

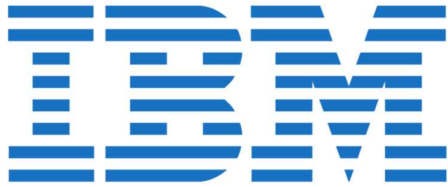
# **IBM PROJECT**

**PERSONAL ASSISTANCE WHO ARE SELF-RELIANT**

**MEDICINE REMAINDER**

**PROJECT REPORT**

EXECUTED BY:



Batch : B9-3A5E

Team Id : PNT2022TMID16541

Team Leader : Rajendran M

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# **CHAPTER-1**

## **INTRODUCTION**

### **1.1 OVERVIEW**

- Sometimes elderly people forget to take their medicine at the correct time.
- They also forget which medicine He / She should take at that particular time.
- And it is difficult for doctors/caretakers to monitor the patients around the clock. To avoid this problem, this medicine reminder system is developed.
- An app is built for the user (caretaker) which enables him to set the desired time and medicine. These details will be stored in the IBM Cloudant DB.
- If the medicine time arrives the web application will send the medicine name to the IoT Device through the IBM IoT platform.
- The device will receive the medicine name and notify the user with voice commands.

### **1.2 OBJECTIVES**

- Gain knowledge of Watson IoT Platform.
- Connecting IoT devices to the Watson IoT platform and exchanging the sensor data.
- Gain knowledge on IBM Text to Speech Service
- Explore python client libraries of Watson IoT Platform, Text to Speech Service.
- Gain knowledge on IBM Cloudant DB
- Creating a Web Application that interacts with IoT device.

### **1.3 PROBLEM STATEMENT**

- The elderly people, memory loss persons and medicine taking persons are affected by this problem.
- Suppose, the person couldn't time. It gives decrease in life span and a give lifeThreatening problems.
- The problem is, the people forgetting the medicine at a correct time and also forget which medicine to take.
- This problem is overcome by introducing medicine reminder system, it is created by Using python IDLE.
- When the system is not created, the people who taking medicine, affected by healthy. It causes his/her life duration in this world.

## **CHAPTER-2**

### **SYSTEM STUDY**

#### **2.1 Pre Requisites**

- IBM Watson IoT Platform
- Node-RED Service
- Cloudant DB

#### **SOFTWARE**

- Install the Python IDE
- Install the required python libraries:
- Install Watson IoT Python SDK.
- And connect to IBM Watson IoT Platform using Python code.
- Give the following command in command prompt : `pip install wiotp-sdk`

#### **2.2. PROJECT WORK FLOW**

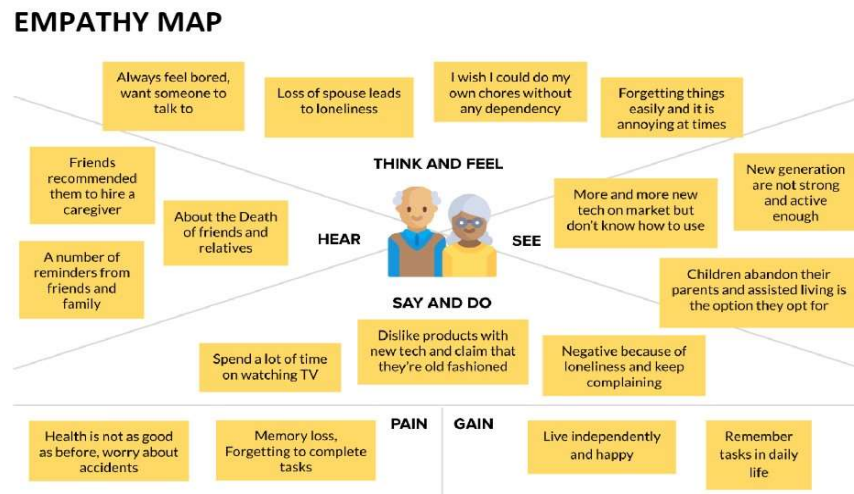
##### **Project Flow:**

- Users can configure the medicine name, and time through a web application.
- All the medicine details will be stored in the IBM Cloudant DB.
- The web application will send the medicine name to the IoT device at the desired time.
- After getting the medicine name the device will speak out the medicine name using IBM text to speech Service to intimate the user to take the medicine.

