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Personal Assistance for Seniors Who Are Self-Reliant

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ABSTRACT: The Advancement of Internet has resulted in tremendous use of Internet of Things technology. Using IBM cloud, medicine reminder system is developed for Elderly People. The caretaker can set the preferred time and medicine name using an application that has been created for the user (caretaker). The IBM Cloudant DB is used to hold these specified details. When it's time to take the medicine, the web application uses the IBM IoT platform to send the medicine name to your IoT device. Once if the device receives the name of the medicine, the user gets notified by voice command.

KEYWORDS: IBM cloud, IBM cloudant DB, IBM IOT platform, IOT device.

I. INTRODUCTION

The majority of nations are witnessing a shift in the distribution of their population towards older age as a result of rising life expectancy, falling birth rates. As they get older, the elderly people are less mobile and will need to rely on technology and equipment to assure a higher quality of life. Nowadays it is noted that most people disregard their health and choose to engage in other activities over taking their medications. Additionally, some elders forget to take their medicines because they are too preoccupied with their day-to-day activities. In extreme circumstances, patients take the same medication more than once in prescribed time forgetting their previous consumption. For milder medications, this might not be hazardous, but for more concentrated medications, it might cause additional bodily harm. This is where our medicine Reminder system can be more helpful.

II. OBJECTIVE

The main Objective is to develop Medicine reminder using IBM Cloud for supporting Elderly people to face the health challenges. The duty of the medicinal reminder is to remind the elder to take medicine within the due timelines. It also ensures that the elder never forgets to take the medicine.

III. LITERATURE REVIEW

1. Afshaan Sarguroh; Munaf Shaikh; Kashif Khan; Dr. Zainab Mirza., "GoMed -Daily medicine reminder Application"-April 2021.

In the medicine reminder section, the user is needed to input the details of the medicine which gets stored. The application helps to remind patients or users to take their medicine in proper due time and proportion using an automated alarm ringing and notification system. It has various modules such as Medication Reminder, BMI Calculator, Health and First Aid Tips, Searching Nearby Hospitals, nearby Medicals, and nearby Doctors, Care Taker Information, Notes, Medicine Reminder, and Update Profile.

2. Juthada Suwanthara; Areena Noinongyao; Sirion Vittayakorn., "WiseMed: medication reminder for seniors"-2019.

A general limitation that users have to be compelled to enter their medication data and schedule by themselves. This restriction may cause several issues such as users inputting incorrect medication details into their smart- phones,

especially elderly users. To prevent this type of crucial data entry, it is made to retrieve details on the user's medicine and setting by scanning the medicine package label for the QR code.

This not only reminds the users to take their medication automatically on schedule but also provides the user with direction of medicine intake, precautions, and side effects. Additionally, the application records the user's medication history over time so the doctor can change the user's medicine schedule during a subsequent appointment in order to provide as effective as doable.

3. Shawn Benedict Kumar; Wei Wei Goh; Sumathi Balakrishnan., “Smart medicine reminder device for the elderly” - 2018.

The IoT-Based Medicinal reminder mobile application will be linked to a pillbox. The following requires that there be the design and development of an IoT device along with a mobile application.

4. Mayuresh Waykole; Vatsalya Prakash; Himanshu Singh; Nalini N., “ArduMed - Smart medicine reminder for old people” - May 2016.

A medicine reminder system's job is to alert the user when it's time to take their medication. It uses three ways to make sure that the user never forgets to take their medication. One is that it has a light-based visual indicator. In case if a person is not sitting close to pill box he may not notice the lights so a buzzer is added which will give a auditory indication that the medicine needs to be taken. If the patient is outside, a mobile reminder app will use smartphone notifications to remind them at that time Android devices support the installation of the mobile application. It will add repeating events to the mobile device's calendar and notify the user when it's time to take a medication, along with a list of the medications and the recommended dosage.

5. Deepti Ameta; Kalpana Mudaliar; Palak Patel., “Medication reminder and healthcare an Android application” - June 2015.

In an Android-based application, an automated alarm ringing mechanism is built. It focuses on doctor and patient interaction. Patients no longer need to keep track of when they require to consume their medications because alarm is set for that respective medicinal intake time. Setting of alarm alert is done for various health needs such as medicine intake date, time and name. Either through mail or SMS the notifications are sent within the system. Patients can obtain the doctor's contact information at their convenience.

IV.EXISTING SYSTEM

There are three ways in existing medicine reminder. It has a light indicator in the pill box, Buzzer sound and Mobile notification. But in existing method the elderly person may not see the light indication if they are seated far away from the pill box, so a buzzer is included to remind medicine intake time. In case if the buzzer is not audible a mobile notification will appear. But at some exceptions the senior may not even see the mobile notification.

