PERSONAL ASSISTANCE FOR SENIORS WHO ARE SELF-RELIANT

TEAM ID: PNT2022TMID48824

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 web application. 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	Existing	Problem Statement Definition	References
1	Health Alert and Medicine Remainder using Internet of Things	This paper proposes a model of automatic medicine reminder and apothecary system. This system can relieve unevenness in taking recommended dosage of pills on time prescribed by the doctor and switch from ways primarily reliant with the memory of the human being insignificant regulation, hence people can be freed doing wrong things due to human error like taking pill at different time with incorrect dosage. Various medicine boxes exist in the market.	1. Eric J. MacLaughlin et al., "Assessing medication adherence in the elderly", *Drugs & aging 22.3*, pp. 231-255, 2005. *2.* Automatic pill dispenser and method of administering medical pills, Mar 1986.
2	Medicine Assistant and Diet Remainder for Secure Healthcare	This assistant helps the end-user to get the medicines and diet remainders as per their daily schedule. There are a lot of remainders available in the market, but this work mainly helps elderly people who are not aware of modern technology, visually challenged people, and people suffering from Alzheimer's	1. F. M. Belenguer, A. Martínez-Millana, F. S. C. Ramón and A. Mocholí-Salcedo 2. A. Carullo and M. Parvis, "An ultrasonic sensor for distance measurement in automotive applications"

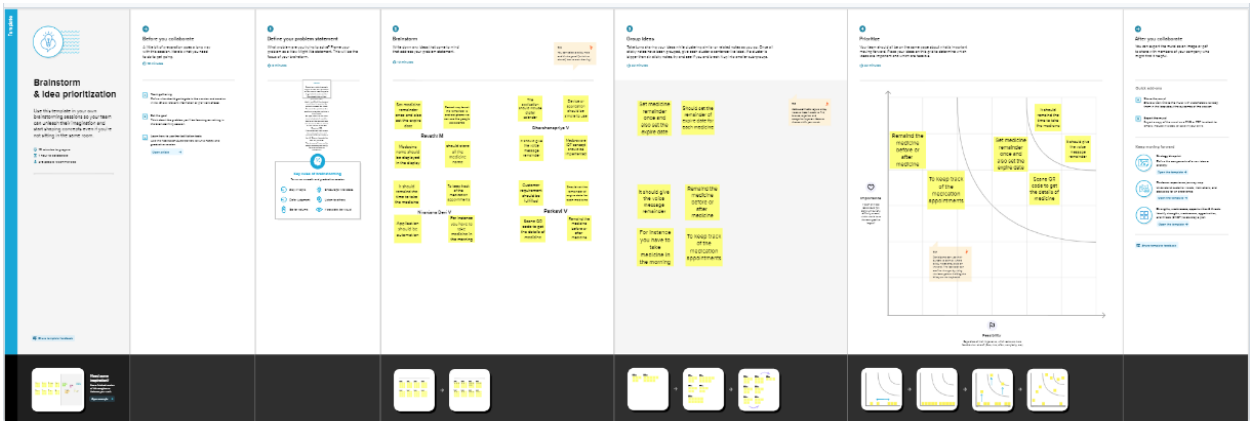
3	Design & Implementation of an Automated Reminder Medicine Box for Old People and Hospital	The device has twenty-one airtight compartments to keep the medicine. The attendant of a patient or nurse can make a weekly plan of medicine remainder by keeping medicine in twenty-one compartments for taking medicine three times per day. The attendant can manually set the time of taking medicine or load a text file in an SD card mentioning the time for taking medicine of every compartment	1. Aakash Sunil Salgia, K. Ganesan and Raghunath Ashwin, "Smart pill box" 2. S. Mukund and N. K. Srinath, "Design of Automatic Medication Dispenser"
4	Intelligent and Safe Medication Box In Health IoT Platform for Medication Monitoring System with Timely Remainders	The progress in IoT health care is considered to be a massive contribution to the elderly people. The elderly people and people who are suffering from chronic diseases need to intake tablets regularly on timely basis. Care takers with their busy daily routine may forget the instructions and time about pills which are prescribed for patient. Also care takers who are dealing increased number of patients may feel hectic to sort the medicine list for corresponding patients at proper time	1. S. V. Zanjal and G. R. Talmale, "Medicine reminder and monitoring system for secure health using IOT" 2. L. M. Dang, M. Piran, D. Han, K. Min and H. Moon, "A survey on internet of things and cloud computing for healthcare"

