PROJECT REPORT

Date	07 November 2022
Team ID	PNT2022TMID31785
Project Name	Personal assistance for senior citizen who are self reliant

Personal Assistance For Senior Citizen Who Are Self Reliant.

TEAM MEMBERS:

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Team Member 2 : Nizar R

Team Member 3: RoneshChristopher L

Team Member 4 : Santhiya S

CONTENTS

1.INTRODUCTION

1.1.Project Overview

The evolution of Internet of Things (IoT) has enabled the vision of personal assistant for seniors who are self-reliant. On the basis of their comfort, they can easily know their medicine/drugs according to their time and the amount of the medicine/drugs on their intake. This data is transmitted back to the cloud for further analysis. The elders/patients who are basically forgot their regular schedule on the medicine/drugs that must be taken by them. So, to avoid those kind of activity our project is more useful for them and all the people who are in risk.

1.2.Purpose

- 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 command

2.LITERATURE SURVEY

[1]. “Elderly Healthcare Assistance Application Using Mobile Phone” - 2017 Andreas

Handojo, Tioe Julio Adrian Sutiono, Anita Nathania Purbowo

Their research try to develop an application on mobile phone that could help elderly people and their family member to supervise and monitor the health of the elderly. This application has feature to monitor the location of the elderly, remainder to take the medication, doctor appointment remainder, medical record records, emergency phone to family number or personal doctor, etc. From their experimental results of the application to the participant and the test with the questionnaire on the prospective users, 94% of respondents feel the application is very useful and can run well. There is also a feature to find the location of elder mobile phone by utilizing GPS and Google Map API.

[2]. “Fuzzy-based Health Monitoring and Voice Assistance Featured Autonomous Elderly

Care Service Robot”

In this study, the service and assistant mobile robot that is developed for the growing elderly population in our country and in the world will help the user to meet their daily needs and support living alone. The mobile robot, with artificial intelligence-supported voice communication capability, will be able to receive voice commands and provide assistant support to the user. Also, with the robot’s autonomous mobility, it will go to the locations that the user says and will be next to the person. It is aimed to increase human-robot interaction by providing interface support with the screen to be placed on the robot. Evarobot is used as mobile robot platform.

[3]. “Monitoring and Detecting Outliers for Elder's Life Activities in a Smart Home: A Case Study”- 2017

The proposed technique is applied in an intelligent environment where a network of wireless sensors is installed. They use a real sensor data extracted from a smart home where an elderly lady living alone during one year. The purpose of detecting these outliers is to find some extreme duration time the elderly stay in a particular location (unusual in normal days). The results of this study can be interpreted to help and support the care system in prediction and identifying the elder’s health status over time to avoid him get chronic diseases.

[4]. “Personal Health Assistance for Elderly People via Smartwatch Based Motion Analysis”-2017

A new approach is presented for a personal health assistant for elderly people utilizing smartwatches. On the smartwatch, an app featuring an artificial neuronal net (ANN) analyzes the motion patterns of the smartwatch wearer. The ANN recognizes health relevant events and activities of daily living (EDLs, ADL). Current smartwatches directly can only measure the performed steps of the smartwatch wearer and/or the heart rate, pulse. EDL, ADL recognition based on an ANN works on today commercial smartwatches and delivers the necessary input for calculating the wellbeing of the smartwatch wearer. Continuous reliable detection of the EDL, the ADLsdescribed requires durable background operations of the smartwatches, which only now will be supported by the most advanced smartwatch operating systems (OSs). The sensitivity of the individual model will require a substantial retraining even in cases of a smartwatch model change or even a major OS update.

2.1.Existing Problem

❑Security and Data Theft is an issue which persists even after the inclusion of the unique API key.
❑Big data handling might be required to handle the enormous amount of data that is generated.
❑Edge-based frameworks have yet to address local storage and information processing management, especially in the context of a dynamic health environment.
❑unexplained errors in the usage of popular medical sensors.
❑battery power.
❑High cost.
❑Absence of voice reminder
❑No voice detection.

2.2.References

- 1 Abdulrazak, B., Malik, Y., Arab, F., Reid, S., PhonAge : Adapted SmartPhone for Aging Population. 27–35 (2013)
- 2 Abdulrazak, B., Roy, P., Gouin-Vallerand, C., Belala, Y., Giroux, S.: Micro Context-Awareness for Autonomic Pervasive Computing. Global Journal of Business Data Communications and Networking (IJBDCN), 7(2) 2011: pp. 49-sixty nine.
- 3 Abdulrazak, B., Yared, R., Tessier, T., Mabilleau, P., 2015. Toward unavoidable figuring framework to enhance wellbeing of maturing people in savvy kitchen. Int. Gathering of Information and Communication Technologies for Aging Well and eHealth.
- 4 Acampora, G., Cook, D.J., Rashidi, P., Vasilakos, A. V, A Survey on Ambient Intelligence in Health Care. Proc. IEEE. Inst. Electr. Electron. Eng., a hundred and one (12), 2470–2494 (2013)
- 5 Beauvais, B.S., Rialle, V., Sablier, J., MyVigi : An Android Application to Detect Fall and Wandering. (c), 156–160 (2012).
- 6 Bilandzic, M., Menkens, C., Sussmann, J., Kleine-Albers, D., Bittner, E., Golpaygani, A., Mehl, B., Huckestein, J., Khelil, O., SociCare: Towards a placing aware flexible network crisis framework. Lect. Notes Inst. Comput. Sci. Soc. Telecommun. Eng., forty eight LNICST 338–352 (2010).
- 7 Bottazzi, D., Corradi, A., Montanari, R., Context-aware middleware answers for on every occasion and wherever crisis help to vintage individuals. IEEE Commun. Mag., forty four (4), eighty two–ninety (2006)

