Automated Wi-Fi controlled Medicine absorb scheduler for elderly people

Anirban Ghosal[1], Moumita Pal[2], Sattwama Basu[3], Rahul Debnath[4],

Ramesh Kumar Yadav[5], Salma Hasan[6], Bijeta Lama[7], Papai Ghosh[8]

[1,2,3,4,5,6,7,8]Electronics & Communication Engineering/JIS college of Engineering/MAKAUT/India

ABSTRACT

Nowadays, due to our extremely busy schedule and also the soaring prices of medical services, it is near to impossible by mediocre people to pay for 24/7 home surveillance of their aged or specially challenged loved ones [6]. Because of our busy work lives, we can't dedicate enough time to their care [5]. Also, in times like a pandemic, many people have to be home quarantined. Taking care of them remotely without getting infected is a challenge. So, this leads to a really big problem. However, with "Wi-Fi based automated medicine reminder machine" we can take care of our patients from afar. Our proposed system involves connection between a blink app with a microcontroller paired with a GSM module, which connects the user with his or her patient. The app will provide time to time reminder to the patient to take a certain medicine in due time [3]. Upon taking the medicine, the app will send a message to the user stating that the patient has taken the medicine. This way one can take care of their patients without being physically available.

Keywords: Arduino UNO, GSM Module, Blynk App, Audio Recorder.

I. INTRODUCTION

In this era, accessing electronics systems using Wi-Fi is very popular. One most popular application is in home automation systems. Nowadays to keep up with our busy lives, automation is a must. Hence the popularity of Wi-Fi based systems is enhanced [4][7]. In our proposed system, we focus on the use of Wi-Fi in providing reminder for medicines. The proposed model enables users to improve health related risks and reduce healthcare costs by reminding to take medicines at time [8]. With the help of this proposal, the time of patients and doctors are saved and doctors can also help in emergency scenario as much as possible. The proposed outcome of the project is to give proper and efficient medical services to patients by reminding them when to take medicines [1][9]. The prototype system could be divided into the following modules. Firstly connection of blink app with the ESP8266 model using Wi-Fi so that the user can send signals as to when the reminder is to be triggered, and secondly connection between the ESP8266 module with the recording module and speaker so to blurt out the recorded message when the user sends signal, connection of ESP8266 with GSM module to send back a confirmation message to the user that the medicine has been taken. Patient monitoring and management in critical care environments such as the ICU 's, SICU 's and ANCU 's involve estimating the status of the patient and reacting to events that may be life threatening. It is impossible to keep a tab on every patient throughout the day. New solutions are needed in this field to help the doctors and the nursing staff to monitor the patients. A critical element of this is the medicine administration and monitoring. This has been achieved by the patient medicine reminder system. This system consists of Arduino, GSM Module, Recording Module. This system is driven by a program that inputs predefined parameters which is processed based on the input variables entered via a user interface app such as the Blynk app. The logic for the processing is built into the embedded program to initiate the alert through an audio alarm. Not only does it have an alarm system, but also gives confirmation when medicine is taken at specified time.