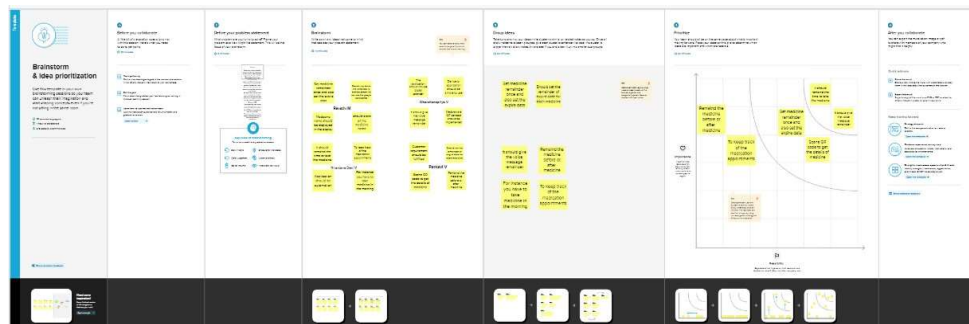
## CHAPTER – 3

### IDEATION & PROPOSED SOLUTION

#### 3.1 Empathy Map Canvas



#### 3.2 Ideation & Brainstorming





### 3.3 Proposed Solution

S.no.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Sometimes the elderly forgets to take their medication at the appropriate time. They also forget which medication He or she should take at that time. It is also difficult for doctors and caregivers to monitor patients around the clock. This medicine reminder system was created to address this issue. A user (caretaker) app is created that allows him to set the desired time and medicine
2.	Idea / Solution description	We present a smart Internet of Things-based medication reminder system. The suggested plan was specifically designed for the Android operating system. We use a reminder system for our system, which sounds an alarm when it's time to take your medication. Additionally, the user can set their medication time using an android application. There will be some features in the application that allow the user to learn more specifics about their medication. It keeps track of the medications, allowing the user to adjust how much medication to take within the application
3.	Novelty / Uniqueness	It is an easy-to-use app that reminds users to take their medications and get them refilled, warns about drug interactions, and assists caregivers in managing prescriptions for loved ones.
4.	Social Impact / Customer Satisfaction	I constructed these proto-personas, or names, based on the research findings from the user interview. They would be crucial to the rest of the design process. All design decisions may be assessed and re evaluated using these personas, keeping the user and their perspective in mind.

5.	Business Model (Revenue Model)	There is no one-size-fits-all answer when it comes to business. The model you select will depend on your target market, business objectives, and the resources you already have available.
6.	Scalability of the Solution	Where the user can set the time for their medication. There will be some features in the application that allow the user to learn more specifics about their medication. It keeps track of the medications, allowing the user to adjust how Much medication to take within the application

