PROJECT REPORT

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1. INTRODUCTION

Tracking the health of a person and proper medication improves their life time. Studies suggest the most of the deaths of the elderly people have occurred during the night when the person is 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 assistance device for health monitoring of elderly people using different sensors which can measure pulse rate, position of elderly. Therefore the doctor can identify the abnormal values easily and can attend the patient if the device is used in the hospital. Proper intake of medicine at correct time is indicated by the display on OLED screen and an alert is produced by buzzer.

The planet undergoes a technical revolution that has become unparalleled, from disconnected networks to all-embracing internet 'stuffs' that produce and share massive quantities of useful data. A digital phenomenon that transforms our daily lives, boosts market efficiency and strengthens policy efficacy, the latest model is widely recognized as the IoT.

At the time of the IoT, ordinary items are cleverer and assume an significant role in infrastructure surroundings.This thriving integrated system is a pledge to follow a wide variety of applications of technical, economic and social possibilities from a normal clever street lamb to a difficultcityor elsefrom an efficient manufacturing device to an intricate lever factory.

One significant field where IoT has provided big improvements and huge implications for healthcare systems. In the field of healthcare research, the implementation of the usage ofinformation and communication technology has demonstrated a range of benefits of continuous health surveillance, and the IoT model allows more responsive, supportive and integrated treatment where patients track and control their own wellbeing.IoT has the ability to contribute to a wide range of medical uses, including virtual health control, chronic illnesses, personal wellbeing and wellness as well as pediatric and elderly care. The healthcare of elderly people and disabled individuals, recognized as Ambient Assisted Living (AAL) become particularly relevant in this broad range of applications because of the projected pace of global population ageing. These approaches may be especially beneficial in rural areas where there is often a small and restricted number and supply of emergency vehicles with the right reaction.

Powerful development activities in IoT-based healthcare software, facilities and innovations have been conducted over the past several years. However, the foundations of wireless sensor networks (WSN) had their early moves in this path.The low cost aging living assistance program for secluded households was introduced by suntiamorntut et al., while Redondi et al. introduced LAURA, an automated client identification and recording network in health care facilities. The pattern, though, is to swap from ancient crafted methods to structured IP networks with the introduction of IoT.introduces and addresses an IoT aware Smart Hospital System (SHS) that offers the automated control and surveillance systems for patients, workers and biomedical equipment inside hospitals and hospitals. A program of IoT for home health treatment of elderly patients living with chronic heart as well as breathing disease has been developed. A single wireless sensor node is mounted, able to track cardiac rhythm, temperature, oxygen saturation as well as electrocardiographic signals. The Carestoreframework[14] is a modern open source application for streamlined distribution and customization of healthcare appliances. A part of the CareStore project, the Universal Recognition and Identification Framework (CRIP) provides sensor-based assistance to automatically recognize the patient and health equipment.

In the industry there are still several sophisticated adaptive applications for AAL. A system for the compilation of patient mobile cardiovascular telemetry (MCT) and tracking for cardiac attacks is the Body Guardian Cardiac. Data from a patient was identified immediately and wirelessly transmitted through a mobile to a control center.Doctors can use different portals, including PatientView and PatientFlow, to access their patient data and review updates on the web. Wellness[16] is a device incorporating cameras, smartphone alerts and home control to deliver secure and cost-effective living choices.

1.1 Project Overview

The Name of the project is **Personal Assistance for Seniors Who Are Self-Reliant.** And is was done by the teammate (Ramesh P, Prasath V, Maria Antony B, Praveen Kumar A(TL)).We August 2022 to November 2022 and in the span of three months we have learned much from IBM and ICT Academy members.

We have discovered the problem in the current that are faced by the elderly person and have interacted with them& the problem are given below

- As a user, I want to take Medicines on time and monitor my health.
- As a user, I want to take my tablets on time by voice command.
- As a user, my patient needs to take medicines on time and monitoring the activity.

- As a user, my patient medication time and prescription should loading database for upcoming week.
- As a user, I need to take my medicine in nearby places with light notification.
- As a user, I need to take my medicine and I am not able see the dosage of medicine properly.
- As a user, Sometimes my medicine aren’t in stock and I usually forget the Stock of my medication

1.2 Purpose

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.

A pill reminder is any device that reminds users to take medications. Traditional pill reminders are pill containers with electric timers attached, which can be preset for certain times of the day to set off an alarm.

2. LITERATURE SURVEY

1. **Sharma, A., Choudhury, T. and Kumar, P., 2018, June. Health monitoring & management using IoT devices in a cloud based framework. In *2018 international conference on advances in computing and communication engineering (ICACCE)* (pp. 219-224). IEEE.**

   The study proposed Textile based Wearable System Technology, Unobtrusive Biosensors, Intelligent Medical Boxes, and a Cloud Computing Architectural Framework amongst other technologies and advancement that would pitch the HealthCare Industry to unparalleled heights in terms of efficiency and Patient Comfort. The paper proposes to revolutionize the industry by real time exchange of data to seamlessly and proactively offer prediction, diagnosis and remedies. The framework this paper proposes is aptly called the Internet of Medical Things (IoMT) which opens a whole new avenue for the Patient-HealthCare provider Interface (PHI) and Wearable Health Technology (WHT).