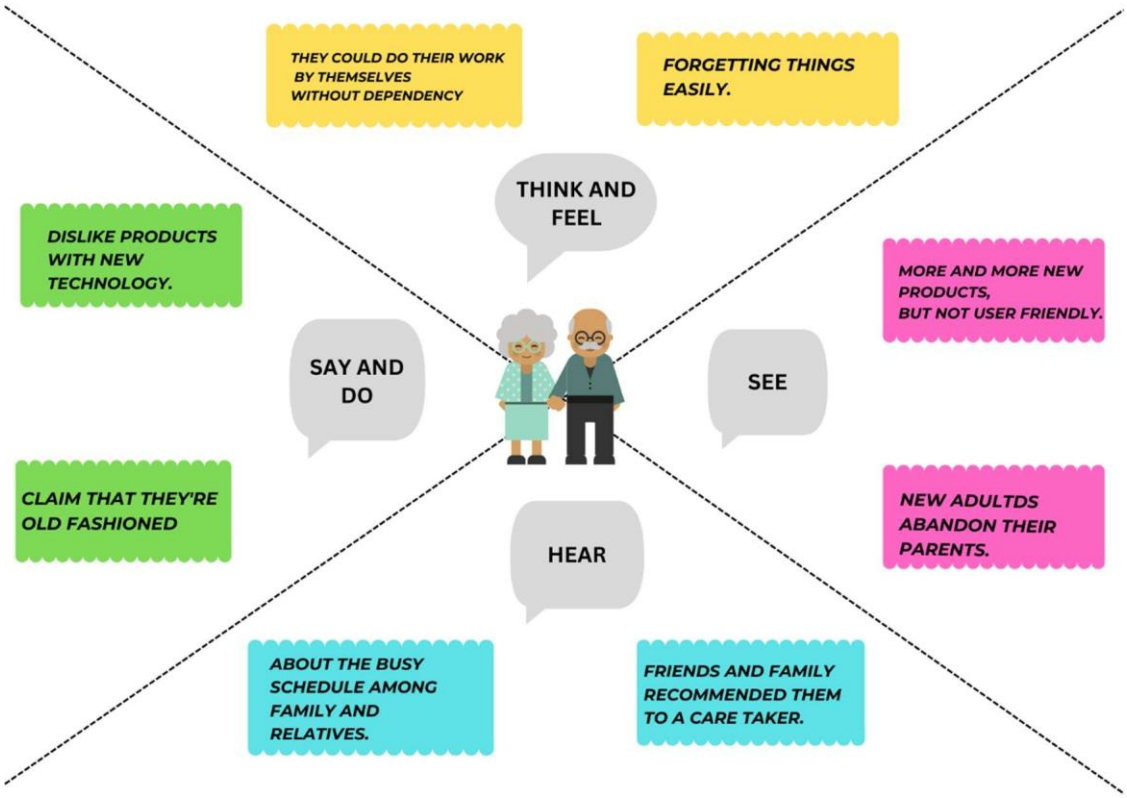
2.3.Problem Statement Definition

Problem Statement(PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	**Asthma patients**	**Take pills**	**I can't take it**	**Of carelessness**	**Wheezing.**
PS-2	**Diabetics patients**	**Take medicines/drugs before/after the food**	**I can't take it**	**I forgot it.**	**Increase in Glucose level.**

3.IDEATION AND PROPOSED SOLUTION

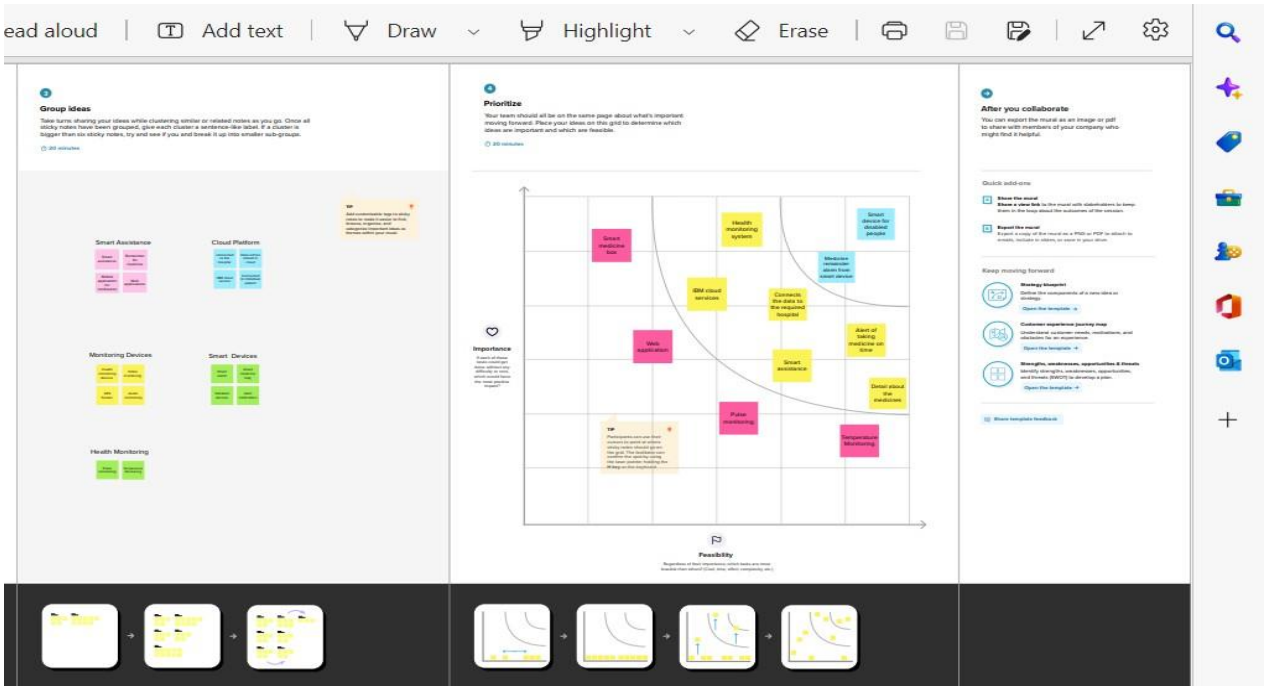
3.1.Empathy Map Canvas

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes. It is a useful tool to helps teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.


THEY COULD DO THEIR WORK BY THEMSELVES WITHOUT DEPENDENCY
FORGETTING THINGS EASILY.
THINK AND FEEL
DISLIKE PRODUCTS WITH NEW TECHNOLOGY.
MORE AND MORE NEW PRODUCTS, BUT NOT USER FRIENDLY.
SAY AND DO
SEE
CLAIM THAT THEY'RE OLD FASHIONED
NEW ADULTDS ABANDON THEIR PARENTS.
HEAR
ABOUT THE BUSY SCHEDULE AMONG FAMILY AND RELATIVES.
FRIENDS AND FAMILY RECOMMENDED THEM TO A CARE TAKER.

3.2.Ideation And Brainstorming

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.


ead aloud
Add text
Draw
Highlight
Erase
Group ideas
Smart Assistance
Cloud Platform
Monitoring Devices
Smart Devices
Health Monitoring
Prioritize
Importance
Feasibility
Smart medicine box
Health monitoring system
Smart device for disabled people
IBM cloud services
Connects the data to the required hospital
Web application
Alert of taking medicine on time
Smart assistance
Detect about the medicines
Pulse monitoring
Temperature Monitoring
After you collaborate

3.3.Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Some people find it difficult to learn new apps in this ever-expanding digital environment, and people nowadays tend to forget things more easily, such as taking their prescriptions
2.	Idea / Solution description	Create a basic, easy-to-use app so that users don't forget their medicine schedules, can easily discover pharmacies and clinics near them.
3.	Novelty / Uniqueness	It is a user-friendly app that sends users medication and refill reminders, provides drug interaction warnings ,and helps caregivers manage 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)	When it comes to the business there is no one size-fits-all solution. The model you choose depends on your target audience , business goals , and the resources you already possess.
6.	Scalability of the Solution	As the model is integrated with cloud software, we can update the user experience without re installing a model and the person can keep a remainder up to the year.