V. PROPOSED SYSTEM

The Caretaker feeds the medicine and its intake time in Developed App by Beforehand. These fed details are stored in the IBM Cloudant DB. The web application will send the medication name to the IOT device via the IBM IOT platform when it is time to take the medication. The information received by IOT device will be routed to TTS service. Hence TTS service notify the user with voice commands through speaker.

Advantages: Medicine reminder helps the users in taking the medicine at the proper time by giving the voice command.

VI. WORKFLOW DIAGRAM

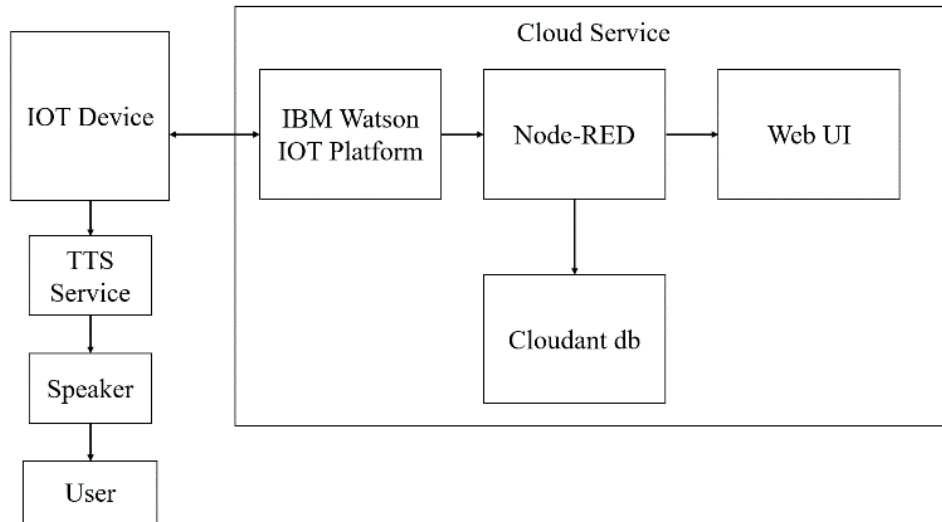


Fig:1 Block Diagram

i. IOT device

Devices connected wirelessly to a network and capable of exchanging information are known as Internet of Things (IoT) devices. In addition to smartphones, laptops, tablets, and desktop computers, IoT devices are extending internet connectivity. These devices may be accessed remotely and enable and help us to communicate through network.

ii. IBM Watson IOT Platform

Devices, gateways, and applications for IoT solutions are all connected through the IBM Watson IoT Platform. For applications, devices, gateways, event processing, and administrative activities, it supports REST and MQTT protocols. The IBM Cloud platform (formerly IBM Bluemix), a cloud platform built on Cloud Foundry and Kubernetes, provides access to the IBM Watson IoT Platform.

Dashboard:

When we access the IBM Watson IoT Platform, the dashboard is the first thing we see. It can be a combination of various boards and cards, providing your IoT solution with a variety of visualisation possible.

Devices, gateways, and applications:

Control over device management is another feature of the platform. Devices, gateways, applications, and device types are the features provided. We are able to inspect the device and initiate actions, like a request for a firmware update or a reset.

Security:

The IoT Platform can also be used to handle the solution's security-related components. This will involve establishing restrictions for device connections, generating white and black lists for the device's IP address, or researching international regulations. Users who are allowed or barred from controlling the IoT organisation for solutions will be under your control.

iii. Node-RED

Node-RED is a flow-based visual programming tool created originally by IBM for connecting physical devices to APIs, internet services, and each other as part of the Internet of Things. It is visually appealing, user-friendly, and supports browser-based flow editing. It is lightweight and convenient because Node.js, a non-blocking, lightweight input output model, is the foundation upon which it is constructed. The JSON format is used to store and import/export flows made in Node-RED. Node-RED can be used both locally and in cloud settings like Bluemix, MS-Azure, FRED, etc. Node library is expanding constantly. Protocols including mDNS, MQTT, Modbus, CoAP, AMQP, BLE, and even OPC UA have built-in support.

iv. Web UI

Through a Web user interface or web application, a user can interact with data or programmes running on a remote server using Web browser.

v. Cloudant DB

An IBM software product called Cloudant is primarily offered as a cloud-based service. A distributed, non-relational database service is called Cloudant. The Apache-supported CouchDB project and the open-source Big Couch project serve as the foundation for Cloudant. An comprehensive data management, search, and analytics engine is provided by Cloudant Service for web applications. On the basis of the CouchDB technology, Cloudant grows databases and offers hosting, management tools, analytics, and paid support for CouchDB and Big Couch.

vi. TTS Service

The durable technology known as text-to-speech (TTS) reads digital text aloud. It's also known as "read aloud" technology. Words on a computer or other digital device can be converted into voice using TTS. The majority of personal digital devices, including as laptops, cell phones, and tablets, support TTS. Read-aloud functionality is available for all text files, including Word and Pages documents. You can read aloud online web pages in addition to TTS.

