

Personal Assistance For Seniors Who Are Self-Reliant

TEAM ID :	PNT2022TMID07000
PROJECT NAME :	PERSONAL ASSISTANCE FOR SENIORS WHO ARE SELF-RELIANT
TEAM MEMBERS:	DHARSHINI B(TEAM LEADER) INDHIRANI S JAYAMEENAKSHI S JAYAPRIYA G VARSHINI S

PROJECT REPORT

1.INTRODUCTION:

1.1.Project Overview Elderly people tend to forget which pill should be taken at what time And also there is much burden placed on the caregivers. This makes the caregivers and also the patients frustrated. We developed a Web application integrated with IoT device to provide scheduled voice output and display the medicine name on a microcontroller during intake

1.2.Purpose :

- To cater to the needs of the elderly lacking physical assistance during their course of medication.
- To provide better quality of life for individuals with chronic disabilities and their caregivers.
- Improved ability to stay self-sufficient at home

2.LITERATURE SURVEY:

2.1.Existing Problem :

The existing methodologies include various gadgets available to assist patients in taking their medication either by simplifying administration or by assisting them in remembering to do so. Pill reminder charts, drug diaries,calendar clocks, telephone prompting service, multi compartment compliance aids (MCAs), talking labels, voice reminders, watch reminders, daily

pill boxes, and automated pill dispensers are just a few examples.

LITERATURE SURVEY

SNo .	IEEE PAPER REFERENCES WITH AUTHOR AND YEAR OF PUBLICATION	ABSTRACT	ADVANTAGES	DISADVANTAGES
1	Elderly Healthcare Assistance Application Using Mobile Phone Andreas Handojo, Tioe Julio Adrian Sutono, Anita Nathania Purbowo 2017	Feature to monitor the location of the elderly, remainder to take the medication, doctor appointment reminder, medical record records, emergency phone to family number or personal doctor, etc.	Home care service, send messages,speed dial contacts, elderly could send emergency (SOS) message only by pressing SOS button, GPS	Perform the reboot function on mobile phone then the mobile phone condition must be in root condition. Permission on android to use automated telephone answering it is only work starting from lollipop android version
2	Home Tele-assistance System for Elderly or Disabled People in Rural Areas Santiago Solorzano, Mateo Rojas-Ortiz, Ricardo-Armando Lopez-Molina, Jean-Michel Clairand, ' David Pozo-Esp'in, 2018	To improve the care of elderly and disabled people in a rural community, through a tele-assistance system implementation that connects with an emergency center in case of assistance needs.	Specially developed for easy use, portability and adapted to the GSM network available in rural areas. Emergency services and relatives can immediately receive the notifications of an incident and monitor the	No autonomous recognition of accidental events.

			situation, based on the containing geographical location and personal information of the elderly, until the problem is solved.	
3	<p>PAS: A Wireless-Enabled, Sensor-Integrated Personal Assistance System for Independent and Assisted Living</p> <p>Jennifer C. Hou, Qixin Wang, Bedoor K. AlShebli, Linda Ball, Stanley Birge, Marco Caccamo, Chin-Fei Cheah, Eric Gilbert, Carl A. Gunter, Elsa Gunter, Chang-Gun Lee, Karrie Karahalios, Min-Young Nam, Narasimhan Nitya, Chaudhri Rohit, Lui Sha, Wook Shin, Sammy Yu, Yang Yu, and Zheng Zeng</p> <p>2007</p>	Used for tracking, fall detection, security and privacy; and results from our pilot study in a real assisted living facilities are presented.	<p>Advances in networking, sensors, and embedded devices have made it feasible to monitor and provide medical and other assistance to people in their homes. Aging populations will benefit from reduced costs and improved health-care through assisted living based on these technologies. However, these systems challenge current state-of-the-art techniques for usability, reliability, and security.</p> <p>The PAS open architecture for assisted living allows independently developed third party components to collaborate.</p>	No speed dial, No suggestion of nutritions.
4	<p>PERSONAL ASSISTANCE FOR ALZHEIMER'S PATIENT</p> <p>Kalpna Devi.S, Amirthavarshini</p>	The features include face recognition, wandering and fainting detection,	Fall Detection, Face Recognition, Reminder System, Wander Detection,	The shortcoming is that it doesn't provide assistance for Alzheimer's patients who

	D2, Anbukani RS3, Bhavatha Ranjanni S4, . 2020	assistance to find a way home, reminders to daily chores and past life, organizing , and planning jobs.		has reached the final stage of Alzheimer's disease.
5	Personal Health Assistance for Elderly People via Smartwatch Based Motion Analysis Rainer Lutze Dr.-Ing. Rainer Lutze Consulting, Klemens Waldhör FOM 2017	A new approach is presented for a personal health assistant for elderly people utilizing smartwatches. On the smartwatch, an app featuring an artificial neural network (ANN) analyzes the motion patterns of the smartwatch wearer. The ANN recognizes health relevant events and activities of daily living (EDLs, ADL).	The unobtrusive presence of those data on the wrist will support better self-management of the widespread diabetes mellitus type 2.	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.
6	Voice Controlled Personal Assistant Robot for Elderly People Jishnu U K, Indu V, K J Ananthakrishnan, Korada Amith, P Sidharth Reddy, Pramod S 2020	Voice communication between the robot and Android smartphones are done via Bluetooth. The proposed four-wheeled robot consists of a camera and robotic arm. The camera is used for object detection, distance measurement, and a robotic arm to perform pick and place actions.	Helps for both physically challenged & elderly people using robots by controlling through voice control	Limitation is that no consulting of doctors during emergency conditions, only helps in daily life not in risk of health issues

7	A Smartwatch Software Architecture for Health Hazard Handling for Elderly People Rainer Lutze, Klemens Waldhör 2015	The approach uses a software architecture for smartwatches supporting and securing the everyday life for the elderly people	The developed conceptual framework and layered architecture is well suited for coping with the handling of specific health hazards for elderly people wearing smartwatches	The modeling of these experiences gained indeed requires frequent updating, adjustments and amendments of the formal description of the processing in the USMs to be done with economic effort.
8	An Ambient Assisted Living System for Elderly Assistance Applications Luca Mainetti, Luigi Manco, Luigi Patrono, Andrea Secco, Ilaria Sergi, Roberto Vergallo, 2016	An Ambient Assisted Living (AAL) works to create better living conditions for older or disable people. AAL systems are able to continuously monitor the health status of the elderly through data coming from heterogeneous sensors.	This system is able to guarantee important features such as continuous monitoring of the elderly locomotor activity and sensing of environmental parameters. In this way, the system can trigger specific events (e.g., to notify family members or medical staff) when particular dangerous situations occur (e.g., fall detection).	The premise is that often in AAL systems a single source of data is not sufficient to detect useful information to describe health state of the monitored person.

