

# **IoT Based Safety Gadget for Child Safety Monitoring & Notification**

## **PROJECT REPORT**

### **SUBMITTED BY**

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*In partial fulfilment for the award of the degree*

*Of*

**BACHELOR OF ENGINEERING**

**In**

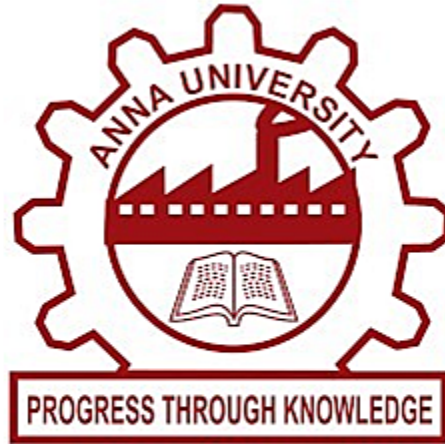
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



**V.S.B.ENGINEERING COLLEGE ,KARUR**

# V.S.B ENGINEERING COLLEGE, KARUR

(Approved by AICTE & Affiliated by Anna University, Chennai)



## BONAFIDE CERTIFICATE

Certified that this **IBM-NALAIYATHIRAN** report titled “**IoT Based Safety Gadget for Child Safety Monitoring & Notification**” is the bonafide record work by **JAYAPRAKASH M (922519104056), ABISHEK S (922519104001), BALAGURU M (922519104019) and JEGAN M (922519104059)** for **IBM-NALAIYATHIRAN** in **VII** semester of **B.E.**, degree course in **Computer Science and Engineering** branch during the academic year of 2022-2023

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## **1. INTRODUCTION**

### **1.1 Project Overview**

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 [4] [32]. However, it is seldom used to monitor child's safety in Malaysia. Actually, there is a need to use IoT-based child security system since the safety of children has become a major concern [14]. IoT is applied to propose a wearable smart band which helps parents to monitor and get known of their 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 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.

### **1.2 Purpose**

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 geofence around the particular location. By continuously checking the child's location notifications will be generated if the child crosses the geofence. 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. a smart IoT device for child safety and tracking is developed to help the parents to locate and monitor their children. The system is developed using LinkIt ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules.

## **2.LITERATURE SURVEY**

## 2.1 Existing problem

Nowadays, the crime rate associated with children keeps increasing due to which draws people's attention regarding child safety. This research is conducted to propose a child security smart band utilizing IoT technology. Online questionnaires and semi-structured interviews are methodologies used to collect data. The online questionnaire gains feedback by sending questions electronically, where answers need to be submitted online. In the semi structured interview, researchers meet and ask respondents some predetermined questions while others being asked are not planned in advanced. Through information obtained, a smart band has been proposed to monitor the safety of children. By this, parents know what is happening remotely and can take actions if something goes wrong. The future improvements of this device will be adding functions and software to make it work like a phone such as messaging, gallery, Google, YouTube, meanwhile, adding more child security features so that child safety is guaranteed.

## 2.2 References

The author describes [1] the awareness of this method is to send an SMS from children's wear tool to their parent or guardian. In the prevailing structure, there is no monitoring method for child, it should create many problems for them and the no protection mechanism to protect the child from the misbehavior. In addition, there is no aware device for the child's protection; it must be completed by hand only. Thus, the planned method will be highly effective when compared to the other existing techniques in helping the victims. Moreover, it doesn't need any manual operation.

The author describes [2] children nowadays do not feel safe, either inside or outside of their homes. The crime rate is high, and accidents happen on every other route for various reasons. As a result, we proposed the idea of a safety band to help women and victims in critical situations. Given the circumstances, we devised a method for a children to obtain administrative assistance on time.

This paper provides an Android based solution for the parents to track their children in real time. Different devices are connected with a single device through channels of internet. The concerned device is connected to server via internet[3]. 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.

The author describes [4] the safety and security of children is a major problem in the current era. The children are too young to take care of themselves. We cannot monitor the children at all times in school, play area, and outside place. In this paper, we discuss the concept of child safety device based on Internet of things. The aim of this device is to provide safety to the child by allowing the

parent to locate the child and view their surroundings.

The author describes [5] the accelerometer and vibration sensors are used to detect the motion of the child. The camera is used to capture the environment of the child. The image taken is processed using convolutional neural network (CNN) which predicts the background like play area, railway station, beach, road, or classroom. The GPS module is used to record current location of the device which is used to track the device if the child is missing. Hence, this device provides a security cover to the child in today's time.

1. Benisha, M., Prabu, R. T., Gowri, M., Vishali, K., Anisha, M., Chezhiyan, P., & Elliot, C. J. (2021, February). Design of Wearable Device for Child Safety. In 2021 Third International Conference on Intelligent Communication Technologies and Virtual Mobile Networks (ICICV) (pp. 1076-1080). IEEE.

2. Chaudhary H, Zinjore R, Pathak V (2020) Parent-hook: a child tracking system based on cloud url. In: 2020 International conference on smart innovations in design, environment, management, planning and computing (ICSIDEMPC). IEEE, pp 219-224

3. Akash Moodbidri, Hamid Shahnasser (Jan. 2017) 'Child safety wearable device', International Journal for Research in Applied Science & Engineering Technology, Vol. 6 Issue 2, pp. 438-444.

4. Huang, Z., Gao, Z., Lu, H., Zhang, J., Feng, Z., Xia, H.: An mobile safety monitoring system for children. In: 10th International Conference on Mobile Ad-hoc and Sensor Networks, pp. 323-328. IEEE (2014)

5. Raflesia, S.P., Lestarini, D., et al.: An integrated child safety using geo-fencing information on mobile devices. In: 2018 International Conference on Electrical Engineering and Computer Science (ICECOS), pp. 379-384. IEEE (2018)

### **2.3 Problem Statement Definition**

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 geofence around the particular location. By continuously checking the child's location notifications will be generated if the child crosses the geofence. 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. A smart IoT device for child safety and tracking is developed to help the parents to locate and monitor their children. The system is developed using LinkIt ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules.

## Problem Statement emplate



Problem Statement (PS)	I am(Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Parent	Monitoring the child location	It is very difficult to monitor	It shows only the current location but it doesnot monitor	panic
PS-2	Parent	Track and Monitor the child location	It is very difficult to find the location	It only shows the approximate location	Unclear

## 3. IDEATION & PROPOSED SOLUTION

### 3.1 Empathy Map Canvas



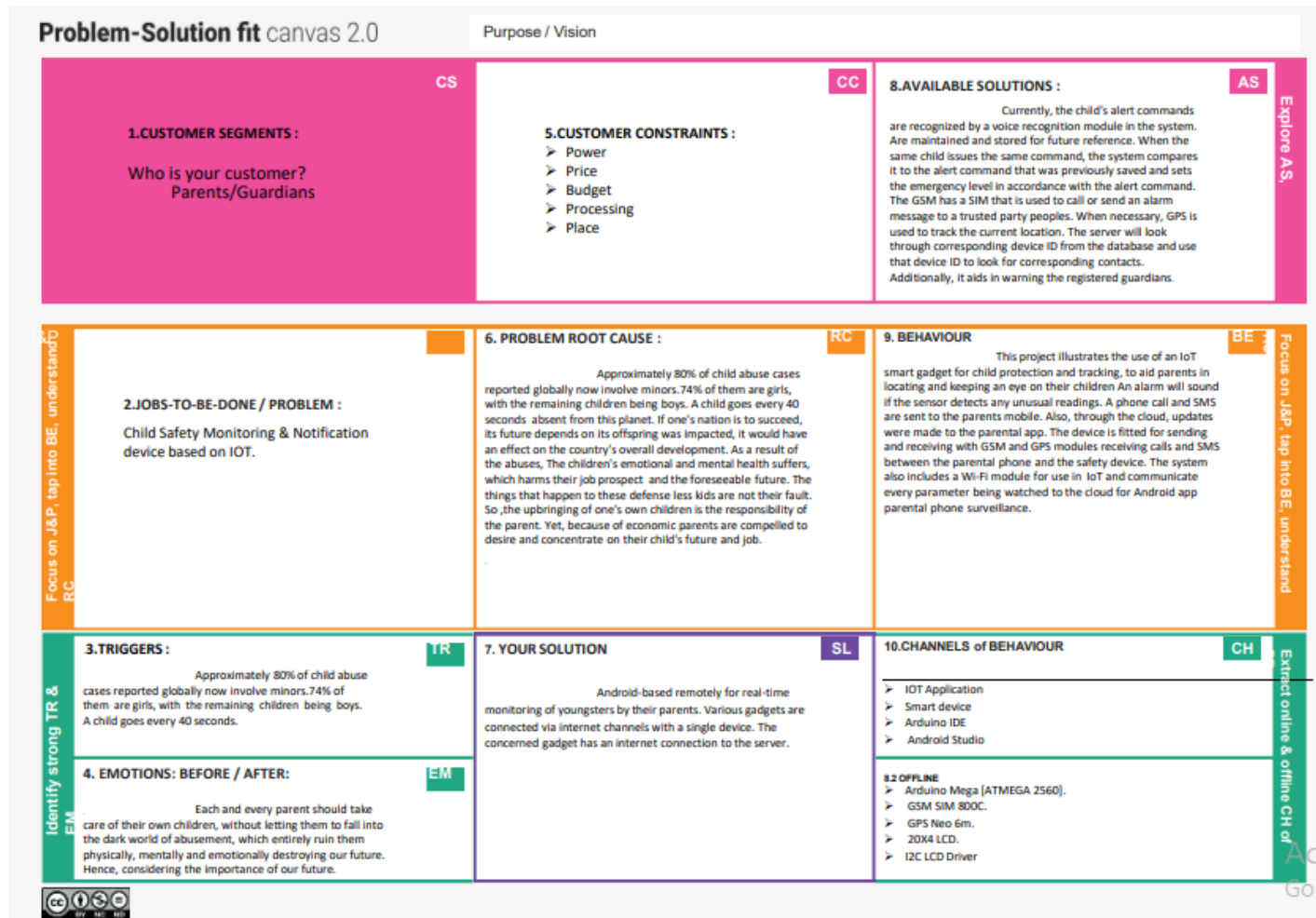


### 3.3 Proposed Solution

S.No.	Parameter	Description
1	Problem Statement (Problem to be solved)	Nowadays, the crime rate associated with children keeps increasing due to which draws people's attention regarding child safety. This research is conducted to propose a child security smart band utilizing IoT technology. A smart band has been proposed to monitor the safety of children. By this, parents know what is happening remotely and can take actions if something goes wrong.
2	Idea / Solution description	The future improvements of this device will be adding functions and software to make it work like a phone such as messaging, gallery, Google, YouTube, meanwhile, adding more child security features so that child safety is guaranteed. The system is developed using LinkIt ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules.
3	Novelty / Uniqueness	provides a tracking solution for the parent to keep tracking their child's location outdoors by using GPS as it allows them to determine the exact location of the child. It, therefore, helps to minimize this tragedy to reoccur in the future. Our main contribution is to preserve the privacy of an end-user while enhancing the accuracy of the child's location to 3 m.

4	Social Impact / Customer Satisfaction	Monitoring customer satisfaction allows early identification of problems relating to the quality, performance and functionality of the product or services and unmet customer expectations.
5	Business Model (Revenue Model)	The revenue model helps to find children by tracking and monitoring by parents(customer) strategies such as to track the location, environmental situation and some response from the child by sensors and Therefore adding additional features by customer feedback. According to that, the revenue will be decided.
6	Scalability of the Solution	<p>The security requirements of a child-care and safety service and establish a conceptual model satisfying the requirements. Based on the system model, we propose a privacy-preserving location supporting protocol for a child-care and safety service using wireless sensor networks.</p> <p>While addressing the above problems, our protocol can be operated over various networks (e.g., Wi-Fi and UWB) providing an RSSI (received signal strength indication) without any modification.</p> <p>Through performance and security analysis of our protocol, we show that our protocol is efficient and secure. More precisely, our protocol reduces the computation and communication overhead of the existing infrastructures to support better scalability.</p>

### 3.4 Problem Solution fit



## 4. REQUIREMENT ANALYSIS

### 4.1 Functional requirement

Following are the functional requirements of the proposed solution.

FR-4	VoiceNavigation	Interviewees prefer to be guided by either voice or map navigation. Generally a map was preferred however two users preferred a car-like voicenavigation.
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FR-5	Variable Sensitivity	The device should be attractive to the child (colourful design). Alternatively the device should be embedded in clothing or somehow locked
FR-6	Early Alarm	The alarm sensitivity should be adjusted by the parent; this is preferred to a fixed alarm sensitivity setting.

#### 4.2 Non-functional Requirements:

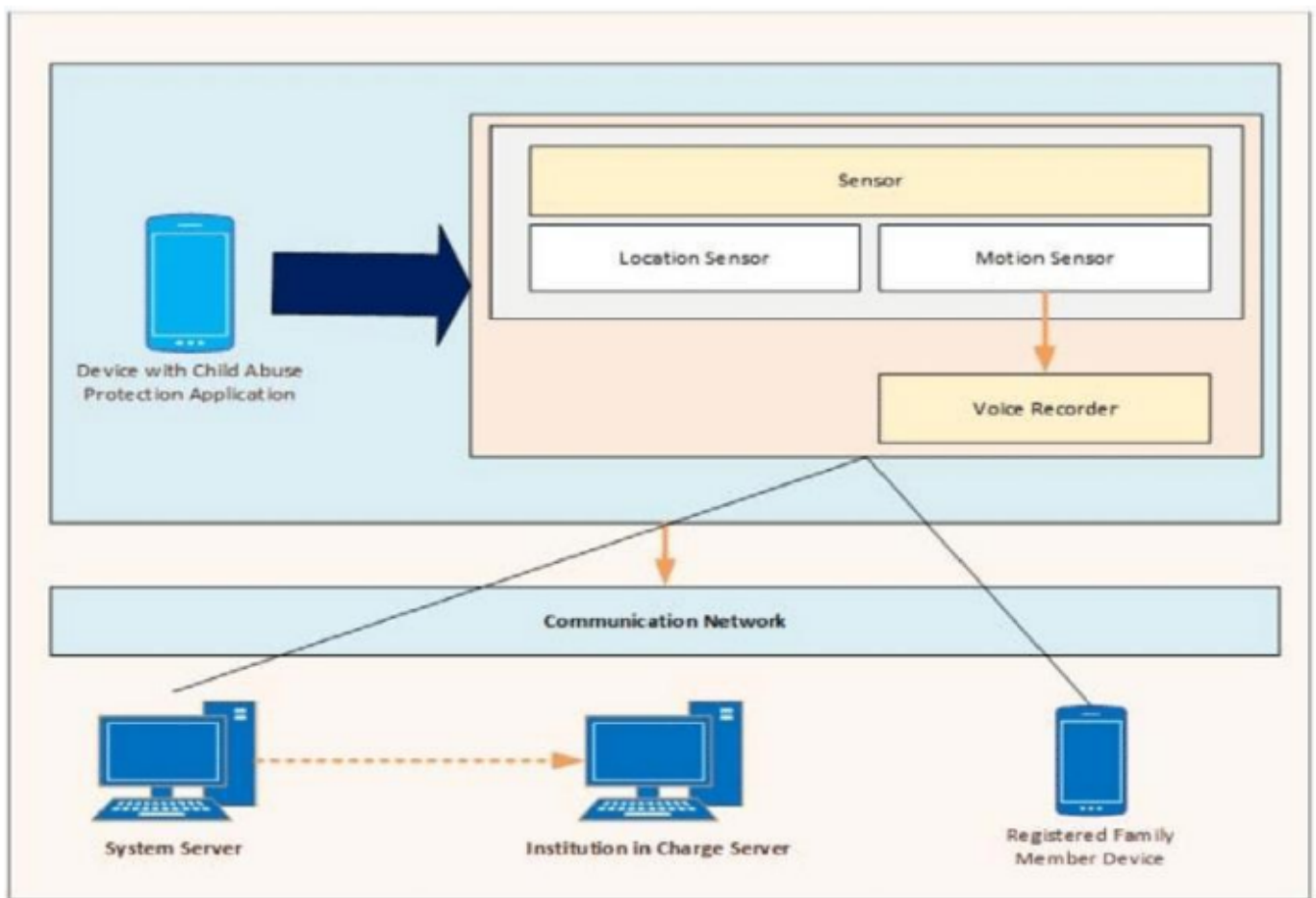
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	How easy is it for a customer to use the system?
NFR-2	Security	How well are the system and its data protected against attacks?
NFR-3	Reliability	How often does the system experience critical failure? eg: the system must perform without failure in 95 percent of use case
NFR-4	Performance	How fast does the system return results?
NFR-5	Availability	How is the user availability time compared to downtime?

