EASWARI ENGINEERING COLLEGE (AUTONOMOUS)

Ramapuram, Chennai

Personal Assistance for Seniors who are Self-Reliant

NALAIYA THIRAN PROJECT REPORT

2022

Submitted by

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TEAM ID: PNT2022TMID54420

Content

PERSONAL ASSISTANCE FOR SENIORS WHO ARE SELF-RELIANT

1. Introduction

1.1 Project Overview

Most of the time due to number of works for the people as well as regarding age and some disease which leads to forget the basic things among daily routine. If the patient sufferings from the disease where it is compulsory to take medicine at proper time, in this paper we have review the technology of home health care system among them a medicine reminder system and some improvement regarding authentication have well focused. 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 Purpose

Internet of Things (IoT) network will provide active and real-time appointment of patient, hospitals, caretaker, and doctors apart from this the secured data transmission from source point to destination for the purpose of remote monitoring there is need of the architecture of a low-cost embedded platform for Web-based monitoring. 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 proposed system consists of an IoT enabled device and an android application

2. Literature Survey

2.1 Existing Problem

Because of healthcare reforms, digital medical records have facilitated the widespread availability of publicly available, statistical data. Feeding the pool of mounting data is the patient doctor interaction Physicians assess the patient's complaint and prescribe a course of action The data collected provides the basis for a decision support tool for patients to compare Prescription Drug Plans based on a patient's individual situation and preferences. The existing tools will not provide explicit information that will assist the patient in determining the most suitable prescription drug plan, considering the individual importance of plan features.

2.2 References

"Work Embedded Platform for Web-based Monitoring and Control of a Smart Home" C. List, O. F. Authors, D. Moga, N. Stroia, D. Petreus, this paper explains the low-cost embedded platform for web-based monitoring and controlling and the platform consist of distributed sensing and control network and touch screen to easy use interface to the user and remote web-based access.

"Personal Assistance Device for Independent Senior Citizens/ Patients" A. Yuvaraj K, B. N. Gunasekhar Reddy, C. V. Saritha, this paper proposes an affordable personal assistance device for health monitoring of elderly people using different sensors which can measure pulse rate, position of elderly. Proper intake of medicine at correct time is indicated by the display on OLED screen and an alert is produced by buzzer. This paper provides shape and operating of an IOT based totally Personal Assistance Device which is a helpful device using low force Atmega328 microcontroller and ESP8266.

Problem Statement Definition

Who does the problem affect?

This problem affects the senior citizens who forget to take their medicines on time.

When does the issue occur?

People suffering from dementia or forget things easily. Mostly occurs when aging.

What would happen if we didn't solve the problem?

Senior citizens will forget to take their medicine in time than in turn results in various health issues.

Why is it important to fix the problem?

It would be easy for senior citizens to take medicine on time as well as help doctors track their health data too.

3. Ideation and Proposed Solution

3.1 Empathy Map Canvas

Template

Empathy map

TEAM ID:
BATCH NUMBER: B9-3A5E
TEAM MEMBERS :
K.R.SAMYUKTHA SHRRUTHI
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B.YOGAPRIYA

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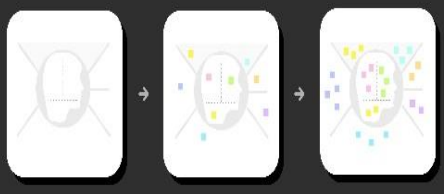
PERSONAL ASSISTANCE FOR SENIOR CITIZENS WHO ARE SELF-RELIANT

MEDICINE REMINDER

Need some inspiration?

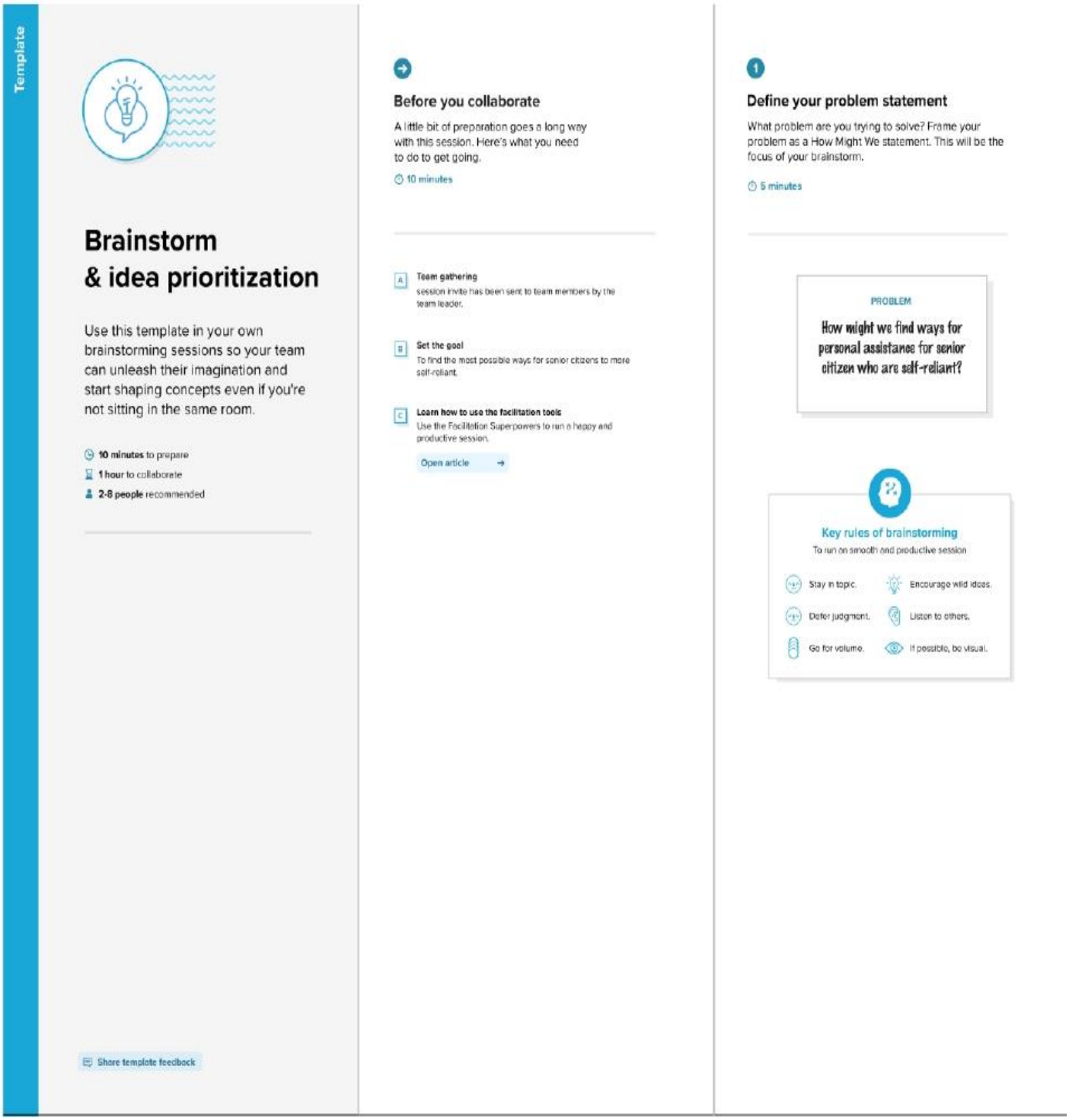
See a finished version of this template to kickstart your work.

