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Smart Medication System For Elderly Care

[1]Archana M, [2]Aishwarya A, [3]Megha M, [4]Ashwini Patil

Abstract

This Paper introduces a remedy for the elder people who tend to forget their medicines to be taken on time we have designed and built a medication system, which will record the time of taking the medicine and accordingly will remind the elderly people to take medicine on time. It is more useful for the aged person who usually forget to take medicine and are prone to serious medication.

Keywords: Elderly care, Medication remainder system, Internet of things (IOT), GSM, and touch sensor etc.

Introduction

With the fast populace maturing that is happening around the world, there is expanding enthusiasm for "smart home" advancements that can help more established grown-ups to keep living at home with security and autonomy. Savvy home advancements are exceptionally effective and valuable for advancing freedom. Smart-home technologies are very efficient and useful for advancing freedom, wellbeing, prosperity and personal satisfaction, in more established grown-ups.

Maturity is a touchy stage; elderly individuals require care and solace to have a sound existence without stresses and tension. As an absence of mindfulness with respect to the changing behavioural examples in elderly individuals at home, henceforth this Smart Home innovation may help elderly individuals to upgrade, anticipate and remunerate the declining physical limits and along these lines empower autonomy. The dangers related with living alone might be diminished by the utilization of various savvy home advances at home. Utilization of brilliant home gadgets can advance autonomy levels of the elderly and enable more established individuals to stay at home by adapting to age-related challenges, for example, prescription administration.

To get greatest advantage from the medicines, it is essential to take them precisely as recommended by the doctor in truth possibility of better wellbeing result enhances when pharmaceuticals are taken as coordinated.

There is a great deal of reasons why elderly individuals disregard to take their medications legitimately. The most widely recognized reason is that they simply overlook, which appears to be sufficiently honest, according to the surveys the normal senior takes around seven distinct meds consistently, so it's little ponder that it can be hard to recollect and monitor them. Consistently, a great many senior residents are put in nursing homes since they didn't take the correct prescription at perfect time. What's more, it's anything but difficult to get befuddled if elderly need to take a ton of tablets at various time. A World Health Organization overview found that half of individuals who took drugs long haul took them erroneously. So in this paper a smart medication system is proposed which is so efficient that it can be used for both medicine remainder according to time and it also indicates which tablets are to be taken at that particular time.

Existing System

ArduMed - Smart Medicine Reminder for Old People. using the web application, or by using the mobile app. Useful resource for those who need technological help in completing or need help in working through day-to-day tasks and taking care of their health [1].

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Medication update and checking framework to secure wellbeing utilizing IOT. Control framework including sensors to observing and reporting weight the state of the surroundings Furthermore its connected control software, which consistently weigh those pharmaceutical taken Toward tolerant or not. RFID will be used on provide for exceptional ID number with client something like that that same time remote following the prescriber could recognize those tolerant for same page [2].

Solution update Also social insurance – a bisexuality provision radio-frequency ID number (RFID), alternately movement identification advances to guarantee that patients really take their medications. Those individual telephone notifications Furthermore reminders need aid a solid supporting device around clinched alongside enhancing prescription adherence methodologies [3].

Electronic solution update to more seasoned mature people. Working practice, perception Furthermore meeting of the elderly would conveyed out to fundamentally investigate those issue regarding the electronic prescription reminders items working practice, perception Also meeting of the elderly need aid conveyed out to principally investigate those issue regarding the electronic prescription reminders items [4].

Shrewdly bundling Also shrewdly medication box to solution administration towards those web of-things. Canny and intelligent bundling Also shrewdly prescription box. Those iMedbox ought further bolstering a chance to be secured with a locking system, making it approachable best Eventually Tom's perusing specified client [5].

Technology survey

From the technology survey [table1]. we proposed this system which is a combination of two technologies that is In-home device and mobile phone technology, which is very easy to handle by elderly people, as most of them stay in rural places they may feel uncomfortable to use the smart phones because of its apps and devices with more complications. So we directed the use of mobile phone technology to be handled by the care taker. So that after receiving the updated message from device the care taker can in turn help the elderly to remind about their medication.

Technology	Success Aspect	Criteria offering success
Mobile phone	SMS[6]	Short, simple, effective, inexpensive, personal
	Applications[3]	Variety of functions, graphic images, cheap
In-home device	Smart Home device[5]	Integration to smart homes, automated 24/7 monitoring, reduce labour costs, increase efficiency, data storage
	Automatic dispenser[7]	Standalone device, effective, multi-medication dispenser
	Video monitoring[9]	Virtual caregivers, increase social interaction
Portable device	Electronic pillbox[4,8]	Portable, suitable for non-tech-savvy people, easy to use
	Alarm Watch[6]	Small, portable, wearable

Table1: Technology survey

Components required

1. Arduino UNO

The Arduino UNO will be a microcontroller board in perspective of the ATmega328. It need 14 electronic input/yield pins (of which 6 camwoods be used Concerning illustration PWM yields), 6 straightforward wellsprings for info, a 16 MHz dirt resonator, An USB association, an energy jack, a ICSP header, furthermore a reset get. It holds All that needed on reinforce those microcontrollers; basically cohort it will a pc with a USB connection alternately control it for AC-to-DC connector or battery with start.

