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# INTRODUCTION

The Internet of Things (IoT) is helping society facilitate a major challenge of meeting the needs of an ageing population.As technology improves, IoT can help eliminate these issues. Data collected

from IoT devices formulates an individual’s daily story by monitoring their routine, picking up inconsistencies and alerting emergency services if necessary. Connected IoT devices in the home improve safety, with experts projecting sales of [50 million wireless consumer devices](http://mobihealthnews.com/17498/by-2017-50m-consumer-wireless-health-devices-to-ship/) for monitoring health by 2017, the smart home is here to stay.

* 1. **Project overview**

**Sometimes elderly people forget to take the medicine at the correct time. They have diﬃculty in taking medicine on time often end up in hospitals or home nursing by spending**

**huge amount of money. And it is diﬃcult for doctors/caretakers to monitor the patients**

**around the clock. To avoid this problem, this medicine reminder system is developed. An app is built for the user (caretaker) which enables him to set the desired time and medicine.**

**These details will be stored in** the **IBM Cloudant DB. if the medicine time arrives the web**

**application will send the medicine name to the IoT Device through the IBM IoT platform. The device will receive the medicine name and notify the user with voice commands.**

* 1. **purpose**

**More senior citizens in the world are facing the problem of living alone. After research, I ﬁnd that medication is a very important part of seniors’ life. The design is about medicine reminder that can also connect the seniors with their family members. At ﬁrst, we focused on the social relationship of senior citizens and started to research medication remindersin the market.Then made mockups to try to test the best way for seniors to control a reminder such as the behavior of remembering medications to take. After that, made the prototypes and brought them to the nursing home. More reﬁnements were made after these discussion in the nursing home. The ﬁnal version of my design uses an interesting and noticeable way to remindsenior citizens to take their medicine. Besides that, my product can connect to phone or a device of seniors’ family members, which gives seniors better connection with family member.**

1. **LITERATURE SURVEY**

**Personal Assistance for Seniors Who Are Self-Reliant**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TITLE** | **AUTHOR** | **DESCRIPTION** | **HIGHLIGHTS** | **DRAWBACKS** |
| HABITAT- AN IOT SOLUTION FOR INDEPENDENT ELDERLY | 1. ELENA BORELLI 2. GIACOMO PAOLINI 3. FRANCESCO ANTONIAZZI 4.MARINA BARBIROLI | project HABITAT (Home Assistance Based on the Internet of Things for the Autonomy of Everybody), aiming at developing smart devices to support elderly people both in their own houses and in retirement homes, and embedding them in everyday life objects, thus reducing the expenses for healthcare due to the lower need for personal assistance, and providing a better life quality to the elderly users. | The technological solutions integrated in HABITAT have the purpose to assist needy people in the longest stay in their homes in safe conditions, helping them to conduct autonomously most of the activities tied to the satisfaction of their primary needs, sustaining actions focused on both de- hospitalization and home-care. | In particular, motorized actuators could be controlled directly by the HABITAT system in order to customize the behavior of the chair according to the proﬁle of each user. |
| Understanding the care and support needs of older people: a scoping review and categorisation using the WHO international classiﬁcation of functioning, disability and health framework | 1. Sarah Abdi 2. Alice Spann 3. Jacinta Borilovic 4. Luc deWitte 5.MarkHawley | The number of older people with unmet care and support needs is increasing substantially due to the challenges facing the formal and informal care system in the United Kingdom. Addressing these unmet needs is becoming one of the  urgent public health | The review highlighted that older people living with chronic conditions have unmet care needs related to their physical and psychological health, social life, as well as the environment in which they live and interact. Findings of  this review also | There is a possibility that the screening process, the analysis and interpretation of the themes was inﬂuenced by the author’s own perceptions or understanding of the topic. |