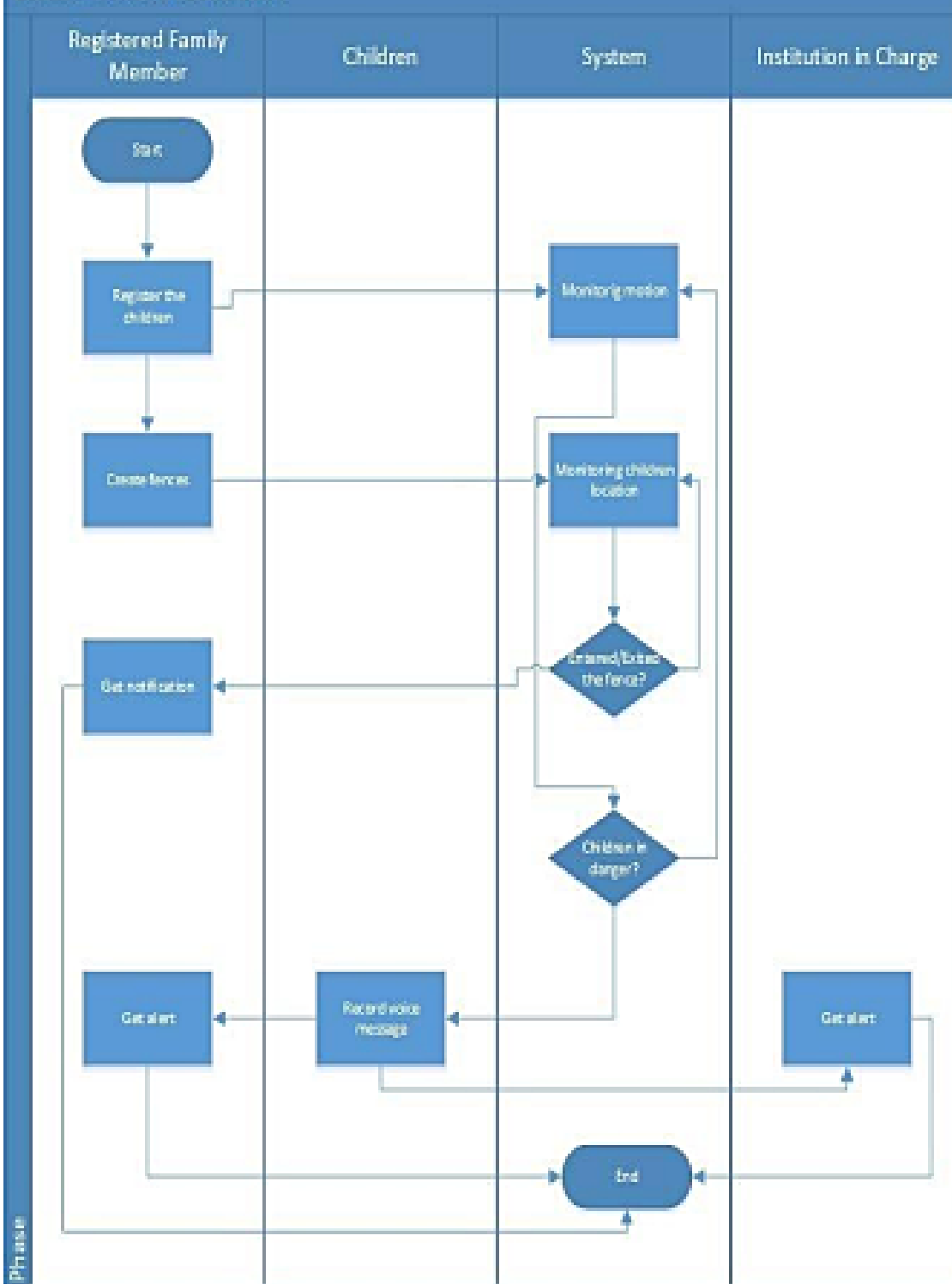
## 5. PROJECT DESIGN

### 5.1 Data Flow Diagrams

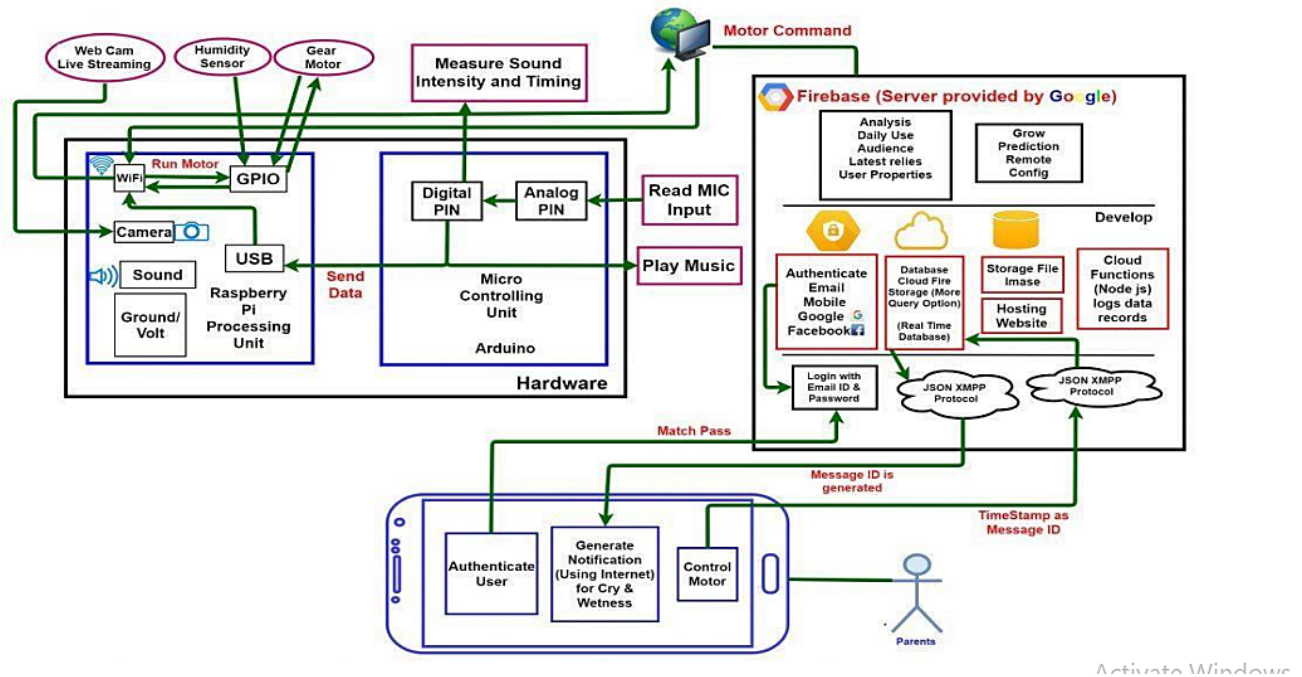
A data-flow diagram is a way of representing a flow of data through a process or a system. The DFD also provides information about the outputs and inputs of each entity and the process itself. A data-flow diagram has no control flow – there are no decision rules and no loops



# Child Abuse Protection



## 5.2 Solution & Technical Architecture



### Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	.Web UI, Mobile App.	HTML, CSS, JavaScript
2.	ApplicationLogic-1	Code development phase	Python
3.	ApplicationLogic-2	Interfacing purpose	IBM Watson Assistant
4.	Cloud Database	Database Service on Cloud	IBM Cloudant
5.	File Storage	Usage of IBM Cloud Storage	IBM Block Storage
6.	Browser based flow editor	Visual programming	Node Red
7.	Infrastructure (server/cloud)	Application deployment on Local Server	Cloud Platform

## 5.3 User Stories



User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password		High	Sprint-1
Customer Care Executive	Login		Once I get to operate the device, I work with it and get to know about the device and use it. Also, errors will be checked, if any it will be rectified and monitor the operation and check the authentication	Login with the provided user credentials.	Medium	Sprint-3

Administrator	Login		Maintaining and making sure the database containing the locations are secure and accurate and updated constant.	I can login only with my provided credentials	High	Sprint-3
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## 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	User Registration	USN-1	Registration through website registration through app	2	High	Jayaprakash M Abishek S Balaguru M Jegan M
Sprint-1	User Confirmation	USN-2	Confirmation via Email Confirmation via OTP	1	High	Jayaprakash M Abishek S Balaguru M Jegan M
Sprint-2	User login	USN-3	Setting up User Id and password	2	Low	Jayaprakash M Abishek S
Sprint-1	App permission	USN-4	Grant the permission for the app to access location, contact etc..	2	Medium	Jayaprakash M Abishek S Balaguru M Jegan M

Sprint-1	Interface with the Device	USN-5	Connecting the device with the registered app with the device ID.	1	High	Jayaprakash M Abishek S Balaguru M Jegan M
<b>Sprint</b>	<b>Functional Requirement (Epic)</b>	<b>User Story Number</b>	<b>User Story/ Task</b>	<b>Story Points</b>	<b>Priority</b>	<b>Team Members</b>
Sprint-2	Setting Geo-location	USN-6	Creating theGeo-location area in the map	2	Low	Jayaprakash M Abishek S
Sprint-3	Database	USN-7	Location history is stored in the cloud. Can be accessed from the dashboard.	2	High	Balaguru M
Sprint-4	Tracking location	USN-8	Tracking the location through app. Tracking the location through website.	2	High	Jegan M

<b>Sprint</b>	<b>Total Story Points</b>	<b>Duration</b>	<b>Sprint Start Date</b>	<b>Sprint End Date (Planned)</b>	<b>Story Points Completed (as on Planned End Date)</b>	<b>Sprint Release Date (Actual)</b>
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	31 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	07 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	14 Nov 2022

## 6.2 Sprint Delivery Schedule

#### Live Location Tracking:

GPS is installed on gadget to track its current location can be tracked on android app and via SMS request sent from parent phone to safety gadget. Outputs of live location tracking.

#### Panic Alert Systems:

Panic alert system on gadget is triggered during panic situation, automatic call and SMS are triggered to parental phone. The alert is also updated to the cloud for purpose of app monitoring. Fig. 4. Outputs of panic alert system.

#### Stay Connected Feature:

Stay connected feature is used to trigger call and predefined SMS anytime from gadget to parental phone by just pressing a button and also parent can make SMS and call to the gadget anytime.

#### Health Monitoring System:

Health monitoring system is implemented using heart beat sensor, temperature sensor which is updated to the cloud and also can be monitored via app. The current value of sensors can be obtained using SMS request sent to gadget from parent phone. Outputs of health monitoring system.

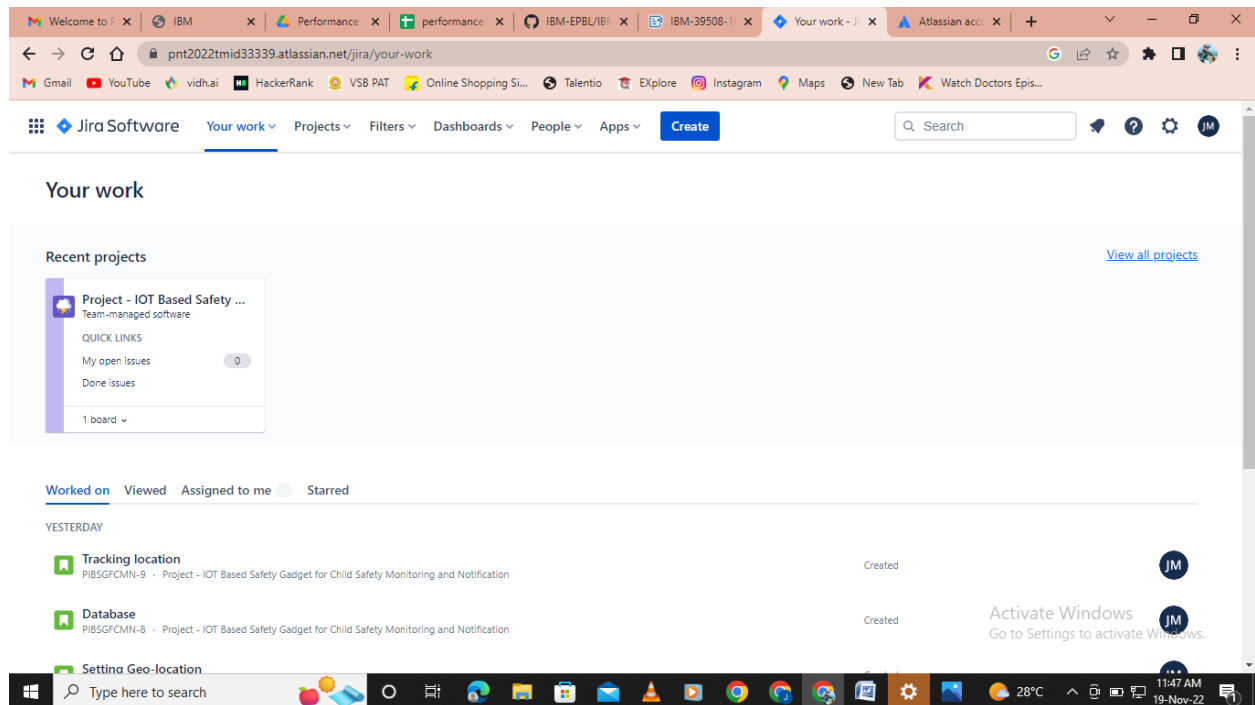
#### Gadget Plugged or Unplugged Monitoring:

Gadget plug or unplugged is monitored using contact switch installed on smart gadget, as soon as the device is unplugged, an alert is provided to parent phone via SMS and it is also updated to cloud for app monitoring.

#### Boundary monitoring system:

This is used to track the safety gadget using the binding gadget by implementing signal strength concept as soon as the safety gadget moves far away from the BLE listener gadget then an alert is provided to itself. Listener device and broad cast device

### **6.3 Reports from JIRA:**



## 7. CODING & SOLUTIONING (Explain the features added in the project along with code)

Login page of parent's application to get information about child's condition:

```
<!DOCTYPE html>
<html> <head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<title> Login Page </title>
<style>
Body {
font-family: Calibri, Helvetica, sans-serif;
background-color: #3b363e;
}
button {
background-color: #7a869a;

width: 100%;
color: black;
padding: 15px;
margin: 10px 0px;
border: none;
cursor: pointer;
}
form {
padding: 37px 200px 38px 200px;
}
input[type=text], input[type=password] {
width: 100%;
margin: 8px 0;
padding: 12px 20px;
display: inline-block;
border: 2px white;
box-sizing: border-box;
}
button:hover {
opacity: 0.7;
}
.cancelbtn {

width: auto;
padding: 10px 18px;
```

```

margin: 10px 5px;
}
.container {
padding: 25px;
background-color: #4d617e;
}
.center{
    color:white;
    padding-right: 100px;
}
</style> </head>
<body>
<center class="center"> <h1> Login Form </h1> </center>
<form>
<div class="container">
<label>Device ID/Number: </label>
<input type="password" placeholder="Enter Password" name="password" required>
<label>E-Mail : </label>
<input type="text" placeholder="Enter Username" name="username" required>
<label>Password : </label>
<input type="password" placeholder="Enter Password" name="password" required>
<button type="submit">Login</button>
<button class="loginBtn loginBtn--facebook">Login with Facebook.</button>
<button class="loginBtn loginBtn--google">Login with Google.</button>

<input type="checkbox" checked="checked"> Remember me
<button type="button" class="cancelbtn"> Cancel</button>
Forgot <a href="#"> password? </a>
</div>
</form>
</body>
</html>

