

NALAIYA THIRAN

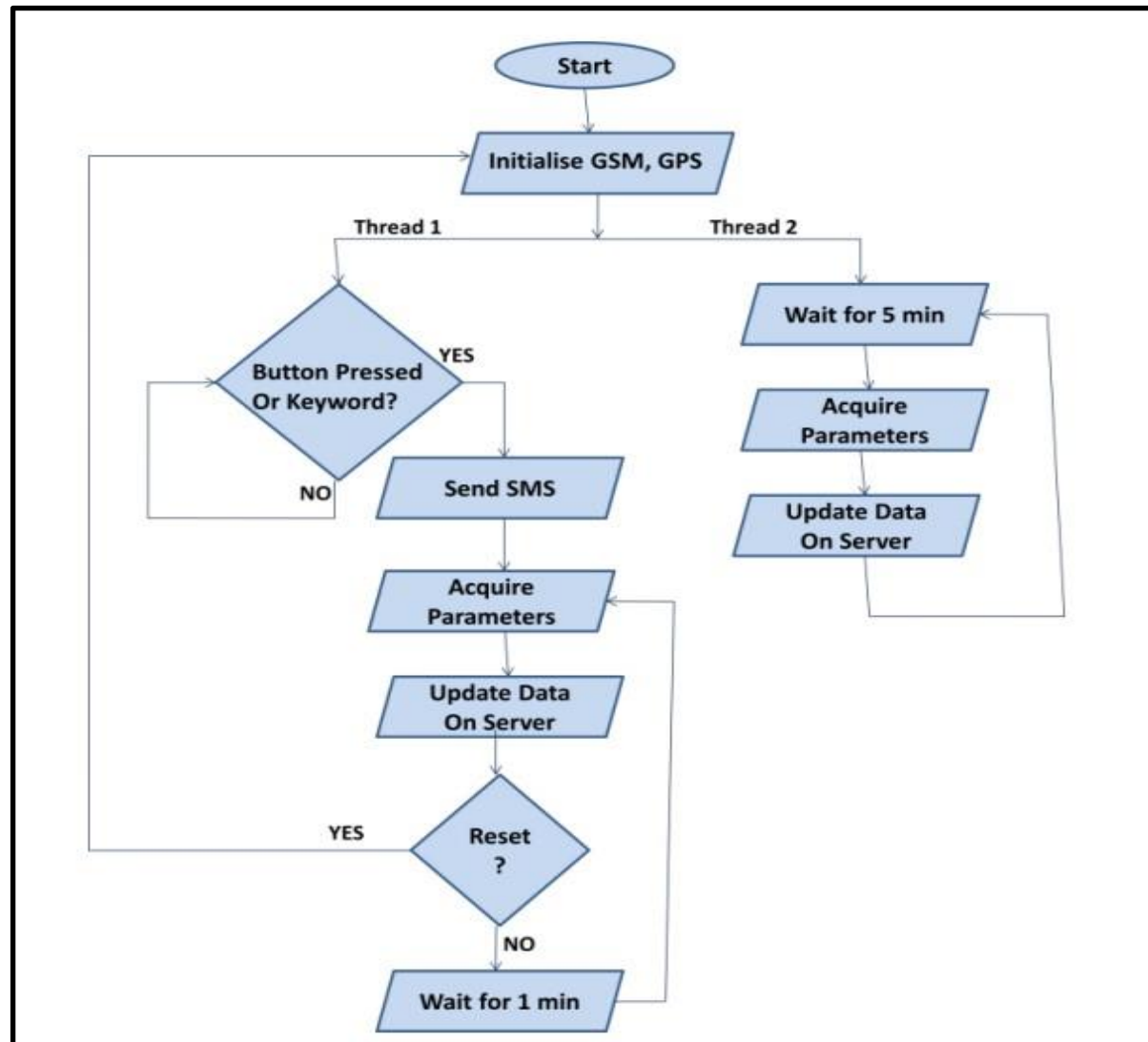
WEEK 8 REPORT

Phase 4 Description: Project Design Phase -II (Requirement Analysis, Customer Journey, Data Flow Diagrams, Technology Architecture)