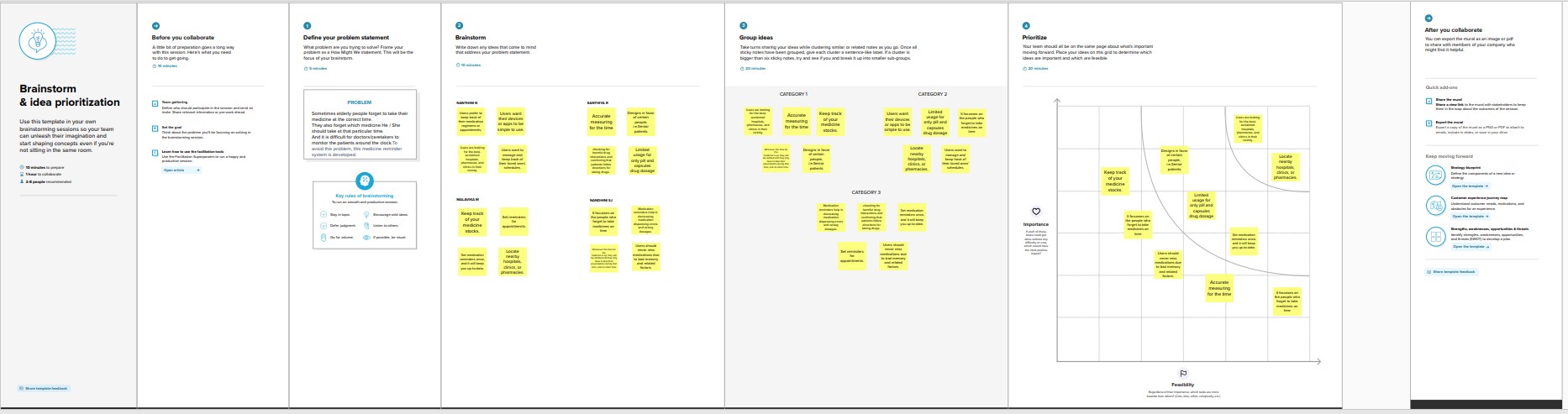
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | priorities. In order to develop effective solutions to address some of these needs, it is important ﬁrst to understand the care and support needs of  older people. | emphasized the importance of developing care models and support services based around the needs of older people. |  |
| Using IoT technologies to develop a lowcost smart medicinebox | 1. Danyllo V. da Silva 2. Taisa G. Goncalves 3. Paulo F. Pires | Regarding IoT scenarios, we applied a scenariobased technique named ScenarIoT. The scenario can be deﬁned as a sequence of actions or an ordered set of interactions among parts. We choose ScenarIoT because it can be employed during requirements speciﬁcation, architecture deﬁnition,documenta tion activities, and system’s features idealization. This technique supports analysts during early development activities and suggests a list of IoT arrangements with their information catalogs | This work proposed a low-cost smart medicine box system employing a robust architecture to support users and health professionals during medicines consumption. The proposed architecture enables to embody other types of devices such as wearable, electronic devices, home appliances,among others, offering inﬁnite possibilities of applications and functions. | This system can be improved, providing a more ﬂexible way to schedule medicines consumption alarms such as twice a week, three times a week, every other day, among others . |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IoT-Based Smart Medicine Dispenser to Control and Supervise Medication Intake v | RodríguezDomínguez  . Hornos  4. Ma Mercedes | The dispenser emits a sound and lights up an LED to alert the patient that it is time to take his/her medication. When he/she is close to the smart medicine dispenser, it will identify him/her through facial recognition and deliver the prescribed medication. If the medication is not removed during the expected timings, a notiﬁcation is sent to the caregiver through the mobile application so that she/he can act consequently. | Using a facial identiﬁcation mechanism, it recognizes the patients registered in the system and supplies IoT-Based Smart Medicine Dispenser them with the medicines they should take just when needed. Every time the dispenser provides a medicine box, it generates a sound and illuminates the corresponding compartment. The system also sends remote notiﬁcations to caregivers, informing them of the medicines dispensed to their dependents directly on their  smartphone. | To improve the proposed system, closing the dispenser compartments so that they only open when the camera detects the face of the caregiver who must place the medicine boxes in them. This would make it safer. It would also be good for the system to automatically detect which medicines and how many of them the caregiver has put in the different compartments; currently, he/she is who must provide these data through  the mobile app |

