

DESIGN THINKING BASED PERSONAL SUPPORT FOR SENIORS WHO ARE SELF-RELIANT

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Abstract -

Medication adherence is a serious issue in today's world, as it has been found that when a patient does not take the right medication at the right time according to their doctor's prescription, it can have a detrimental effect on their health and lead to increased medical costs. This problem is complex, common and costly, and it contributes to poor treatment outcomes and the use of additional healthcare resources. This issue is especially relevant for those who are away from home, such as students, businessmen and housewives, as it can be difficult for family members to keep track of the dosage timings and remind them when they are not around. In this digital age, we are surrounded by technology, and it has provided us with an opportunity to make use of this in a better way. Smartphones are now a common device and they can be used to help people stay fit and healthy. Using technology, we can develop applications which can help remind patients to take their medication on time and in the right proportions. Through the use of such apps, patients can be notified when it is time for them to take their medication and be reminded of the dosage amount. This can help to ensure that they stay on track with their medication and improve their adherence to the treatment plan. These apps can also be used to keep track of the number of pills taken, and can help to provide information to doctors and healthcare providers regarding a patient's adherence to the treatment plan. This data can be used to identify potential problems and address any issues that may arise. In addition to this, the apps can also provide information about the side effects of certain medications, and can help to ensure that patients are aware of the potential risks that come with taking their medication. Furthermore, the apps can also provide information about the cost of medications and other treatments that may be required. Overall, the use of technology can be a great way to help improve medication adherence. By providing reminders, tracking usage and providing information, these apps can play an important role in helping patients to stay on track with their medication and improve their overall health.

Keywords: Medication, Patients, IoT-device, Applications.

1. INTRODUCTION

The development of creative methods that make it easier for patients to take their medications at the proper time and for the appropriate length of time. The user (caretaker) can set the preferred time and medication with the help of an app. The database will keep these specifics. The web application will transmit the pharmaceutical name to the IoT Device once the medication time has come. Once the gadget has received the name of the medication, voice instructions will alert the user. A person's life can be extended by keeping track of their health and giving them the appropriate medication. Studies show that the majority of elderly deaths have occurred while they are asleep at night. There are times when a Caretaker cannot assist someone. A personal helper for a sufferer or senior is also suggested in this article. Personal assistants can also provide in-home respite care, allowing family members or other caregivers to take a short vacation. This works major objective is to help elderly take their medications on time and continue to live their lives as they see fit while also lessening the stress It can be difficult for carers and medical staff to constantly monitor patients, therefore the project's purpose was to develop intelligent devices that would assist older people in taking their prescription at home. To avoid this problem, this system of medication reminders was developed.

PURPOSE:

1. This helps elderly people to take medicine on time.
2. Taking medicine on time can improve their health conditions Caretakers can feel at ease and are reminded too.
3. If the Seniors forgot to take their medicine on time then it will also send an alert to the Caretakers/Nurses

2. LITERATURE SURVEY:

[1] Sanjay Bhati, Harshid Soni, Vijayrajsinh Zala, Parth Vyas, "Smart Medicine Reminder Box"

An intelligent pillbox system is designed whether the patients have taken the correct dosage or not which has to be monitored by the caretaker. The caretaker will be notified by using the audio instructions when the medicines are taken or refilled. Different functions that are present in this device are which pill has to be taken, the remainder of medicine timings to patient/caretaker and notifying using LED, buzzer, voice alarms, and the Android applications.

[2] Naga Swetha R, Mahendar, Roopsingh, Chinna, "Smart Pill Box Using IOT"

An IOT device for the people who take medicine frequently and also remembering the prescription of the patient's medicine for a long time is very hard to remember by the patient and also the caretaker. Present time and notification time could be saved in RTC and EEPROM. So, at the time of taking medicine, the system will be sending a notification and beep sound and display the bright light in the IOT device from which the patient has to consume medicine. This system has an advantage of sensing whether the patient has consumed medicine or not and also senses when the patient tries to postpone the medication by opening and closing the box in to stop the notification and lighting.