```

#### INDEX:

```

<!DOCTYPE html>
<html lang="en" style="height: 100%; margin: 0;">
<head>

```

```
<meta charset="UTF-8" />
<meta name="description" content="The Home Page after Logged In" />
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
<title>IOT Based Safety Gadget for Child Safety Monitoring and Notification</title>
<script src="C:\Users\Diwakar\OneDrive\Documents\IBM PROGRESS\comjs.js"></script>
</head>
<body
style="
height: 100%;
margin: 0">
<div
font-weight: 300;
font-family: -apple-system, BlinkMacSystemFont, 'Segoe UI', Roboto,
Oxygen, Ubuntu, Cantarell, 'Open Sans', 'Helvetica Neue',
sans-serif;

class="wrapper"
style="
height: 90%;
display: flex;
flex-direction: column;
align-items: center;
justify-content: center;

text-align: center;
"
>
<div
class="details"
style="
display: flex;
flex-direction: column;
align-items: center;
gap: 20px;
padding: 1rem;
border-radius: 5px;
box-shadow: 0 0 8px 0px #44444444;
```



```

max-width: 80%;
"
>
<h1 class="name" style="margin: 0"></h1>
<div
class="imageContainer"
style="padding: 10px; height: 10rem; width: 10rem"
>
<img class="image" alt="profile picture" />
</div>
<h2 class="email" style="margin: 0"></h2>

<a style="text-decoration: none;text-align: center;font-size: 1.2rem;color: #0070f3;font-
weight:400;" href="./dashboard">Go to Dashboard ?</a>

</div>
</div>
</body>
</html>

```

#### LOCAL FORAGE:

```

!function(a)
{
    if("object"===typeof exports&&"undefined"!==typeof module)module.exports=a();
    else if("function"===typeof define&&define.amd)define([],a);
    else
    {
        var b;
        b="undefined"!==typeof window?window:"undefined"!==typeof
global?global:"undefined"!==typeof
self?self:this,b.localforage=a()
    }
}
(function()
{

```

```

return function a(b,c,d)
    {
    function e(g,h){if(!c[g]){if(!b[g])
        {
        var i="function"==typeof require&&require;
        if(!h&&i)return i(g,!0);if(f)return f(g,!0);
        var j=new Error("Cannot find module '"+g+"'");
        throw j.code="MODULE_NOT_FOUND",j}var k=c[g]={exports:{}};
        b[g][0].call(k.exports,function(a)
            {
            var c=b[g][1][a];return e(c| |a)},k,k.exports,a,b,c,d)
            }
        return c[g].exports
        }
    for(var f="function"==typeof require&&require,g=0;g<d.length;g++)e(d[g]);
    return e
    }
}({1:[function(a,b,c){(function(a){"use strict";

function c()
{
    k=!0;for(var a,b,c=l.length;c;)
    {
    for(b=l,l=[],a=-1;++a<c;)
        b[a]();c=l.length
    }
    k=!1
}
function d(a)
{
    1!==l.push(a)||k| |e()

}
var e,f=a.MutationObserver| |a.WebKitMutationObserver;
if(f)
{
    var g=0,h=new

```

```

f(c),i=a.document.createTextNode("");h.observe(i,{characterData:!0}),e=function(){i.data=g+++g
%2}}
else if(a.setImmediate void ea.MessageChannel)e="document"in all"onreadystatechange in
a.document.createElement("script")
function()
{
var b=a.
document.createElement("script");b.onreadystatechange=function(){c(),b.
onreadystatechange=null,b.parentNode.removeChild
(b),b=null),a=document.documentElement.appendChild(b)
}
:function() (setTimeout(c,8));else{var j=new
a.MessageChannel;j.port1.onmessage=c,e=function()
{
j.port2.postMessage(0)
}
}
var k,1-[];b.exports=d)).call(this, "undefined"!=typeof global?global: "undefined"!=typeof
self?self: "undefined"!=typeof
window?window: {}),{}},2: [function(a,b,c){"use strict"; function d(){} function e(a)
{
if("function" !=typeof a) throw new TypeError("resolver must be a function");
this.states, this.queue=[], this.outcome vald
0,aldi(this,a)
}
function f(a,b,c)
{
this.promise-a, "function"==typeof b&&(this.onFulfilled-b, this.callFulfilled-
this.otherCallFulfilled), "function"typeof c&&(this.onRejected=c,

```

FIREOAUTH:

```

<!DOCTYPE html>
<html lang="en">
<head>

```

```
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<link rel="stylesheet" href="/css/fireoauth.css">
<link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/nprogress/0.2.0/nprogress.min.css">

<link rel="shortcut icon" href="https://raw.githubusercontent.com/tharunoptimus-
pd/firepwa/main/favicon.ico?token=GHSAT0AAAAAABR46HVJ5M5L3QGFRZRQXOISYUJUWAA"

type="image/x-icon">
<style>
html,
body {
height: 100%;
margin: 0;
font-family: -apple-system, BlinkMacSystemFont, "Segoe UI", Roboto, Oxygen,

Ubuntu, Cantarell, "Open Sans", "Helvetica Neue", sans-serif;
font-weight: 300;
}
a {
text-decoration: none;
color: #007bff;
font-weight: 500;
font-size: 1.2rem;
}
h3 {
font-size: 1.4rem;
}
h3, h4 {
margin: 0;
padding: 0.3rem 0;
}
.wrapper {
display: flex;
flex-direction: column;
align-items: center;
```

```
justify-content: center;
height: 100%;
text-align: center;

}
.oneClickSignin {
padding: 0.5rem;
border: 1px solid #44444444;
border-radius: 5px;
box-shadow: 0 0 3px 0px #44444444;
opacity: 0.2;
pointer-events: none;
}
.qrcode {
opacity: 0.1;
}
.learnAboutFire {
padding-top: 1.25em;
}
.qrHolder {
display: none;
margin-top: 3rem;
}
.qrContainer {
align-items: center;
display: flex;

justify-content: center;
padding: 8px;
margin: 2rem auto;
box-shadow: 0 0px 6px 1px rgb(0 0 0 / 16%);
border: 1px solid #44444444;
border-radius: 6px;
width: 200px;
height: 200px;
}
</style>
```

```

<title>Fire OAuth</title>
</head>
<body>
<div class="wrapper">
<h3 class="pageTitle">Login with Fire ??</h3>

<div class="qrAuthorize">
<h4 class="subTitle">Scan QR from your Fire OAuth App??</h4>
<div class="qrContainer">
<canvas id="qr-code" class="qrcode"></canvas>

</div>
</div>
<div class="oneClickSignin">
<h4>Have Fire PWA on this device?</h4>
<a target="_blank" id="authorizeOverLink"
href="https://firepwa.netlify.app/authorize?sessionId" rel="noopener">Click to Authorize ??
</a>
</div>
<div class="learnAboutFire">
<a target="_blank" href="https://fireoauth.netlify.app" rel="noopener">Learn More about Fire
??</a>
</div>
</div>
<script src="https://cdnjs.cloudflare.com/ajax/libs/nprogress/0.2.0/nprogress.min.js"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/qrious/4.0.2/qrious.min.js"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/socket.io/4.2.0/socket.io.js"></script>
<script>
const FIRE_API_KEY = "635b790a3bcc6b59c4b772d0"
const FIRE_ENDPOINT = "https://fire.adaptable.app/api/apis/generate"
const CHANNEL_NAME = "fireOAuthChannel"
const broadCastingChannel = new BroadcastChannel(CHANNEL_NAME)

const FIRE_SERVER_SOCKET_ENDPOINT = "https://fire.adaptable.app"
let socket = io(FIRE_SERVER_SOCKET_ENDPOINT)
let qr

```

```

let qrCode = document.querySelector(".qrCode")
let oneClickSignin = document.querySelector(".oneClickSignin")
let pageTitle = document.querySelector(".pageTitle")
let subTitle = document.querySelector(".subTitle")
function setOpacity(opacity) {
  oneClickSignin.style.opacity = opacity
  oneClickSignin.style.pointerEvents = opacity === "1" ? "auto" : "none"
  qrCode.style.opacity = opacity
}
async function getSessionID() {
  let response
  try {
    response = await fetch(`${FIRE_ENDPOINT}/${FIRE_API_KEY}`, {
      method: "GET",
      headers: {
        "Content-Type": "application/json",
      }
    })
  } catch (error) {
    console.log(error)
  }

  return null
}
let data = await response.json()
let { sessionId, chatRoomId } = data
return { sessionId, chatRoomId }
}
function generateQR(value) {
  (qr = new QRious({
    element: document.getElementById("qr-code"),
    size: 200,
    level: 'M',
    value: value,
  })))
}
function changeHREF ({sessionId, chatRoomId}) {
  let firePwaUrlHostname = "https://firepwa.netlify.app"

```

```

let originURL = encodeURIComponent(window.location.origin)
let url =
`${firePwaUrlHostname}/authorize.html?sessionId=${sessionId}&chatRoomId=${chatRoomId}&u
rl=${ori
ginURL}`
let a = document.getElementById("authorizeOverLink")
a.href = url
}

```

```

async function fire() {
NProgress.set(0.4)
let { sessionId, chatRoomId } = await getSessionID()

null) {
if(sessionId === undefined || chatRoomId === undefined || sessionId === null || chatRoomId
===
pageTitle.innerHTML = "Something went wrong ???"
subTitle.innerHTML = "Please try again later ????"
return
}
setOpacity("1")

```

```

NProgress.done()
let data = {
sessionId,
url: encodeURIComponent(window.location.origin)
}
data = JSON.stringify(data)
generateQR(data)
changeHREF({sessionId, chatRoomId})
socket.emit("join room", sessionId)
}
fire()

```

```

socket.on("trusted token", (token) => {
let data = {}
data.success = true

```



```
data.token = token
broadcastingChannel.postMessage(data)
window.close()
})
</script>
</body>
</html>
DASHBOARD:
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<link rel="stylesheet" href="/css/dashboard.css">
<title>Dashboard</title>
<script src="/localforage.js"></script>
</head>
<body>
<div class="wrapper">

<div class="header">
<span class="heading">Dashboard</span>
<span class="right">
<span class="username">Hello User</span>
<span>


</span>
</span>
</div>
<div class="actionCenter">
<div class="action">
<span>Create Child Card</span>
</div>
```

```

<div class="action">
<span class="logout">Log out</span>
</div>
</div>
<div class="childCardContainer">
<div class="childCard">
<div class="childCardHeader">
<span>Child Name</span>
<span>Age 12</span>
</div>
<div class="actions">

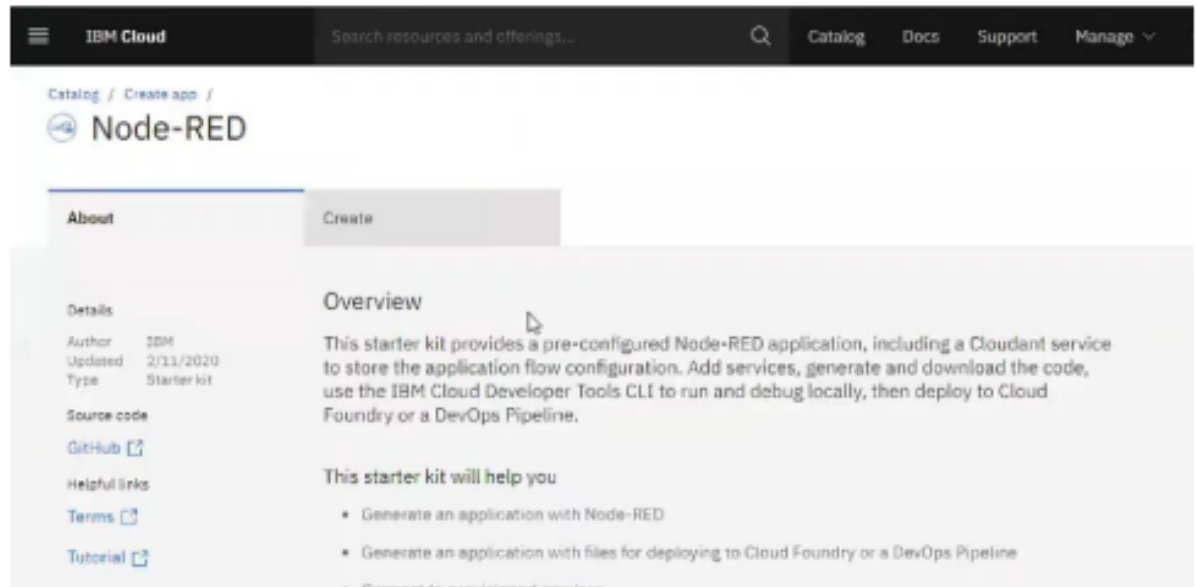
<span>View</span>
<span>GeoFence</span>
</div>
</div>
</div>
</div>
<script>
async function main() {
let userData = await localforage.getItem('userData')
if(userData == null) {
window.location.href = "/login"
}
document.querySelector(".username").innerHTML = `Hello ${userData.firstName}`
document.querySelector(".profilePic").src = userData.profilePic
}
main()
document.querySelector(".logout").addEventListener("click", async () => {
await localforage.setItem('userData', null)
window.location.href = "/login"
})
</script>
</body>
</html>

```

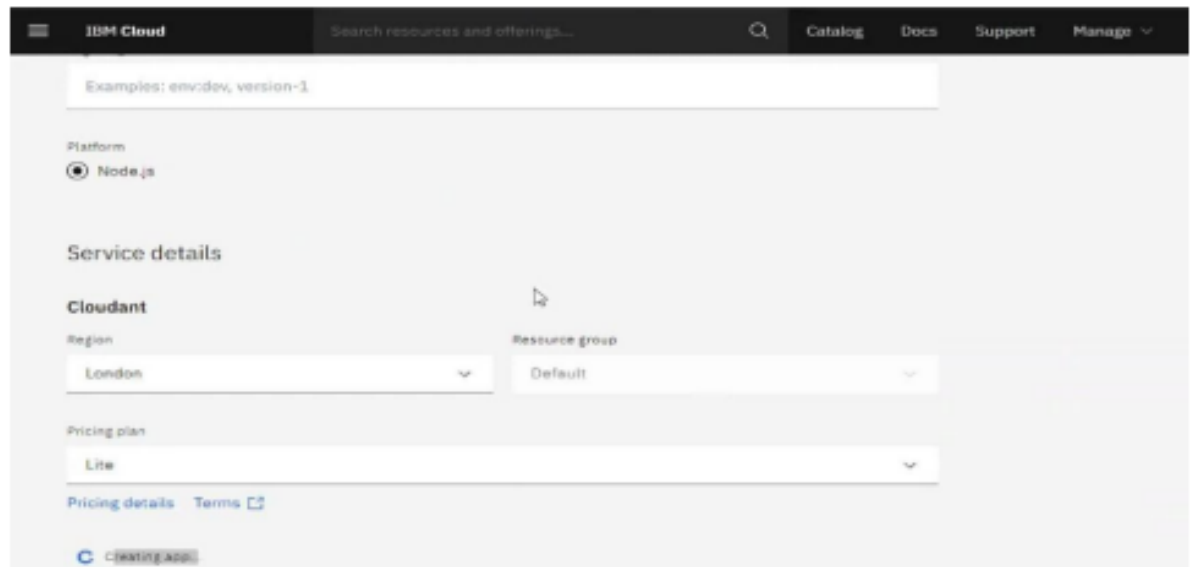
## 7.1 Feature 1

To create a web application create a Node-RED service.

