PERSONAL ASSISTANCE FOR SENIORS WHO ARE SELF-RELIANT

TEAM ID: PNT2022TMID50096

Team Member:

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Chapter - 1

INTRODUCTION

Project overview

By analyzing the data, an internet of things (IoT) based reminder system has been developed. It is designed to assist the patient who forgets to take medicine.
The system consists of an IoT enabled device with mobile application and webapplication. From both web application and mobile application get the data from user and store it in cloudant DB, those datas are stream in IBM watson IoT Platform, get those datas which stream in watson IoT platform and the Alarm remainder is done through simulation .

Purpose

- **Medication reminders serve as a good way to stay on track and uphold an appropriate schedule.**

- **It is a strategy for engaging with patients and caregivers to create a complete and accurate medication list .**

- **It is designed to assist the patient who forgets to take medicine,patients will no longer have to worry about daily medication.**

- **The application will remaind when it's time to take medicine.**

- **The mobile application is used for keeping the record in medicine details and reminding the schedule of medicine.**

Chapter-2

LITERATURE SURVEY

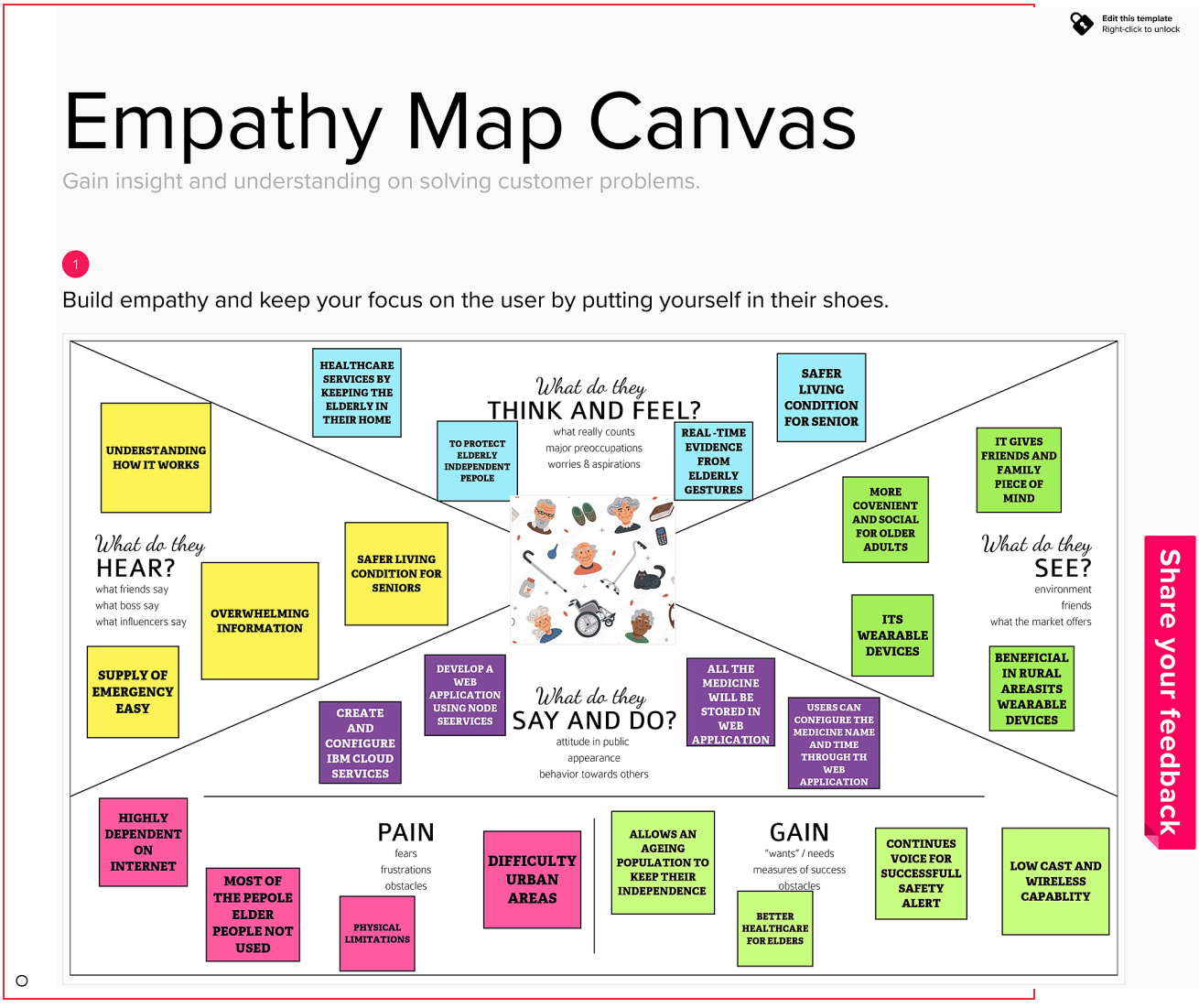
SI.NO	TITLE,AUTHOR NAME, PUBLISHED YEAR	CONCEPT	DISADVANTAGES	FUTURE WORK
1.	An IOT Based Health Care System For Elderly People by S.Pinto, J. Cabral and T.Gomes in 2017.	Aiming to contribute for a better elderly living assisting, developed We-care, a wireless IoT- ready solution for elderlypeople that is able to monitor and collect patients important vital data, making it available to medical staff and/or the designed caretaker. We-watch wristband can collect data from available sensors, such asenvironmental and bodytemperatures, pressure, humidity, light, receivedsignal strength indicator values and pushbuttons. If the wristband is detached, the system triggers an alarm to the caretaker system, alerting the situation.	Privacy and security issues relating to medicaldata and as it flows from the connected things to thecloud.	Focus on addition of new sensors to the wristband in order to collect data from other vital parameters such as blood pressure and heart rate and focus on low end devices, develop a Trust Zone - based solution. Propose in for the latest generation of (low-end) ARM cortex-M processors.