   Advantage
   An alert is sent to emergency contacts and respective healthcare providers in case the Health Indexes exceed the normal values thereby leading to better prognosis thus preventing the illness before it takes an extreme form. Real Time Data is being provided to the hospice care specialists which enables them to make informed decisions and provide prediction-based remedies.

   But the **limitations** related to this study are Security and Data Theft is an issue which persists even after the inclusion of the unique API key. Also, for more patients, big data handling might be required to handle the enormous amount of data that is generated. For IoMT to become commercially and publicly available, a more user-friendly UI is desirable.

2. **Balakrishnan, L., 2021, May. An Internet of Things (IoT) Based Intelligent Framework for Healthcare–A Survey. In *2021 3rd International Conference on Signal Processing and Communication (ICPSC)* (pp. 243-251). IEEE.**

   The study focuses on a brief survey of overall use of IoT-based frameworks in medical services, starting with an early medical care monitoring design based on wearable sensors and progressing to a discussion of the most recent fog/edge computing technologies for smart healthcare framework.
   Advantages
   This research indicates that the guidance is flexible based on a couple of approaches. Ambient Assisted Living (AAL), Internet of m-health Things (m-IoT), Adverse Drug Reaction (ADR), Community Healthcare (CH), Children Health Information (CHI),

Wearable Device Access (WDA), Semantic Medical Access (SMA), Indirect Emergency Healthcare (IEH), Embedded Gateway Configuration (EGC). Researchers have applied DL to Wearable body sensor information and E - Health Records are two examples of medical Big Data. The handling of an enormous amount of information requires escalated preparing capacities. In the writing for continuous IoT frameworks, a few major information examination procedures were recommended and the requirement for QoS was not effectively replied.

Limitations

Since personal and sensitive information is used in medical care frameworks and also information security and preservation is a key objective in a smart healthcare framework. Furthermore, edge-based frameworks have yet to address local storage and information processing management, especially in the context of a dynamic health environment.

3. **Alshehri, F. and Muhammad, G., 2020. A comprehensive survey of the Internet of Things (IoT) and AI-based smart healthcare. *IEEE Access, 9,* pp.3660-3678.**

A comprehensive survey of IoT- and IoMTbased edge-intelligent smart health care, mainly focusing on journal articles published between 2014 and 2020. The survey has undergone literature by answering several research areas on IoT and IoMT, AI, edge and cloud computing, security, and medical signals fusion. The systematic review process PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to identify studies and narrow down results for this review. In the review process, there are three sequential steps, which are identification, scanning, and eligibility testing.

Challenges

The major challenges of IoT and AI-based smart healthcare include sensors' interoperability, device communication, security and privacy, device management, information management barrier, and efficient use of AI. In some health care environments, the bulk of IoMT devices can be used to identify and diagnose an illness, and the data collected from heterogeneous sensors contains a variety of issues, such as hardware glitches, drained batteries, or connectivity problems [106]. There are certain basic problems that are normal and unregulated. In particular, there are sometimes unexplained errors in the usage of popular medical sensors, such as mobile phones and smart watches. There are also regular complexities, such as battery power, distinctions between particular physical characteristics, and variations in the environment.

4. **Kumar, M.P. and Nelakuditi, U.R., 2019, December. IoT and I2C protocol based M-health medication assistive system for elderly people. In *2019 IEEE 16th India Council International Conference (INDICON)* (pp. 1-4). IEEE.**

   IoT based Medication Assistive System was proposed and developed to facilitate medication adherence. The proposed system incorporates features such as sending a message to a medical practitioner one week ahead to remind the status of medicines and also buzzer beep to ensure the attendance of a candidate which is not available in existing software remainders. It can perform the task even though internet is not available physically by using NodeMCU and Blyank app. The proposed system assists older people in reminding medication timings as well as selection of medicines. It also reduces the dependency of old people on younger generations. Design can be realized at a lower price due to the availability of intelligent programmable hardware at an affordable cost.

   Advantages

   Medication assistive system for elderly people was implemented in a cost effective manner using Aurdino, RTC, EEPROM etc, which helps them in a better way in their medication process. It facilitates in reminding timings, taking proper medicines for a specific slot, and also obtaining medicines from medical shop automatically. They can even read the status from time to time. This system is very helpful for independently living older people. It is thoroughly tested and accuracy observed is 97%.

5. **Ranjana, P. and Alexander, E., 2018, December. Health alert and medicine remainder using internet of things. In *2018 IEEE International Conference on Computational Intelligence and Computing Research (ICCIC)* (pp. 1-4). IEEE.**

   The study proposed medicine box would help people who are under medication mainly for old persons to take the medicine on time without forgetting. It also continuously monitor the people's health condition like Blood pressure, ECG through the tensors kept at home and inform them to take necessary action. A person’s life can be saved by this system. Human effort can also be decreased by this health alert and medicine remainder. This systems can easily detect the abnormalities in the body condition and also remands of medicine to take through the buzzer and the LCD display. The user relatives or doctors were also informed about the abnormal conditions.

   Advantages

   The advantage of this is it is a convenient way to use by people of any age and people busy with their work will not forget to take medicine. It also takes care of the people health by alerting during abnormalities.

6. **Ayshwarya, B. and Velmurugan, R., 2021, March. Intelligent and Safe Medication Box In Health IoT Platform for Medication Monitoring System with Timely Remainders. In *2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS)* (Vol. 1, pp. 1828-1831). IEEE**.