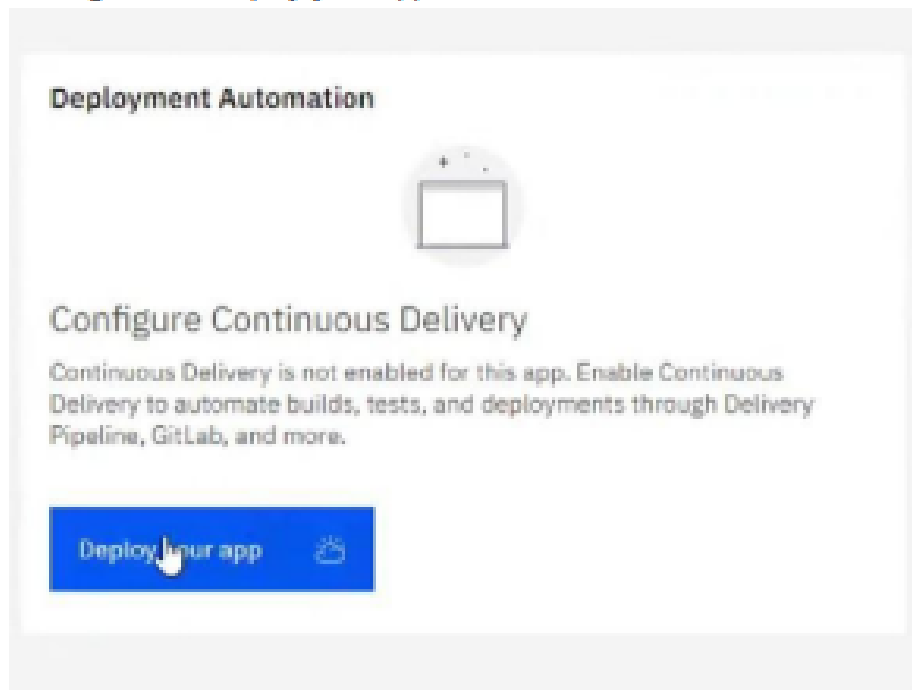
- Navigated to the App creationpage



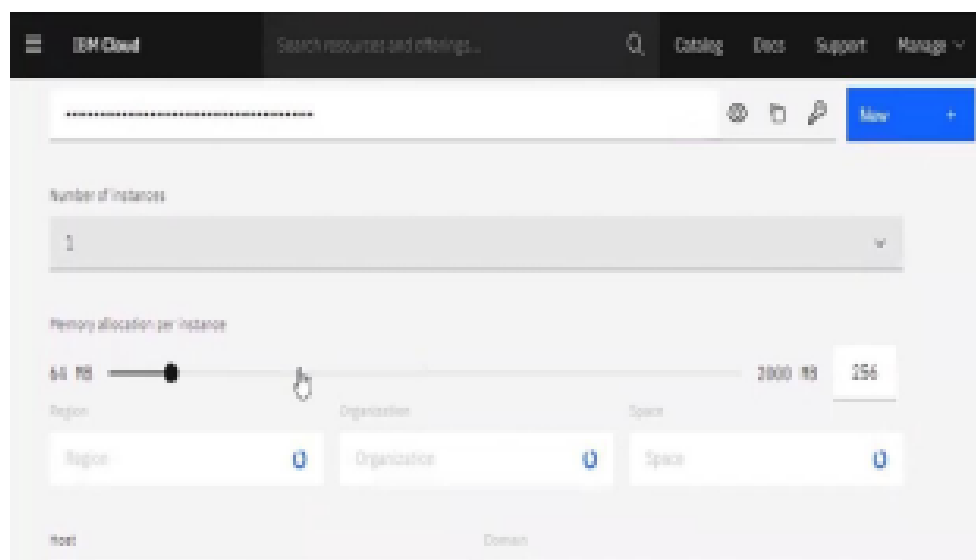
- Entered project details and clicked on create



- Clicking on the "Deploy your App" Button




- Setting up the environment and deploying the app



- Successfully deployed the app

### Delivery Pipelines

Name	ci-pipeline <a href="#">↗</a>
Status	 Success <a href="#">↗</a>
Last input	Last commit by IBM Cloud DevOps Services (7 minutes ago) <a href="#">Clone from zip</a> <a href="#">↗</a>

- Welcomed by the instance editor

### Welcome to your new Node-RED instance on IBM Cloud

We know you're eager to start wiring up your flows, but first there are a couple of tasks you should do:

- Secure your Node-RED editor
- Learn how to install additional nodes

- Setting up credentials

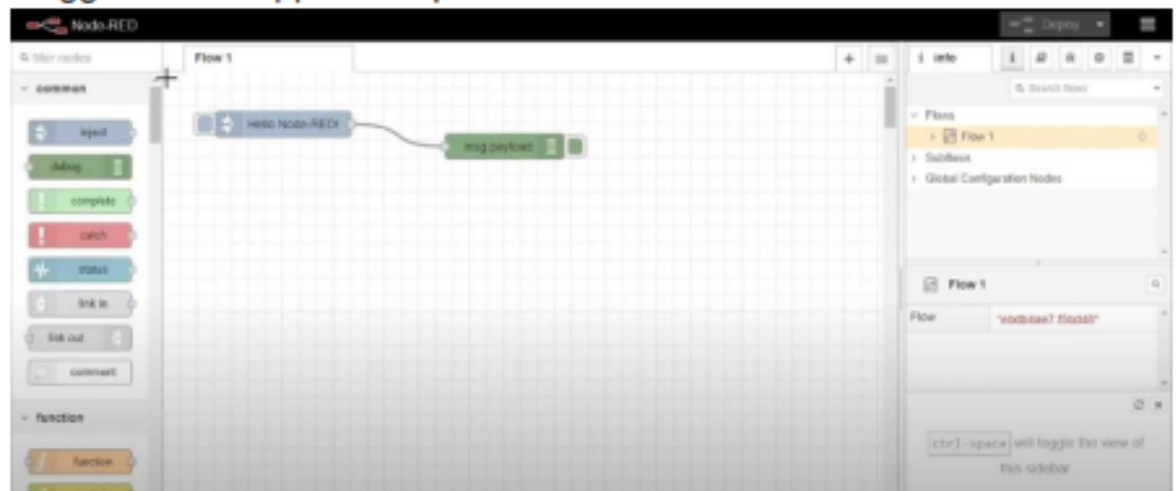
☐ Secure your editor so only authorised users can access it

☒ *Not recommended:* Allow anyone to access the editor and make changes

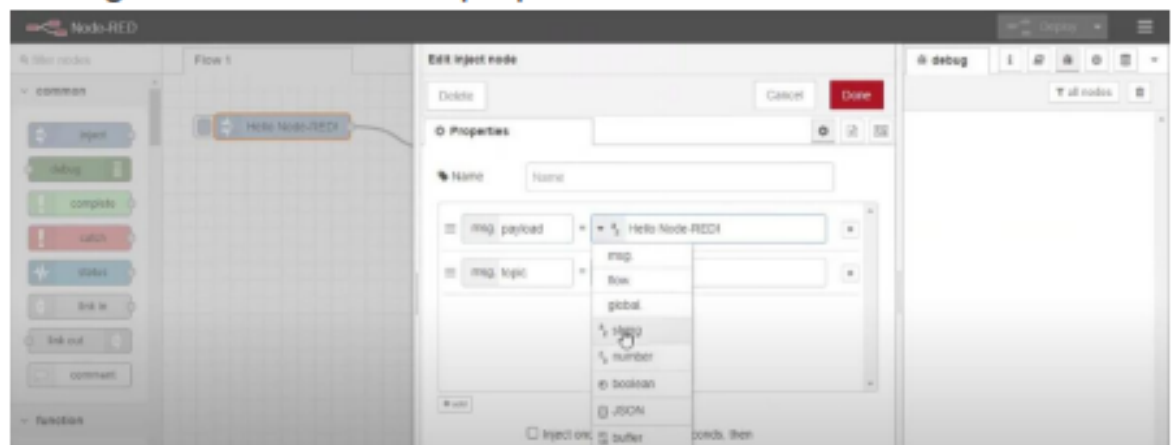
Your editor will not be secured. Anyone with the URL will be able to access your flows, data and bound services.

☒ Tick this box to confirm you want your editor to be insecure

- Dragged and dropped components into the editor



- Editing some values of the properties



- Successfully deployed the app

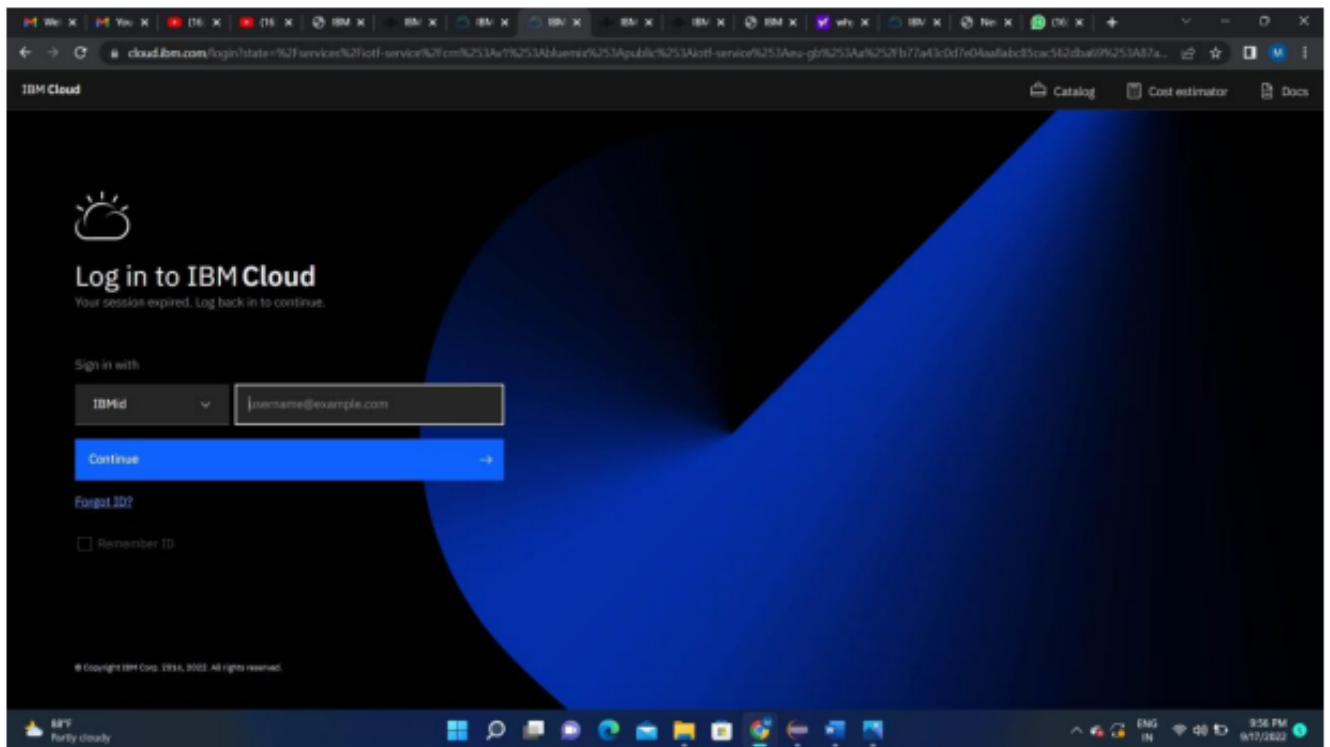


Successfully created a Node RED service on IBM Cloud

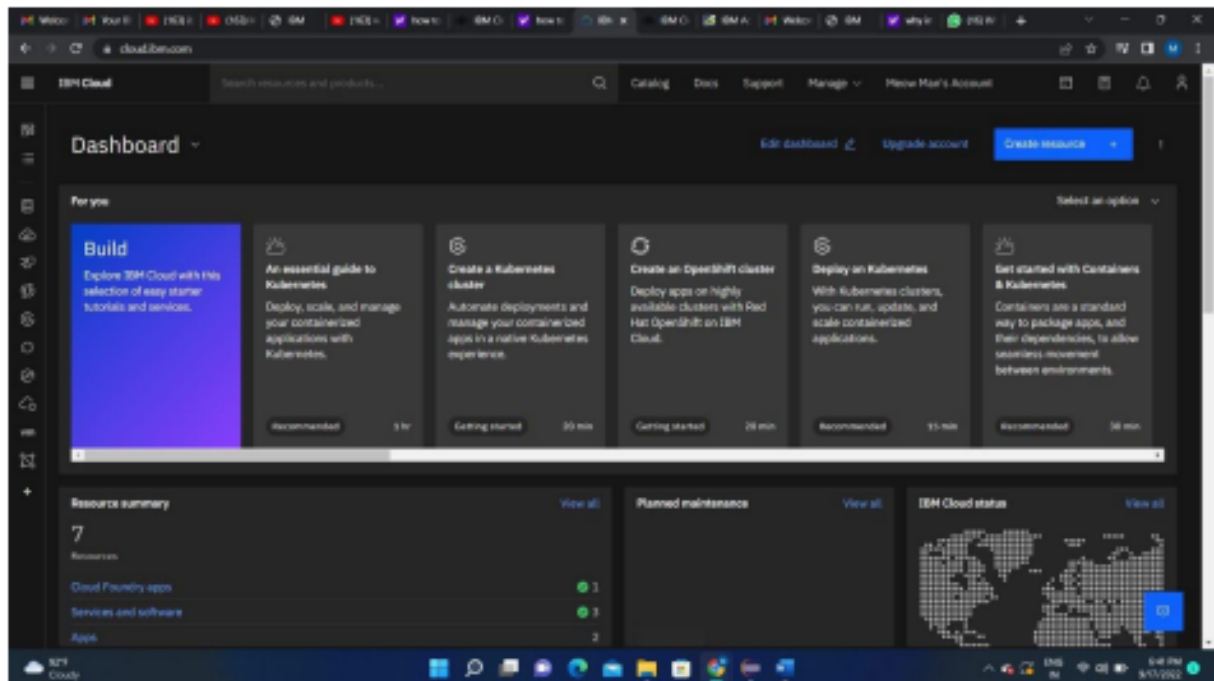
## 7.2 Feature 2

To create the IBM Watson IoT platform and device

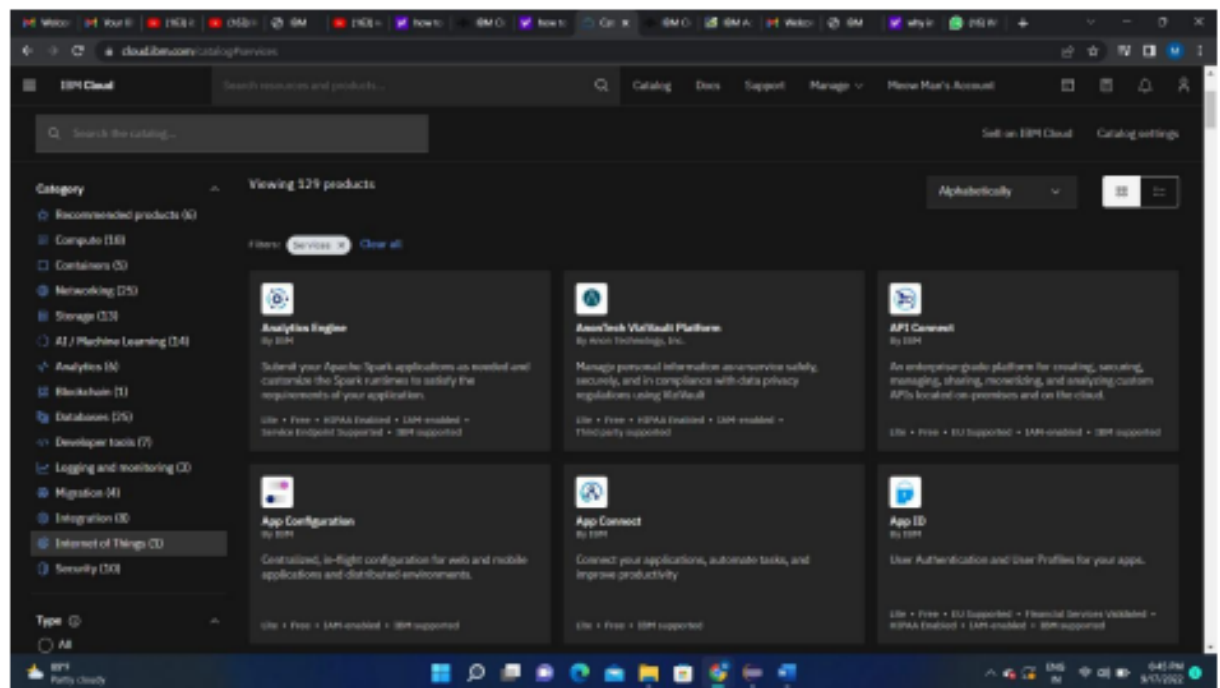
### 1. Firstly create an IBM cloud account with IBMid and password



