

IOT BASED MEDICINE REMINDER PILLBOX SYSTEM FOR PATIENT AND PHARMACIST

Dr.P. Padmaloshani¹
Associate Professor,
Department of Electronics and Communication
Engineering,
Muthayammal Engineering College,
padmaloshani.p.ece@mec.edu.in¹

R. Gowtham², S. Elamurugan³, G. Ajay⁴
UG Student's,
Department of Electronics and communication Engineering,
Muthayammal engineering college,
gowthamkr122001@gmail.com²,
elamuruganbeece@gmail.com³, ajay26092002@gmail.com⁴.

ABSTRACT - This IoT Based medicine reminder pill box system is designed to help patients and pharmacists manage their medication more effectively. The medicine gets over the notification sends to pharmacist using IoT module and they take action to deliver the medicine. It features automatic reminders to take medicine on time, tracking of medicine dosages, and a secure connection between the patient and the pharmacist. The system also allows pharmacists to monitor and adjust the patient's medication, providing real-time updates on medication status. The system is designed to reduce medication errors and increase health outcomes. The traditional ways require human efforts to remind them to take medicines on time. The digital era doesn't follow that and we can use machines to do that. The proposed application of IoT based Medicine Reminder System is very unique and can be used by patients at home, doctors at hospitals, and at many other places.

Key Words: IoT, Medicine Remainder, IR sensor, Health care, Pill box system.

I INTRODUCTION

This IoT based medicine reminder pill box system is useful to patients and pharmacists, sometimes patients forget to take the medicine at the required time and correct medicines. Also forgets which medicine He/ She have to take at required time. To overcome this, we have tried to design the Medicine Reminder Pillbox. We are using Arduino to interface the LCD module, buzzer, Real time Clock (RTC). The user can feed the type of medicine as a tablet, capsule, one or two capsule/tablet, after food or before food setting, and notify timing as Morning, Afternoon and Night. The morning time is assumed to be 9 AM, Afternoon time is assumed to be 12.30 PM and Night time is assumed to be 8 PM.

One of the most common reasons for the failure of a method to cure a patient is because of not taking the medicine at the prescribed time. People aged 50 or above are prone to diseases such as high blood pressure, diabetes, Alzheimer's and Parkinson's to name a few. Missing a dose for such a patient can prove to be very harmful. Hence it is vital for the patients to take the medicines on time. It has been observed that people in general neglect their health and give preference to other things than taking their medicines.

This paper will be helpful for people who forget to take their medicines or even to those who have to take a lot of medicines and get confused about which medicine to take at what time. So, this work will help people provide information about the patient's status whether he has taken the medicine or not. In this period, it is difficult for the family members to be present all the time for the aged. Sometimes despite their best efforts, the aged fail to take the medicine on time. This device is one approach to help them take the medicines effectively. It comes with one more Feature that the medicine gets over the notification sends to pharmacist using IoT module and they tack action to deliver the medicine.

The main objectives of the work are:

- Dispense of medicines from pill box at scheduled time.
- Medical alerts to care taker and pharmacist.

- Real-time health statistics monitoring of medicines.
- Configuration data is sends through IoT.

The rest of the paper is organized as follows: Related works on medicine pill box remainder system has been presented in section 2. The details of existing system and proposed system are explained in section 3 Hardware details are provided in section 4 and simulation results of the proposed IoT based pill box system is presented in section 5. Finally, the concluding remarks are given in section 6.

II

RELATED WORKS

There are various medication systems which are in use currently. They depend on various stages and ideas. There is a medicine update framework, My Medi Health [2] which has been created for children. It is made available on mobile phones such as personnel digital assistance. It is a mobile application that gives Graphical User Interface to design drug schedules and alarm system to remind the patients, about time and other details.

Zao et al. have created application - a smartphone application intended to help patients to avoid prescription organization mistakes [3]. Prasad B has proposed an application, 'Medicine update expert'. This App has a limit of 15 updates. A patient can select these updates while rehashing or non-rehashing caution designs. Between the two caution designs at a time should be selected. The duration between two caution designs should be at least one hour. A reminder shall be delivered at the schedule time. This reminder could be cautioning vibration or LED sign [4].

Hamida et al. have recommended a secure and efficient in Habitation Wearable insomnia monitoring and diagnosing system (2013) [5]. The sleeping data of patient at home could be received by Remote clinical background system with the help of recent technology like an experimental estimation of communication and security measures protocols in terms of security and overhead.

According to Ray, (Home Health Hub Internet of Things 2014), health is one of the most important parts of the life span. Making life easier is one of the most desired things that humans want to achieve with the help of recent development of IoT [6]. The novel framework designed by Ray, helps to monitor the health of old people at their residence places through this H3IoT system.