9	Smart Monitoring Service Through Self Sufficient Healthcare Gadget for Elderly Rowshni Tasneem Usha Fariha Sazid Sejuti Samiul Islam 2019	A remote health monitoring system focusing on the general well being of elderly people. The system provides several functionalities such as a wearable gadget to monitor the overall health condition of the patient and an android application software for relatives involved in eldercare.	The proposed system includes the features : Patient's general health condition monitoring. • Portable gadget with Simple button functions and display. • Motion tracking, Location tracking and Geo fencing. • Medicine Reminder and Refill alerts. • Emergency distress notifications • Communication services with relatives and doctors. • Patient's activity record in app.	Some of the areas of improvement missing in this system: -This system can be integrated to provide mobility to the elderly which is not included in the proposed system. -With the help of sensors, the system will calculate and determine how the room condition should be for comforting the patient's situation. The data will be transferred locally to a home WiFi system and automatically adjust light, fan, air conditioner
10	eButton: A Wearable Computer for Health Monitoring and Personal Assistance Mingui Sun, Ph.D.1,3, Lora E. Burke, Ph.D., R.N.2 , Zhi-Hong Mao, Ph.D.3 , Yiran Chen, Ph.D.3 , HsinChen Chen, Ph.D.1,3, Yicheng Bai1,3, Yuecheng Li1 , Chengliu Li1,3, and Wenyan Jia, Ph.D. 2014	Besides healthcare, mobile devices have not yet been designed to fully benefit people with special needs, such as the elderly and those suffering from certain disabilities, such as blindness. This paper presents an overview of research on a new wearable computer called eButton.	eButton is a complex miniature computer with a powerful CPU and an array of sensors for data collection. Diet and physical activity evaluation, sedentary behavior evaluation, and assistance to the elderly and blind.	In wearable design, a power supply is always a critical issue since the battery often has a dominant effect on device size and weight. In order to support automatic operation, the "big data" problem of the wearables must be solved. The multimodality data, including image sequences and waveforms, require a tremendous processing power

2.2.References:

- **Elderly Healthcare Assistance Application Using Mobile Phone** Andreas Handojo,

Tioe Julio Adrian Sutiono, Anita Nathania Purbowo Department of Informatics Petra Christian University Surabaya, Indonesia 2017

- **Home Tele-assistance System for Elderly or Disabled People in Rural Areas** Santiago Solorzano, Mateo Rojas-Ortiz, Ricardo-Armando Lopez-Molina, Jean-Michel Clairand, ´ David Pozo-Esp´in, 2018
- **PAS: A Wireless-Enabled, Sensor-Integrated Personal Assistance System for Independent and Assisted Living** Jennifer C. Hou*, Qixin Wang*, Bedoor K. AlShebli*, Linda Ball†, Stanley Birge†, Marco Caccamo*, Chin-Fei Cheah*, Eric Gilbert*, Carl A. Gunter*, Elsa Gunter*, Chang-Gun Lee‡, Karrie Karahalios*, Min-Young Nam*, Narasimhan Nitya***, Chaudhri Rohit**, Lui Sha*, Wook Shin*, Sammy Yu*, Yang Yu**, and Zheng Zeng* * Department of Computer Science, University of Illinois at Urbana-Champaign, † College of Medicine, Washington University in Saint Louis, ‡ Department of Electrical and Computer Engineering, Ohio State University, ** Pervasive Platforms and Architectures Lab, Motorola Labs, Schaumburg IL. 2007
- **PERSONAL ASSISTANCE FOR ALZHEIMER’S PATIENT** Kalpana Devi.S1, Amirthavarshini D2, Anbukani RS3, Bhavatha Ranjanni S4, Assistant Professor1. 2020
- **Personal Health Assistance for Elderly People via Smartwatch Based Motion Analysis** Rainer Lutze Dr.-Ing. Rainer Lutze Consulting, Klemens Waldhör FOM University of Applied Sciences 2017
- **Voice Controlled Personal Assistant Robot for Elderly People** Jishnu U K, Indu V, K J Ananthakrishnan, Korada Amith, P Sidharth Reddy, Pramod S 2020
- **A Smartwatch Software Architecture for Health Hazard Handling for Elderly People** Rainer Lutze, Klemens Waldhör 2015
- **An Ambient Assisted Living System for Elderly Assistance Applications** Luca Mainetti, Luigi Manco, Luigi Patrono, Andrea Secco, Ilaria Sergi, Roberto Vergallo, 2016
- **Smart Monitoring Service Through Self Sufficient Healthcare Gadget for Elderly** Rowshni Tasneem Usha Fariha Sazid Sejuti Samiul Islam 2019
- **eButton: A Wearable Computer for Health Monitoring and Personal Assistance** Mingui Sun, Ph.D.1,3, Lora E. Burke, Ph.D., R.N.2 , Zhi-Hong Mao, Ph.D.3 , Yiran Chen, Ph.D.3 , HsinChen Chen, Ph.D.1,3, Yicheng Bai1,3, Yuecheng Li1 , Chengliu

Li1,3, and Wenyan Jia, Ph.D.1 Departments of 1 Neurosurgery, 2 Health and Community Systems, and 3 Electrical & Computer Engineering, University of Pittsburgh 2014

2.3.Problem Statement Definition:

The caretaker(user) needs a way to schedule medicines and notify the elderly(user needs) so that the older people take medicine at the correct time(benefits) because older people often forget to take medicines(insights).

3.IDEATION & PROPOSED SOLUTION

3.1.Empathy Map Canva:



3.2.Ideation & Brainstorming:



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

🕒 10 minutes to prepare

🕒 1 hour to collaborate

👤 2-8 people recommended



Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

🕒 10 minutes

A

Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B

Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

C

Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) →

1

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

🕒 5 minutes

PROBLEM

How might we remind and alert elderly people to take correct medicines at correct time?



Key rules of brainstorming

To run a smooth and productive session



Stay in topic.



Encourage wild ideas.

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Person 1

Make emergency call	Use voice to make a call	Recommend healthy meal plans
Recommend relaxation music and videos	Video interactions	Notify family members in case of emergency
Send GPS location to the family members contact	Customizable settings	Schedule intake of medicines

Person 2

Secure life	Contact Doctor Immediately	Easy navigation
Instantaneous notification	Speed dial	Enable Team chatting with family and friends
Regular body check up	Beneficial during lockdown period also	Automatically place orders when the stock of medicines becomes 90% of prescribed course

Person 3

Help in emergency situation	Scheduling intake of medicines	Adaptability
Suggestion of Nutrients	Alert the care takers when strangers come to the home	Consulting the family doctors if they are not feeling well
Checking Pulse rate regularly	Place orders for groceries, fruits and vegetables	Track medicine intake

Person 4

Reminder of Doctor's appointment	Alarm notification with prescribed medicine name and dosage	Alerting family members about the missed dosage
Easy to use	Multiple user support	Takes the stress out of remembering
Snooze option	Improved medication adherence	Keeps you connected with care providers.