### 3.4 Problem Solution fit

Problem-Solution fit canvas 2.0		Purpose / Vision	Team Id : PNT2022TMD48824
Define CS, fit into CC	<b>1. CUSTOMER SEGMENT(S)</b> <span>CS</span> Who is your customer? i.e. working parents of 0-5 y.o. kids  Customer is a Old man or woman who is suffering from some health issues who doesn't have a personal care taker to give prescribed medicine on time	<b>6. CUSTOMER CONSTRAINTS</b> <span>CC</span> What constraints prevent your customer from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.  The customer is unaware of the prescription due to lack of knowledge to read a particular prescription. He/She is forgetting to take medicine on time before and after food because no care taker to remind.	<b>5. AVAILABLE SOLUTIONS</b> <span>AS</span> Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking  If the medicine time arrives the web application will send the medicine name to the IOT device. The device will receive the medicine name and notify the user with voice commands.
	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <span>J&amp;P</span> Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one, explore different sides.  Forgot to take medicine The person will be notified to take medicine in a right time using alert messages	<b>9. PROBLEM ROOT CAUSE</b> <span>RC</span> What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations.  The seniors don't have care taker to guide them to take medicine according to the prescription because care taker lead their own life with their busy schedules so there is need of additional source.	<b>7. BEHAVIOUR</b> <span>BE</span> What does your customer do to address the problem and get the job done? i.e. directly related, find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend less time on volunteering work (i.e. Greenpeace)  The seniors directly seek for help to allot a person or any other devices which is based on reminding the seniors about the medicines which should be taken and monitor around the clock.
Identify strong TR & EM	<b>3. TRIGGERS</b> <span>TR</span> What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the press. Promote the usage of app through advertisements Seniors with learning disabilities may also triggers the usage of app  <b>4. EMOTIONS: BEFORE / AFTER</b> <span>EM</span> How do customers feel when they face a problem or a job and afterwards? i.e. lost, insecure > confident, in control > use it in your communication strategy & design. Feeling taking correct medicines at correct time After the usage of app they feel healthy	<b>10. YOUR SOLUTION</b> <span>SL</span> If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour. An app is build for the user which enables him/her to set the desired time and medicine name to the IOT device. The device will receive the medicine name and notify the user with voice commands.	<b>8. CHANNELS of BEHAVIOUR</b> <span>CH</span> <b>8.1 ONLINE</b> What kind of actions do customers take online? Extract online channels from #7 Upload details about medicine and get alert messages on correct time  <b>8.2 OFFLINE</b> What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. Setting alarm at the correct time
	<div>            Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 license            Created by Daria Negrahina / Amaltama.com         </div> <div>  </div>		



## Chapter - 4

### REQUIREMENT ANALYSIS

#### 4.1 Functional requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form in the application.
FR-2	User Confirmation	Confirmation within application.
FR-3	Internet Connectivity	Users should have a stable internet connection to access the app.
FR-4	Data management	All the data are managed & manipulated using the cloud.
FR-5	User Input management	All the user's data are gotten with the help of a text field in the dashboard in the app.
FR-6	Acknowledgement	All the data are stored in the cloud via the app and acknowledgment will be given to the user.

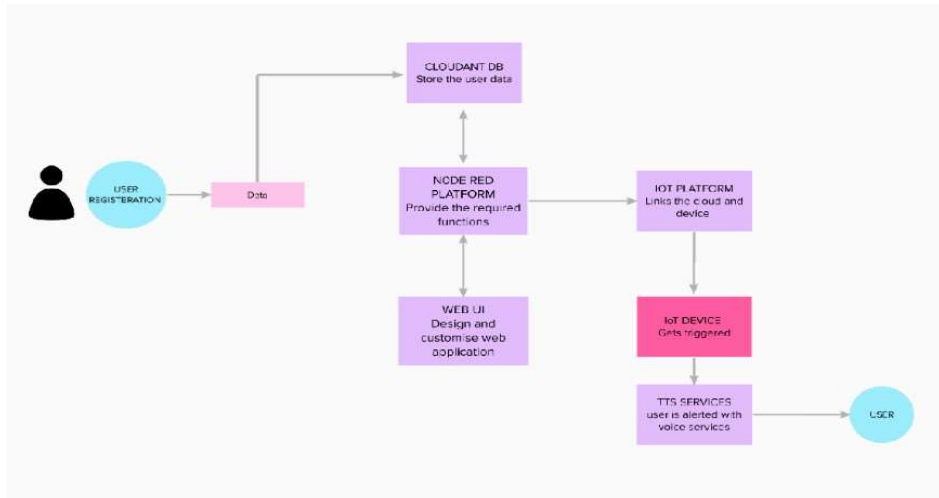
#### 4.2 Non-Functional requirements

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The app is made with a simple UI, so the elders can easily use the app.
NFR-2	Security	All the data are stored in the IBM cloudant DB, so the user's data will be secured.
NFR-3	Reliability	As the data are stored in the IBM cloud, the user's data will be reliable and confidential.
NFR-4	Performance	As the app uses virtual sensors, so the accuracy and performance will be high.

