A PERSONAL ASSISTANCE FOR SENIOR WHO ARE SELF-RELIANT USING IOT

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Submitted By

Team ID:PNT2022TMID52345

Ashlin Asok.A-963619106002

Asbin Dhas D.S-963619106001

Biju P-963619106003

Tellma J-963619106005

1.INTRODUCTION:

1.1.Project Overview:

Tracking the health of a person and proper medication improves their lifetime.Studies suggest the most of the deaths of he elderly people have occured during the night when the person in asleep.A Caretaker cannot assist a person all the time.This work proposes a personal assistant for an elderly people or a patient.The Personal assistants can provide in-home respite care,allowing family members or other caretakers to take a temporary break.The main objective of this work is to help seniors maintain their quality of life at home and to keep them living their lives their way,as well as to lighten the load of full-time or family caretaker.

This paper proposes an affordable personal asssistance 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.

1.2.Purpose:

Giving consideration to others can be distressing and can probable upload to despondency and proper disorder.Studies have exhibited that round 16% of parental figures record their wellbeing has intensified due to fact they become guardians.Providing care might also result in more budgetary weights; roughly 40% of guardians collect new financial costs

diagnosed with administrations, items, and sporting activities.One gauge expresses that 26% of parental figures spend round 10% of their month to month pay on supplying care costs

Personal assistance device is a handy device which provides a way for improving the health care services.This device tracks the pulse rate using pulse sensor and the motion of the person is tracked by accelerometer and their respective reading are displayed in the mobile application.IOT pulse sensor and accelerometer can be connected to communicate and transfer information between patient and doctor.

This system can assist the elderly with health check-ups.So doctors or care takers can follow the health condition of the elderly.Moreover, due to the functional and physical limitations the elderly may not be able to inform anything to anyone when they feel sick.

Personal assistants can be used to supplement the care of a family member or other caretaker by fulfilling a required task.

2.LITERATURE SURVEY:

2.1.Existing problem

Elderly people let slip the medications at the correct time and the existing solutions for this problem is setting reminders or using pill boxes, calenders, Personal Assistance.Though the solutions give reminders, the voice commands or assistance given by this system is more efficient

2.2.Reference

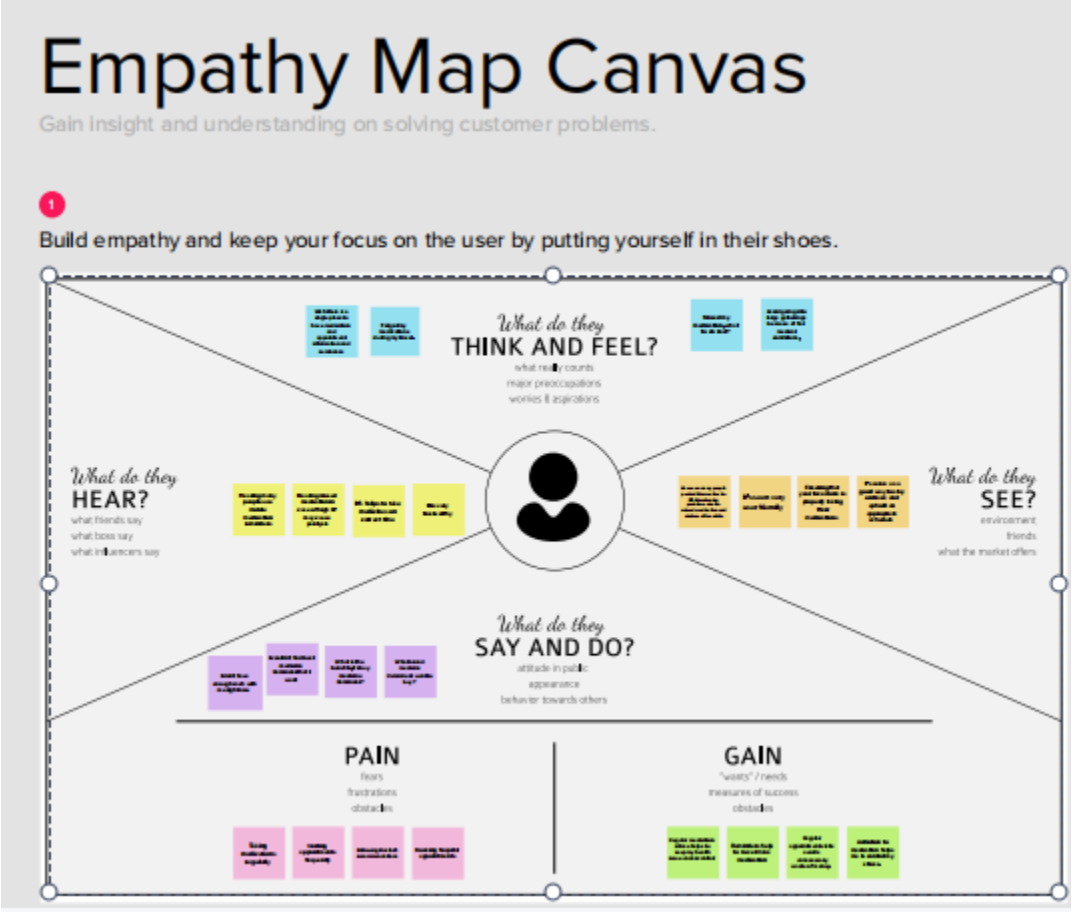
- Personal Assistance Device for Independent Senior Citizens/Patients
  A.Yuvaraj K, B.NGunasekhar Reddy, C.V.Saritha
- IoT Based Pill Remainder and Monitoring System
  Sultan Ahmad, Mahamudul Hasan, Gouse Pasha Mohammed
- Medicine Remainder and Monitoring System for Secure Health using IOT
  Samir V.Zanjal, Girish.r.Talmale

