NALAIYA THIRAN

PROJECT REPORT

USERCASE: *PERSONAL ASSISTANCE FOR SENIORS WHO ARE SELF-RELIANT*

CATEGORY: *INTERNET OF THINGS*

PROJECT: *MEDICINE REMINDER*

TEAM ID:*PNT2022TMID554251*

SUBMITTED BY

KAVIPRIYA K S	**(TEAM LEAD)**	*(111919106029)*
ISHRATH BEGUM I	**(TEAM MEMBER 1)**	*(111919106021)*
DIVYA VANI R	**(TEAM MEMBER 2)**	*(111919106010)*
KAMAL RAJ R	**(TEAM MEMBER 3)**	*(111919106026)*
HARISH KUMAR A	**(TEAM MEMBER 4)**	*(111919106020)*

+

TABLE OF CONTENTS

7. **CODING & SOLUTIONING**

        7.1 Feature 1

        7.2 Feature 2

8. **RESULTS**

        8.1 Performance Metrices

9. **ADVANTAGES & DISADVANTAGES**

10.   **CONCLUSION**

11.   **FUTURE SCOPE**

12.   **APPENDIX**

        13.1 Source Code

        13.2 GitHub & Project Demo Link

1.INTRODUCTION

Healthcare sector is continuously updated up with extensive technologies. The rise in chronic diseases, as well as limits on hospitals', doctors', and service providers' ability to give quality healthcare services in order to enhance patient health, are all quickly expanding healthcare concerns. Internet of Things (IoT) technology is one of those technologies along with artificial intelligence and machine learning. IoT with its own benefits which include real-time monitoring, providing accuracy in collection of data and tracking patients activities meets the requirements of the users. IoT helps in the health care sector at different phases, from making an appointment with the doctor, analysing the patient condition and communicating the condition of the patient using mobile application. These changes emphasis on the individual needs of people thereby improving the efficiency, quality of medical care, and represent the future development direction of modern medicine science.

1.1 PROJECT OVERVIEW

In day-to-day life most of the people need to take medicines which was not there in past couple of years and the reason behind this is diseases are increasing in large amount. So sooner or later many people come in contact with these diseases. Some diseases are temporary diseases while many are permanent life threatening diseases. Life threatening diseases gets mixes with the human body in such a way that they can't leave the body ever and they increases in rapid time. Life span of humans became less because of such diseases and to overcome or to live a better life we need to take medicines regularly and also in large amount. We need to be in advice of Doctor who tells us to take desired pills in desired way so that patients face problems like forgetting pills to take at right time and also when Doctor changes the prescription of medicine patients have to remember the new schedule of medicine. This problem of forgetting to take pills at right time, taking wrong medicines and accidentally taking of expired medicine causes health issues of patient and this leads to suffer from unhealthy life. Our project is to made Arduino-Uno based Smart medicine box which uses Real time clock. The new awaited feature in our project is our system is sensible that patient has taken medicine or not and thus the patient can't postpone the time on which he needs to take pills. It is compulsory for the patient to take pills from the box at the right time otherwise our systems continues to make large sound until the medicine is taken out from the box. This notification feature adds life years to the patient and thus this thing is not available in any device which is the necessity for present days.

1.2 PURPOSE

In day together life, People have trouble to remember the pills they need to take from the bag of medicine. Multiple times the problem is the time required to take medicine is not printed on the box of medicine or they couldn't read English. People have also habit to sometimes forget to take pills. Due to this, some medicines were expired. In order to reduce the responsibility of family members the proposed pill box is of great help. By adding some required medicine to the pillbox and set the pill time for that particular medicine.This project will be helpful for people who forget to take their medicines or even to those who have to take a lot of medicines and get confused about which medicine to take at what time. So this project will help people provide information about the patient's status whether he has taken the medicine or not. In this era, it is difficult for the family members to be present all the time for the aged. Today, most of the families in our society are a nuclear family. Elderly prefer staying independent, but it is a worry for their children. Sometimes despite their best efforts, the aged fail to take the medicine on time. This device is one approach to help them take the medicines effectively.

2.LITERATURE SURVEY

Medicine Reminder and Monitoring System for Secure Health Using IOT:

The elderly people and the people victims of chronicle diseases who need to take the medicines timely without missing are suffering from dementia, which is forgetting things in their daily routine. Considering this situation study has been done in this. Paper reviewing the technologies of home health care which are currently used for improving this situation by reminding the scheduled of medicine, remote monitoring and update new medicine data of patients, which can be done by prescriber through web.

Smart Medicine Reminder Box:

This project's main aim is to make a Smart medicine box for those users who regularly take medicines and the prescription of their medicine is very long as it is hard to remember to patients and also for their care giver. Also, Old age patients suffering from problems of forget to take pills on proper time which causes certain health issues for patients having Permanent diseases like diabetes, blood pressure, breathing problem, heart problems, cancer diseases etc. These are a kind of problems in hospitals & people around us who have such kind of diseases and thus based on these two problems smart medicine box which solve these problems by Setting up time table of prescribed medicines through push buttons as given in prescription. Present time will be saved in RTC module and notification time will be saved in EEPROM. Therefore, at the time of taking medicine system generate Notification sound and display the Bright light in certain pill boxes. So, patient can know the specific number of boxes from which he has to take out medicines.

Smart Pill Box With Reminder To Consume And Auto-Filling Process Using IOT:

Many countries are affected by population growth issues, as a result of the low birth rate elderly age, people are increasing day by day. They need more attention from the family side to take care of them. So for this issue a well-equipped automatic reminder to consume pills at right time, for this introduced smart pillbox which considerably reduce family responsibilities. Over on this peak of technology, this smart pill is prepared by using GSM interfaces with Arduino and also implemented IOT through Blynk app receive notifications. The major responsibility of making people to consuming pills is resolved by using this smart pill setup. The main working principle of this box is remainder to consume pills at right time and also give remainder if the pills are going to finish. Sensors are arranged in the setup to identify the room temperature and humidity and all the information is can view through the Blynk app from anywhere.

