NAALAIYA THIRAN – IBM PROJECT

PROJECT REPORT

IOT BASED GADGET FOR CHILD SAFETY

MONITORING AND NOTIFICATION

Presented by,

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1.INTRODUCTION

1.1 PROJECT OVERVIEW

The main concept is to create a app that used to check the location of the child as safety system. This concept focus on finding the child and continuously update the current location to the parent or caretaker.

The IBM cloud, Node-red and IBM Watson are used to create the web-application which is to be used in IoT child safety

1.2 PURPOSE

Parents can simply leave their children in park, school or somewhere else, child tracker application helps the parent to continuously monitor the child's location.

Notifications will be sent to the caretaker's mobile, according to the particular geofence aound the child.

2. LITERATURE SURVEY

1.1 EXISTING PROBLEM

1. If the child may in the area where there is no network or move away from the network coverage area, there is a difficulties to identify and track the location of the child.

2. The wearable device may be removed by someone who try to kidnap the child.

3. If it was removed or missed by the child, the identification and tracking are worthless then we proposed the method of sense the body temperature of child to identify whether it is with the child or not.
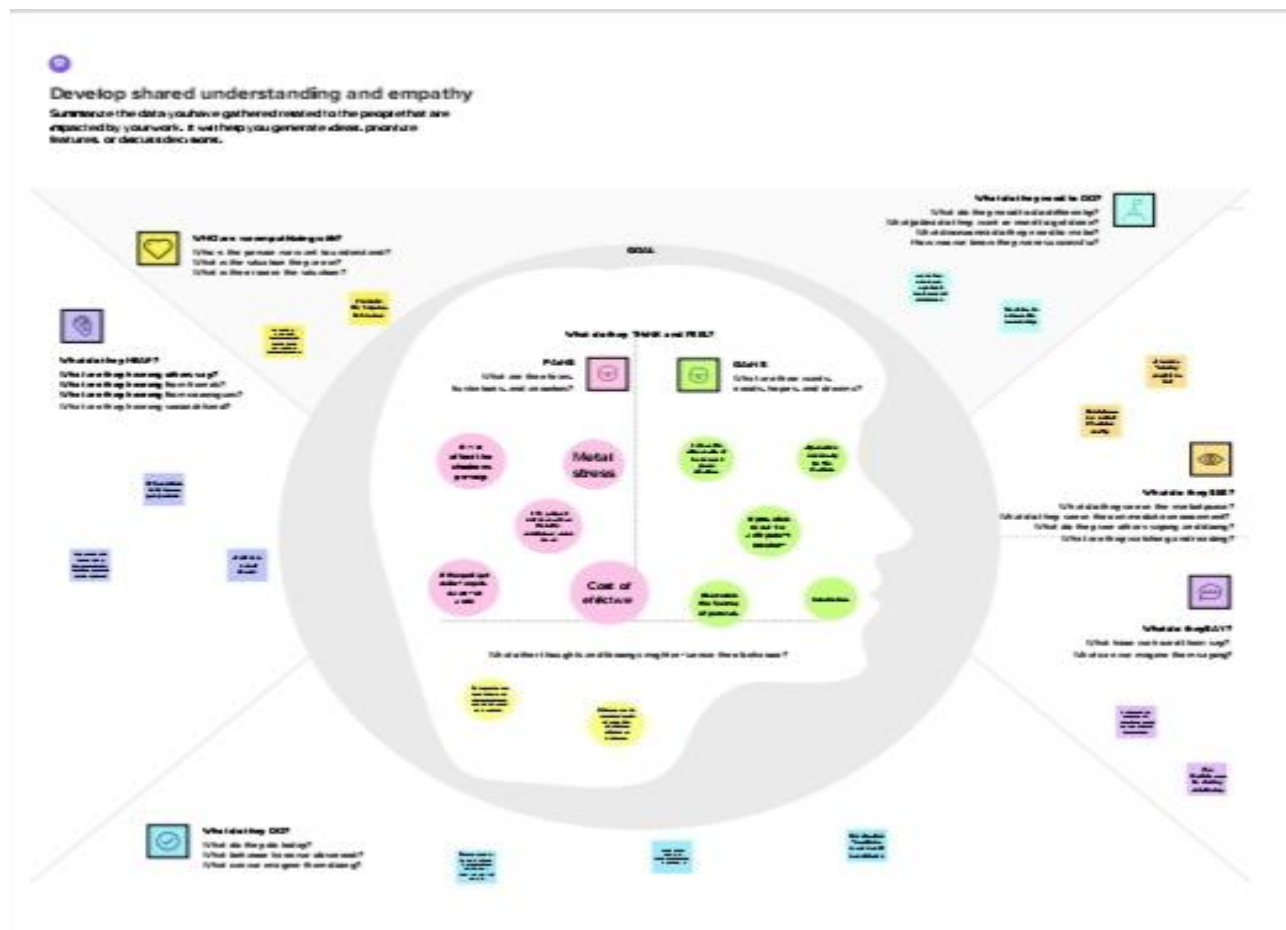
2.2 REFERENCE