4.3 Prepare the Functional Requirement Document & Data Flow Diagrams

Data Flow Diagrams

IoT Based Safety Gadget for Child Safety Monitoring & Notification



User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1 (FATHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a Father.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1
		USN-2 (MOTHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a Mother.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1
		USN-3 (GUARDIAN/ CARETAKER)	As a user, I can also monitor the children's activities using a safety gadget monitoring system.	I can access my account / dashboard and receive confirmation email & click confirm	Medium	Sprint-1
	Login	USN-4	As a user, I can log into the application by entering email & password.	I can access my account / dashboard.	Medium	Sprint-2
	Dashboard	USN-5	As a user, I can fix the geofence for my child's location so that I will receive alerts if my child crosses the geofence.	I can monitor the current location of my child.	High	Sprint-2
Customer (Web user)	Registration	USN-1 (FATHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a Father.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1
		USN-2 (MOTHER)	As a user, I can register by entering my email, password, and confirming my password. I can access the location of my children using the credentials provided as a Mother.	I can access my account / dashboard and receive confirmation email & click confirm	High	Sprint-1
		USN-3 (GUARDIAN/ CARETAKER)	As a user, I can also monitor the children's activities using a safety gadget monitoring system.	I can access my account / dashboard and receive confirmation email & click confirm	Medium	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
	Login	USN-4	As a user, I can log into the application by entering email & password.	I can access my account / dashboard.	Medium	Sprint-2
	Dashboard	USN-5	As a user, I can fix the geofence for my child's location so that I will receive alerts if my child crosses the geofence.	I can monitor the current location of my child.	High	Sprint-2
Customer Care	Dashboard	USN-6	As a customer care service person, whenever I receive a complaint, I forward the complaint and ensure that the complaint is resolved.	I can keep track of all the complaints and the status of the complaints received.	Medium	Sprint-3
Administrator	Admin Dashboard	USN-7	As an administrator, I will take care of all the payment processes, queries and complaints and login credentials.	I can access all the customer details, payment details and complaints received.	High	Sprint-4

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 Email Registration through Mobile number Registration in person
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Notifications	Email and SMS message
FR-4	User Interface	Mobile app for parents Web interface for registrations, record tracking, information and payment

Non-functional Requirements

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

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	To find out whether the child crosses the geofence or not, upon which the parent/guardian of the child gets an alert.
NFR-2	Security	Database security must meet HIPAA requirements. Extra security protocols and measures are also in place.
NFR-3	Reliability	Webpage gets automatically logged out unless password has been saved in the Google account. In case of server crash data gets backed up beforehand.
NFR-4	Performance	Site gets updated every 1 hour. Speed per transaction depends on the internet strength.
NFR-5	Availability	Available world wide, and requires an internet source.
NFR-6	Scalability	Short term scalability where memory is stored and erased, can be scaled to keep records in the future.