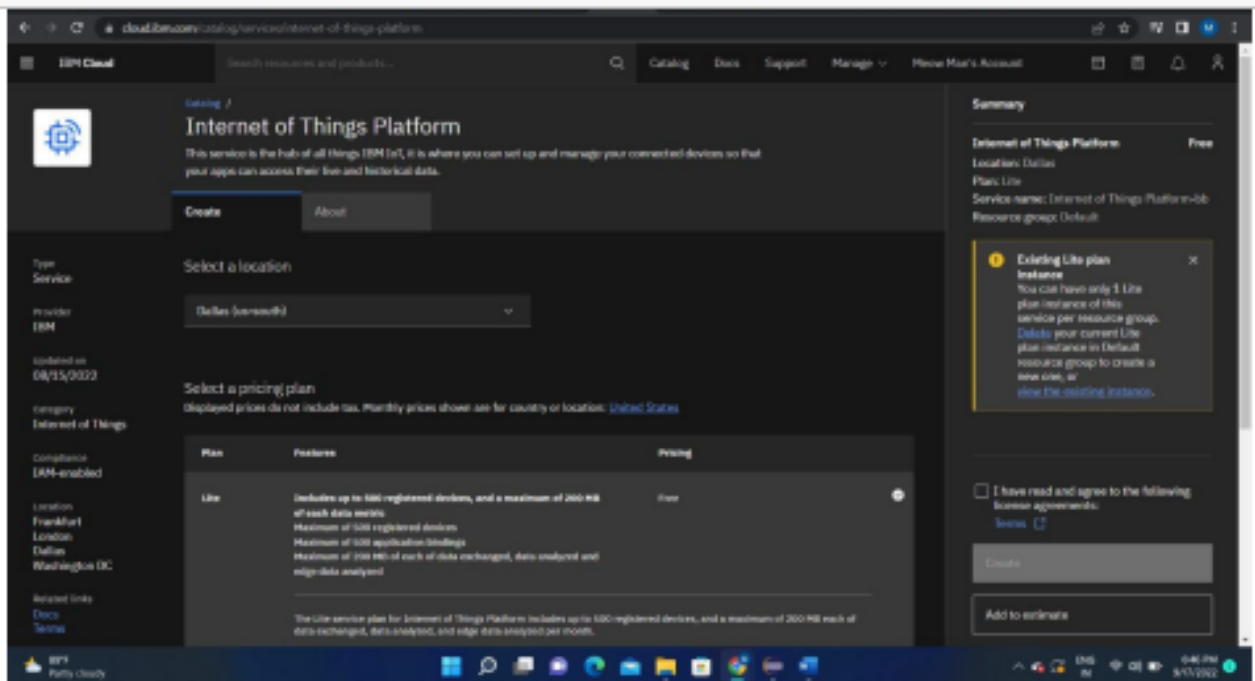
### 2. Home page of IBM cloud



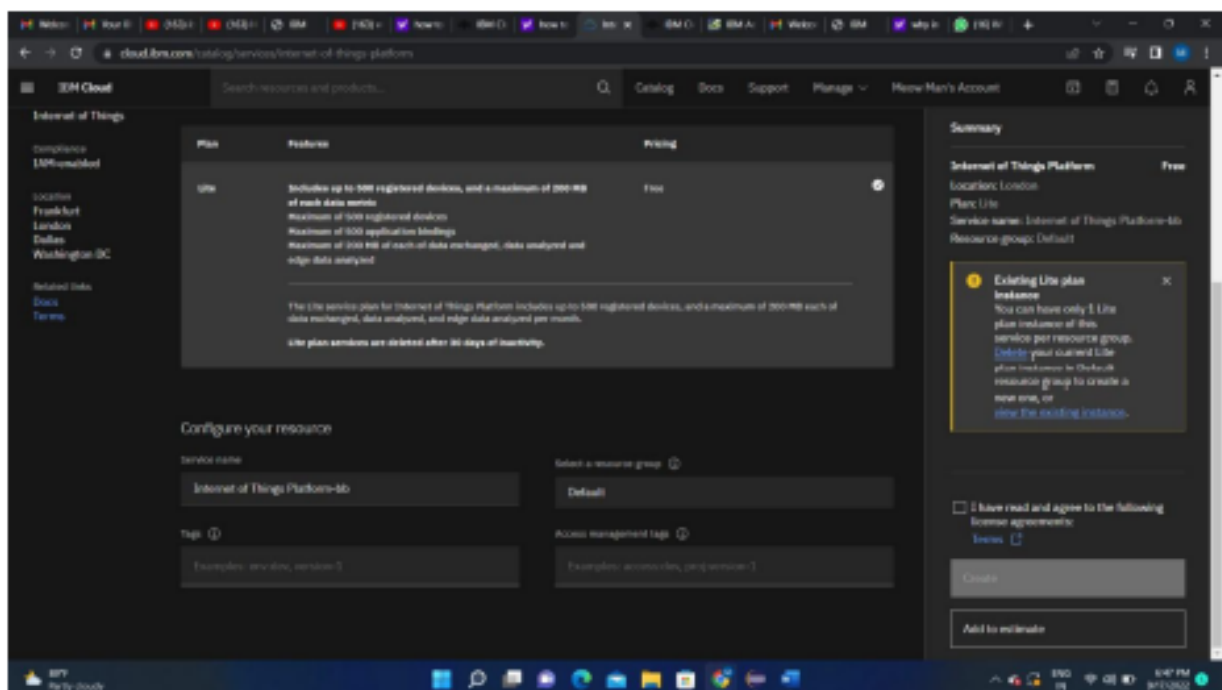
### 3. Click on the catalog on the top



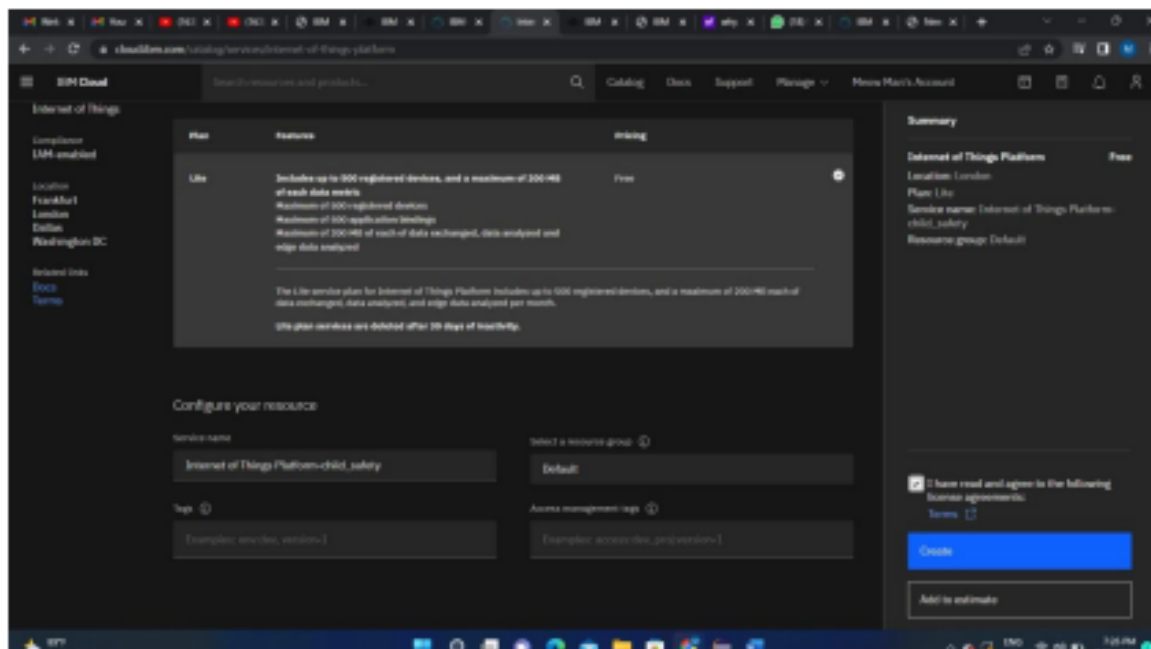
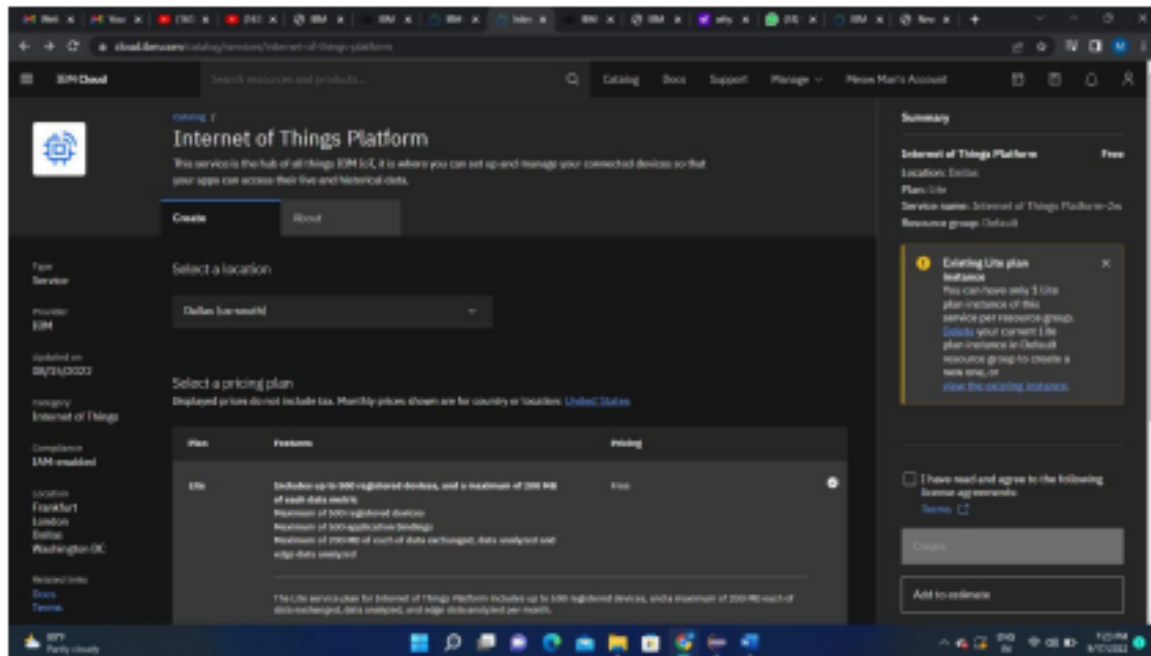




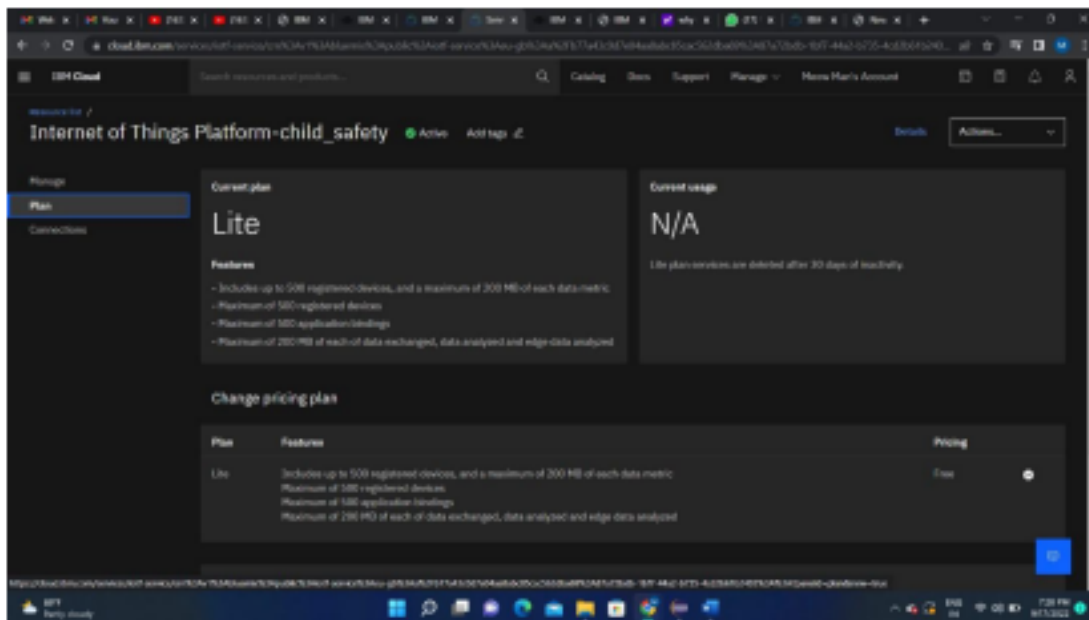
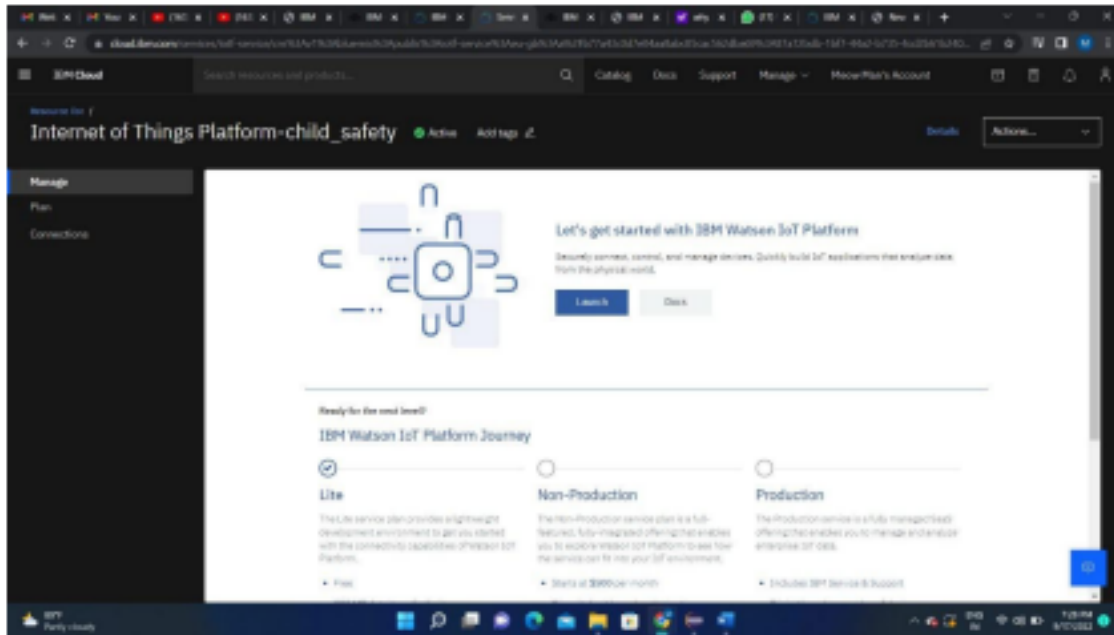
## 5. If already a lite is present delete it else u can't create another



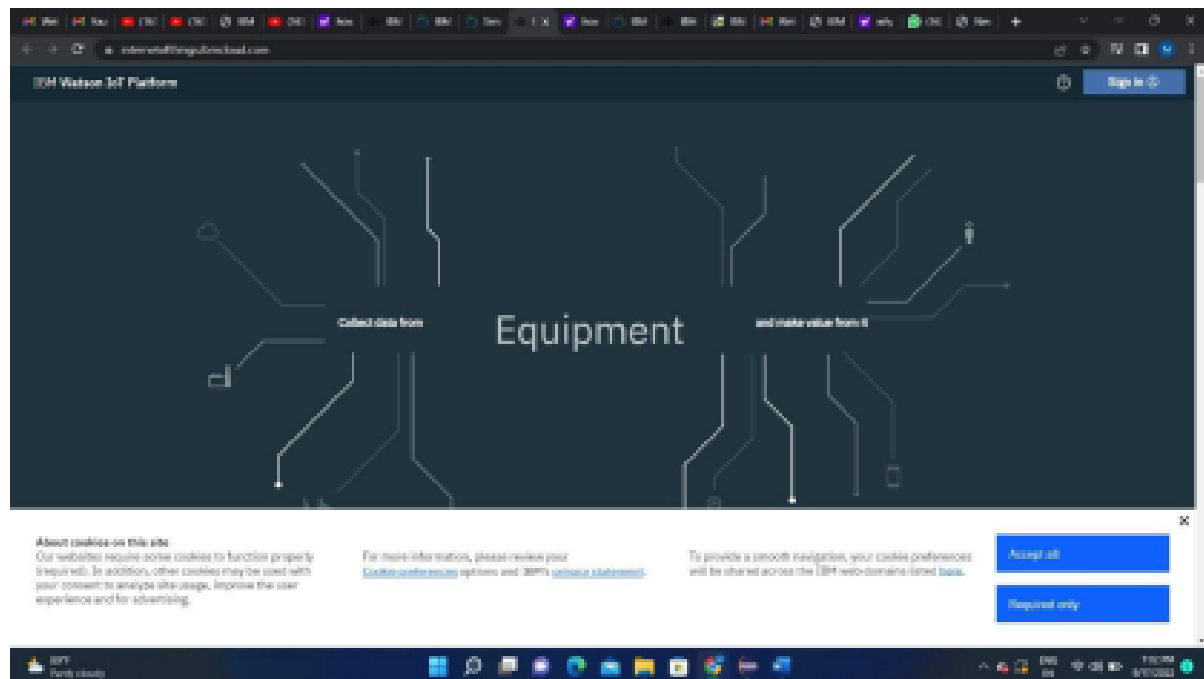
6. Enter the location and in the configure your resource type the service name and choose the plan, tick the agree with agreements and then click on create