2.	Elderly Perception on the Internet of Things-Based Integrated Smart-Home System by Tae Hee Jo, Jae Hoon Ma and Seung Hyun Cha,2021.	An integrated smart home system (ISHS) is an powerful manner to enhance the quality of lifestyles of the aged. Both wearable and non-wearable IoT sensors such as Bio-medical sensors such as ECG, body temperature and galvanic skin response are also applied in smart home to provide remote healthcare monitoring to the elderly. power meters and environmental sensors have been used to assist in managing energy and indoor air quality in a smart homes,	elderly participants experienced both comfort and discomfort with the ISHS sensor-set.	Focus on non-wearable sleeping sensors that can continuously monitor the physiological levels of the elderly without causing discomfort from interruption to their sleep by wearable smart home sensors and lightweight replaceable batteries are essential variables that should be taken into consideration.
3.	An IoT Solution for Independent Elderly by Elena Borelli , Giacomo Paolini , Francesco Antoniazzi , Marina Barbiroli , Francesca Benassi , FedericoChesani , Lorenzo Chiari , Massimiliano Fantini , Franco Fuschini , Andrea Galassi , Gian Andrea Giacobone , Silvia Imbesi,2019.	In this work, a flexible and extensive digital platform for Smart Homes is presented, exploiting the most advanced technologies of the Internet of Things, such as Radio Frequency Identification, wearable electronics, Wireless Sensor Networks, and Artificial Intelligence. Thus, the mainnovelty of the paper is the system-level description of the platform flexibility allowing the interoperability of different smart devices. This research was developed within the framework of the operative projectHABITAT (Home Assistance Based on the Internet of Things for the Autonomy of Everybody), aiming at developing smartdevices to support elderly people both in their own houses and in retirement homes, and embedding them in everyday life objects, thus reducing the expenses for healthcare dueto the lower need for personal assistance, andproviding a better life quality to the elderly use	High cost and security issues.	It will be interesting to integrate the inertial sensor, ina lumbar band or common belt, in order to improve its acceptability and usability