Intelligent and Safe Medication Box In Health IoT Platform for Medication Monitoring System with Timely Remainders:

The progress in IoT health care is considered to be a massive contribution to the elderly people. The elderly people and people who are suffering from chronic diseases need to intake tablets regularly on timely basis. Care takers with their busy daily routine may forget the instructions and time about pills which are prescribed for patient. Also care takers who are dealing increased number of patients may feel hectic to sort the medicine list for corresponding patients at proper time. Earlier many researches have been carried in this area and different pill boxes have been proposed already. The intelligent medication box proposed in this work have specialized features including six sub boxes which helps to organize six different pills, provides timely remainders for the patient or caretaker in an android application like hand-held devices like smartphone. This intelligent medication box contains bio sensor for monitoring of temperature and heartbeat. Overdosage and improper intake of medicines may lead to serious issues in health of elderly people to avoid mis usage of medicines a simple authentication process either by the care taker or the patient himself is performed. The proposed medication is much safer as it clearly intimates about time, dosage, stock of medicine and sorts out different pills in correct sub boxes during the next fill by caretaker.

IoT based smart medicine kit:

This paper presents an optimal solution, the smart medicine kit for regular patients using an IoT based sensors which provides diagnostic feature. The intake of medicine by the patients are prepared as a data and stored in drive or cloud. The medication kit acts as a remainder to take medicines with timer circuit. The heart rate of humans, glucose level in blood can also be monitored with the kit, with IR temperature check and mini CPR patch sensors. Health based IoT ease the medical diagnosis.

**Design & Implementation of an Automated Reminder Medicine Box for Old People and Hospital:**

The main objective of this research is to develop a smart medicine box to remind the old people or patient in the hospital to take the appropriate dose of medicine in the time suggested by the doctor. The device has twenty-one airtight compartments to keep the medicine. The attendant of a patient or nurse can make a weekly plan of medicine remainder by keeping medicine in twenty-one compartments for taking medicine three times per day. The attendant can manually set the time of taking medicine or load a text file in an SD card mentioning the time for taking medicine of every compartment. The device has a real-time clock to read the time. When time is matched with the set time, the device plays a sound in the speaker to share the information of medicine quantity and blinks the LED of the specific compartment where medicine is kept for that time. The device also informs the patient whether the medicine should take before a meal or after a meal. The device can ensure the medication safety, appropriate medicine dose, and prevention of drug abuse of elderly people.

2.2 REFERENCES

1. A. Sawand, S. Djahel, Z. Zhang, and F. Na. Multidisciplinary Approaches to Achieving Efficient and Trustworthy eHealth Monitoring Systems. Commun. China (ICCC), 2014 IEEE/CIC Int. Conf., pp. 187–192; 2014.
2. D. a. Clifton, D. Wong, L. Clifton, S. Wilson, R. Way, R. Pullinger, and L. Tarassenko. A large-scale clinical validation of an integrated monitoring system in the Emergency Department. IEEE J. Biomed. Heal. Informatics vol. 17, no. 4, pp. 835–842; 2013.
3. M. Parida, H.-C. Yang, S.-W. Jheng, and C.-J. Kuo.Application of RFID Technology for In-House Drug Management System.15th Int. Conf. Network-Based Inf. Syst., pp. 577–581; 2012.
4. L. Ilkko and J. Karppinen.UbiPILL A Medicine Dose Controller of Ubiquitous Home Environment. 2009 Third Int. Conf. Mob. Ubiquitous Comput. Syst. Serv. Technol., pp. 329–333; 2009.
5. A. Kliem, M. Hovestadt, and O. Kao.Security and Communication Architecture for Networked Medical Devices in Mobility-Aware eHealth Environments," 2012 IEEE First Int. Conf. Mob. Serv., pp. 112–114;2012.
6. S. T.-B. Hamida, E. Ben Hamida, B. Ahmed, and A. Abu-Dayya.Towards efficient and secure in-home wearable insomnia monitoring and diagnosis system. 13th IEEE Int. Conf. Bioinforma. Bioeng., pp. 1–6; 2013.
7. P. Ray.Home Health Hub Internet of Things (H 3 IoT): An architectural framework for monitoring health of elderly people.Sci. Eng. Manag. Res. (, pp. 3–5, 2014.
8. S. Huang, H. Chang, Y. Jhu, and G. Chen.The Intelligent Pill Box - Design and Implementation. pp. 235–236; 2014.
9. F.-T. Lin, Y.-C. Kuo, J.-C. Hsieh, H.-Y. Tsai, Y.-T. Liao, and H. C. Lee A Self-powering Wireless Environment Monitoring System Using Soil Energy. IEEE Sens. J., vol. 15, no. c, pp. 1–1; 2015.
10. S. S. Al-majeed.Home Telehealth by Internet of Things (IoT). pp. 609–613; 2015.

2.3 PROBLEM STATEMENT DEFINITION

Customer Problem Statement:
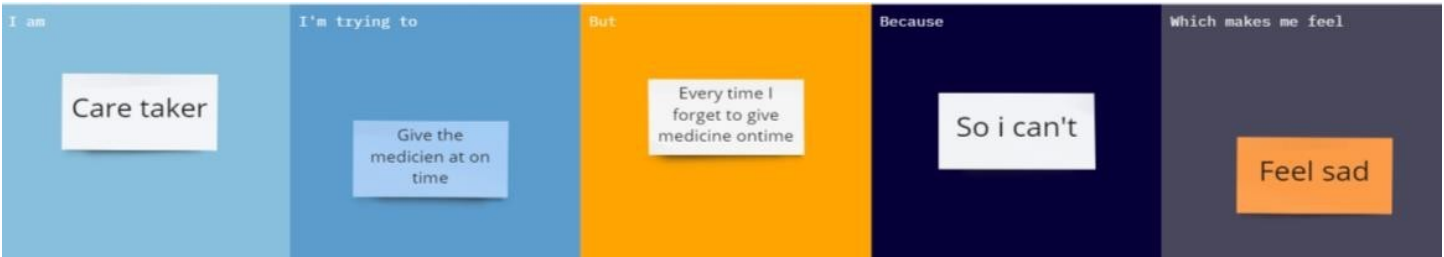
| Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
Can't Remember the Amount of the medicine remaining	Caretaker	Keep remembering the amount of remaining medicine.	But I forget every time.	Sometimes the amount of medicine is less in the Pack.	Frustrated
Can't Give medicine at time	Caretaker	Provide the medicine at time.	Every time I'm missing it.	I'm unable to remember.	Feeling sad

