IoT Based Safety Gadget for Child Safety Monitoring & Notification

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Abstract

These days, kids lack a sense of security and face numerous security-related challenges. Many family members spend more time working and fulfilling their societal obligations, which include caring for their children. The situation in our nation right now is unsuitable for keeping an eye on kids. It is challenging to keep an eye on the kids constantly in the absence of a child surveillance system. Where Young children may act impulsively and choose impulsive locations. The majority of human behavior is formed during the formative years, necessitating the need of a child monitoring system. Accidents and events frequently involve children. Due to their inability to defend themselves, children's safety is absolutely essential.

The major goal of this project is to design a child-safe smart

wearable device that makes use of cutting-edge technologies. The article offers a clever Internet of Things-based method for preventing kids from becoming lost when out with their parents or by themselves. Our suggested system will guarantee the highest level of security and provide live tracking for kids. It suggests a strategy for child safety using smartphones that allows parents to follow their kids' whereabouts and instantly receive their precise locations. The security status of the kids is assessed anywhere by watching their actions.

1. INTRODUCTION

In everyday life, the Internet of Things (IoT) is crucial. More and more company automation methods are beginning to center on the Internet of Things. Businesses are utilizing sensors in the logistics chain to track delivery locations with incredibly high accuracy. This wearable was inspired by the growing concern for young children's safety in modern society, as there is always a chance that they could be lost in a crowded area.

This essay focuses on the important idea that, up until they are reunited with their parents, those closest to a missing kid can help ensure their safety. An SMS and phone calls are sent to the parent's mobile phone if the sensor reports any abnormal values. Additionally, it updates the parental app via the cloud.

The method includes GSM and GPS modules for SMS and call communication between the parental phones and the safety device.

A Wi-Fi/cellular data module is also part of the system, which is utilised to integrate IoT and send all the observed parameters to the cloud for parental phones to monitor.

When a panic attack occurs, the panic alert system is utilised to send alerts to the parent's phone and request assistance while simultaneously updating the alert parameters in the cloud. The majority of wearables on the market today are designed to inform parents about the whereabouts and activities of their children.

2. LITERATURE SURVEY

{1} Authors: M Nandini Priyanka, S Murugan, K. N. H. Srinivas, T. D. S. Sarveswararao, E. Kusuma Kumari.

Title: Smart IoT Device for Child Safety and Tracking.

The system is developed using Link-It ONE board programmed in embedded C and interfaced with temperature, heartbeat, touch sensors and also GPS, GSM & digital camera modules. The novelty of the work is that the system automatically alerts theparent/caretaker by sending SMS, when immediate attention is required for the child during emergency.

{2} Authors: Akash Moodbidri, Hamid Shahnasser

Title: Child safety wearable device.

The purpose of this device is to help the parents to locate their

children with ease. At the moment there are many wearables in the market which helps to track the daily activity of children and also helps to find the child usingWi-Fi and Bluetooth services present on the device.

{3} Authors: Aditi Gupta, Vibhor Harit
Title: Child Safety & Tracking Management System by using GPS

This paper proposed a model for child safety through smart phones that provides the option to track the location of their children as well as in case of emergency children are able to send a quick message and its current location via Short Message services.

{4} Authors: Dheeraj Sunehera, Pottabhatini Laxmi Priya
Title: Children Location Monitoring on Google Maps Using GPS and GSM.

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 the internet. The concerned device is connected to the server via the internet. The device can be used by parents to track their children in real time or for women's safety. The proposed solution takes the location services provided by the GSM module. It allows the parents to get their child’s current location via SMS.

{5} Authors: David Hanes, Gonzalo, Patrick Grosetete, Robert, Barton, Jerome.

Title: Henry “IoT Fundamental and Networking Technologies, Protocols”.

Mobile apps can notify surrounding police stations' control rooms during emergencies, as well as child care providers. According to the literature, there are location monitoring gadgets on the market, but they do not offer a comprehensive solution to the issue. The answer to this issue is to create an Internet of Things (IoT) device that can track a child's location and environment and, in the event of an emergency, automatically alert the parents

{6} Authors: Khushalsing Rajput,Ankur Chavan.

The affordable, lightweight Wristband Vital, which detects and alerts dangerous environments for individuals who require quick assistance such as children and elders, is one example of the previous work done along these similar lines. The Vital band's primary flaw is that it uses Bluetooth as the parent and child's primary method of communication. Since there may be a significant distance between the two in some circumstances, Bluetooth just won't be able to create a close link between the two. Therefore, this system integrates GSM and GPS technology to offer assistance in such circumstances. The location is determined by GPS, and a message is sent to them using GSM.

{7} Authors: Omkar Tanawade, Swapnil Sonawane.

How to assemble and display the changes of children's whereabouts in a brief (near real-time) period when accessed from outside communication is one of the most challenging technical solutions.

{8} Authors: Zambada J,Quintero R,Isijara R,Galeana R, Santillan, L.(2015)

Using the paradigm of IoT, the proposed sensors send data about the location to the Internet through a broker, as well as billions of objects in the world are sending their own data to the Internet.

{9} Authors: M Nandini Priyanka, S Murugan.

The parent can send a message to the GSM module, and the GSM module will respond with specific information about the children based on the message information. You may view the location on Google Maps. The device button should be depressed when a specific child is in an emergency situation so that the device can take a picture and send it along with the user information to the registered mobile numbers. The young child's life can be saved immediately

3. EXISTING SYSTEM

The child's alarm commands are captured and stored for further use in the voice recognition module of the current system. The emergency level will be changed in line with the alert command if the same child provides the same command, which will be compared to the alert command that was previously recorded. For calling or sending alarm messages to people you can trust, the GSM has a SIM. GPS is utilized to track the current location as necessary. The server will look up the proper device ID in the database, look for the necessary contacts using that device ID, and assist in contacting the registered guardians.