VII. IMPLEMENTATION

Initially we have to develop a web UI so that we require a form to give medicine details such a medicine name, date and time, so that person can take the medicine at desired time.

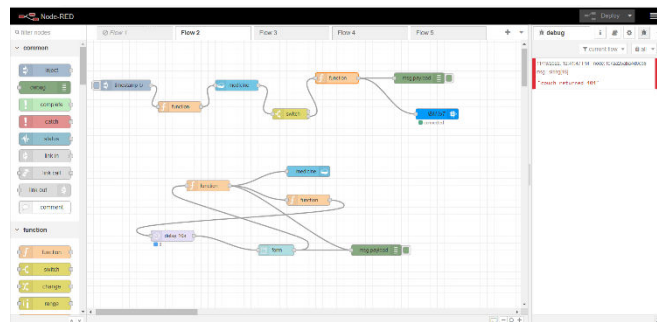


Fig:2 Node-RED flow

Using Node-RED Web Application Form is created and below is the view of web UI, through Web UI User feeds Medicine Name and time.

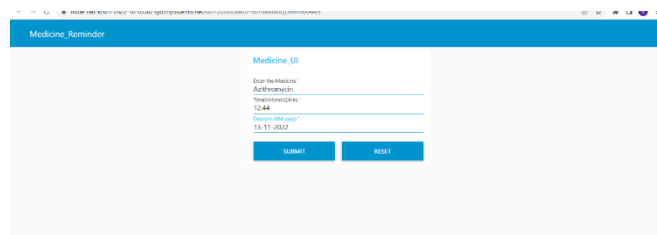


Fig:3 Web UI

The Medicine details gets Stored in Database in figure 4.

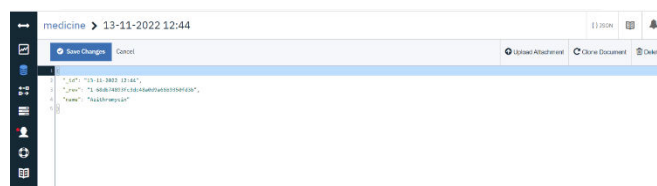


Fig:4 Database

When medicine time arrives the web application it is Node-RED app sends the medicine name is displayed in Debug Message as well as send to IOT device through IBM IOT Platform. The device will receive the medicine name.

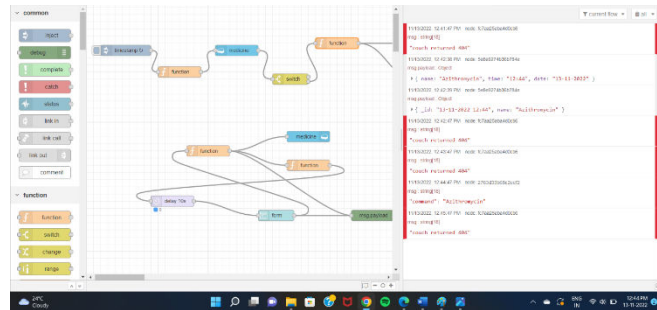


Fig: 5 Medicine name in debug message

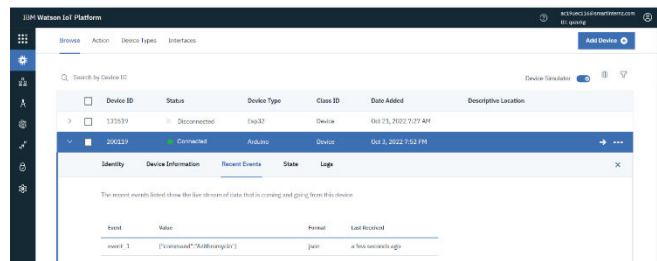


Fig: 6 Medicine name in IOT device

We developed a Python Script to receive the event payload from IBM IOT Platform and also TTS service Credentials are given to the Python Script to give out voice command.

VIII. RESULT AND DISCUSSION

The Web application sends the medicine name to the IOT device through the IBM IOT Platform. The device receives the medicine name and notify the user with voice command.



Fig: 7 Output

IX. CONCLUSION

One of the most significant problems facing the elderly is the consumption of medication. The IoT-based smart medicine reminder device in this instance has been created to assist the elderly in remembering to take their medications without the help of anyone nearby.

Due to a variety of factors, including a heavy workload, forgetfulness, and changes in daily activity, patients find it extremely difficult to remember to take their prescribed prescriptions on a regular basis, especially if they must take tablets on a daily basis. It was also thoroughly discussed what a user can anticipate from the suggested IoT-Based Smart Medicine Reminder Device in terms of projected results.

X. FUTURE ENHANCEMENT

There are various manually operated medication reminder devices on the market right now. This manual labour makes the current system more time-consuming.

As a result, an attempt has been made in the presented work to construct a fully automatic medication reminder system

based on information saved in a cloudant database and voice command utilizing a TTS service. The precision of the medication reminder can be enhanced in the future, and more functions can be added.

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