2.3.Problem Statement Definition

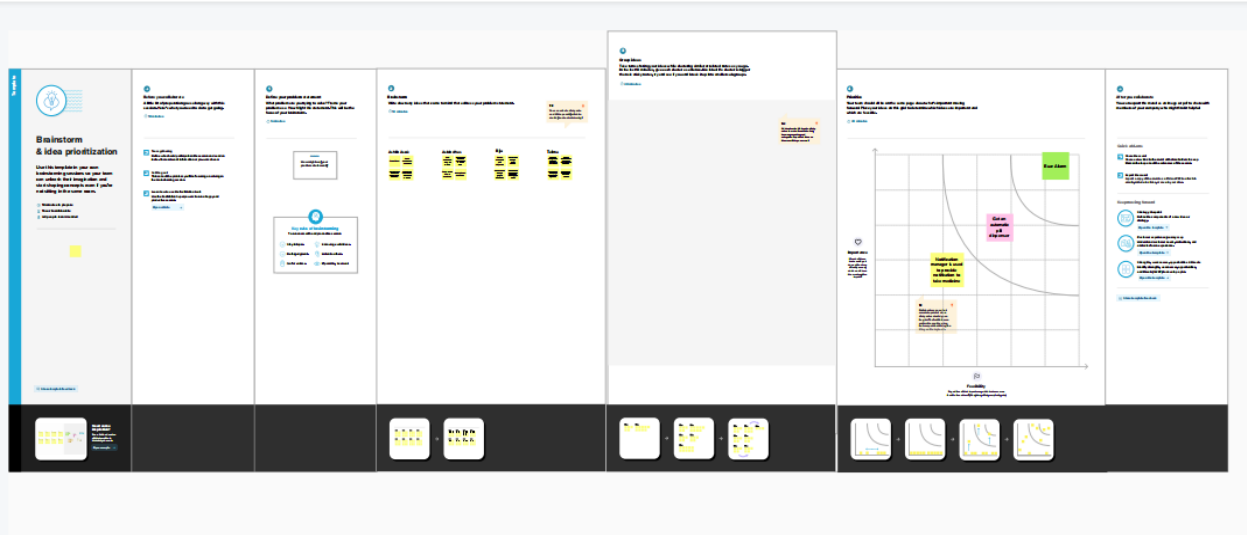
Patients may often fail to comply with their medication whether it was from forgetting to take medicine, from taking medicine at wrong time or even from taking too much medicine.Therefore, there are many systems such as remainder, alarm, and so on to remind patient.We have focus on those patients who having difficulty to take medication on time, we tried to design and to aid patients with managing their medical prescriptions, through a reminder app they will use to look at and manage their medicatins.The Pill Remainder will facilitate users to require the right medication on time.This system provides a real time monitoring system that allow related people to monitor the patient's activity remotely.