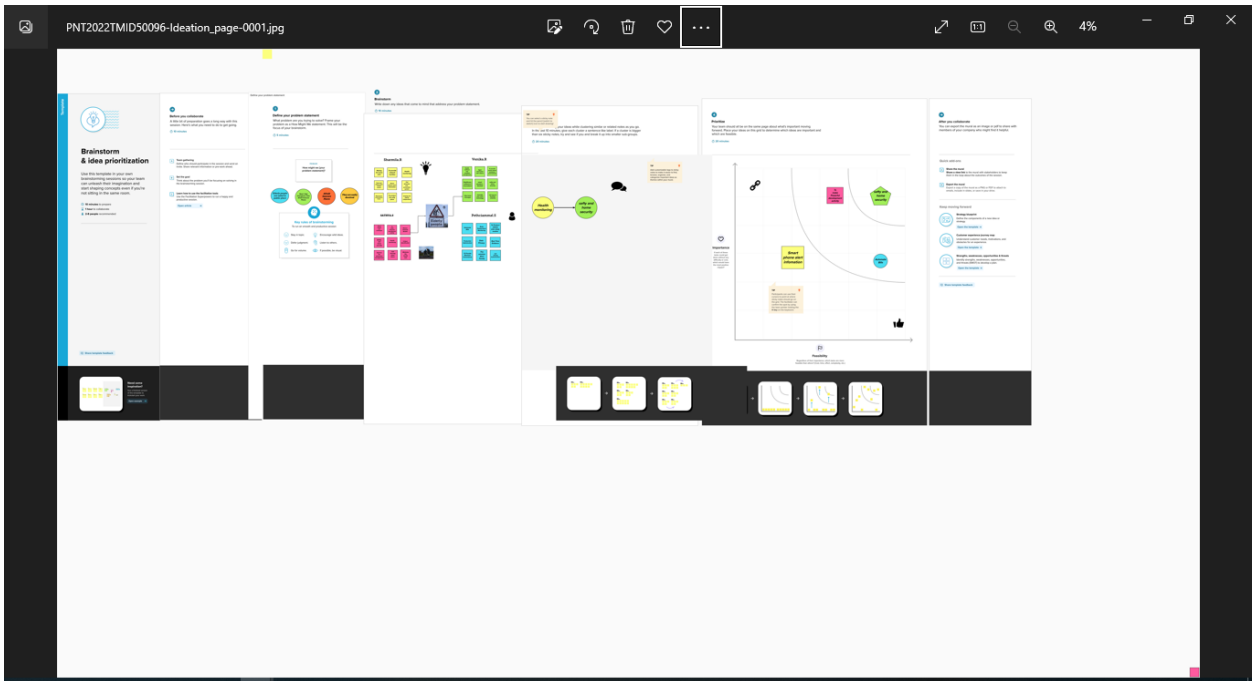
chapter 2

IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming



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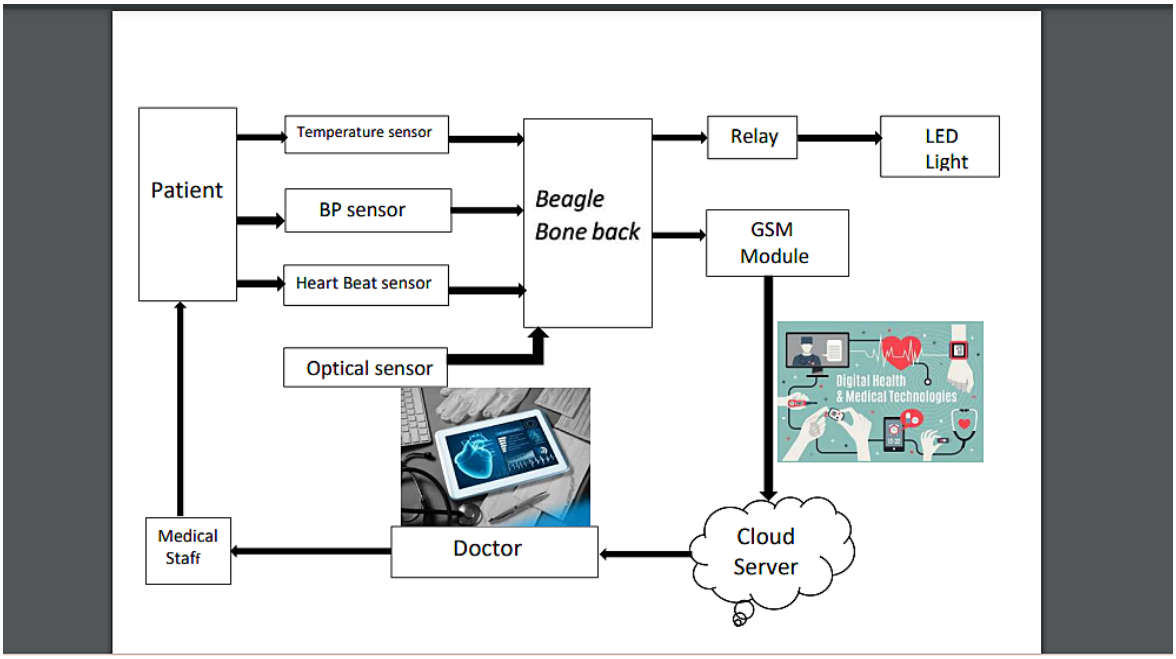
3.3 Proposed Solution