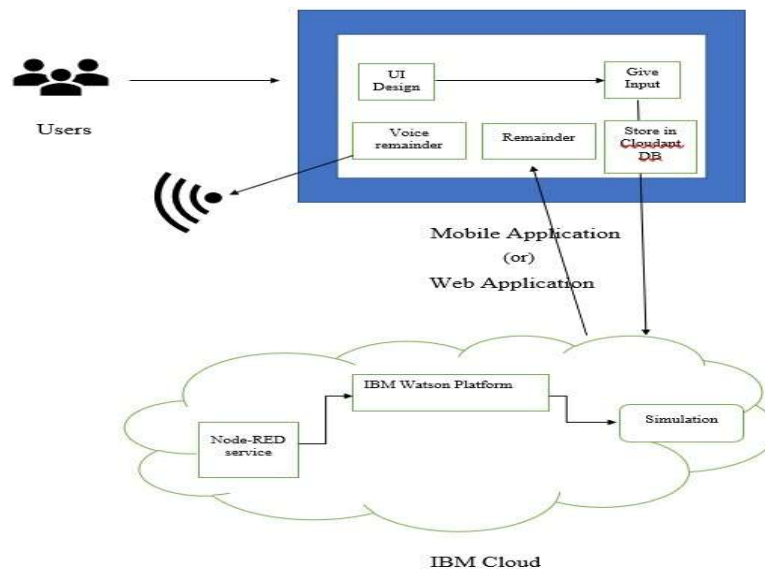
## Chapter - 5

### PROJECT DESIGN

#### 5.1 Data Flow Diagrams



#### 5.2 Solution & Technical Architecture



### 5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Senior user)	caretaker	USN-1	As a user, I want to take Medicines on time and monitor my health	I want to take medicines on time	High	Sprint-1
Customer (Diabetes Patient)	Smart medicine box	USN-2	As a user, I want to take my tablets on time by voice command	I want to take my tablets on time by voice command	High	Sprint-1
Customer (Thyroid Patient)	Smart medicine box	USN-3	As a user, my patient needs to take medicines on time and monitoring the activity	My patient needs to take medicines on time	Medium	Sprint-2
(Coma Patient )	Caretaker	USN-4	As a user, my patient needs medication time and prescription should load in database for upcoming week	My patient medication time and prescription should be in database list	low	Sprint-4

## Chapter - 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	Registration	USN-1	As a user, I can register for the application by entering my email, and password, and confirming my password.	3	High	Rajendran M, Pradeep Raj s Shree Varshan T Subashchandrabose K
Sprint-1	Confirmation Email	USN-2	As a user, I will receive a confirmation email once I have registered for the application	4	High	Rajendran M, Pradeep Raj s Shree Varshan T Subashchandrabose K
Sprint-1	Authentication	USN-3	As a user, I can register for the application through Gmail and mobile app.	4	Medium	Rajendran M, Pradeep Raj s Shree Varshan T Subashchandrabose K
Sprint-1	Login	USN-4	As a user, I can log into the application by entering email & password	3	High	Rajendran M, Pradeep Raj s Shree Varshan T Subashchandrabose K
Sprint-1	Dashboard	USN-5	As a user, I need to be able to view the functions that I can perform	4	High	Rajendran M, Pradeep Raj s Shree Varshan T Subashchandrabose K
Sprint-2	Notification	USN-1	As a user, I should be able to notify my parent and guardian in emergency situations	10	High	Rajendran M, Pradeep Raj s Shree Varshan T Subashchandrabose K

