



# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: [www.ijirce.com](http://www.ijirce.com)

Vol. 5, Issue 2, February 2017

## An Intelligent Patient Medicine Reminder System

R. Surender Reddy<sup>1</sup>, C. Niharika<sup>2</sup>, Rohit Sharma<sup>3</sup>, A. Bharath Kumar<sup>4</sup>, E. Narayana<sup>5</sup>

Assistant Professor, Dept. of ECE, Lords Institute of Engineering and Technology, Hyderabad, Telangana, India<sup>1</sup>

UG Students, Dept. of ECE, Lords Institute of Engineering and Technology, Hyderabad, Telangana, India<sup>2,3,4,5</sup>

**ABSTRACT:** The aim of this project is to remind individuals who forget to take their medicines on time. Elderly people because of their age typically forget about to take their drugs. This project will support to remind the patient to take his/her medicinal drug at prescribed time. The proposed system is best suited for elderly persons and those who're very busy, as this device will now not most effective remind them of their drug treatments with a buzzer sound however also shows the call of the medication to be taken at that time. The patient can store the respective time of the unique medicine by a matrix keypad. Based on an RTC (Real Time Clock) interfaced to the microcontroller, the programmed time for medicinal drug is displayed on the LCD in conjunction with a buzzer sound to alert the patient approximately taking the best medicine. The microcontroller used in this challenge is of 8051 family. RTC used maintains a correct time as it is supported with the assistance of a crystal.

**KEYWORDS:** 8051 unit, LCD, alarm system, RTC

### I. INTRODUCTION

Now a day's Technological innovation is updating the way sufferers are receiving care services. Smartphone's aren't best used for calling purpose but now may be used as an ensemble of embedded sensors that together allow new packages in wide spread areas including healthcare, e-trade, homecare, healthcare, social networks, environmental tracking, transportation and protection. Today in healthcare systems, the utilization of mobile devices is becoming an increasing number of useful. In addition with, cellular generation is gambling critical position in continual ailment management, empowering the elderly and pregnant ladies, to take remedy on the right time, extending service tunderserved regions, and enhancing health situations and scientific system performance.

Mobile phones are effective and rich in functions and also much lesshighly-priced due to advances made in various generation domains. Now a day's Mobiles are not most effective used for personal conversation and amusement, but it could also curiouslyutilized in numerous fitness and Wellness monitoring packages. The proliferation of multimedia, greater computing and multitouch interface provides robust embedded gadget offers smooth touse smart phones like iPhones and other smart phones thattypically have contact pad and different features. And subsequently smartphone with internet facility may be used broadly all over theworld starting from beyond few years. All types of Mobiles haveperson pleasant design as well as intuitive usage, such that thismobiles may be used by every person even by disabled and elderlypatients.

Normally, patient's health information facts had been recordedinside the shape of paper and stored. Now we can use mobile phonesto remind the dosage of medication by using sending text messagevia GSM module. Also if mobile is Smart/Android smartphonethen an advance function is introducing for reminding of drugsand its miles WhatsApp messenger. This Whatsapp message may beacquired through Raspberry Pi module. So it could be beneficial for allform of people such as rich human beings the ones who've smart phoneand also middle magnificence humans those who don't have smartphone. Reminding systems are so useful for the nurses and Doctorswho each day paintings for affected person. With the usage of this machine lot oftime is stored for them. Also this System is useful for the onesthose who deal with patient aside from Doctors and Nursesincluding Relatives and Friends.



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This system can also be useful in hospital where number of patients is present and sometimes it is difficult to remember the medicine and dosage by the staff. So this system with some updates can also be used in hospitals. The problem such as 1) maintaining the regularity of prescribed dosage is difficult to be remembered in busy schedule 2) remembering the name of medicine to be taken is really difficult 3) due to above two reasons the patient's life can get more complicated. These above problems are arising to everyone due to non-adherence of medications. Therefore, there is a growing need and urgency for in-home healthcare devices and technologies in order to provide patients with the electronic tools to support medication self-management

## II. RELATED WORK

Many times patient forgot to take medicine on time once they discharged from hospital and due to this negligence it may cause to death. So to avoid such situation HSU CHUN-LIANG developed such system who reminds the medicine on time. For such system he uses local web-net, LCD Display, GSM communication, voice-DSP, and sensors techniques to produce a medicine-box and its co-related monitoring mechanism suitable for both in hospital and patient's house. Mei-Ying Wang et. Al. proposed in 2009 Wedjat System [2]. This can be used to take the medicine on correct time and also take the record of intake of medicine. Wedjat has two important features. First is it can alert patient about the right medicine with proper intake with food instruction and second is it can revise the amount of medicines when dose was missed.