# IDEATION & PROPOSED SOLUTION

## Empathy Map Canva

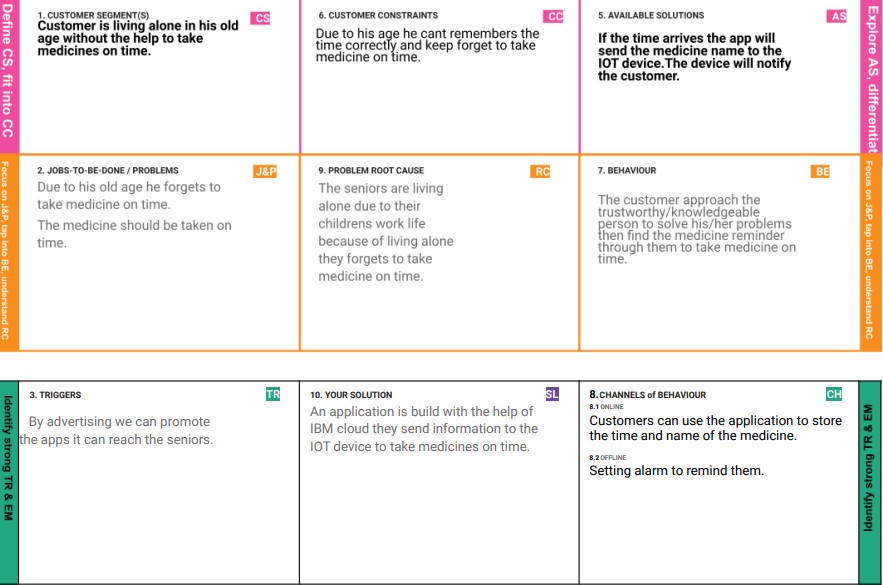
* 1. **Ideation & Brainstorming**



### Proposed Solution

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **Parameter** | **Description** | | | | | | | | |
| 1 | Problem Statement (Problem to be solved) | Sometimes elderly people forget to take their medicine at the correct time. They also forget which medicine He / She should take at that particular time. And it is diﬃcult for doctors/caretakers to monitor the patients around the clock | | | | | | | | |
| 2 | Idea / Solution description | To avoid this problem, this medicine reminder system is developed. An app is built for the user (caretaker) which enables him to set the desired time and medicine. | | | | | | | | |
| 3 | Novelty /  Uniqueness | Voice medicines. | assistant | is | used | to | remember | the | time for | take |
| 4 | Social  Impact /  Customer Satisfaction | It helps the family members to know about their loved ones | | | | | | | | |
| 5 | Business Model (Revenue Model) | By using subscription model we increase the revenue of the business | | | | | | | | |
| 6 | Scalability of the Solution | The details will be stored in the IBM cloud so the space is provided more than enough. The user also has the option to change the timings whenever the situation changes. | | | | | | | | |

* 1. **Problem Solution fit**





## REQUIREMENT ANALYSIS

### Functional requirement

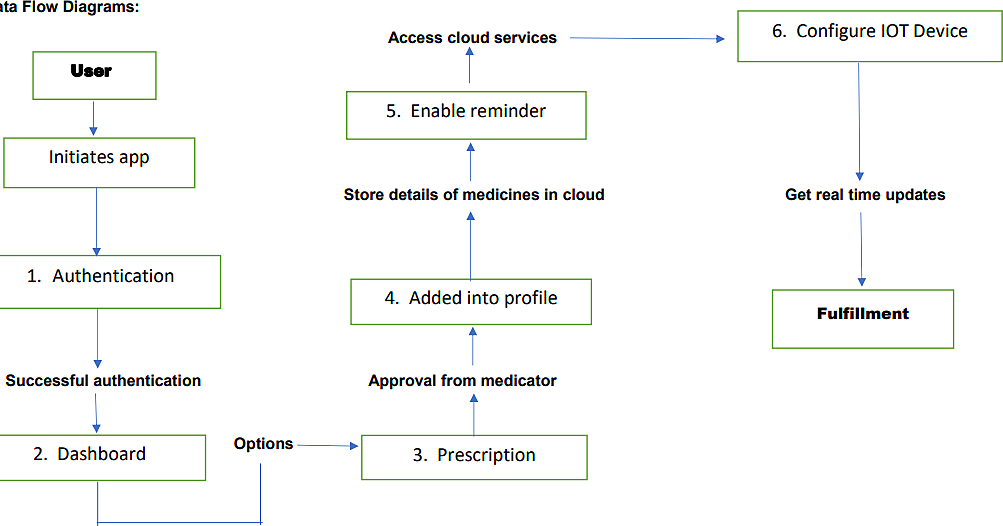
|  |  |  |
| --- | --- | --- |
| **FR No.** | **Functional Requirement**  **(Epic)** | **Sub Requirement (Story /**  **Sub-Task)** |
| **FR1** | User Registration | Registration through SMS  Registration through Gmail |
| **FR2** | User Conﬁrmation | Conﬁrmation via Email  Conﬁrmation via OTP |
| **FR3** | User Login(Web) | Login with Registered Mail id and Password Login with Registered Mobile number and  OTP |
| **FR4** | User Login(Mobile app) | Login with Registered Mail id and Password Login with Registered Mobile number and  OTP |
| **FR5** | User’s Medical Information E | Enter your Medical Information.Then set the Date  and Time. |
| **FR6** | User Input Management | All the user’s data are  available in the dashboard. |