3.4.Problem Solution fit

4.REQUIREMENT ANALYSIS

4.1.Functional requirement

1.Proper Medication - Proper Time for medication Intake of tablets
2.Tablets on Time - Remainder for tables Via Voice message
3.Disabled people – Vibration mode is designed for their requirement

4.2.Non-Functional requirements

Usability

Smart Medicine Box usability is the characteristics of the User Interface that facilitate Use, to make it easier for the users to perceive the information presented by the User Interface, to understand and decide based on that information.

Smart

Smart Medicine Box, like other computer systems, can be vulnerable to security breaches, potentially impacting the safety and effectiveness of the device.

Reliability

The probability of Smart Medicine Box will perform a required function without failure under static conditions for a specified period.

Performance

Medical device testing is the process of demonstrating that the device will reliably and safely perform in use.

Availability Our smart pill box is programmable that enables medical caretakers or clients to determine the pill amount and timing to take pills, and the service times for every day.

Scalability

In Feature, we can upgrade the smart medicine box to the health care assistant to monitor our healthcare and book appointments with doctors.

5.PROJECT DESIGN

5.1.Data Flow Diagram

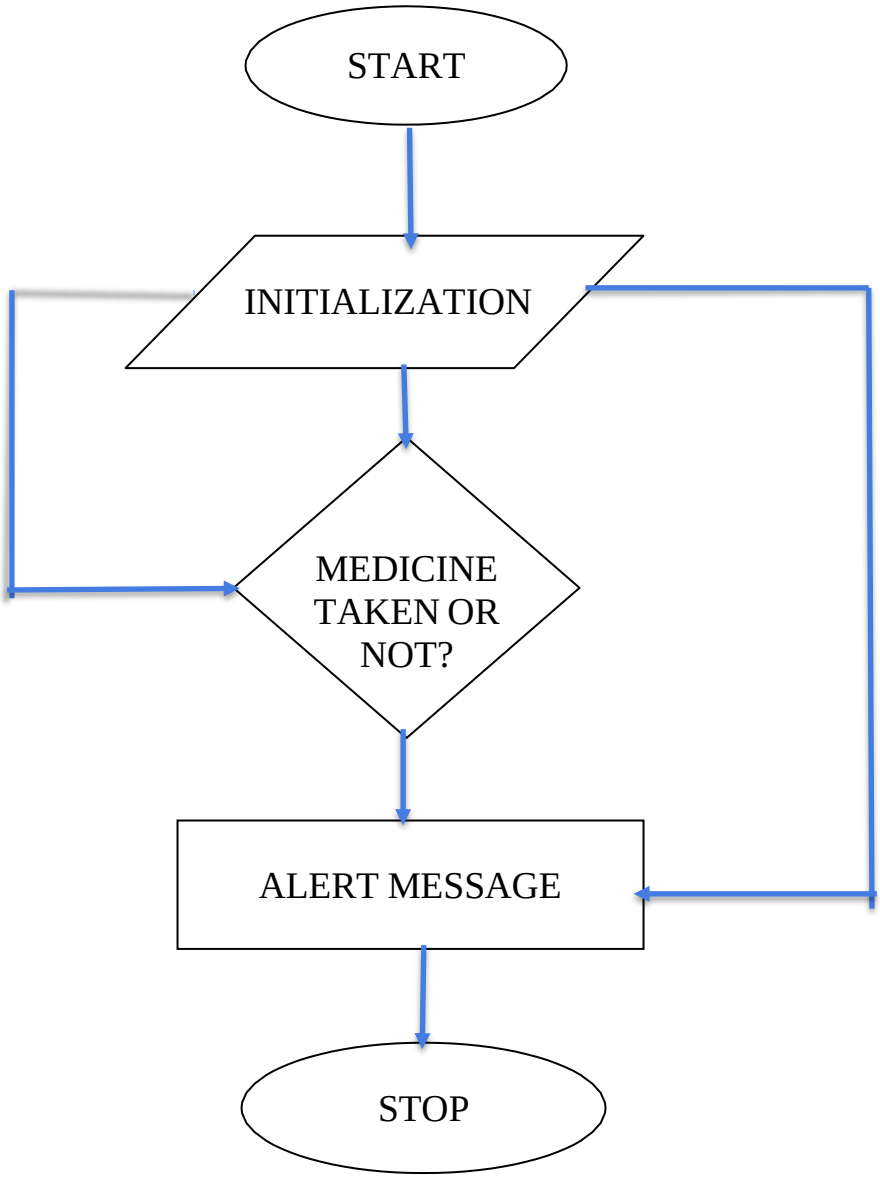


Fig: Data Flow Diagram

5.2.Solution & Technical Architecture

a) ➤ As elders were not remembering of their tablet routine, they were facing many health issues.

b) ➤ By use of this project, they need not to worry about their medicine remainderbecause this device automatically notifies the people to take their medicine ontime.

c) ➤ By creating portable web application, they were able to use this application without facing any diffabilities.

d) ➤ As it remains the elder to take their medicine, their health will also maintain in good condition. ϖ If the medicine time arrives, the web application will send the medicine name to the IoT Device through the IBM IoT platform.

e) ➤ The device will receive the medicine name and notify the user with voice commands and vibrate.

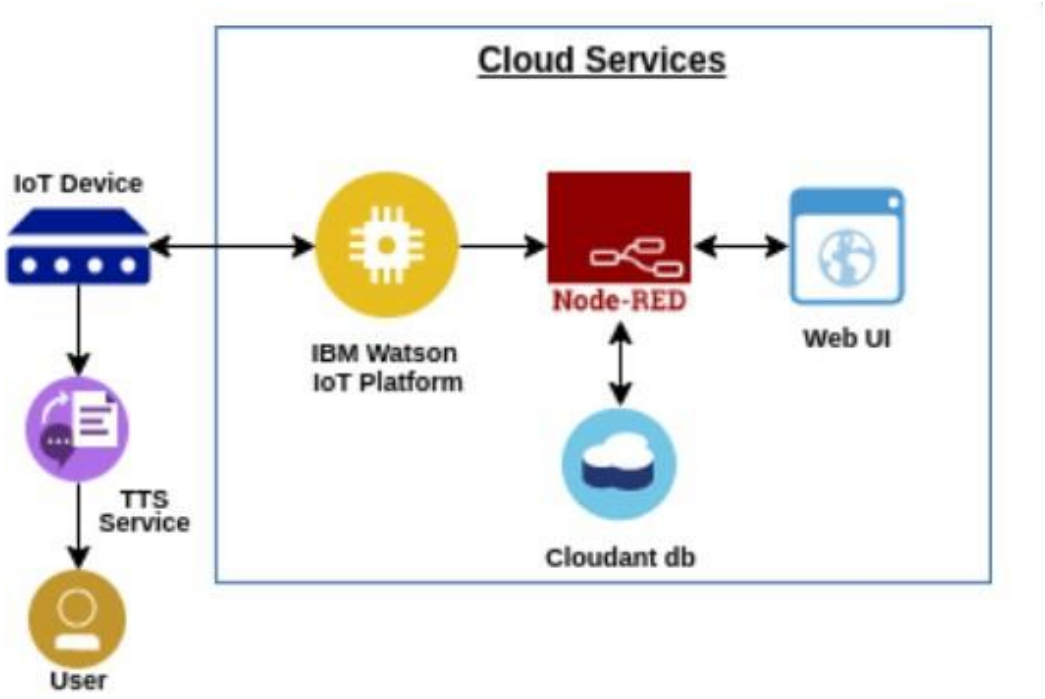


Fig: Architecture and data flow of the plasma donor application

5.3.User story:

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement	User Story Number	User Story / Task	Story points	Priority	Team Members
Sprint 1	Website development	USN-1	As a user, they must develop a website for the user information.	5	High	Nizar R
Sprint 2	Admin user page	USN-2	As the user want to interact with the doctor, a new page is created	5	High	Akshan T
Sprint 3	Node red implementation	USN-3	To connect the both user node red is created	5	High	Ronesh Christopher L
Sprint 3	Deployment	USN-4	Data of the patient will be stored in the cloud & the project is deployed	5	High	Santhiya S

6.PROJECT PLANNING AND SCHEDULING

6.1.Sprint Planning And Estimation

Sprint 1

- ➢ Sprint one is about web Development, by which the user can access easily.
- ➢ As the app get started, it requires the user's detail so that they can store theirdata in cloud platform.
- ➢ Therefore, the user needs to enter their medicine details and their time to takeoff.

Sprint 2

- ➢ To collect the details of the user, an admin page is created to store their details.
- ➢ And to get the details from the user and to transfer it the cloud platform an admin page is created using HTML code.
- ➢

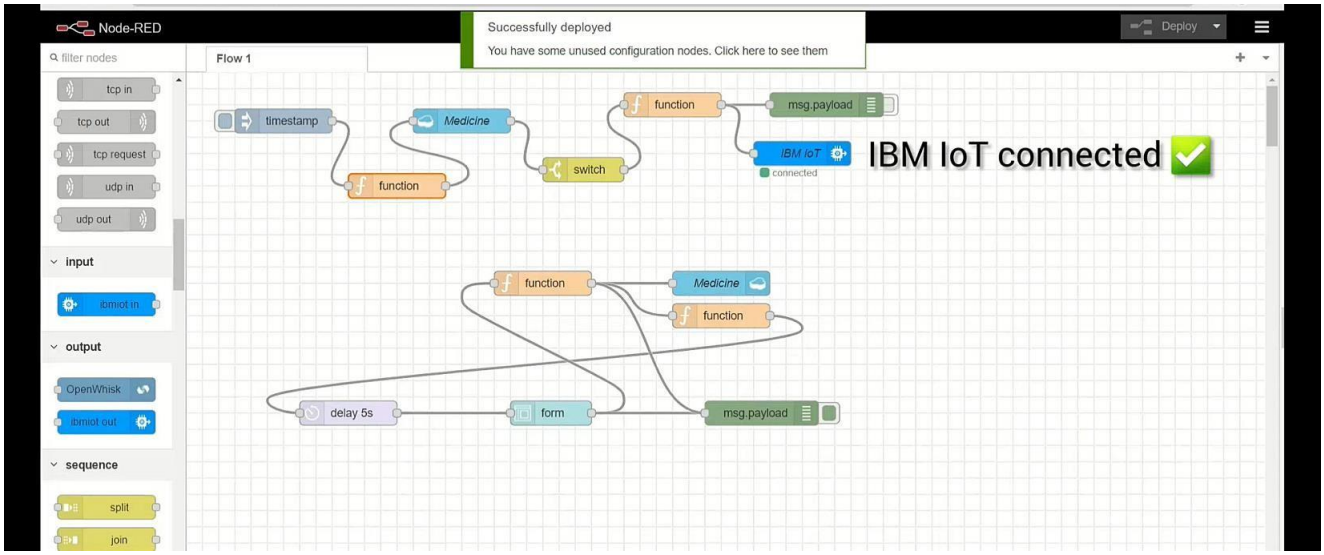
Sprint 3

- ➢ In this sprint, already created app and admin page backend program is created.
- ➢ By using this node red, the remainder will automatically reach the user by voice command with the medicine name.
- ➢ The cloud database connections were made in this sprint.

Sprint 4

- ➢ Once all the connection were made, the testing process is deployed

➤ And as a result, the app notifies the user by voice command with the required medicine name.

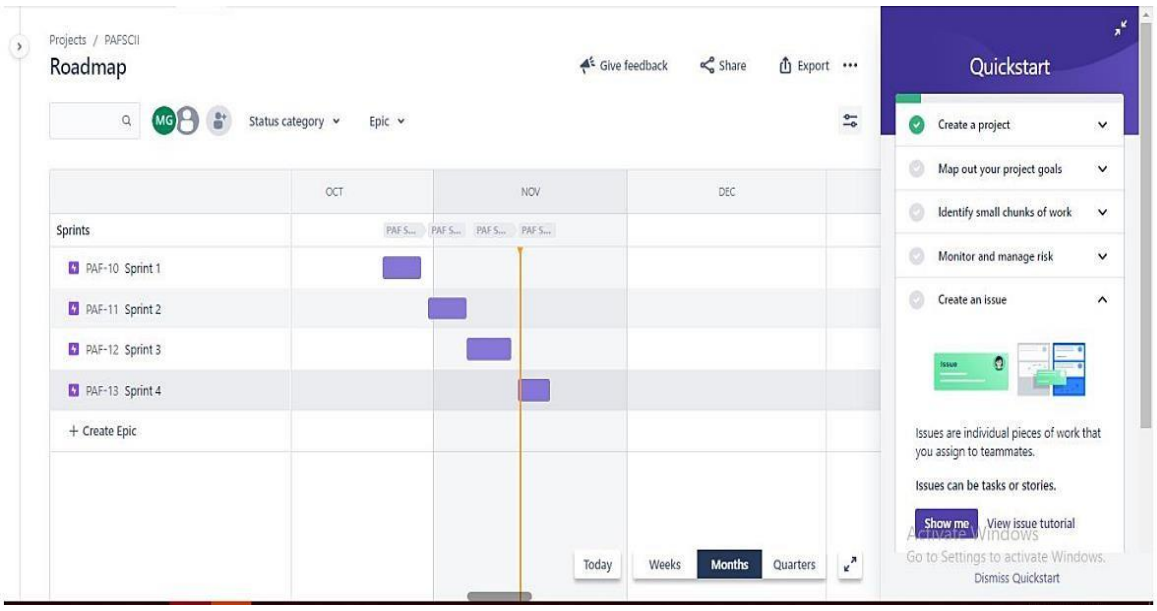


6.2.Sprint Delivery Schedule

Milestone Template:

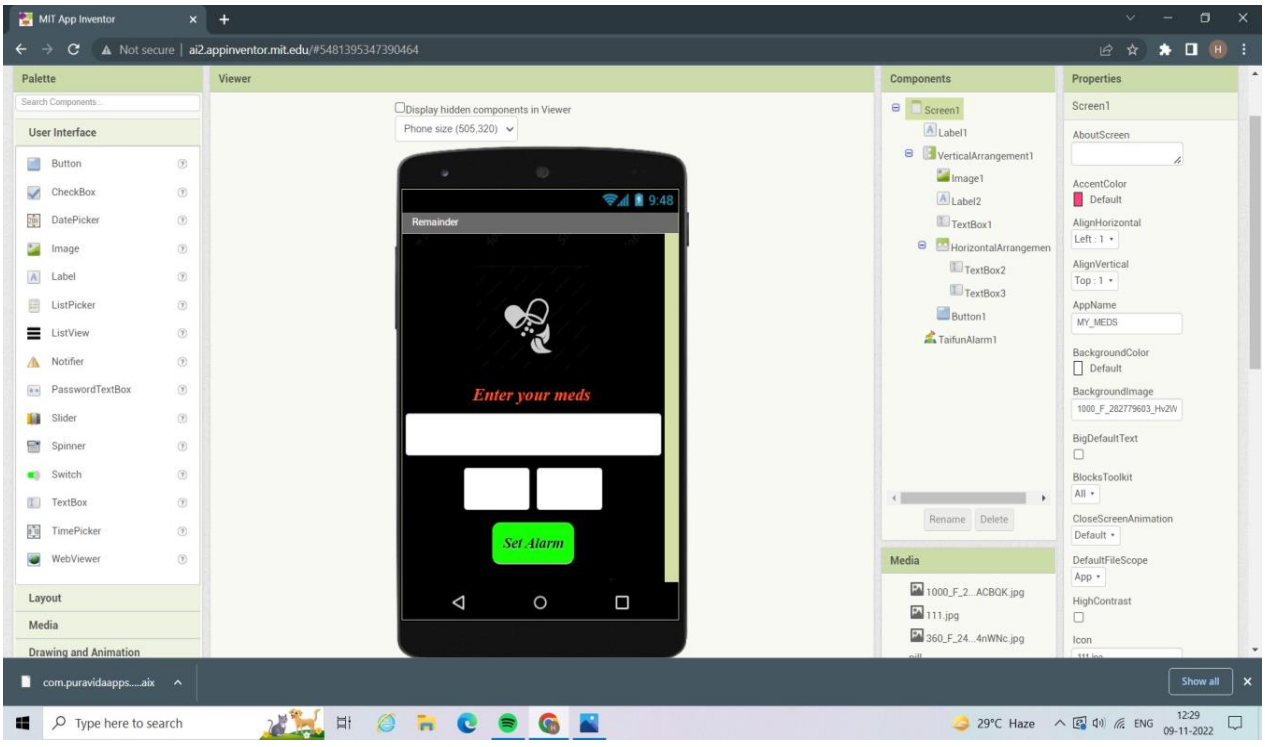
Sprint	Sprint Topic	Start Date	Expected Delivery
Sprint 1	Web development	29-10-2022	5-11-2022
Sprint 2	Admin page	7-11-2022	14-11-2022
Sprint 3	Node red	16-11-2022	23-11-2022
Sprint 4	Deployment	23-11-2022	30-11-2022

6.3.Reports from JIRA



7CODING AND SOLUTIONING

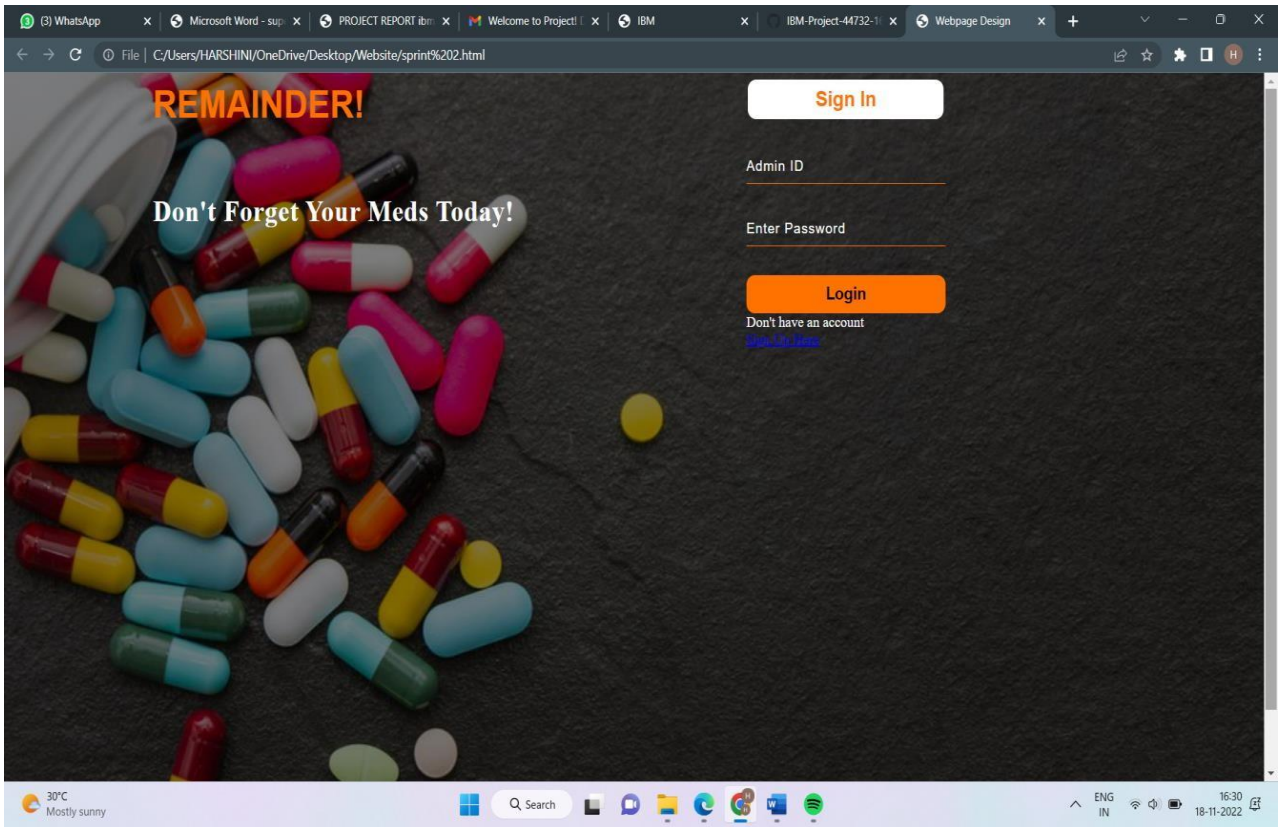
7.1. Feature 1



CODE

```
import './App.css'
import React, {useState, useEffect } from "react"import
axios from "axios"
import DateTimePicker from "react-datetime-picker"
```

