



A SMART MEDBOX FOR ELDERLY PEOPLE USING IoT

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ABSTRACT

In elder people as age ascends the capability of remembering things subsides. So that, they won't follow regular medication. The presence of care taker cannot be expected at every time. Health of elders deteriorate.

An IoT application in the health platform is proposed here, which involves LEDs and Buzzer to indicate the variations in medicine slot like counting the number of tablets a patient is consuming, alarms gives alert at set reminder time. A mobile application is used to feed scheduled data or doctors prescription in smart medbox.

KEYWORDS : Medbox, Node MCU, buzzer, Reset Button, Mobile App

INTRODUCTION

Currently, worldwide aging and regularity of persistent diseases are flattering a broad concern. Numerous countries are undergoing hospital restructuring by reducing number of hospital beds and escalating home healthcare, which is envisioned to perk up health care quality, has fascinated wide-ranging attention. In order to track the physical status of the elderly and, in the meanwhile, to keep them healthy, the proposed idea will be helpful. IoT expands the Internet into our everyday lives by wirelessly connecting various smart objects, and will bring significant changes in the way we live and interact with smart devices. The new wave in the era of computing will be outside the sphere of the conventional desktop[1].

Internet of Things (IoT) is a network where many of the objects that surrounds us will be networked in one form or another. By using this technology the health statistics of medication are observed. In this process of encryption the schedule data or doctor's prescription are sent to medbox through mobile app. The LEDs are placed for indication and buzzer for alarm alerts and reset button is used to count for medicine in cloud platform. The existing techniques to the market for the reminder include a medbox. But this does not help in checking the medicine. This proposed idea is valuable solution to the medical non-compliance problem. The innovation scheme to help patient keep trail of their medicine consumption through a series LED alarm indicator signal and audio alarm indicator signals[2].

The main objectives of the project are:

- I. Dispense of medicines from Medbox at scheduled time.
- II. Medical alerts to care taker and retailer
- III. Online report generation of medicine
- IV. Real-time health statistics monitoring of medicines
- V. Configuration data is send through mobile app

INTERNET OF THINGS

The Internet of Things (IoT) is an important topic in technology industry, policy, and engineering circles and has become headline news in both the specialty press and the popular media. This technology is embodied in a wide spectrum of networked products, systems, and sensors, which take advantage of advancements in computing power, electronics miniaturization, and network interconnections to offer new capabilities not previously possible. An abundance of conferences, reports, and news articles discuss and debate the prospective impact of the "IoT revolution"- from new market opportunities and business models to concerns about security, privacy, and technical interoperability[3].

IoT systems like networked vehicles, intelligent traffic systems, and sensors embedded in roads and bridges move us closer to the idea of "smart cities", which help minimize congestion and energy consumption. IoT technology offers the possibility to transform agriculture, industry, and energy production and distribution by

increasing the availability of information along the value chain of production using networked sensors. However, IoT raises many issues and challenges that need to be considered and addressed in order for potential benefits to be realized[4].

HARDWARE COMPONENTS

- I. Medbox
- II. Node MCU
- III. Multiplexer
- IV. Reset & Configuration Switch
- V. LEDs & Buzzer

Node MCU (ESP8266-12E)

ESP8266 is an impressive, low cost WiFi module suitable for adding WiFi functionality to an existing microcontroller project via a UART serial connection. The module can even be reprogrammed to act as a standalone WiFi connected device—just add power! The feature list is impressive and includes: 802.11 b/g/n protocol Wi-Fi Direct (P2P), soft-AP Integrated TCP/IP protocol stack As shown in FIG[1].



Fig 1: ESP8266-12E board Description

PROPOSED METHOD

To ensure the elderly people consume medicines as per schedule time table, here we developed a smart Medbox As shown in FIG[3]. The schedule data/configuration data is send to the Medbox through Mobile app. The smart Medbox contains Node MCU, multiplexer, LEDs, buzzer, reset button and configuration switch As shown in FIG[2].

SMART MEDBOX

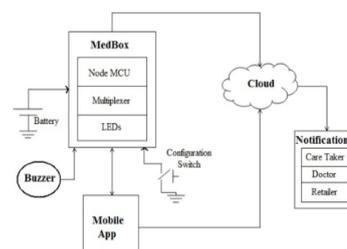


Fig 2: Working Principle of Smart Medbox

The multiplexer are used to connect LED's in Medbox by Node MCU. Node MCU is inbuilt with wi-fi module. The wi-fi module is configured as MEDBOXAP, such that the IP address is generated in local network. By pairing the IP address generated by MEDBOXAP to the Mobile App. The configuration data is send to the smart Medbox when the configuration is in ON mode. The concerned LED glow with buzzer at schedule time As shown in FIG[4].

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 As shown in FIG[6] and excel sheet is provided to know the consumption detailed number of tablets consumed by a person As shown in FIG[5]. If the person or elderly people doesn't reset button at schedule time the alert/SMS is send to the user.

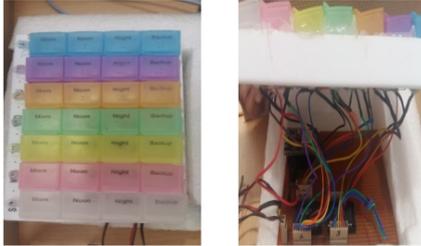


Fig 3: Medbox with hardware connections

SOFTWARE TOOLS

- I. Arduino IDE
- II. Android Studio(Mobile App)

I. Arduino IDE

Arduinio is an open-source prototyping platform based on easy-to-use hardware and software. The Arduinio Integrated Development Environment - or Arduinio 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 Arduinio and Genuino hardware to upload programs and communicate with them.

II. 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 hardware, software, and telecom companies devoted to advancing open standards for mobile devices.

III. Web Application: Webpage client side and server side coding. Client side coding is used to design frontend of web page it involves following languages.

- 1)HTML
- 2)Jquery
- 3) Server side

RESULTS



Fig 4 Indication of slot in MEDBOX

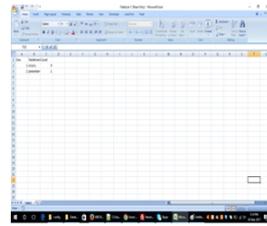


Fig 5: Detailed no of tablet consumed by a Person in cloud



Fig 6: Medicine information in cloud platform

ADVANTAGES

- I. Monitoring of health statistics Medicine, alarms and medication non-compliance control.
- II. Emergency and medical management services.
- III. Wireless identifiable Embedded healthcare systems.

CONCLUSION

Integrating of Hardware modules Node MCU ,multiplexer, Buzzer, push Button and Mobile application to MedBox and every module has been placed carefully to give resonated output, thus contributing to the best working of the unit. Secondly, using highly advanced hardware with the help of growing technology, the Smart MedBox showing significant without any deviation. Thus the MedBox has been successfully designed and tested.

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