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SMART MEDIBOX

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1. ABSTRACT

In today's world, it is a difficult task to take care of the elderly and long term bedridden patients and providing them with the right medicine at the right time. The health and wellness sector is critical to human society. It should be one of the first to receive the benefits of upcoming technologies like IoT. One such attempt is made to design a multipurpose portable intelligent device in this paper. It is a medical box, which helps to take the medications of a patient at the right time. This box is a proficient system which helps to maintain the potency of the medicines even if the patient is in travel. Cloud-based installation and monitoring that stores and controls the medical box functionality for further analysis and future modification in design aspects.

2.INTRODUCTION

The medical box has many slots, where the patients can keep their pills. The notifications are sent to the patient through android applications, which reminds them to take the tablet at the right time. Due to this, the caretakers do not want to stay next to the patient anytime. The medical box has an alarm and a display along with it, which says what pills have to be consumed at that time and from which slot.It is possible to reduce the use of human power.

An android application is in such a way which has the same number of slots as in the medical kit, where the user can select each slot and manually enter the time of consuming the tablet to set the alarm, which they want to place in the given slot. Buying medicine for the patient is being a tedious process. So, once the pills from a particular slot is being emptied then the notification is send to the patient and to their care taker and allow them to place order directly to the medical shop by asking the medicine details such as name, dosage and delivery address.A weekly report on the consumption of tablet by the patient is send to the doctor and the caretaker in order to check the amount of medicines being consumed by the patients. This is to help the care taker to take care of the patient very effectively without any miss consumption of pills and also remind the patient when the medical box is empty.

3.LITERATURE SURVEY

Sensor-based intake-tracking methods track and assess the user's medication habits using sensors. SmartDrawer [17], which is a representative example of this type of method, involves use of an RFID tag and reader. Additionally, motion detection technologies based on computer vision are used in some systems [18, 19]. These methods have an advantage in that they can detect whether the user is actually taking the medications.

The Simple Network Management Protocol (SNMP) of the Internet Engineering Task Force (IETF) [20], Web-Based Enterprise Management standard (WBEM) [21] of the Distributed Management Task Force (DMTF), and OMA DM [13] are the representative remote device-management methods that increase device reliability and minimize user inconvenience. Among these methods, OMA DM is the international de facto standard for mobile device management and is used most widely. Various studies are being carried out to apply OMA DM to a wide variety of fields. In the early days, many studies focused on mobile device management [22–24], whereas recent work has focused on software fault management and debugging [25, 26], network management [27], vehicle management [28], and so on. Nevertheless, the application of OMA DM to managing personal health devices is rare.

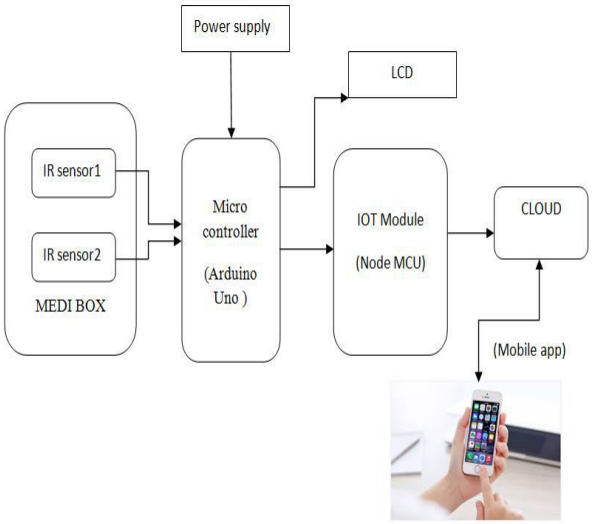
Finally, electronic medication dispensers are considered very efficient for improving medication adherence [9–12]. They prevent overdosing, misdosing, and underdosing through lockdown of the medication-dispensing tray, dispensing of medications according to the preconfigured medication schedule, and the medication time alarm. Although early medication dispensers were built as stand-alone models that could not communicate with external

devices [4, 5], communicable medication dispensers have been proposed in recent years [6–8]. These dispensers collect a patient's medication status and transmit them to a monitoring server to be analyzed by medical staff.