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 reevaluated 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

Chapter - 4

REQUIREMENT ANALYSIS

4.1 Functional requirement

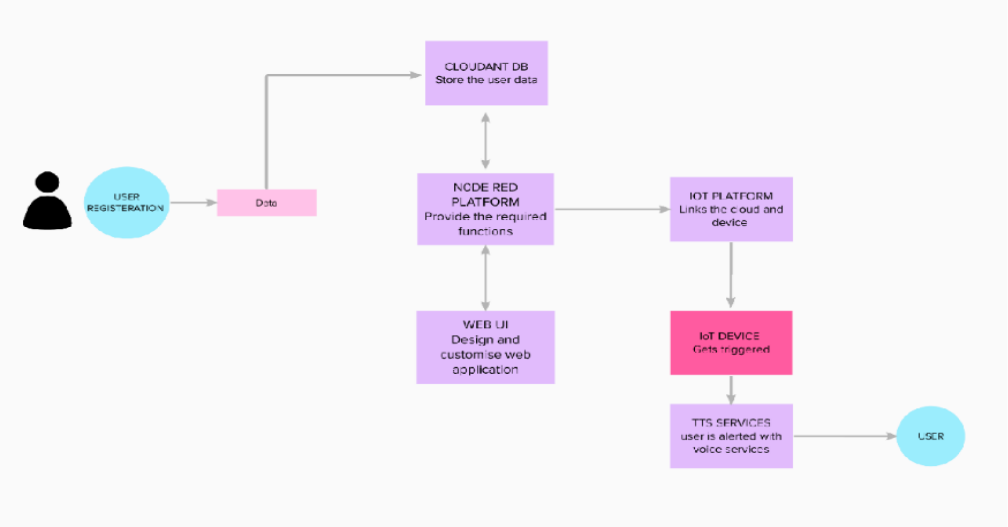
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form in the application.
FR-2	User Confirmation	Confirmation within application.
FR-3	Internet Connectivity	Users should have a stable internet connection to access the app.
FR-4	Data management	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

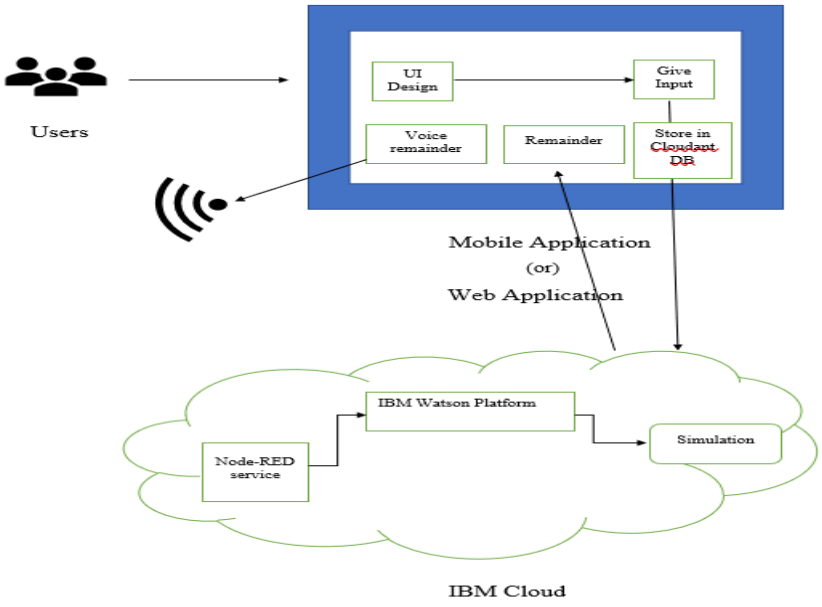
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The app is made with a simple UI, so the elders can easily use the app.
NFR-2	**Security**	All the data are stored in the IBM cloudant DB, so the user's data will be secured.
NFR-3	**Reliability**	As the data are stored in the IBM cloud, 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.
NFR-5	**Availability**	The data stored in the cloud is available for all the time, So the users can avail the app all the time.
NFR-6	**Scalability**	Even though the users count increases, the app will be more scalable.