[3] Rushikesh Jadhav, Gajanan Bhople, Jyotsna Mahajan, Yogita Patil, "Intelligent Pillbox for Monitoring the Health using IOT Concepts"

A Pillbox with a reminder and consumption function that gives alert and box will be in an open position at the time of taking medicines. Most patients don't recollect their whole drug routine and they additionally sometimes neglect to take their prescription

3. EXISTING METHODS:

Outpatients with chronic illnesses, especially those who must manage more than one medication or take drugs more than once a day, may not take their meds properly. The rate of medication adherence, defined as "the extent to which the patient adheres to medical instructions", has been reported to be around 50-80%. Patient adherence to medication is clinically significant in reducing mortality of serious disease and overall healthcare costs. Currently, the aforementioned issues have resisted a solution for quite some time. The most common patient-related factor resulting in non-adherence includes 'simply forgotten', although medication adherence is a multidimensional phenomenon. The rate of 'simply forgotten' was 66% in HIV/AIDS clinical trials and 30% in other clinical trials.

In order to address this issue, various gadgets have been developed to assist patients in taking their medicines either by simplifying administration or by assisting them in remembering to do so. Pill reminder charts, drug diaries, calendar clocks, telephone prompting service and multi compartment compliance aids (MCAs), talking labels, voice reminders, watch reminders, daily pill boxes, and automated pill dispensers are just a few examples. To further help these communities, an application has been built which sends notifications to an IOT device. The device will receive the medicine name and notify the user with voice command, in addition to alerting with an alarm and light indications. To confirm whether the person has taken the medicines or not, a button is placed at the opening end of the pillbox. When the person/patient is feeling uneasy, they can press one of the fixed buttons to notify family members about the situation.

The IOT device is designed for people who take medicine frequently, and also for those who have difficulty remembering their prescription for a long time. The present time and notification time can be saved in RTC and EEPROM. Thus, at the time of taking medicine, the system will send a notification and beep sound, and display a bright light in the IOT device from which the patient has to consume the medicine. This system has an advantage of sensing whether the patient has consumed the medicine or not, and also sensing when the patient tries to postpone the medication by opening and closing the box in order to stop the notification and lighting. Furthermore, an intelligent pillbox system is designed which can detect whether the patient has taken the correct dosage or not and this has to be monitored by the caretaker. The caretaker will be notified by using audio instructions when the medicines are taken or refilled. Different functions that are present in this device include which pill has to be taken, the remainder of medicine timings to patient/caretaker and notifying using LED, buzzer, voice alarms, and the Android applications.

This system will be a great help to those who have difficulty in remembering to take their medications on time, and also to those who need assistance in taking their medicines. It will also help to reduce the chances of missing or forgetting to take their medications, thus reducing the risk of adverse health outcomes. Furthermore, it will also help to reduce the burden of medication management on carers, who may have difficulty in keeping track of their loved one's medication schedule. In conclusion, this system would be a great way to ensure that individuals are able to take their medications on time, and it would be a great benefit to both the patient and the caretaker.

4. PROPOSED METHOD:

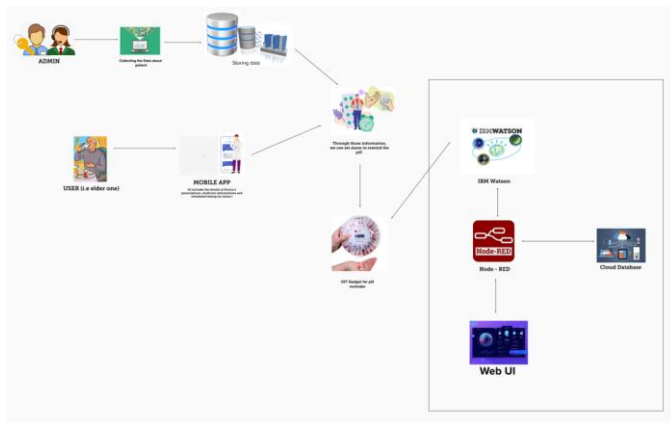


Fig - 2

4.1 Working:

To start with, our devices mentioned in the diagram are both software and hardware devices. First of all, It collects the data from the user and it stores the data. Through that information we can set an alarm to remind the patients who are self-reliant. By means of giving the alert to the pillbox reminder gadget. By means of using those data it will also send alerts to the mobile application such that the patient can easily take the pill at the right dosage at the right time. Here Node-Red connects the Web UI with the Cloudant DB where the entire medication details are stored. From the Node-Red It automatically sends the data to the IBM Watson Platform where we create the devices. The data from the IBM Watson works as a Backend for the Mobile application. So it fetches data from Cloudant and it sends alerts to the mobile application by means of converting the text into speech.