S.No	Title	Reference
01	Safety of a child in large public	https://ieeexpl ore.ieee.org/ab stract/document/9031524
02	Intelligent child safety system using Machine Learning in IoT devices	https://ieeexpl ore.ieee.org/do cument/927713 6
03	Smart wearable devices for little children	https://ieeexpl ore.ieee.org/do cument/789953 1

2.3 PROBLEM STATEMENT DEFINITION

I am	Product developer	to make a device
I'm trying to	made a device	for child safety
But	will not receiving the propersignal	signal clashes
Because	out of coverage and sometechnical issue	internet issue and serverdown
Which makes me feel	Anxiety	we can't face the problemdirectly

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

2.3   IDEATION & BRAINSTORMING

3.3PROPOSED SOLUTION

s.no	Parameter	Description
1.	Problem Statement (Problem to be solved)	Child abductors continue to kidnap children from their parents/legally appointed guardians in order to obtain a ransom for their own advantage. Parents have no other option than to see the actual circumstance of their children'sintuitions. Kidnapping's crisis outcome might be exceedingly cynical and everlasting; additional precautions must be done to prevent children from abduction and its consequences
2.	Idea / Solution Description	A smart IOT tracking gadget is being created to help parents identify and monitor their children. In this project, we will create a wearable safety device that will reveal a child's current position on the parent's phone at any moment, putting a seal on their safety. The program not only allows you to

		track down your children while they are within Bluetooth range, but it also works when they are further away. Its tracker competence is exceptional if you dwell in heavily populated places such as cities or large towns. This implies that you will be able to see the identities of the devices that are participating, which helps to reduce their vulnerability in dangerous scenarios while also protecting children in emergency situations.
3.	Novelty / Uniqueness	The system software involuntarily warns the parent/guardian by diverting a text message where prompt examination is required for the youngster during a disaster. Contrary to other devices, it has plenty Of characteristics such as the development of sensors technology,availability of inter net-connected devices; data analysis algorithms making

		IOT devices acts martine mergencies without humaninter vention
4.	Social Impact Customer Satisfaction	Child kidnapping is a contentious issue all around the world. It is a complicated crime that can have serious consequences for a child's future. Parents should make certain that their children are safe and are not at risk of injury. If a scenario develops, alerts will be sent to the parents so that steps may be taken at the earliest possible moment. This ensures child safety and reduces crime rates. When parents are away from their children, they can keep them safe and stress-free. Precisely predicting the circumstances Of the children and swiftly sensing the problems around children will make parents at ease. It will be great helpful to parents who are busy workers not having time to watch over their children, an easy to operate so any one can handle it.
5.	Business Model (Revenue Model)	The most demanded in today's market,

		since children require greater protection in this day and age. The device may be purchased at a reasonable price. Our device has several innovative features and will be accessible and advantageous to everyone laying the groundwork for a significant revolution in goods. It is a device with numerous subscriptions for tracing and notification assistance.
6.	Scalability of the solution	This technology may be developed further by embedding a little camera into a smart device for increased security and protection, allowing a glance to be captured on the live footage on the parental phone during emergency situations. If a complication develops, parents may view some of the features of the kid, such as location, temperature, and heartbeat, as well as living viewpoint surrounding the children, without

		being discouraged.