   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 smart phone. This intelligent medication box contains bio-sensor for monitoring of temperature and heartbeat. Over dosage 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.

7. **Amin, R., Saha, T.S., Hassan, M.F.B., Anjum, M. and Tahmid, M.I., 2020, November. IoT Based Medical Assistant for Efficient Monitoring of Patients in Response to COVID-19. In *2020 2nd International Conference on Advanced Information and Communication Technology (ICAICT)* (pp. 83-87). IEEE.**
   The researchers had developed a complete model of monitoring patients at regular intervals through an interconnected network among the doctors, nurses and patients with a view to minimizing the workload of the doctors and nurses, reducing the chances of medical professionals being infected by COVID-19 type of contagious disease and increasing the overall efficiency of patient monitoring in hospitals. Bio-medical sensors interfaced with microcontroller are used to collect the data of heart beat rate, body temperature and body movement to get an overview of the present health condition of the patient. The recorded data are stored in an excel file and updated automatically to the internet via OneDrive in every 30 seconds. In case of any large deviation from the normal condition, an automated alarm system will notify the assigned doctor about the condition of the patient. A medication reminder system is added in our designed android app to notify the patient to take the medicine prescribed by the doctor at proper time. The patient can also call the nurse in case of emergency and there is also scope for the patient to control the position of the bed according to his comfort. The level of saline or blood injected into the vein of the patient can also be monitored in our system to inform the nurse at the time of being finished.

8. **Kumar, S.B., Goh, W.W. and Balakrishnan, S., 2018, October. Smart medicine reminder device for the elderly. In *2018 Fourth international conference on advances in computing, communication & automation (ICACCA)* (pp. 1-6). IEEE.**

This paper discusses in detail a proposed IoTBased Smart Medicine Reminder Device that will be designed for the elderly based on the issues faced by the elderly. The paper explains the background of the study and the main aim is to ensure that the IoT-Based Smart Medicine Reminder Device will be solving problems faced by the elderly. The issues that have been identified are targeted very much to the elderly and are aimed to solve the issues faced by the elderly on a daily basis, especially with the consumption of medicine. The paper will also explore the similar implemented devices/systems to identify strengths and weaknesses of other relevant devices/systems so that a better device can be developed.

Advantages

- Keep track of their medication
- consumption patterns, receive reminders to
- consume their medications
- Pill restock alert will alert close contacts
- Added level of security
- Multiple methods of reminding use

Limitations

- Lack of health apps integration
- Absence of voice reminder
- Not cross-platform
- Absence of self-deployed cellular connection

9. **Alkandari, A. and Almutairi, N., 2019. Smart medicine drawers using IOS application and Arduino board.** ***International Journal on Perceptive and Cognitive Computing, 5*****(2), pp.59-65.**

   This paper proposed an application running on the iPhone connecting with smart drawers through the Arduino Board. The primary purpose of this application is to organize and remind patients to take their medicines on the accurate time. Drawers can be opened and closed through the application.

   Advantage

   It reduces workload of doctor and nurses.

   Very handy for elder peoples

10. **Al-Mahmud, O., Khan, K., Roy, R. and Alamgir, F.M., 2020, June. Internet of things (IoT) based smart health care medical box for elderly people. In** ***2020 International Conference for Emerging Technology (INCET)*** **(pp. 1-6). IEEE.**

    The proposed medicine box helps the patient to take the right medicine at the right time along with an email which will help the patient to take the medicine. A laptop is used as a server where detailed information about doctor and patient are stored along with prescription and appointment date. Both doctor and patient have IDs' and password for accessing the server. Also, the data of medication and temperature of patient are stored on the server for doctor's ease. The Doctor can change the patient's prescription if

necessary, which will also be notified via email. Moreover, the doctor can take immediate steps in case of an emergency. Older people who need regular monitoring of their medication will be benefited through this project. Server for storing medication time and other information, mail transferring protocol, temperature sensor for proper monitoring of patient body temperature has been integrated in this project.

11. **Bhatia, H., Panda, S.N. and Nagpal, D., 2020, June. Internet of Things and its Applications in Healthcare-A Survey. In *2020 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions)(ICRITO)* (pp. 305-310). IEEE.**