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
Customer						

(Coma Patient)	Caretaker	USN-4	As a user, my patient needs medication time and prescription should load indatabase for upcoming week	My patient medication time and prescription should be in database list	low	Sprint-4
Customer (Disabled People’s)	Smart medicinebox	USN-5	As a user ,i need to take my medicine in nearby places with light notification	I need to take my medicine in nearby places with light notification	Medium	Sprint-3

Chapter - 6
PROJECT PLANNING & SCHEDULING

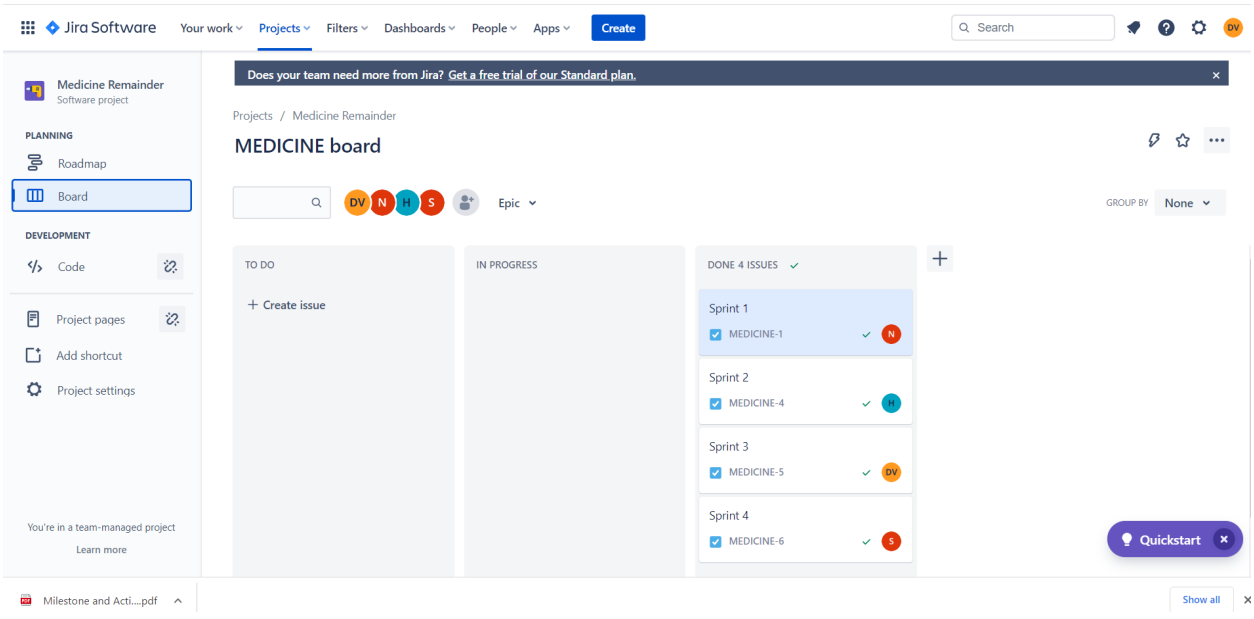
6.1 Sprint Planning & Estimation

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	Parkavi V
Sprint-1	Confirmation Email	USN-2	As a user, I will receive a confirmation email once I have registered for the application	4	High	Niranjana Devi V
Sprint-1	Authentication	USN-3	As a user, I can register for the application through Gmail and mobile app.	4	Medium	Dharshanapriya V
Sprint-1	Login	USN-4	As a user, I can log into the application by entering email & password	3	High	Revathi M
Sprint-1	Dashboard	USN-5	As a user, I need to be able to view the functions that I can perform	4	High	Dharshanapriya V Niranjana Devi V
Sprint-2	Notification	USN-1	As a user, I should be able to notify my parent and guardian in emergency situations	10	High	Parkavi V Revathi M
Sprint-2	Store data	USN-2	As a user, I need to continuously store my location data into the database.	10	Medium	Niranjana Devi V
Sprint-3	Communication	USN-3,1	I should be able to communicate with user	6	Low	Revathi M
Sprint-3	IoT Device – Watson communication	USN-1,4	The data from IoT device should reach IBM Cloud	7	Medium	Niranjana Devi V
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	Dharshanapriya V
Sprint-4	User – WebUI interface	USN-1,4	The Web UI should get inputs from the user	6	High	Dharshanapriya V Revathi M
Sprint-4	Alarm	USN-2,3,5	The Alarm of the remainder should be done based on the medication time	7	High	Parkavi V Niranjana Devi M