3.4 PROBLEM SOLUTION FIT

Define CS, fit into CC	**CUSTOMER SEGMENTS** CS	**CUSTOMER LIMITATION** CC	**AVAILABLE SOLUTION** AS	Explore AS
	This helps the parents to track the daily activity of children and helps to find the child using GPS location.	It is fully about safety and secured electronic system for child . Less tension to Parents.	In Previous method, the model created which can be capable of handling the battery for long time. Nowadays, the system proposes a location tracking facilities and speeding monitoring using GPS, GSM with IOT technology for child safety at low cost which can be affordable by the people.	
Understand RC	**PROBLEMS/PAINS** PR	**PROBLEM ROOT/CAUSE** RC	**BEHAVIOUR** BE	Understand RC
	The child safety is a complex far reaching health priority, which requires holistics ways of identifying safety issues.	It fears frustration obstacles and understanding the working of the system. Due to this solution, the kidnapping rate will be decreased.	It mainly focus on improving parent-child interactions, home safety and child health care as well as monitoring.	
& EM	**TRIGGERS TO ACT** TR	**YOUR SOLUTION** SL	**CHANNELS OF BEHAVIOUR** CH	Extract
	The parents are working with new and various technology. So, they	The parents can monitor	Children and their parents are turning to digital solutions more than ever to	

4. REQUIREMENT ANALYSIS

4.1   FUNCTIONAL REQUIREMENT

Functional Requirements :

FR No.	Functional Requirement(Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	➢ Registration through Gmail ➢ Registration through phone number
FR-2	User Confirmation	➢ Confirmation via Email ➢ Confirmation via OTP
FR-3	App installation	➢ Installation through link ➢ Installation through play store
FR-4	Settings geo fence	➢ Setting by user to find child location
FR-5	Detecting child location	➢ Detecting location via app ➢ Detecting location via SMS
FR-6	User Interface	➢ User Login Form. ➢ Admin Login Form.

4.2 NON FUNCTIONAL REQUIREMENT

Following are the non-functional requirements of the proposed solution

NFR NO	Non-functional Requirements	DESCRIPTION
NFR-1	Usability	➢ Device have GSM can help to inform the parents or relatives about the current situations of the child by deliver the message immediately to save the child.
NFR-2	Security	➢ Make children parents more assure about their kid's security, we have a feature in our device called Geo-Fence. ➢ Whenever your child crosses that specific area, you will get an instant notification on your phone.
NFR-3	Reliability	➢ Portable ➢ Easy to use ➢ Flexibility
NFR-4	Performance	➢ Create a Child tracker which helps the parents with continuously monitoring the child's location. ➢ The notification will be sent according to the child's location to their parents or caretakers. ➢ The entire location data will be stored in the database.
NFR-5	Availability	➢ Track your child even in a crowd ➢ Get travel details of kids at any time ➢ Know the current location