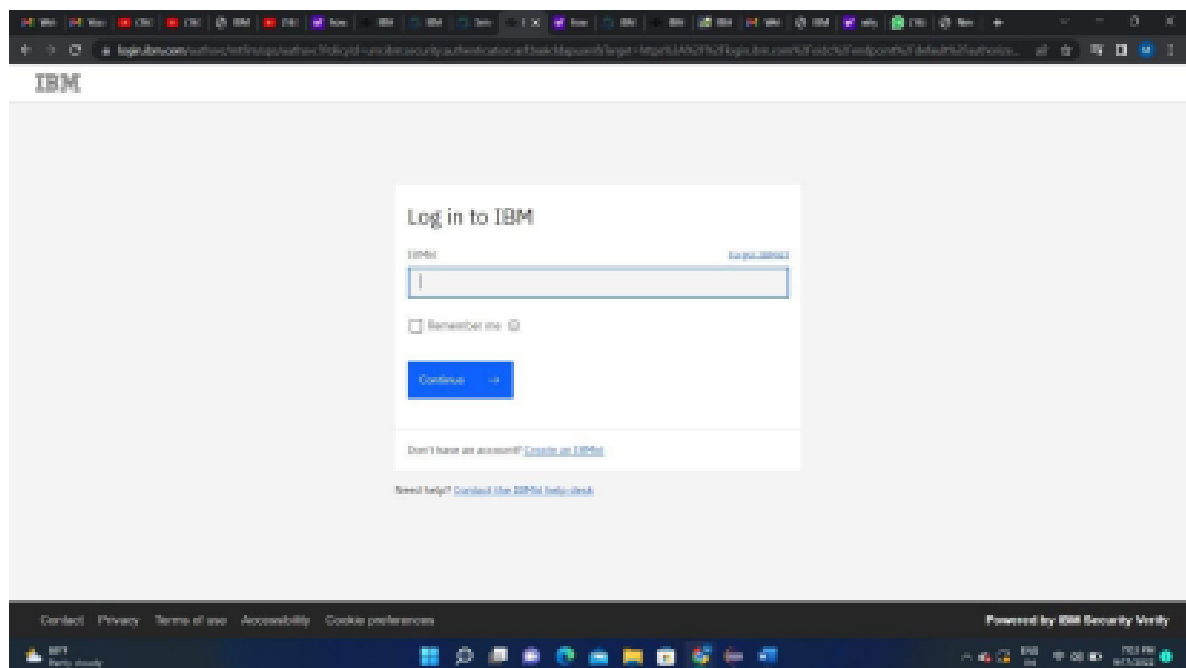
7. Internet of Things Platform Child\_safety will be created, where there are different options like manage, plan, and connection (manage is for launch, Plan gives us the idea about the payment package and its upgrades, and lastly the connection is for to connect IoT with other services)

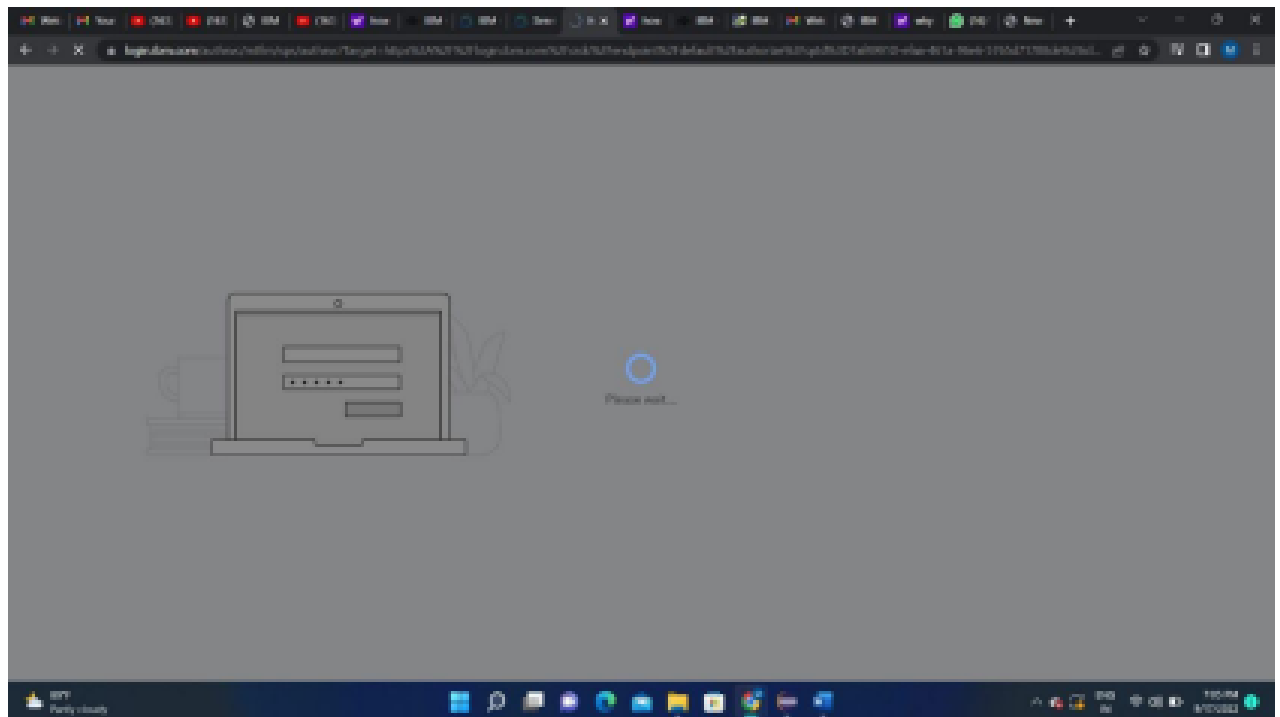


8. Clicking on the launch button in the manage tab, it will open to this

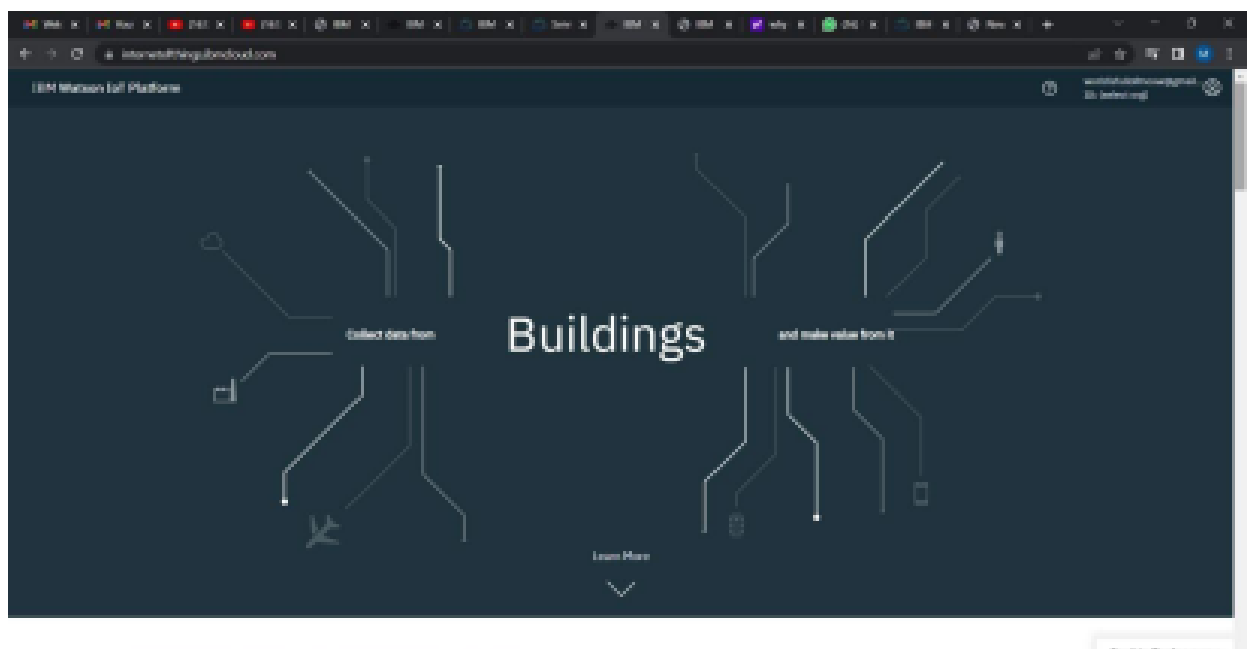


9. Enter the details to sign in to the Watson Cloud to create a device

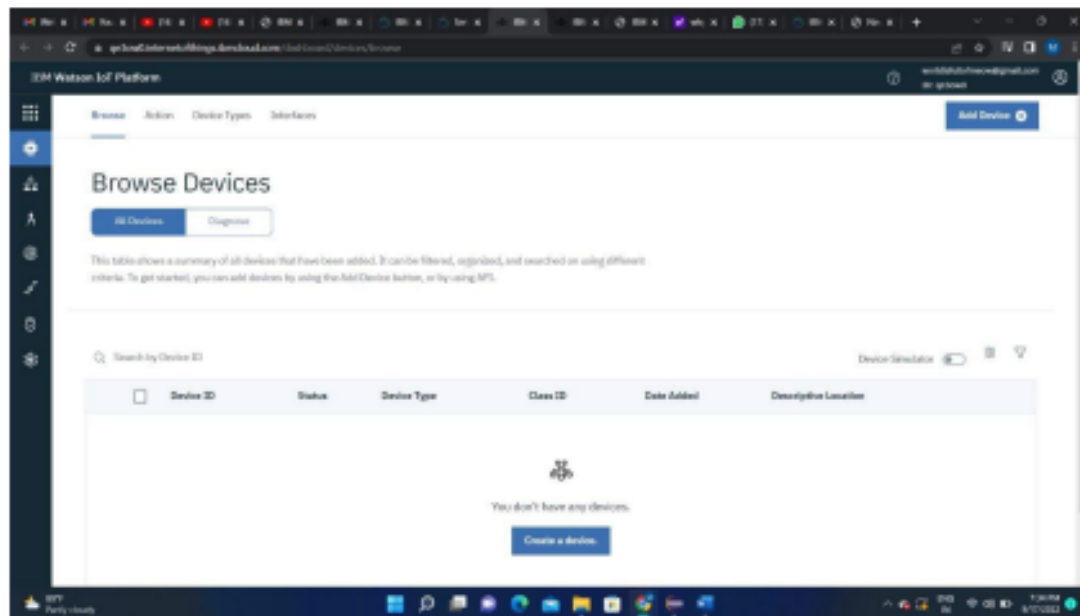




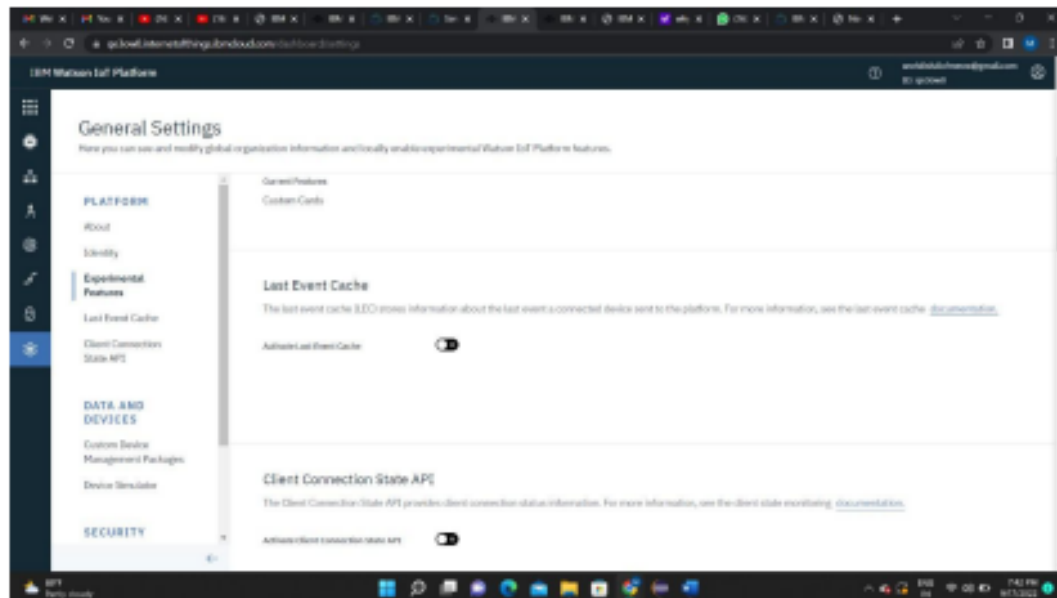
10. Once logged in the name will be displayed and it goes back to the first page



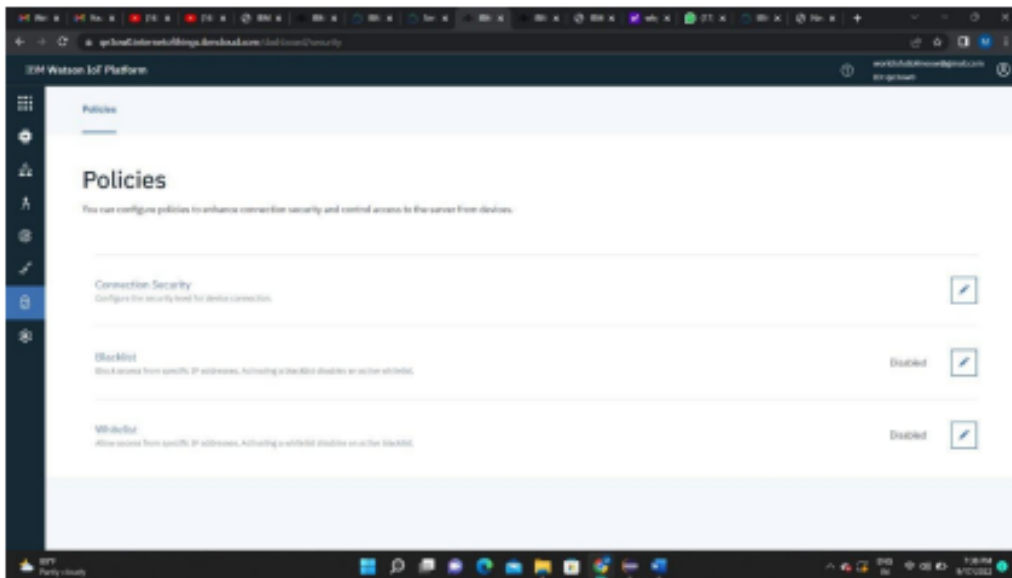
11. And again clicking on the launch button will open this tab, the device will help in the creation of the devices, the addition of devices, and the display of details of the devices.



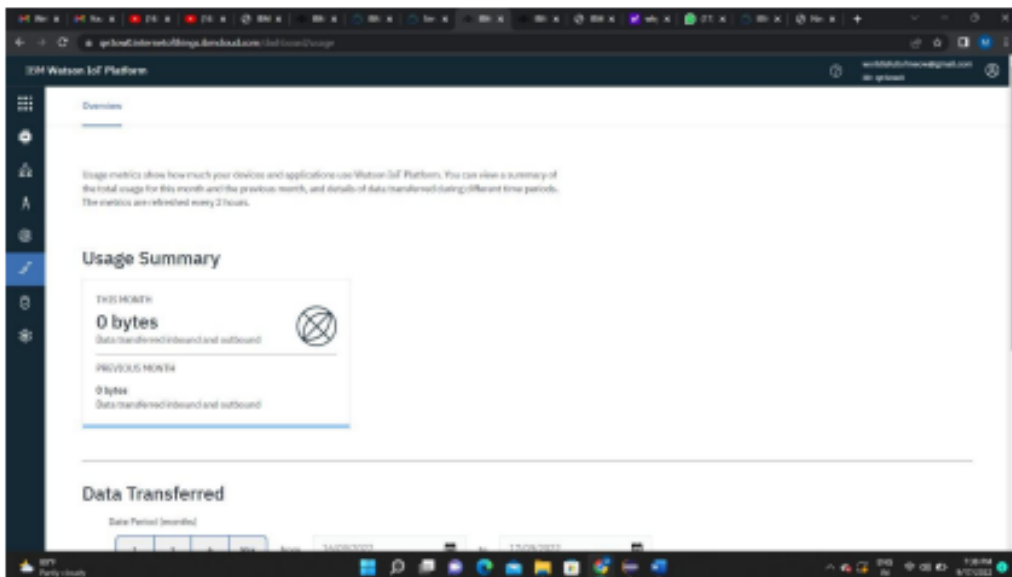
12. The setting tab is used to change the general setting if needed for the project.