Sprint-2	Store data	USN-2	As a user, I need to continuously store my location data into the database.	10	Medium	Rajendran M,Pradeep Raj s Shree Varshan T Subashchandrabose K
Sprint-3	Communication	USN-3,1	I should be able to communicate with user	6	Low	Rajendran M,Pradeep Raj s
Sprint-3	IoT Device – Watson communication	USN-1,4	The data from IoT device should reach IBM Cloud	7	Medium	Rajendran M,Pradeep Raj s
Sprint-3	Node RED-Cloudant DB communication	USN-5,2	The data stored in IBM Cloud should be properly integrated with Cloudant DB	7	High	Rajendran M,Pradeep Raj s Shree Varshan T Subashchandrabose K
Sprint-4	User – WebUI interface	USN-1,4	The Web UI should get inputs from the user	6	High	Rajendran M,Pradeep Raj s Shree Varshan T Subashchandrabose K
Sprint-4	Alarm	USN-2,3,5	The Alarm of the remainder should be done based on the medication time	7	High	Rajendran M,Pradeep Raj s Shree Varshan T Subashchandrabose K

## 6.2 Sprint Delivery Schedule

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	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

## 6.3 Reports from JIRA

The screenshot displays the Jira Software interface for a project named 'Medicine Remainder'. The main view is the 'MEDICINE board', which is a Kanban board. The board is divided into three columns: 'TO DO', 'IN PROGRESS', and 'DONE 4 ISSUES'. The 'DONE 4 ISSUES' column contains four items, each representing a sprint and its associated issue: Sprint 1 (MEDICINE-1), Sprint 2 (MEDICINE-4), Sprint 3 (MEDICINE-5), and Sprint 4 (MEDICINE-6). Each item has a status icon (N, D, S, S) and a checkmark. The left sidebar shows the project navigation menu with options like Roadmap, Board, Code, Project pages, Add shortcut, and Project settings. The top navigation bar includes Jira Software, Your work, Projects, Filters, Dashboards, People, Apps, and a Create button. A search bar and a notification banner are also visible.

## Chapter –7

### CODING & SOLUTIONING

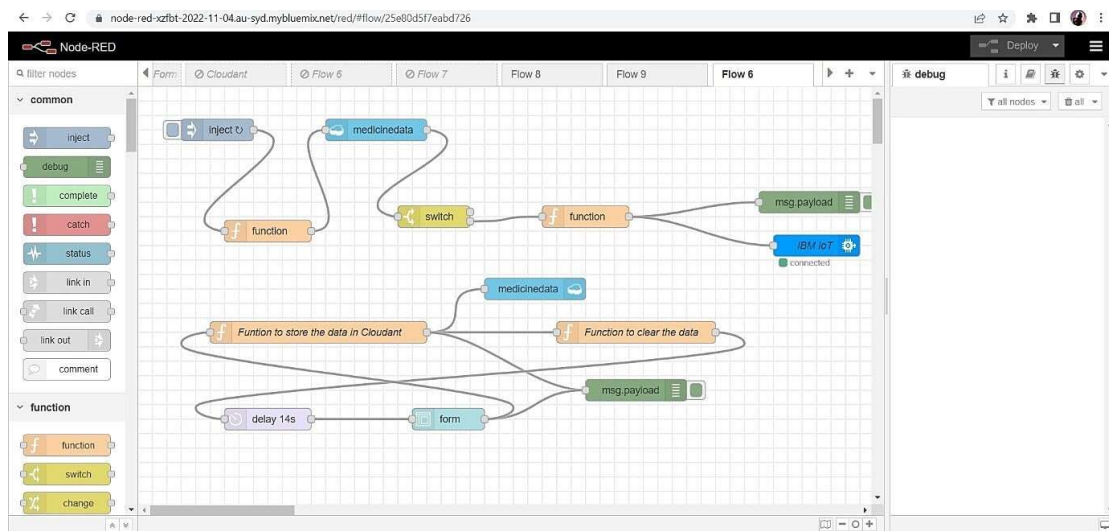
#### 7.1 Feature 1

##### Node-Red

It is built on Node.js, which is a non-blocking, lightweight I/O model, making it lightweight and efficient. Flows created in Node-RED are stored using JSON, and can be imported and exported and shared with ease.