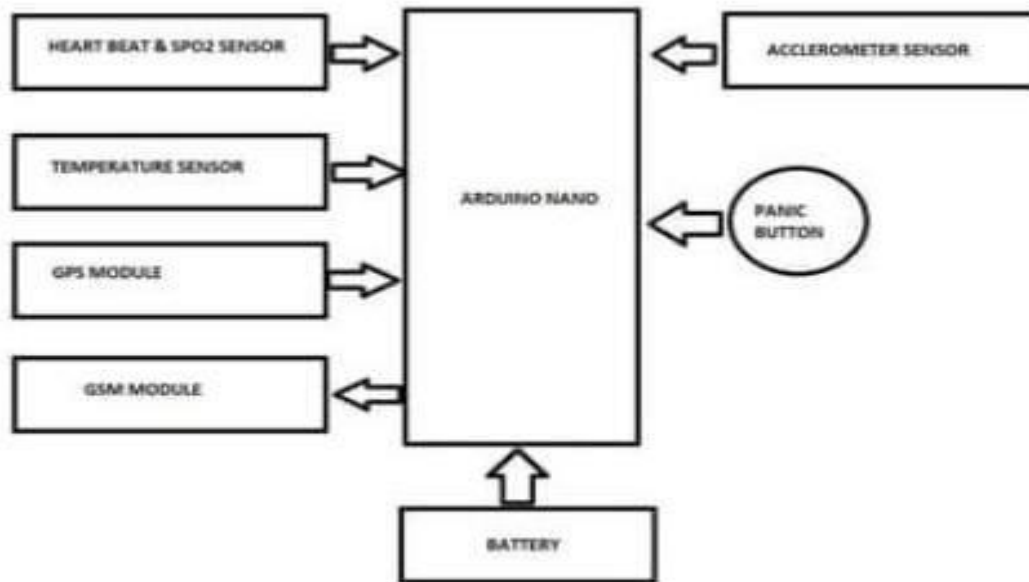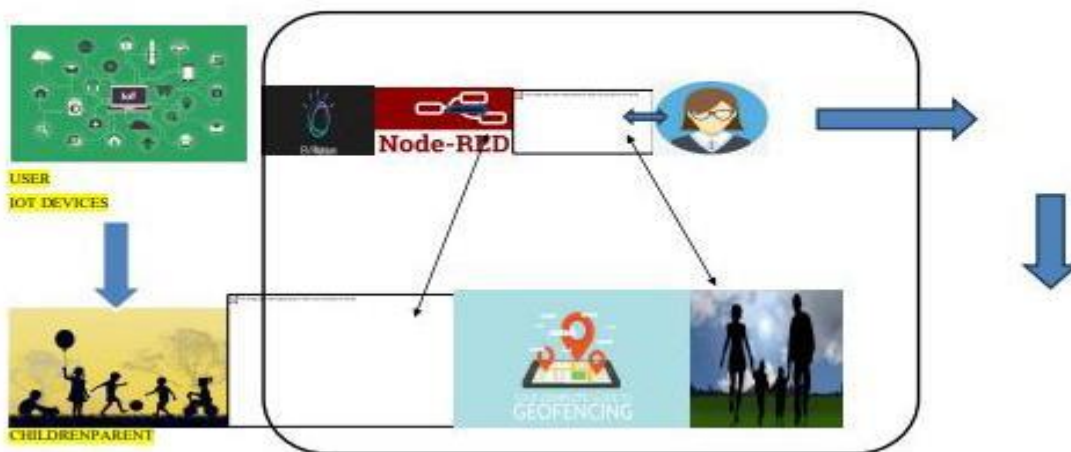# 5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAM

DATA FLOW DIAGRAM :

Fig. Block Diagram

5.2 S0LUTION AND TECHNICAL ARCHITECTURE

TechnicalArchitecture:

TheDeliverableshallincludethearchitecturaldiagramasbelowandtheinformationasperthetable1& table2

5.3 USER STORIES

List all the user stories for the product

USER STORY NUMBER	USER STORY/ TASK	ACCEPTANCE CRITERIA	PRIORITY
USN-1	To use the product when the child needs safety	Parents can access the device with lock	HIGH
USN-2	Notification will be provided when child is in trouble.	Child cannot access the device as there is a lock	HIGH
USN-3	To safeguard the child when in danger using GPS they can track their location.	Lock Access Only by parents.	LOW
USN-4	During Emergency there will be alarm	Lock Access Only by concerned persons.	MEDIUM
USN-5	When child is missing parents will be notified	Lock Access Only by Users.	HIGH

6. CODING & SOLUTIONING

6.1 FEATURE 1

1.HTML

2.JAVA SCRIPT

3.CSS

4. PYTHON

6.2 FEATURE 2

Table – 1:Components&Technologies:

S.No	COMPONENT	DISCRIPTION	TECHNOLOGY
1.	UserInterface	Userhadtoregisterandviewtheotherdevice's locatione.g.WebUI,MobileAppetc.	HTML,CSS,JavaScript
2.	IOTApplicationLogic-1	Registrationofchild'sandparent'sdeviceineachother device.	Python
3.	IOTApplicationLogic-2	Child'sGPSshouldbeinoncondition,Parent'sdeviceshouldalwa ysconnectedtoChild'sdevice.	IBMWatson Assistant
4.	IOTApplicationLogic-3	Ifchildshoutsoutofdangeritwillbenotifiedtoparent'sdevicebytra cking&convertingusing STT.	IBMWatsonSTTService
5.	Database	DataTypecanbeany formatsuchas arbitrarybinarydata,text.User- definedblobofdatasentfromCloudIOT Coretoadeviceetc.	SQlite,InFluxDB
6.	CloudDatabase	Users install tracking software on a cloud infrastructuretoimplementthedatabase.	IBMDB2,IBMCloudantetc.