Open example →

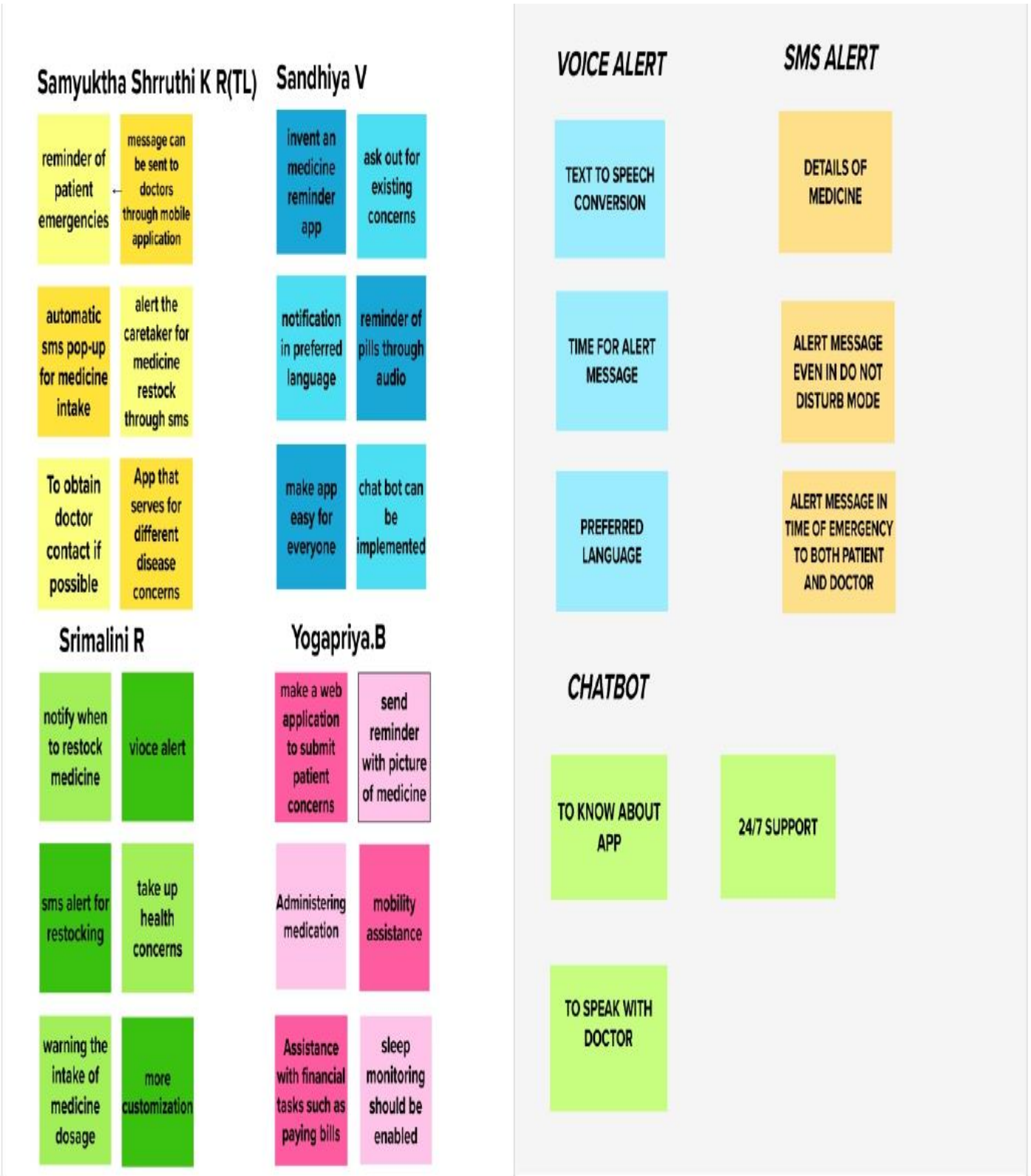


3.2 Ideation and Brainstorming

Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



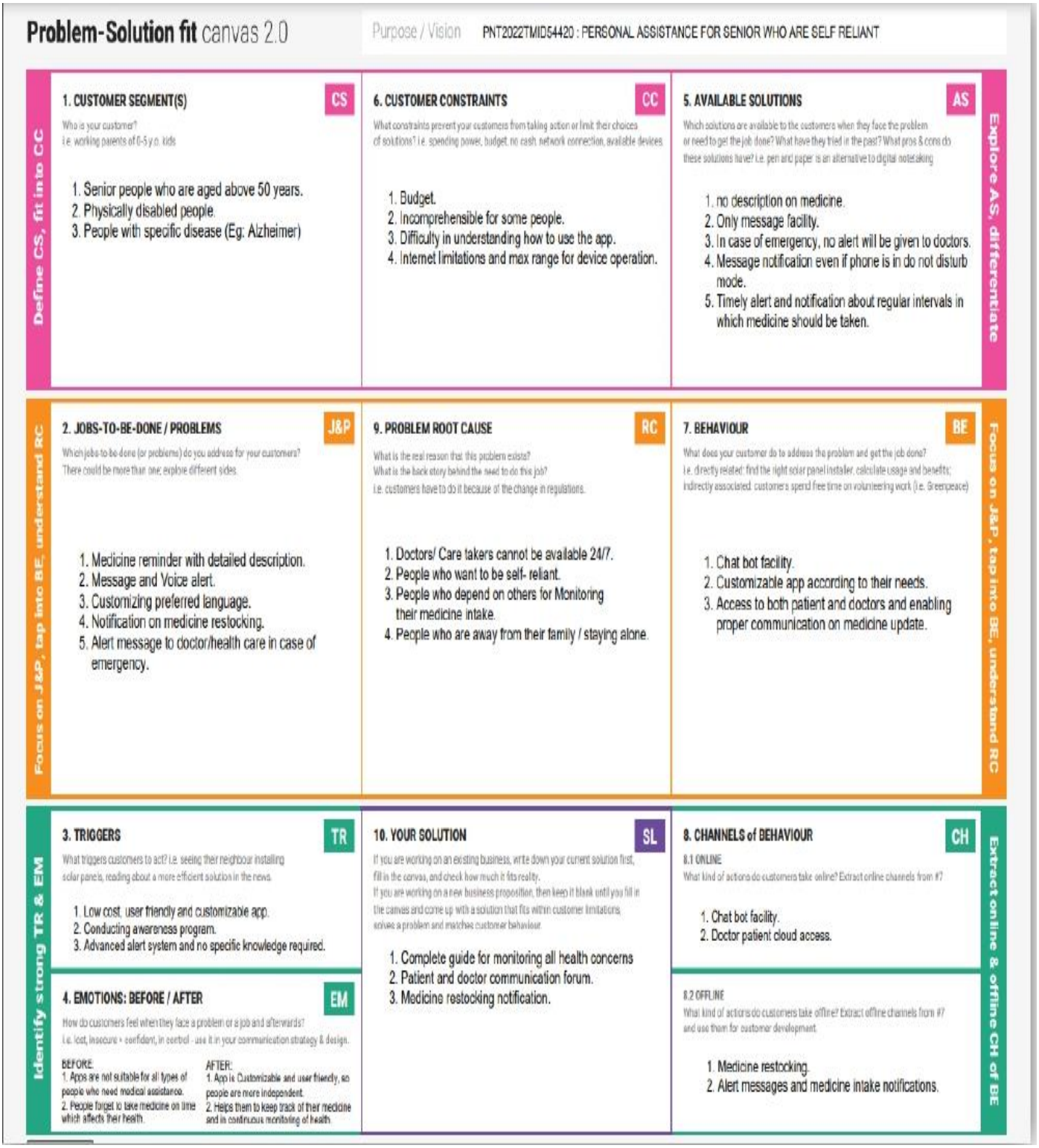
Step-3: Idea Prioritization

3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	• Senior citizens who are self-reliant mostly forgets to take medicine, although many apps are available, they tend difficult in use
2.	Idea / Solution description	• An application that can be customized for their different concerns.

		• Medicine reminder can be done using voice command, SMS with picture of medicine and dosage.
3.	Novelty / Uniqueness	• Comprehensible to all seniors • Manage prescriptions after every doctor's visit. • Updating them with symptoms of their new medicine. • Inform a family member and doctor in case of emergencies.
4.	Social Impact / Customer Satisfaction	• As, the application is user-friendly customers finds this as best solution mostly for senior who are self-reliant. • Any issues with the application is resolved using a chat bot feature so customer need not feel any difficulty.
5.	Business Model (Revenue Model)	• The application's target audience are seniors who are self-reliant, as the business model serves around user-friendly features. • The revenue model, comes in advertising in websites, social media and targeting the high population users who are in need of this application. By creating awareness to use the app.
6.	Scalability of the Solution	• Seniors are in need of solution that are more portable, user-friendly and answer their different medical concerns. • As the model consists of cloud service, node-red service the doctor and senior both are benefited with specified medical details.

3.4 Problem Solution Fit



4. Requirement Analysis

4.1 Functional Requirement

Following are the functional requirements of the proposed solution.

	Functional Requirement (Epic)	**Sub Requirement (Story / Sub-Task)**
FR-1	User Registration	Registration through Form Registration through Gmail Registration through phone number
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP Confirmation via SMS
FR-3	User Login	Login with mail id /phone number and password
FR-4	Subscription	Trial plan / monthly / annual subscription according to needs
FR-5	User data	Personal data medical data Caretaker / Doctor details
FR-6	Setting up Remainder	Time and duration of notification. Medicine details Notification on what device.

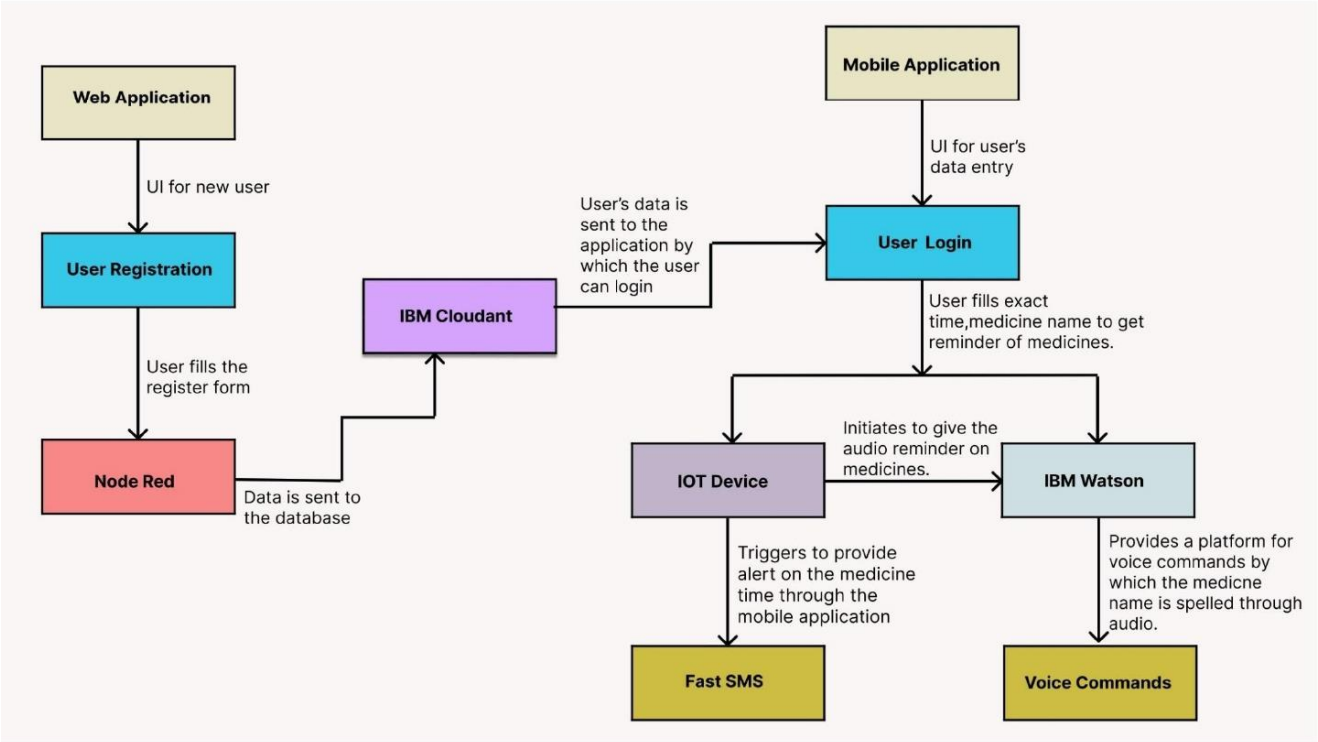
4.2 Non-Functional Requirement

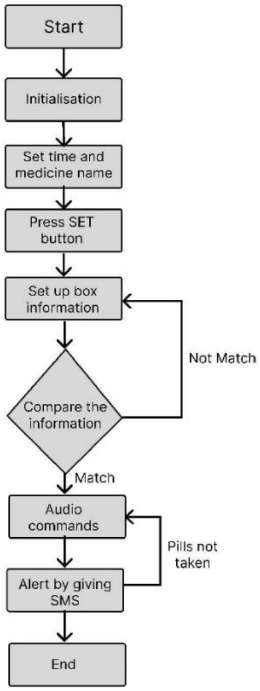
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	User-friendly, allows to use voice command.
NFR-2	**Security**	Two – step authentication to secure user data.
NFR-3	**Reliability**	timely data updating after doctor visit, customization.
NFR-4	**Performance**	The app is adaptable to every user and customer support.
NFR-5	**Availability**	24/7 customer support through chat bot.
NFR-6	**Scalability**	Services can be used through subscription plans.

