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Low Powered IOT Enable Smart Medicine Pill Box Using ESP 8266

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Abstract: ***There can be a lot of individuals out there who need constant help – may it be our elderly people, family members, the ones who have special needs. These people apparently need the kind of care which most busy family members cannot provide. Some people may forget to take the medicines at the correct time and can forget the medicines which they have to take. So in order to help them with this liability we have developed this project. The people are provided a smart med box on which there will be a display which notifies the people about the medicine. Along with this we can alert them with an alarm and light indications. So that even if the person is sleeping or busy with some work the alarm helps in alerting him. to confirm that the person has taken that medicine or not we can put one button at the opening end of the pill box. so when the person tries to open the box the button is pressed and the alarm will be off only if the buzzer is pressed by this data we can tell that the person has taken medicine. It comes with one more feature that when the person is feeling uneasy or in case of some emergency he can notify the people by pressing the button on the device. There are different buttons, one is used to notify the doctor and the other one is used to notify family members about the emergency.***
Keywords: (IOT, Nod MCU, ARDUINO, Voltage Controller).

I. INTRODUCTION

For India the estimated figures would be 4,00,000 deaths due to Adverse Drug reaction (ADRs)720,000 Adverse Drug Event (ADEs)per annum, Rate of increase of ADRs is 6.7%ADEs prolong hospital stay by 2 days and increase in cost by 5000 INR. For preventable ADEs, the figures are 5days and 10,000 INR Serious ADEs-the figures are around 25000 INR Capturing and sharing of vital data of the network connected devices through a secure layer is what defines IOT. In simple terms Internet of things can be defined as the network of devices which are connected to each other to share information data in order to communicate and produce new information so as to record it for future use. Collection of real-time data and recording data base of patients has become easy.

II. METHODOLOGY

This project 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 project will help peopleprovide information about the patient's status whether he has taken the medicine or not. In this era, it is difficult for the family members to be present all the time for the aged. Today, most of the families in our society are a nuclear family. Elderly prefer staying independent, but it is a worry for their children. 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.

A. Literature Review

In a study of over 3500 prescriptions, the use of drugs was unnecessary in 47 per cent, irrational in 19 per cent and hazardous in 11 per cent. Approximately 30 percent of hospital admissions of **older adults** are **drug related**, with more than 11 percent attributed to medication no adherence and **10–17 percent** related to adverse drug reactions (ADRs) Looking in to the data we found that most of the deaths are caused due to negligence of patient or caretaker some patients couldn't afford a care taker so taking care of the cost effectiveness we came up with the idea to make a Pill reminder which is low on cost and easy to be handled by an average intelligent patient

B. Discreption

9V supply is applied to the bridge rectifier Bridge rectifier having LM7805 converts it into 5V supply .This voltage is supplied to microcontroller LED, buzzer, are connected to the microcontroller .Buzzer is connected to D7LED will be connected to D1-D D4. Dosage of medicine will be set through timer Alarm will be set for timing at which medicine is to be taken As soon as the medicine box is turn don, the algorithm will ask for the time at which the patient needs to be given his/her medicine. The time is set using a webpage/app into the microcontroller. Using the RTC the microcontroller will monitor the current time. It will check for the condition that the current time is equal to the condition is true. The medicine box will send a notification and at the same time, the front display LED and BUZZER will be turned on for 30 sec.

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The box will open the particular section of the box allocated to the patient/user. The box will be open about 60 sec and then the section will be closed, also it will store data as DOSAGE TAKEN. It will then go back to monitor the current time. If the condition is false and 30 sec after the notification was send are completed the LED and BUZZER will be turned off. It shall then check for the current time is equal to set time + 5 minutes, if the condition is true, the patient user will receive the second reminder. The LED and BUZZER will be turned on again for 30 sec. The controller shall check for detection of RFID TAG. If detected, it will follow the procedure of opening the box of the particular patient/user and storing the data. Even after waiting for 60 sec the RFID TAG is not detected the data would be stored as DOSAGE MISSED. After that,the controller will again go back to monitor the current time until the set time of other patient is achieved. The process is then repeated for other patient/user.