G. Mougkakou et. al. [3] presents the modular system for management of medicine, medical image archiving, telematics cooperation and diagnosis support. Guanling Chen et. al. [4] suggested Mobile-phone based Patient Compliance System (MPCS) that can reduce the time-utilization facility and error prone processes of existing self-regulation practice to facilitate non-compliance detection, self-reporting, and compliance reminders.

Mark Donnelly et. al. in 2010 developed such a system which delivers a series of static message such as "visit the doctor" or "take lunch" for the patients who suffered with dementia. This system is designed to offer support via control of the environment and also delivery of reminders through a touchscreen device embedded in the home. It has specific feature to set the reminders directly on to the device with proper time and date which deliver necessary reminders. For maintaining incontinence among dementia subjects at nursing care center, it is difficult to have timely diaper change with exact checks of scheduled. Delays in diaper change may cause serious implications in social, economic and clinical aspects.

So A. A. Phyo Wai et. al. all developed intelligent Continence Management System (ICMS) to enable timely change diaper by sensing wetness of diaper. Apart from reliable wetness detection, an easy and simple to use reminder which is important to attract immediate attentions from care givers [6]. The most common disease in the world are Sickle cell disease which affects patient lives from childhood. This disease requires frequent medical monitoring, such as severity, tracking the frequency, and duration of painful events. So to reduce the efforts for the patients Chihwen Cheng et. al. developed a prototype of Sickle cell disease Monitoring Telemedicine system and Reporting (Sickle REMOTE), focusing to solve the limitations of conventional monitoring diaries [7]. An automated short message service text (SMS-text) developed by this system that arrive at a mobile phone anywhere on a cellular network. Lanlan Huang et. al. introduced the location based mobile health system on which system prototype was developed [8].

## III. SYSTEM ARCHITECTURE

The proposed prototype system consists of 8051 microcontroller, LCD, keypad (push button), RTC system and alarm system. The brain of the system is 8051 microcontroller which controls the function of the system and performs all the tasks. No external peripheral devices and memory devices are required. Initially the 8051 based unit interfaces with keypad and LCD display. Basically two process is required to be done

- 1) Enter the name of medicine to group 1 and if the system is used for more than two people then we can also use group two.
- 2) By using the keypad enter the time for the dosage as prescribed in the prescription.

The RTC system which is one of the feature of 8051 based unit is present in it, is used to match with current time. Here the number of medicines and time setting operations are changed frequently as per the prescription schedule given by

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doctor; but there should not be made any changes in current time. The name of medicine and the group to which it belong is displayed on LCD display unit and buzzer gives the beep on time at which medicine is required to be taken.

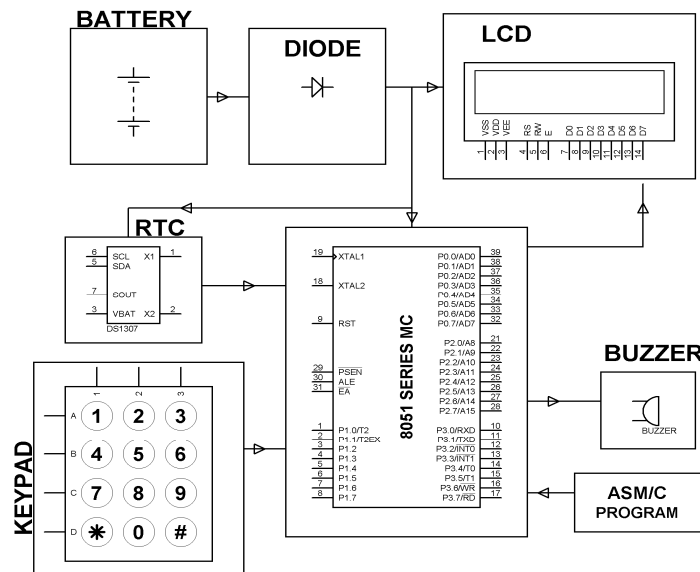


Fig 1 Block Diagram of Automatic Medicine Reminder

Fig .1 shows the prototype of automatic medicine reminder system which can be handled easily and simple to use. This system makes the work of patient very easy. The user just to need to update the system once and after that system will perform all the tasks itself. This system just not reduces the complexity but is also reliable for use

A microcontroller is a highly integrated single chip, which consists of on chip CPU (Central Processing Unit), RAM (Random Access Memory), EPROM/PROM/ROM (Erasable Programmable Read Only Memory), I/O (input/output) – serial and parallel, timers, interrupt controller. The AT89S51 is a low-power, high-performance CMOS 8-bit microcontroller with 4Kbytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S51 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications.

**A. MATRIX KEYPAD:** This is a matrix of keys which responds to specific row and column. In case of matrix keypad both the ends of switches are connected to the port pin. The design has demand for a 4 × 3 matrix keyboard i. e. four rows and three columns, altogether 12 keys, where ten keys used for numeral input and remaining two used for adjusting the real-time parameters.