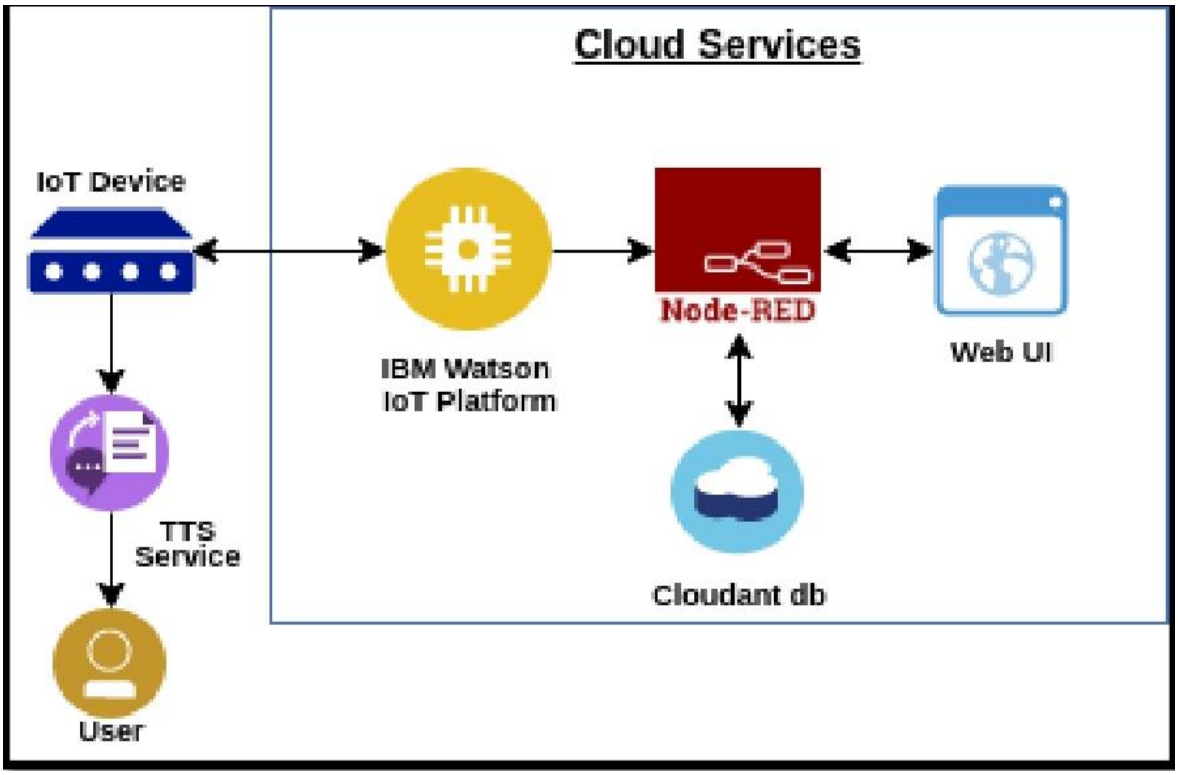
5. Project Design

5.1 Data Flow Diagram

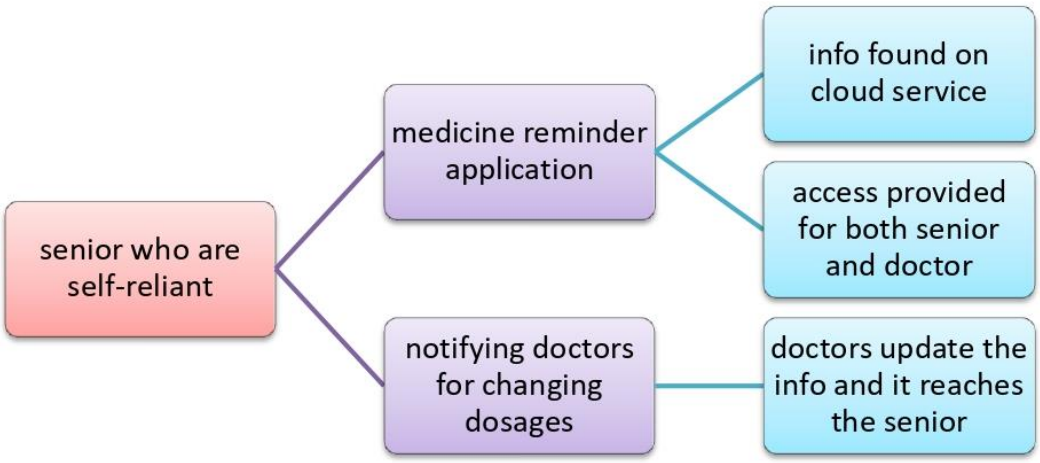




5.2 Solution and Technical Architecture



Example flow :



6. Project Planning and Scheduling

6.1 Script Planning and Execution

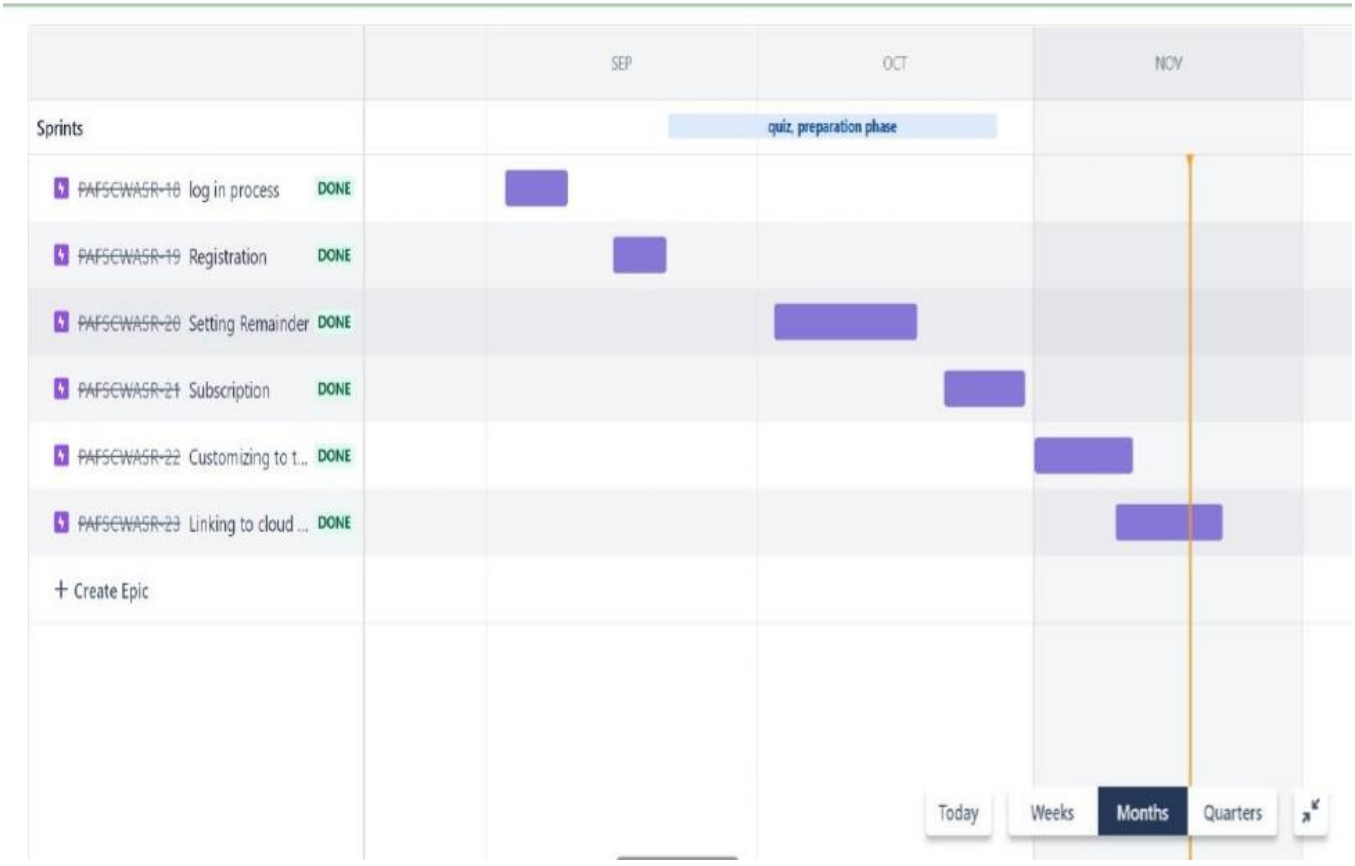
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Login	USN-1	As an admin, I can log into the application byentering username & password	5	Medium	1
Sprint-1		USN-2	When the admin does not enter the username, itdisplays an error message group	3	Medium	1
Sprint-1		USN-3	When the admin does not enter the password, itdisplays an error message popup	4	Medium	1
Sprint-1	Dashboard	USN-4	When the admin enters the invalid credentials, itdisplays an error popup	5	Medium	2
Sprint-1		USN-5	When the admin enters the correct username and password it redirects to the dashboard	3	High	2
Sprint-2		USN-1	Creating a Node-Red dashboard	5	Medium	3
Sprint-2		USN-2	Developing a Node-Red to publish data to IBMcloud	8	High	3
Sprint-2		USN-3	Create a register form in Node-Red	7	Medium	3
Sprint-3	Creating Devices	USN-1	Creating a device in IBM Watson IOT platform	10	High	4
Sprint-3	Python	USN-2	Connect the device created in wokwi to thedevice created in IBM Watson IOT platform.	10	High	4
Sprint-4	MIT App Inverter	USN-1	Create an Interface for login page andDashboard	5	Low	4
Sprint-4		USN-2	Connect MIT app to Node Red	5	High	1
Sprint-4		USN-3	As a user, I can keep track of the medicine time	6	Medium	3