II. PROPOSED PROTOTYPE AND SCHEMATIC APPROACH TOWARDS SYSTEM MODIFICATION

In our proposed system, the user has to install blynk app in his/her phone. By design, Blynk user can run ESP8266 boards with either WIFI or GSM/GPRS by using different sketches, and have to upload / update firmware to change. This library enables user to include both Blynk GSM/GPRS and WIFI libraries in one sketch, run both WIFI and GSM/GPRS simultaneously, or select one to use at runtime after reboot. This is the new library, adding to the current Blynk_WiFi Manager. It's designed to help us eliminate `hardcoding` of our Blynk credentials in `ESP8266` boards using GSM shield (SIM800, SIM900,etc). Blynk was designed for the Internet of Things. It can control hardware remotely, it can display sensor data, it can store data, visualize it and do many other cool things. Fig1 is showing Blynk app interfacing with NodeMCU.
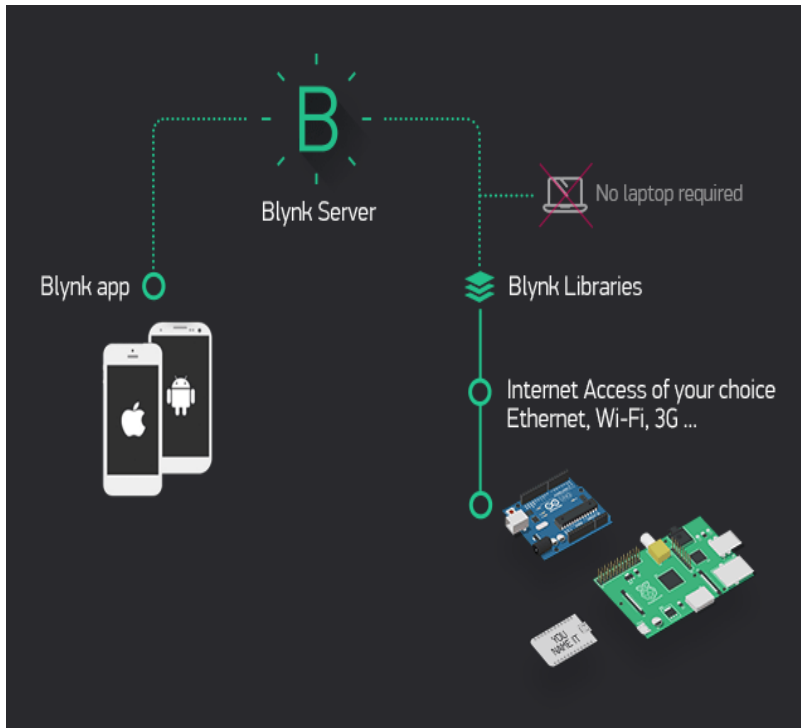
Fig. 1: Blynk app interfacing with Node MCU

The blink app is connected to the ESP8266 microcontroller which is set in the room of the patient. Fig 1 is showing the block diagram of our proposed medicine reminder system.
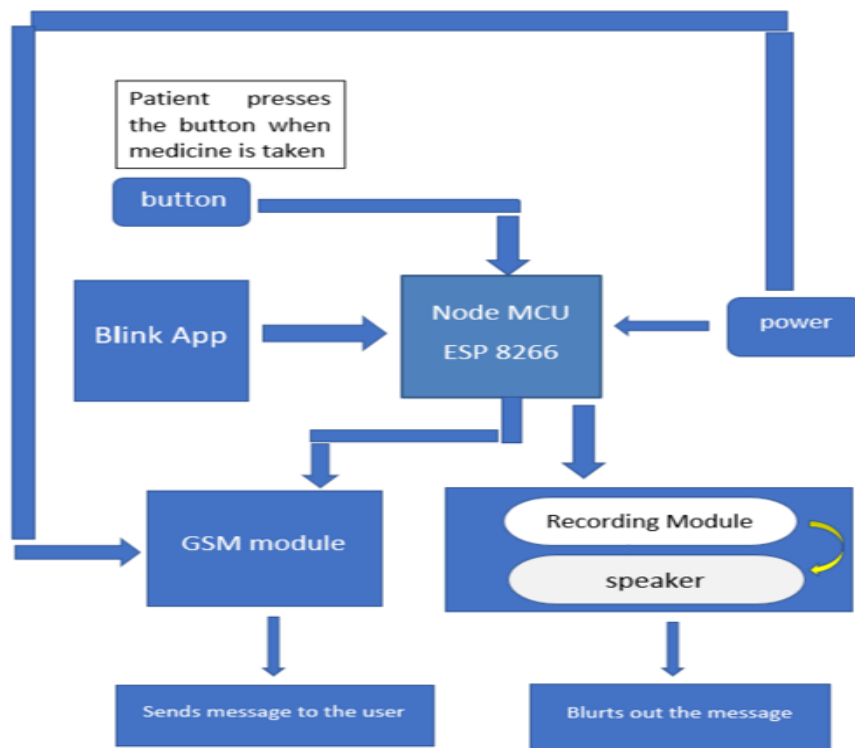