3.IDEATION & PROPOSED SOLUTION:

3.1 EMPATHY MAP CANVAS
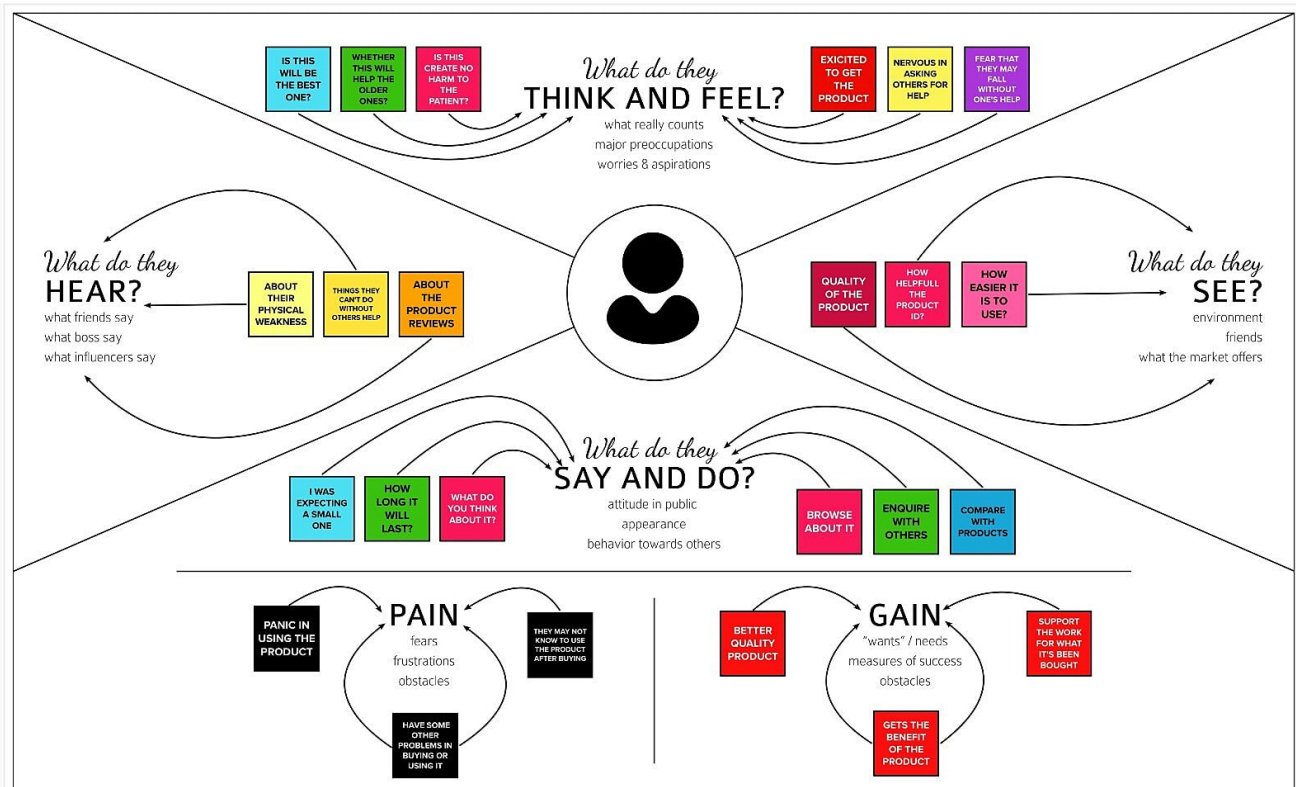
3.2 IDEATION & BRAINSTORMING
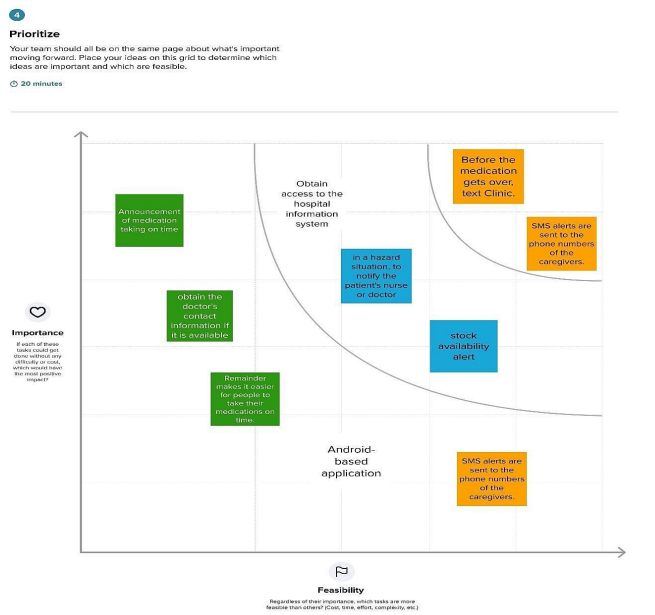
Brainstorm & idea prioritization

🕐 **10 minutes** to prepare
⧗ **1 hour** to collaborate
👤 **2-8 people** recommended

🗨 Share template feedback

→ 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

> Sometimes the elderly forget to take their medication at the appropriate time. They also forget which medication He or she should take at that time. It is also difficult for doctors and caregivers to monitor patients around the clock. This medicine reminder system was created to address this issue. A user (caretaker) app is created that allows him to set the desired time and medicine.