Sprint-4	Alert	USN-4	Retrieving the time from cloudant and alert theuser through voice command	4	High	2

6.2 Sprint Delivery Schedule

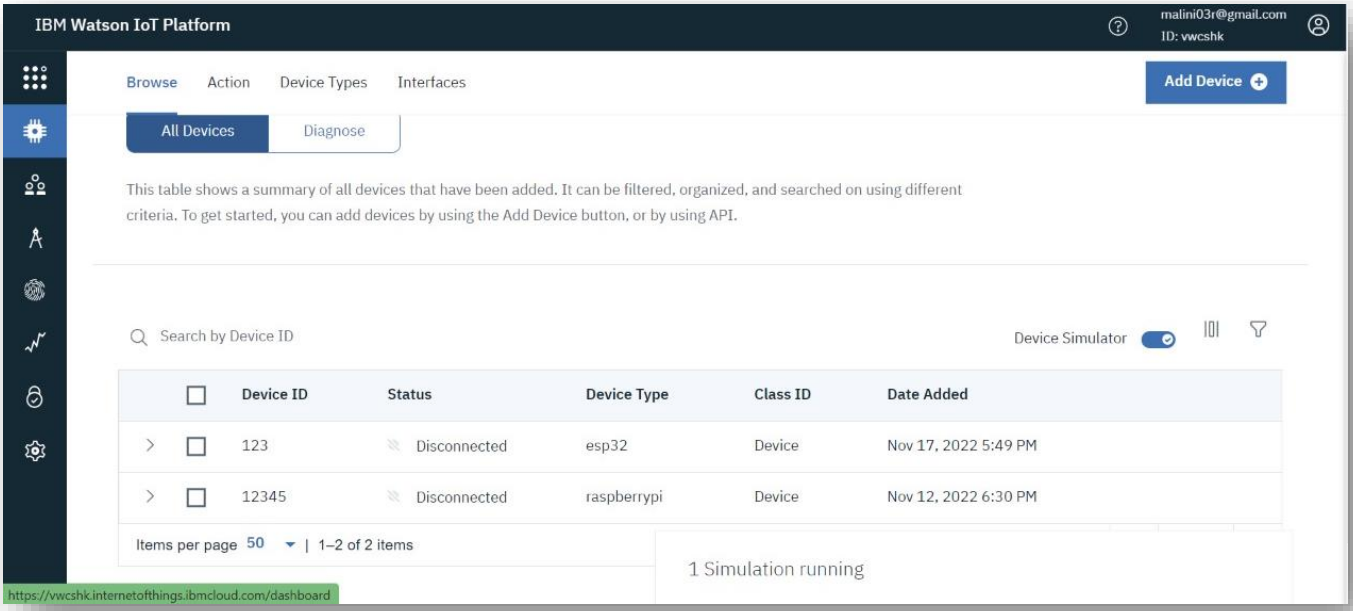
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	4 Days	31 Oct 2022	03 Nov 2022	20	02 Nov 2022
Sprint-2	20	5 Days	04 Nov 2022	08 Nov 2022	20	08 Nov 2022
Sprint-3	20	5 Days	09 Nov 2022	13 Nov 2022	20	12 Nov 2022
Sprint-4	20	4 Days	17 Nov 2022	17 Nov 2022	20	18 Nov 2022

