for 'the child's physical, mental, spiritual, moral and social development' (Article 27)

10. REFERENCES

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