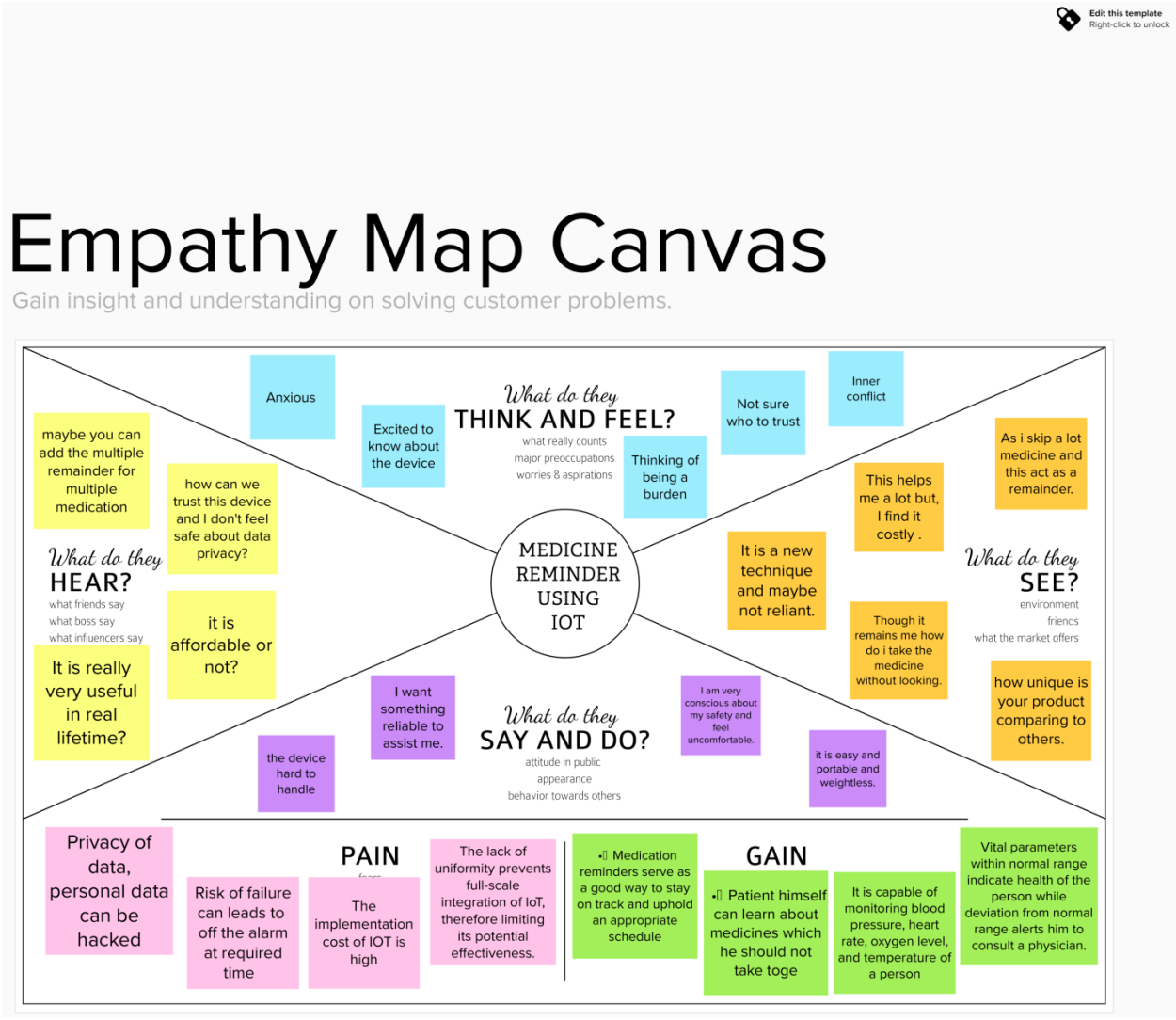
    The paper also presents a comparison between various sensors used in the field of healthcare and their types, the IoT architecture, tools and technologies used to develop IoT systems, and m-Health apps. The objective of the paper is to clarify the concept of IoT to the reader and to make the reader aware of the present trends used in IoT healthcare. Basic Three-level architecture and Five-level architecture for IoT based systems have also been discussed. The commonly used sensors in IoT-enabled or IoT-based healthcare systems have also been discussed. Then, the various tools and technologies used in the development of IoT systems such as hardware platforms like Arduino, Raspberry Pi, Intel's Galileo, BeagleBone, etc. have also been discussed. In the end, various m-health healthcare applications that are available for use to the general public based on IoT have been discussed.

12. **Lu, D. and Liu, T., 2011, December. The application of IOT in medical system. In *2011 IEEE International Symposium on IT in Medicine and Education* (Vol. 1, pp. 272-275). IEEE.**

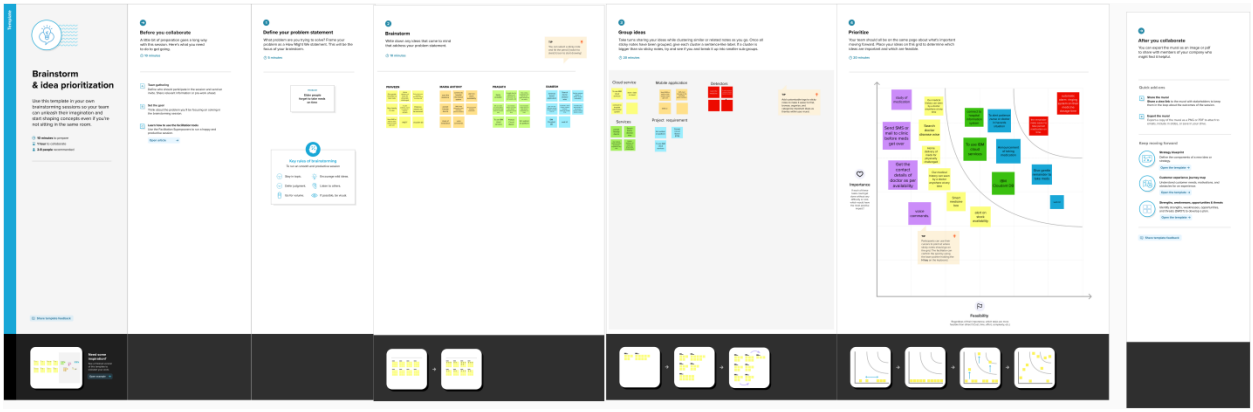
    The study defines concepts of IOT (the internet of things) ,including the structure of IOT and the implementations of IOT functions .It also introduces the telemedicine ,including the advantages of telemedicine and the telemedicine in China . And the paper illustrates the technologies of IOT used in medical system. The application of IOT in medical system includes clinical care is in-need of the information management in hospital are as follows: identification, sample identification, medical record identification. Using the RFID technology, the doctor can take the bedside sample easily. They can identify the patient's identification; if there are some errors the alert will call the doctor automatically. Secondly, Remote real-time ECG monitoring Mobile communications technology from the current 2.5- generation CDMA and GPRS to the third generation mobile communications development, with the 3G communication technology and promote the use of increasingly sophisticated, 3G mobile communication technology in cardiovascular. Remote areas of health care play a huge role.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