BLOCK DIAGRAM

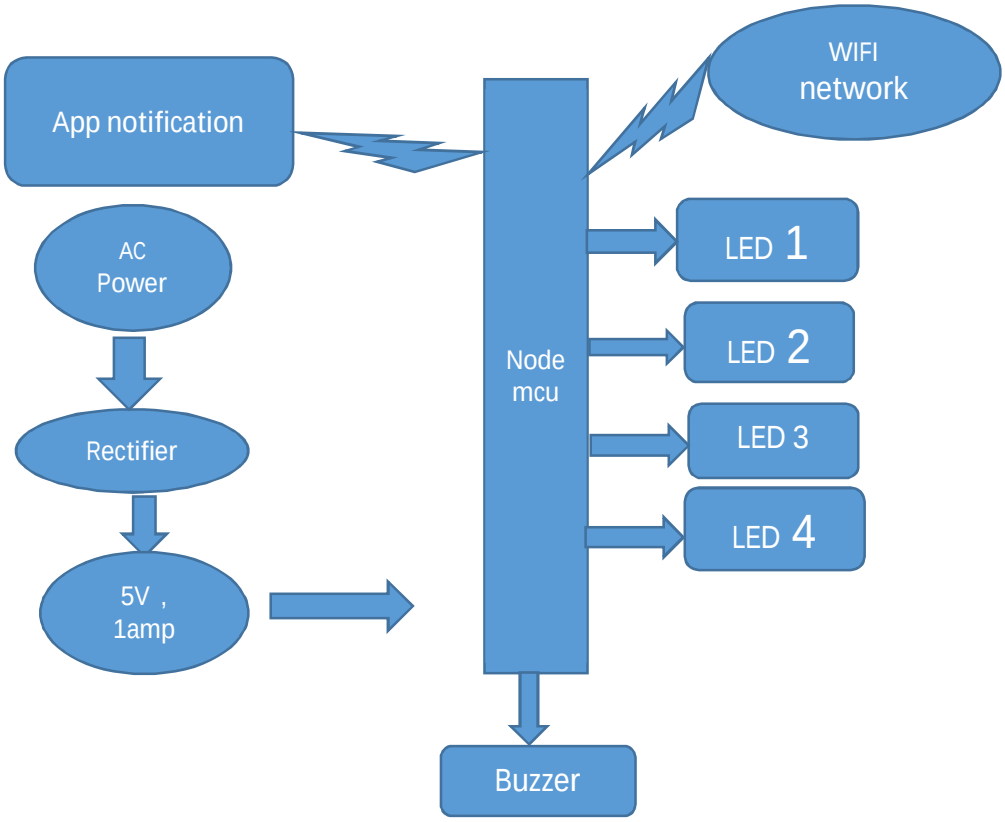


Figure1: Block diagram of System

C. Arduino IDE Arduino

The Arduino is a flexible platform with great ability to interface to most anything. It is a great platform to learn first and perfect for many smaller projects. The Raspberry Pi is good for projects that require a display or network connectivity. It has incredible price/performance capabilities. The Beagle Bone is a great combination of some of the interfacing flexibility of the Arduino with the fast processor and full Linux environment of the Raspberry Pi (more so in fact

ARDUINO IDE ARDUINO is an open-source prototyping platform based on easy-to-use hardware and software. The ARDUINO Integrated Development Environment - or ARDUINO Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the ARDUINO and GENUINO hardware to upload programs and communicate with them. Android Studio Android is a software platform and operating system for mobile devices, based on the Linux kernel, and developed by Google and later the Open Handset Alliance. It allows developers to write managed code in the Java language, controlling the device via Google-developed Java libraries. The unveiling of the Android platform on 5 November 2007 was announced with the founding of the Open Handset Alliance, an association of 48