* 1. **Non-Functional requirements**

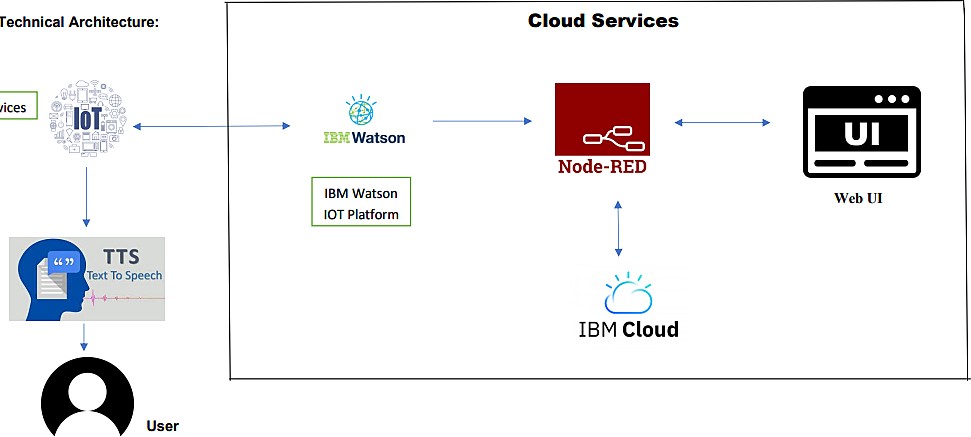
|  |  |  |
| --- | --- | --- |
| **FR NO** | **Non-Functional Requirement** | **Description** |
| **NFR 1** | Usability | The App Should be User- friendly for the Users. It is used to remind the Medicine on time. It alerts the users through Voice  Commands. |
| **NFR2** | Security | The Data of the users Should not be accessed by Cyber Attackers. The Data of the users should be kept  Conﬁdential |
| **NFR3** | Reliability | It reminds the users correct on time. It shows the correct medicine name on  that particular time. |
| **NFR4** | Performance | The Reminders will be delivered accurately on time. It works without any  glitch. |
| **NFR5** | Availability | The device should be monitored 24X7 for the alert of Medicine reminder.  It can be used at any Place. |
| **NFR6** | Scalability | The Device is compatible and portable. It is easily  adaptable |