4. PROPOSED SYSTEM

In this system we proposed IoT enabled medical box to solve the existing problems.The alarm can be set for taking multiple medicines and contains information pertaining to date, time and medicine description. A notification will be sent to them through email or message as chosen by the patients.

It provides a system for medication adherence monitoring of people with memory regarding conditions like dementia. It mainly vocally guides the patient through the steps of medication intake, controlling correctness and completeness of his actions and alerting the caretaker if problems occur. It also helps the manufacturer to monitor and correct the design issues in future productions. Medical box is connected with cloud.Notification is available after every intake of medicines.It reduces human effort.Convenient operations due to android application.The sizeof the medical box is comfortable during travel and also itprescribed timings alarms.



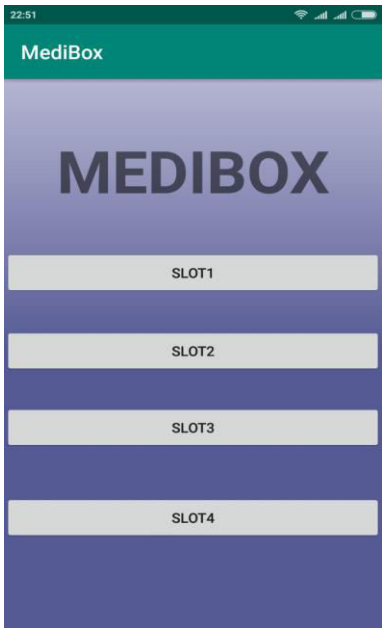
The medical box is provided with two IR sensor which detect the intake of medicine as well as detect if the box is empty. It is then interlinked with the microcontroller. Here we use Arduino UNO as the microcontroller. This can be run via both power supply as well as using battery.

The box consist of a LCD display to show the user which pills have to be taken at a particular time and it has a buzzer alarm along with it to notify the patient. The microcontroller is then connected with the IOT module named Node MCU. All this processes are carried out through cloud based installation.

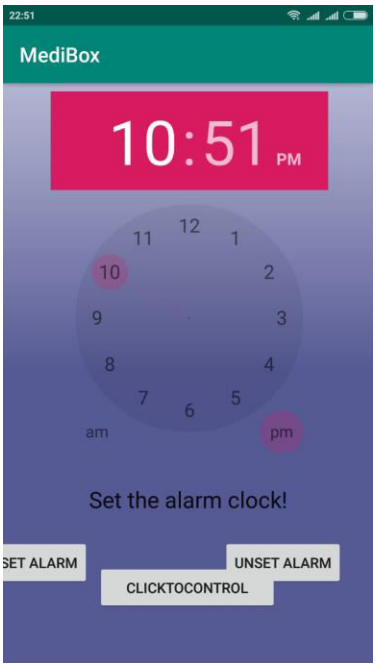
5. IMPLEMENTATION AND RESULTS:

SOFTWARE MODULE:

The android application has number of slots connected to the medical box. Each slot have its own behaviour of setting alarm and control system.



We can set alarm for each and every slot according to the timings of the medical consumption. Here we can set and reset alarms.



We can order medicine as well as send weekly analysis to the doctors via control system.

HARDWARE MODULE:

Sensing Module:

Here we use two IR sensors to sense the presence of tablets. One sensor detects whether the tablet is taken or not and other one detects if the medical box is empty.

Arduino UNO:

It is the microcontroller board which act as a mini computer. It stores and controls the whole process of the medical box. The connections are connected towards the analogous phase.

IOT Module:

Here Node MCU is used as an IOT Module. It is a component of hardware and software for IOT prototyping. It is connected through USB interface.

LCD Display:

The LCD display indicate the patient whether the tablet is taken or not and from which slot the tablet must be taken. It also display the message when the tablet is empty.

Buzzer:

The buzzer notifies the patient with an alarm at the time of consumption of tablet. The buzzer is linked with the alarm timing through the interface.

8. CONCLUSION

We have designed a new device medical box which aims at assisting a patient completely with a compact and user-friendly manner. It reminds the patient to consume the medications on right time due to the availability of notifications.

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