##### Json File:

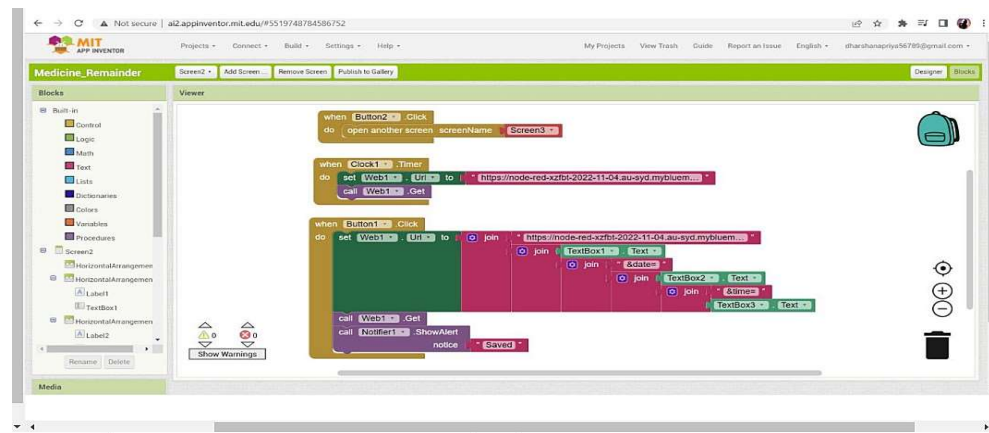
[https://drive.google.com/file/d/104GP3MHhTZMsZW3nU3E8LwmNsKSNWd4/view?usp=share\\_link](https://drive.google.com/file/d/104GP3MHhTZMsZW3nU3E8LwmNsKSNWd4/view?usp=share_link)



## 7.2 Feature 2

### MIT App inventor

MIT App Inventor is an online platform designed to teach computational thinking concepts through development of mobile applications. Students create applications by dragging and dropping components into a design view and using a visual blocks language to program application behavior



## 7.3 Database Schema (if Applicable)

<div>medicinedata</div> <div>All Documents</div> <div>Query</div> <div>Permissions</div> <div>Changes</div> <div>Design Documents</div>	<div>Document ID</div> <div>Options</div> <div>{ } JSON</div> <div>Table</div> <div>Metadata</div> <div>{ } JSON</div> <div>Create Document</div> <table><thead><tr><th>_id</th><th>medicine</th></tr></thead><tbody><tr><td>18/11/2022 10:47 AM</td><td>ishaq</td></tr><tr><td>2022-11-13 17:13</td><td>acetaminophen</td></tr><tr><td>2022-11-13 17:33</td><td>Paracetamol</td></tr><tr><td>2022-11-13 18:32</td><td>Insulin</td></tr><tr><td>2022-11-13 19:40</td><td>Glipizide</td></tr><tr><td>2022-11-16 23:09</td><td>Metformin</td></tr><tr><td>2022-11-16 23:36</td><td>Antibiotics</td></tr></tbody></table>	_id	medicine	18/11/2022 10:47 AM	ishaq	2022-11-13 17:13	acetaminophen	2022-11-13 17:33	Paracetamol	2022-11-13 18:32	Insulin	2022-11-13 19:40	Glipizide	2022-11-16 23:09	Metformin	2022-11-16 23:36	Antibiotics
_id	medicine																
18/11/2022 10:47 AM	ishaq																
2022-11-13 17:13	acetaminophen																
2022-11-13 17:33	Paracetamol																
2022-11-13 18:32	Insulin																
2022-11-13 19:40	Glipizide																
2022-11-16 23:09	Metformin																
2022-11-16 23:36	Antibiotics																