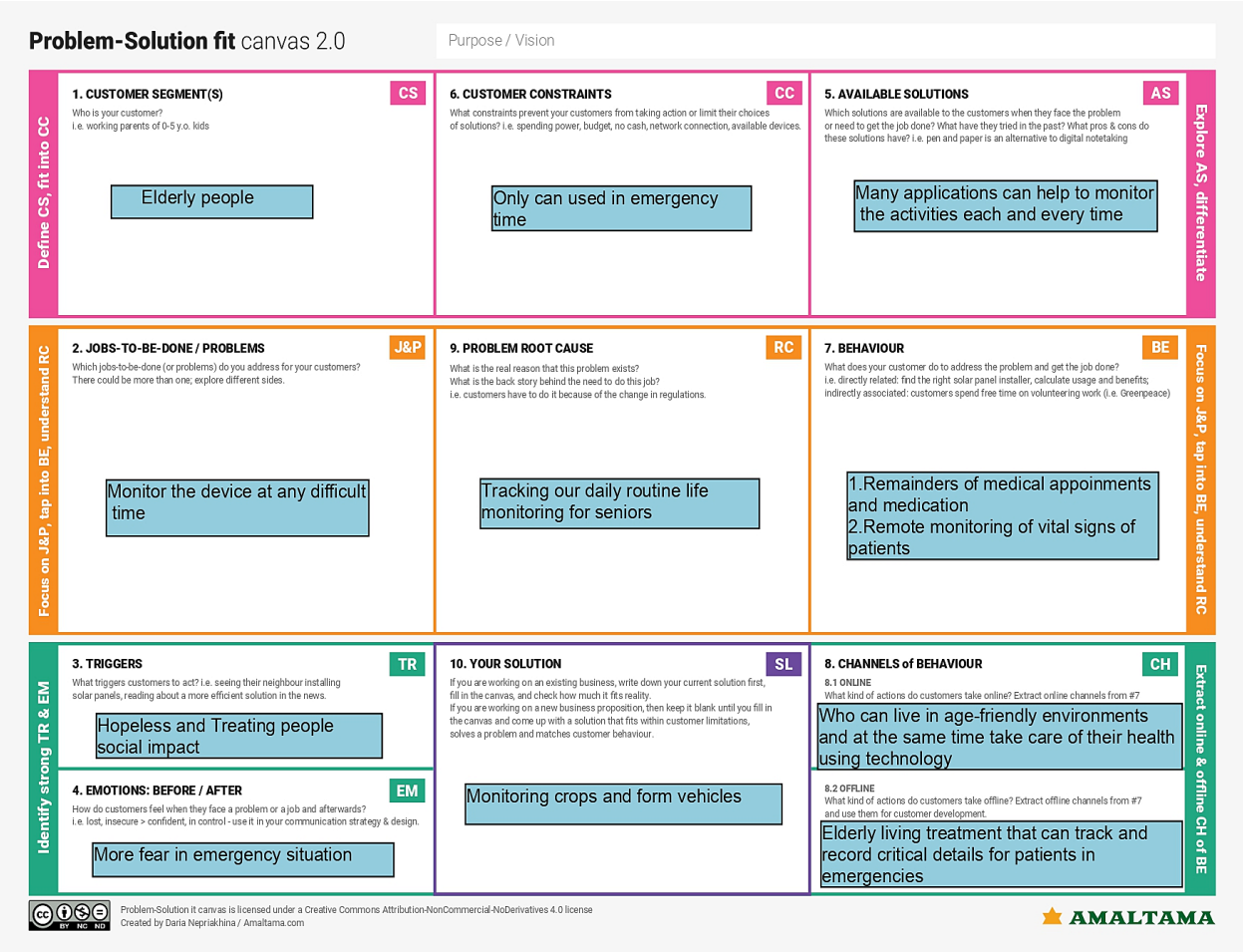
Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Older adult who have difficulty with such daily activities as bathing,grooming,cooking,eating or just getting to the bathroom often end up in hospital or nursing homes,spending huge number of healthcare dollars,according to a report department of health & human services.
2.	Idea / Solution description	To track and activities on a daily basis life in the form of health monitoring or hardware devices.user are get analysis and immediate response.Reduce the expenses for healthcare due to the lower need for personal assistance.
3.	Novelty / Uniqueness	Users can improve their treatments
4.	Social Impact / Customer Satisfaction	well treatment healthcare services , emergency time best services all needs
5.	Business Model (Revenue Model)	We can provide the automatic wearable sensor devices.
6.	Scalability of the Solution	Improvement and healthcare while making for a more customized.It is also capable of alerting carers or medical staff remotely in the track of an emergency.

5.2 .Architecture



3.4 Problem Solution fit



Chapter - 4

REQUIREMENT ANALYSIS

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 e-mail id&Mobile Number
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Web Applications	Node Service
FR-4	Configure to Device	IBM Wastson IoT Platform
FR-5	Data base	Cloudant DB
FR-6	Python Script	IBM IoT Platform

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	To help the physicians monitor and track continuously
NFR-2	**Security**	Disability remote access, incorrect access.
NFR-3	**Reliability**	More expensive time spend
NFR-4	**Performance**	Easy to moniter
NFR-5	**Availability**	Available in we-watch
NFR-6	**Scalability**	Effective manufacturing for future.