Person 5

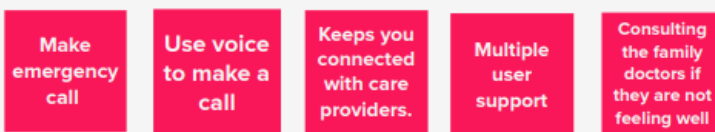
Alerting more times to patient	Contacting doctors	Track medical reports
SOS	Reachout neighbours	Flexibility
Safety Alert	Monitoring Body	Healthy foods suggestion

Group ideas

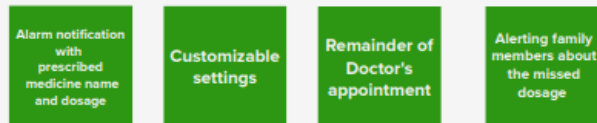
Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

 20 minutes

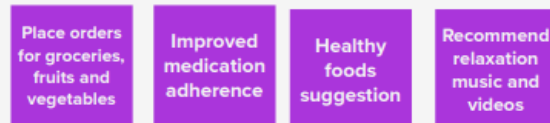
Category 1



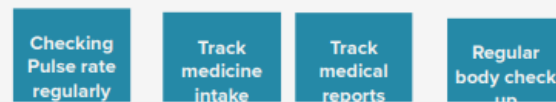
Category 2



Category 3



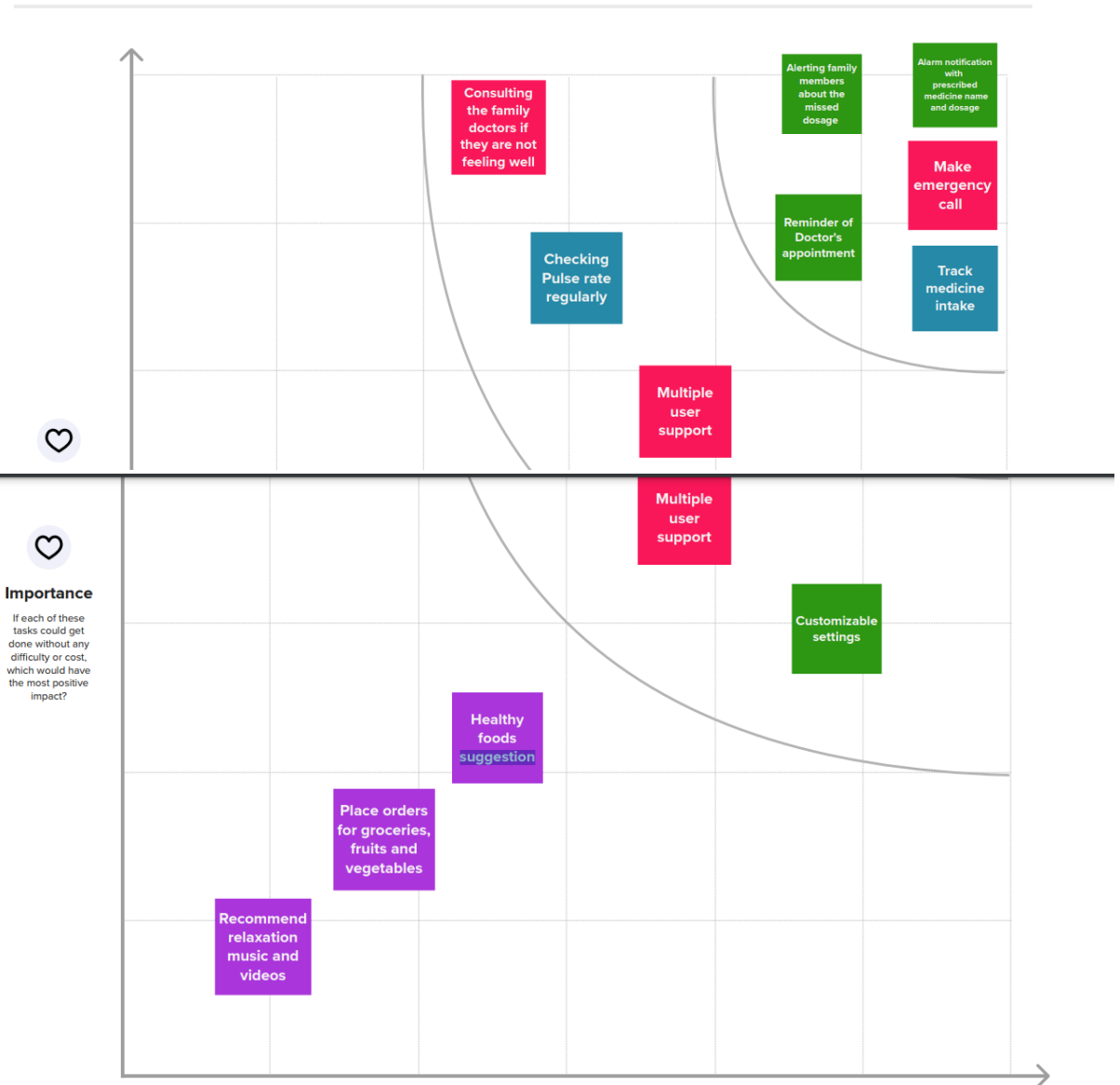
Category 4



Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

🕒 20 minutes



Importance
If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

3.3.Proposed Solution:

S.No.	Parameter	Description
	Problem Statement (Problem to be solved)	<p>The caretaker/doctor needs a way to notify the older people to take medicines as prescribed and to make them feel relieved from the fear of forgetting to take medicines.</p> <p>To enable the caretaker/doctor to maintain the medicine intake status of the elderly ,which helps to know the current health condition and to suggest medications.</p>
	Idea / Solution description	<p>The solution is to design an IoT device and an user-friendly application to notify the older people with medicine names at the scheduled time ,</p> <p>Enabling caretakers to schedule medicines, Maintain the medicine intake history and to suggest healthy meal plans.</p>
	Novelty / Uniqueness	<p>The solution also helps older people who suffer from blindness, hearing loss , Alzheimer's disease and people who are bedridden. A text-to-speech service and a LCD display are used to help people who suffer from blindness and hearing loss , respectively.</p> <p>Reduces the risk of overdose of medicines, which further helps in reducing side effects of overdosage.</p> <p>Encourage people to take medicine at the scheduled time.</p>
	Social Impact / Customer Satisfaction	<p>Relieves the stress of older people remembering to take medicines.</p> <p>It will be a life saving model for the older people.</p> <p>The caretaker can remotely monitor the medicine intake using the app dashboard.</p> <p>Continuous monitoring without physical presence of caretaker.</p>
	Business Model (Revenue Model)	<p>This model ,when used by older people, eliminates the need for frequent visits to the hospital , which is an economical benefit and time-saver.</p> <p>As we are planning to design a proprietary product as a solution and distribute it to clients/users, this will serve as our return on investment.</p>