3.3 PROPOSED SOLUTION:

S.No	Parameter	Description
1.	Problem Statement (Problem to be solved)	Sometimes elderly people forgot to take their medicine at the correct time. They also forgot which medicine should they take at that particular time. And it is difficult for doctors/caretakers to monitor the patients around the clock.
2.	Idea / Solution description	To avoid this problem, this medicine reminder system is developed. A IOT based remainder will be proposed to solve this problem.
3.	Novelty / Uniqueness	The device will receive the medicine name and notify the user with voice commands.
4.	Social Impact / Customer Satisfaction	It is lifesaving, easy to use and effective. It allows aged people to consume their tablets at a correct time.
5.	Business Model (Revenue Model)	Revenue can be generated from advertisement. For additional features subscriptions can be provided which is payable.
6.	Scalability of the Solution	It provides alarm functionality. Data privacy and security. Monitored and handled by closed ones.

3.4 PROBLEM SOLUTION FIT

1. CUSTOMER SEGMENT(S)

➢ Caretakers
➢ Persons, who need to help their closed one

5. AVAILABLE SOLUTIONS

➢ Pill Reminder and Med Tracker App e-pill Time Cap & Bottle Last Opened Time Stamp with Reminder

8. CHANNELS of BEHAVIOUR

8.1 ONLINE
If it is in online mode, the patients can make a report in the help section present in the setting option.
8.2 OFFLINE
If it is in offline mode, the patients can directly send a
feed a mail or message to the receiver.

2. JOBS-TO-BE-DONE / PROBLEMS

➢ Forget to give medication on time.
➢ Can't keep remember the amount of medicine remains.

6. CUSTOMER CONSTRAINTS

➢ Low power
➢ Budget Friendly
➢ No cash

9. PROBLEM ROOT CAUSE

➢ If there is no internet connection, there would be no sharing of data between Cloud and device.
➢ So, we need proper net connection.

3. TRIGGERS
➢ Unable to give or take medicine on time and can't remember the amount of medicine remains triggers the customer to act like this

7. BEHAVIOUR
What does your customer do to address the problem and get the job done?
➢ The Customer first update the system with medicine name, Time to take and amount of medicine in pack into the device.
➢ The Device will take care of the remaining things like remainder and notify when the medicine get over.

4. EMOTIONS: BEFORE
➢ Caretakers feels guilty

10. YOUR SOLUTION
➢ We introduce a smart medicine reminder system based on IOT. The proposed scheme was particularly created for the Android platform. For our system.
➢ We implement Medicine amount tacker to be notified by the caretakers when the medicine get over.

4.REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution.

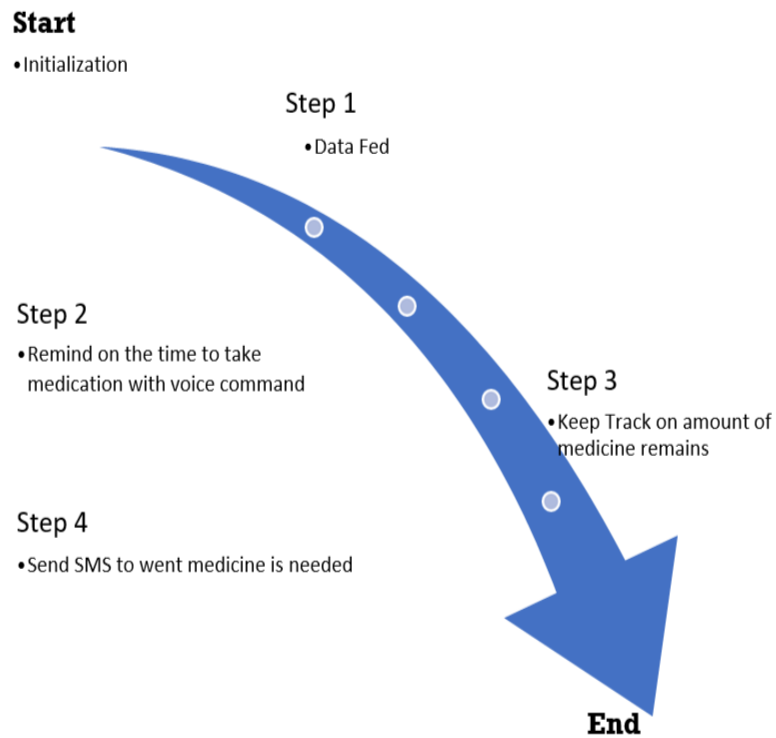| FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Login	login through User Id and Password.
FR-4	Network Connectivity	via WIFI /mobile data.
FR-5	IBM IoT Platform	Access cloud storage via internet and it gives medication information.
FR-6	Node-RED	Uses to transfer the data from IOT platform to UI platform and helps in storing the data.

4.2 NON-FUNCTIONAL REQUIREMENTS

Following are the non-functional requirements of the proposed solution.
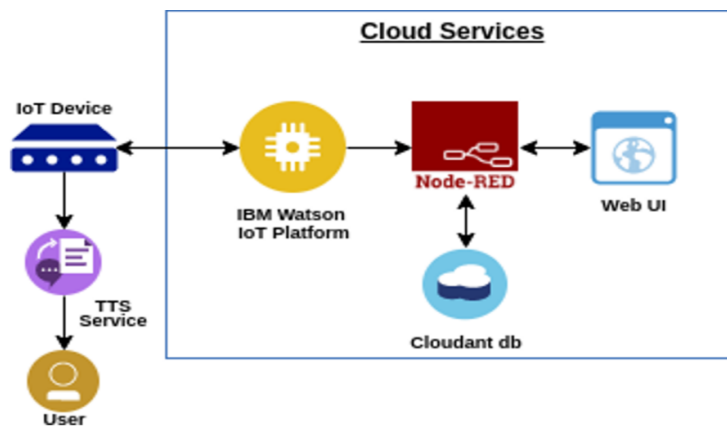
NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	It can easily track and monitor the medication time of users and share the information to the caregivers.
NFR-2	Security	The cloud ant database is highly secured and it prevents data from hacking.
NFR-3	Reliability	The prescription of medication for users is assured all the time.
NFR-4	Performance	It reminds users to take their medications and get them refilled, warns about drug interactions, and assists caregivers in managing prescriptions.
NFR-5	Availability	To keep track the medication of users.
NFR-6	Scalability	The users can set the time for their medication and also can adjust how much medication to take within the application.