3.IDEATON AND PROPOSED SOLUTION:

3.1.Empathy Map Canvas:



3.2 Ideation and Brainstroming:



3.3 Proposed Solution:

S.No	Parameter	Description
1.	Problem Statement (Problem to be solved)	Some peoples 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 prescription.
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	My research began with a series of inquiries directed at a variety of people in order to have a better understanding of their issues and demands in remembering their routines.
4.	Social Impact / Customer Satisfaction	I constructed these proto-personas,or namess, based on the research findings from the user interview. They would be crucial to the rest of the design process.

5.	Business Model (Revenue Model)	By using the model,we can collect basic and some medical information about the persona that helps us in showing relevant and profitable advertisements.
6.	Scalability of the Solution	As the model is integrated with cloud software,we can update the user experience without reinstalling a mode and the person can keep a reminder up to the year.

3.4 Problem Solution Fit:

Project Design Phase-I - Solution Fit Template

PROJECT TITLE:MEDICINE REMAINDER Team ID:PNT2022TMID52345

1.PATIENT SEGEMENT(S) **According to our problem statement,doctors ,active patients are older people.**	2JOBS-TO-BEDONE/PROBLEMS **Patients care is the core responsibility of a medical practitioner.They have to assure that the patient is given the best possible care.**	3.TRIGGERS **Something that either sets off a disease in people who are genetically Predisposed to developine the disease,or that cause a certain symptoms to occur in a person who has a disease.**
4.EMOTIONS:BEFORE/AFTER **The patients would feel anxious at first.Then they would try to think of a solution to solveit themselves.**	**5.AVAILABLE SOLUTIONS** When the notification options is not working,then an emergency call or message wull be passed on to the patients.	**6.PATIENT CONSTRAINTS** Within healthcare systema,these constraints may show up as bottlenecks is evidence of a constraints,the constraints is usually related to equipment.
7.BEHAVIOUR **The patients could get help from the help options in the settings of the application if they facing any issues.**	**8.CHANNELS OF BEHAVIOUR** If it is in online mode,the patients can make a report in the help of medicine reminder app. If it is in offline mode,the patients can directly send a feedback mail or messages to the receiver.	**9.PROBLEM ROOT CAUSE** If there is no internet connection,there would be no sharing of information from one person to another.Due to these false the problem exists. The world functions with the help of networks so our patients tracker application can also operates on a internet

4.Requirement Analysis

4.1.Functional Requirements:

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No	Functional Reqirements (Epics)	Sub Requirement (Story/Sub-Task)
FR-1	User Registration	Registration through Gmail Registation by phone number
FR-2	User Confirmation	Confirmation via Email Confirmation through SMS/Messages
FR-3	User Login(Web)	Login with registered mail id and password
FR-4	User Login(Mobile app)	Login with registered mobile number and password.
FR-5	User's Medical Information	In the app,enter your medicine details with date.Then set the time in the app for alarm remainder.

4.2 Non-Functional Requirement

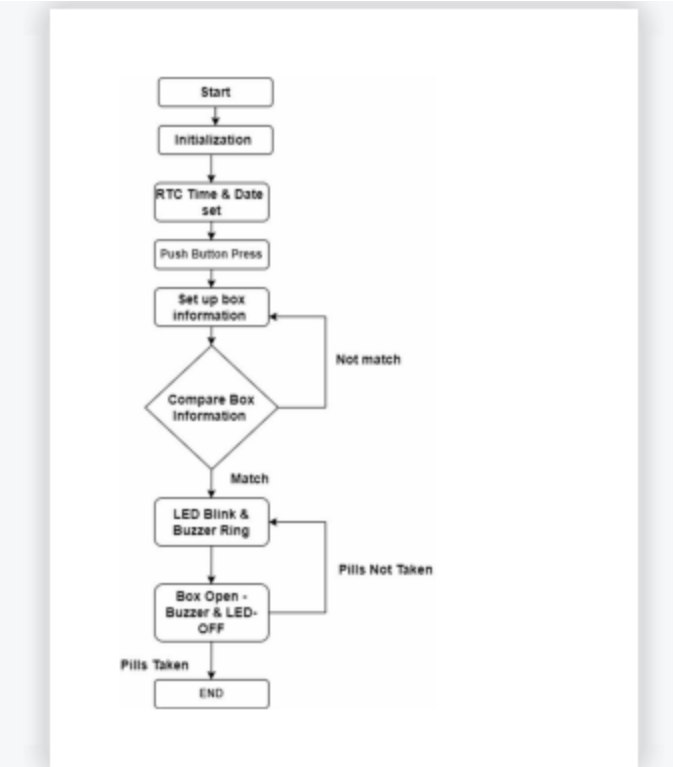
Non-Functional Requirements:

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

FR No.	Non-Functional Requirements	Description
NFR-1	**Usability**	The system should be user-friendly for the users. It is used to remind the medicine names.
NFR-2	**Security**	The login information should not be accessed by any other users than the respective user. The data of the user should kept confidential.
NFR-3	**Reliability**	It reminds on correct time. The user data should be updated and examined after certain period of time.
NFR-4	**Performance**	It works without any correction interruption
NFR-5	**Avaliability**	The System should be monitored 24x7 for the alert of medicines. It can be used by any registered users from any place.
NFR-6	**Scalability**	It is easily adaptable.

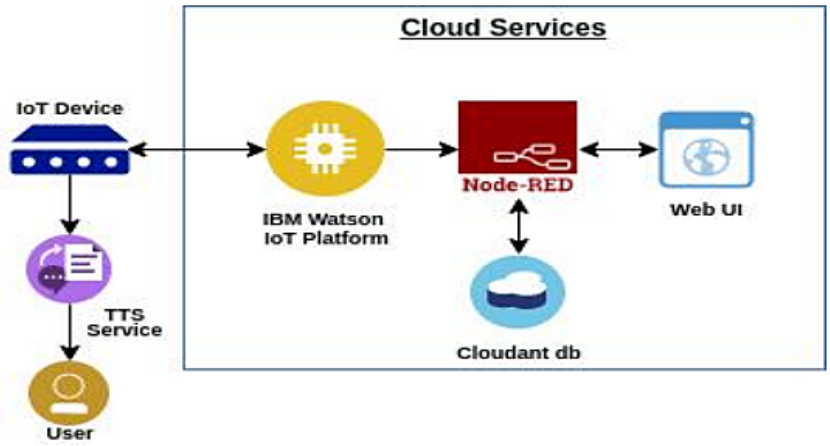
5.Project Design

5.1 Data Flow Diagram



5.2 Technical Architecture:

Technical Architecture:



5.3 User Stories:

User Type	Functional Requirement(Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Senior citizen)	Caretaker	USN-1	As a user, I want to take Medicines on time and monitor my health	I want to Take Medicines On time	High	Sprint-1
Customer (Alzheimer 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 (Mentally idled patient)	Caretaker	USN-3	As a user, my patient needs to take medicines on time and monitoring the activity	My patient needs to take medicines on time	Medium	Sprint-2
Customer (Coma patient)	Caretaker	USN-4	As a user, my patient medication time and prescription should load in database for upcoming week	My patient medication time and prescription should be in database list	Low	Sprint-4
Customer (Disabled people's)	Smart medicine box	USN-5	As a user, I need to take my medicine in nearby places with light notification	I need to take my medicine in nearby places with light notification	Medium	Sprint-3