6.2 Jira Report

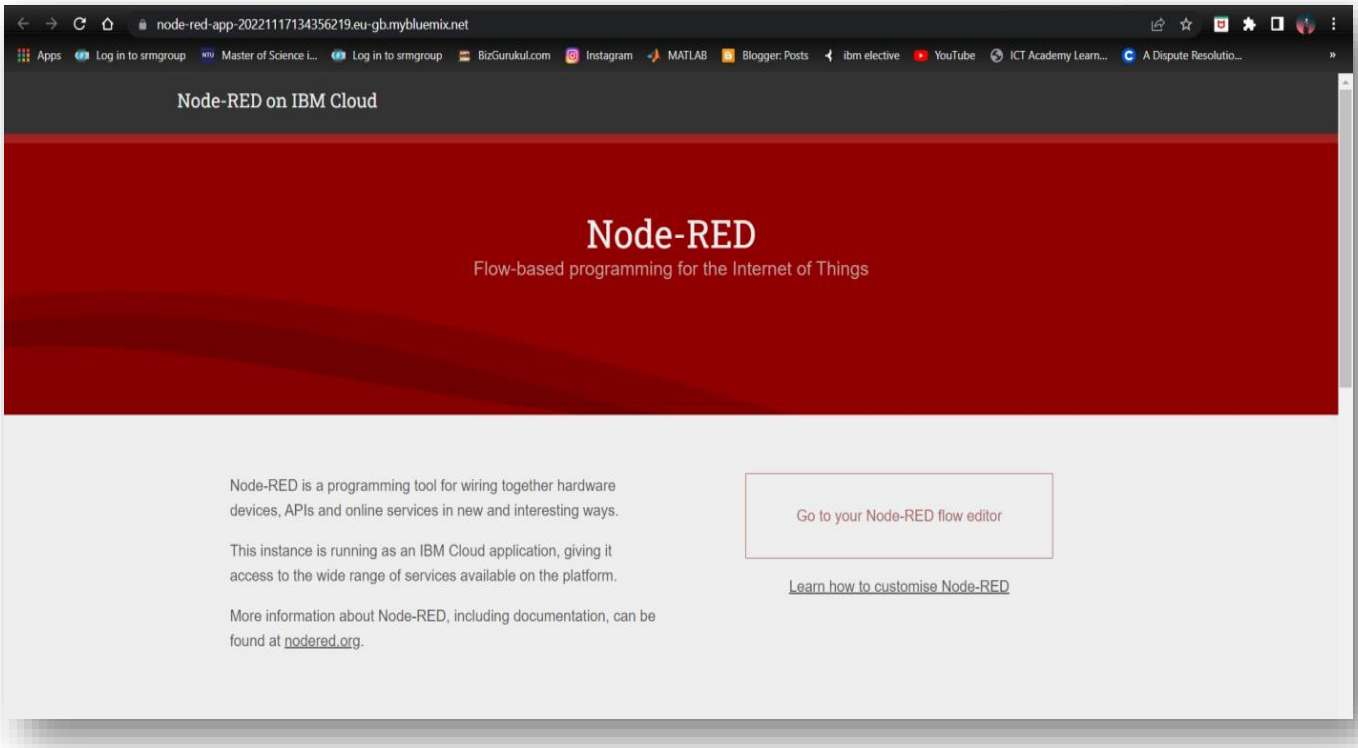


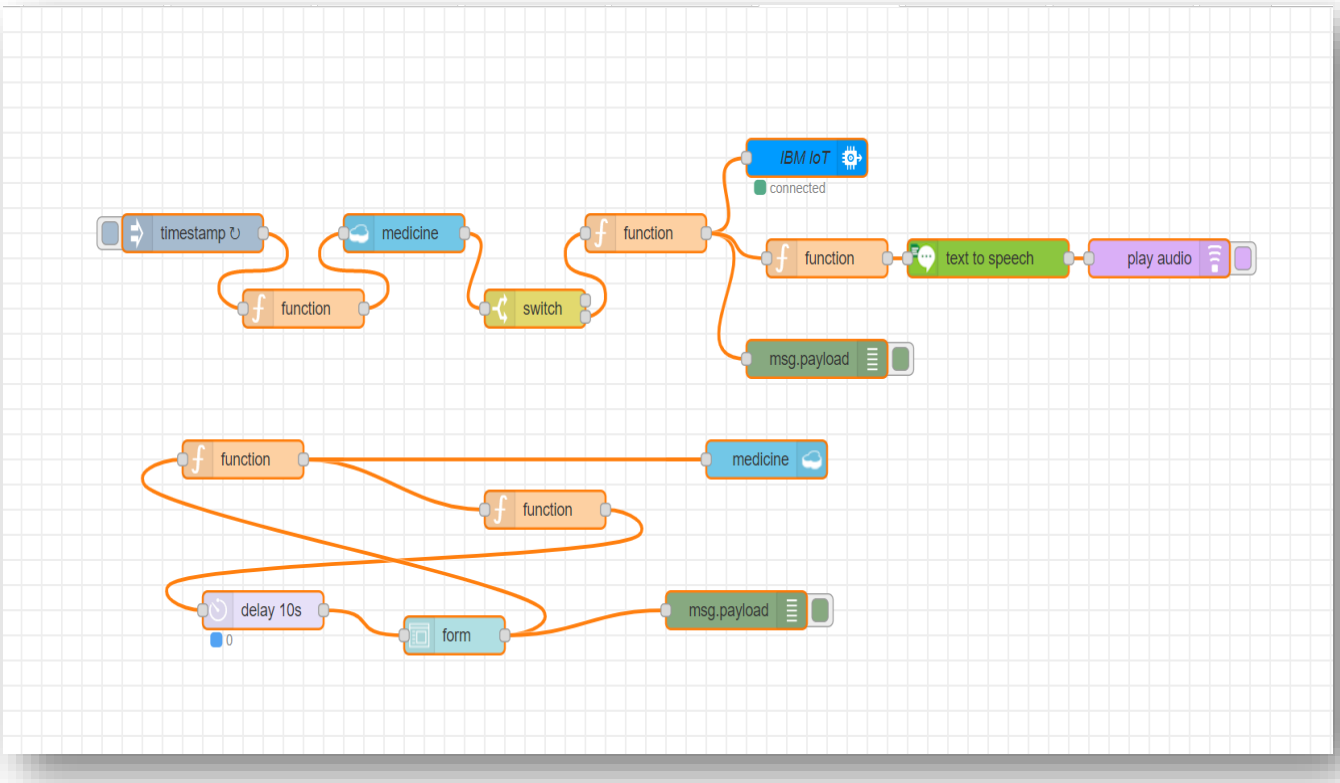
7 Coding And Solutioning

7.1 CREATING IBM WATSON IOT PLATFORM &DEVICE:

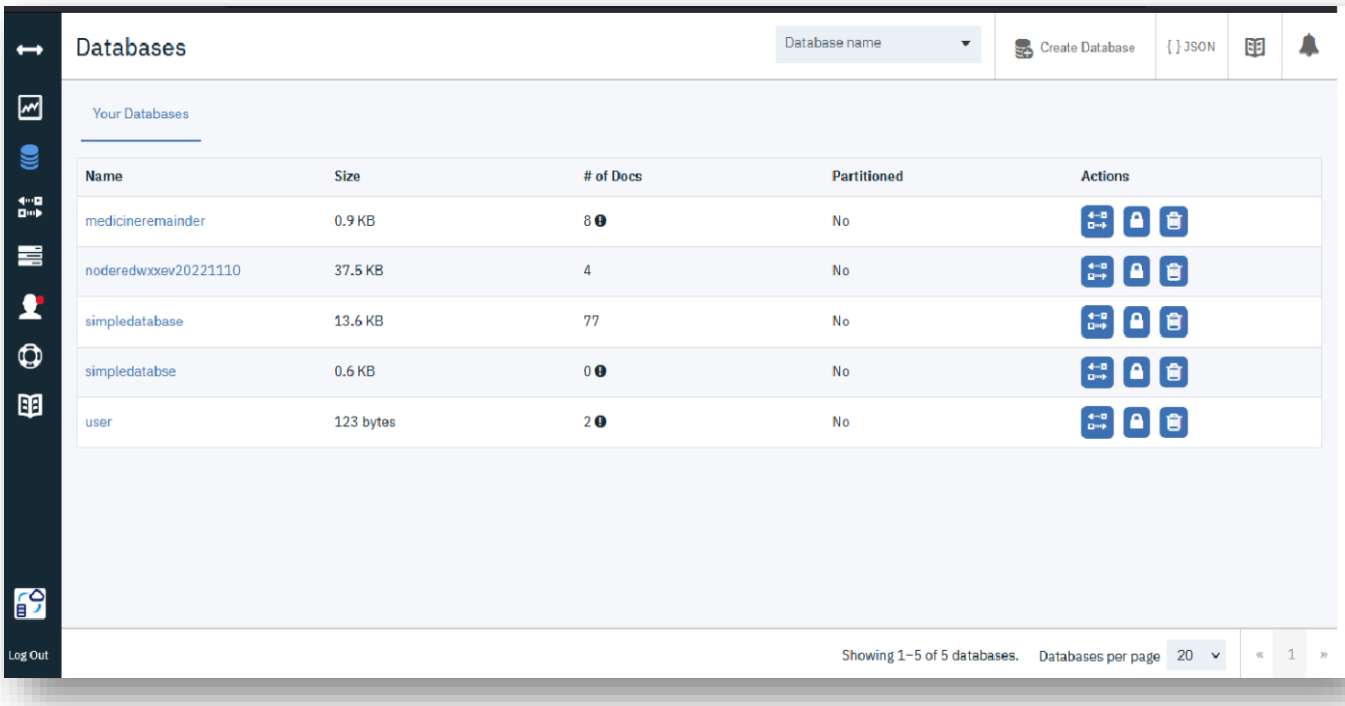


7.2 CREATING NODE-RED SERVICE:

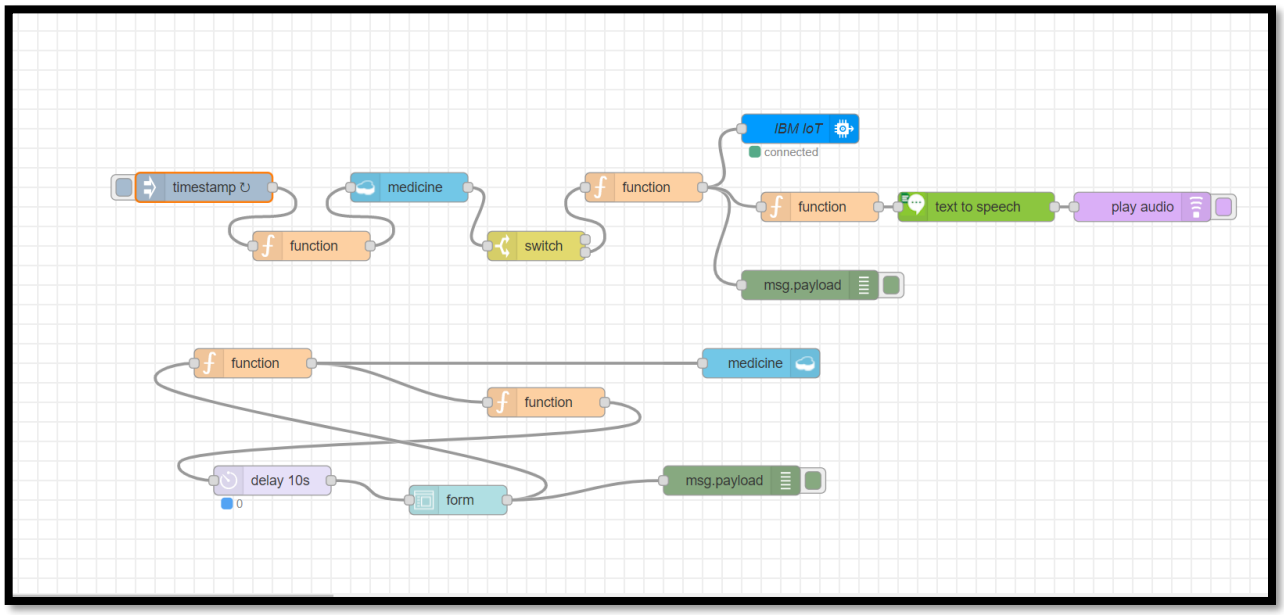




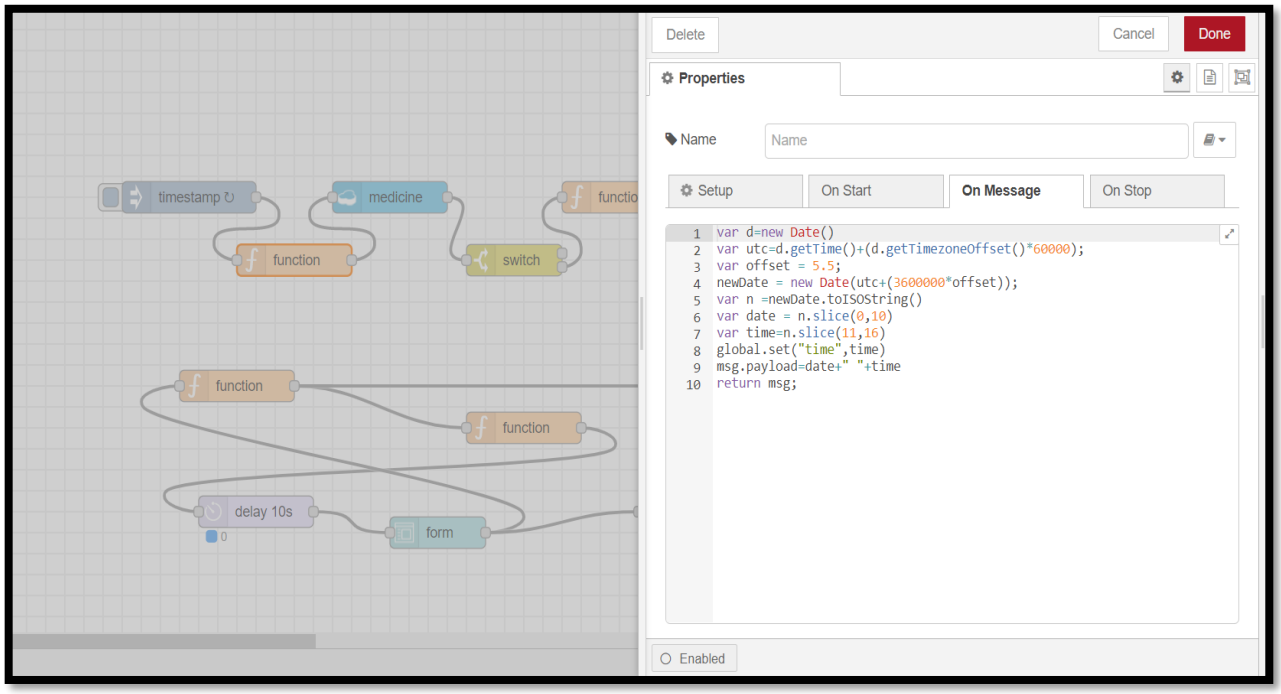
7.3 CREATE DATABASE IN CLOUDANT DB

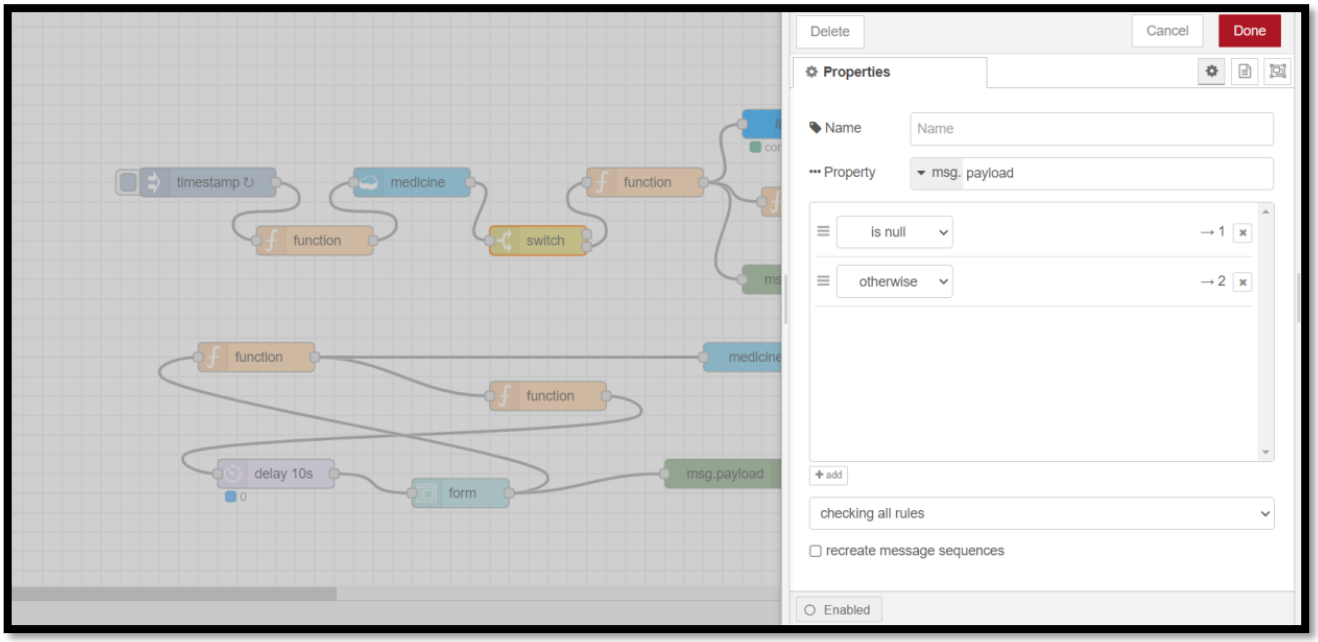


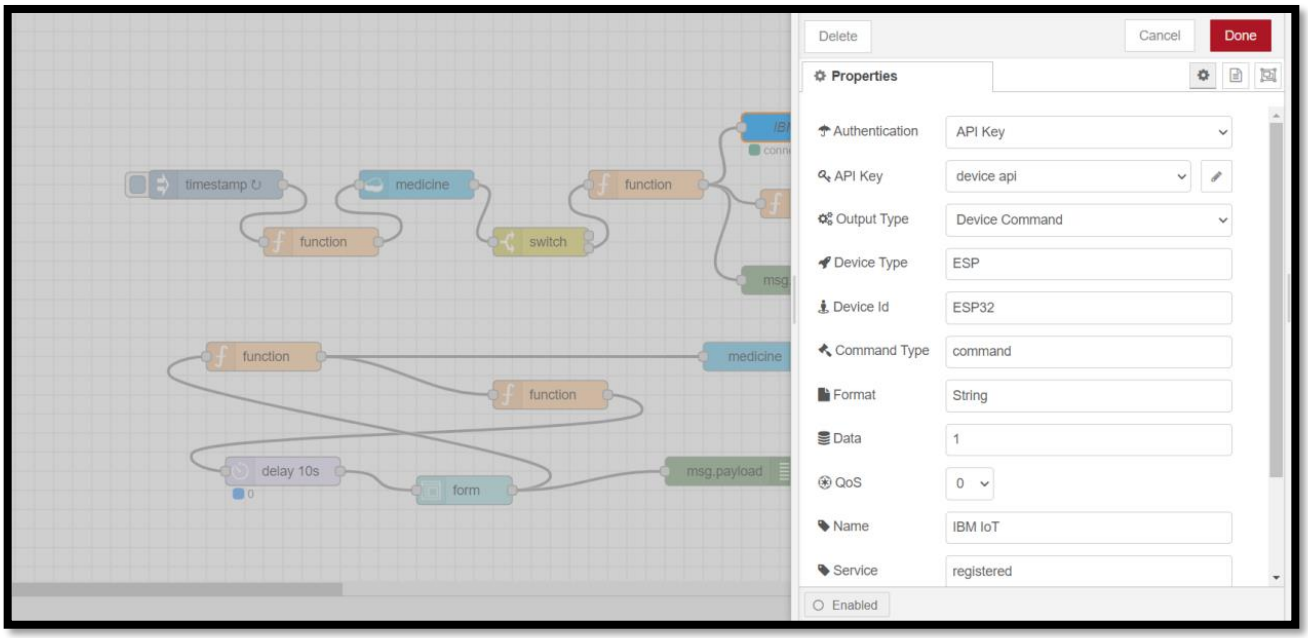
7.4 CREATE NODE-RED FORM



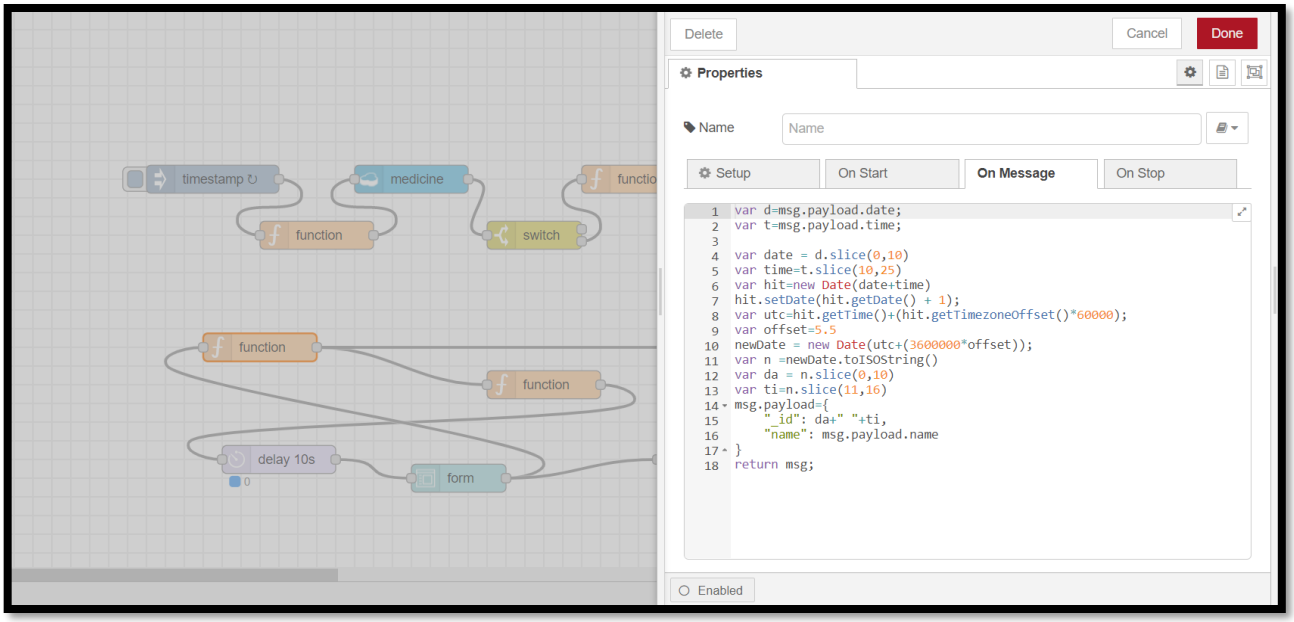
7.5 ADDING IoT CREDENTIALS

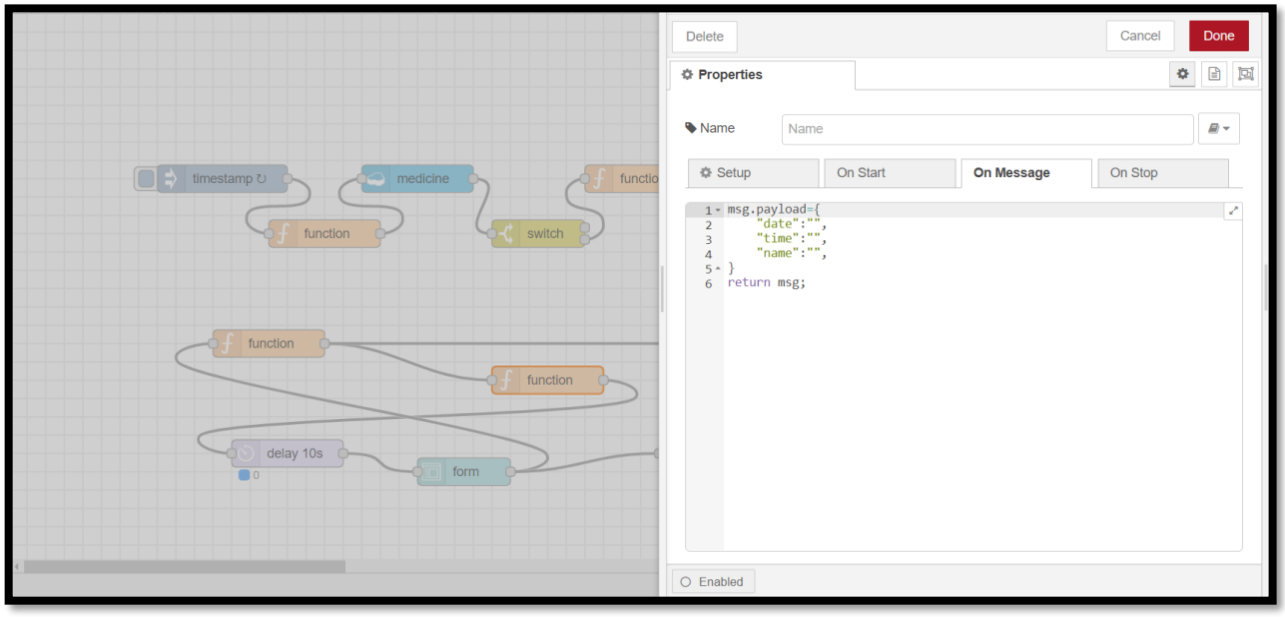






7.6 FUNCTION TO GET MEDICINE DETAILS AND TIME





7.6 Python code for random medicine and time generating:

```
import json
import wiotp.sdk.deviceimport time
import random

myConfig = {"identity": {
"orgId": "mni3qc", "typeId":
"medicine","deviceId": "123456"
 },
"auth": {
"token": "paul@123"
```

```
}
}
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)


client.connect()

for i in range(0,20): tablet=["Paracetamol","Aspirine","Azithral","Asthalin","Sinarest"]
medicinetime=[12.00,1.00,2.00,3.00,5.00,18.00,20.00,7.00]
name = "mani" medicine=random.choice(tablet)
medicinetime=random.choice(medicinetime)
mydata = {'Patient  Name': name, 'Medicine Name': medicine, 'Time': medicinetime}

client.publishEvent("IoTSensor", "json", data=mydata, qos=0, onPublish=None) print("Data published to
IBM IOT platform :", mydata)
time.sleep(5) client.disconnect()
```

temp.py - C:\Users\91637\Downloads\temp.py (3.7.4)