	Scalability of the Solution	The app can handle a large number of users' requests simultaneously because we use cloud for server implementation. Hence it is scalable.
--	-----------------------------	---

3.4.Problem Solution fit:

Problem-Solution fit canvas 2.0		The vision is to help older people to take medicines at the prescribed time to maintain their stable health condition.	
Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS Older people might forget to take medicines and their caretakers/doctors wish to monitor medicine intake continuously and update medicine schedule.	6. CUSTOMER CONSTRAINTS CC Blindness, Hearing impairments, Available devices, Network connection	5. AVAILABLE SOLUTIONS AS Available solution is medicine reminder, just it provides reminder. In our solution, it sends a notification to a family member/caretaker about the missed medicine. And also reminds about the medicine stock out. It sends a reminder about Doctor's appointments.
	2. JOBS-TO-BE-DONE / PROBLEMS J&P The caretaker and the doctor receives the notification when the person feels abnormality symptoms. They don't have to worry about the remembrance of taking their daily dose of medicines.	9. PROBLEM ROOT CAUSE RC The person forget about the intake of medicine at right time and correct dosage because of visibility issues and lack of remembrance.	7. BEHAVIOUR BE Find the right caretaker, Each time suggested diet plan by a nutritionist according to the updated medical report manually. They need to continuously remember the intake of medicines at right time.
Identify strong TR & EM	3. TRIGGERS TR Seeing their neighbors using the reminder, which makes them take the medicine at right time, suggestion for right diet plan and this leads to good improvement in their health	10. YOUR SOLUTION SL Our solution is designing an application which helps in reminding about the medicine intake at the correct time along with prescribed dosage. It enables caretakers/doctors to schedule the medicine timings and to suggest healthy meal plans.	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE They can update medicine schedules, diet schedules, and doctor's appointments virtually 8.2 OFFLINE During the doctor's appointment the person needs to consult the doctor in person for regular checkup
	4. EMOTIONS: BEFORE / AFTER EM Fear of missing medicine > Timely intake of medicine Dislike to take continuous medicine > encourages to take medicine		



Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 license Created by Daria Nepriakhina / Amaltama.com



4.REQUIREMENT ANALYSIS:

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Mobile number Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Personal Information	Gathering patient's bio data and medicine history
FR-4	Scheduling	Doctor medicine prescription Doctor's appointment. Suggestion of food plan by nutritionist.
FR-5	Reminding the medicine timings	Alert the person to take medicine with the correct dosage and medicine name. Remind the doctor's appointment. Remind everyday's diet plan.

FR-6	Emergency alarm	<p>Doctor and caretaker gets the alarm when the person's health is abnormal, which is indicated by heart rate fluctuations or if any fall is detected.</p> <p>Caretaker gets the alarm for the person's missed medicine.</p>
------	-----------------	--

Non-functional Requirements:

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

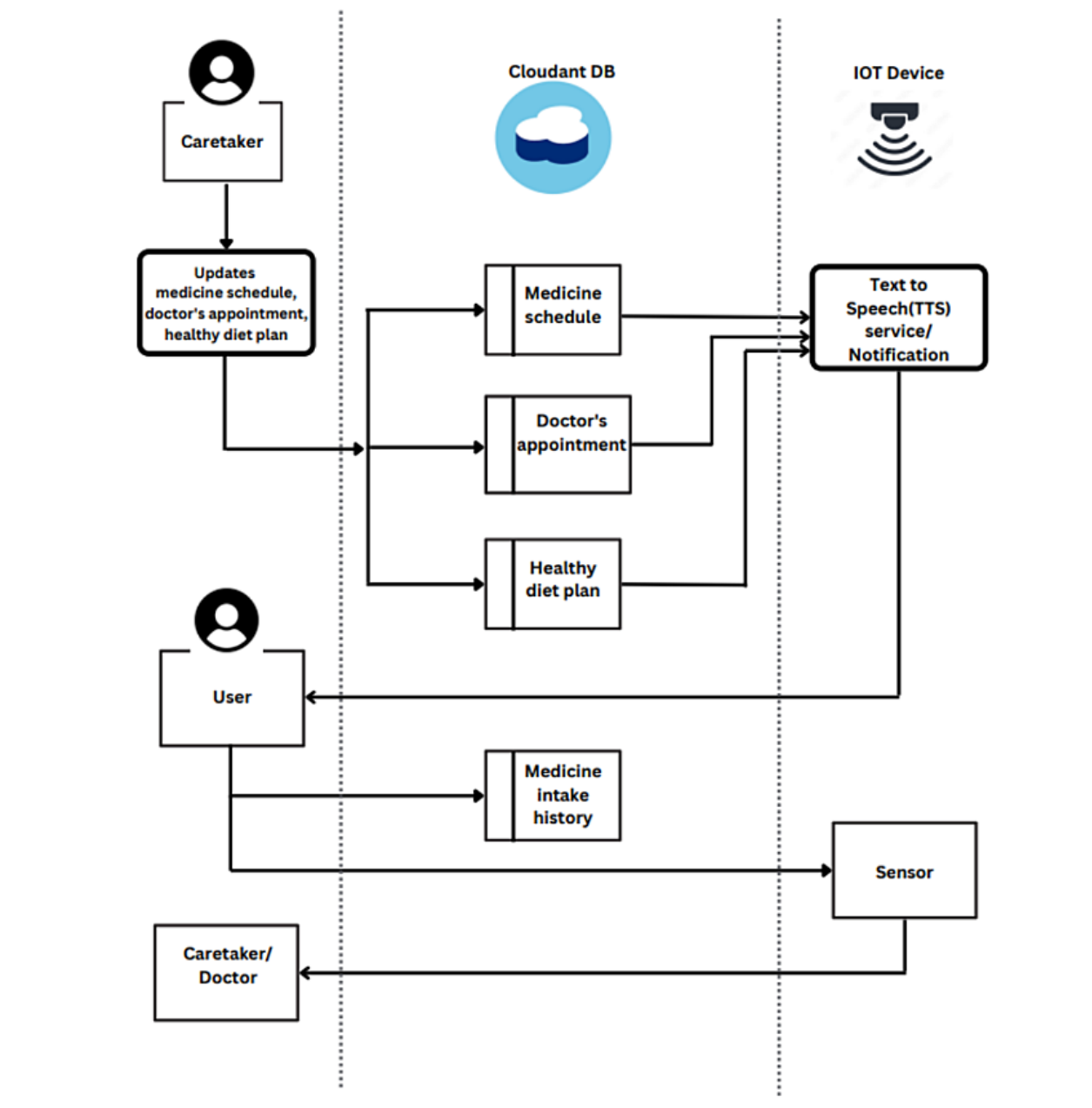
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Caretaker/doctor can easily schedule medicine timings through his/her dashboard. The person can acknowledge the medicine intake using a simple UI.
NFR-2	Security	The person's information is secured by providing access permission only to the corresponding registered caretaker and doctor.
NFR-3	Reliability	The application is reliable because of authentication of users and providing database updates regularly.
NFR-4	Performance	The application uses virtual sensors, so the performance will be high. The modularization helps in improving the performance of the application.
NFR-5	Availability	The services provided are available to the registered users.