6.Project Planning and Scheduling

6.1.Sprint Planning and Estimation

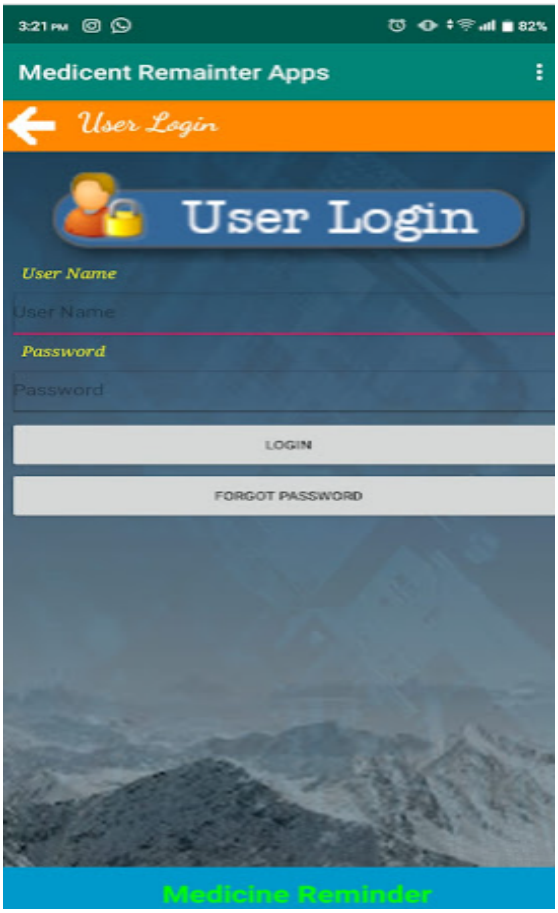
Sprint	Functional Requirement (Epic)	User Story Number	User Story/Task	Story Points	Priority	Team Members
Sprint 1	Registration	USN-1	As a user,I can register for the application by entering my email, and password, and confirming my password.	4	High	Ashlin Asok.A
Sprint 1	Confirmation Email	USN-2	As a user,I will receive a confirmation email once I have registered for the application.	4	High	Tellma.J
Sprint 1	Authentication	USN-3	As a user,I can register for the application through Gmail and mobile app.	4	Medium	Asbin Dhas D.S,Biju P
Sprint 1	Login	USN-4	As a user,I can log into the application by entering email& password.	4	High	Ashlin Asok A Asbin Dhas D S

Sprint 1	Dashboard	USN-5	As a user,I need to be able to view the functions that I can perform.	4	High	Biju P
Sprint 2	Notification	USN-1	As a user,I should be able to notify my parent and guardian in emergency situation.	10	High	Asbin Dhas D S
Sprint 2	Store Data	USN-2	As a user, I need to continuously store my location data into the database.	10	Medium	Tellma J Biju P
Sprint 3	Communication	USN-3,1	I should be able to communicate with user.	6	Low	Ashlin Asok A

7.Coding and Solutioning

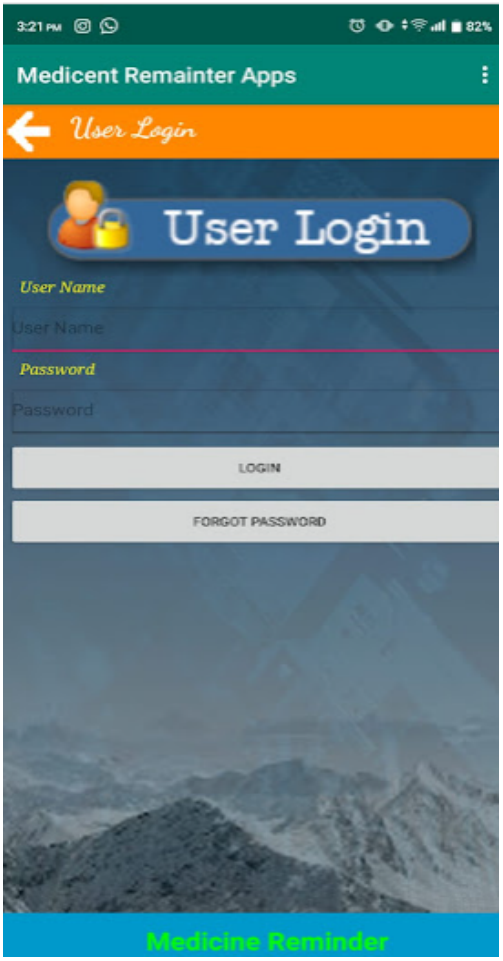
7.1.Feature 1

The mobile applications developed has a feature of induvidual login by different users.