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



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:

[{"id":"25e80d5f7eabd726","type":"tab","label":"Flow 6","disabled":false,"info":"","env":[]},{"id":"5f4d0ada73cc55c1","type":"inject","z":"25e80d5f7eabd726","name":"","props":[{"p":"payload._id","v":"","vt":"date"},{"p":"topic","vt":"str"}],"repeat":"1","crontab":"","once":false,"onceDelay":0.1,"topic":"","x":110,"y":60,"wires":[["9c8adefc6d1779c4"]]},{"id":"9c8adefc6d1779c4","type":"function","z":"25e80d5f7eabd726","name":"","func":"var d= new Date();\nvar utc=d.getTime() + (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 msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":180,"y":200,"wires":[["8f7d76639d5f94dd"]]},{"id":"8f7d76639d5f94dd","type":"cloudant in","z":"25e80d5f7eabd726","name":"","cloudant":"f42e6b50.00d088","database":"medicinedata","service":"node-red-fysyl-2022--cloudant-1667109493143-42012","search":"_id_","design":"","index":"","x":330,"y":60,"wires":[["2fb55de161698808"]]},{"id":"2fb55de161698808","type":"switch","z":"25e80d5f7eabd726","name":"","property":"payload","propertyType":"msg","rules":[{"t":"null"},{"t":"else"}],"checkall":"true","repair":false,"outputs":2,"x":410,"y":180,"wires":[["f95865b1d9e1b711"],["551edaf7fb9ec70d"]]},{"id":"551edaf7fb9ec70d","type":"function","z":"25e80d5f7eabd726","name":"","func":"msg.payload={\"medicine\":msg.payload.medicine}\nglobal.set(\"medicine\",msg.payload.medicine);\nreturn msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":620,"y":180,"wires":[["1e02d85ab74e642c","102f967d15928f52"]]},{"id":"1e02d85ab74e642c","type":"debug","z":"25e80d5f7eabd726","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","statusVal":"","statusType":"auto","x":930,"y":160,"wires":[]},{"id":"102f967d15928f52","type":"ibmiot out","z":"25e80d5f7eabd726","authentication":"apiKey","apiKey":"25ef956a02333189","outputType":"cmd","deviceId":"b11m3edeviceid","deviceType":"b11m3edevicetype","eventCommandType":"command","format":"String","data":"medicinedata","qos":0,"name":"IBM IoT","service":"registered","x":940,"y":220,"wires":[]},{"id":"6da02a687e43c04b","type":"function","z":"25e80d5f7eabd726","name":"Funtion to store the data in Cloudant","func":"var d=msg.payload.date\nvar t=msg.payload.time\nmsg.payload={\n   \"medicine\": msg.payload.medicine,\n   \"_id\":d+\" \"+t\n}\nreturn msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":250,"y":340,"wires":[["7b0e41295a320ce5","d7