5.PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

Start

• Initialization

Step 1

• Data Fed

Step 2

• Remind on the time to take medication with voice command

Step 3

• Keep Track on amount of medicine remains

Step 4

• Send SMS to went medicine is needed

End

5.2 SOLUTION & TECHNICAL ARCHITECTURE

Cloud Services

IoT Device

IBM Watson IoT Platform

Node-RED

Web UI

TTS Service

Cloudant db

User

5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (citizen)	Registration	USN-1	As a user, I can register for the application by confirming OTP and access manually	I can access my account.	High	Sprint-1
Customer (Doctor)	User Requirements	USN-2	As a user, I want to monitor patients heartbeat24/7.	I can receive Confirmation email & clickconfirm.	High	Sprint-1
Customer (Care takers)	Confirmations	USN-3	As a user, I can register and confirm through e-mail OTP.	I can register & access the dashboard with Facebook Login.	Low	Sprint-2
Customer (Elderly people)	Payment options	USN-4	As a user, I can pay through Cash on Delivery or else with Credit/Debit card.	I can register or pay through login Dashboard.	Medium	Sprint-1
Administrator	Dashboard	USN-5	As a user, I can log into the application by entering the mail and password.	I want to access customer Health and save the Data 24/7.	High	Sprint-1

6.PROJECT PLANNING & SCHEDULING

6.1 SPRINT DELIVERY SCHEDULE

Identifying the problem and preparing for the Problem statement and Abstract.

Listing the requirements for the problem statement.

Creating the hardware structure and creating coding to it.

Simulating the coding and Checking the designed Prototype.

7.CODING & SOLUTIONING

7.1 FEATURE 1

LISTING THE REQUIREMENTS:

1.Hardware Requirement

2.Software Requirement

HARDWARE REQUIREMENT:

1. 16X2 LCD Display

2. Arduino UNO

3.LED

4.Micro Servo Motor

5.Buzzer

6.Breadboard

7.Resistor

8.Jumper Wires

9.Power Supply

1.16X2 LCD DISPLAY

The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

- Pin1 (Ground/Source Pin): This is a GND pin of display, used to connect the GND terminal of the microcontroller unit or power source.
- Pin2 (VCC/Source Pin): This is the voltage supply pin of the display, used to connect the supply pin of the power source.
- Pin3 (V0/VEE/Control Pin): This pin regulates the difference of the display, used to connect a changeable POT that can supply 0 to 5V.
- Pin4 (Register Select/Control Pin): This pin toggles among command or data register, used to connect a microcontroller unit pin and obtains either 0 or 1(0 = data mode, and 1 = command mode).
- Pin5 (Read/Write/Control Pin): This pin toggles the display among the read or writes operation, and it is connected to a microcontroller unit pin to get either 0 or 1 (0 = Write Operation, and 1 = Read Operation).
- Pin 6 (Enable/Control Pin): This pin should be held high to execute Read/Write process, and it is connected to the microcontroller unit & constantly held high.
- Pins 7-14 (Data Pins): These pins are used to send data to the display. These pins are connected in two-wire modes like 4-wire mode and 8-wire mode. In 4-wire mode, only four pins are connected to the microcontroller unit like 0 to 3, whereas in 8-wire mode, 8-pins are connected to microcontroller unit like 0 to 7.
- Pin15 (+ve pin of the LED): This pin is connected to +5V
- Pin 16 (-ve pin of the LED): This pin is connected to GND.

2.ARDUINO UNO
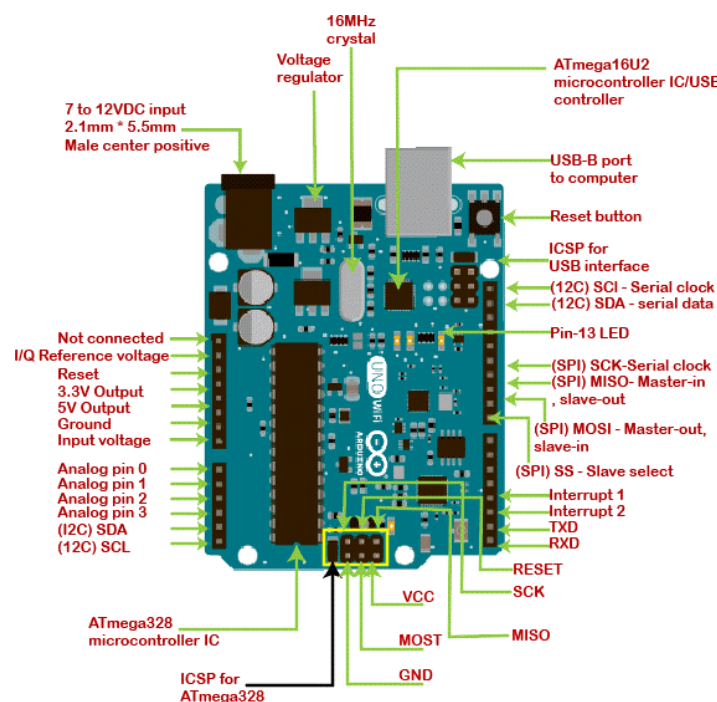
ARDUINO UNO is a microcontroller board with 14 digital I/O and 6 analogue pins based on the ATmega328. It includes everything necessary to support the microcontroller. To get started with the ARDUINO Uno board, simply connect it to your computer through USB. Hardware and software are adaptable and simple to use. The ARDUINOUNO can perceive its surroundings by accepting information from a number of sensorsand can influence them by controlling lights,motors, and other actuators.
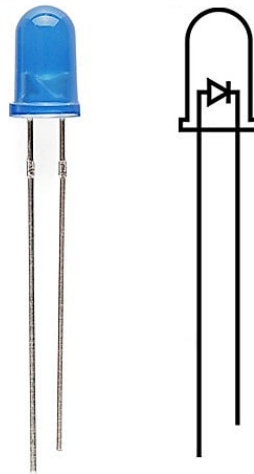
TECHNICAL SPECIFICATIONS.