Again, according to Al Majeed et al. (Home Tele Health by IoT, 2013), IoT helps in real time monitoring of health condition. The related devices can sense, transfer data and do analysis in order to perform healthcare process. In this proposed system, they are using cost effective feasible algorithm to minimize the complexity in order to process huge data. These data are being generated by imaging devices, sensing devices and Human interaction [7].

Finally, we studied expensively the existing problems in the current methods and proposed systems. We have tried to solve them and developed our novel Pill reminder and monitoring system.

III

PROPOSED SYSTEM

In order to reduce the responsibility of family members of driving the medications in the pill box, was assume that the medicine the patients need to take at particular times has been packed into the pill box. In this system we have to set the pill time for required medicine by using input system. We can set the different time for different pills. If the more than one pill is required at a time, give the box nos. to the system to get required pills. We also set the no. of pills we are inserting in the system. The real-time clock gives continuous time as an output. Monitor the time continuously using a Real-time clock to identify the pill time. If the system time match with pill time, the system shows that that it is time to take a pill.

It is necessary to alert the user to take pills at a particular time. When the system time match with pill time, the buzzer starts continuously until the Pill taken. As pills removed by the user, it is necessary to put the no. of pills removed by the user. Multiple time a user required more than one pills of same medicine or more than one person are using the same system. So, it is required that the no. of pills removed by the user.

The system counts no. of pills in the system by using the total no. of pills and the pills used by the patient. When the no. of pills remains less, the purchase order sends automatically to medical shop. On the basis of below attribute we are using the ID3 algorithm and to display result. The Architecture of the remind and confirm processes. At the medication time, the pill box will remind the elderly patients, to take their medication via alert sound, the sound is off only after push button is pressed.

WORKING PRINCIPAL

The proposed IoT based pill box system is built on Arduino Uno and has an RTC interfaced to keep track of time without fail. The medicine information is saved in the internal EEPROM of the Arduino board. A four-switch keypad is provided to feed medicine information and an LCD display is interfaced to the system for providing the user interface. An IOT module is interfaced to send notification alerts and a series of IR sensor is connected to the system for the testing purpose. The Arduino sketch manages to input and store medicine information, keep track of time using RTC, compare dosage time with real time, track confirmation of dosage taken and send notification alert if dosage taken is not up to the level by the user. The Arduino code is written on Arduino IDE and burnt to the board using Proteus testing tool. The proposed system block diagram is shown in Fig. 1

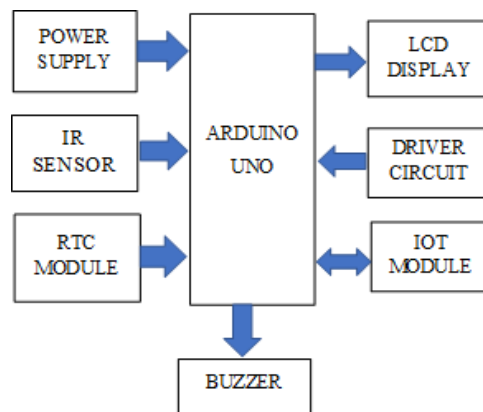


Fig. 1 Block Diagram of the proposed system

IV

SIMULATION RESULT

This section presents the simulation output of the proposed system of IoT based medicine remainder system which is simulated using the Proteus software. Fig. 2 shows the setup of our module and Fig. 3 shows the simulation output.

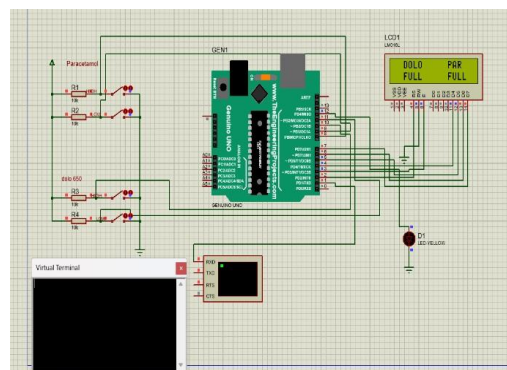


Fig. 2 Simulation of proposed system using Proteus software

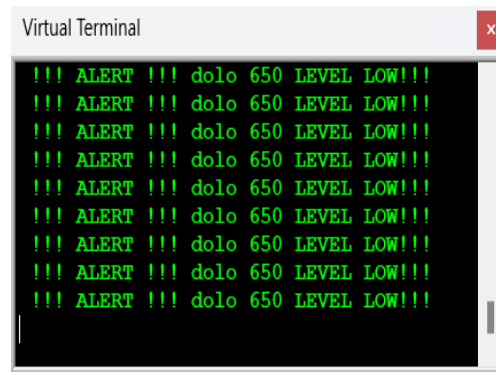


Fig. 3 Simulation output

VII CONCLUSIONS

The goal of this work is to provide healthy and tension free life to those users who are taking regularly pills and to provide this product at affordable cost also. The proposed work's objective is to help elderly people. It can be concluded that the results of the proposed work are useful for those elderly people who take pills regularly and whose course of prescription is very long and difficult to remember. This device will notify them at the right time, the right medicine to be taken. This in turn helps them to stay fit and healthy without any issues.