The project's drawbacks include the following:

i. The child was having a panic episode and could not precisely produce the alert order.

ii. It's possible that the command generated and the command previously stored are different.

ii. For this job, manual labour is necessary.

PROPOSED SYSTEM

Manual intervention was required in the old method. However, in the suggested approach, we provide each action autonomy.

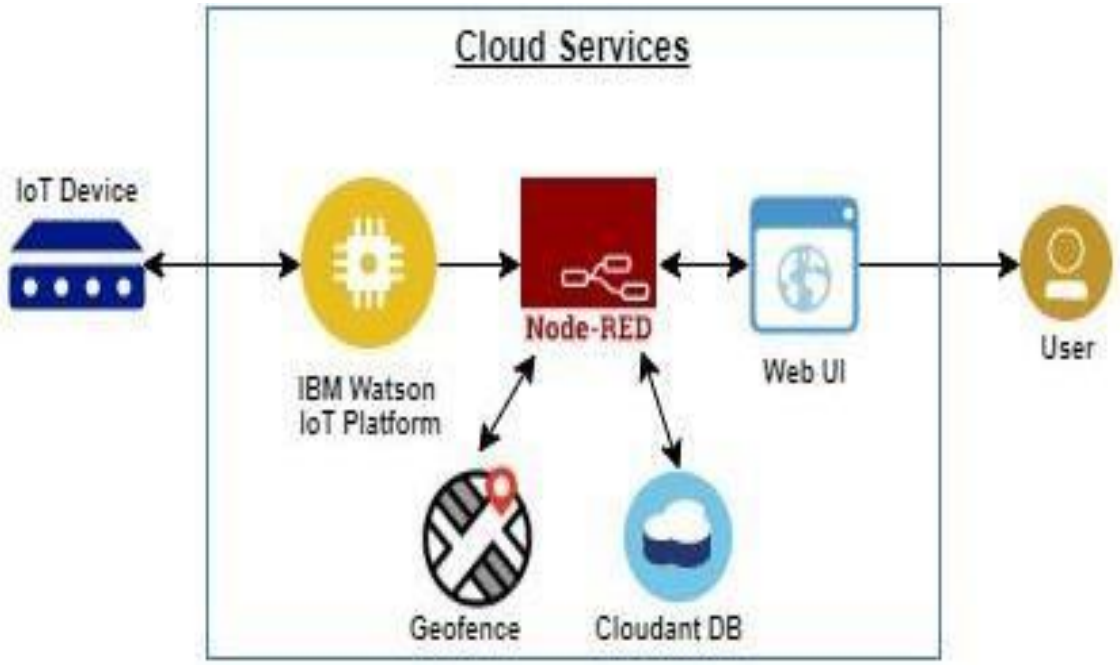


Fig.1: Block diagram of the proposed system

As the front end user interface, we can use either a web application or a mobile application. As the back end for storing and retrieving information, we can use a database or the cloud.

Fig.2: GPS

The child wearing the device can be tracked in real time using GPS. We can easily implement the Geo-fencing concept with the aid of GPS by feeding that device with a specific boundary.

Fig.3: GSM

The child's guardians will each receive a GSM alert notification if the child crosses the specified boundary. We employ a number of components in our system, including

1. GPS
2. GSM
3. IBM Watson Cloud

4. IBM IoT Platform

5. IBM Node RED

6. IBM Cloudant DB

In a single integrated environment, Watson Studio enables you to prepare and analyse data as well as train, deploy, and manage your AI models.

Fig.4 :IBM WATSON CLOUD

The Internet of Things (IoT) is the vast number of physical objects that are currently online and collecting and exchanging data. Businesses may gain useful insights to enhance practically every part of their operations and develop novel, new business models by merging IoT data with IBM Cloud technology.

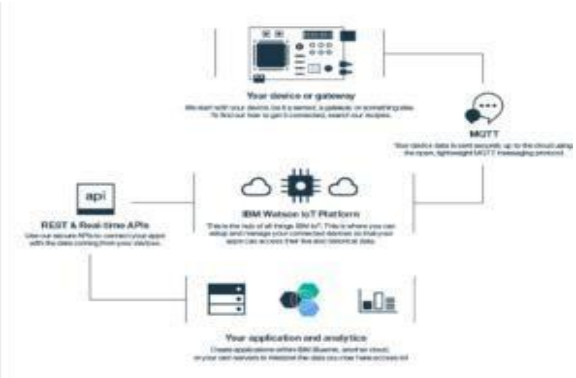


Fig.5:IBM IoT Platform

NODE-RED is a stream-based advancement tool for visual programming with a primary concentration on visual equipment for Internet of Things wiring. This programming tool was created for connecting hardware devices, APIs, and web services in novel and exciting ways.

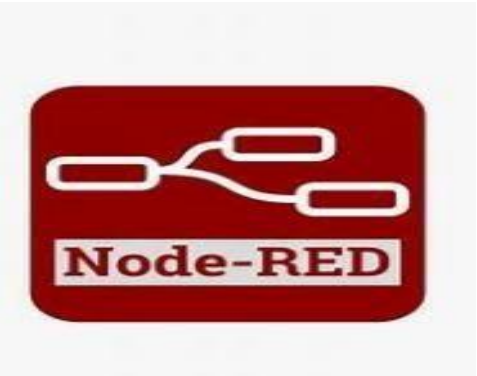


Fig.6:IBM Node RED

IBM Cloudant enables queries to be run against a single database, returning a list of documents that match the query along with a bookmark that gives access to the next block of search results.