NFR-6	Scalability	As we are using IBM cloud, our application supports many users at the same time.Hence, it is scalable.
-------	--------------------	--

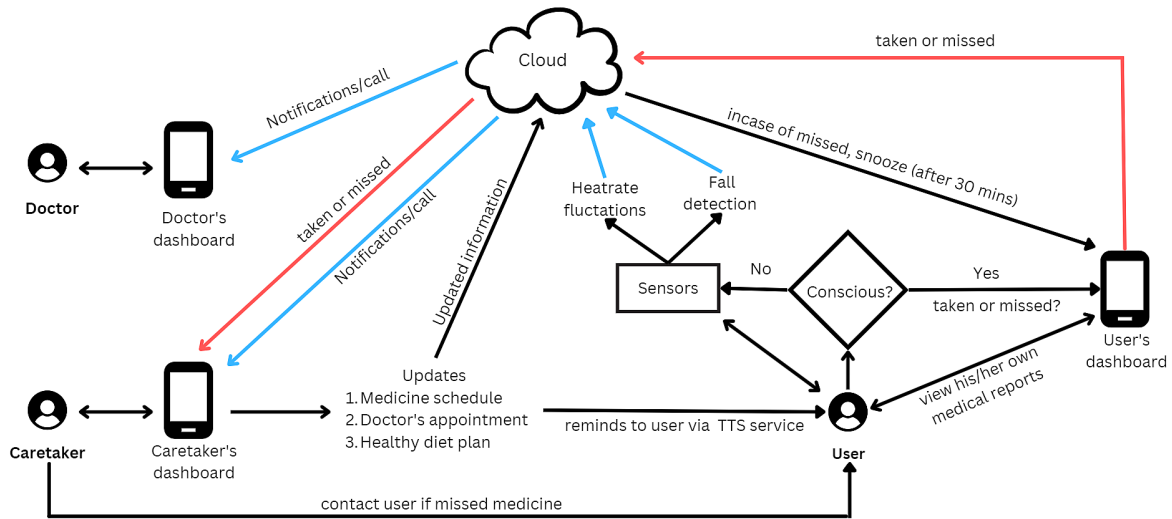
5.Project Design

5.1.Data Flow Diagrams

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



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 (Citizen)	Scheduling	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 (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 (Doctor)	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	Low	Sprint-2
Customer (CareTaker)	Data storage	USN-4	As a user, my patient needs medication time and prescription should load in the database for the upcoming week.	My patient medication time and prescription should be in database list	Medium	Sprint-3
Customer (CareTaker)	Smart medicine box	USN-5	As a user, I need to take my medicine in nearby places with light notification.	I want to access the customer health 24/7	High	Sprint-4
Customer (Patient)	User Experience	USN-6	As a user,the app should be easy and simple to use	I want an easy to handle application	Medium	Sprint-4

6.PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation:

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Jayapriya, Indhirani, Jayameenakshi
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Dharshini, Jayapriya, Varshini
Sprint-1		USN-3	As a user, I can register for the application through Gmail	3	Medium	Indhirani, Varshini
Sprint-1	Login	USN-4	As a user, I can log into the application by entering email & password	1	High	Dharshini, Jayapriya
Sprint-1	Dashboard	USN-5	As a user, I can set the medicine schedule in the dashboard.	8	High	Jayameenakshi, Indhirani, Dharshini
Sprint-1		USN-6	As a system, it will send the medicine schedule to IBM cloud.	5	High	Indhirani, Jayapriya, Dharshini

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2	Dashboard	USN-7	As a user, the schedule is displayed in the dashboard of the user.	5	High	Jayameenakshi, Varshini
Sprint-2	Features	USN-8	As a system, it uses Text To Speech Service to remind the senior citizen at the scheduled time.	8	High	Dharshini, Indhirani
Sprint-2	Features	USN-9	As a system, it will send a notification to take medicine .	2	Medium	Jayapriya, Jayameenakshi
Sprint-2	Features	USN-10	As a user, I can update the doctor's appointment schedule.	5	High	Varshini, Indhirani
Sprint-3	Dashboard	USN-11	As a senior citizen, I can view the schedule for medicine intake.	2	Medium	Dharshini, Jayameenakshi
Sprint-3	Features	USN-12	As a senior citizen, I will receive notification at the scheduled time.	8	High	Jayapriya, Dharshini, Indhirani
Sprint-3	Features	USN-13	As a senior citizen, I can acknowledge the medicine intake.	5	High	Varshini, Jayameenakshi
Sprint-3	Dashboard	USN-14	As a system, it sends the medicine intake status to the user's dashboard.	3	High	Varshini, Indhirani
Sprint-3	Features	USN-15	As a user, I will receive emergency notification if the medicine is missed.	2	High	Jayapriya, Jayameenakshi, Dharshini
Sprint-4	Dashboard	USN-16	As a doctor, I can access my dashboard and make use of available services.	5	Medium	Indhirani, Varshini
Sprint-4	Features	USN-17	As a doctor, I can suggest a healthy diet plan to the user.	5	Medium	Indhirani, Jayameenakshi

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-4	Dashboard	USN-18	As a doctor, I can view appointment schedules.	5	High	Dharshini, Varshini, Jayapriya
Sprint-4	Dashboard	USN-19	As a doctor, I can view the medicine intake history.	5	High	Dharshini, Jayameenakshi, Indhirani