Fig 1: Block diagram of our proposed medicine reminder system

The user can be present anywhere in the world and still be connected to the patient this way. When the user presses a button on the blink app and sends a signal to the ESP8266 microcontroller, a pre-assigned pin in code becomes high. This switches on the recording module. A message is already pre-recorded in the module that reminds the patient as to what medicine to be taken now [2]. The recording module is connected with a speaker. The speaker blurts out the recorded message. This alerts the user in time. The user then takes the necessary medication as per instructions. The user then presses a switch on the circuit that is connected with a certain pin on the microcontroller. The pin becomes high.
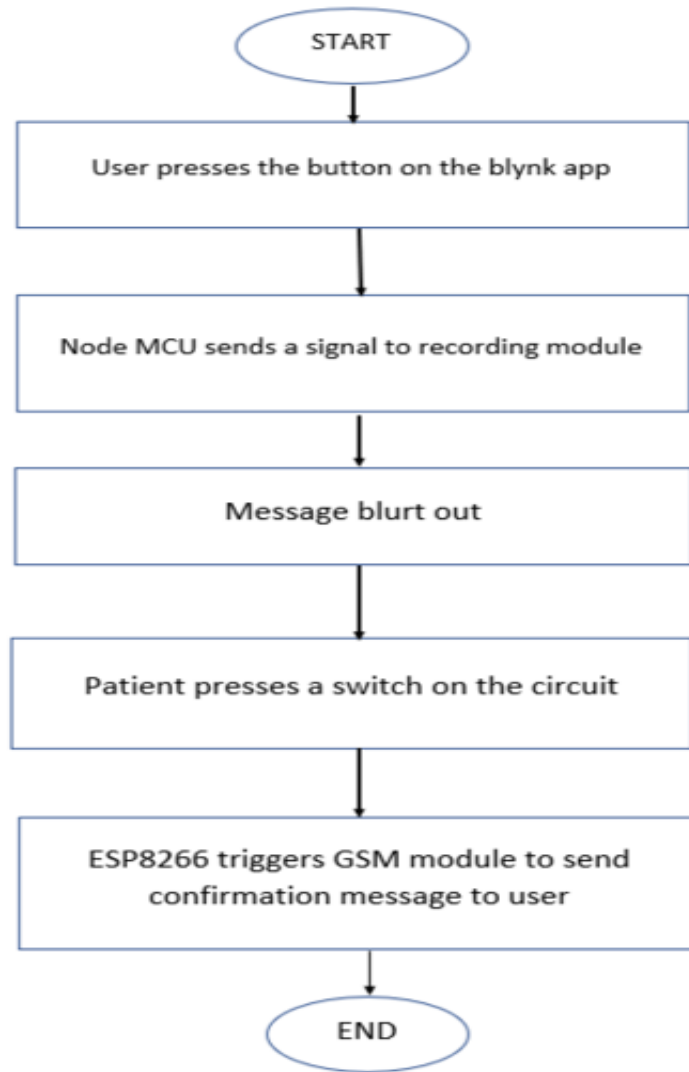

Fig 3: Flow chart

Fig. 3 displays the Flow chart of the system. The ESP module is pre-programmed such that when the PIN is high, it commands the GSM module to send an SMS message to the user. The user gets a confirmation message as is pre-programmed in the controller.
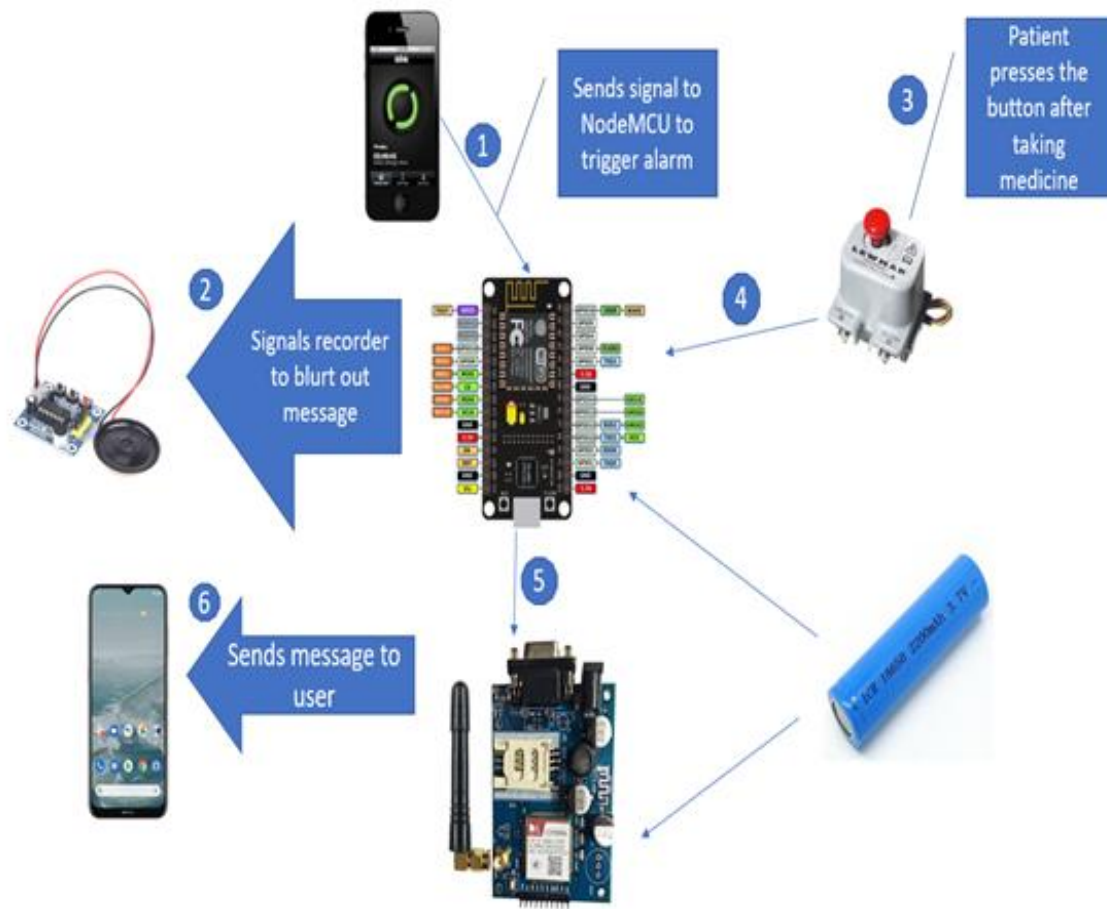
Fig 4: Functionality of Proposed idea with all elctronic components neede to implent the system