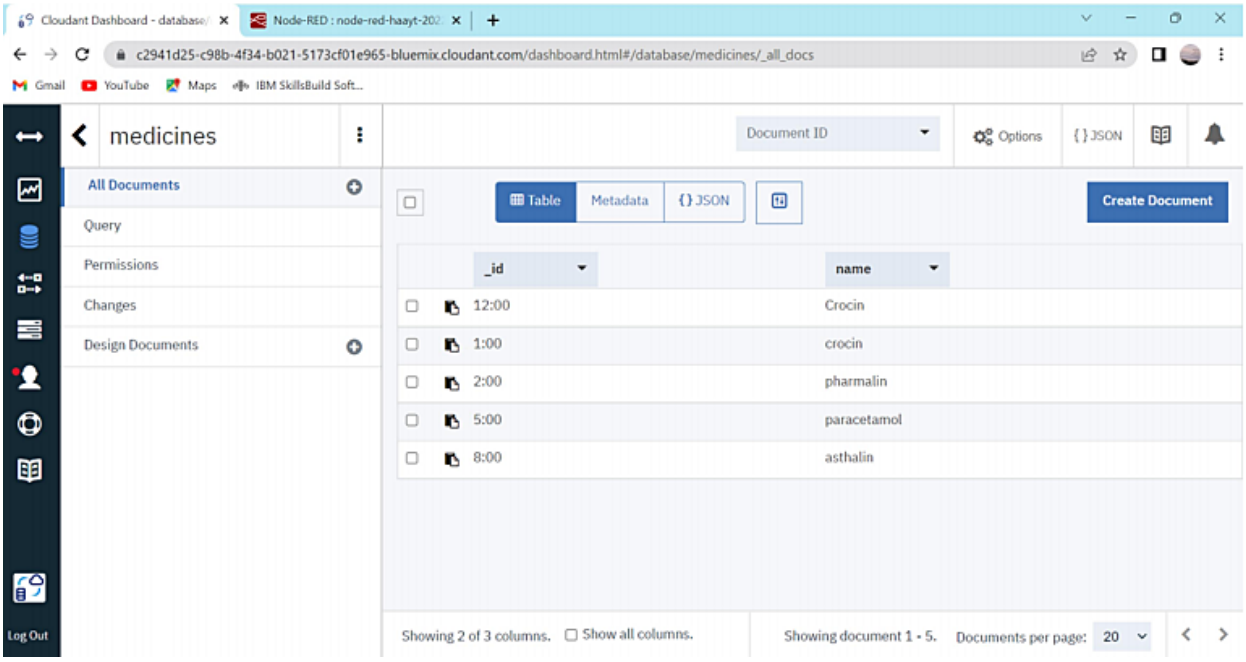
7.2.Feature 2

The mobile application also has the feature of uploading medicine names in the cloud.



7.3.Feature 3

The project includes a cloud database system.