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

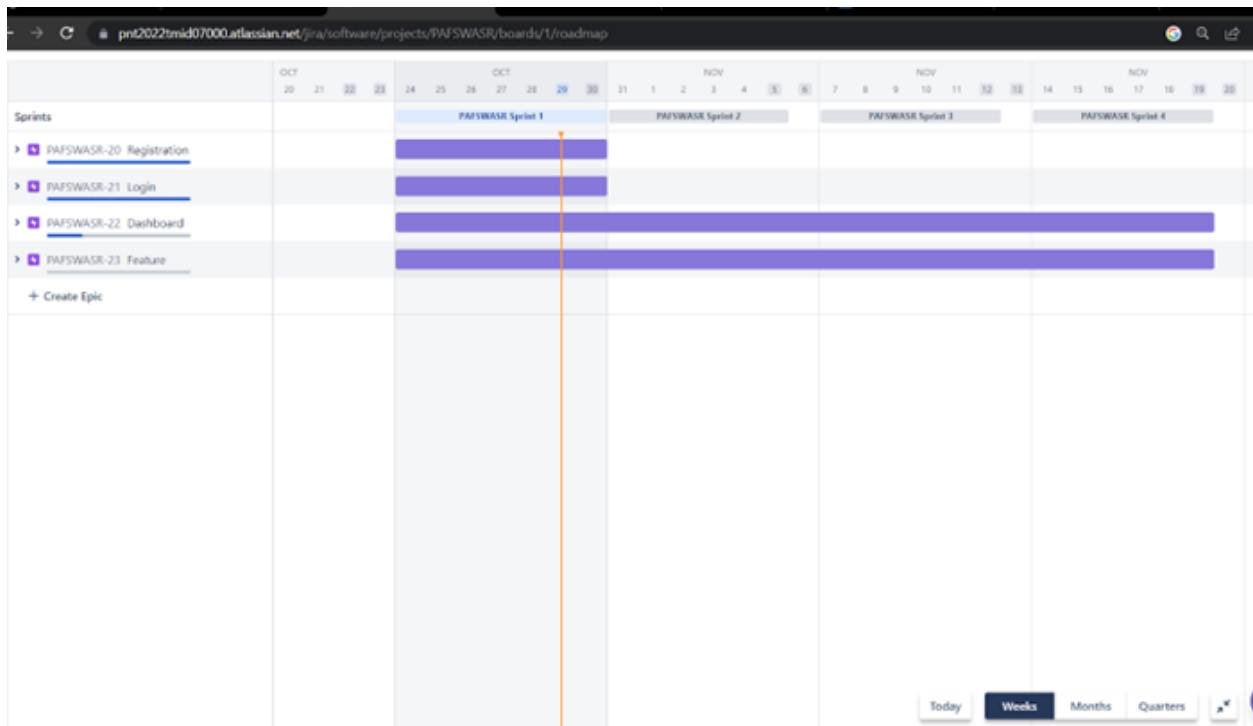
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022		29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022		05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022		12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022		19 Nov 2022

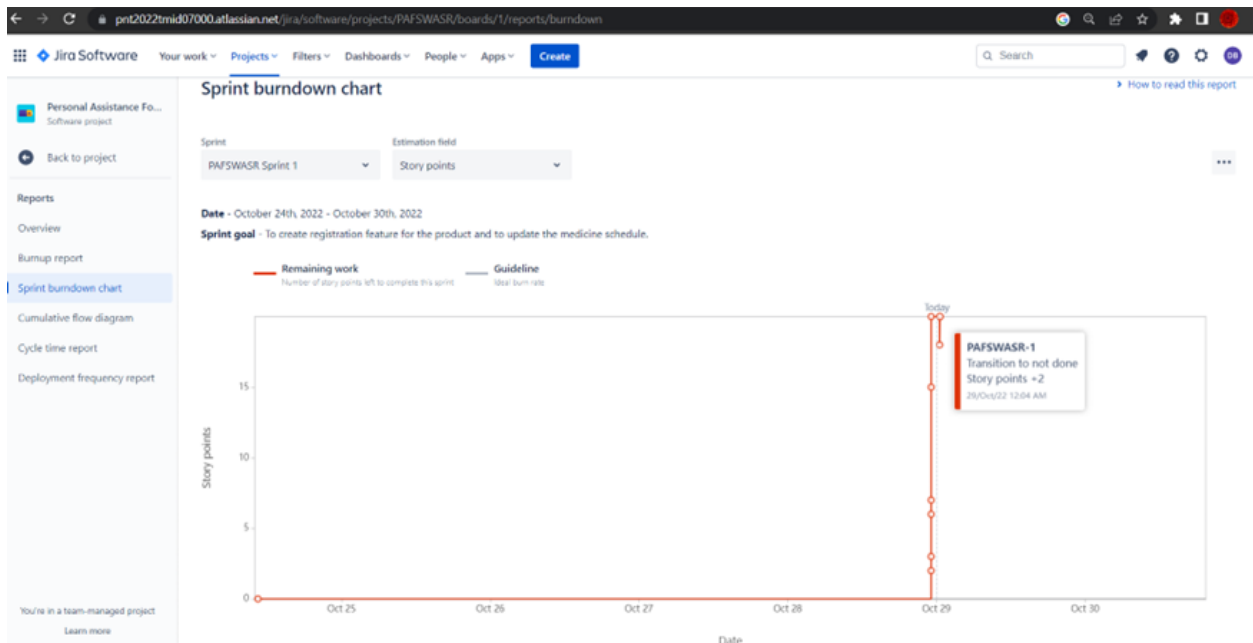
6.2 Sprint Delivery Schedule

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

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022		29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022		05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022		12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022		19 Nov 2022