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equired":true,"rows":null},{"label":"Date","value":"date","type":"date","required":true,"rows":null},{"label":"Time"
,"value":"time","type":"time","required":true,"rows":null}],"formValue":{"medicine":"","date":"","time":""},"paylo
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account"},{"id":"25ef956a02333189","type":"ibmiot","name":"api","keepalive":"60","serverName":"64yf7x.messag
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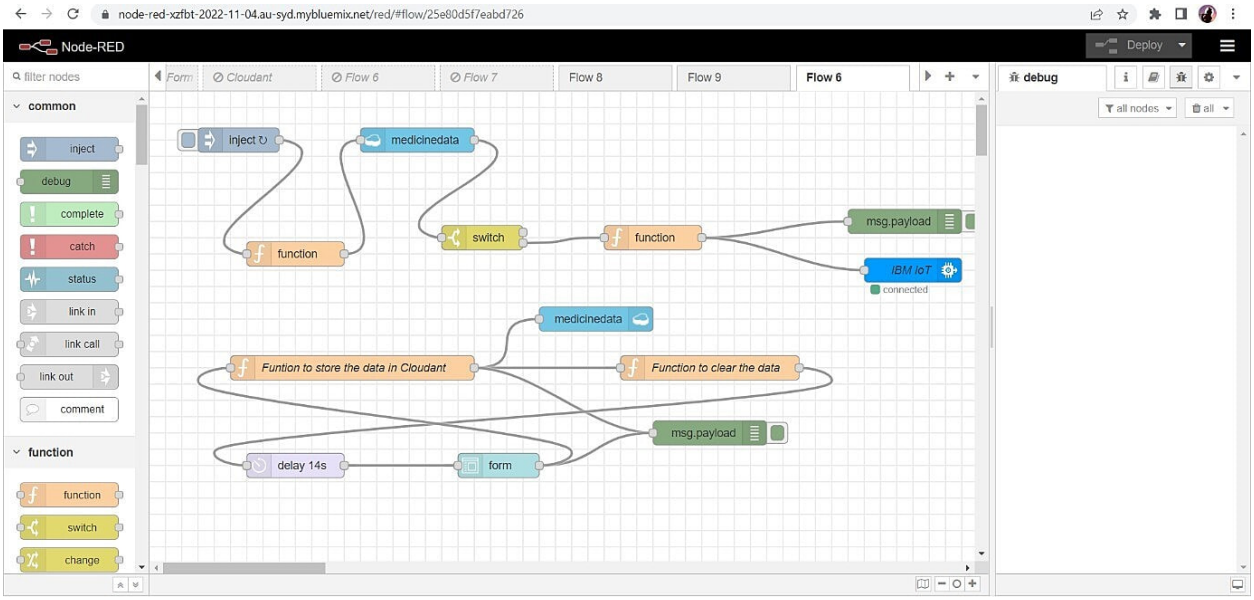
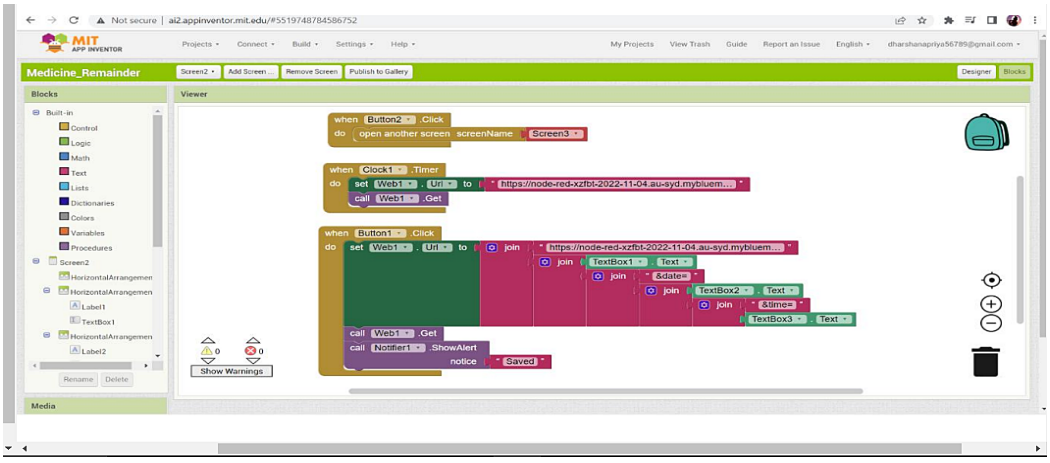