The above represents the whole process along with the actual images of the components. The flow of process is with the flow of the numbers marked on the arrows and follows the pattern of 1->2->3->4->5->6.

III. CONCLUSION

The Conclusion of this paper is to eliminate the nearly impossible and costly routine of monitoring patients and elderly peoples' medication. We can express our care punctually by pressing a button from afar with an app via a signal to the processor. The message we would like to convey is announced through a speaker with a recording module consisting of the recorded voice message installed in the room of the Patient. Then after intake of the medicine in exchange a button is clicked to activate the GSM module to send a message to us. This easy-to-use device can be a   convenient option for households where family members have work-hour compulsions or are compelled to keep a nurse for the member with medical complications. By improving the previously automated medicine reminders which would include automation provided by Arduino following a certain algorithm with requirement of regular updating as per the medical changes of the patient we have come up with this project. This Project also has room for more updated automation if any is made in the future.

REFERENCES

[1]. Tsai PH, Shih CS, Liu JWS (2011) Mobile reminder for flexible and safe medication schedule for home users.

[2]. Bhandane Ashwini, Kale Sapna, Bhuse Ishwari, Pawar Pallavi, P.N. Achaliya. International Journal of Computer Applications (0975 – 8887) International Conference on Recent Trends in engineering & Technology - 2013(ICRTET'2013) Line 1-25

[3]. Deepti Ameta, Kalpana Mudaliar and Palak Patel,MEDICATION REMINDER AND HEALTHCARE – AN ANDROID APPLICATION International Journal of Managing Public Sector Information and Communication Technologies (IJMPICT) Vol. 6, No. 2, June 2015, pp 39,40

[4]. Kumar SB, Goh WW, Balakrishnan S (2018) Smart medicine reminder device for the elderly. In: 2018 Fourth international conference on advances in computing, communication & automation (ICACCA), pp 1

[5]. Suwanthara J, Noinongyao A, Vittayakorn S (2019) WiseMed: medication reminder for seniors. In: 2019 23rd International computer science and engineering conference (ICSEC), pp 409–414

[6]. Jabeena A, Sahu AK, Roy R, Basha N (2017) Automatic pill reminder for easy supervision. In: 2017 International conference on intelligent sustainable systems (ICISS), pp 630–637

[7]. Ulloa GG, Hornos MJ, Dominguez CR, Coello MF (2020) IoT-based smart medicine dispenser to control and supervise medication intake. Intell Environ 28:39–48

[8]. Chawariya A, Chavan P, Agnihotri A (2019) Fundamental research on medication reminder system. Int Res J Eng Technol (IRJET)

[9]. Park K, Lim S (2012) Construction of a medication reminder synchronization system based on data synchronization. Int J Bio-Sci Bio-Technol 4:1–10.