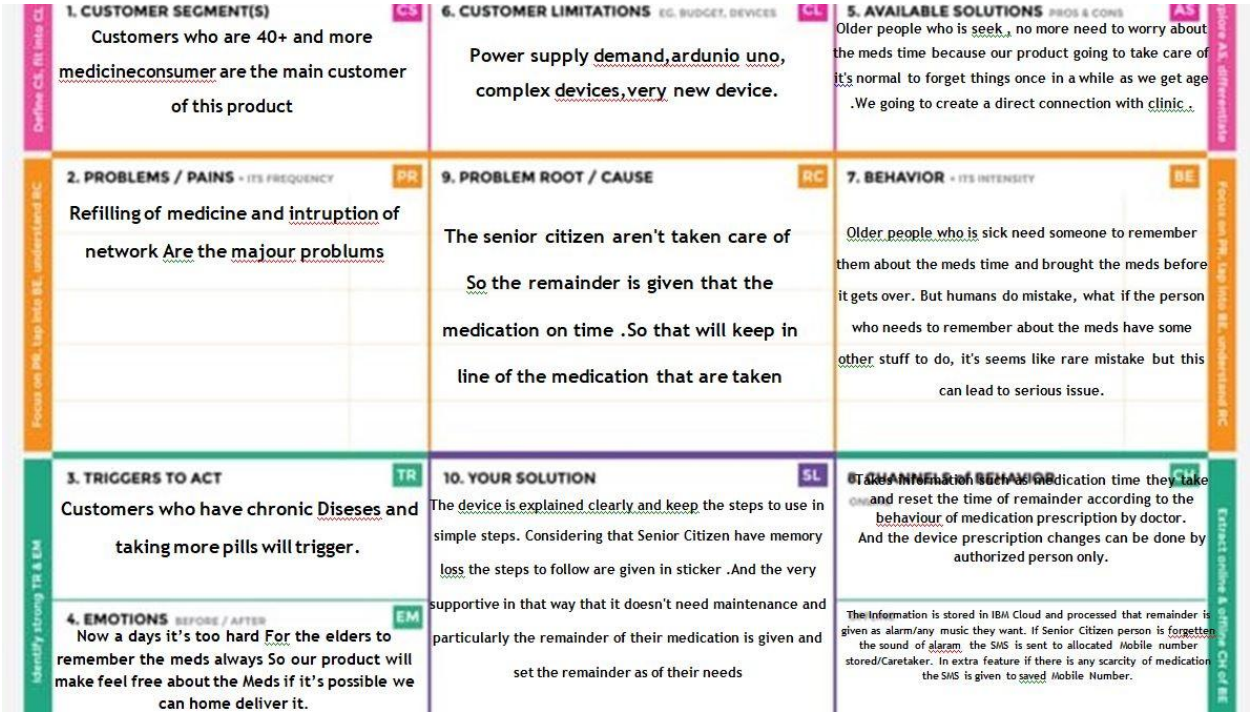
3.2 Ideation & Brainstorming



3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Sometimes the elderly forgets 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.
2.	Idea / Solution description	We present a smart Internet of Things-based medication reminder system. The suggested plan was specifically designed for the Android operating system. We use a reminder system for our system, which sounds an alarm when it's time to take your medication. Additionally, the user can set their medication time using an android application. There will be some features in the application that allow the user to learn more specifics about their medication. It keeps track of the medications, allowing the user to adjust how much medication to take within the application.
3.	Novelty / Uniqueness	It is an easy-to-use app that reminds users to take their medications and get them refilled and we can scan the medicine .So that the Senior Citizen can know when the medication should be taken.
4.	Social Impact / Customer Satisfaction	I constructed these proto-personas, or names, based on the research findings from the user interview. They would be crucial to the rest of the design process. All design decisions may be assessed and re-evaluated using these personas, keeping the user and their perspective in mind.
5.	Business Model (Revenue Model)	The device,app focus on services and the model is small and affordable price. Targets not only Senior Citizen But also any Children from 8+.
6.	Scalability of the Solution	where the user can set the time for their medication. There will be some features in the application that allow the user to learn more specifics about their medication. It keeps track of the medications, allowing the user to adjust how much medication to take within the application.