8.Testing

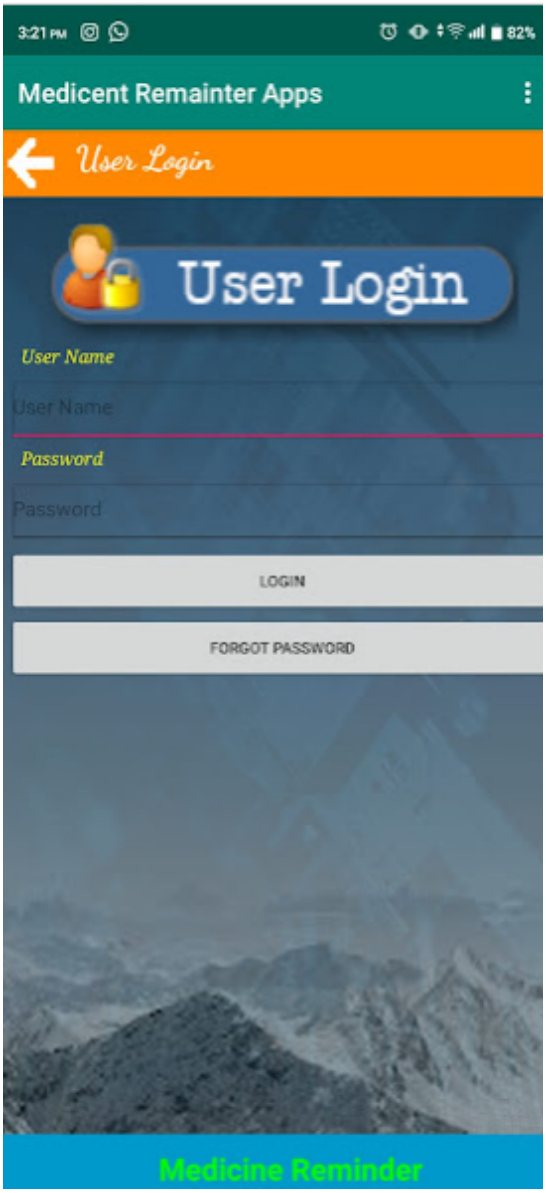
8.1.Test cases

8.1Test cases

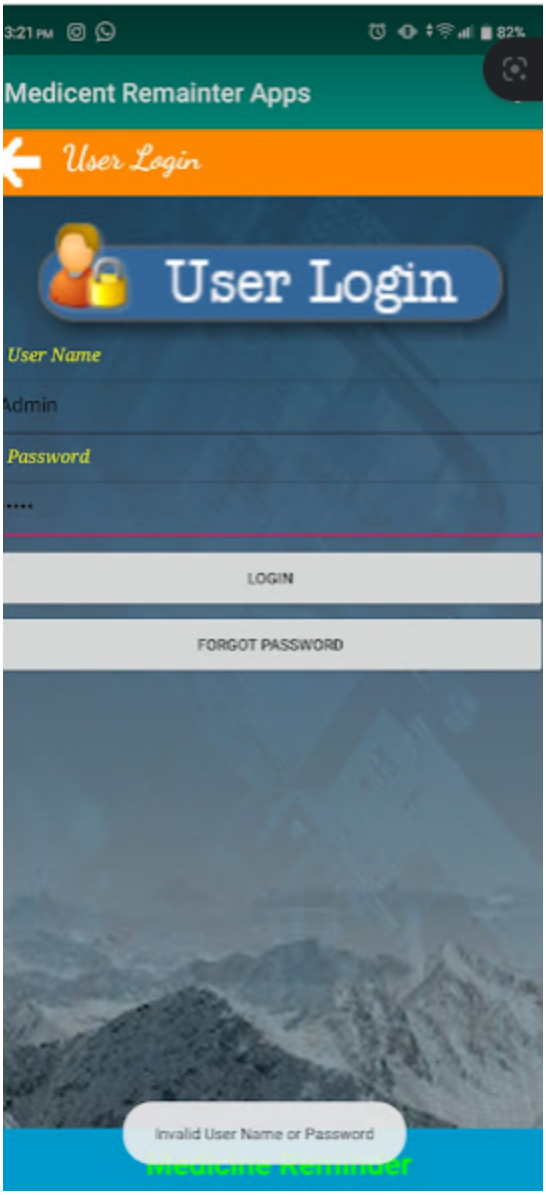
Testcase	Precondition	Teststeps	Testdata	Expectedr esult
Verify login with valid credentials	User should have a network connection	1. Launch URL 2. Enter valid username. 3. Enter valid password. 4. Click on the “Login” button.	Username: admin Password: admin	Users should be able to login Successfully .
Verify login with invalid credentials	User should have a network connection	1. Launch URL 2. Enter valid username. 3. Enter invalid password. 4. Click on the “Login” button.	Username: Admin Password: admin123	Users should not be able to Login .
Update the medicine name with the time.	User should have a network connection	1. Enter valid medicine name. 2. Enter the time when the medicine has to be consumed. 3. Click on the “Submit” button.	Medicine Name: Azithromycin Medicine Time: 20.00	Users should be able to update it Successfully .