Fig.7:IBM Cloudant DB

WORKING

This proposed approach focuses on the crucial notion that people closest to a missing child can help secure their safety up until they are reunited with their parents. If the sensor reveals any unusual values, an SMS and phone calls are made to the parent's mobile phone. Additionally, it utilises the cloud to update the parental app. For SMS and call communication between the parental phones and the safety device, the method uses GSM and GPS modules.

The system also includes a Wi-Fi/cellular data module that is used to integrate IoT and send all the measured metrics to the cloud for parental phones to monitor.

When a panic attack strikes, the panic alert system is used to alert the parent's phone, request help, and update the alert parameters in the cloud all at once. The bulk of wearables on the market today are made to let parents know where their kids are and what they're up to.

RESULTS

IBM WATSON IOT PLATFORM

The Watson IoT platform to find the In-Area and out-Area Locations

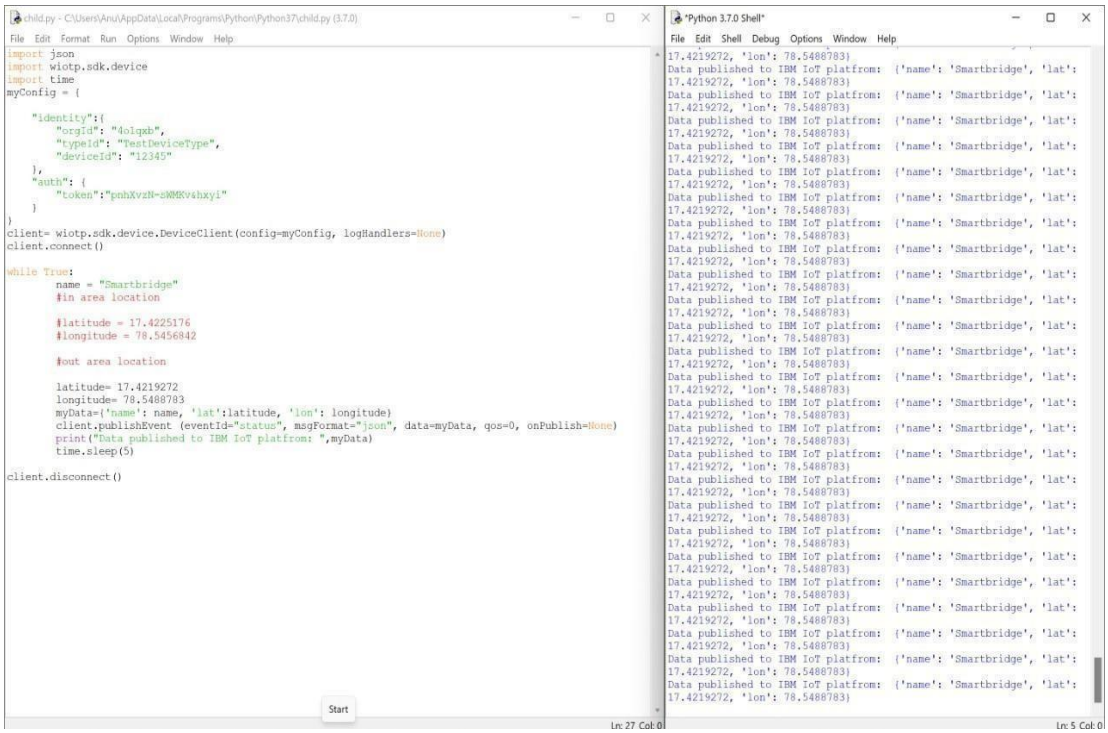


Fig.8:Out-Area Location

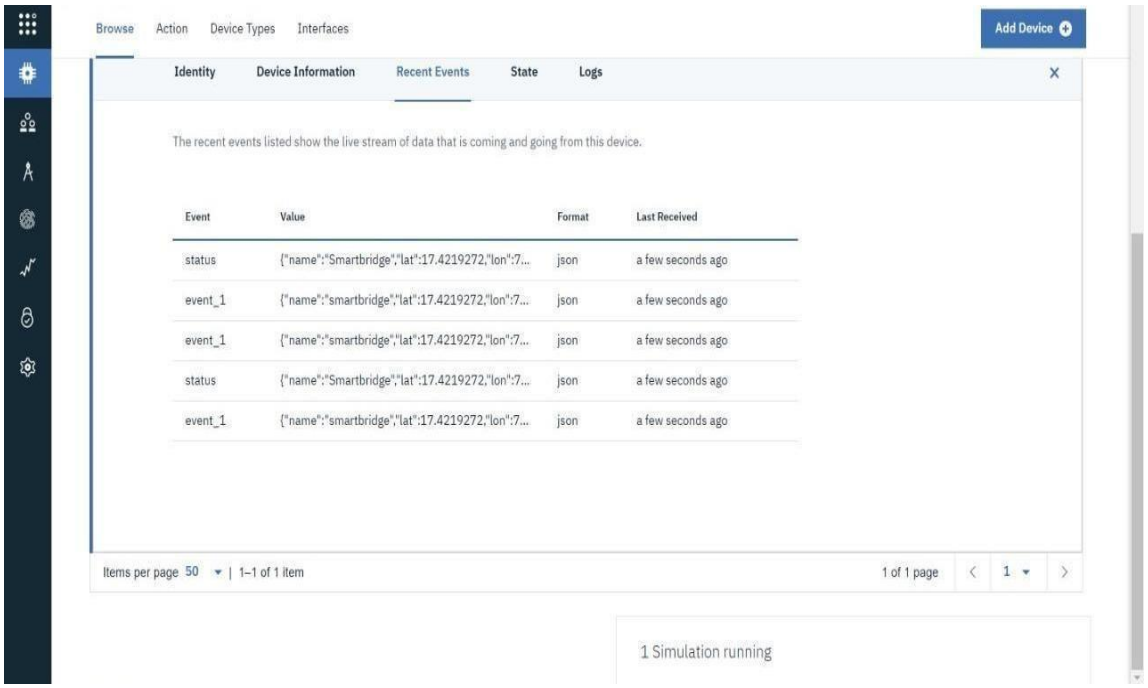
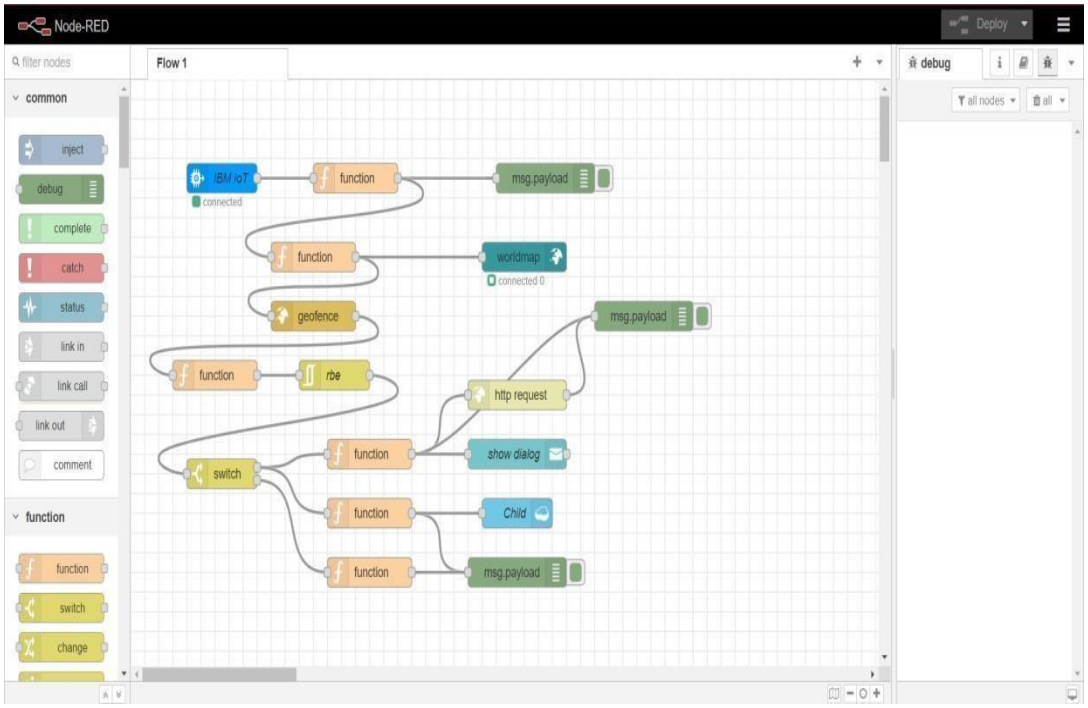
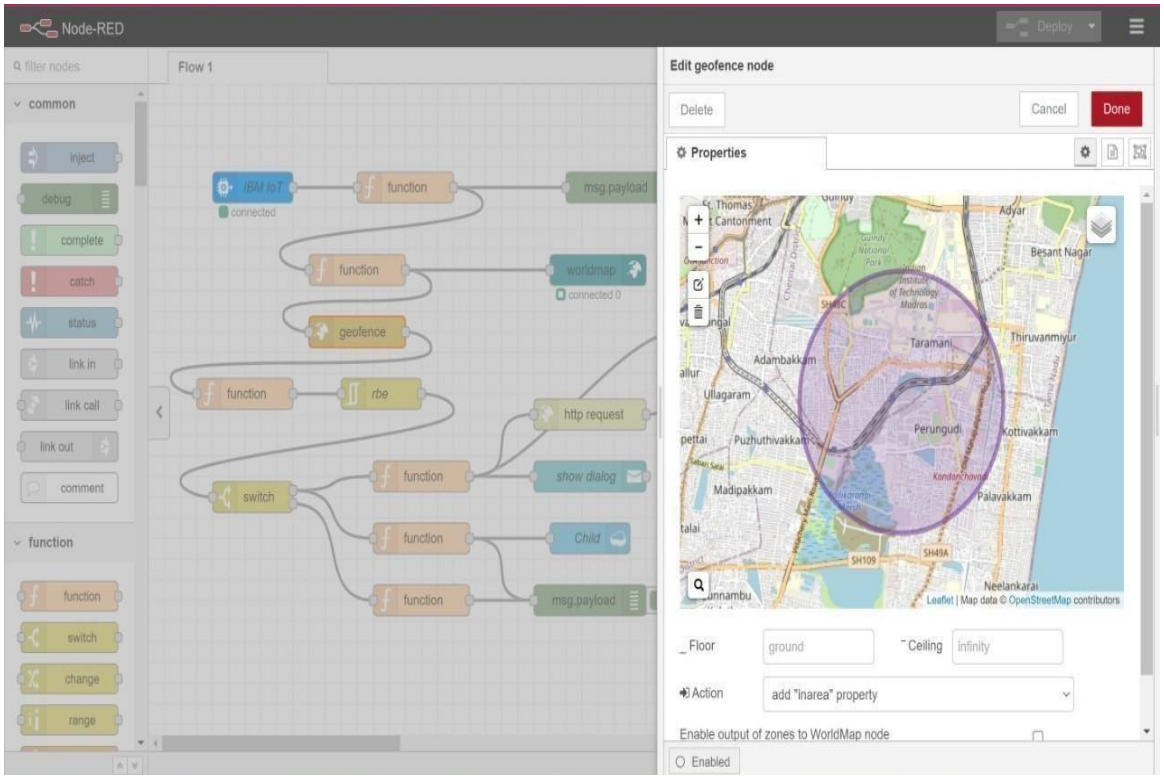