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III. MODELING AND ANALYSIS

A. Proposed Method

To ensure the people consume medicines as per schedule time table, here we developed a smart pill box. The schedule data/configuration data is send to the pill box through Mobile app. The smart pill box contains Node MCU, OLED display, LEDs, buzzer, buttons. The OLED are used to display the commands in pill box by Node MCU. Node MCU is inbuilt with Wi-Fi module. The Wi-Fi module is configured as PILL BOXAP, such that the IP address is generated in local network. by pairing the IP address generated by PILLBOXAP to the Mobile App. The configuration data is send to the smart pillbox when the configuration is in ON mode. The concerned LED glow with buzzer at schedule The configuration data from Mobile App is send to the EEPROM with an IP address and to cloud platform. The configuration data checks with the automated time and matching data will respond to the glow of LED and buzzer. By resetting the button the tablet details are uploaded to the cloud platform and excel sheet is provided to know the consumption detailed number of tablets consumed by a person. If the person or elderly people doesn't reset button at schedule time the alert/SMS is send to the user.

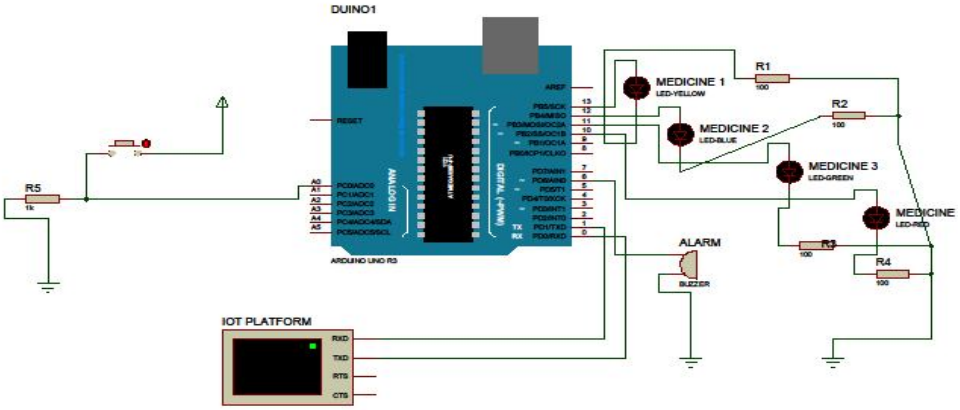


Figure2: Development Board

IV. RESULTS AND DISCUSSION

The project work that we focused on overcoming/modifying of above cases Our design contains separate boxes for different medicines with LED glowing at indicated timings This device contains a set of 4 box for different medicines App notification will help patients to recall its dose We click The middle button "MEDICINES" to write the medicine that the patient take. After that we go to the last button "SET ALARM" to set alarm on the time we need there are a lot of tunes and if we forget to set the alarm and clicked go out the device gives us warning message like that.

V. CONCLUSION

Looking in to the data we found that most of the deaths are caused due to negligence of patient or caretaker some patients couldn't afford a care taker so taking care of the cost effectiveness we came up with the idea to make a Pill reminder which is low on cost and easy to be handled by an average intelligent patient Usually normal dosage is of three times a day with different tablets at equal interval of 8 hours or 12 Hours They made a pill box for a week with 7*4=28 small boxes with each day having its own 4 boxes. In this scenario a caretaker would fill the pill box for a week with required dosage and number of medicine in each box. This case was of weight based E Pill observer or reminder It would be a simple box containing pills and would notify when there is an over dosage or failed to take a medicine, by variation of weight in the box. Different kind of medicines would have different boxes. This design was much mechanical based so not preferable for long period