Chapter - 5

PROJECT DESIGN

5.1 Data Flow Diagrams

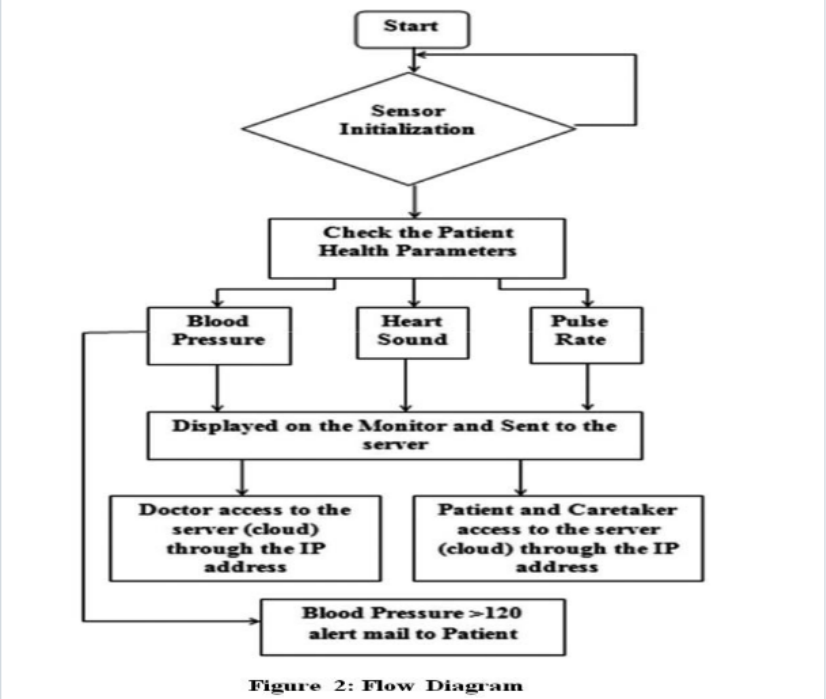


Figure 2: Flow Diagram

5.3 User Stories

User Type	Functional Requirement	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 email and Mobile number	I can accessmy wifi ,bluetooth and sensor device.	High	Sprint-1
Customer (Web User)	Web Application	USN-2	Create a web application through which the user interact with the device	Create with Node-Red Service	High	Sprint-1
Customer Care Executive	Configure to device	USN-3	Create and Configure IBM Cloud Service with devices	Create with IBM WatsonIoT platform	High	Sprint-2
Customer (Data Base)	To monitor Location data	USN-4	The entire location data will be store in Database	Create a database in Cloudant DB	Low	Sprint-2
Customer (care)	Care services	USN-5	Notifies the physician track sensor device	Develop apython IDLE	High	Sprint-1

Chapter - 6

PROJECT PLANNING & SCHEDULING

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user,Ican register for the application by entering my email, password, and confirming my password.	2	High	Sharmila
Sprint-1		USN-2	As a user, I will receive confirmation emai lonce I have registered for the application	1	Medium	Sharmila
Sprint-2	Login	USN-1	As a user, I can log into the application byentering email & password	1	High	Sathya
Sprint-3	Dashboard	USN-1	As a user,I can access my dashboard through the url provided.	1	High	Petchiamma
Sprint-4	Schedulingappointments	USN-1	During this interaction, the company often collects basic information about the patient and his or her healthcare needs. With this information, the provider is able to perform an initial assessment of urgency and schedule an appointment for the patient.	2	High	Venika

Project Tracker, Velocity & Burndown Chart: (4 Marks)

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

Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Chapter - 7

CODING & SOLUTIONING

7.1 Feature 1

Node-Red

It is built on Node. js, which is a none-blocking, lightweight I/O model making it
lightweight and efficient. Flows created in Node-RED are stored using JSON, and
can imported and exported and shared with ease

json code:

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(d.getTimezoneOffset() *
60000);\nvar offset=5.5;\nnewDate = new Date(utc + (3600000*offset));\nvar
n=newDate.toISOString()\nvar date =
n.slice(0,10)\nvar time = n.slice(11,16)\nglobal.set('time',time)\nmsg.payload=date+\"
\"+time\nreturn
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ll},{"label":"Time"
,"value":"time","type":"time","required":true,"rows":null}],"formValue":{"medicine":"","date":"","t
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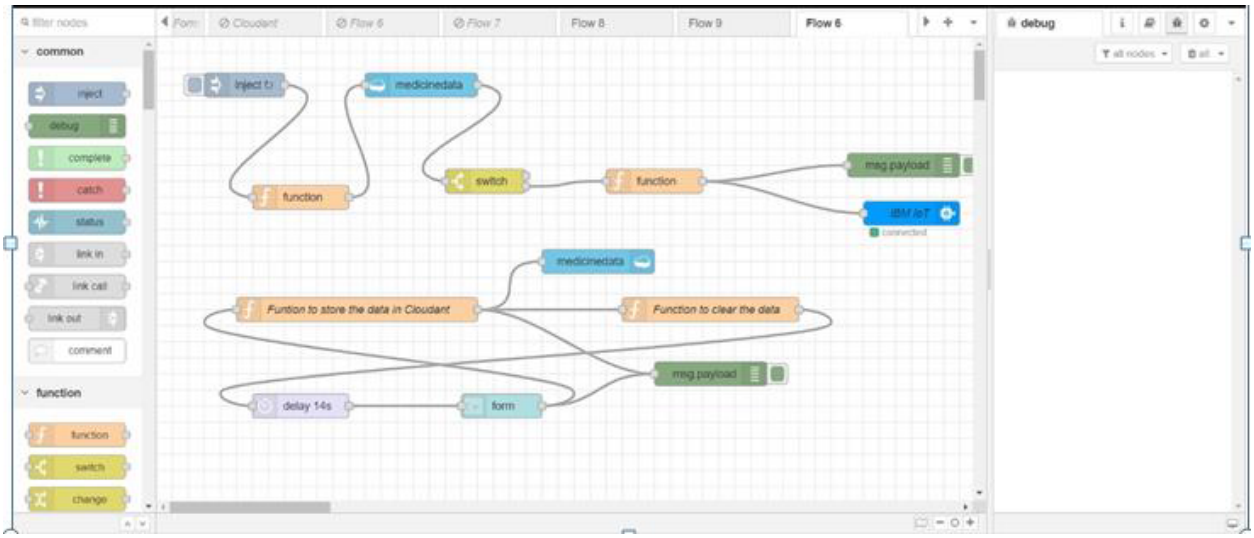

Chapter - 8

ADVANTAGES & DISADVANTAGES

Advantages :

1. Remote monitoring: Real-time remote monitoring via connected IoT devices and smart alerts can diagnose illnesses, treat diseases and save lives
in case of a medical emergency.

2. Prevention: Smart sensors analyze health conditions, lifestyle choices and
the environment and recommend preventative measures, which will reduce the occurrence of diseases and acute states.

3. Reduction of healthcare costs: IoT reduces costly visits to doctors and hospital admissions and makes testing more affordable.

4. Medical data accessibility: Accessibility of electronic medical records allow patients to receive quality care and help healthcare providers make the
right medical decisions and prevent complications.

5. Improved treatment management: IoT devices help track the administration of drugs and the response to the treatment and reduce medical
error.

6. Improved healthcare management: Using IoT devices, healthcare authorities can get valuable information about equipment and staff

Disadvantages:

1. Security and privacy: Security and privacy remain a major concern deterring users from using IoT technology for medical purposes, as health monitoring solution have the potential to be breached or hacked. The leak sensitive information about the patient's health and location and meddling with sensor data can have grave consequences, which would counter the benefits of IoT.

2. Risk of failure: Failure or bugs in the hardware or even power failure can impact the performance of sensors and connected equipment placing healthcare operations at risk. In addition, skipping a scheduled software update may be even more hazardous than skipping a doctor checkup.

3. Integration: There's no consensus regarding IoT protocols and standards, devices produced by different manufacturers may not work well together. The lack of uniformity prevents full-scale integration of IoT, therefore limiting its potential effectiveness.

4. Cost: While IoT promises to reduce the cost of healthcare in the long-terms,the cost of its implementation in hospitals and staff training is quite high.