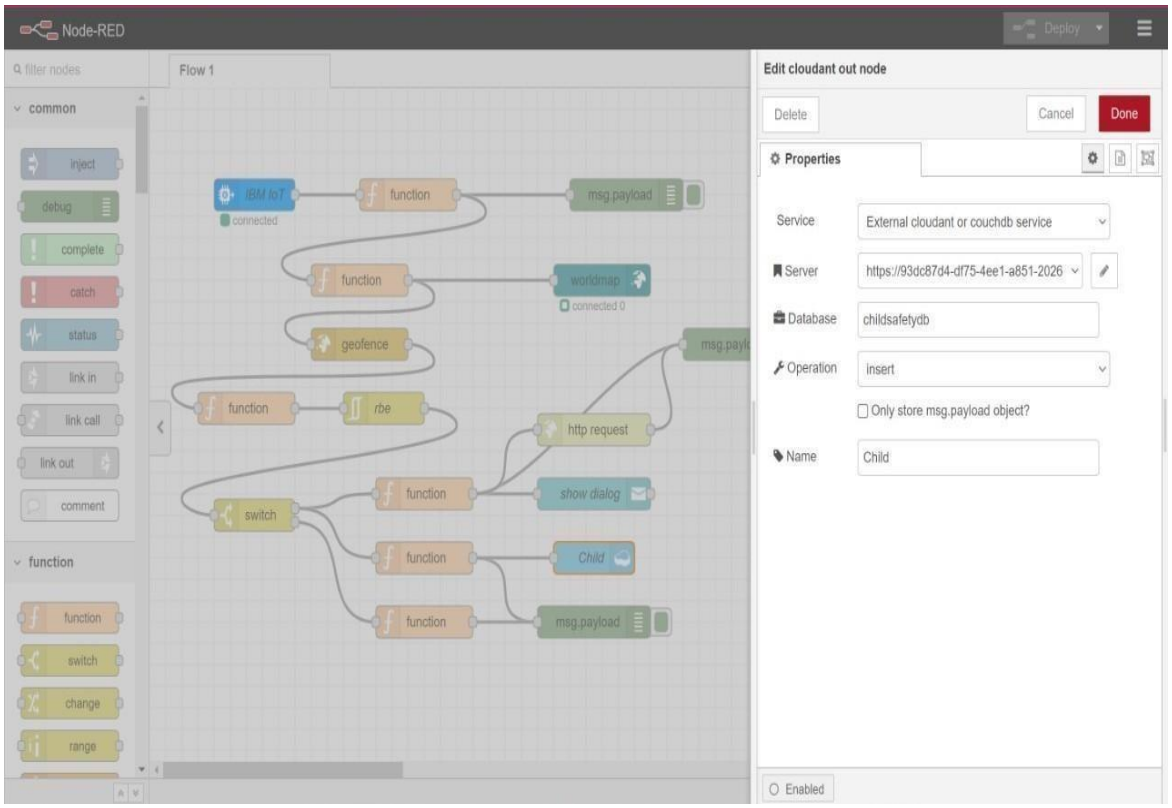
Fig.9:IBM Watson IoT

NODE-RED SERVICE

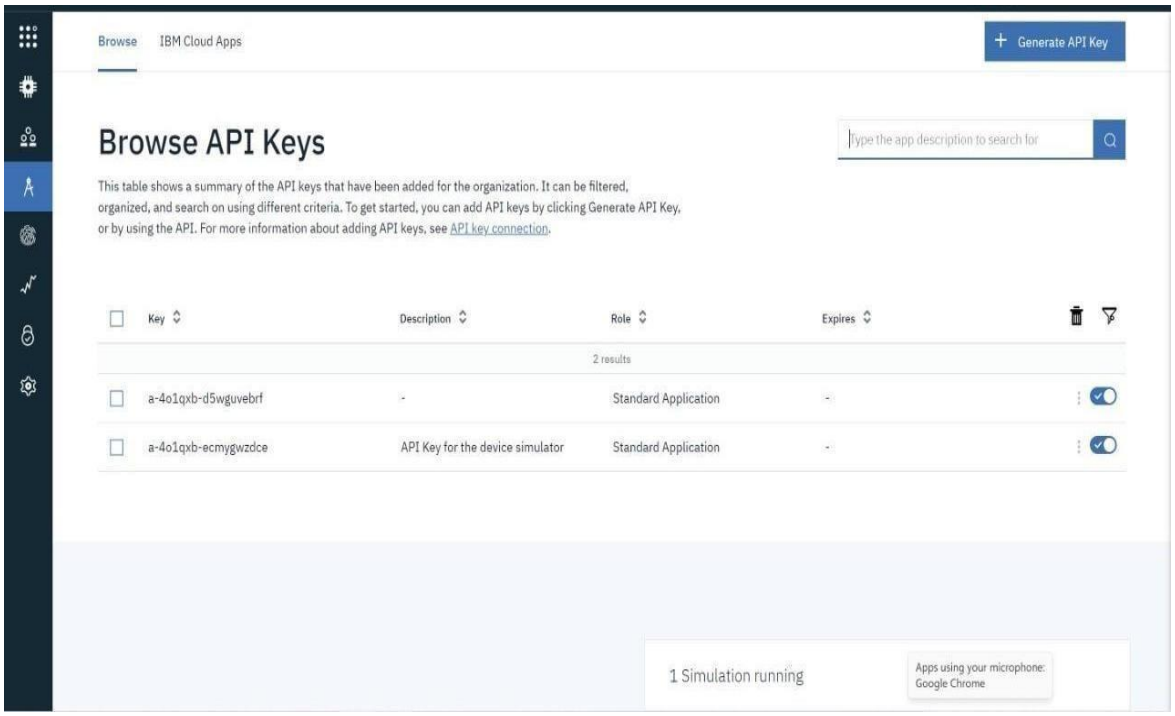
In Node-RED Service ,firstly, node connections are created and then each of the nodes are coded.