## PROJECT DESIGN

### Data Flow Diagrams



* 1. **Solution & Technical Architecture**



### User Stories

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **User Type** | **Functional Requirement**  **(Epic)** | | **User Story Number** | **User Story / Task** | **Accepta nce criteria** | | **Priority** | **Release** |
| tomer | Caretaker | | USN-1 | As a user, I | I need to | | High | sprint1 |
| enior |  | |  | want to take | take a | |  |  |
| er) |  | |  | medicine on | medicine | |  |  |
|  |  | |  | proper time | on proper | |  |  |
|  |  | |  | and to take | time | |  |  |
|  |  | |  | care my |  | |  |  |
|  |  | |  | health. |  | |  |  |
| stomer | Smart box | medicine | USN-2 | As a user, I | I want to | | high | sprint1 |
| iabetes |  | want to take | take | my |  |  |
| tient) |  | medicine on | medicine | |  |  |
|  |  | time and | on proper | |  |  |
|  |  | monitor my | time by a | |  |  |
|  |  | health. | voice | |  |  |
|  |  |  | command | |  |  |
|  |  |  | /msg. | |  |  |
| Custer | Smart box | medicine | USN-3 | As a user, | Mypatient | | medium | sprint2 |
| (Thyro |  | my patient | needs | to |  |  |
| id |  | needs to | take | |  |  |
| patien |  | take | tablets on | |  |  |
| t) |  | medicines | time. | |  |  |
|  |  | on time and |  | |  |  |
|  |  | monitoring |  | |  |  |

s

s

u

a

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | the activity. |  |  |  |
| Custo | Caretaker | USN-4 | As a user, | Mypatient | low | sprint3 |
| mer( |  |  | my patient | medicati |  |  |
| ma |  |  | needs | on time |  |  |
| patien |  |  | medication | and |  |  |
| t) |  |  | time and | prescripti |  |  |
|  |  |  | prescription | on should |  |  |
|  |  |  | should load | be in |  |  |
|  |  |  | in database | database |  |  |
|  |  |  | for | list |  |  |
|  |  |  | upcoming |  |  |  |
|  |  |  | week. |  |  |  |
| Custo | Smart medicine | USN-5 | As a user, I | I need to | medi | sprint2 |
| mer(D | box |  | need to take | take my | um |  |
| isabl |  |  | my | medicine |  |  |
| ed |  |  | medicine in | in nearby |  |  |
| peopl |  |  | nearby | places |  |  |
| e) |  |  | places | with light |  |  |
|  |  |  | along with | notiﬁcatio |  |  |
|  |  |  | light | n. |  |  |
|  |  |  | signal/notifi |  |  |  |
|  |  |  | cation. |  |  |  |

### PROJECT PLANNING & SCHEDULING

* 1. **Sprint Planning and Estimation**

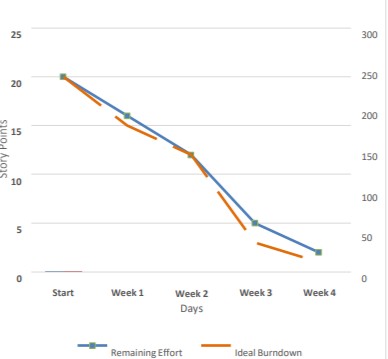
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **Functional Requireme**  **nt (Epic)** | **User Story Number** | **User Story**  **/ Task** | **Story points** | **Priority** | **Team Members** |
| sprint1 | set alarm | USN 1 | As a user, I can set an  alarm for | 10 | high | nanthini n |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | alerting to take medicine through Medicine remainder  system |  |  |  |
| sprint1 |  | USN 2 | As a user, I can Activate and Deactivate  the alarm | 10 | high | santhiya r |
| sprint2 | voice assistant | USN 3 | As a user once I set the alarm it will alert us voice  assistant. | 10 | high | nandhini sj |
| sprint2 |  | USN 4 | It will tell us the time and name of the medicine once the time has  set. | 10 | high | malavika m |
| sprint3 | Cloudant DB | USN 6 | For storing the details of medicine reminder for which Cloud  DB is used | 5 | low | nanthini n malavika m nandhini sj santhiya r |
| sprint3 |  | USN 7 | As a user, I can stor the name of th medicine  wit timing. | 10 | high | malavika m santhiya r nandhini sj nanthini n |
| sprint4 | User  Friendly | USN 8 | Our app  will b | 5 | low | santhiya r  nandhinsj |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Application |  | companian for th senior citizen to consumes the medicines  on time. |  |  | nanthini n malavika m |
| sprint4 |  | USN 9 | As a user, one need to set the medicine and time as per th instruction given by the user the voice assistan will help to take medicines on time fo senior  citizens. | 10 | high | nandhini sj malavika m  nanthini n santhiya r |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| sprint | Total Story Points | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
| sprint1 | 20 | 8 days | 08-10-2022 | 15-11-2022 | 20 | 17-11-2022 |
| sprint2 | 10 | 8 days | 09-11-2022 | 16-11-2022 | 10 | 18-11-2022 |
| sprint3 | 20 | 8 days | 10-11-2022 | 17-11-2022 | 20 | 19-11-2022 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| sprint4 | 10 | 8 days | 10-11-2022 | 17-11-2022 | 10 | 19-11-2022 |