6. SOFTWARE

6.1 NODE - RED :

Node-RED is a flow-based development tool that was created by IBM to help developers easily wire together hardware devices, APIs, and online services to create Internet of Things applications. With Node-RED, users can use a web browser-based flow editor to quickly create JavaScript functions. The flow editor allows users to drag and drop pre-defined nodes onto the canvas and then connect them together to build an application. The nodes can be used to create custom applications and automate tasks, as well as integrate with external services and APIs. Node-RED also allows users to easily debug their apps and view the flow of data with its built-in debugging tools. All of the code in Node-RED is open source and can be extended with custom nodes and libraries, making it a versatile and powerful tool for developers.

6.2 CLOUDANT DB

Cloudant is a cloud-based software product from IBM that provides non-relational, distributed database services. It is based on two open source projects, Apache-backed CouchDB and BigCouch. Cloudant is designed to provide a scalable, reliable and secure NoSQL database service, allowing users to store and query large amounts of data. It supports multiple data sources and APIs, making it easy to integrate with existing applications. Cloudant also provides powerful indexing capabilities, allowing users to quickly search and retrieve data. Additionally, it can also be used to build applications that can be scaled to global levels. With its built-in replication features, Cloudant provides high availability and fault tolerance. It also offers several security features such as encryption, role-based access control and authentication. Overall, Cloudant is a powerful, cloud-based database service that enables users to store and query large volumes of data quickly and reliably.

6.3 WEB UI:

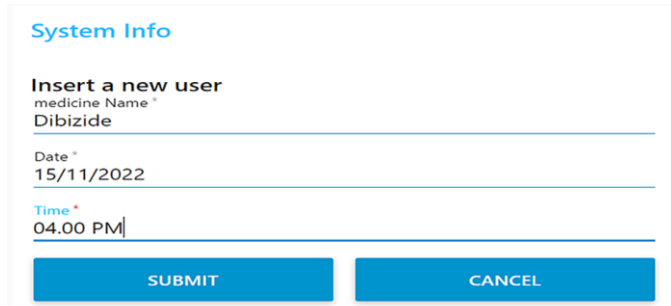
A Web user interface or Web app is a way for users to interact with content or software running on a remote server on the Web. The content or Web page is downloaded from the server and rendered in the user's Web browser, which acts as a client. Through the user interface, users can control the content and software, such as navigating between pages, selecting options, and providing input. This allows the user to access and use the content or software without having to install it on their own computer. Web user interfaces are used to access and interact with websites, web applications, and web services. This makes it easy to use content or software without needing to install any additional software on the user's machine.

6.4 MIT APP INVENTOR:

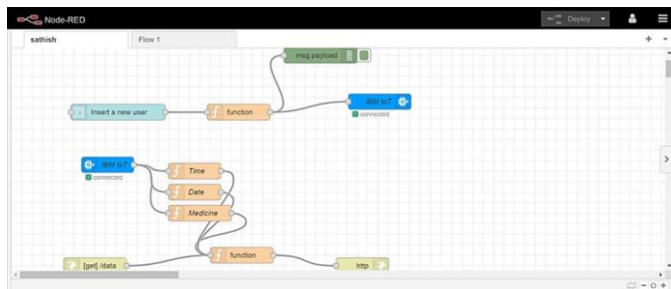
MIT App Inventor is a web application integrated development environment. MIT App Inventor is an intuitive, visual programming environment that allows everyone, even children to build fully functional apps for smartphones and tablets.