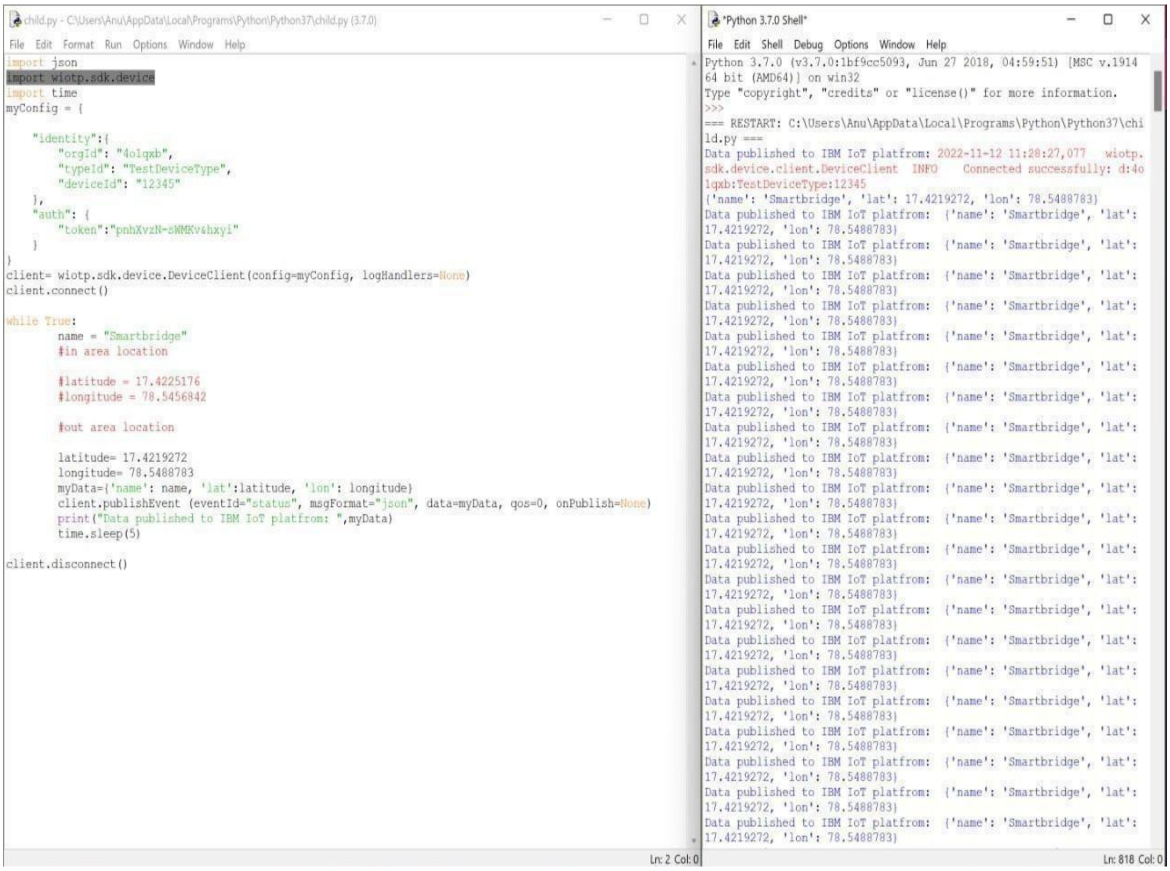




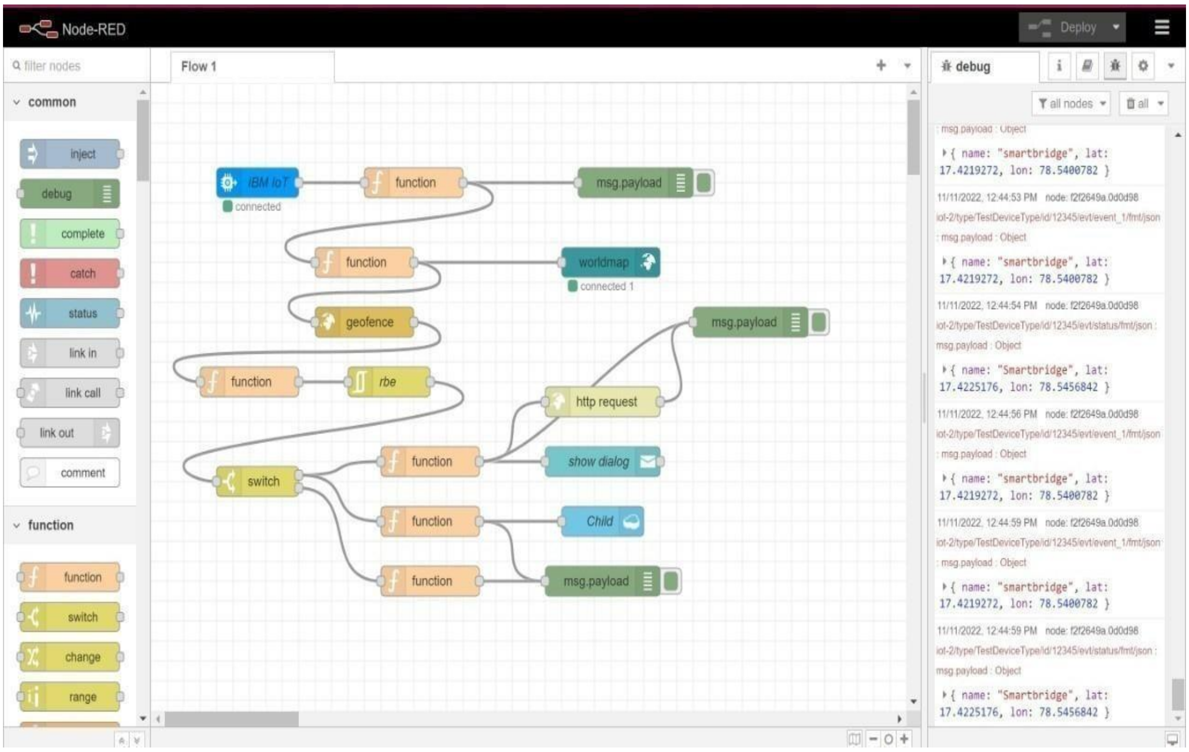
Connecting with IBM Cloud: Using