3.4 Problem Solution Fit



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 Registrationthrough Gmail
FR-2	User Confirmation	Confirmation via EmailConfirmation via OTP
FR-3	Access Cloud services	Access the cloud service with correct credentialsStore the details in the database
FR-4	IOT configuration	Fine Tuning the IOT device based onAccess the Cloud DB via device Manage the request and response effectively

4.2 Non-Functional Requirement

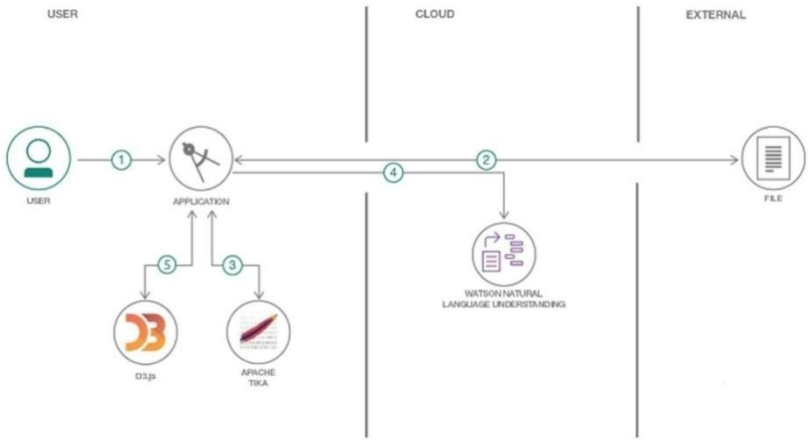
Following are the non-functional requirements of the proposed solution.

FR No.	Non-FunctionalRequirement	Description
NFR-1	**Usability**	App can be used by anyone who has knowledgeabout internet and computer.

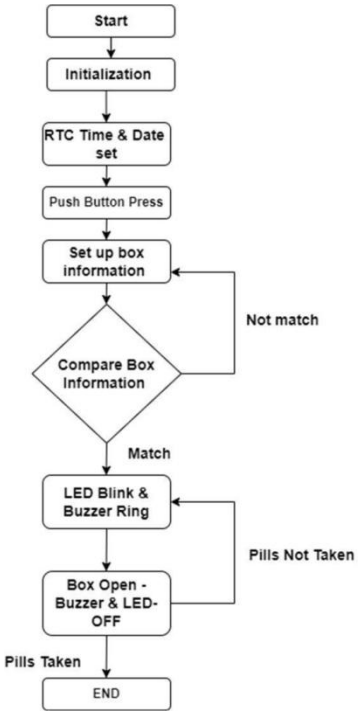
NFR-2	**Security**	For security, TFA is enabled and biometricsarealso added for user safety.
NFR-3	**Reliability**	Highly reliable since, It uses Trusted cloudservices like IBM
NFR-4	**Performance**	Performance is better compared to othermarketproducts.
NFR-5	**Availability**	Available on mobile app.
NFR-6	**Scalability**	Using Cloud services, makes the scalabilityhigher the using traditional database.

5. PROJECT DESIGN

5.1 Data Flow Diagram



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 (Senior citizen)	Caretaker	USN-1	As a user, I want to take Medicines on time andmonitor 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 byvoice 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 ontime 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 andprescription 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 nearbyplaces with light notification	I need to take my medicinein nearby places with Light notification	Medium	Sprint-3
Customer(No Clear Vision)	Smart medicine box	USN-6	As a user, I need to take my medicine and I amnot able see the dosage of medicine properly	Scan the medicine	High	Sprint-1
Customer(No Clear Vision)	Smart medicine box	USN-7	As a user, Sometimes my medicine aren't instock and I usually forget the Stock of my medication.	Stock remainder	Medium	Sprint -1

7. PROJECT PLANNING &SCHEDULING

6.1 Sprint Planning &Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Caretaker	USN-1	As a user, I want to take Medicines on time andmonitor my health	2	High	PraveenKumar,Ramesh P,Maria AntonyB,Prasath V
Sprint-1	Smart medicine box	USN-2	As a user, I want to take my tablets on time byvoice command	1	High	PraveenKumar,Ramesh P,Maria AntonyB,Prasath V
Sprint-2	Caretaker	USN-3	As a user, my patient needs to take medicineson time and monitoring theactivity	2	Medium	PraveenKumar,Ramesh P,Maria AntonyB,Prasath V
Sprint-4	Caretaker	USN-4	As a user, my patient medication time andprescription should loadin database forupcoming week	2	Low	PraveenKumar,Ramesh P
Sprint-3	Smart medicine box	USN-5	As a user, I need to take my medicine in nearby places with light notification	1	Medium	PraveenKumar
Sprint -1	Smart medicine box	USN-6	As a user, I need to take my medicine and I amnot able see the dosage of medicine properly	1	High	Ramesh P,Maria Antony B,Prasath V
Sprint -1	Smart medicine box	USN-7	As a user, Sometimes my medicine aren't instock and I usually forget the Stock of my medication.	2	Medium	Praveen Kumar,Prasath V

6.2 Sprint Delivery Schedule

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

7. CODING&SOLUTIONING

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#include "DHT.h"// Library for dht11
#define DHTPIN 15     // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11
#define BUZZER_PIN 2
int BUZZER_CHANNEL = 0;
DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of dht
connected