| 7.	FileStorage	Fileswillbelabeledwithwhattheycontainandhowlongtheyshould bekept.	IBMBlockStorageorLocalFilesystem
8.	ExternalAPI-1	PurposeofExternalAPIusedinthedeviceistousetheinternetfor communicatingandconducting allottedoperationsefficiently	Aadhar API …..etc.
9.	ExternalAPI-2	External API used in the device to expose data thatenablesthosedevicestotransmitdatatoyour device/mobile,actingasadatainterface.	CityGeo-LocationLookupAPIetc.
10.	MachineLearningModel	IOTandmachinelearningdeliverinsightsotherwise hiddenindataforrapid,automatedresponsesandimproveddecisio nmaking	Object Recognition Model,DangerPredictionMode letc..
11.	Infrastructure(Server/Cloud)	Application Deployment on Local System / CloudLocalServerConfiguration:Wearabletechdevice CloudServerConfiguration:massivenetworkthatsupportsIOT devicesandapplications	Local, Cloud Foundry,Kubernetes,Un derlyingInfrastructureetc.

7.TESTING

7.1. USER ACCEPTANCE TESTING

MIT APPLICATION INTERFACE

PARENTAL CONTROL INTERFACE
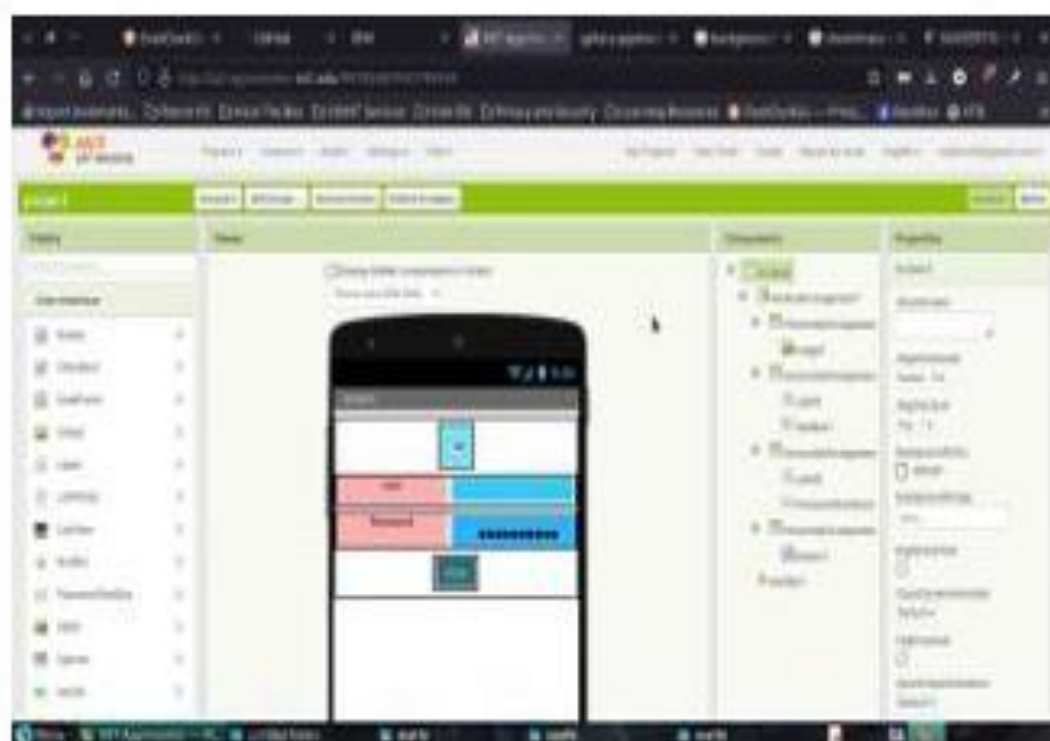
OUTPUT

LOCATION STATUS OF CHILD (EMULATOR)

LOCATION STATUS OF CHILD (MONITOR)

BLOCK DIAGRAM

8. ADVANTAGES & DISADVANTAGES

ADVANTAGES:

Provide safety to the child by allowing their parent to locate.