7.2. Feature 2



CODE

```
*{
   margin: 0;
   padding: 0;

}

.main{
    width: 100%;
    background: linear-gradient(to top, rgba(0,0,0,0.5)50%,
rgba(0,0,0,0.5)50%),url(med.jpg);
    background-position: center;
    background-size: cover;
    height: 109vh;
}

.navbar{
    width: 1200px;
    height: 75px;
    margin: auto;
}

.icon{
    width:   200px;
    float:center;
    height: 70px;
}

.logo{
    color: #ff7200; font-
    size: 40px; font-
    family: Arial;
    padding-left: 20px;
    float: left; padding-
    top: 10px;
}
```

```css
.content{
    width: 1200px;
    height: auto;
    margin: auto;
    color: #fff;
    position: relative;

}

.content h1{
    font-family: 'Times New Roman';
    font-size: 30px;
    padding-left: 20px;
    margin-top: 2%;
    letter-spacing: 1px;

}

.form{
    width: 250px;
    height: 380px;
    background: linear-gradient(to top, #000000(3, 3, 3, 0.8)50%,#000000(3, 3, 3,
0.8)50%);
    color:#fff;
    position: absolute;
    top: -20px;
    left: 870px;
    border-radius: 10px;
    padding: 25px;

}

.form h2{
    width: 220px;
    font-family: sans-serif;
    text-align: center;
    color: #ff7200;
    font-size: 22px;
    background-color: #fff;
```

```
    border-radius: 10px;
    margin: 2px;
    padding: 8px;
}

.form input{
    width: 240px;
    height: 35px;
    background: transparent;
    border-bottom: 1px solid#ff7200;
    border-top: none;
    border-right: none;
    border-left: none;
    color: #fff;
    font-size: 15px;
    letter-spacing: 1px;
    margin-top: 30px;
    font-family: sans-serif;
}

.from input:focus{
    outline: none;
}
::placeholder{
    color: #fff;
    font-family: Arial;
}

.btrn{
    width: 240px;
    height: 40px;
    background: #ff7200;
    border: none;
    margin-top: 30px;
    font-size: 18px;
    border-radius: 10px;
    cursor: pointer;
    color: #fff;
```

```
        transition: 0.4s ease;
    }
```

```
.btrn:hover{
    background: #fff;color:
    #ff7200;
}

.btrn a{
    text-decoration: none;color:
    #000;
    font-weight: bold;
}

.form.link{
   font-family: Arial, Helvetica, sans-serif;font-
   size: 17px;
   padding-top: 20px;text-
   align:center;
}
.form.link a{
    text-decoration: none;color:
    #fff;
}


.liw{
    padding-top: 15px; padding-
    bottom: 10px;text-
    align:left; color:#fff;
}
```

8.TESTING

8.1.Test Cases

A test case might be created as an automated script to verify the functionality per the original acceptance criteria. After doing manual exploratory testing, QA testers might suggest other functionality be added to the application as well as updated test cases be incorporated in the automated test suite.

Test case ID	Feature Type	Component	Test Scenario
SMS Notification TC	Twilio SMS Notification	Node.JS (Server)	Verify user is able to Receive SMS when Users Medication Time arrives
Backend TC	App Configuration	Node.JS (Server)	It should get the data from the frontend and process data for Twilio SMS notification and DB store
Frontend TC	Dashboard UI	Home page (Client)	It should get the data from the frontend and process data for Twilio SMS notification and DB store
Datebase_TC_OO4	MongoDB	MongoDB (Server)	Verify that it can store the medicine reminder notes in the cloud DB

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation	BUG ID	Executed By
LoginPage_TC_OO1	UI	Home Page	Verify whether user is able to access the URL	https://node-red-psifx-2022-11-13.au-syd.mybluemix.net/ui/#!/0?sock	URL	Able to access the URL	failed to access in mobile	Fail	Wrong Browser selected	NO	101	RUFUS AR
LoginPage_TC_OO2	UI	Home Page	Verify whether user is able to access the URL	https://node-red-psifx-2022-11-13.au-syd.mybluemix.net/ui/#!/0?sock	URL	Now User able to access the URL	Able to access in mobile	Pass	Able to access in Chrome and Edge	YES		MARK GERALD
LoginPage_TC_OO3	Functional	Home page	User can enter the data in specified	To have browsers to have enhanced capabilities	URL	enter a data in specified format	specified input is not	Fail	Specify the User formats	NO	110	KINGSTON LEONARD V
LoginPage_TC_OO4	Functional	Home page	User can enter the data in any format	User can enter the data in required format	Time(HH:MM): DATE(YYYY-MM-DD):	User can enter the data in	Input received	Pass	Format specified	YES		MELODINA CARNELIAN D
CLOUD_STORAGE_TC_005	Functional	Cloud	Verify if User input is stored in the cloud	User is able to access the URL with the given link. User has to enter the data(name,time and date) and click the SUBMIT button.Data to be stored in IBM cloud	MEDICINE NAME: Time(HH:MM) : DATE(YYYY-MM-DD):	User inputs has to be stored in cloud	Failed to storing the inputs	Fail	Cloud not connected properly	YES	111	RUFUS AR
CLOUD_STORAGE_TC_OO	Functional	Cloud	Verify if User input is stored in the cloud	User is able to access the URL with the given link. User has to enter the data(name,time and date) and click the SUBMIT button.Data to be stored in IBM cloud	MEDICINE NAME: Time(HH:MM) : DATE(YYYY-MM-DD):	User inputs has to be stored in cloud	Inputs are stored in the cloud	Pass	Cloud connected properly	YES		KINGSTON LEONARD V
OUPUT_TC_007	Functional	Iot device	Verify if it reminds the medicine intake to the user	Comparing the UTC time and medicine intake time	Real time and medicine intake time	Gives True when both times match	Null	Fail	Check the input	YES	113	RUFUS AR