4.4 Prepare Technology Architecture of the solution

Technology Architecture

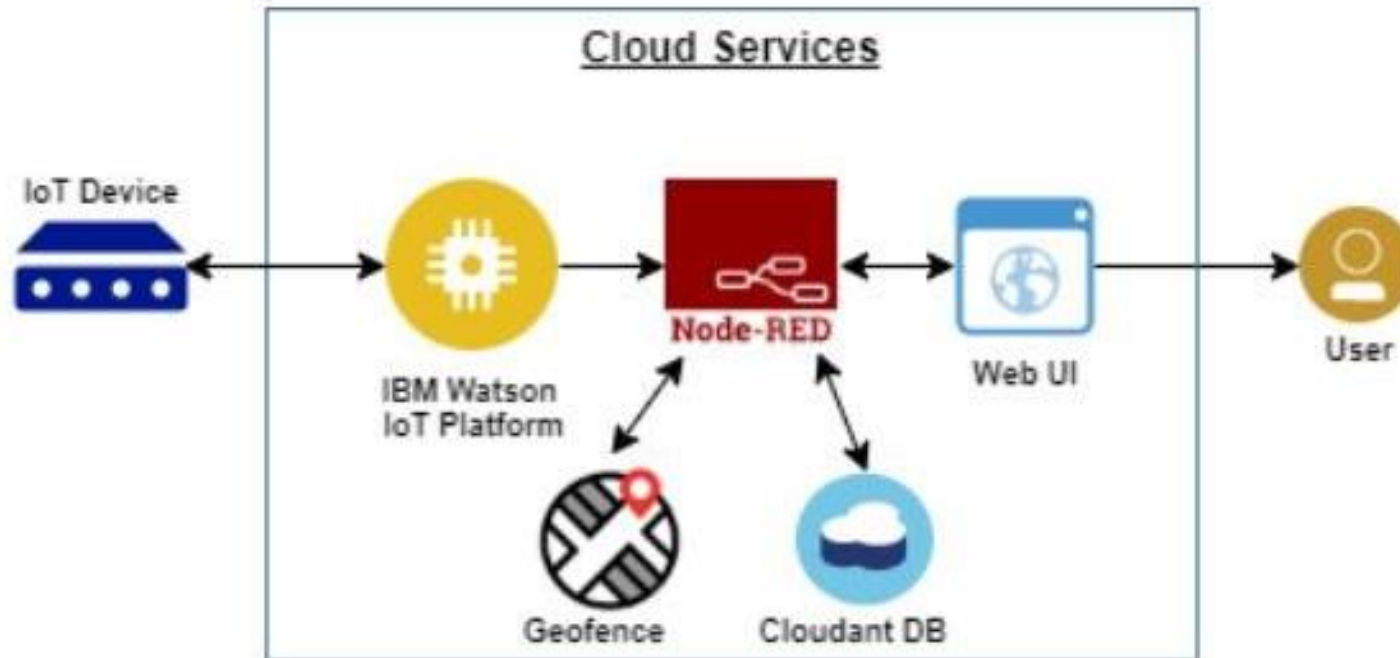


Table-1: Components & Technologies

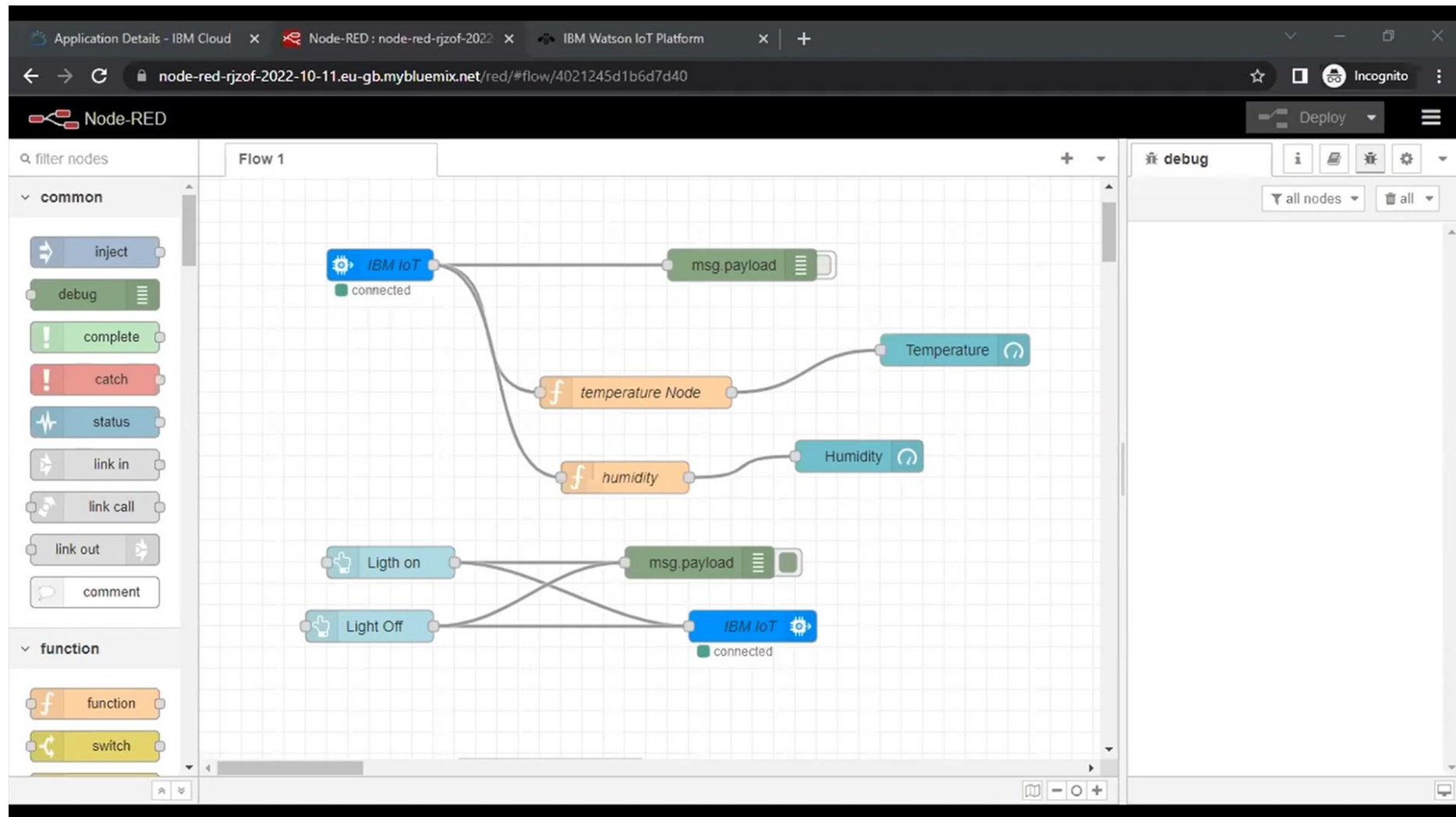
S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used

