# MEDIBOX – IOT ENABLED PATIENT ASSISTING DEVICE

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**Abstract—**Many of old people live alone and suffering from disability, making it harder to take care of themselves. The health and wealth are critical to human society and as such should be one of the first to receive the benefits of upcoming technologies like IOT. Some of the Internet of Medical Things (IOMT) is connected to IOT networks to monitor the day-to-day activities of the patients. One such attempt is made to design a multipurpose intelligent device named MEDIBOX - IOT Enabled Patient Assisting device which helps the patients take their medications at the right time. This box is a proficient system which maintains the parameters like temperature and humidity in a controlled range recommended by the drug manufacturer and thus maintains the quality of the medicines. Related to this, we have established a Host Management System (HMS) which is capable of IOT monitoring that store and controls the MEDIBOX functionality for further investigation and future modification in design aspects. MEDIBOX takes control on alerting patient to take medicines, by giving voice alert and led indication for right medicines, avoids wrong medications at wrong time. And also confirms the medicine taken by patient with timings, if patient avoids taking medicine at correct time it sends IOT alert to care taker in order to take control over that situations confirms patients from not to skip medicine.

**Keywords—MediBox, Medicine, health care, Monitoring system, IOMT, meditation safety, Widget Alert.**

## 1. INTRODUCTION:

Now a days, healthcare monitoring by 24x7 needs a huge cost and manpower. In today's life, human beings facing difficulty to keep in mind of the medicines they required to take. With such a large amount of prescribed medicine, the probability of forgetting to take medications at a particular time and amount prescribed is high. Some of the Internet of Medical Things (IOMT) is connected to IOT networks to monitor the day-to-day activities of the patients. Recently, there has been an attempt to design and model new medical devices which monitor the patients and help aged people for a better assisted living.

The design of an IOT Enabled Patient Assisting device is introduced. One such attempt is made to design a multipurpose smart device named MEDIBOX which helps the patients take their medications at the right time. The ideal opportunity for the following tablets is shown in an LCD (Liquid Crystal Display) screen and messages are sent when the time comes to, alongside LED flickering implying

which compartment to open. At the point when a compartment is opened by the patient, this is identified by a sensor and patient has taken the medicine. This box is a proficient system which maintains the parameters like temperature and humidity in a controlled range recommended by the drug manufacturer and thus maintains the medicines.

The MediBox- IOT Enabled Patient Assisting device can be used by either the patient or even by nurses who are taking care of a patient or older people. The MediBox contains separate portions that can be aligned for different user's needs. MediBox helps the caregiver by specifying the required medicine quantity, the exact time to take the medicine each day. An application has been developed to support different categories of users such as patients who have either some disease, old people who have right medications, or who take care of those patients.

Regular medication containers could be updated programmed multi-medicine update and gadget for simplicity of activity and ease to use. The proposed model of MediBox –an automated IOT Enabled Patient Assisting device medicine reminder is designed with the help of a micro controller. This micro controller is used to keep track of when a patient should take his/her medicines.

## 2. SYSTEM MODEL:

This is a modest IOT device using a Micro controller to receive inputs and send outputs. In the proposed system IOT were used to intimate the patients to take medicine on time by using a buzzer sound and the name of the medicine is exhibited on the LCD screen. This system gets the exterior input from the IOT devices and the system is used to relay the buzzer supply for informing the patients. This system also alerts if the patients didn't take the medicines.
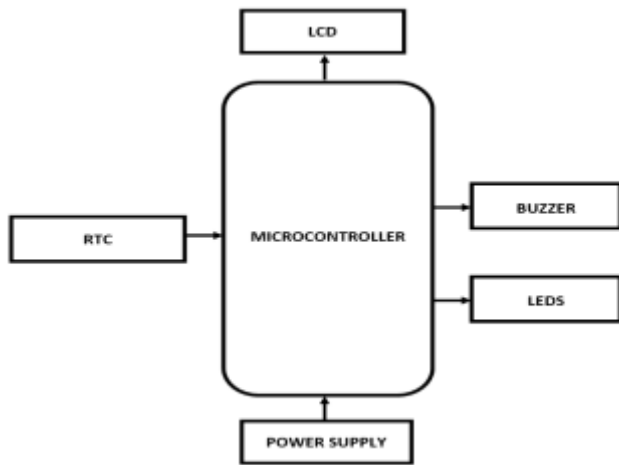
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Figure 1 Existing System