6.3 Reports from JIRA





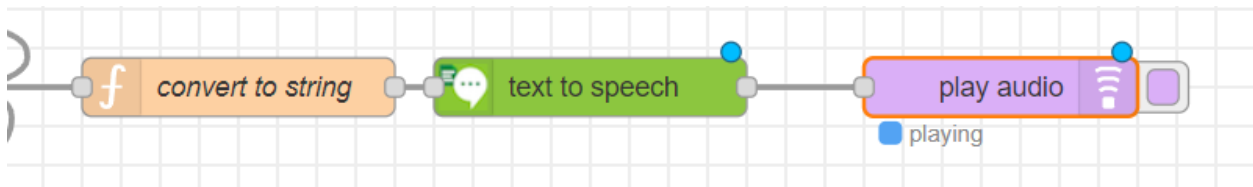
7.CODING AND SOLUTIONING

Features

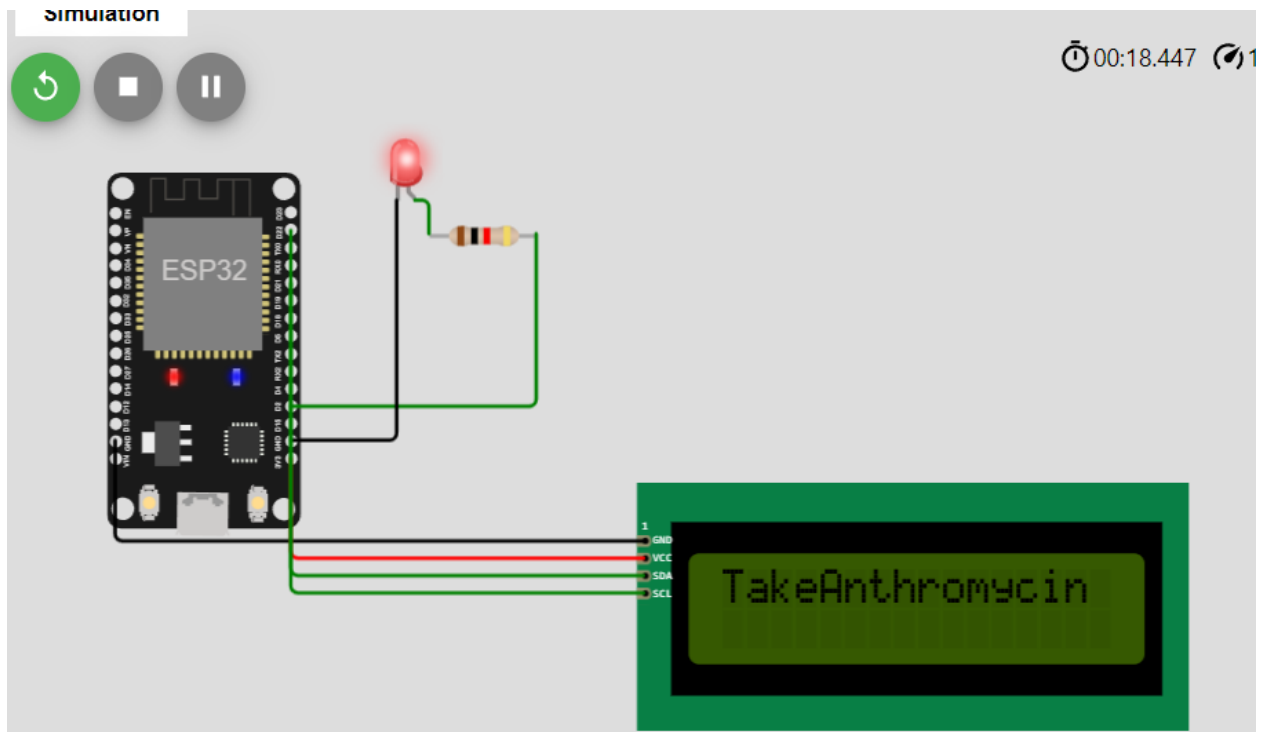
#1 Web UI to schedule medicine name and intake time:

The screenshot shows a web application interface with a 'Medicine Reminder' form. The form has three input fields: 'Medicine Name' (containing 'Anthromycin'), 'Time' (containing '21:18'), and 'Date' (containing '20-11-2022'). Below the fields are two buttons: 'SUBMIT' and 'CANCEL'. The application is running on a Node-RED instance, as indicated by the browser tabs and the URL. The system tray at the bottom shows the date as 20-11-2022 and the time as 21:17.

#2 Sending the medicine name as Voice output at the scheduled time



#3 Displaying the medicine name on the IoT



4 Secure data transmission and storage with IBM Cloudant

Resource list - IBM C... Application Details - Node-RED : node-red... IBM Watson IoT Platf... Node-RED Dashboard x PNT2022TMID07000... Cloudant Dashboard x

15e4c53d-5af6-460a-ac5d-1d371423c7a0-bluemix.cloudant.com/dashboard.html#database/medicine/2022-11-20%2021%3A18

medicine > 2022-11-20 21:18

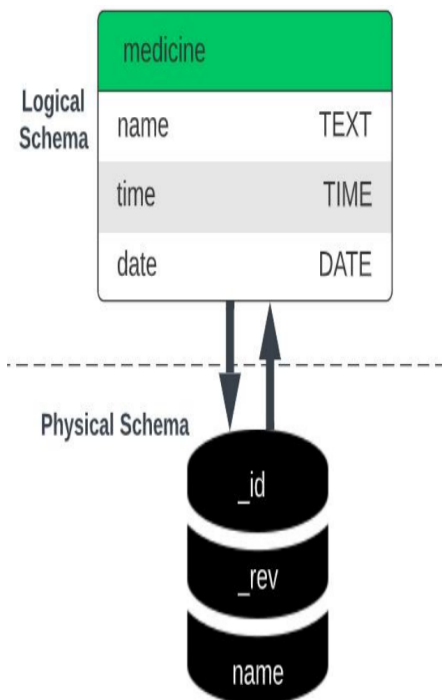
Save Changes Cancel Upload Attachment Clone Document Delete

```
1 {
2   "_id": "2022-11-20 21:18",
3   "_rev": "1-e556f5e7d84e3f9171d8412c21b2a253",
4   "name": "Anthromycin"
5 }
```