4.5 Attend the technology trainings as per the training calendar

IoT-B4-4M6E (Morning Session)-Day-13 (13.10.2022)



Application Details - IBM Cl... Node-RED: node-red-rjzof-2 IBM Watson IoT Platform MIT App Inventor New ESP32 Project - Wokwi

wokwi.com/projects/new/esp32

WOKWI SAVE SHARE Docs

sketch.ino diagram.json Library Manager

```
131 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
132 {
133     Serial.print("callback invoked for topic: ");
134     Serial.println(subscribetopic);
135     for (int i = 0; i < payloadLength; i++) {
136         //Serial.print((char)payload[i]);
137         data3 += (char)payload[i];
138     }
139     Serial.println("data: " + data3);
140     if(data3=="lighton")
141     {
142         Serial.println(data3);
143         digitalWrite(LED,HIGH);
144     }
145     else
146     {
147         Serial.println(data3);
148         digitalWrite(LED,LOW);
149     }
150     data3="";
151 }
152
153
154
155
156
157
158 }
```

Simulation

ESP32

DHT22

27°C Cloudy 10:36 AM

Application Details - 1 x Node-RED : node-red x IBM Watson IoT Platf MIT App Inventor x New ESP32 Project - x Node-RED Dashboard x +

node-red-rjzof-2022-10-11.eu-gb.mybluemix.net/red/#flow/4021245d1b6d7d40 Incognito

Node-RED Successfully deployed
You have some unused configuration nodes. Click here to see them

Flow 1

filter nodes

common

- inject
- debug
- complete
- catch
- status
- link in
- link call
- link out
- comment

function

- function
- switch

Flow 1 diagram:

```
graph TD
    Ligh on --> msg payload
    Ligh Off --> msg payload
    Ligh on --> IBM IoT
    Ligh Off --> IBM IoT
    msg payload --> IBM IoT
    [get] /sensor --> httpfunctionnode
    httpfunctionnode --> http
```

debug

all nodes

10/13/2022, 11:13:34 AM node: 0d9ec2a6c3a1254c
iot-
2/type/b11m3edevicetype/id/b11m3edevicetype/evt/harish/fml
: msg.payload : Object
{ Temperature: -40, Humidity: 52.5 }

10/13/2022, 11:13:35 AM node: 0d9ec2a6c3a1254c
iot-
2/type/b11m3edevicetype/id/b11m3edevicetype/evt/harish/fml
: msg.payload : Object
{ Temperature: -40, Humidity: 52.5 }

10/13/2022, 11:13:36 AM node: 0d9ec2a6c3a1254c
iot-
2/type/b11m3edevicetype/id/b11m3edevicetype/evt/harish/fml
: msg.payload : Object
{ Temperature: -40, Humidity: 52.5 }

10/13/2022, 11:13:37 AM node: 0d9ec2a6c3a1254c
iot-
2/type/b11m3edevicetype/id/b11m3edevicetype/evt/harish/fml
: msg.payload : Object
{ Temperature: -40, Humidity: 52.5 }

Effective Policing

More than 3 lakh surveillance cameras already installed in three Commissionerates

- Each junction covered with eight ANPR cameras
- ANPR to give real-time information on vehicles involved in crime
- Cameras are connected to the Integrated Command and Control Centre
- Software to help track down vehicle with help of RTA database



**ANPR
cameras being
installed at 350
junctions in the three
Commissionerates**