1.	Microcontroller	ATmega328p
2.	Operating voltage	5V
3.	Inputvoltage(recommended)	7-12V
4.	Inputvoltage(limit)	6-20V
5.	Digital I/O pins	14(ofwhich 6 provide PWM output)
6.	PMW Digital I/O pins	6
7.	Analog Input pins	6
8.	DCCurrent per I/Opin	20mA
9.	DCCurrent for 3.3V pin	50mA
10.	Flashmemory	32KB (ATmega328p) of which 0.5KBused by boot-loader
11.	SRAM	2 KB (ATmega328p)
12.	EEPROM	1 KB (ATmega328p)
13.	Clock Speed	16MHz
14.	LED_BUILTIN	13
15.	Length	68.6mm
16.	Width	53.4mm
17.	Weight	25g

3.LED

A Light Emitting Diode (LED) is a semiconductor device, which can emit light when an electric current passes through it. To do this, holes from p-type semiconductors recombine with electrons from

n-type semiconductors to produce light. The wavelength of the light emitted depends on the bandgap of the semiconductor material. Harder materials with stronger molecular bonds generally have wider bandgaps. Aluminium Nitride semiconductors are known as ultra-wide bandgap semiconductors.

4.MICRO SERVO MOTOR

- SG90 is a servo motor which operates based on PWM control signals
- The servo maintains a certain angle (position) based on the width of the pulse fed in through a signal input
- Some technical specifications

- Weight: 9 g

- Dimension: 22.2 x 11.8 x 31 mm approx.

- Stall torque: 1.8 kgf·cm

- Operating speed: 0.1 s/60 degree

- Operating voltage: 4.8 V (~5V)

- PWM frequency = 50Hz

- Pin configuration: Yellow / Light Orange / White (Signal), Red / Dark Orange (+5V), Brown/Black (Ground)

5.BUZZER

The buzzer is a sounding device that can convert audio signals into sound signals. It is usually powered by DC voltage. It is widely used in alarms, computers, printers and other electronic products as sound devices. It is mainly divided into piezoelectric buzzer and electromagnetic buzzer, represented by the letter "H" or "HA" in the circuit. According to different designs and uses, the buzzer can emit various sounds such as music, siren, buzzer, alarm, and electric bell.

6.BREADBOARD
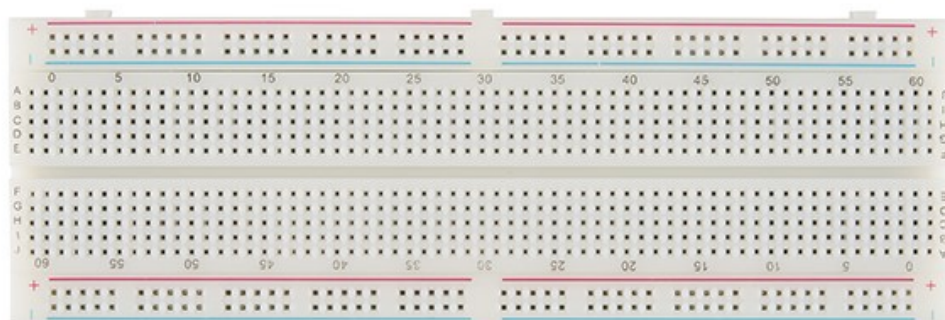
A breadboard is a construction platform for electronics prototyping. A polished piece of wood used for slicing bread was originally called a bread board. it was The solder-less breadboard is reusable since it does not require soldering. This makes it simple to use for making temporaryprototypes and circuit design experiments. A perforated block of plastic with several tin plated phosphor bronze or nickel silver alloy spring clips under the holes makes up a modern solder-less breadboard socket. Tie points or contact points are common names for the clips. The number of tie points is frequently specified in the breadboard specification. The lead pitch (the distance between the clips) is usually 0.1 inch (2.54 mm). In DIPS, integrated circuits (ICs) can be placed to straddle the block's centerline. To complete the circuit, interconnecting wires and discrete component leads (such as capacitors, resistors, and inductors) can be placed into the remaining open holes. Discrete components and accompanying wires may use any of the holes if ICs are not employed. Spring clips are typically rated for1 amp at 5 volts and 0.333 amps at 15 volts (5 watts). Male and female notches are located on the board's edge, allowing it to be clipped together to form a giantbreadboard.

7.RESISTOR

A passive electrical component with two terminals that are used for either limiting or regulating the flow of electric current in electrical circuits. The main purpose of resistor is to reduce the current flow and to lower the voltage in any particular portion of the circuit. It is made of copper wires which are coiled around a ceramic rod and the outer part of the resistor is coated with an insulating paint.

8.JUMPER WIRES

Generally, jumpers are tiny metal connectors used to close or open a circuit part. They have two or more connection points, which regulate an electrical circuit board. Their function is to configure the settings for computer peripherals, like the motherboard. Suppose your motherboard supported intrusion detection. A jumper can be set to enable or disable it. Jumper wires are electrical wires with connector

pins at each end. They are used to connect two points in a circuit without soldering. You can use jumper wires to modify a circuit or diagnose problems in a circuit. Further, they are best used to bypass a part of the circuit that does not contain a resistor and is suspected to be bad.This includes a stretch of wire or a switch. Suppose all the fuses are good and the component is not receiving power; find the circuit switch. Then, bypass the switch with the jumper wire.
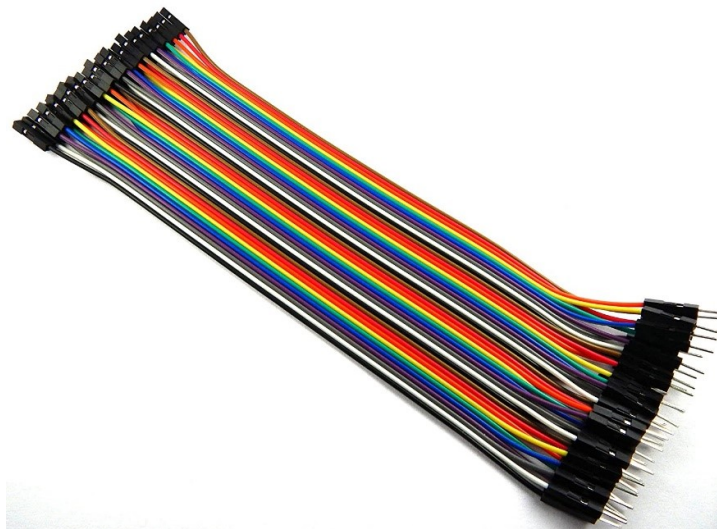
9.POWER SUPPLY