## Chapter - 8

### TESTING

#### 8.1 Test Cases

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status
SplashScreen_TC_O1	Functional	Home Page	Verify the splash screen is working good	1.Enter URL and click go 2.The splash screen will open 3.click the image in splash screen	<a href="https://drive.google.com/file/d/13vcj8LGrt4fgnGKDyyosiMQbrMZFvS2/view?usp=share_link">https://drive.google.com/file/d/13vcj8LGrt4fgnGKDyyosiMQbrMZFvS2/view?usp=share_link</a>	Splash screen should display	Working as expected	Pass
HomePage_TC_OO2	UI	Home Page	Verify the UI elements in Home screen	1.Enter URL and click go 2.Enter the medicine details to store data: a.Enter the medicine name b.Enter the Date c.Enter the Time 3. click next button to move to the next page	<a href="https://drive.google.com/file/d/13vcj8LGrt4fgnGKDyyosiMQbrMZFvS2/view?usp=share_link">https://drive.google.com/file/d/13vcj8LGrt4fgnGKDyyosiMQbrMZFvS2/view?usp=share_link</a>	Application should show below UI elements: a.Name of Medicine text box b.Date text box c.Time text box d.Next button	Working as expected	pass
RemainderPage_TC_OO3	Functional	Home page	Verify user is able to get the remainder alarm with medicine name displayed	1.Enter URL and click go 2. automatically display the medicine data in the text box 3.The alarm should ring	It' Time to Take Medicine Glipizide	Get the remainder alarm	Working as expected	pass

				at the user entered time				
DB_TC_O04	Functional	Login page	verify the data is stored in cloudant DB	1.Enter URL and click go 2.go to cloudant DB 3.Verify the data	{ "id": 2022-11-18 21:23, "medicine":Glipizide }	The Medicine data should stored in the DB	Working as expected	pass
Simulation_TC_OO5	Functional	Login page	Verify the simulation is Working Good	1.Enter URL and click go 2.Run the simulation 3.The LED should Blink 4.The Alarm should ring	Glipizide	The Alarm should come through buzzer and the LED also Blink then the Medicine name should display in the LED	Working as expected	pass

## 8.2 User Acceptance Testing

### 8.2.1 Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the project-personal assistance for seniors who are self reliant at the time of the release to User Acceptance Testing(UAT).

### 8.2.2 Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved.

Resoluti on	Severi ty 1	Severi ty 2	Severi ty 3	Severi ty 4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

### 8.2.3 Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested.

Section	Total Cases	Not Tested	Fa il	Pass
Print Engine	2	0	0	2
Client Application	2	0	0	2
Security	1	0	0	1

[illegible]

## Chapter - 10

### ADVANTAGES & DISADVANTAGES

#### 10.1 Advantages :

- **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.
- **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.
- **Reduction of healthcare costs:** IoT reduces costly visits to doctors and hospital admissions and makes testing more affordable.
- **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.
- **Improved treatment management:** IoT devices help track the administration of drugs and the response to the treatment and reduce medical error.
- **Improved healthcare management:** Using IoT devices, healthcare authorities can get valuable information about equipment and staff

## 10.2 Disadvantages:

- **Security and privacy:** Security and privacy remain a major concern deterring users from using IoT technology for medical purposes, as health monitoring solutions have the potential to be breached or hacked. The leak of 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.
- **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's checkup.
- **Integration:** There's no consensus regarding IoT protocols and standards, so 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.
- **Cost:** While IoT promises to reduce the cost of healthcare in the long-term, the cost of its implementation in hospitals and staff training is quite high.

## **Chapter - 11**

### **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 - 12**

### **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 -13

### 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
mqtt
conn
ect()
{
  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 & Demo Link**

GitHub: <https://github.com/IBM-EPBL/IBM-Project-40331-1660628010>

Demo: [https://drive.google.com/file/d/1GDBdQowLjM0sHxBy5Si3aOicYOyg5DNs/view?usp=share\\_link](https://drive.google.com/file/d/1GDBdQowLjM0sHxBy5Si3aOicYOyg5DNs/view?usp=share_link)