IBM IOT node through the API key



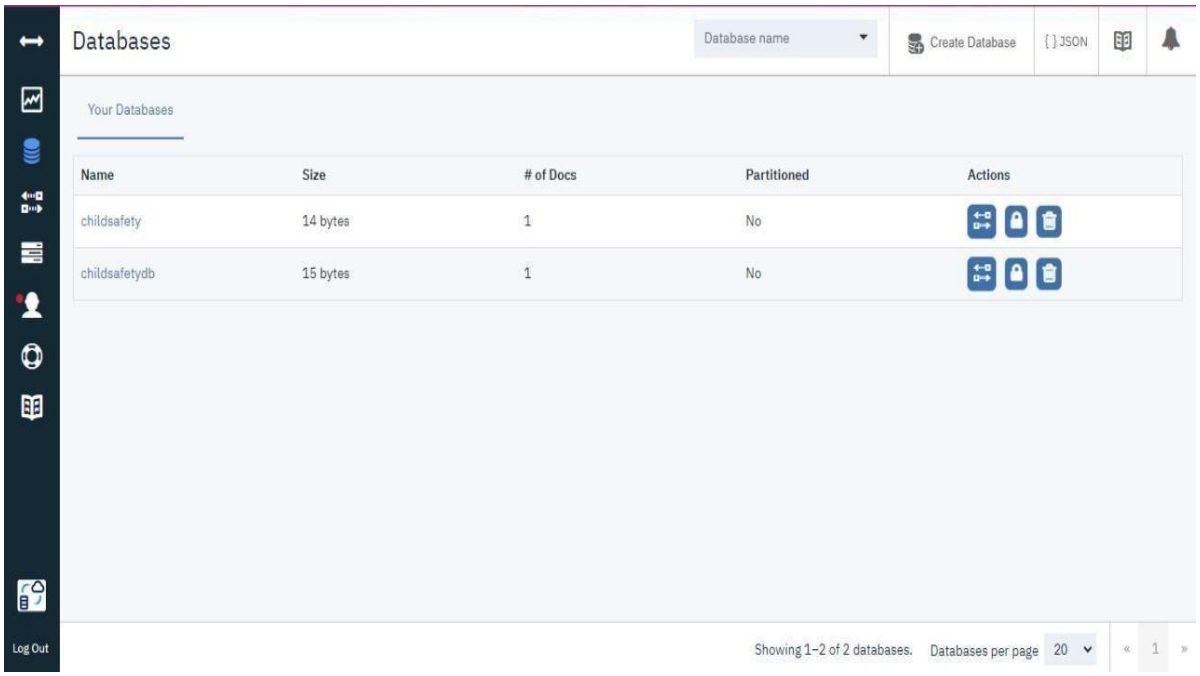
Transferring values from Python Code:



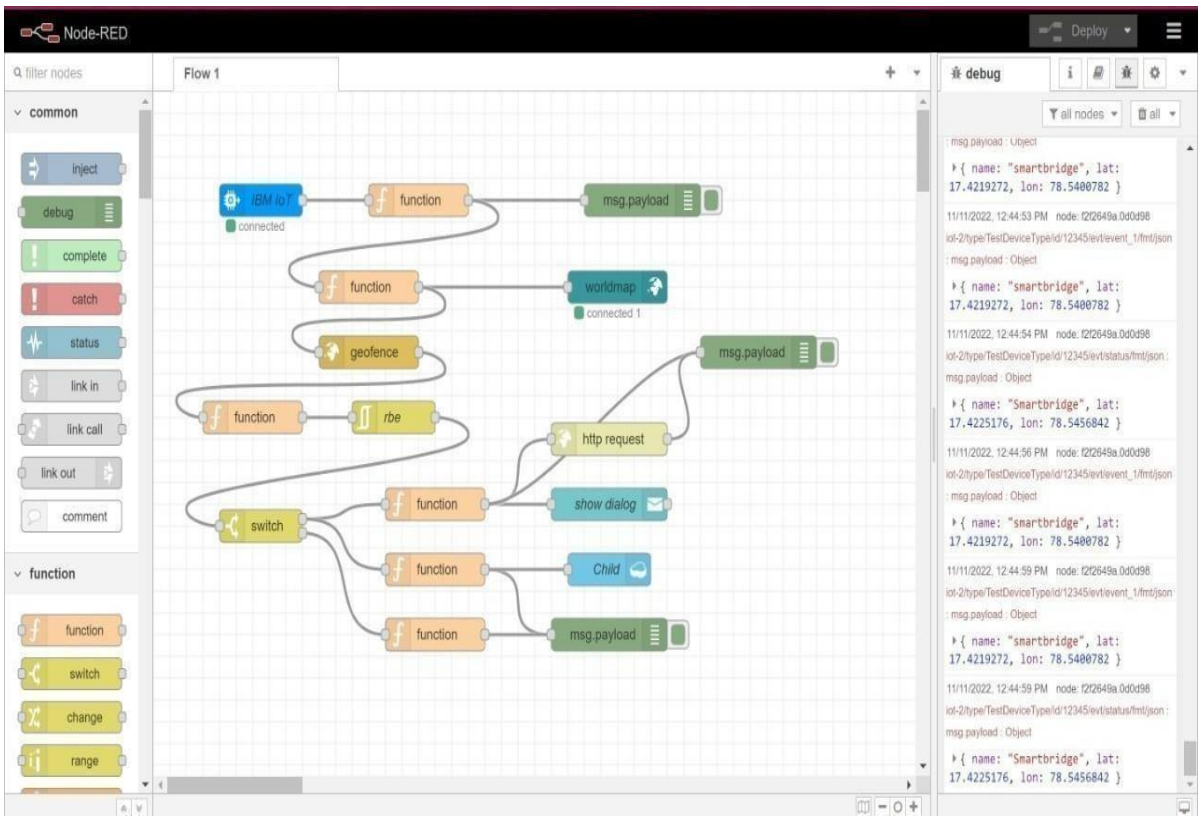
Node-Red:



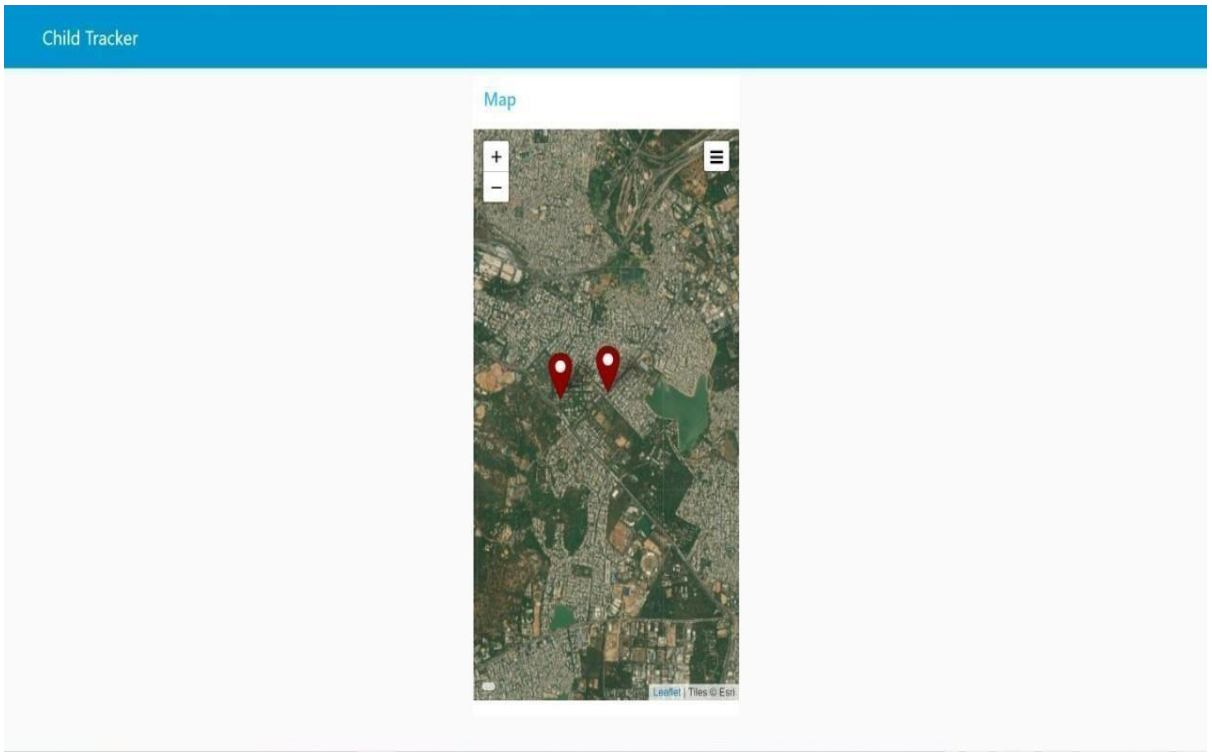
Creating Cloudant DB and integrating Node-Red with the Web UI



Node-Red Service with Cloudant Database:



Node-RED Dashboard(Web ui):



CONCLUSION

Children's safety and self-assurance are ensured by this essay. Different technologies to assist children have been developed by numerous experimenters that work in this field. The main idea in this article makes use of the upscale features that smartphones like Google maps, SMS, etc. offer. The child safety and protection tool is skilled at functioning as a smart Internet of Things tool. It gives parents access to their child's whereabouts in real time, the temperature of the area, a buzzer alarm for any emergency situations, and the ability to find their child. The essential design idea, functionality, and expected results are all illustrated in this paper.

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