### CODING & SOLUTIONING:

HTML code for Login Page:

<!DOCTYPE html>

<html lang="en" >

<head>

<meta charset="UTF-8">

<title>Login and Registration Form </title>

<h1>Personal Assistance for Seniors who are Self-reliant</h1>

<link rel="stylesheet" href="https:/ cdnjs.cloudﬂare.com/ajax/libs/normalize/5.0.0/normalize.min.css">

<link rel='stylesheet' href='https:/ cdnjs.cloudﬂare.com/ajax/libs/font-awesome/4.2.0/css/font- awesome.min.css'><link rel="stylesheet" href="./style.css">

</head>

<body>

<!-- partial:index.partial.html -->

<nav class="main-nav">

<ul>

<li><a class="signin" href="#0">Sign in</a></li>

<li><a class="signup" href="#0">Sign up</a></li>

</ul>

</nav>

<div class="user-modal">

<div class="user-modal-container">

<ul class="switcher">

<li><a href="#0">Sign in</a></li>

<li><a href="#0">New account</a></li>

</ul>

<div id="login">

<form class="form">

<p class="ﬁeldset">

<label class="image-replace email" for="signin-email">E-mail</label>

<input class="full-width has-padding has-border" id="signin-email" type="email" placeholder="E-mail">

</p>

<p class="ﬁeldset">

<label class="image-replace password" for="signin-password">Password</label>

<input class="full-width has-padding has-border" id="signin-password" type="password" placeholder="Password">

<a href="#0" class="hide-password">Show</a>

</p>

<p class="ﬁeldset">

<input type="checkbox" id="remember-me" checked>

<label for="remember-me">Remember me</label>

</p>

<p class="ﬁeldset">

<input class="full-width" type="submit" value="Login">

</p>

</form>

<p class="form-bottom-message"><a href="#0">Forgot your password?</a></p>

<!-- <a href="#0" class="close-form">Close</a> -->

</div>

<div id="signup">

<form class="form">

<p class="ﬁeldset">

<label class="image-replace username" for="signup-username">Username</label>

<input class="full-width has-padding has-border" id="signup-username" type="text" placeholder="Username">

</p>

mail">

<p class="ﬁeldset">

<label class="image-replace email" for="signup-email">E-mail</label>

<input class="full-width has-padding has-border" id="signup-email" type="email" placeholder="E-

</p>

<p class="ﬁeldset">

<label class="image-replace password" for="signup-password">Password</label>

<input class="full-width has-padding has-border" id="signup-password" type="password" placeholder="Password">

<a href="#0" class="hide-password">Show</a>

</p>

<p class="ﬁeldset">

<input type="checkbox" id="accept-terms">

<label for="accept-terms">I agree to the <a class="accept-terms" href="#0">Terms</a></label>

</p>

<p class="ﬁeldset">

<input class="full-width has-padding" type="submit" value="Create account">

</p>

</form>

<!-- <a href="#0" class="cd-close-form">Close</a> -->

</div>

<div id="reset-password">

<p class="form-message">Lost your password? Please enter your email address.</br> You will receive a link to create a new password.</p>

<form class="form">

<p class="ﬁeldset">

<label class="image-replace email" for="reset-email">E-mail</label>

<input class="full-width has-padding has-border" id="reset-email" type="email" placeholder="E-mail">

</p>

<p class="ﬁeldset">

<input class="full-width has-padding" type="submit" value="Reset password">

</p>

</form>

<p class="form-bottom-message"><a href="#0">Back to log-in</a></p>

</div>

<a href="#0" class="close-form">Close</a>

</div>

</div>

<!-- partial -->

<script src='https:/ cdnjs.cloudﬂare.com/ajax/libs/jquery/2.1.3/jquery.min.js'></script><script src="./script.js"></script>