This application can be used to monitor the temperature and motion of the child.

Child safety can be ensured and crime rate against the child can be reduced.

It can be used to analyze the dynamic environment of the child and alerting system.

DISADVANTAGES:

- Technical difficulties.

- High cost and difficult to implement.

- Poor data quality.

- Design quality.

9. CONCLUSION

This concept demonstrates IoT based gadget for child safety monitoring and notifications is helping the parent to locate and monitor their children. If any abnormal values are read by the sensor then an SMS is sent to the parents mobile. It assists parents to monitor their children remotely. The project aims to create a system that allows the parents to keep track their children when they are out of their sight. This is done by using the IBM cloud, Node-red and IBM Watson which is used to create and store the informations of the project. The child will wear GPS enabled device which is connected to the parent's smart phone where the child safety web-application is installed.

10. FUTURE SCOPE

In this web-application if any abnormalities are read by the sensor an MMS indicating an image or video captured by the serial camera which is to be included with emergency and safety system for accurate surveillance of the child's surroundings. The future scope of the work is to implement the IoT device which ensures the complete solution for child safety problems.

For this project using the GSM technologies is beneficial as the cellular range is vast and since all the communication between wearable device and the parent is taking place via SMS, therefore no internet connectivity is required. But, still the GSM module possess the added advantages of using GPRS which enables the board to use the internet if required. Whereas for camera module which supports video streaming but due to the constraint of trying to use only SMS, therefore more number of connections will be taking place.

11. APPENDIX

Source Code

```
#include <ESP8266WiFi.h>
#include <WiFiClient.h>
#include <PubSubClient.h>
#include "DHT.h"

const char* ssid = "project1";
const char* password = "22222222";

#define DHTPIN 12
#define DHTTYPE DHT22
DHT dht(DHTPIN, DHTTYPE);

#define ID "4wau6e"
#define DEVICE_TYPE "ESP8266"
#define DEVICE_ID "PRO"
#define TOKEN "PROJECT3"

char server[] = ID ".messaging.internetofthings.ibmcloud.com";
char publish_Topic1[] = "iot-2/evt/Data1/fmt/json";
char publish_Topic2[] = "iot-2/evt/Data2/fmt/json";
char publish_Topic3[] = "iot-2/evt/Data3/fmt/json";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ID ":" DEVICE_TYPE ":" DEVICE_ID;//////a-6758fk-
gbpgmf1xf8///SyKj8fKYlys)9wQ9at

WiFiClient wifiClient;
PubSubClient client(server, 1883, NULL, wifiClient);

void setup() {
  Serial.begin(115200);
  dht.begin();
```

```
    Serial.println();
    WiFi.begin(ssid, password);
    while (WiFi.status() != WL_CONNECTED) {
      delay(500);
      Serial.print(".");
    }
    Serial.println("");
    Serial.println(WiFi.localIP());

    if (!client.connected()) {
      Serial.print("Reconnecting client to ");
      Serial.println(server);
      while (!client.connect(clientId, authMethod, token)) {
        Serial.print(".");
        delay(500);
      }
      Serial.println("Connected TO IBM IoT cloud!");
    }
}

long previous_message = 0;
void loop() {
    client.loop();
    long current = millis();
    if (current - previous_message > 3000) {
      previous_message = current;
       float ph = 7.8;
       float temp = 32;
       float tu = 1;

//       if (isnan(hum) || isnan(temp)  ){
//   Serial.println(F("Failed to read from DHT sensor!"));
//   return;
// }

      String payload = "{\"d\":{\"Name\":\"" DEVICE_ID "\"";
        payload += ",\"LOC\":";
```

```cpp
    payload += "22.4885° N, 88.3142° E";
    payload += "}}";
  Serial.print("Sending payload: ");
  Serial.println(payload);

  if (client.publish(publish_Topic1, (char*) payload.c_str())) {
    Serial.println("Published successfully");
  } else {
    Serial.println("Failed");
  }


  }
}
```