## 3. PROPOSED SYSTEM-MEDIBOX:

In this proposed system, Web Application is used to Online Monitoring the patients. Patients get on time remainder about correct medicine by using Voice play. So, the name of the medicine will not get change. Here, we used Limit switch for knowing, while they have taken the PROPER MEDICINE. Otherwise, the intimation will receive by the take care persons.
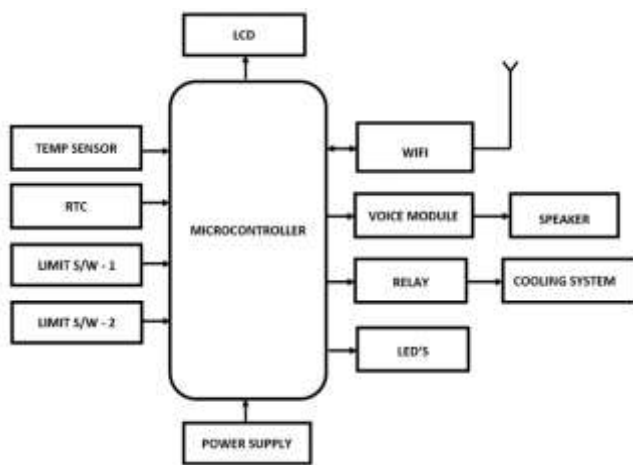


Figure 2 Proposed systems MediBox

## 4. HARDWARE DESCRIPTION:

Arduino does the function of a computer where the hardware projects can be build using the software programmed on the micro controller. It is a kid for building the digital objects and make them to work in a real time application. Since the Arduino is a open source platform it is easy to used with less cost. It can be connected to other components like sensors, actuators and transmitters to receive and send the signals.

The LCD is a liquid crystal display. There are various sizes in the LCD. The display can be done based on the applications like 8X1, 8X2 and so on. The function of the LCD is to get the data from the micro controller and

displays the information as programmed in the micro controller. Figure 1 represents the LCD interface with the micro controller.

A buzzer is used to give the alert symbol. It is also known as signaling device. It is embedded with all the system with the micro controller. The micro controller sends the message to take care persons. Buzzer and alerts the user with a beep sound. They are the integrated electronic transducers. The cooling kit uses a TEC1-12706 Thermoelectric Cooler 6A Peltier Module. The kit has 2 heat sinks: the bigger one is for the hotter side and the smaller one is for the cooler side. The fan, also included in this kit acts as a radiator. This is attached to the bigger heat sink. The TEC1-12706 thermoelectric Peltier module is sandwiched between the two heat sinks. The module will reduce the temperature.

DS3231 RTC is Precise Real-Time Clock Module with 32Kbit EEPROM and a built-in 10-bit temperature sensor having a resolution of 0.25C. The DS3231 RTC module Precise Real-Time Clock Module is a low-cost, extremely accurate I€ real -time clock (RTC) with an integrated temperature-compensated crystal oscillator (TCXO) and crystal. The device incorporates a battery input and maintains accurate timekeeping when main power to the device is interrupted. The integration of the crystal resonator enhances the long-term accuracy of the device as well as reduces the piece-part count in a manufacturing line. The ds3231 Arduino is available in commercial and industrial temperature ranges and is offered in a 16-pin, 300-mil SO package.

## 5. PROGRAMMING MODULES:

Using the code, the system can be automated and customized in a way that the user needs. The MediBox contains Login page, Medication monitoring page, Patients details of tablet taken page and Widgets. All the data will store in an online server database.