8.2.User acceptance testing

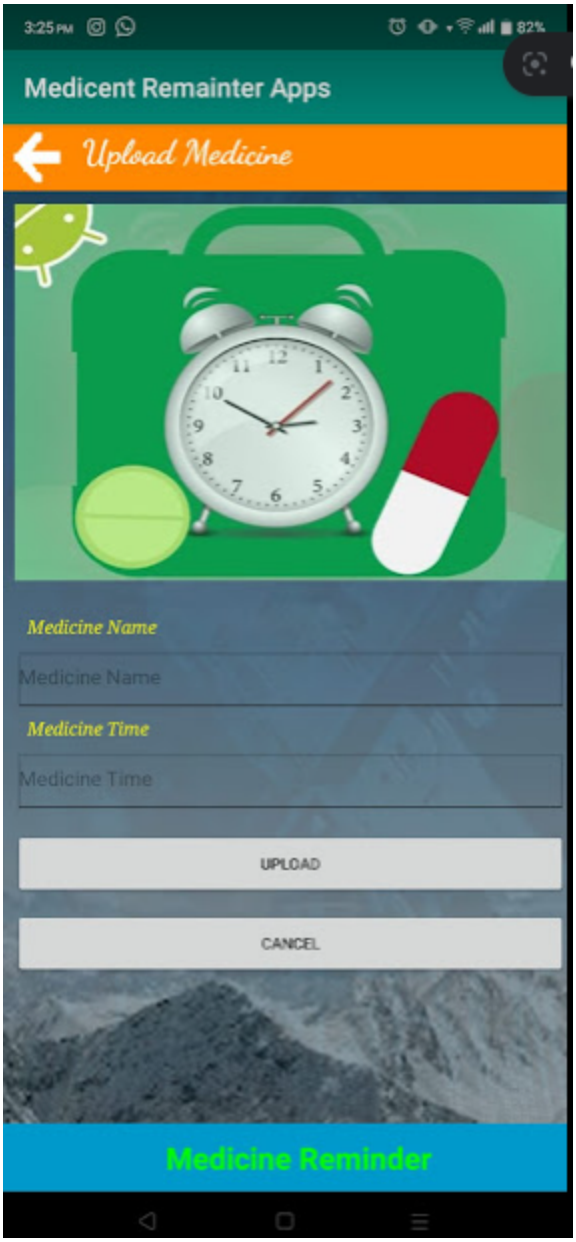
Login Page Testing:



Incorrect password Attempt:



Medicine Page Testing:



9.Results

9.1.Performance Matrics

S.NO	Parameter	Performance
1.	ResponseTime	0.2s (Average of 10trials)
2.	Workload	500 users (Calculated based on Cloud Space)
3.	Revenue	Individual users and pharmaceutical industries.
4.	Efficiency	Simple and straight forward workflow, which makes the process efficient.
5.	DownTime	Almost no down time due to IBM Cloud enabledsolution.

10.Adantages and Disadvantages

Advantages

- Help the elderly people to take their medicine at the correct time.
- Avoid personal assistants or caretakers needed for medically sick people.
- Cost efficient.
- Can store multiple data and many notifications can be generated.
- Since it includes voice assistance, even blind people can use our device.

Disadvantages

- Makes people lethargic and makes them dependent always on others.
- Requires a stable internet connection.

11.Conclusion

The project offers the elderly or medically sick people a personal assistant which reminds them of the medicines to be consumed at the particular time.Skippping tablets may lead to serious problems if the person has a severe illness and this can be avoided.Since the cloud is interated with the mobile applications, numerous data can be fed into the database and notifications can be generated.The mobile application developed is highly customiable by the user and easy to use.

12.Future Scope

The project can be further developed by bringing into the feature of informing the medicine name during the notification.The voice assistant which is given can be customized by adding the user's voice or the caretaker's voice.Further the mobile application can update medicines by taking voice commands as an input from the user.

13.Appendix

Source code:

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

myConfig={
   "identify":{
       "orgId":"mni3qc",
        "typeId":"medicine",
        "deviceId":"Admin123"
      },
      "auth":{
          "token":"admin@admin"
       }
}
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,'MedicineName':medicine,'Time':medicinetime}
      client.poblishEvent("IoTSensor","json", data=mydata, qos=0, onPublish=None)
      print("Data published to IBM IOT platform:", mydata0
      time.sleep(5)
client.disconnect()
}
 }
   else
{
   pass

}
    data="";
}
```

Github Link: http://github.com/IBM-EPBL/IBM-Project-52050-1660988535