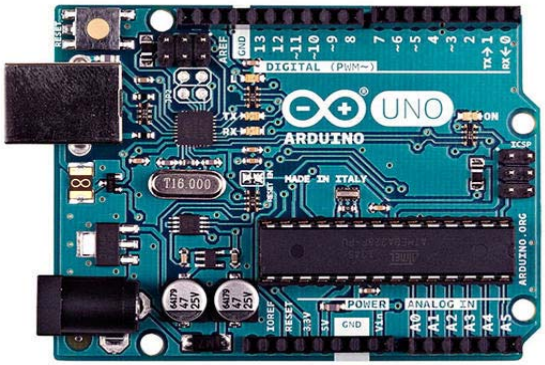

Figure1:Arduino board uno atmega 328

2. GSM module

The Arduino GSM shield v2 interfaces the Arduino to the web utilizing the GPRS remote system it permits an Arduino board to associate with the web, and makes or get voice calls and send or get SMS.

Figure 2: GSM module

3. Capacitive touch sensor

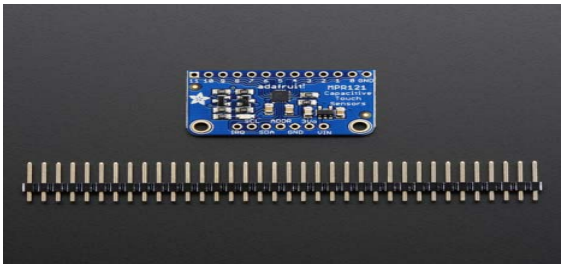

Figure3: Touch sensor

Capacitive sensor library transforms at least two Arduino pins into capacitive sensor which can detect the electrical capacitance of human body. All the sensor setup requires is a medium to high esteem resistor and a bit of wire and a little bit of aluminium thwart toward the end. Furthermore, its most delicate sensor will begin to detect a hand or body inches far from the sensor.

4. Real Time Clock

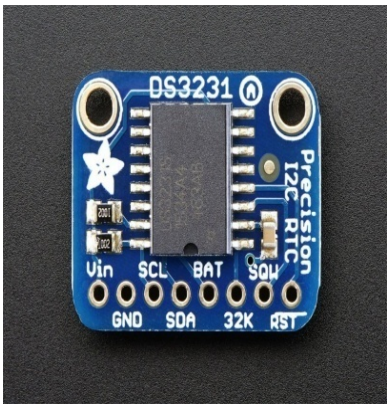

Figure4: Clock module

The DS3231 is an ease, to a great degree exact I2C continuous clock (RTC) with a coordinated temperature-repaid precious stone oscillator (TCXO) and gem. The gadget consolidates a battery input, and keeps up exact timekeeping when primary energy to the gadget is interfered. Exceedingly Accurate RTC Completely Manages All Timekeeping Function Real-Time Clock Counts Seconds, Minutes, Hours, Date of the Month, Month, Day of the Week, and Year, with Leap-Year Compensation Valid Up to 2100.

System architecture

The Arduino board is the microcontroller which is used to control the functioning of all components The touch sensor will be placed on the medicine box and the box contains different (inner boxes)partitions each would contain a different colour LED.The Real Time Clock(RTC) is used to provide a time based alarm for medication and according to time the alarm system reminds to take tablet and the LED lights are used which blink according to time in turn which indicates the particular tablets needed to be taken .The alarm rings 3 times with a delay of 5 minutes and simultaneously the touch sensor output will be recorded. If the sensor output does not become high within 15 minutes then this situation is captured to send the messages to the care taker that the elderly did not take the medicine on time, else if the touch sensor becomes high within 15 minutes this condition is captured to send a message to the care taker that the medicine has been taken by the elderly at specified time

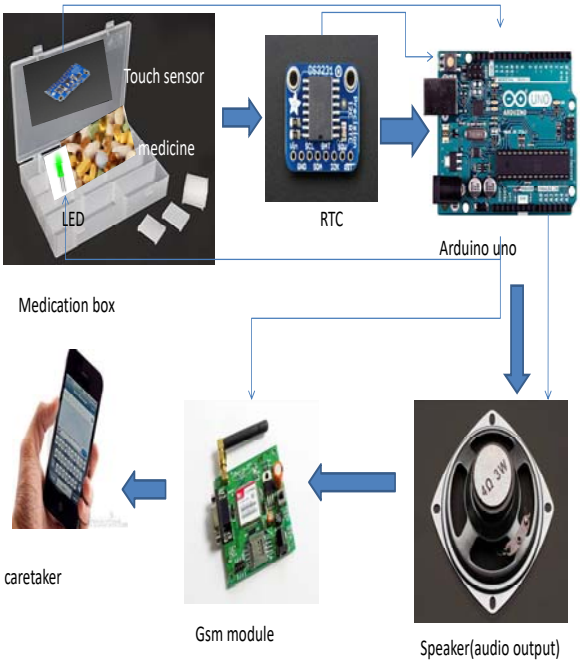

Figure5: Overview of the proposed medication system.