**B. RTC:** RTC stands for real time clock and used to keep the system update with current time and date. This is one of the features of 8051, therefore only library and few commands are required to include RTC into the system. The Lithium cell of 3.3V is used to keep the time running.

**C. LIQUID CRYSTAL DISPLAY (LCD):** LCD in the proposed system is used to display the current time, time of intake of medicine and the name and group of medicine. A liquid crystal display is a flat panel display or other electronic visual display that uses the light-modulating properties of liquid crystals.

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**D. ALARM SYSTEM:** The alarm system consists of a buzzer. The buzzer used in proposed system is piezoelectric buzzer. A buzzer is a mechanical, electromechanical, magnetic, electromagnetic, electro-acoustic or piezoelectric audio signaling device. A piezo electric buzzer can be driven by an oscillating electronic circuit or other audio signal source. A click, beep or ring can indicate that a button has been pressed. The buzzer is also output device and gives a beep when current time meets the set time.

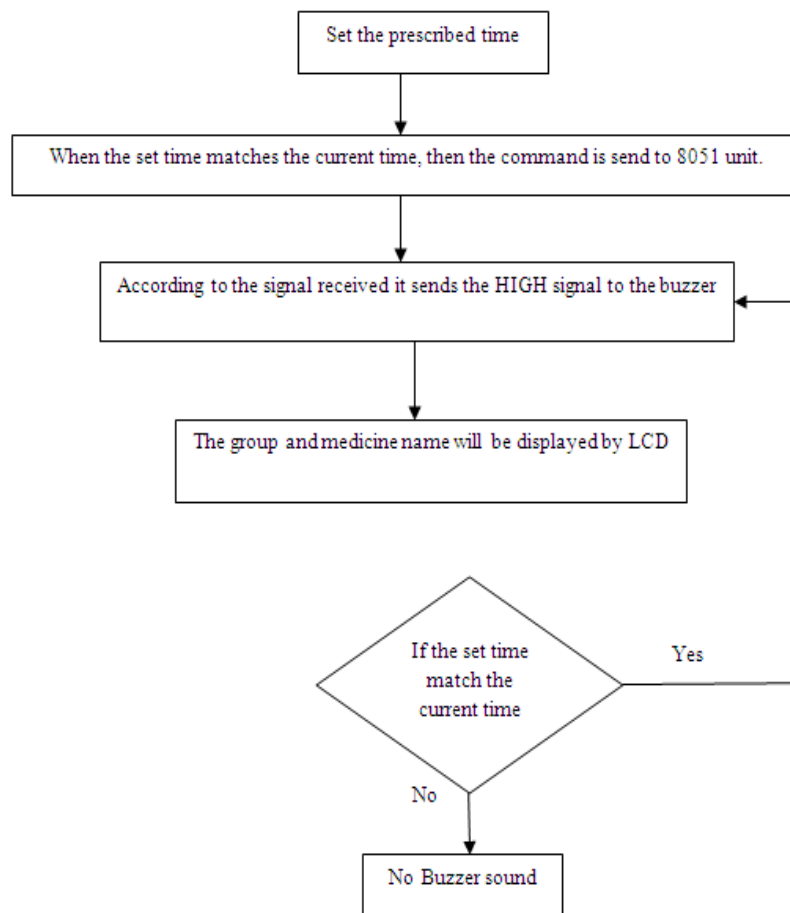


Fig-2 Flow chart for Proposed System

## V. CONCLUSION & FUTURE SCOPE

There are many systems which are helping for the same purpose. But these systems are problematic to use, non-mobile, expensive and complex process. The proposed system overcomes these problems. The 8051 Based Medicine Reminder is simple to use, affordable, better accuracy. This system is cooperative for every age group and can also be used in hospital for a group of people. This system will definitely reduce the bad effect caused due to wrong intake of medicine. This project in future may be more desirable via integrating it with GSM technology, in order that the affected person gets a reminder approximately the medication he has to take via SMS on his/her mobile phone. Also a provision to change the name of the drugs can be included by means of interfacing the device with a PC or EEPROM (non-volatile memory).



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## BIOGRAPHY



**R. Surender Reddy** having 5 years of teaching Experience, field of interest is Digital signal processing and VLSI system Design. Presently working as Assistant Professor in Department of Electronics and Communication Engineering, LORDS Institute of Engineering and Technology, Hyderabad.



**C. Niharika** presently pursuing B.Tech 3rd Year in Lords Institute of Engineering and Technology, Hyderabad, Telangana India.



**Rohit Sharma** presently pursuing B.Tech 3rd Year in Lords Institute of Engineering and Technology, Hyderabad, Telangana India.



**A. Bharath Kumar** presently pursuing B.Tech 3rd Year in Lords Institute of Engineering and Technology, Hyderabad, Telangana India.



**E. Narayana** presently pursuing B.Tech 3rd Year in Lords Institute of Engineering and Technology, Hyderabad, Telangana India.