A power supply is an electronic device that provides electric power to a load. A power supply's main job is to convert one type of electrical energy to another. As a result, electric power converters are sometimes used to refer to power supply. Some power suppliesare standalone units, while others are integrated into bigger equipmentwith their loads. Power suppliesseen in desktop computers and consumer electronics devices are examplesof the latter. Every power supply must obtain the energy it supplies to its load, as well as it consumes some energy while performing that task, from an energy source. Dependingon its design, a power supply may obtain energy from varioustypes of energy sources, includingelectrical energy transmission systems, energy storagedevices such as a batteriesand fuel cells, electromechanical systemssuch as generators and alternators, solar power converters, etc.

SOFTWARE REQUIREMENT
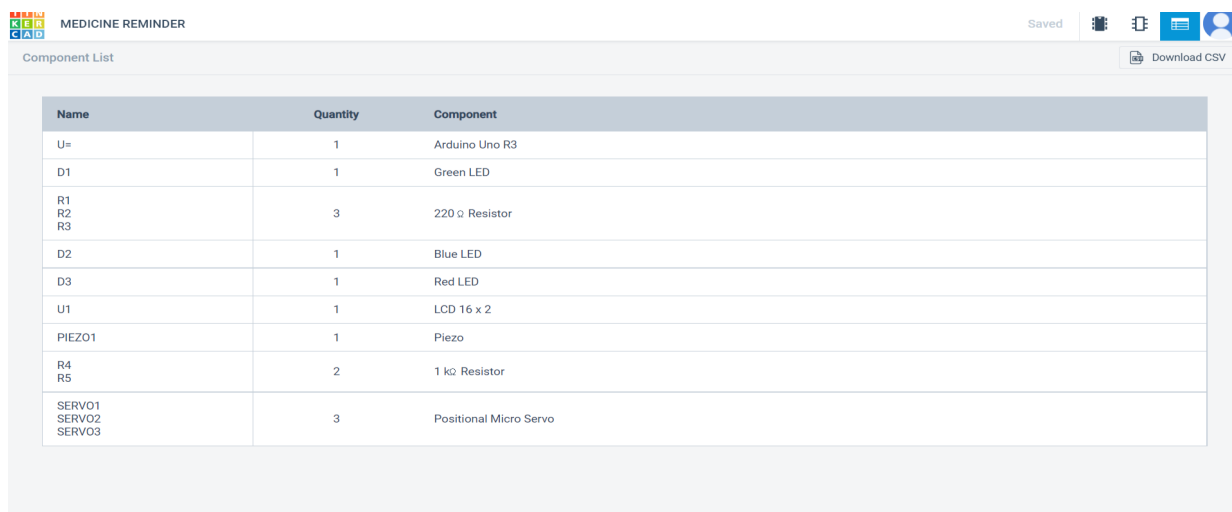
1.Arduino IDE

2.TinkerCad

1.ARDUINO IDE

The ARDUINOproject provides the ARDUINO integrated development environment (IDE), which is a Java-based cross-platform application. It came from the IDE for the Processing and Wiring programming languages. It comes with a code editor that enables text cutting and pasting, text finding and replacement, automatedindenting, brace matching,and syntax highlighting, as well as one-click compiling and uploading to an Arduino board.A message area, a text terminal, a toolbar with common function buttons, and a hierarchy of operation menus are also included. A sketch is an ARDUINOprogramme created with the ARDUINO IDE. Sketches are saved as text files with the file extension(.ino.) on the development computer. ARDUINO Software(IDE) saved sketchesprior to version1.0 with the extension (.pde.).

2.TINKERCAD

Tinkercad is probably one of the simplest and most intuitive 3D modeling tools available. It's free, it runs in your web-browser, it has a clear and logical interface, and its easy-breezy use make it the go-to program for many beginners. In this article, we'll cover the basics on how to design in Tinkercad by creating a simple wrench. This should be a familiar tool with a modest shape that can easily be 3D printed later on, and by following this tutorial, you should be able to learn the basic functionality and tools that Tinkercad has to offer.
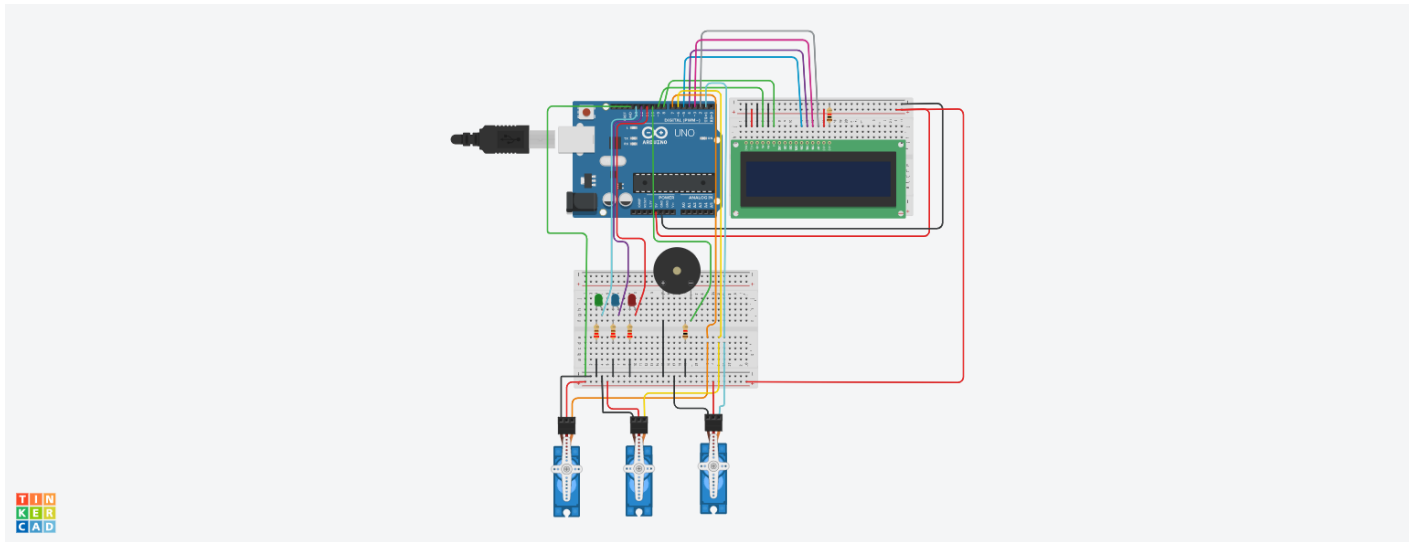
7.2 FEATURE 2