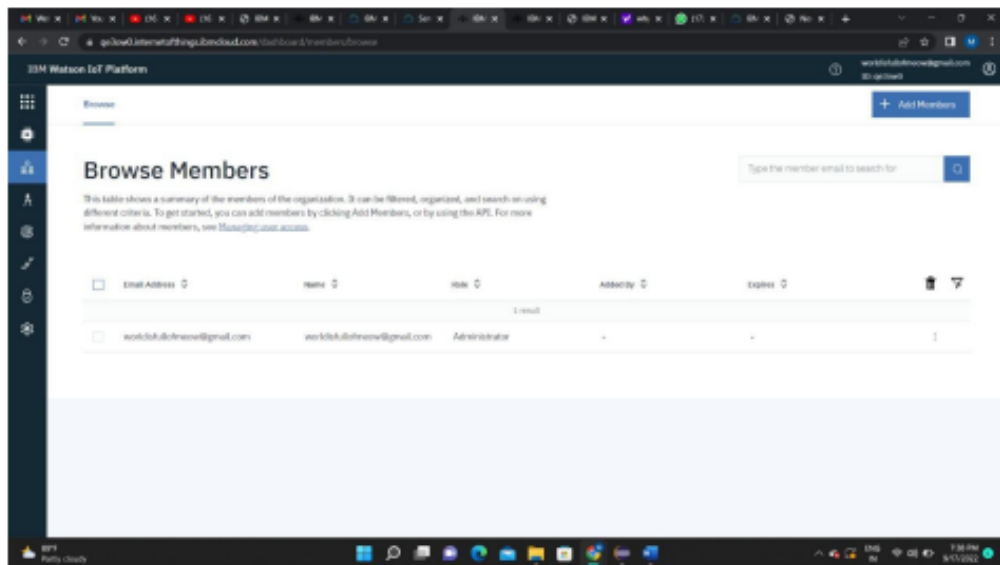
13. In the security tab we can choose the type of security connection and can change according to specification



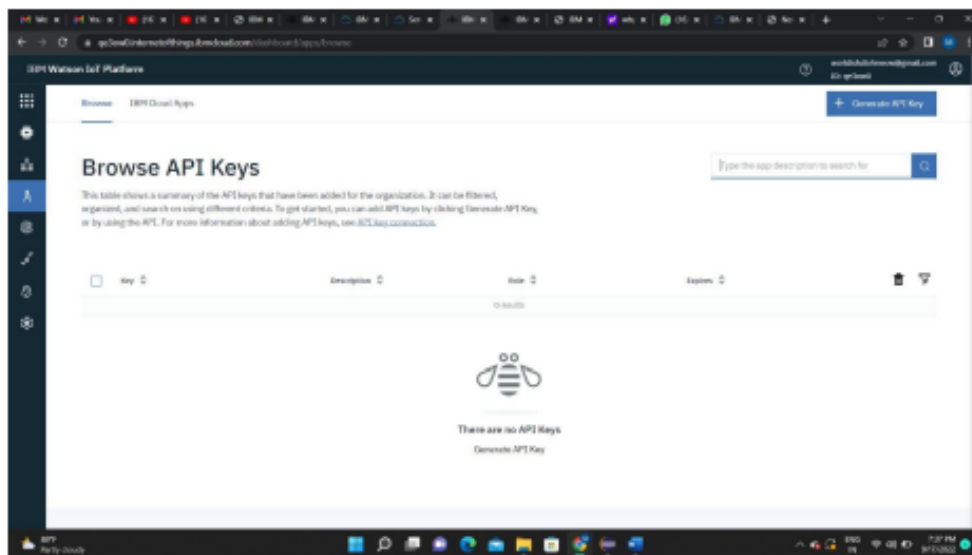
14. Usage gives the summary of how many bytes are used between the devices and the IBM cloud.



15. The member tab is add the teams members to work in the platform

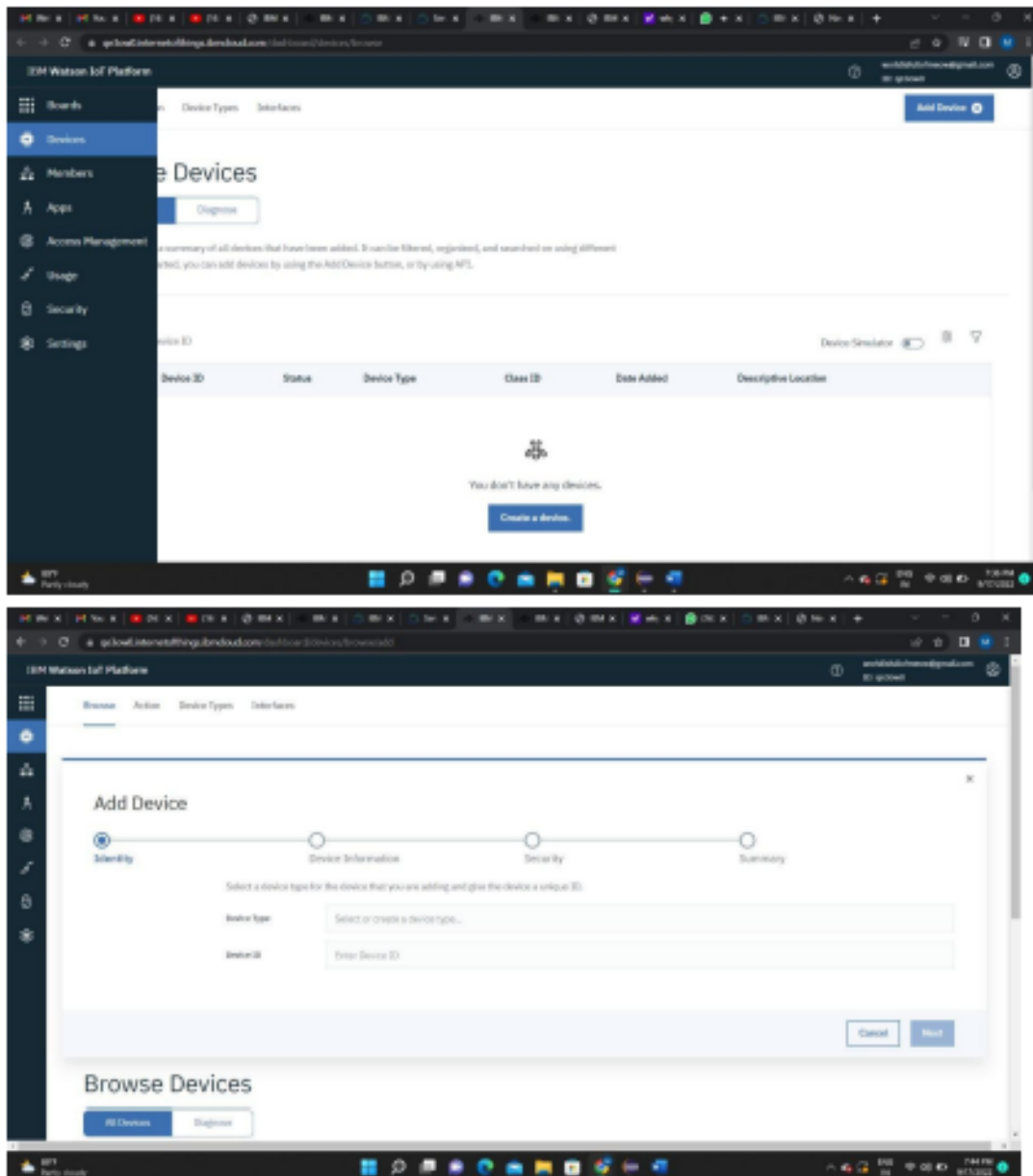


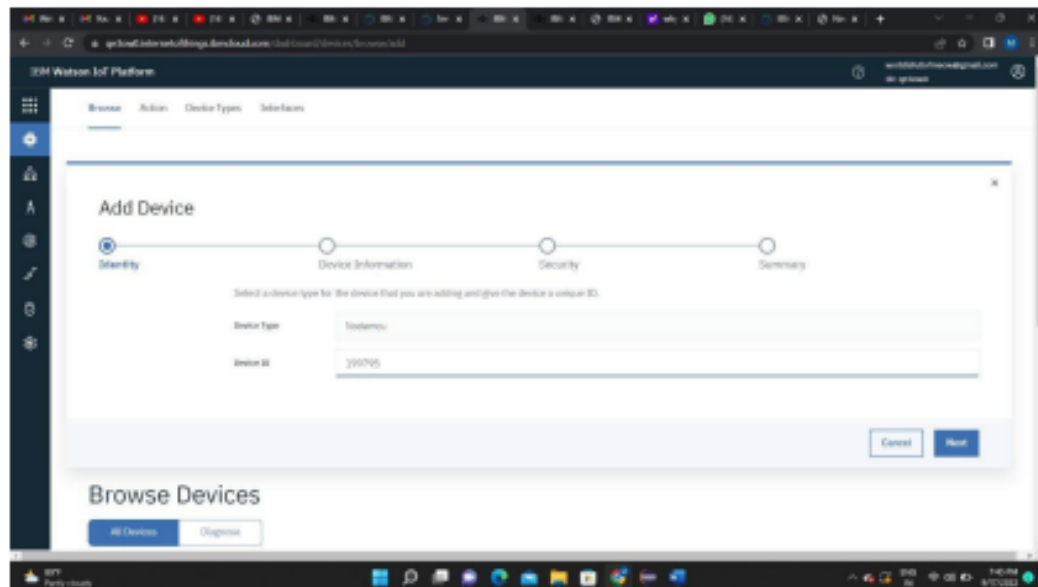
16. This tab is used when you want to connect to some other platform and to integrate with other services.



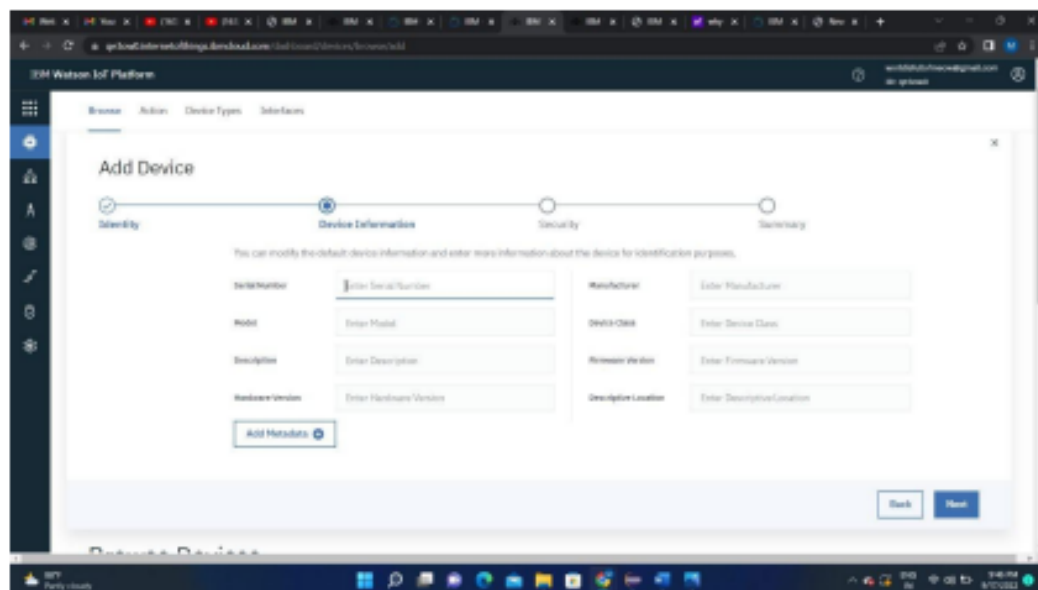


17. Click on the device tab and click on the add device button, then give the device type and device id and click next

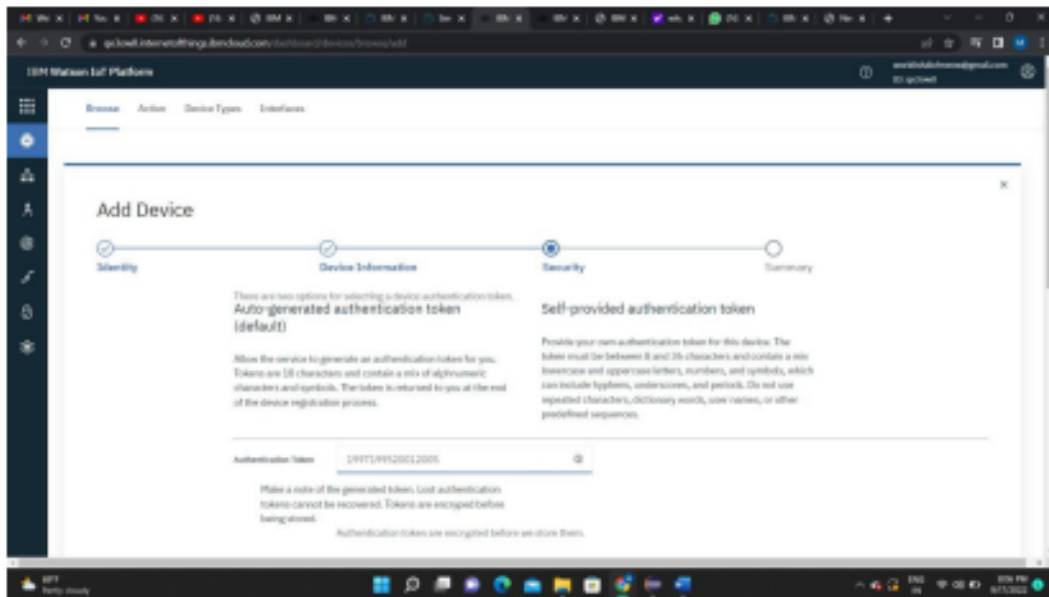




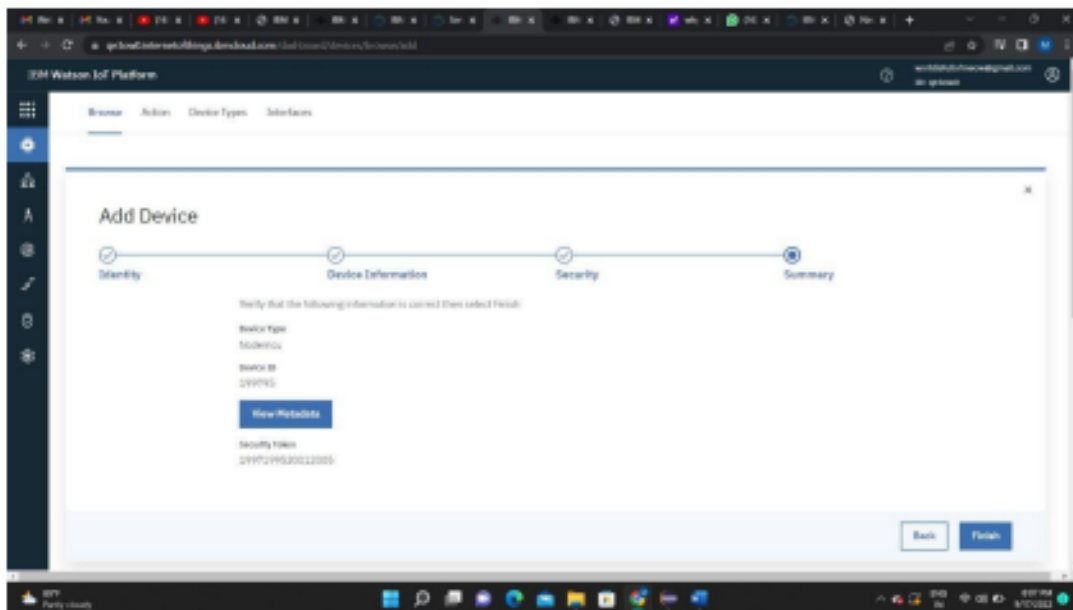
18. This page to enter extra details and of the hardware



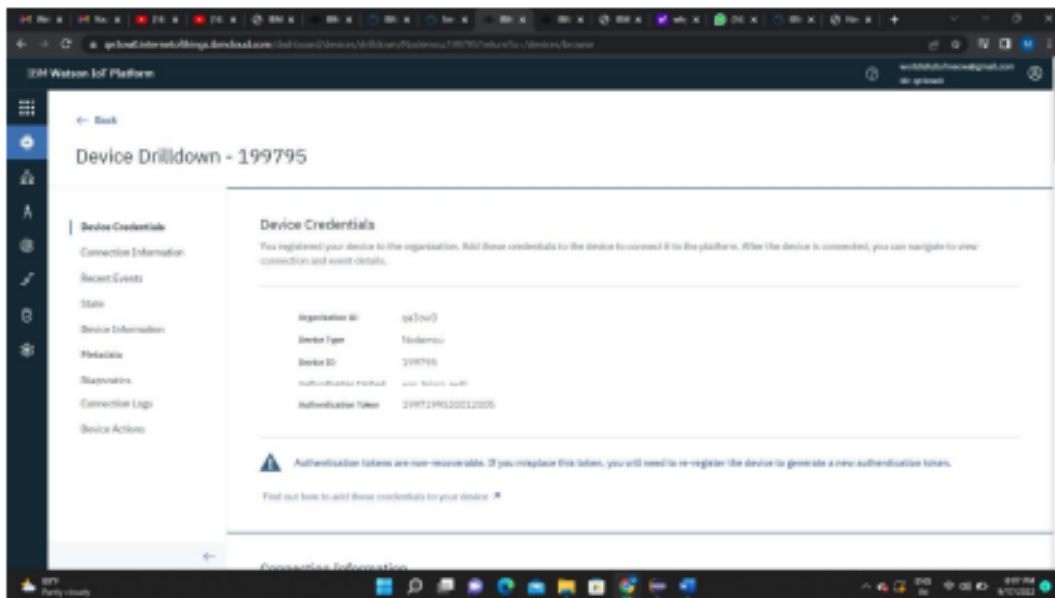
19. Clicking next it goes to the security where we do authentication token id.