File Edit Format Run Options Window Help

```
import json
import wiotp.sdk.device
import time
import random

myConfig = {
    "identity": {
        "orgId": "mni3qc",
        "typeId": "medicine",
        "deviceId": "123456"
     },
     "auth": {
        "token": "paul@123"
    }
}
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

for i in range(0,20):
    tablet=["Paracetamol","Aspirine","Azithral","Asthalin","Sinarest"]
    medicinetime=[12.00,1.00,2.00,3.00,5.00,18.00,20.00,7.00]
    name = "mani"
    medicine=random.choice(tablet)
    medicinetime=random.choice(medicinetime)
    mydata = {'Patient  Name': name, 'Medicine Name': medicine, 'Time': medicinetime}
    client.publishEvent("IoTSensor", "json", data=mydata, qos=0, onPublish=None)
    print("Data published to IBM IOT platform :", mydata)
    time.sleep(5)
client.disconnect()
```

Python 3.7.4 Shell

File Edit Shell Debug Options Window Help

```
ython 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (AMD64)] on win32
ype "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: C:\Users\91637\Downloads\temp.py ==========
022-11-16 15:50:06,267   wiotp.sdk.device.client.DeviceClient  INFO    Connected successfully: d:mni3qc:medicine:123456
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Asthalin', 'Time': 5.0}
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Azithral', 'Time': 12.0}
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Sinarest', 'Time': 12.0}
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Azithral', 'Time': 18.0}
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Aspirine', 'Time': 1.0}
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Aspirine', 'Time': 5.0}
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Paracetamol', 'Time': 20.0}
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ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Sinarest', 'Time': 5.0}
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Sinarest', 'Time': 20.0}
ata published to IBM IOT platform : {'Patient  Name': 'mani', 'Medicine Name': 'Paracetamol', 'Time': 2.0}
```
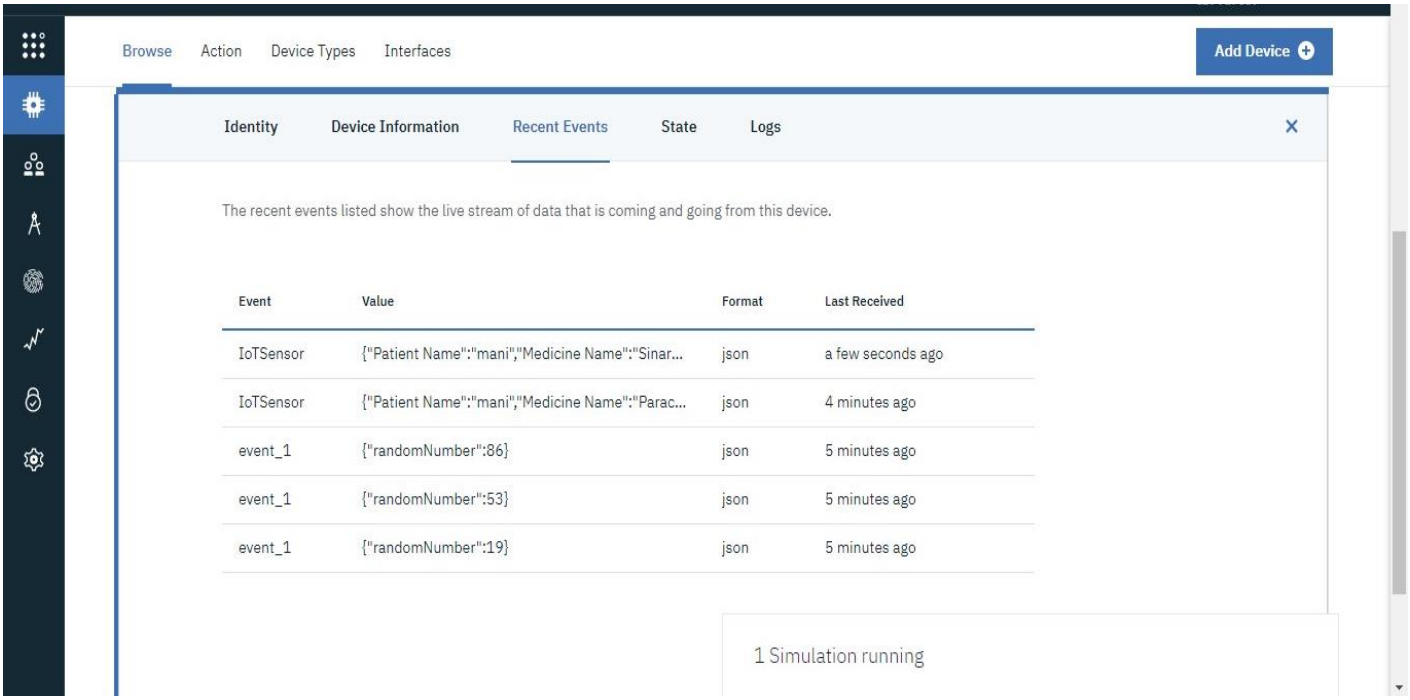
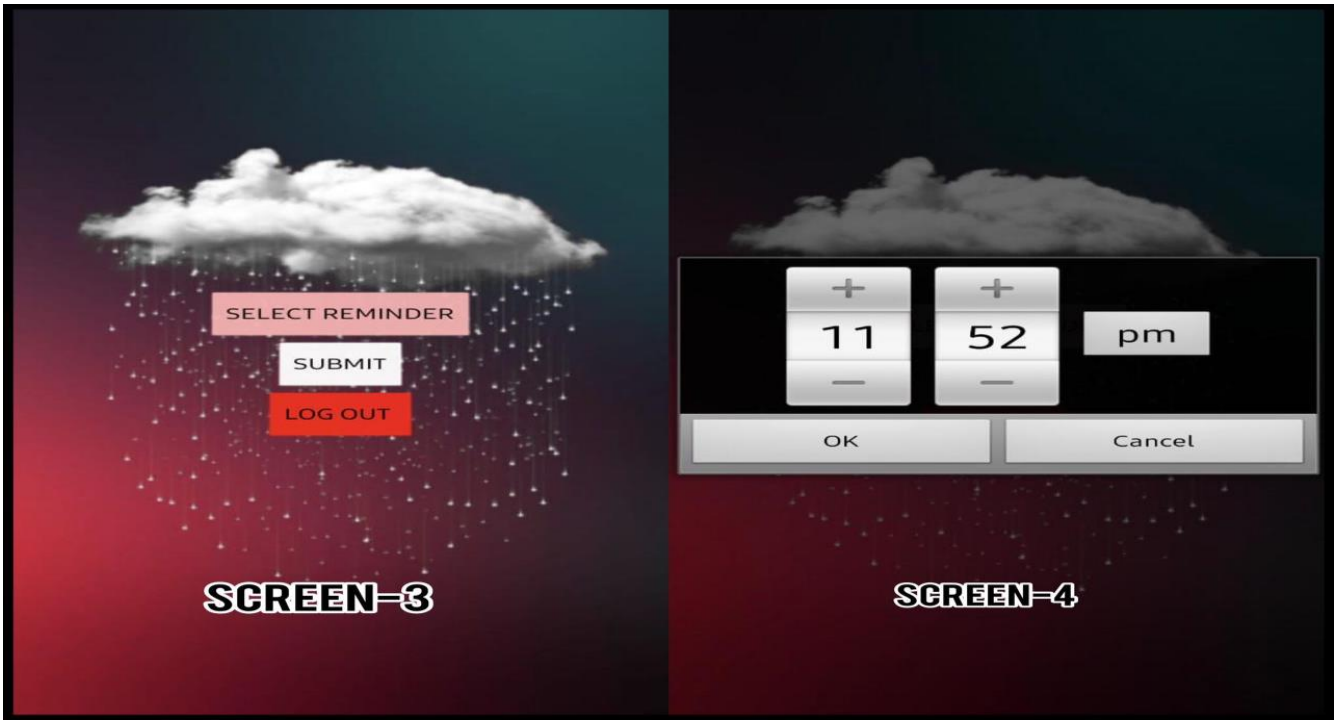
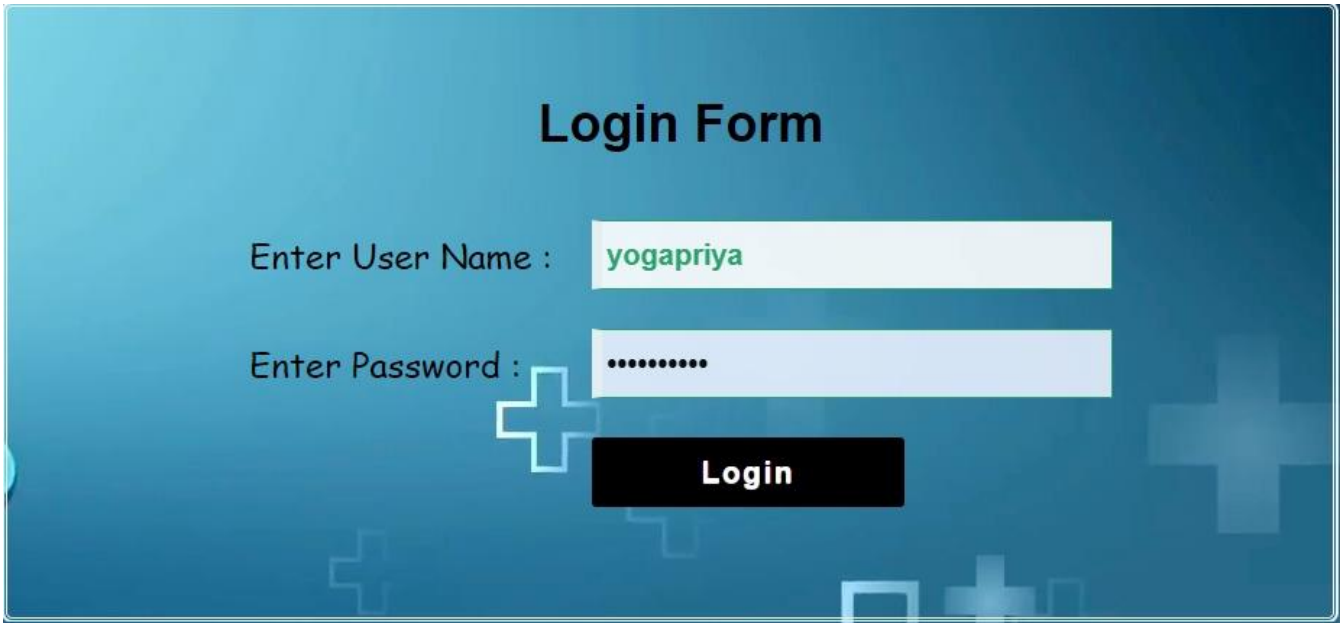