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation	BUG ID	Executed By
OUPUT_TC_007	Functional	Iot device	Verify if it reminds the medicine intake to the user	Comparing the UTC time and medicine intake time	Real time and medicine intake time	Gives True when both times match	Null	Fail	Check the input	YES	113	RUFUS AR
OUPUT_TC_007	Functional	Iot device	Verify if it reminds the medicine intake to the user	Comparing the UTC time and medicine intake time	Real time and medicine intake time	Gives True when both times match	TRUE	Fail	verified	Yes		MARK GERALD
TTS_TC_008	Functional	Iot device	Verify if it gives voice notifications	When True it gives a voice notifications	Voice notifications	Voice notifications	Voice notifications service didn't work	Fail	In program, commands are as object instead of string	NO	121	KINGSTON LEONARD V
TTS_TC_009	Functional	Iot device	Verify if it gives voice notifications	When True it gives a voice format notifications	Voice notifications	Voice notifications	Voice notifications	Pass	New string functions were added	YES		RUFUS AR
ACK_TC_010	Functional	URL	Verify whether the patient has taken the medicine or not	The TAKEN button has been included	The status of the medicine intake	The User clicks the TAKEN button to show that medicine has	Button is unfunctional	Fail	Error occurs due to failure of call and connect function of the "taken " button`	NO	132	MELODINA CARNELIAN D
ACK_TC_011	Functional	URL	Verify whether the patient has taken the medicine or not	The TAKEN button has been included	The status of the medicine intake	The User clicks the TAKEN button to show that	The Taken status is updated in	Pass	The status of the medicine intake is updated in the cloud	Yes		KINGSTON LEONARD V

8.2.User Acceptance Testing

Purpose of Document: The purpose of this document is to briefly explain the test coverage and open issues of the personal assistance for seniors who are Self-Reliant project at the time of the release to User Acceptance Testing (UAT). Defect Analysis: This report shows the number of resolved or closed bugs at each severitylevel, and how they were resolved.

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	5	3	1	2	11
Duplicate	2	1	0	0	3
External	2	2	0	0	4
Fixed	10	2	3	15	30
Not Reproduced	0	1	0	0	1
Skipped	0	0	2	0	2
Won't Fix	0	2	4	5	11
Totals	19	10	8	22	62

9.RESULTS

9.1.Performance MetricsDetailed Test Plan

S.No	Project Overview	NFT Test approach	Assumptions/Dependencies/Risks	Approvals/Sign Off
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

Project Overview	NFT Test approach	NFR - Met	GO/NO-GO decision	Identified Defects	Approvals/ Sign Off
Medicine Reminder Web -UI	Stress	Performance	GO	Closed	Approved
Medicine Reminder Web -UI	Load	Scalability	NO-GO	Closed	Approved

10.ADVANTAGES & DISADVANTAGES

ADVANTAGES

- The software can help people set free from remembering the medication time and names.
- It helps the caretaker to determine the medication time, which can be variable sometimes, depending upon the patient's severity.
- The software is very user-friendly; the need not install any external app by the patient, economic for the caretaker too.
- The single software can be used by the caretaker for managing multiple patients at the same place.
- The details of the time scheduled, and patients' intake is stored in the database for future reference easily.
- The overall stress of patients and caretakers is reduced and maintained under control by the software.

DISADVANTAGES

- The software currently can only alert the patient to take medicine, we cannot ensure whether they have taken it or not.
- The software currently can only alert people with SMS, it cannot make phone calls to help the illiterate.

Elderly people should be aware of how to use the application.
There is no way to determine what happened as it only gives the remainder to take the medicine Internet connection is required.

11.CONCLUSION

This leads to the conclusion that, unless patients indicate otherwise, all patients should receive a reminder or 'reminder plus is that actively encourages patients who are unable to attend to cancel their appointment and to reschedule if further appointments are required. The reminder should be sent around 3 days in advance of the appointment as timing of a reminder, between 1 and 7 days prior to the scheduled appointment, has no effect on patient attendance behaviour. This will allow sufficient time for patient cancellation and health service reallocation of the appointment to another patient or allow the clinician to undertake care-related administrative tasks. To optimise attendance, cancellation and rescheduling there needs to be robust procedures to ensure that patient contact details are up to date and

that there are easy to use, probably multiple, systems for cancelling appointments that suit the needs of the patients, e.g., automated SMS cancellation, answerphone, e-mail, etc. Robust 24-hours-per-day rescheduling procedures should allow easy rescheduling of appointments for patients. Finally, an effective reminder system will increase the workload on clinical staff and alternative time will need to be scheduled for staff to undertake health-care-related administration. Further research is required to investigate the differential effectiveness and cost-effectiveness of an 'optimised' reminder system over and above usual reminder systems.

There were few studies investigating the differential effectiveness of alternative types of reminders for different segments of the population and this we believe is a key area for further research. Nevertheless, we have used the findings of our review to suggest possible reminder alternatives for key groups of patients who appear to be at higher risk of not attending appointments, namely deprived, ethnic, substance abusers, and those with comorbidities and illness. Simple reminders and automated reminders to attend may be ignored or overlooked and may put these patient groups at a disadvantage compared with general outpatient populations. Reminders with direct personal contact might be appropriate in these groups. To facilitate attendance in the most at risk, vulnerable groups we have suggested that reminder systems of increasing intensity and interactivity could be introduced to ensure that disparities in health-care opportunities are not compounded. We have introduced the concept of a sequential reminder intervention in order to reach the greatest number of patients and maximise attendance, although their effectiveness in this context needs to be established. The re-engagement of these patient groups with treatment after they have missed their appointment may be important if they have health problems that need ongoing treatment. Intensive approaches, such as 'stepped reminders and patient navigators have been effective at increasing attendance at screening and immunisation programmes in disadvantaged and vulnerable populations, although their effectiveness in this context needs to be investigated.

Reminder systems are a complex intervention, because of the potential number of interacting components within the interventions, the requirement for tailoring of the intervention to the health service and the number of difficulties and behavioural changes from those receiving and delivering the reminder. Therefore, in addition to following the general recommendations provided above, health service managers will need to tailor their reminder systems to meet the needs of the service and the patient population that it serves. This review provides a range of findings that will inform health service managers' decision-making processes. To this end, we are producing a practice guide to help health service managers consider specific issues that may be relevant to the design of reminder systems for their health service

12. FUTURE SCOPE

- ➤ The project can be enhanced with many other features that can serve senior citizens even better. The product currently is a simple basic version which can only send SMS alerts on time. Some other additional features that are planned to be incorporated with this existing product are listed below:
- ➤ The dashboard can be made more versatile for the caretakers to manage patients medicine intake time and to monitor how it changes every day, by this a new or speculated time can be scheduled individually.
- ➤ The system can be enhanced with a smartwatch or health devices so that the health conditions can be continuously connected with the hospitals, and doctors to supervise and help them during emergencies.
- ➤ The system can relate to hardware product that stores and automatically opens the container and alerts with a voice message.

The system can further relate to the medical shop so that the hardware system automatically senses the tablet counts and alerts the medical shop to deliver the medicine.