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

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

#define ORG "fqeyos"//IBM ORGANITION ID
#define DEVICE_TYPE "praveen107devicetype"//Device type mentioned in ibm watson IOT
Platform
#define DEVICE_ID "meds108"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "p__P14YR0cP-CSHEkN"     //Token
String data3;
float h, t;


//-------- 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


//-------------------------------------
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);
  dht.begin();
  pinMode(BUZZER_PIN,OUTPUT);
  ledcAttachPin(BUZZER_PIN, BUZZER_CHANNEL);
  delay(10);
```

```
  Serial.println();
  wificonnect();
  mqttconnect();
}

void loop()// Recursive Function
{

  h = dht.readHumidity();
  t = dht.readTemperature();
  Serial.print("temperature:");
  Serial.println(t);
  Serial.print("Humidity:");
  Serial.println(h);

  PublishData(t, h);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}



/*.....retrieving to Cloud.....*/

void PublishData(float temp, float humid) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"Temperature\":";
  payload += temp;
  payload += "," "\"Humidity\":";
  payload += humid;
  payload += "}";


  Serial.print("Sending payload: ");
  Serial.println(payload);


  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it will print
publish ok in Serial monitor or else it will print publish failed
  } else {
    Serial.println("Publish failed");
```

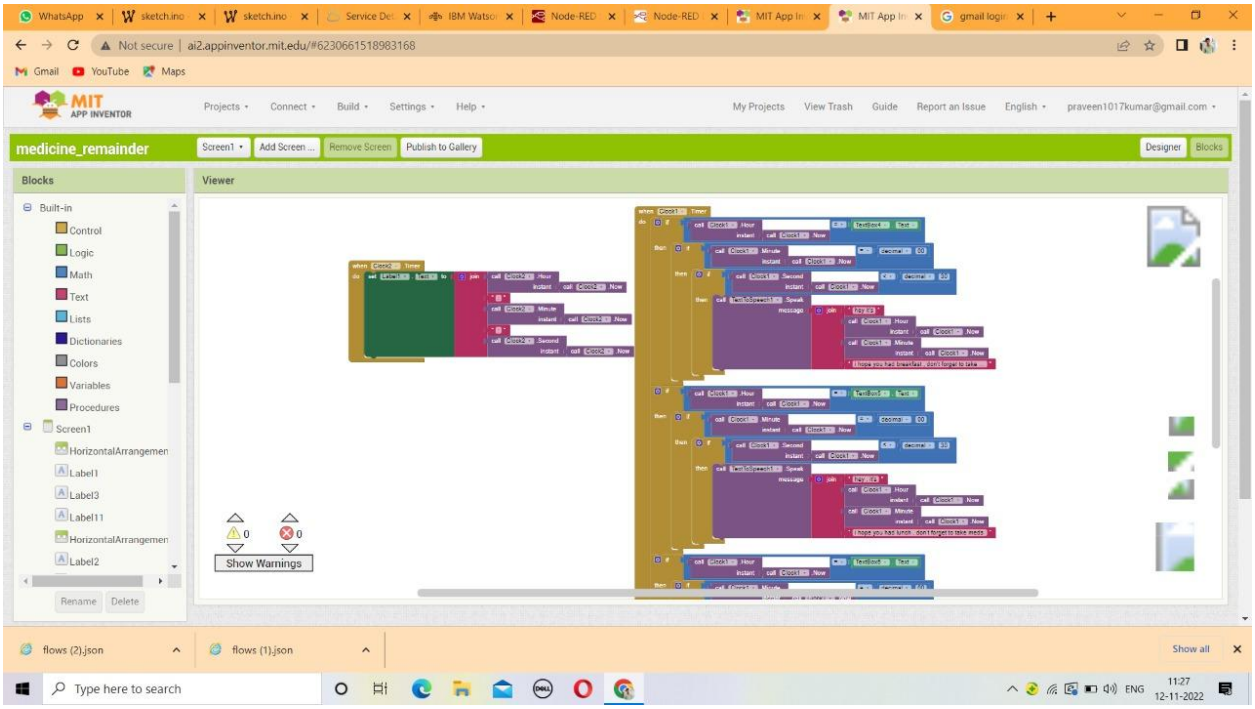
```
  }

}
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() //function defination for wificonnect
{
  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
  while (WiFi.status() != WL_CONNECTED) {
    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, unsigned int payloadLength)
{