Chapter - 9
Conclusion

It is an advanced digital era, we can also opt for expert agencies without thinking much about the distance. For example, suppose we stay in the European region. In that case, we can look for a healthcare app development company in the USA or a healthcare mobile app development firm in other states.
IoT is already practicing most of these technologies to assist healthcare in developing, and this development will proceed. Promptly than later, healthcare and the Internet of Things will become intertwined, ultimately modifying how we approach our healthcare.

Chapter - 10

FUTURE SCOPE

IoT has a lot of potentials and it’s not only in healthcare. In future challenges of IoT in healthcare, many companies are working on new ways to solve the challenges with the help of this technology to help our medical world.
It can reach every patient from all over the world and connect doctors with patients. There is no denying that IoT has already made a huge impact and is only set to grow further.
It is a matter of time before the future use of IoT in healthcare medical industry will be run mostly by IoT technology and will be treating patients in less time and low cost of treatment.

Chapter - 11

APPENDIX

Source Code :

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#include <LiquidCrystal_I2C.h>
#include "DHT.h"// Library for dht11
#define DHTPIN 15 // what pin we're connected to
#define DHTTYPE DHT11 // define type of sensor DHT 11
#define LED 2
DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and
typr of
dht connected
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "64yf7x"//IBM ORGANITION ID
#define DEVICE_TYPE "b11m3edevicetype"//Device type mentioned in ibm
watson IOT Platform
#define DEVICE_ID "b11m3edeviceid"//Device ID mentioned in ibm watson
IOT
Platform
#define TOKEN "-&EMtr7l-v-Gz2G))e" //Token
String data3="";
int buzz= 13;
//-------- Customise the above values --------
```

```
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server
Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of
event
perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd
REPRESENT
command type AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
LiquidCrystal_I2C lcd(0x27,32,2);
//---------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the
predefined
client id by passing parameter like server id,portand wificredential
void setup()// configureing the ESP32
{
Serial.begin(115200);
dht.begin();
pinMode(buzz, OUTPUT);
pinMode(LED,OUTPUT);
delay(10);
Serial.println();
wificonnect();
mqttconnect();
}
void loop()// Recursive Function
{
if (!client.loop()) {
mqttconnect();
```

```
}
}
/*.....retrieving to Cloud.....*/
void PublishData(float temp, float humid) {
mqttconnect();//function call for connecting to ibm
}
void mqttconnect() {
if (!client.connected()) {
Serial.print("Reconnecting client to ");
Serial.println(server);
while (!!!client.connect(clientId, authMethod, token)) {
Serial.print(".");
delay(500);
}
initManagedDevice();
Serial.println();
}
}
void wificonnect() //function defination for wificonnect
{
Serial.println();
Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish
the
connection
while (WiFi.status() != WL_CONNECTED) {
delay(500);
Serial.print(".");
}
Serial.println("");
Serial.println("WiFi connected");
Serial.println("IP address: ");
```

```
Serial.println(WiFi.localIP());
}
void initManagedDevice() {
if (client.subscribe(subscribetopic)) {
Serial.println((subscribetopic));
Serial.println("subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength)
{
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic);
for (int i = 13; i < payloadLength-2; i++) {
//Serial.print((char)payload[i]);
data3 += (char)payload[i];
}
Serial.println("Medicine Name: "+ data3);
if(data3 != "")
{
lcd.init();
lcd.print(data3);
digitalWrite(LED,HIGH);
tone(buzz, 100, 1000);
delay(2000);
digitalWrite(LED,LOW);
noTone(buzz);
delay(1000);
}
else
```

```
{
digitalWrite(LED,LOW);
}
data3="";
}
```

GitHub & Project Demo Link :

GitHub Link: https://github.com/IBM-EPBL/IBM-Project-38651-1660384126

Demo Link: https://drive.google.com/file/d/1RAuUN9f7EL_Suy8q5dcXsmeKdaP3sfQB/view?usp=share_link