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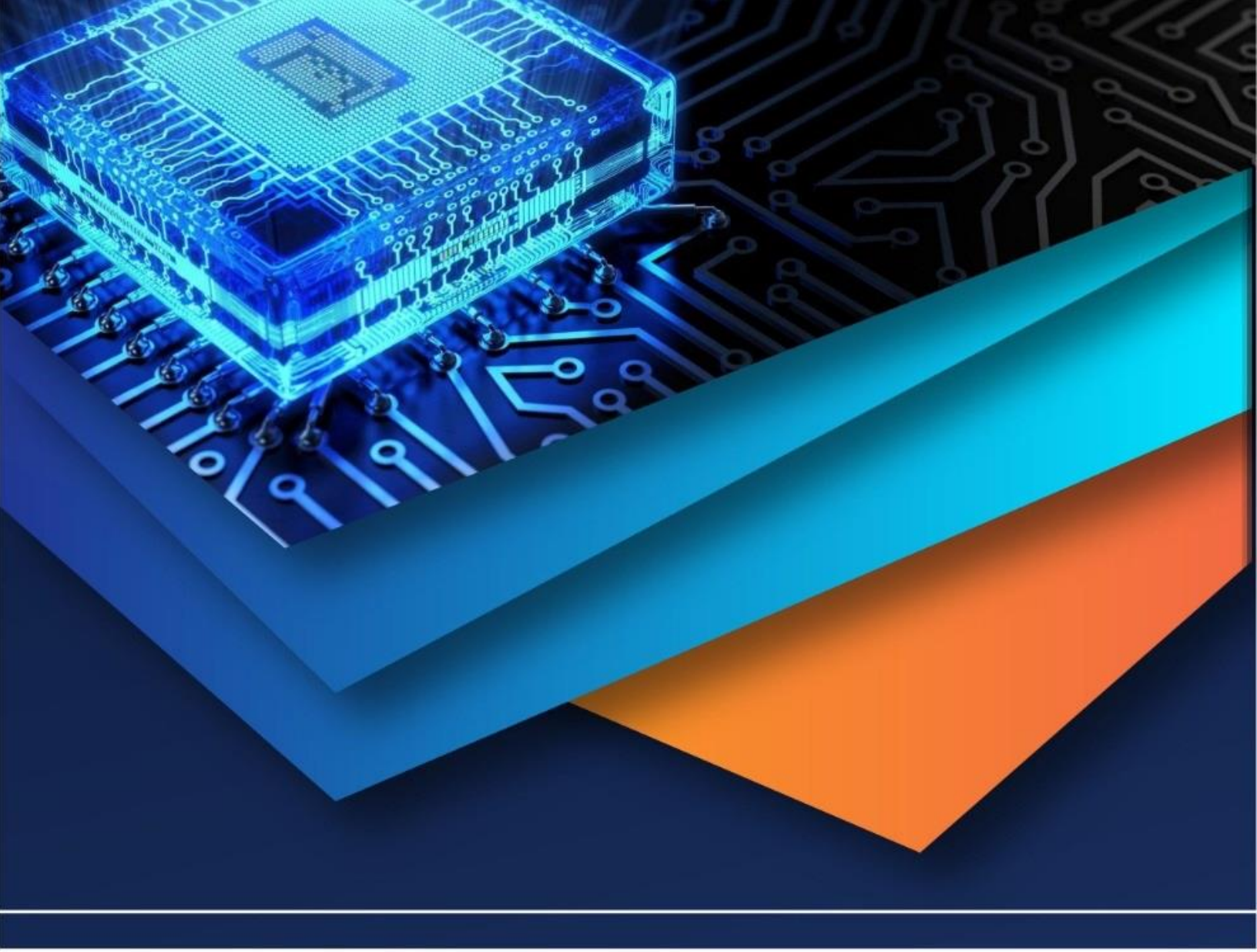
VI. FUTURE SCOPE

This project would help to decrease the number of deaths due to human error It is specially designed for old age patients who suffer from diseases like Alzheimer's, Diabetes, COVID 19..etc..According to a Business Insider report, the market for IOT healthcare technology will rise to $400 billion by 2022. Such growth will be due to the increasing demand, the improvement of 5G connectivity and IOT technology and the growing acceptance of healthcare IT software. The plans of tech giants like Apple, Google and Samsung to invest in bridging the gap between fitness

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