13.APPENDIX

13.1Source Code

```
import  './App.css'
import React, { useState,
useEffect } from "react"import
axios from "axios"

import DateTimePicker from "react-
datetime-picker"function App () {

const [ reminderMsg, setReminderMsg
] = useState("")const [ remindAt,
setRemindAt ] = useState()

const [ reminderList, setReminderList
] = useState([])useEffect(() => {
```

```
axios.get("http://localhost:9000/getAllReminder").then(
\=>setReminderList(res.data))

}, [])

const addReminder = () => {

axios.post("http://localhost:9000/addReminder", {

reminderMsg, remindAt})

.then( res

=>setReminderList(res.

data))

setReminderMsg("")

setRemindAt()
```

```
        }
        const deleteReminder = (id) => {
        axios.post("http://localhost:9000/deleteR
        eminder", { id })
        . then(res =>setReminderList(res.data))
         }
         return (
        <div className="App">

<div className="homepage">
        <div className="homepage_header">
        <h1>Medicine Reminder </h1>
        <input type="text" placeholder="Reminder notes here..."
        value={reminderMsg}onChange={e
        =>setReminderMsg(e.target.value)} />
        <DateTimePicker
        value={rem
        indAt}
        onChange=
        {setRemind
        At}
        minDate={n
        ew Date()}
        minutePlac
        eholder="
        mm"
        hourPlaceh
```

```
older="hh"
dayPlaceho
lder="DD"
monthPlac
eholder="
MM"
yearPlaceh
older="YYY
Y"

<div className="button" onClick={addReminder}>Add Reminder</div>
</div>
<div
className="homepa
ge_body">
reminderList.map(
reminder=> (
<div className="reminder_card" key={reminder._id}>
<h2>{reminder.reminderMsg}</h2>
<h3>Remind Me at:</h3>
<p>{String(new Date(reminder.remindAt.toLocaleString(undefined,
{timezone:"Asia/Kolkata"})))}</p>
<div className="button" onClick={()
=>deleteReminder(reminder._id)}>Delete</div>
</div>
</div>
```

```
</div>
</div>

require('dotenv').config()
const express =
require("express")
const mongoose =
require("mongoose")
const cors =
require("cors")

//APP config
const app =
express()
app.use(expre
ss.json())
app.use(expre
ss.urlencoded(
))
app.use(cors()
)

//DB config
mongoose.connect('mongodb://127.0.0.1:27017/IBM-
Prototype_DB', {useNewUrlParser: true,

useUnifiedTopology: true
}, () =>console.log ("DB connected"))
```

```
const reminderSchema = new
mongoose.Schema({reminderMsg:
String,
remindAt:
String,
isReminded
: Boolean
})
const Reminder = new mongoose.model("reminder", reminderSchema)
//Whatsapp
reminding
functionality
setInterval(() => {
Reminder.find({},  (err,
    reminderList) => {
    if(err) {
        console.log(err)
    }
if(reminderList){
reminderList.forEach(remin
der => {
            if(!reminder
                .isRemind
                ed){const
```

```
                now =
                new Date
                ()
if((new Date(reminder.remindAt) - now) < 0) {
Reminder.findByIdAndUpdate(reminder._id,
{isReminded: true}, (err,remindObj)=>{
                    if(err){
                        console.log(err)
                    }
                    const client =
require('twilio')('ACed0ea1d4fae9d7375672d0742331e96b','dcc8fb9
228ae68d156727d7ed5f656b2');
client.messages
.create({
                                body:
                                reminder.remi
                                nderMsg,to:
                            })
.then(message => console.log(message.sid))
.done();
                    })
                }
            }
        })
    }
  })
```

```
},1000)
//API routes
app.get("/getAllReminder", (req, res)
=> {Reminder.find({}, (err,
reminderList) => {
    if(err){
    console.log(err)
    }
    if(reminderList){ res.send(reminderList)
    }
    })
    })
    app.post("/addReminder", (req, res) => {
    const { reminderMsg, remindAt } = req.body const reminder = new
    Reminder ({
    reminderMsg, remindAt, isReminded: false
    })
    reminder.save(err => { if(err){
    console.log(err)
    }
    Reminder.find({}, (err, reminderList) => { if(err){
    console.log(err)
    }
    if(reminderList){ res.send(reminderList)
    }
    })
```

```
})
})
app.post("/deleteReminder", (req, res) => { Reminder.deleteOne({_id:
req.body.id}, () => { Reminder.find({}, (err, reminderList) => {if(err){
console.log(err)
}
if(reminderList){ res.send(reminderList)
}
})
})
})
app.listen(9000, () => console.log("Be started"))
```

HTML CODE

```
*{
   margin: 0;
   padding: 0;

}

.main{
    width: 100%;
    background: linear-gradient(to top, rgba(0,0,0,0.5)50%,
rgba(0,0,0,0.5)50%),url(med.jpg);
    background-position: center;
    background-size: cover;
    height: 109vh;
}

.navbar{
    width: 1200px;
    height: 75px;
    margin: auto;
```

```
.icon{
    width:     200px;
    float:center;
    height: 70px;
}

.logo{
    color: #ff7200; font-
    size: 40px; font-
    family: Arial;padding-
    left: 20px;float: left;
    padding-top: 10px;
}

.content{
    width: 1200px; height:
    auto; margin: auto;
    color: #fff; position:
    relative;

}

.content h1{
    font-family: 'Times New Roman';
    font-size: 30px;
    padding-left: 20px;
    margin-top: 2%; letter-
    spacing: 1px;

}

.form{
    width: 250px;
    height: 380px;
    background: linear-gradient(to top, #000000(3, 3, 3, 0.8)50%,#000000(3, 3, 3,
0.8)50%);
```

```
    color:#fff; position:
    absolute;top: -20px;
    left: 870px;
    border-radius: 10px;
    padding: 25px;

}

.form h2{
    width: 220px;
    font-family: sans-serif;
    text-align: center; color:
    #ff7200;
    font-size: 22px;
    background-color: #fff;
    border-radius: 10px;
    margin: 2px;
    padding: 8px;
}

.form input{
    width: 240px;
    height: 35px;
    background: transparent;
    border-bottom: 1px solid#ff7200;
    border-top: none;
    border-right: none;
    border-left: none;
    color: #fff;
    font-size: 15px;
    letter-spacing: 1px;
    margin-top: 30px;
    font-family: sans-serif;
}

.from input:focus{
    outline: none;
}
::placeholder{
```

```
    color: #fff;
    font-family: Arial;
}

.btrn{
    width: 240px; height:
    40px; background:
    #ff7200;border: none;
    margin-top: 30px; font-
    size: 18px; border-
    radius: 10px;cursor:
    pointer; color: #fff;
    transition: 0.4s ease;
}

.btrn:hover{
    background: #fff;
    color: #ff7200;
}

.btrn a{
    text-decoration: none;
    color: #000;
    font-weight: bold;
}

.form.link{
   font-family: Arial, Helvetica, sans-serif;
   font-size: 17px;
   padding-top: 20px;
   text-align:center;
}
.form.link a{
    text-decoration: none;
    color: #fff;
}
```

```
.liw{
    padding-top: 15px;
    padding-bottom: 10px;
    text-align:left;
    color:#fff;
}
```

13.2.GitHub Link

a) **GitHub**
https://github.com/IBM-EPBL/IBM-Project-46946-1660795091