</body>

</html>

Text to Speech code:

from ibm\_watson import TextToSpeechV1

from ibm\_cloud\_sdk\_core.authenticators import IAMAuthenticator

authenticator = IAMAuthenticator('NF0qqePBq845-q9DzSz-fdFMGfr7kvKxILoxBykOnlbX') text\_to\_speech = TextToSpeechV1( authenticator=authenticator

)

text\_to\_speech.set\_service\_url('https:/ api.au-syd.text-to-speech.watson.cloud.ibm.com/instances/f4c57d17- ac42-458a-8552-cf3a0baa9ca7')

with open('hello\_world.wav', 'wb') as audio\_ﬁle: audio\_ﬁle.write( text\_to\_speech.synthesize( 'its time to take insulin',

voice='en-US\_AllisonV3Voice', accept='audio/wav'

).get\_result().content)

## 08.Testing:

***Test Cases:***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Feature Type | Compon ent | Test Scenario | Pre- Requisi te | Steps To Execute | Test Data | Expect ed Result | Actual Result | Status |
| TC\_OO1 | Function al | Medici ne reminde r\_ Home Page | Verify user is able to set alarm into applicati on with Valid credenti als | IBM  Cloud,Py thon IDLE,No  de-Red | 1.Enter medici ne name 2.Enter time (h:m) 3.Enter date (d:m:y) | medici ne name:pa racetam ol time:09: 00 | Alarm is set | Alarm is set | Pass |
| TC\_OO2 | Function al | Medici ne reminde r\_ Home Page | Verify user is able to set alarm into applicati on with Valid credenti als | IBM  Cloud,Py thon IDLE,No  de-Red | 1.Enter medici ne name 2.Enter time (h:m) 3.Enter date (d:m:y) | medici ne name:do lo time:11: 00 | Alarm is set | Alarm is set | pass |
| TC\_OO3 | Function | Medici | Verify | IBM | 1.Enter |  | Alarm is | Alarm is | pass |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | al | ne reminde r\_ Home page | user is able to set alarm into applicati on with Valid credenti als | Cloud,Py thon IDLE,No  de-Red | medici ne name 2.Enter time (h:m) 3.Enter date (d:m:y) | medicin e\_name:I nsulin time:02: 00 | set | set |  |
| TC\_OO4 | Function al | Medici ne reminde r\_ Home page | Verify user is able to set alarm into applicati on with Valid credenti als | IBM  Cloud,Py thon IDLE,No  de-Red | 1.Enter medici ne name 2.Enter time (h:m) 3.Enter date (d:m:y) | medicin e\_name: paraceta mol time:03: 30 | Alarm is set | Alarm is set | pass |

***Performance test cases:***

NFT-Risk Assessment:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S.No | Project Name | Scope/fe ature | Function al Changes | Hardwa re Changes | Software Changes | Impact of Downti me | Load/Vol uem Changes | Risk Score | Justiﬁcat ion |
| 1 | Personal | New | Low | Modera | Modera | Low | >5 to | ORANGE | As we |
|  | Assistan |  |  | te | te |  | 10% |  | have |
|  | ce for |  |  |  |  |  |  |  | seen the |
|  | seniors |  |  |  |  |  |  |  | changes |
|  | who are |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | self reliant |  |  |  |  |  |  |  |  |

NFT-Detailed test plan:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S.No | Project Overview | NFT Test approach | Assumptions/Depen dencies/Risks | Approvals/SignOff |
| 1 | Medicine Reminder Web -UI | Stress | App Crash/ Developer team/ Site Down | Approved |
| 2 | Medicine Reminder Web -UI | Endurance | App Crash/ Site Down | Approved |

End of test report:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S.No | Project Overview | NFT Test approach | NFR - Met | Test Outcome | GO/NO-GO  decision | Recommen dations | Identiﬁed Defects (Detected/C losed/Ope n) |
| 1 | Medicine Reminder Web -UI | Stress | Performan ce | CPU -01 | GO | High Performan ce server | Closed |
| 2 | Medicine Reminder Web -UI | Load | Scalability | DB Storage  - 01 | NO-GO | ibm cloud | Closed |

## Advantages & Disadvantages:

Advantages:

The technological solutions integrated in HABITAT have the purpose to assist needy people in the longest stay in their homes in safe conditions, helping them to conduct autonomously most of the activities tied to the satisfaction of their primary needs, sustaining actions focused on both de-hospitalization and home-care.