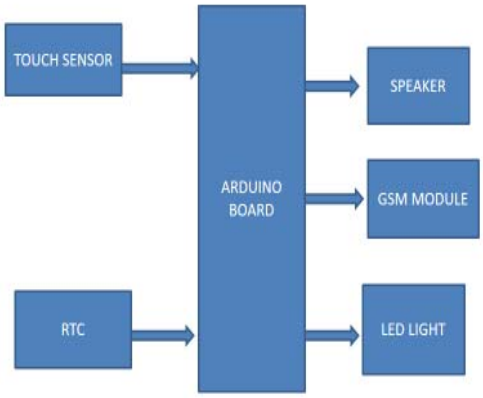

Figure6: Block diagram of system architecture

Design process

1. Alarm system

- The speakers are used to alarm the (elderly) the aged adults which reminds about the medicine in a timely manner.
- Here the alarm rings (which just speaks the given input string) according to time set in the program.
- The alarms will be triggered in a timely manner using real time clock (RTC).
- The alarm will be triggered three times with a time gap of 5 minutes this repeats for nearly 15 minutes.

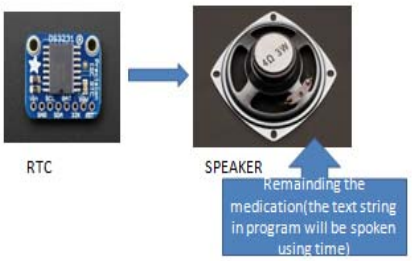

Figure7: Working of alarm system

2. Monitoring the elderly about their medication according to time

- An RTC is used to check whether the touch sensor that is placed on the medication box is triggered within 15 minutes.

3.Indication of whether the tablets are taken on time

- The LED lights are used to indicate whether the correct medicine is taken. This is done by partitioning the medicine box. Where the medicines will be place according to time and each partition will be containing a LED light which glows according to time, by which the elderly can take tablets easily without any confusion.

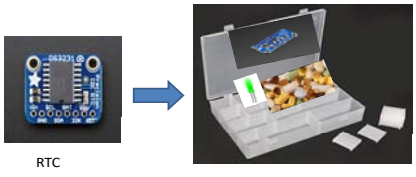

Figure8: Indication of whether the tablets are taken on time

4. Sending message to the caretaker

- If it triggers within 15mins. Message will be sent to care taker, that the elderly as taken the medicine.

➢ If the sensor is not triggered then the message will be sent to the caretaker, that the elderly as missed to take medicine along with the time (whether morning. Afternoon or evening).

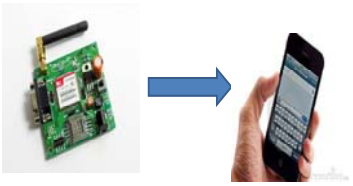

Figure9: Process of sending message to care taker.

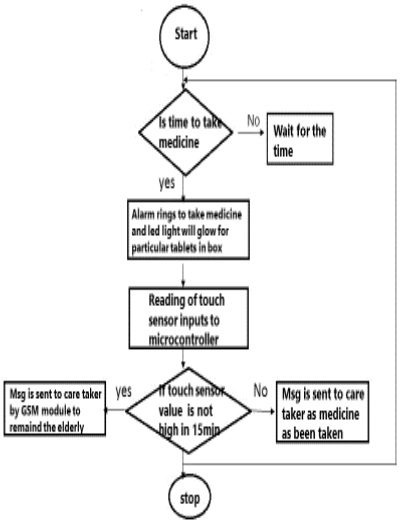

Figure10: Flowchart of medication system

Conclusion

In this paper we have proposed a smart medication reminder system which is very simple and easy for elderly to use. This system is an in-home device which reminds the elderly to take the medicines at correct time. It just reminds as well as it dodges from getting befuddled if elderly have a great deal of tablets to take at various circumstances. It also updates the caretaker about the aged persons about their medications. This is one of the comfortable device for elderly because it does not include much complications in its working. So that they can handle it easily. And the caretaker can be tension free about them, as it updates the messages time to time.

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Author's details

1. Student, Department of Computer Science, T. John institute of technology, Karnataka, India, archanamo1996@gmail.com

2. Student, Department of Computer Science, T. John institute of technology, Karnataka, India, a.aish1997@gmail.com.

3. Student, Department of Computer Science, T. John institute of technology, Karnataka, India, megha7m@gmail.com

4. Assistant Professor, Department of Computer Science, T. John institute of technology, Karnataka, India, ashwinipatil@tjohngroup.com