8.DASH BOARD

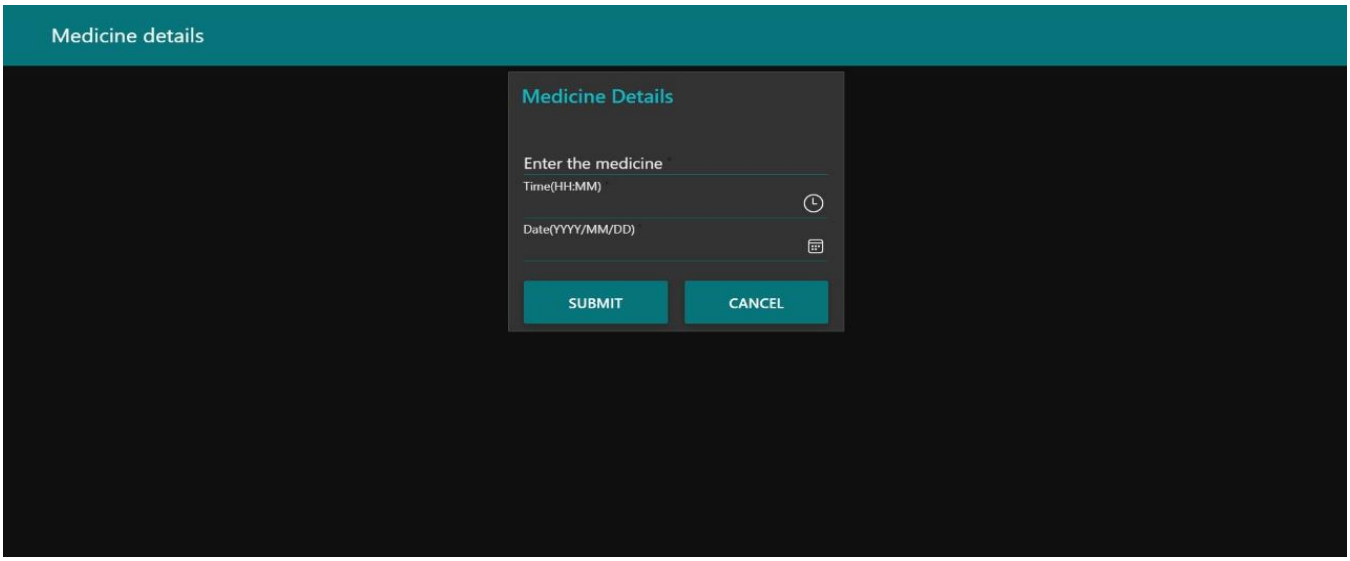
8.1 MIP APP INVENT0R



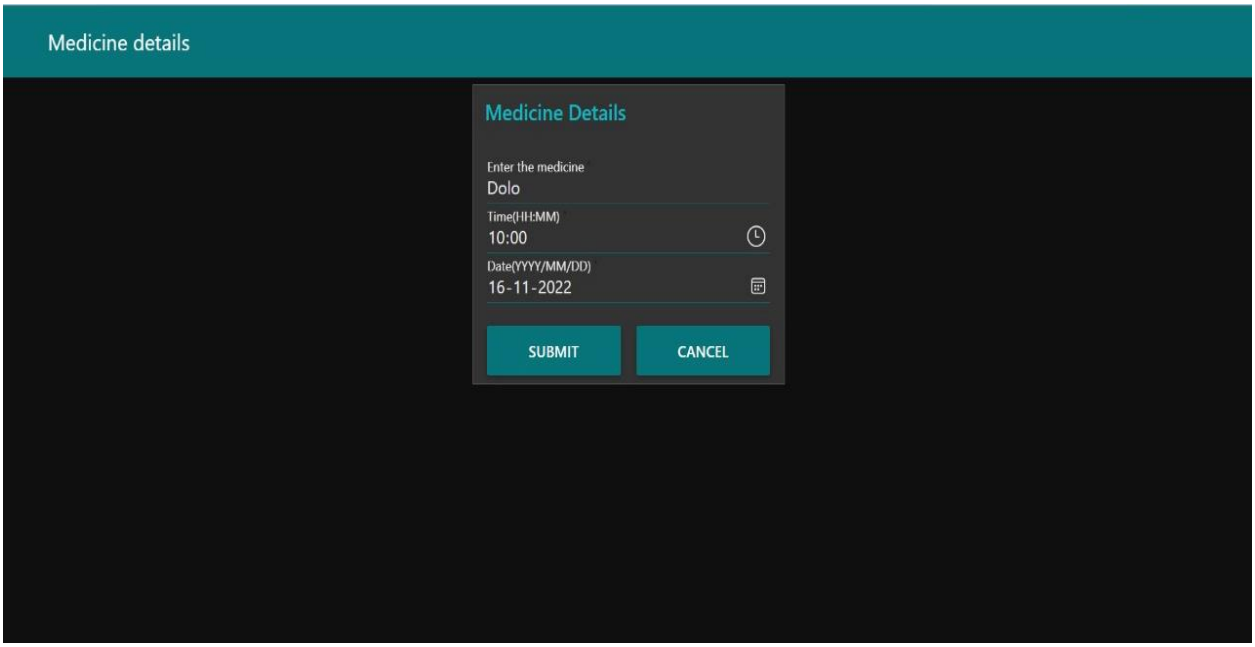
8.2 NODE-RED DASHBOARD

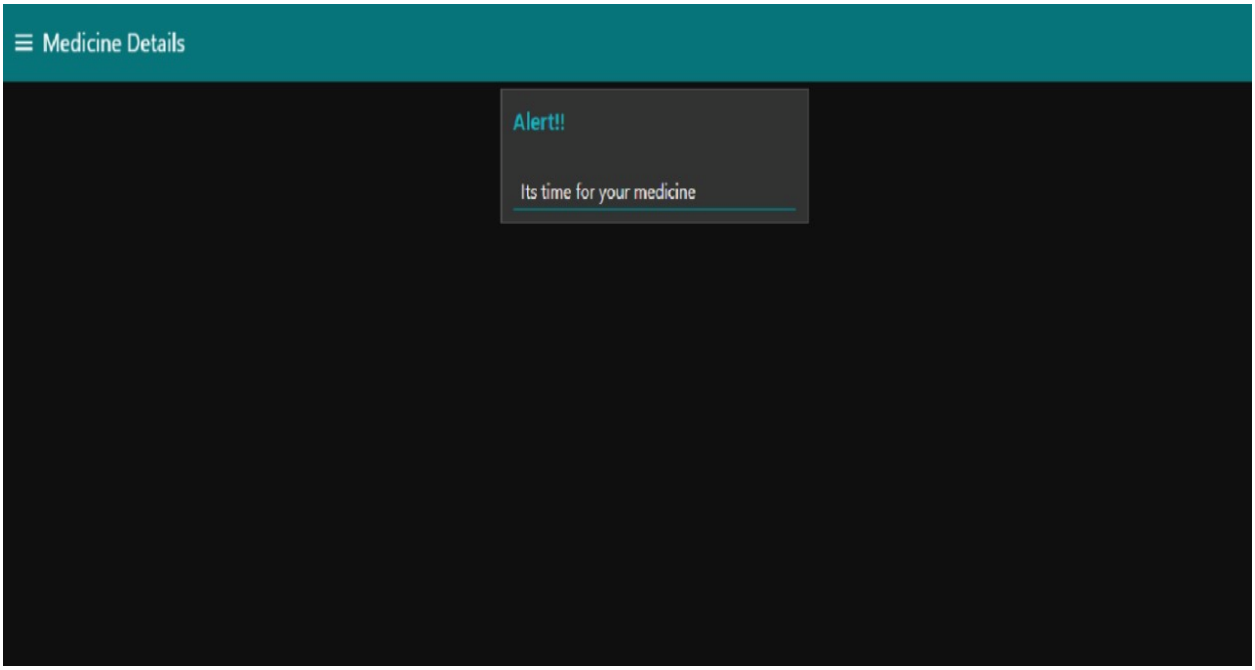


POP-UP MESSAGE APPEARS:



9.Testing


Medicine details
Medicine Details
Enter the medicine
Dolo
Time(HH:MM)
10:00
Date(YYYY/MM/DD)
16-11-2022
SUBMIT
CANCEL


Medicine Details
Alert!!
Its time for your medicine

10.Result

Medicine remainder app helps you to remember when to take your pills and manage pill usage. The app collects user's email id and password to login into the app where the User can enter medicine name, dosage, time and date. The entered data is saved in IBM cloud and generates remainder message on time and User can snooze it once he/she has taken Medicine.

S.NO	PARAMETERS	PERFORMANCE
1.	Request latency	0.3ms
2.	Usage count	10
3.	Error rate	<1%
4.	Request rate	100
5.	Down time	Almost no down time

11.Advantages and Disadvantages

Advantages:

- The distant monitoring is made possible by using various biomedical devices, they measure and transmit data via Bluetooth or ZigBee to a unit that manages them.
- The tool will provide explicit information that will assist the patient in determining the most suitable prescription drug plan, considering the individual importance of plan features.
- The alarm will generate according to scheduled and the situation can be recorded with help of sensor which will remotely monitor, save for the future reference, update drug information according to need through web after comparing drug taking during habit of patient.
- It is user friendly and easily accessible

Disadvantages:

- Needs active internet connection
- Users need to know how to use the technology
- Does not provide suggestions to users
- Sensors are not readily available along with medicinal service gadgets

12.Conclusion

We have demonstrated a web application that generates alarm signals to remind a patient to take medication. We focus on helping patients and improving the monitoring system. The application is easily accessible. Combination of a sensing system with web application helps us to measure how well a patient can take their daily medication in real- time. The availability of sensors and other medicinal services gadgets (IoT) work better in consideration of patients.

13.Future Scope

A data-sharing feature between patient and health care professionals would also be developed. Voice-alert notification is being considered as part of the future works; a system that will not only send notification however also read the content of the notification alert to the listening of the patient.

14.Appendix

Source Code: https://github.com/IBM-EPBL/IBM-Project-42447-1660663103.git

Demo video link:
https://drive.google.com/file/d/1DH3ukLUWb__bAD8e2fn3ijCWGMpkRAvO/view?usp=sharing