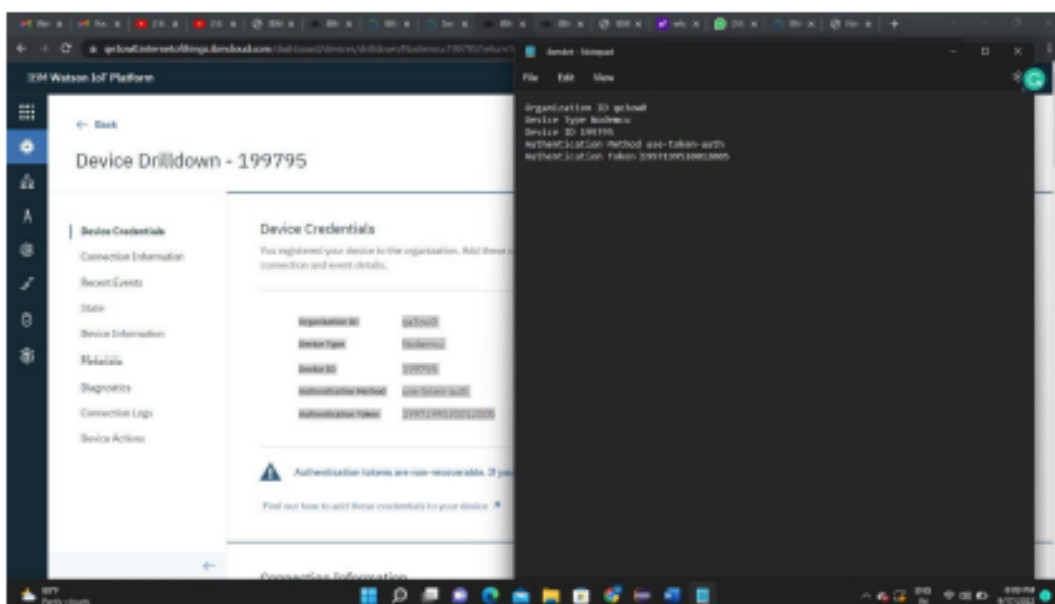
20. Clicking on next it goes to the summary of the device then click finish



21. The device credentials will be displayed with all the details

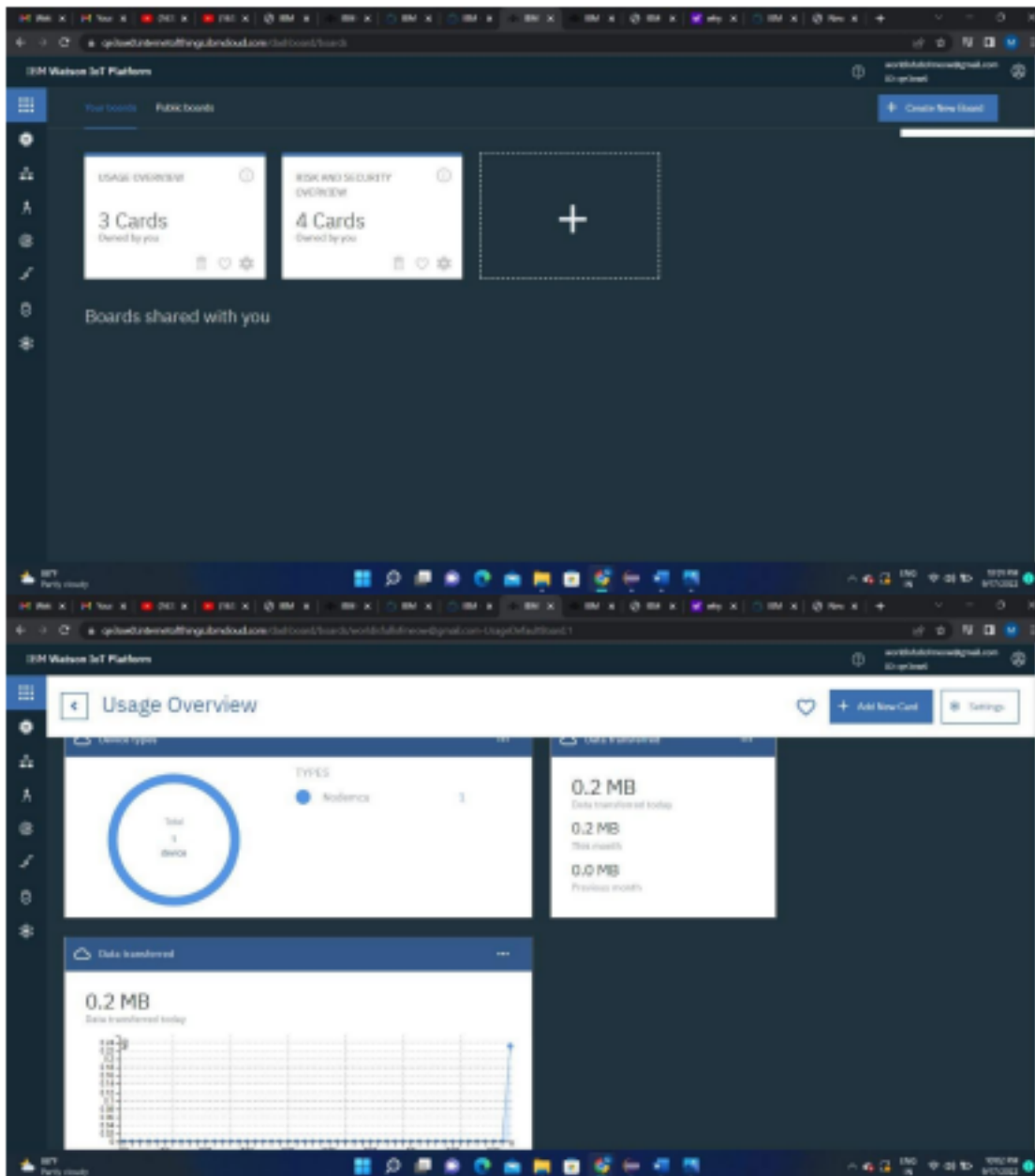


22. Save the details of the device as the authentication tokens are non-recoverable and if misplaced then we have to create a new one.



23. Clicking on the device tab we can now see the added device. Clicking on it will display the other details.

24. The Boards will display card for the project.



**RESULT:**

An IBM Watson cloud for IoT and a device is created

## 8. TESTING

### 8.1 Test Cases

Section	Total Cases	Not Tested	Fail	Pass
Client Application	10	0	3	7
Security	2	0	1	1

Performance	3	0	1	2
Exception Reporting	2	0	0	2

### 8.2 User Acceptance Testing

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Total
By Design	1	0	1	0	2
Duplicate	0	0	0	0	0
External	0	0	2	0	2
Fixed	4	1	0	1	6
Not Reproduced	0	0	0	1	1
Skipped	0	0	0	1	1
Won't Fix	1	0	1	0	2
Total	6	1	4	3	14

## 9. RESULTS

Browser tabs: Fwd: PROJECT NEW PDF, IBM, New Tab, Login Page, Fire OAuth, IOT Based Safety Gadget

Address bar: File | C:/Users/Diwakar/OneDrive/Documents/IBM%20PROGRESS/Log%20In.html

### Login Form

Device ID/Number:

Enter Password

E-Mail :

Enter Username

Password :

Enter Password

Login

Login with Facebook

Login with Google

☒ Remember me  [Forgot password?](#)


System tray: 22°C Haze, Search, File Explorer, Microsoft Edge, Task View, Settings, Network, Volume, 11:43 PM 18-11-2022

Browser tabs: Fwd: PROJECT NEW PDF, IBM, New Tab, Login Page, Fire OAuth, IOT Based Safety Gadget

Address bar: File | C:/Users/Diwakar/OneDrive/Documents/IBM%20PROGRESS/next.html

### Login with Fire ??

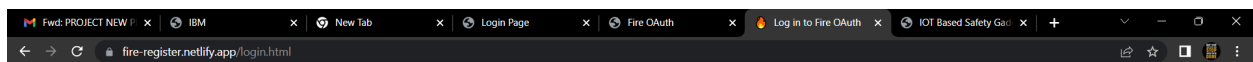
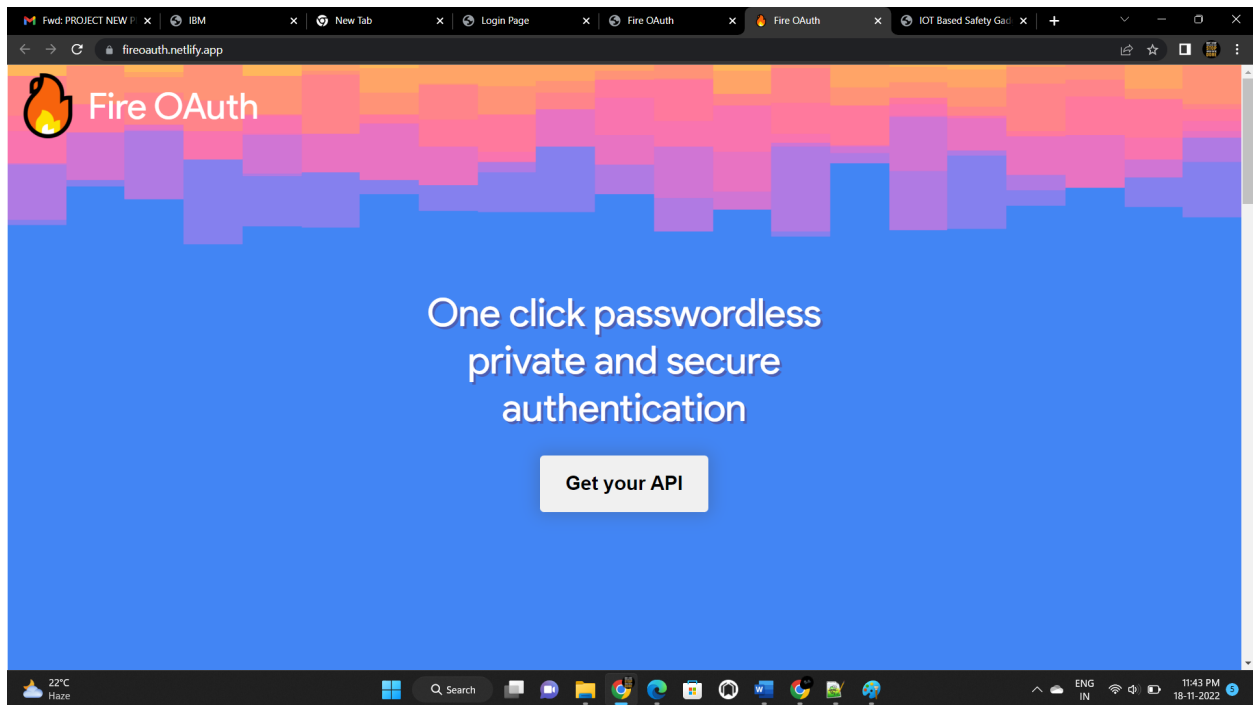
Scan QR from your Fire OAuth App??



Have Fire PWA on this device?  
[Click to Authorize ??](#)

[Learn More about Fire ??](#)

System tray: 22°C Haze, Search, File Explorer, Microsoft Edge, Task View, Settings, Network, Volume, 11:43 PM 18-11-2022



## 9.1 Performance Metrics



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.

## **10. ADVANTAGES & DISADVANTAGES**

### **10.1 Advantages**

Ensure 100% safety for your children with the help of the Trans Global Geomatics Personal GPS Tracking Device. Track, locate & monitor your kids 24/7 anytime anywhere. Our gps tracking system provides an instant alert if in case your children leave assigned safe zones. Mostly parents worried about their children safety if they are going to school or outside. By using Kids Gps Tracker you can know every movement of your children with the exact location. Generally, a Child's GPS Tracker reports any potential dangers and protects them in the process. It acts as a communication tool for parents and can be helpful even when traveling.

Usually, children tend to wander a lot. With the help of GPS Tracking devices, you can easily and quickly know where your children are. Whether it is a mall, park, or somewhere in the city center, you can simply find your children with our child tracking device.

#### **Advantages of GPS Child Tracking System:**

By using the Trans Global Geomatics Pvt Ltd Personal GPS Tracking Device, some of the important benefits to the parents are as follows:

**Know the current location**

Our Kids GPS Tracker provides real-time location of your children. You can track the live locations of your kids, where they are and what they are doing.

#### **Get travel details of kids at any time:**

Parents will get all the details like their kid boarding/de-boarding school bus. Also, they can get emergency alerts when the child fails to board or de-board at the other stop.

#### **Emergency call:**

Our GPS trackers have an emergency call button. In case your kids are in any danger, just they need to do is press the button to connect to you. It will be on alert state, a call can be done & a notification will be sent to family members.

#### **Alerts:**

Both the parents and school authorities can receive alerts, notifications or

messages about the child's whereabouts. Even if there is any traffic jam, break down, parents will get a warning helping to take necessary actions and precautions.

**Track your child even in a crowd:**

Prevent abduction and let your children play and walk around safely. Our Personal GPS trackers for kids are great options for parents for monitoring their children 24/7. Our device can track a children's location as well as allow parents to set up a safe zone for their kids.

**Uses of GPS Trackers for your Kids:**

- Real-time tracking
- Geofence Notification
- SOS button emergency
- Location history
- School Attendance (By RFID)
- Support GPS and LBS (Location-based service) double tracking solutions.
- School bus on/off notification

**10.2 Disadvantages**

- The child could not produce the exact alert command during a panic condition.
- The command produced may not match with the previously stored command.
- This project requires manual intervention.

**11. CONCLUSION**

Throughout the research, it is clearly explained the IoT concept, child safety issues and the need of using child security system. Some previous studies have been included for designing the IoT-based child security smart band. It assists parents to monitor their children remotely. In case situations happen, notifications will be sent to parents so that actions can be taken. Through this, child safety can

be ensured and crime rate will be reduced. However, the proposed device is not robust enough and does not contain sufficient functions to operates like a mobile phone. Hence, the future enchantments will be adding more features, software, applications, hardware to make the proposed system capable of working more intelligently, meanwhile guarantee the safety of children.

## **12. FUTURE SCOPE**

In our system, we automatically monitor the child in real time using Internet of Things, with the help of GPS, GSM, and Raspberry Pi. 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. There also occurs time delay in video streaming through the server. Hence in the future, these issues can be overcome by using Zigbee concept or accessing the system without internet and using high-speed server transmission.

## **13. APPENDIX**

### **Source Code:**

Source Code is Available in the Github Section

### **GitHub Link:**

<https://github.com/IBM-EPBL/IBM-Project-39508-1660452847>

### **Project Demo Link:**

<https://drive.google.com/file/d/1ji5FFdVLzjV4UTskY9kzRe6v6J7iYshn/view?usp=sharing>