  Serial.print("callback invoked for topic: ");
  Serial.println(subscribetopic);
```

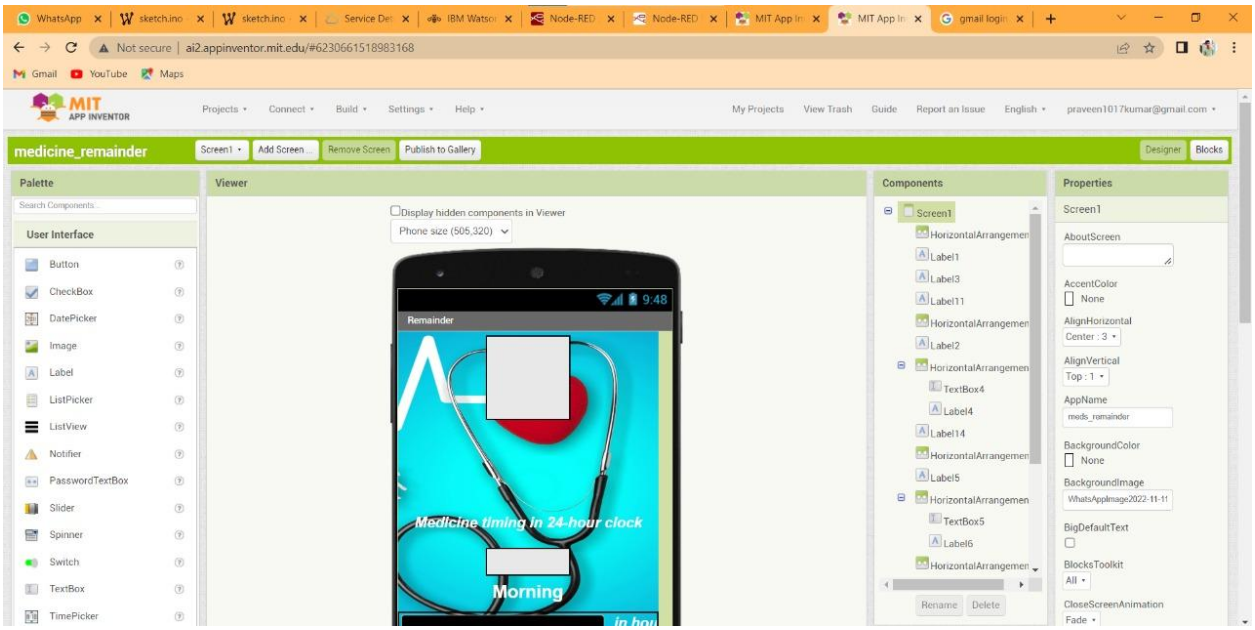
```
  for (int i = 0; i < payloadLength; i++) {
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
  }

  Serial.println("data: "+ data3);
  if(data3=="lighton")
  {
Serial.println(data3);
digitalWrite(BUZZER_PIN,HIGH);
ledcWriteNote(BUZZER_CHANNEL, (note_t)NOTE_D, 8);
  }

  else
  {
Serial.println(data3);
digitalWrite(BUZZER_PIN,LOW);
ledcWriteNote(BUZZER_CHANNEL, (note_t)NOTE_D, 0);
  }
data3="";


}
```

7.1 Feature

The coding enable the buzzer and gives alert the medicine

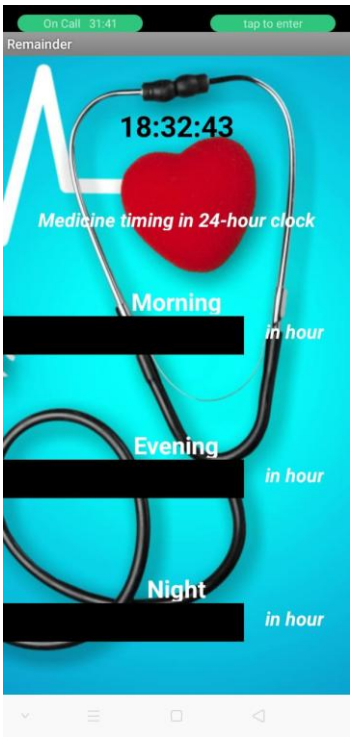
8. TESTING


MIT APP INVENTOR
medicine_remainder
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Viewer
Show Warnings
Type here to search


MIT APP INVENTOR
medicine_remainder
Palette
Viewer
Components
Properties
Remainder
Medicine timing in 24-hour clock
Morning
Type here to search

9. RESULTS

9.1 Performance Testing



10. ADVANTAGES & DISADVANTAGES

Advantages is that the MIT App helps to gives the medicine remainder on time.

Disadvantages is that the App should run at backend and consume power in mobile.

11. CONCLUSION

By using the MIT App we have done messaging app and which gives an remainder to medication**.**

13.FUTURE SCOPE

We have future plans like execute in an hospital .So that the most of mistake by the nurse and caretaker is reduced.

1. Support their social life
Help them continue their regular activities like attending church, visiting with relatives, and reconnecting with old friends or groups they were involved in. If they are able to manage it, take them to library lectures, local theater or any community event they're interested in.

2. Involve them in the day-to-day
Ask them to plan meals, fold the laundry and participate in the shopping, cooking and cleaning where possible. Bake cookies together, even if they can only help stir the dough. Let them decide what TV shows, radio programs and music they want to listen to.

3. Encourage exercise
Staying active is critical for good health, so keep them moving—whether it's a yoga class at the senior center, planting flowers in the yard, a walk around the block or chair exercise at home. If they have exercises recommended by a physical therapist, remind them and encourage them to do them regularly.

4. Keep the brain busy
Play cards or board games, do sudoku or crosswords, work on a jigsaw puzzle, play along to TV game shows, or follow their favorite sports teams. In other words, play along with whatever they enjoy!

5. Put safety first
Prevent falls by removing hazards that could cause your loved one to trip or fall down. Add handrails in hallways and stairways and grab bars in the bathroom for extra support. If they are alone for lengths of time, consider getting a personal emergency response system so that they can call for help by simply pressing an alert button.

14.APPENDIX

GitHub link : https://github.com/IBM-EPBL/IBM-Project-2979-1658490128

Project Demo Link: https://youtu.be/IJ23QAOP9bY