### A. Login Page:

This is the first page that opens as soon as you click on run command in the web browser. We need login and give your own credentials such as username and password and login to the account.
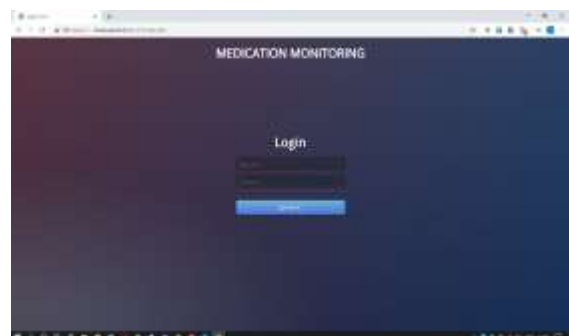


Figure 3 Login Page

### B.  Process Page:

Once the user logins, the connection should be established between the desired device and the software. After successful connection, the user can able to monitor the patients list and can either update or add the medicine to the database along with the desired dosage and time which the medicine should be taken. Once the admin click on to the patient details, it will enter into the particular patient tablet details.



Figure 4 Process Page

### C.  Monitoring Page:

In this page, the user can able to view the status of the medicines.  They have taken or not as date, time, minutes and seconds. If they failed or forgot to take the tablets, then the immediate alert will send to the take care person.



Figure 5 Monitoring Page

### D.  Widgets for Alerts:

Be always up to date with a state of your IOT devices connected to Thing speak. You don't need to start an app every time you want to know your sensors actual readings, because they will be always on your Home screen in sight.
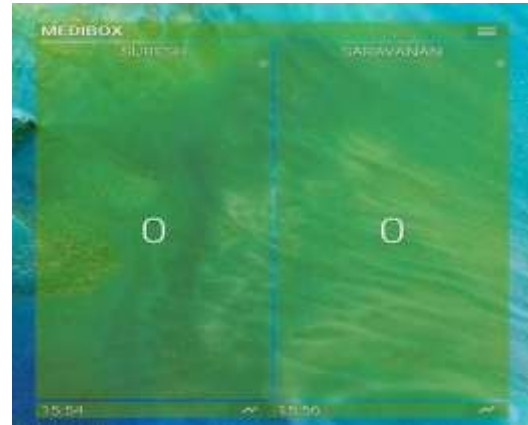


Figure 6 Widgets Page

### 6. IMPLEMENTATIONS & RESULTS:
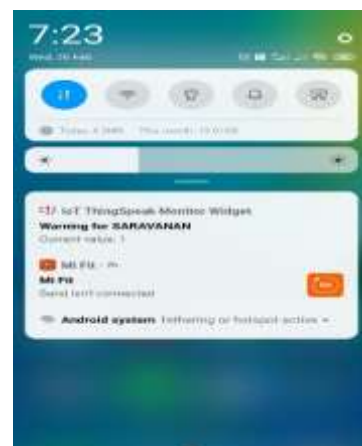


Figure 7 Prototype Model
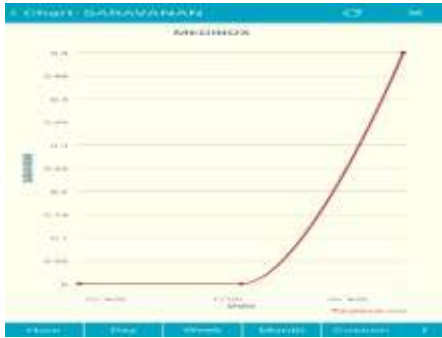


Figure 8 Mobile Notification

Figure 9 Charts



Figure 10 LCD Display



Figure 11 Sending Data

## 7. FUTURE SCOPE:

The future updates can be monitored by using cameras. So that the patients really taking the proper medications or not will be noticed. The actual real-time model designing can be built with low cost efficiency. So that peoples can use this as a device in their day to day life.

## 8. CONCLUSION:

One such attempt is made to design a multipurpose intelligent device named MEDIBOX - IOT Enabled Patient Assisting device which helps the patients take their medications at the right time. In this paper, the design of a MediBox has been introduced. This MediBox contains separate portions that can be programmed for different user's needs. MediBox helps the users or take care person by specifying the required medicine quantity. MediBox takes control on alerting patient to take the medicines by giving voice alert and patients can take their medications at the right time.

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## 10. BIBLIOGRAPHY:

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