REFERENCE

- 1) *Intelligent Medicine Box For Medication Management Using IOT* by M.Srinivas, P.Durga Prasad, V.Naga Prudvi Raj on 2018 IEEE second international conference on inventive systems and control
- 2) "SMART MEDICINE DISPENSER" by Jabeena.A (Prof.) (Co-Author), Shivam Kumar (Student) (Author), in 2018 International Conference on Smart Systems and Inventive Technology (ICSSIT 2018) IEEE Xplore Part Number: CFP18P17-ART; ISBN:978-1-5386-5873-4 ©2018 IEEE.
- 3) "Smart Medicine Box System" by Hiba ZEIDAN, Khalil KARAM, Roy ABI ZEID DAOU in 2018 IEEE International multidisciplinary conference on engineering technology, 978-1-5386-4500-0/18@2018 IEEE
- 4) Nurmiza Binti Othman and Ong Pek Ek. Pill dispenser with alarm via smart phone notification. In *Consumer Electronics, 2016 IEEE 5th Global Conference on*, pages 1–2. IEEE, 2016.
- 5) C. List, O. F. Authors, D. Moga, N. Stroia, D. Petreus, R. Moga, and R. A. Munteanu. *Work Embedded Platform for Web-based Monitoring and Control of a Smart Home* no. 53, pp. 1–3; 2015.

Authors Profile



Dr. P. Padmaloshani received her BE degree in Electronics and Communication Engineering from Bharathiar University, Coimbatore, India in 1993 and her M.E. degree in Process Control and Instrumentation from Annamalai University, Chidambaram, India in 2005. She has completed her Ph.D. in 'Autonomous and Distributed Inter-cell Interference Management in Heterogeneous Networks' from Anna University, Chennai in the year 2021. She is currently working as an Associate Professor at the Department of Electronics and Communication

Engineering, Muthayammal Engineering College, Rasipuram, India. She is known for his scholastic acumen and student friendly approach while teaching subjects that lead to a unique combination of pedagogy and teaching learning methodologies. Her main research interests are the modeling and simulation of wireless networks, self-organization of heterogeneous networks, and the implementation of soft computing strategies for such networks. She has 14+ years of experience in Academics and Research. She has more than 30 paper publications in reputed SCI / Scopus / UGC Recognized / Peer-Reviewed International Journals and conferences. Her worthy research articles have a total of 75 citations with h-index 4 and i10 -index 2. She is a lifetime member of the Indian Society for Technical Education.



I am R.Gowtham, currently I am pursuing a Bachelor of Engineering (BE) in Electronics and Communication Engineering final year at Muthayammal Engineering College, Rasipuram. And I completed my Higher Secondary in Model Government Higher secondary School in between 2018 to 2019. And I completed my secondary school in Lotus Matric Higher Secondary School, Kakapalayam. And I am interested in IoT (Internet of Things) domain. I am deeply passionate about the transformative potential of IoT in connecting devices, collecting and analysing data, and creating intelligent systems that enhance efficiency and improve quality of life.



I am G. Ajay, currently I am pursuing a Bachelor of Engineering (BE) in Electronics and Communication Engineering final year at Muthayammal Engineering College, Rasipuram. And I completed my diploma in Muthayammal Polytechnic Institution, Rasipuram. And then I completed my Secondary School in Veeralakshmi Vidyalaya Higher Secondary School, Salem. And then I am interested in Wireless Communication and Networking. I am particularly fascinated by the continuous advancements in wireless communication and the pivotal role it plays in enabling seamless connectivity, mobility, and information exchange.



I am S. Elamurugan, currently I am pursuing a Bachelor of Engineering (BE) in Electronics and Communication Engineering final year at Muthayammal Engineering College, Rasipuram. And I completed My Schooling in Kalaimagal Matric Higher Secondary School, Belukurichi. And then I am interested in Embedded System. I have dedicated considerable time to studying embedded systems and their applications, which involves the integration of hardware and software to develop efficient and compact devices for various industries.