7. RESULT

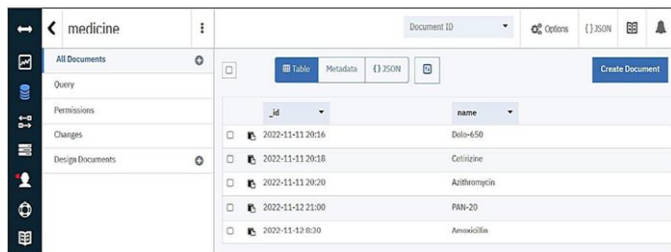
7.1 WEB UI TO ENTER MEDICINE NAME AND TIME FOR INTAKE



7.2 NODE - RED FEATURE FOR SENDING DATA TO IBM PLATFORM



7.3 CLOUDANT DATABASE TO STORE MEDICINE NAME AND INTAKE TIME

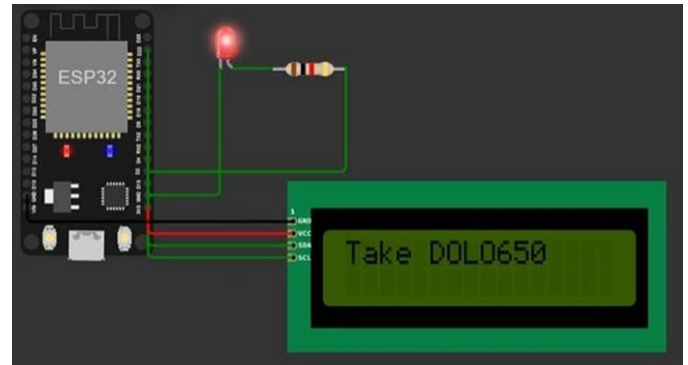


_id	name
2022-11-11 20:16	Dolo-650
2022-11-11 20:18	Cefixime
2022-11-11 20:20	Acikneomycin
2022-11-12 21:00	PAN-20
2022-11-12 0:30	Amoxicillin

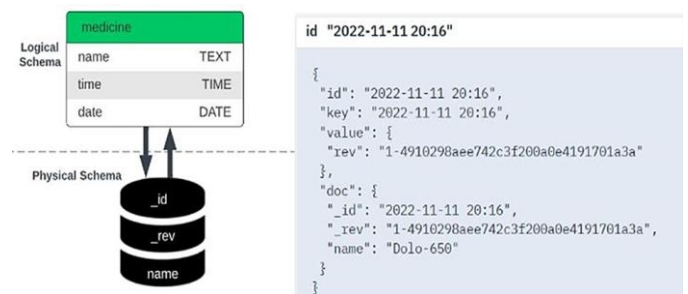
7.4 MOBILE APPLICATION (MEDVANZA):



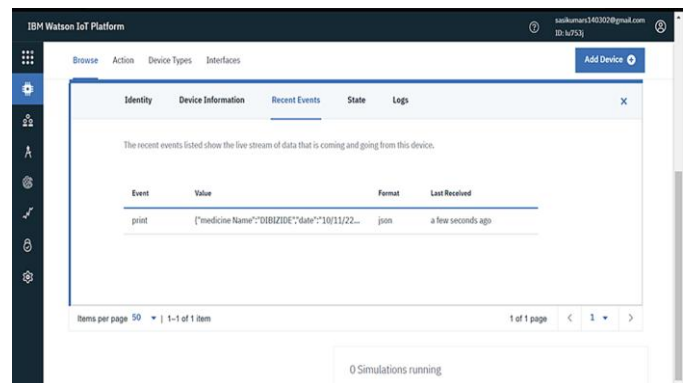
7.5 DISPLAY THE NAME OF THE MEDICINE IN AN IOT DEVICE AT THE SCHEDULED TIME:



7.6 DATABASE SCHEMA:



7.7 IBM WATSON:



8. CONCLUSION AND FUTURE WORK:

This device is mainly intended for the patients with memory impairments and several of the medical diagnoses recorded for the trial participants, including Alzheimer and dementia . The elderly and the persons with long term medical conditions who must take many prescriptions every day.

Some of the future scopes are:

- We can integrate a voice assistant to your mobile application to remind you to take your medicines and to ask for medical help if the dosage is not taken on time.

- We can add an option to connect the app with a fitness tracker or smartwatch to track your health.
- We can add a feature that allows you to share information about your health with your doctor or family members.
- We can integrate AI technology to provide personalized suggestions and reminders for your medication and lifestyle.
- We can add a medical chatbot to the mobile application that can provide health related advice and help in seeking medical help.

9. REFERENCES:

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