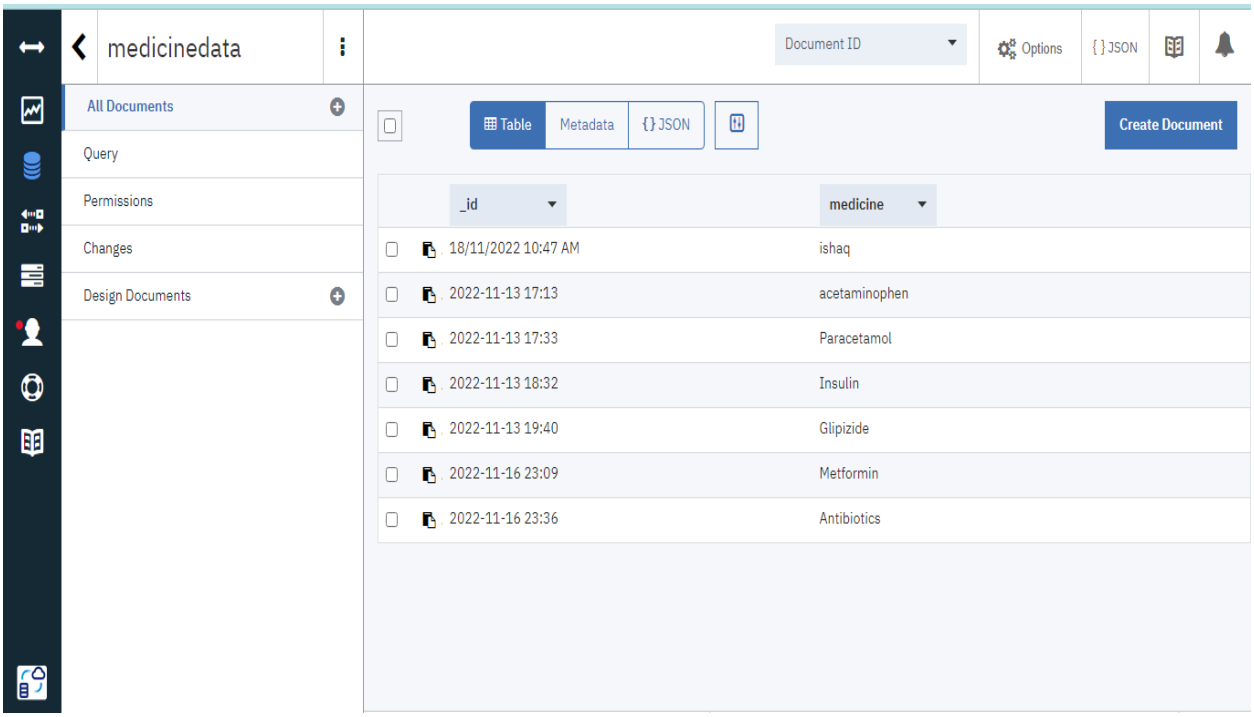
7.2 Feature 2

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)



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_OO1	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	https://drive.google.com/file/d/13vcj8LGrt4_fgnGKDyyosiMQbrMZFvS2/view?usp=share_link	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	https://drive.google.com/file/d/13vcj8LGrt4_fgnGKDyyosiMQbrMZFvS2/view?usp=share_link	Application should show below UI elements: a.Name of Medicine text box b.Date text box c.Time tedt box d.Next button	Working as expected	pass
Remainder Page_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 diplay the medicine data in the text box 3.The alarm should ring at the user entered time	It' Time to Take Medicine Glipizide	Get the remainder alarm	Working as expected	pass

DB_TC_OO4	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

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).

2. **Defect Analysis**

This reportshows the numberof resolved or closed bugs at each severity level,and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 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

3. **Test Case Analysis**

This report showsthe number of test casesthat have passed,failed, and untested

Section	**Total Cases**	**Not Tested**	**Fail**	**Pass**
Print Engine	2	0	0	2
Client Application	2	0	0	2
Security	1	0	0	1

Chapter - 9
RESULTS

9.1 Performance Metrics

			NFT - Risk Assessment						
S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Impact of Downtime	Load/Voluem Changes	Risk Score	Justification
1	Personal Assistance	New	Low	Moderate	Moderate	Low	>10 to 30%	GREEN	As we had made this project in
	for Seniors Who Are								MERN stack With industry Mentor Aproval
	Self-Reliant								

NFT - Detailed Test Plan				
S.No	Project Overview	NFT Test approach	Assumptions/Dependencies/Risks	Approvals/SignOff
1	Medicine Reminder Web -UI	Stress	App Crash/ Developer team/ Site Down	Approved
2	Medicine Reminder Web -UI	Load	Server Crash/ Developer team/ Server Down	Approved

End Of Test Report								
S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	GO/NO-GO decision	Recommendations	Identified Defects (Detected/Closed/Open)	Approvals/SignOff
1	Medicine Reminder Web -UI	Stress	Performance	CPU -01	GO	High Performance Netlify Cloud server	Closed	Approved
2	Medicine Reminder Web -UI	Load	Scalability	DB Storage - 01	NO-GO	One MongoDB Instance for free	Closed	Approved

Chapter - 10
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 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.
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, 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.
4. **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 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-41605-1660643352

Demo Link: https://drive.google.com/file/d/13kuClw-fyrDRefvtmIV3zB7u0YIt-HCC/view?usp=share_link