Log Out

26°C Haze 21:17 20-11-2022

Database schema





8. TESTING

8.1 TEST CASES

5	Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Autom	BUG ID	Executed By
6	LoginPage_TC_001	UI	Home Page	Verify whether user is able to access the URL	APP URL	https://node-red-wrmkf-2022-10-22.eu-gb.mybluemix.net/ui/#/0/socketid-bbPbnjU_DmVuUWscnAAA	URL	Able to access the URL	failed to access in mobile	Fail	Wrong Browser selected	NO	101	DHARSHINI B
7	LoginPage_TC_002	UI	Home Page	Verify whether user is able to access the URL	APP URL	https://node-red-wrmkf-2022-10-22.eu-gb.mybluemix.net/ui/#/0/socketid-bbPbnjU_DmVuUWscnAAA	URL	Now User able to access the URL	Able to access in mobile	Pass	Able to access in Chrome and Edge	YES		INDHIRANI S
8	LoginPage_TC_003	Functional	Home page	User can enter the data in specified format	APP URL	To have browsers to have enhanced capabilities	URL	enter a data in specified format only	specified input is not received	Fail	Specify the User formats	NO	110	JAYAMEENAKSH
9	LoginPage_TC_004	Functional	Home page	User can enter the data in any format	APP URL	User can enter the data in required format	Time(HH-MM-DD): DATE(YYYY-MM-DD):	User can enter the data in specified format now	Input received properly	Pass	Format specified	YES		JAYAPRIYA G
10	CLOUD_STORAGE_TC_005	Functional	Cloud	Verify if User input is stored in the cloud	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-DD): DATE(YYYY-MM-DD):	User inputs has to be stored in cloud	Failed to storing the inputs	Fail	Cloud not connected properly	YES	111	VARSHINI S
11	CLOUD_STORAGE_TC_006	Functional	Cloud	Verify if User input is stored in the cloud	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-DD): DATE(YYYY-MM-DD):	User inputs has to be stored in cloud	Inputs are stored in the cloud	Pass	Cloud connected properly	YES		DHARSHINI B
12	OUPUT_TC_007	Functional	Iot device	Verify if it reminds the medicine intake to the user	IOT device	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	INDHIRANI S
13	OUPUT_TC_007	Functional	Iot device	Verify if it reminds the medicine intake to the user	IOT device	Comparing the UTC time and medicine intake time	Real time and medicine intake time	Gives True when both times match	TRUE	Fail	verified	Yes		JAYAMEENAKSH
14	TTS_TC_008	Functional	Iot device	Verify if it gives voice notifications	IOT device and TTS	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	JAYAPRIYA G
14	TTS_TC_008	Functional	Iot device	Verify if it gives voice notifications	IOT device and TTS	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	JAYAPRIYA G
15	TTS_TC_009	Functional	Iot device	Verify if it gives voice notifications	IOT device and TTS	When True it gives a voice format notifications	Voice notifications	Voice notifications	Voice notifications arrived	Pass	New string functions were added	YES		VARSHINI S
16	ACK_TC_010	Functional	URL	Verify whether the patient has taken the medicine or not	IOT device	The TAKEN button has been included	The status of the medicine intake	The User clicks the TAKEN button to show that medicine has been	Button is unfunctional	Fail	Error occurs due to failure of call and connect function of the "taken " button"	NO	132	DHARSHINI B
17	ACK_TC_011	Functional	URL	Verify whether the patient has taken the medicine or not	Iot device	The TAKEN button has been included	The status of the medicine intake	The User clicks the TAKEN button to show that medicine has been	The Taken status is updated in the cloud	Pass	The status of the medicine intake is updated in the cloud	Yes		INDHIRANI S

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 severity level, and how they were resolved

they were received

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

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	5	0	0	5
Client Application	42	0	0	43
Security	1	0	0	1
Outsource Shipping	0	0	0	0
Exception Reporting	2	0	0	2
Final Report Output	6	0	0	6
Version Control	1	0	0	1

9.Results

9.1.Performance Metrics

2			NFT - Risk							
3	S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Impact of Downtime	Load/Volume Changes	Risk Score	Justification
4	1	Personal Assistance For Seniors who are Self-Reliant	Existing	Low	Moderate	Moderate	Causes delay in runtime	>10 to 30%	ORANGE	As we have seen the changes, it adds the setup time
5										
6			NFT - Detailed							
7			S.No	Project Overview	NFT Test approach	Assumptions/Dependencies/ Risks	Approvals/SignOff			
8			1	Personal Assistance For Seniors who are Self-Reliant	LOAD	Dependencies	SignOff			
9										
10			End Of Test							
11	S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	GO/NO-GO decision	Recommendations	Identified Defects (Detected/Closed/Open)	Approvals/SignOff	
12	1	Providing Assistance to Seniors by developing a Software application to remind their medicine intake time	LOAD	MET	Able to Support in Other Platforms	GO	To have browsers to have enhanced capabilities	Closed	Approval	
13										

10.ADVANTAGES & DISADVANTAGES :

Advantages:

- Helpful for people who have no caretakers.
- Helps people to take medicines on time by voice command.

Disadvantages:

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

11.Conclusion:

Our project's goal is to see how successful an automated pilldispenser will be in assisting individuals in better self-managing their medications. This might be demonstrated by the following:

- Better quality of life for individuals with chronic disabilities and their caregivers. 1

Improved ability to stay self-sufficient at home.

- Social impact on the pharma sector .
- Less dependency on health-care and social-services. The device is intended for those with memory impairments, and several of the medical diagnoses recorded for trial participants, including Alzheimer's and dementia, the elderly and persons with long-term medical conditions who must take many prescriptions every day, backed up this claim. In conclusion, we used technology to have a social effect in the pharmaceutical industry.

12.Future scope:

- We will further extend the app where the prescriptions of the patients will be directly uploaded to the database.
- When your medicine runs low, we will reach out to third parties so you can get it delivered at your door.
- Touch sensors can be incorporated on each compartment to track the number of times the compartment has been opened so that refill time can be calculated.

13. APPENDIX

GITHUB LINKS:<https://github.com/IBM-EPBL/IBM-Project-1911-1658420583>

NODE RED: <https://node-red-wrmkf-2022-10-22.eu-gb.mybluemix.net/red/#flow/edb2e43b31963c69>

WOKWI: <https://wokwi.com/projects/348761455120613972>

DEMO LINK:

https://drive.google.com/file/d/1ZnHhTtupiJ_CuHb1EJ8Wf1HNJ1pml7Ex/view?usp=share_link

SOURCE CODE:

```
#include <WiFi.h>//library for wifi
```

```
#include <PubSubClient.h>//library for MQTT
```

```
#include <LiquidCrystal_I2C.h>
```

```

#define LED 2
void callback(char* subscribetopic, byte* payload, unsignedint payloadLength);

//-----credentials of IBM Accounts-----

#define ORG "te1vcf"//IBM ORGANITION ID
#define DEVICE_TYPE "personalAssistance"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "personalID"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "UiBv3g(MGWWdCAQk7m" //Token
String data3="";

//----- 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(0x27,16,2);

//-----
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);
    pinMode(LED,OUTPUT);

    delay(10);
    Serial.println();
    wificonnect();
    mqttconnect();
}

```

```
void loop()
{
  if (!client.loop()) {
    mqttconnect();
  }
}
```

```
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()
{
  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("Wokwi-GUEST", "", 6);
  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, unsignedint payloadLength)
{

  Serial.print("callback invoked for topic: ");
  Serial.println(subscribetopic);
  for (int i = 0; i < payloadLength; i++) {
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
  }

  Serial.println("Please take " + data3);
  if(data3 != "")
  {
    lcd.init();
    lcd.print("Take" + data3);

    digitalWrite(LED,HIGH);
    delay(20000);
    digitalWrite(LED,LOW);
  }
  else
  {
    digitalWrite(LED,LOW);
  }
  data3="";
}

```

Circuit :