Using a facial identiﬁcation mechanism, it recognizes the patients registered in the system and supplies IoT-Based Smart Medicine Dispenser them with the medicines they should take just when needed. Every time the dispenser provides a medicine box, it generates a sound and illuminates the corresponding compartment. The system also sends remote notiﬁcations to caregivers, informing them of the medicines dispensed to their dependents directly on their smartphone.

This work proposed a low-cost smart medicine box system employing a robust architecture to support users and health professionals during medicines consumption. The proposed architecture enables to embody other types of devices such as wearable, electronic devices, home appliances,among others, offering inﬁnite possibilities of applications and functions.

**Disadvantages:**

In particular, motorized actuators could be controlled directly by the HABITAT system in order to customize the behavior of the chair according to the proﬁle of each user. To improve the proposed system, closing the dispenser compartments so that they only open when the camera detects the face of the caregiver who must place the medicine boxes in them. This would make it safer. It would also be good for the system to automatically detect which medicines and how many of them the caregiver has put in the different compartments; currently, he/she is who must provide these data through the mobile app.

This system can be improved, providing a more ﬂexible way to schedule medicines consumption alarms such as twice a week, three times a week, every other day, among others .

## Conclusion and Future Scope:

In this work,we propose a medication reminder framework that is not only practical for young people who are familiar with technology but also for senior citizens. The framework begins with users scanning the QR code on their pill bag as an input. Then, the medication notiﬁcation is automatically generated and reminds the user to take the medication as prescribed. All of the user's medication-taking records are collected and analysed in various forms in order to assist the physician to identify medication non adherence. As a result, they can adjust the prescribed schedule to be more suitable for their patients or monitor their patients related symptoms closely and in a timely manner. Several quantitative results demonstrate that our frame work out perfoms the baselines in many aspects. Moreover, qualitative results emphasize that our medication-taking report is practical.

There are a couple of directions in which we would like to extend our work. First, we would like to apply a text detection and recognition algorithm directly to the medication label and automatically extract the information for the purpose of reminder generation. By doing this, our system will be simpler and much more user-friendly, especially for seniors. Moreover, we hypothesize that by training the deep learing algorithm to inspect the user's medication-taking records, as physician assistant, it might be able to identify a clue of some of disclosed illness. Further more, we aim to enlarge our MedThai dataset to include more medicines, directions of use videos or an English-language version of our dataset. Finally, we would like to include the text-to speech function to obviate the necessity for seniors to read the medication details.

### Source code:

Python code:

import time import sys

import ibmiotf.application import ibmiotf.device import random

#Provide your IBM Watson Device Credentials organization = "y2uwyi"

deviceType = "medicinereminder" deviceId = "16011601" authMethod = "token"

authToken = "20222023"

# Initialize GPIO

def myCommandCallback(cmd):

print("Command received: %s" % cmd.data['command']) name=cmd.data['command']

print ("Take medicine :" +name)

try:

deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-

token": authToken}

deviceCli = ibmiotf.device.Client(deviceOptions) #..............................................

except Exception as e:

print("Caught exception connecting device: %s" % str(e)) sys.exit()

# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10 times deviceCli.connect()

while True:

#Get Sensor Data from DHT11 deviceCli.commandCallback = myCommandCallback

# Disconnect the device and application from the cloud deviceCli.disconnect()

## GITHUB LINK:

[https:/ github.com/IBM-EPBL/IBM-Project-16335-1659611621](https://github.com/IBM-EPBL/IBM-Project-16335-1659611621)

## DEMO LINK:

[https:/ youtu.be/ExgDZm2SiJw](https://youtu.be/ExgDZm2SiJw)