COMPONENTS LIST

Name	Quantity	Component
U=	1	Arduino Uno R3
D1	1	Green LED
R1 R2 R3	3	220 Ω Resistor
D2	1	Blue LED
D3	1	Red LED
U1	1	LCD 16 x 2
PIEZO1	1	Piezo
R4 R5	2	1 kΩ Resistor
SERVO1 SERVO2 SERVO3	3	Positional Micro Servo

CONNECTIONS

8.RESULTS

8.1 PERFORMANCE METRICES

S. NO	Parameter	Performance
1.	Response Time	0.2s
2.	Workload	One At a time
3.	Revenue	Individual users and pharmaceutical industries.
4.	Efficiency	Simple and straightforward workflow, which makesthe process efficient.
5.	Down Time	Almost no down time

9.ADVANTAGES & DISADVANTAGE

ADVANTAGES

- Help the elderly peopleto take their medicine at the correcttime.
- Avoid personalassistants or caretakers needed for medicallysick people.
- Cost efficient.
- Since it includes Buzzer, even blindpeople can use our device.

DISADVANTAGES

- Makes people lethargic and makes them dependent always on others.
- Requires a good power supply.

10.CONCLUSION

In conclusion, the proposed project is aiming to control medication adherence. It is an automated medication project that helps to increase the life expectancy for those of older as well as younger. This system remind the patient to take the medication during the allocated time. This device is low cost, a safe system and user friendly. This sytem is a very good to apply in hospitals because it can make the patients more comfortable to stay at the hospitals.

11.FUTURE SCOPE

The project can be further developed by bringing into the faeture of informing the medicine name during the notification. The voice assistance 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.

12.APPENDIX

12.1 SOURCE CODE

#include<LiquidCrystal.h>

#include <Servo.h>

```
LiquidCrystal lcd(9, 8, 5, 4, 3, 2);
Servo servo_7;
Servo servo_6;
Servo servo_1;
const int buzzer = 10;
void setup()
{
 lcd.begin(16,2);
 pinMode(buzzer, OUTPUT);
 pinMode(11, OUTPUT);
 pinMode(12, OUTPUT);
 pinMode(13, OUTPUT);
 servo_7.attach(7);
 servo_6.attach(6);
 servo_1.attach(1);
}

void loop()
{
 servo_7.write(0);
 servo_6.write(0);
 servo_1.write(0);
 lcd.setCursor(0,0);
 lcd.print("MEDICINE");
 lcd.setCursor(2,1);
 lcd.print("REMINDER");
 delay(5000);
 lcd.clear();
```

```
    delay(1000);

    lcd.print("NextCycle = 8AM");

    delay(5000);

     lcd.clear();

    digitalWrite(13, HIGH);

    lcd.setCursor(0,0);

    lcd.print("8:00 AM");

    lcd.setCursor(2,1);

    lcd.print("MORNING MED");

    servo_7.write(90);

    servo_6.write(0);

    servo_1.write(0);

    tone(buzzer, 500);

    delay(1000);

    noTone(buzzer);

    delay(1000);

    tone(buzzer, 500);

    delay(1000);

    noTone(buzzer);

    digitalWrite(13, LOW);

    lcd.clear();

    servo_7.write(0);

    servo_6.write(0);

    servo_1.write(0);

    lcd.print("NextCycle = 3PM");

    delay(5000);

    lcd.clear();

 digitalWrite(12, HIGH);
```

```
lcd.setCursor(0,0);

lcd.print("3:00 PM");

lcd.setCursor(2,1);

lcd.print("AFTERNOON MED");

servo_7.write(0);

servo_6.write(90);

servo_1.write(0);

tone(buzzer, 500);

delay(1000);

noTone(buzzer);

delay(1000);

tone(buzzer, 500);

delay(1000);

noTone(buzzer);

digitalWrite(12, LOW);

lcd.clear();

servo_7.write(0);

servo_6.write(0);

servo_1.write(0);

lcd.print("NextCycle = 10PM");

delay(5000);

lcd.clear();

digitalWrite(11, HIGH);

lcd.setCursor(0,0);

lcd.print("10:00 PM");

lcd.setCursor(2,1);

lcd.print("NIGHT MED");
```

```
  servo_7.write(0);

  servo_6.write(0);

  servo_1.write(90);

  tone(buzzer, 500);

  delay(1000);

  noTone(buzzer);

  delay(1000);

  tone(buzzer, 500);

  delay(1000);

  noTone(buzzer);

  digitalWrite(11, LOW);

  lcd.clear();

  servo_7.write(0);

  servo_6.write(0);

  servo_1.write(0);

  delay(5000);

}
```

13.2 GITHUB & PROJECT DEMO LINK

GITHUB LINK: https://github.com/IBM-EPBL/IBM-Project-42199-1660655979
PROJECT DEMO LINK: https://photos.app.goo.gl/qUc43cqjWkKaj6ek6